
**WATERLOO REGIONAL POLICE SERVICE**

# FINAL REPORT

# PLANNING FOR A NEW & EXPANDED PUBLIC SAFETY COMMUNICATIONS CENTER

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APEXPRO CONSULTING INC.

MAY 28, 2019

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May 28, 2019

David Bishop
Inspector, Police Facility Project
Waterloo Regional Police Service
200 Maple Grove Road
Cambridge, ON N3H 5M1

Dear Inspector Bishop:

PLANNING FOR A NEW & EXPANDED PUBLIC SAFETY COMMUNICATIONS CENTER

It is with great pleasure that we submit this report on the above project. Our findings are discussed at length in the body of the report, while our recommendations are summarized below.

- Preliminary plans for the 3rd floor of the former courthouse building show an available program area of 14,819 SF. This figure falls far short of the total floor area requirement for all communications functions under consideration, which is 21,253 SF on the 3rd floor. For this reason, our report examines three alternative options.
- We favour Option 1 “911/Police & Fire Dispatch” as the preferred program co-location option. This option excludes paramedic communications services and ROW SFCC.
- We also favour Option 3 “911/Police & Fire Dispatch plus Paramedic Communications”. WRPS and Region of Waterloo may wish to consider deferring a decision for 6-12 months until the Province affirms its intentions as they relate to possible uploading of paramedic services into Ontario's health care system.
- For reasons set out below, we do not favour Option 2 “911/Police & Fire Dispatch plus ROW SFCC”.
- Operationally, in our opinion, Option 2 is not a good fit for the former courthouse building. There is no interaction with public safety functions. SFCC requires its own distinct technology systems; and downside challenges include space and additional costs to segregate portions of the building, and to implement access and security.

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Planning for a New & Expanded Public Safety Communications Center

- Based on current building drawings there will not be enough program area space on the 3rd floor to accommodate all functions proposed under Option 2, and the arguments cited above may become mute points.
- We estimate Option 2's floor area shortfalls at about -524 SF in 2021, -2,482 SF in 2031 and -3,602 SF in 2041 – albeit they could become worse if municipal and regional call centers are consolidated by the current provincial review.

Thank you for giving us the opportunity to work on this most interesting assignment.

APEXPRO CONSULTING INC.

Marvin Rubinstein
President

Enc.

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# Executive Summary

## Project Objectives

Region of Waterloo (ROW) has purchased the former provincial courthouse building at 200 Frederick St. Kitchener. The building is being re-purposed to house Waterloo Regional Police Service (WRPS) Central Division, and a new and expanded communications center that will be situated on the 3rd floor.

On March 1, 2019 WRPS engaged APEXPRO Consulting Inc. to provide planning services and advice regarding what communications functions are best suited to the new communications center space.

Specifically, the project scope is to:

1. Investigate the range of communications functions that may be therein housed, including contemporary design and growth requirements for the next 20-25 years.
2. Assess whether the former courthouse building is suitable to accommodate the communications functions under consideration.
3. Assess whether the existing 911 communications center in WRPS headquarters at 200 Maple Grove Road, is suitable to function as a back-up emergency communications center.

## Communications Functions that are Being Considered

The new communications center is intended mainly, to replace the existing 911 communications center in WRPS headquarters at 200 Maple Grove Road, Cambridge. Managed by WRPS, the 911 communications center serves as primary Public Safety Answering Point (PSAP) for Region of Waterloo.

The existing 911 communications center was constructed over 25 years ago based on design standards that currently are outdated. It presently operates at maximum capacity and there is no room within WRPS headquarters to expand the center for growth or to overhaul its design to contemporary standards.

The new communications center will also include a Real Time Operations Center (RTOC) whereby, police dispatch will be enhanced by video surveillance and business intelligence systems to ensure that police resources and responses to policing emergencies are effectively managed in real time.

The new communications center may also include the following additional public safety communications functions – this, on a co-located basis.

- Fire communications (a secondary PSAP) which would be relocated from its present location in Kitchener Fire Department headquarters at 270 Strasburg Road, Kitchener.

- Paramedic communications service (another secondary PSAP) which would be relocated to the Frederick St building – should future provincial government decisions allow for, or mandate municipalities to assume land ambulance communications services responsibility.

It also has been proposed that ROW Service First Call Center (SFCC) be re-located to the former provincial courthouse building; this, for the following reasons. The current SFCC facility at 131 Goodrich Drive, Kitchener, is overcrowded. There is not enough space to accommodate all customer service representatives, some of whom must work off-site. Nor is there space at the current facility for expansion to accommodate future growth.

### Fully Integrated Public Safety Communications

Current PSAPs are staffed with well trained dedicated employees. Regardless, their current separation (physically, technologically and governance) hinders interoperability, coordination and emergency response times.

For these reasons WRPS, Region of Waterloo, its Paramedic Service and locally based fire departments have for many years advocated for eventual consolidation to a fully integrated public safety communications system.

Co-location of Fire and Paramedic communications services with 911/police dispatch would be a significant step toward a fully integrated public safety communications system.

This notwithstanding, neither Kitchener Fire nor the province (MOHLTC) has yet committed to relocation.

### What Does Co-Location Mean?

Within the context of this project co-location is intended to mean the following.

- Public safety communications functions are situated in a secure purpose-built communications center
- Call takers and dispatchers are co-located in a contiguous space, which will enable eventual transition to a fully integrated public safety system
- Agencies manage own services; whereas, a fully integrated public safety system has one governance structure and mandate.
- Each agency employs own staff and communicators are not cross-trained. In full integration, there is one employer and some staff are cross-trained.
- Public safety communications functions share common CAD-COM systems.
- Agencies maintain own off-site backup communications centers; whereas in full integration, there is one backup center.

## Main Assumptions Underlying Our Assessment

Population growth is the primary driver of communications services demand. Call volume projections for Region of Waterloo are based on the provincial "Places to Grow" population forecasts.

Resourcing needs are predicated on call volume, and on design and performance metrics derived from a survey of contemporary facilities managed by peers, including RTOC managed by York Regional Police Services and the Niagara Ambulance Communications Service.

Additional square footage that may be needed to make layouts work in an "existing" building – the issue being that efficient design configurations may not be achievable (due to existing building infrastructure), resulting in wasted space.

Specifics concerning wasted space are difficult to ascertain prior to building 'detailed design', which is still several months away. We addressed this by adjusting most floor area estimates by +20%.

## Floor Area & Capital Cost Estimates

Floor space requirements and capital costs for all communications functions that are being considered for co-location at the former provincial courthouse building, are discussed extensively within Section 7 of this report and in Appendices A to C. Listed below are our principal findings:

- The total floor area requirement for all communications functions under consideration is estimated at 22,903 SF (21,253 SF on the 3rd floor and 1,650 SF on the 2nd floor).
- Capital cost at move in (in or about 2022) is about $21 million in current 2019 dollars. Capital cost at full build out in 2041 is about $23 million.
- Costs include technology infrastructure for the building, e.g.: Motorola radio reconfiguration, redundant Bell 911 trunk, network connections, UPS, firewall infrastructure, and security and access control. They also include technology costs to outfit 911 Communications and RTOC.
- Costs exclude technology for Fire Dispatch, Paramedic Communications Services and ROW SFCC. It is assumed that these services will determine their own technology costs during their respective re-location planning.

## Floor Area Assessment – All Functions

Preliminary plans for the 3rd floor of the former courthouse building (per Exhibit 8.1) show a floor area of approximately 14,819 SF of potentially available program area for the proposed co-located communications center.

This includes a relatively large contiguous floor space area of 8,020 SF and two smaller contiguous floor space areas of 5,234 SF and 1,565 SF.

Our assessment concludes that the potentially available program area falls short of the total floor area requirement by about -2,972 SF in 2021, -5,308 SF in 2031 and -6,434 SF in 2041.

### Program Co-Location Options

In consideration of the above noted floor area shortfalls, we investigated the following alternative options.

**Option 1 - 911/Police & Fire Dispatch**. *This option excludes paramedic communications services and ROW SFCC.*

- There appears to be enough program area space to accommodate a police and fire communications center's needs to 2041.
- In addition, the current floor layout (shown in Exhibit 8.1) should be capable of accommodating all police and fire call takers/dispatchers in a single contiguous space arrangement - as would be required for eventual transition to a fully integrated communications service.

**Option 2 - 911/Police & Fire Dispatch plus ROW SFCC**. *This option excludes paramedic communications services.*

- This option is intended to resolve a pressing space constraint at the current SFCC location.
- Operationally, in our opinion, it is not a good fit for the Frederick St location. There is no interaction with public safety functions. SFCC requires its own distinct technology systems; and downside challenges include space and additional costs to segregate portions of the building, and to implement access and security.
- Based on current drawings (per Exhibit 8.1), there will not be enough program area space on the 3rd floor of the building to accommodate all functions proposed under this option – and the arguments cited above may be mute points.
- We estimate floor area shortfalls at about -524 SF in 2021, -2,482 SF in 2031 and -3,602 SF in 2041 – albeit they could become worse if municipal and regional call centers are consolidated by current provincial review.

**Option 3 - 911/Police & Fire Dispatch plus Paramedic Communications**. *This option excludes ROW SFCC.*

- This option aligns to best practices for public safety communications.
- Based on current drawings (per Exhibit 8.1), there appears to be enough program area space on the 3rd floor of the building to accommodate the 2021 requirements for all functions proposed under this option.

- Small floor area shortfalls are forecast beyond 2021 – these, contingent on:
  - Actual population growth which may occur more slowly than presently anticipated – deferring shortfalls to later dates.
  - Transition to a fully integrated service (possibly within a few years) which will require less staff and floor area space than projected by this report.
- This option also is incumbered by tentative provincial uploading of paramedic services into Ontario's health care system, in which case there may be no need to plan for a future region-managed paramedic communications facility.

### Building Suitability for Use as a Comm. Center

Best practices suggest that emergency communications centers should be housed in secure purpose-built facilities. It is our understanding that in keeping with best practices, the 3rd floor of the former courthouse building is being re-furbished as a purpose-built facility to house a fully outfitted communications center of contemporary design and technology in a secure environment.

Additionally, Section 3 of this report presents a selection of attributes for contemporary communications center design; and Section 8.3 presents program co-location options and estimated floor space requirements.

Clear ceiling height is a key consideration. Contemporary communications centers are designed with a clear ceiling height of at least 9 feet – higher where feasible, for sound dampening, climate control and to accommodate large wall-mounted video screens. Analysis of current drawings for the former courthouse building suggests that a clear ceiling height of 10 feet should be achievable – perhaps higher, depending on final design.

Governance while housed in a police facility is another consideration. In the co-location model, governance should not be an issue since each agency will continue to manage their own communications service – albeit, clarity will be needed as it relates to such items as security, access, shared amenities, and cost apportionment.

In a fully integrated public safety communications (PSC) model, PSC serves as “provider” of emergency communications services for its clientele, i.e., police, fire and paramedic services. Best practices dictate that governance oversight of PSC should be by way of an executive level Committee or a Board of Directors that should include representatives of the respective agencies. In this arrangement, governance while housed in a police facility should not be an issue, if the clients (police, fire and EMS) abide by the terms of the arrangement.

Employee parking is another consideration - more specifically, lack of employee parking at the former courthouse building. For communications staff who for

many years have had access to free on-site parking at their communications center locations, this can be a sensitive issue. We understand that WRPS and Region of Waterloo are investigating the situation by way of a separate study.

## Recommendations

- In consideration of the above information, we favour Option 1 “911/Police & Fire Dispatch” as the preferred program co-location option. This option excludes paramedic communications services and ROW SFCC.
- We also favour Option 3 “911/Police & Fire Dispatch plus Paramedic Communications”. WRPS and Region of Waterloo may wish to consider deferring a decision for 6-12 months until the Province affirms its intentions as they relate to possible uploading of paramedic services into Ontario's health care system.
- For reasons set out above, we do not favour Option 2 “911/Police & Fire Dispatch plus ROW SFCC”.

# 1 Introduction

## 1.1 Project Objective

Region of Waterloo (ROW) has purchased the former provincial courthouse building at 200 Frederick St., Kitchener. The building is being re-purposed to house Waterloo Regional Police Service (WRPS) Central Division, and a new and expanded communications center that will be situated on the 3rd floor.

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3. Assess whether the existing 911 communications center in WRPS headquarters at 200 Maple Grove Road, is suitable to function as a back-up emergency communications center.

## 1.2 Project Background

The new communications center is intended mainly, to replace the existing 911 communications center in WRPS headquarters at 200 Maple Grove Road, Cambridge. Managed by WRPS, the 911 communications center serves as primary Public Safety Answering Point (PSAP) for Region of Waterloo.

The existing 911 communications center was constructed over 25 years ago based on design standards that currently are outdated. It presently operates at maximum capacity and there is no room within WRPS headquarters to expand the center for growth or to overhaul its design to contemporary standards.

The new communications center will also include a Real Time Operations Center (RTOC) whereby, police dispatch will be enhanced by video surveillance and business intelligence systems to ensure that police resources and responses to policing emergencies are effectively managed in real time.

The new communications center may also include the following additional public safety communications functions – this, on a co-located basis.

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- Paramedic communications service (another secondary PSAP) which would be relocated to the Frederick St building – should future provincial government decisions allow for, or mandate municipalities to assume land ambulance communications services responsibility. [1] [2]

It also has been proposed that ROW Service First Call Center (SFCC) be re-located to the former provincial courthouse building; this, for the following reasons. The current SFCC facility at 131 Goodrich Drive, Kitchener, is overcrowded. There is not enough space to accommodate all customer service representatives, some of whom must work off-site. Nor is there space at the current facility for expansion to accommodate future growth.

Current PSAPs are staffed with well trained dedicated employees. Regardless, their separation (physically, technologically and governance) hinders interoperability, coordination and emergency response times.

For these reasons WRPS, Region of Waterloo, its Paramedic Service and locally based fire departments have for many years advocated for eventual consolidation to a fully integrated public safety communications system.

Co-location of Fire and Paramedic communications services with 911/police dispatch would be a significant step toward a fully integrated public safety communications system. [3]

This notwithstanding, neither Kitchener Fire nor the province (MOHLTC) has yet committed to relocation.

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[1] Such a decision would likely result in a Region of Waterloo land ambulance communications service operating under contract to MOHLTC as presently is the case in Toronto, Ottawa and Niagara Region. Note however, the province may decide to go a different direction, as they have recently announced their intent to integrate emergency health services into Ontario's health care system – with details to follow.

[2] The former CACC based at 15 Reuter Drive, Cambridge was the primary ambulance communications service for ROW Paramedic Services. On December 17, 2018 MOHLTC suddenly announced that Cambridge CACC dispatchers have been relocated to Hamilton, due to an ongoing staffing shortage.

[3] Other advancements toward this target include Kitchener Fire Department's recent assumption of responsibility for all fire dispatching in Waterloo Region, March 25, 2019; and the Fire Department's recent transition to a common computer aided dispatch (CAD) technology platform for police and fire dispatch, which occurred on April 24, 2019.

## 1.3 Project Approach

APEXPRO carried out this assignment under the direction of a Working Group comprised of:

- David Bishop, Inspector Police Facility Project, WRPS
- Mark Bullock, Inspector Operational Support Division, WRPS
- Bob Hilhorst, Director Information Technology, WRPS
- Chris Gibson, Manager Facilities, WRPS
- Rene Van den Berg, Sr. Project Mgr, Facilities and Fleet Management, ROW
- Nick Walters, Project Engineer, Facilities and Fleet Management, ROW.

Our assessment is based on information provided by members of the Working Group; also, on information extracted from the following sources:

- Preliminary building plans for the former courthouse building prepared by Dialog Design (architects engaged by Region of Waterloo)
- Places to Grow Growth Plan for the Greater Golden Horseshoe, Ministry of Municipal Affairs, May 2017.
- “Public Safety Answering Point (PSAP) Consolidation Feasibility Report”, L.R. Kimball Consulting, May 2014.
- “Region of Waterloo Paramedic Services Master Plan”, ApexPro Consulting Inc., August 2016.
- “Implementation Report: Common Technology Platform for Police and Fire Dispatch in Region of Waterloo”, ApexPro Consulting Inc., April 2017.
- “WRPS Facilities Master Plan”, WalterFedy Architects, February 2018.

The assessment also included comparisons to contemporary emergency communications facilities managed by the peer services listed below.

| Police | Fire | Other |
|---|---|---|
| **Waterloo Regional Police Service** | **Kitchener Fire Department** | **ROW Service First Call Center** |
| Niagara, Halton and York Regional Police Services; City of Barrie Police Service; and OPP London | St. Catharines and City of Toronto Fire departments | Ambulance Communications Service managed by Niagara EMS |

# 2 Context

## 2.1 Current Stand-Alone Emergency Communications Arrangement

Region of Waterloo (ROW) consists of 7 unique and distinct local municipalities covering a combined area of approximately 1,370 square kilometres, currently housing a resident population of about 586,800 persons.

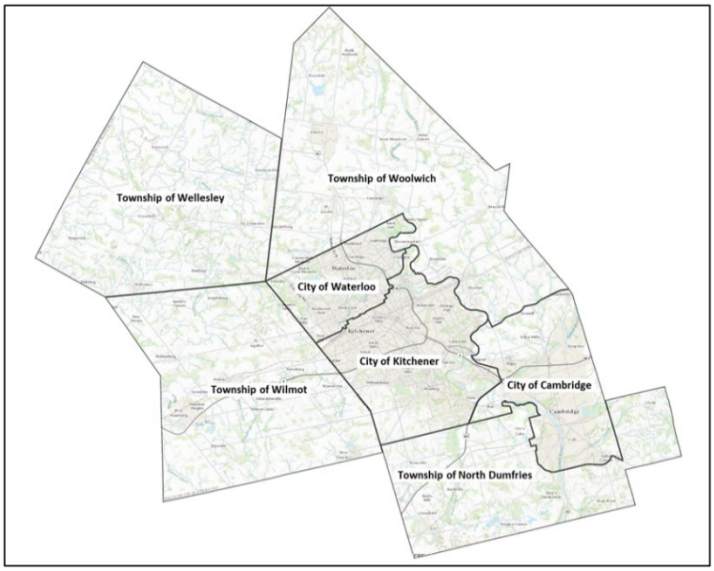
WRPS is responsible for policing operations throughout Region of Waterloo.

ROW Paramedic Services is responsible for emergency medical services throughout Region of Waterloo.

The seven constituent municipalities are individually responsible for Fire suppression services within their respective jurisdictions.

Kitchener, Cambridge and Waterloo fire departments are staffed by career firefighters. Wellesley, Wilmot, Woolwich and North Dumfries fire departments are staffed by paid-on call firefighters.

**Exhibit 2.1: Region of Waterloo**




Region of Waterloo is served by three (3) independently managed (stand-alone) emergency communications centers.

- The 911 communications center managed by WRPS serves as primary Public Safety Answering Point (PSAP) for Region of Waterloo. In this center, 911 call-taking and police dispatch are carried out on an integrated basis by WRPS communications personnel.
- Calls requiring a Fire response are routed to a secondary PSAP (communications center) managed by the Kitchener Fire Department.
- Calls requiring a ROW Paramedic Service response are routed to an alternate secondary PSAP managed by MOHLTC.

Providing continuous coverage by way of telephone, radio and computer aided dispatch (CAD) systems, WRPS communications personnel work diligently and

quickly to evaluate each incoming 911 call to determine the nature, location and urgency of each incident, and appropriate dispatch response.

WRPS communications personnel frequently stay on the line to monitor and support front-line responder activity, i.e., responding as requested with additional information, dispatching additional resources and when required, executing a coordinated multi-agency response.

The three PSAPs operate from separate locations. The 911 communications center is situated in WRPS headquarters, at 200 Maple Grove Road, Cambridge. Fire communications is situated in Kitchener Fire Department headquarters at 270 Strasburg Road, Kitchener. Paramedic Services communications is currently situated in the City of Hamilton.

Although each PSAP is staffed with well trained, dedicated employees that perform excellent work, their current separation (physically, technologically, and in terms of governance) hinders interoperability and coordination among emergency responder agencies and it can adversely affect response times.

For these and other related reasons WRPS, Region of Waterloo, its Paramedic Service and the locally based fire departments have for many years advocated for an eventual consolidation of emergency communications services to one fully integrated public safety communications system.

The following section of this report (Section 2.2) presents the main attributes of a fully integrated emergency communications service system. The attributes are derived from APEXPRO's prior research which includes consultations and site visits to multiple emergency communications centers.

Our assumptions pertaining to the co-location of public safety / public service communications functions as a step toward an eventual consolidation to a fully integrated public safety communications system, are presented in Section 2.3.

## 2.2 Fully Integrated Public Safety Communications System

Full integration is a configuration that is driven principally by a strong desire by emergency and protective services agencies (Police, Fire and Paramedic Services) to improve the quality and interoperability of public safety communications services.

In a full integration configuration, communications services are consolidated into a single 'public safety communications' operation, designed to operate in a manner that will respond efficiently and cost-effectively to the emergency dispatch needs of each agency.

The fully integrated service operates out of a single purpose-built communications center, under a single management structure, and mandate that have been defined by the participating agencies.

Governance oversight of the fully integrated public safety communications center operation is generally provided by way of an executive level Committee or Board made up mainly by representatives of the respective agencies.

Staff working at a fully integrated communications center are employed by the consolidated service (i.e., there is only the one employer) and the staff are represented by a single bargaining agent.

In a full integration configuration, some or all communications centre staff are cross trained to handle the call taking and dispatch functions of multiple agencies (i.e., 911, police and fire; 911, police, fire and paramedic services, etc). This enhances operational interoperability and provides flexibility for scheduling and for responding to unplanned workload variations.

A fully integrated service typically operates with a single CAD system designed to accommodate the requirements of the individual agencies, as they pertain to such items as information, security, confidentiality, etc.

A fully integrated service also operates with one communications system for radio, telephone and paging. They may however operate with separate RMS. It is essential that the service have access to round-the-clock IT technical support.

A fully integrated service also operates with one comprehensive set of procedures, which includes modules for quality assurance, risk management, etc. The communications training program of a fully integrated service covers the call taking and dispatch needs of all participating agencies.

To ensure uninterrupted communications services delivery, fully integrated centers are outfitted with technological redundancies, which may include such features as dual power supply, multiple telephone and data lines, etc. As further insurance, a fully integrated service will also have access to a fully outfitted off-site backup communications center.

## 2.3 Co-Location Proposal Assumptions

Presented below are our assumptions pertaining to the proposed co-location of public safety / public service communications functions at the former provincial courthouse building; this, as a step toward an eventual consolidation to a fully integrated public safety communications system.

### Occupancy

Occupancy is assumed to occur in or about 2022, this based on the 2018 WRPS Facilities Master Plan which tentatively suggests that construction will be completed in 2022.

### Governance

For “co-location”, each communications service will continue to be managed separately by the respective participating agencies, i.e.:

- WRPS will maintain accountability for 911 and police dispatch;
- Kitchener Fire will continue to manage fire dispatching;
- Region of Waterloo will continue to operate SFCC; and
- ROW Paramedic Services, under contract to MOHLTC, will manage ambulance communications services for Region of Waterloo.

Each participating agency will deliver the services per their respective mandates, using their own staff and operating procedures. Emergency communications center staff will not be cross trained to handle the call taking and dispatch functions of multiple agencies.

Emergency communications services are likely to evolve to shared CAD, radio and telephone systems.

During the “co-location” period each participating agency will continue to maintain their own off-site backup communications centers.

### Replacement Based on Contemporary Standards

We have assumed that each existing communications center will be re-located in their entirety, i.e., one-to-one replacement of communications workstations, offices, server rooms, storage areas, and amenities.

Further, that in conjunction with the planned re-location, unit floor area will be adjusted to contemporary standards (derived from peer surveys) and current deficiencies relative to contemporary standards will be rectified, i.e., with provision of floor area space for a meeting room, dedicated training room, quiet rooms, equipment storage, entry lockers, etc.

We have assumed that the meeting room will be sized to accommodate about 15 persons and that the dedicated training room will be outfitted for groups of about 15 students.

Further, we have assumed that each service’s floor area requirements will be adjusted to accommodate growth for the next 20-25 years – this, based on the future demand forecasts presented later in this report.

### Floor Layout

Since the long-term objective is an eventual consolidation to a fully integrated public safety communications system, we have assumed that all call taking and dispatch consoles for 911 and for police, fire and paramedic services emergency communications, will be co-located in a single contiguous space arrangement.

We have also assumed that SFCC customer service representatives will be co-located in a contiguous space arrangement of their own.

Related functional requirements, such as the following, may be situated in separate areas of the 3rd floor: offices, meeting rooms, training rooms, quiet rooms, filing, storage, kitchenettes, washrooms, entry lockers, etc.

We assume that all co-located communications services will have shared access to the new meeting and training rooms; also, to common amenities, i.e., kitchenette, washrooms and areas designated for entry lockers.

### Real Time Operations Center (RTOC)

Our assumptions pertaining to a proposed RTOC at the former courthouse building are based mainly on the RTOC managed by York Regional Police.

We assume that the proposed RTOC will be situated immediately adjacent to the emergency communications floor - this, to enhance interoperability.

Further, we assume that adjoining the RTOC there will be a separate working area in which personnel can assemble to manage a major occurrence when the need arises. The separate working area, which York Regional Police refers to as the Major Incident Support Center (MISC), will be outfitted with communications consoles and business intelligence systems like those in the RTOC.

The MISC managed by York Regional Police Services is situated adjacent to a relatively large meeting room, separated only by a panelled partition. The panelled partition can be opened when management of a major incident requires additional working area.

In lieu of the York Region approach, we assumed that if management of a major incident requires additional working area, then personnel will commandeer the on-site meeting room (which as we suggested above should be sized to accommodate about 15 persons).

### Servers & IT Support

As suggested by WRPS IT management, our analysis assumes that the Hexagon CAD servers (for 911, police, fire and potentially paramedic services) will remain at WRPS headquarters and be accessed by way of Bell fiber cable.

Our analysis also assumes that SFCC servers will remain at Region of Waterloo headquarters and be accessed by way of Bell fiber cable.

As suggested by client, our analysis also assumes that floor area provision will be made on the 2nd floor of the building to accommodate need for on-site data and communications network servers.

Similarly, provision will be made on the 2nd floor of the building to accommodate offices for 2 to 3 WRPS IT staff who will be stationed on the premises to provide round-the-clock emergency communications service support.

**Summary**

The main co-location proposal assumptions are summarized in Exhibit 2.2. The exhibit also shows corresponding attributes for full integration.

**Exhibit 2.2: Principal Co-Location Proposal Assumptions**

| | Full Integration | Co-Location |
|---|---|---|
| **Facility Arrangement** | Emergency communications services are co-located in a secure purpose-built communications center.<br>Call takers and dispatchers are co-located in a contiguous space arrangement. | Emergency communications services are co-located in a secure purpose-built communications center.<br>Call takers and dispatchers are co-located in a contiguous space arrangement. This will enable eventual consolidation to a fully integrated public safety communications system. |
| **Governance** | One 'public safety communications' governance structure and mandate. | Each agency manages own communications service using own (autonomous) governance structure and mandate. |
| **Staffing** | Staff are employed by the consolidated service, i.e., one employer.<br>Training program covers the dispatch needs of all participating agencies.<br>Some communicators are cross trained to dispatch multiple agencies. | Each agency employs own communications staff.<br>Staff are uniquely trained to deliver on their agency's responder needs.<br>Communicators are not cross trained to dispatch multiple agencies. |

| | Full Integration | Co-Location |
|---|---|---|
| **CAD-COM Infrastructure** | Consolidated service operates with one CAD-COM system. | Services may operate with own CAD-COM systems, or they may share one common system.<br>System(s) are supported by a common communications infrastructure (e.g., same 911 lines, radio towers, etc). |
| **Backup Solution** | Service maintains a fully outfitted off-site backup communications center. | Agencies maintain own off-site backup communications centers. |

## 2.4 Radio System Replacement

The Region of Waterloo voice radio system, EDACS, provides public-safety grade two-way voice radio communications for WRPS, municipal fire departments, and various other regional and municipal departments (principally Grand River Transit).

The radio system serves as the primary link between 911 dispatch and police and fire personnel for day-to-day communications and it provides critical interoperability between users during emergencies.

ROW Paramedic Services can access the Region's EDACS radio system but MOHLTC policy requires the Service to use the provincial FleetNet trunked radio system for service-related communications. The province's radio system is a Motorola Smart Zone Type II licensed to operate in the VHF radio spectrum.

The EDACS system was originally installed in 1994 and since then, it has undergone several upgrades to ensure optimum performance and coverage.

This notwithstanding, the system is past its end-of-life cycle. It will not accommodate NG911. Nor will it support contemporary standards for interoperable, digital public safety radio communications, i.e., Project 25 (P25) North American standards for public safety communication, established by the Association of Public-Safety Communications Officials (APCO).

Region of Waterloo has contracted Motorola Solutions Canada Inc. to plan, design and implement a full radio system replacement. The new radio system will take advantage of digital capabilities, provide increased functionality, and comply with P25 digital public safety radio communications standards.

# 3 Contemporary Design Attributes

Exhibit 3.1 (next page) presents a selection of attributes for emergency communications center design, based on our survey of contemporary facilities managed by peers. The attributes are also discussed below.

- Contemporary centers are designed to 'post disaster' and 'Accessibility for Ontarians with Disabilities Act (AODA)' standards.
- Contemporary centers incorporate natural lighting (windows).
- Contemporary centers are designed with a clear ceiling height of at least 9 feet. Higher ceilings are preferable - this, to facilitate sound dampening and climate control; also, to accommodate large wall-mounted video screens.
- Floor space currently averages 150 to 160 SF per communications console.
- Floors are typically raised 12-18 inches, or more, to accommodate power and communications cables.
- A raised platform for Communications Supervision is a matter of individual preference.
- It is essential that the center be outfitted with enough offices and space for servers and storage. However, these areas need not be situated in a contiguous arrangement immediately adjacent to the emergency communicators.
- Communications center staff should have access to a dedicated training room, meeting room, quiet room, and to such amenities as kitchenette / breakroom, washrooms and an area to store personal belongings (e.g., locker). These areas, some of which may be shared spaces, also need not be situated in a contiguous arrangement immediately adjacent to the emergency communicators.
- To ensure uninterrupted communications services delivery, contemporary centers are outfitted with technological redundancies such as dual power supply, and multiple telephone and data lines.

## Exhibit 3.1: Contemporary Attributes for Communications Center Design

| | WRPS | NRPS | HRPS | YRPS | BARRIE | OPP LONDON |
|---|---|---|---|---|---|---|
| Occupancy | Circa 1991 | 2016 | 2018 | Circa 2014 | Under Const'n | Under Const'n |
| Designed to Post-Disaster | Y | Y | Y | Y | Y | Y |
| Designed to AODA | N | Y | Y | N | Y | Y |
| Comm. Ctr. Ceiling Height (Ft) | 9.7 - 11.5 | 12 | 9 - 12 | 9 - 10 | 9.5 | 12 - 15 |
| Floor Space per Console (S.F.) | 90 | 150 | 150 | 130 | 160 | 150 |
| Windows | N | Y | Y | Y | Y | Y |
| Raised Platform for Supervisors | Y | Y | N | N | N | Y |
| Management Offices | 1 | 2 | 2 | 2 | Nearby | 4 |
| Trainer & QA Offices | Y | Y | Y | Nearby | Nearby | Nearby |
| Switchboard Room / Console(s) | Y | N | Y | Y | N | N |
| Briefing (Mtg) Room | N | Y | Y | Access | Access | Access |
| Training Room / # Students | Off Site (10) | Y (6) | Y (8) | Off Site (15) | Y (6) | Off Site (25) |
| Quiet Room | N | Y | Y | Access | Y | Access |
| Break Room / Kitchenette | Y | Y | Y | Y | Y | Access |
| Washrooms | Access | Y (3) | Access | Access | Y (1) | Access |
| Lockers / Cloak Closet | N | Lockers | Lockers | Cloak Closet | Lockers | Lockers |
| Telephone / Data Server Room | In Ctr. | Nearby | Nearby | Nearby | Nearby | Nearby |
| IT Systems Support | Nearby | Nearby | Nearby | Nearby | Nearby | Nearby |
| Storage Space | N | Y | Nearby | Nearby | Nearby | Nearby |

Legend: “Y” stands for yes. “N” stands for no. “Nearby” means that space is provided for the specified use – but the space is situated outside the area dedicated to the communications function. “Access” means that shared space is available for the specified use. That space is also situated outside the area dedicated to the communications function.

# 4 Existing Communications Centers

Brief overviews of the public safety / public service communications centers currently serving Region of Waterloo are presented below.

## 4.1 911 Communications (WRPS)

The 911 communications center in WRPS headquarters at 200 Maple Grove Road, Cambridge, was constructed over 25 years ago, in or about 1991.

The center area totals approximately 3,600 SF, with about 1,565 SF dedicated to the communications floor functions.

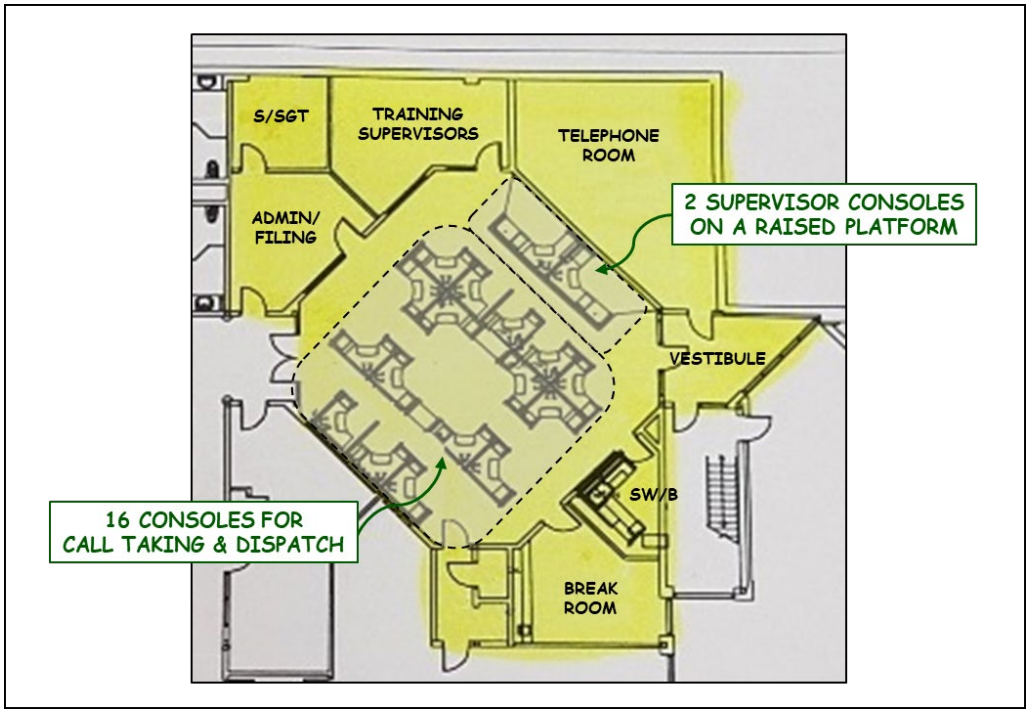
The center is outfitted with a total of 18 communications consoles, which include: 16 for call taking and dispatch, and 2 for on-duty Supervisors.

As shown by Exhibit 4.1, ancillary spaces include Staff Sergeant office, Training Supervisors' office, switchboard room, break room, and telephone server room.

The communications floor is situated roughly 12 inches above a concrete sub-floor. Supervisors are situated on a platform elevated some 8 inches or so above the communications floor.

The ceiling height within the communications area is about 9.7 feet about the room's periphery, and 11.5 feet in the center of the room.

**Exhibit 4.1: Existing 911 Communications Center Layout**



### Technology

The center is equipped with a leading-edge computer aided dispatch (CAD) system manufactured by Hexagon (formerly Intergraph), with interfaces to:

- E911
- Integrated GIS/mapping
- GPS/AVL for vehicle and asset tracking
- Radio console
- Mobile wireless mapping, data and messaging
- Text/alphanumeric paging
- Integrated Niche records management system (RMS).

The technology systems are managed and maintained by WRPS IT personnel (i.e., analysts, programmers, technicians and administrators) whose range of expertise includes computers, networks, software applications, business systems, data security, and mobile workstations.

### Communications Staffing

The center is staffed with about 100 personnel, as listed below:

- Inspector
- Staff Sergeant
- 2 Training Supervisors
- 81 Communicators (70 full-time and 11 part-time)
- 10 Supervisors (consisting of 5 Sergeants and 5 Constables)
- 6 Switchboard Operators (3 full-time and 3 part-time).

The communications center operates 24/7/365 on shifts of 8.5 to 10 hours' duration. Typical staffing per shift is 13 persons, which includes: 10 communicators, 2 supervisors and 1 switchboard operator.

### Current Challenges

The center is staffed with well trained, dedicated employees that perform excellent work. This notwithstanding, as discussed below, there are several reasons to consider replacing the existing 911 communications center.

- The center was constructed over 25 years ago based on design standards that currently are outdated, e.g.: not designed to AODA standards; also, the center is overcrowded with floor space averaging 90 SF per communications console – compared to contemporary centers which are designed at about 150 to 160 SF.

- The center currently operates at maximum capacity and there is no room within existing WRPS headquarters building to expand the center for growth or to overhaul its design to contemporary standards.

- With many concurrent activities, the center can get noisy, as was the case during our site visit (i.e., ineffective sound dampening).
- Climate control within the center is also an issue, with some console locations subject to cold drafts while others are overly warm.
- In contrast to contemporary standards, the center lacks natural lighting (i.e., no windows). There is no quiet room. There is no meeting room for staff meetings. Trainers' office doubles as a meeting room. The center lacks storage for administration and equipment. There's no area to store coats and personal belongings and consequently, such items are strewn about individual workstations.
- There is no on-site area for communications training. Group training is conducted off-site, at WRPS Central Division, 134 Frederick St., Kitchener. The training room, commonly referred to as the Annex, is outfitted to accommodate groups of about 10 students at a time. The Annex also serves as the backup 911 communications center.
- One-on-one training is conducted on the communications floor amid communications center activities. Two consoles are occasionally seconded for one-on-one training, thus reducing the overall number of consoles for 911 call taking and dispatch to fourteen.
- Occasionally there are not enough consoles to fully accommodate shift changes.
- Management are considering a change in shift length to 12 hours duration (up from the current 8.5-10 hours), which would be more consistent to police communications peers. An additional 3 communicator consoles will be needed to support a near-term change in shift length to 12 hours. There are not enough communications consoles or floor space within the existing center to support this change.

## 4.2 Fire Dispatch

On March 25, 2019 the Kitchener Fire Department (KFD) assumed responsibility for all fire dispatching in the Region. Prior thereto, KFD dispatched fire resources north of Highway 401 and Cambridge Fire Department dispatched fire resources to the south.

On April 24, 2019 KFD transitioned to a common computer aided dispatch (CAD) technology platform for police and fire dispatch. The CAD, manufactured by Hexagon (formerly Intergraph), is managed by WRPS.

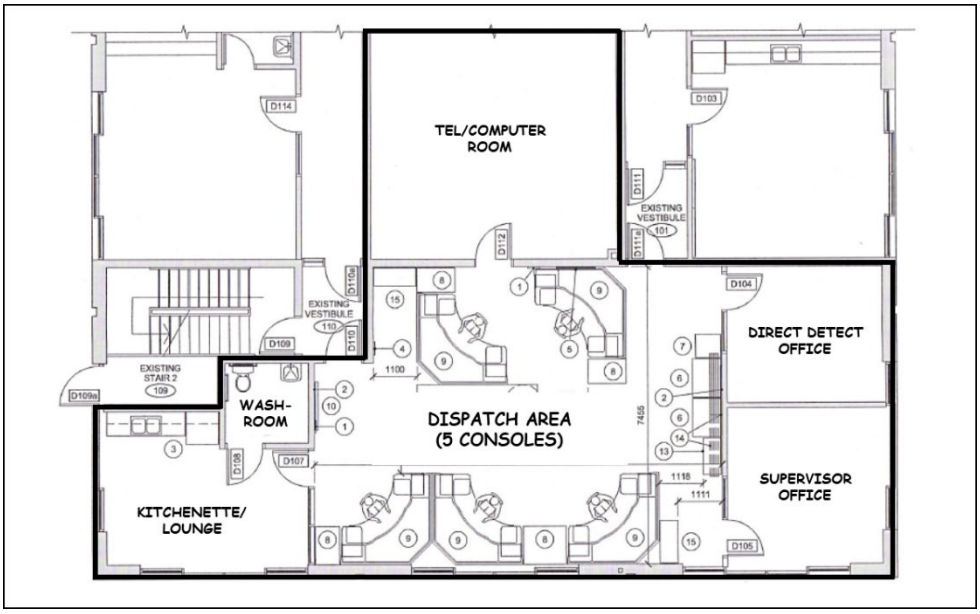
The fire communications center is situated in KFD headquarters, at 270 Strasburg Road in the City of Kitchener. We estimate that the center occupies about 1,800 SF, with about 800 SF dedicated to the communications floor.

The center is outfitted with a total of 5 communications consoles - 4 for call taking and dispatch and 1 for the Supervisor.

As shown by Exhibit 4.2, ancillary spaces include Supervisor's office, Direct Detect office, washroom, kitchenette/lounge, and telephone/computer room.

The communications floor is situated roughly 18 inches above a concrete sub-floor. The ceiling height within the communications area is about 10 feet.

**Exhibit 4.2: Existing Fire Communications Center Layout**




## Technology

Each communications console is equipped with telephone call taking; radio dispatch; and Hexagon CAD system with integrated GIS/mapping interface for call handling and incident management.

Most fire calls are routed from the primary PSAP at WRPS, whereas requests for medical assistance are received directly from the MOHLTC-managed CACC; this, based on pre-defined tiered response criteria.

KFD communications center is equipped with a CAD-to-CAD interface that enables automatic transfer of EMS calls originating north of Highway 401. KFD has asked MOHLTC to extend this interface capability to south of Highway 401. Currently, KFD receives those requests by telephone.

Fire station alerting is by way of a stand-alone Zetron base paging system. The system provides audible alert tone and dispatch announcement. Paid-on call firefighters are paged out using portable pagers capable of text messaging.

For CAD support, KFD relies on WRPS IT personnel. For other IT, support is provided by systems personnel internal to the organization, the City's corporate IT, and technology vendors.

**Communications Staffing**

The communications center is staffed with about 20 personnel, including Manager, Supervisor, and 18 Communicators (16 full-time and 2 part-time).

The center operates 24/7/365. Day shifts are of 10 hours duration. Night shifts are 14 hours. Minimum staffing per shift is 3 communicators.

**Additional Observations**

The center is staffed with well trained, dedicated employees that perform excellent work.

The center was recently overhauled to accommodate the additional communications infrastructure needed to dispatch fire resources south of Highway 401.

This included replacement of all console furniture. The new furniture is manufactured by Bramic Creative Business Products Limited, a leading supplier of high-quality sit/stand height adjustable furniture console systems. The consoles include the following comfort features: personal storage, personalized environmental control, and individual task access lighting.

The floor area conforms to contemporary standards. We estimate the floor space to be 150 to 160 SF per communications console.

The center benefits from natural lighting (windows). Communications personnel have access to shared headquarter space including meeting rooms.

The above notwithstanding, potential shortcomings include:

- Kitchener Fire headquarters was constructed about 20 years ago (circa 1999) and does not conform to AODA standards.
- The communications center lacks storage for administration and equipment.
- While KFD advises that the center can accommodate additional growth in call volume, our analysis (in Section 6.3 of this report) indicates that additional center space / consoles will be needed to accommodate service demand growth over the next 10-15 years.

## 4.3 Paramedic Services Communications

MOHLTC manages a province-wide system of Central Ambulance Communications Centers (CACC) that are responsible for dispatching municipal paramedic services.

The former Cambridge CACC situated at 15 Reuter Drive, Cambridge, was the primary ambulance communications service for ROW Paramedic Services. The Cambridge CACC also dispatched land ambulance services for portions of Oxford, Wellington and Dufferin counties.

On December 17, 2018 MOHLTC suddenly announced that Cambridge CACC dispatchers have been relocated to Hamilton, due to an ongoing staffing shortage.

APEXPRO's assessment assumes that a future provincial government decision may allow for, or mandate municipalities to accept land ambulance communications services responsibility. Such a decision would likely result in a Region of Waterloo land ambulance communications service operating under contract to MOHLTC as presently is the case in Toronto, Ottawa and Niagara Region. [4]

To such ends, we have further assumed that space will be allocated within the former courthouse building to accommodate co-location of a communications center for ROW Paramedic Services.

For this functional planning study, APEXPRO did not endeavor to replicate the dispatch arrangement at the former Cambridge CACC – this, mainly because of the staffing shortcomings which, as demonstrated by MOHLTC's recent action, have posed an insurmountable challenge to resolve.

Instead, we adopted as surrogate, the dispatch arrangement used by Niagara EMS in its operation of a contracted land ambulance communications service to MOHLTC.

The Niagara service, commonly known as Niagara Ambulance Communications Service (NACS), was chosen for its similarities which include serving a comparable call volume; also, because of its reputation as a forward-looking communications center, known to periodically trial new dispatch technologies and approaches.

[4] Note however, the province may decide to go a different direction, as they have recently announced their intent to integrate emergency health services into Ontario's health care system, with details to follow.

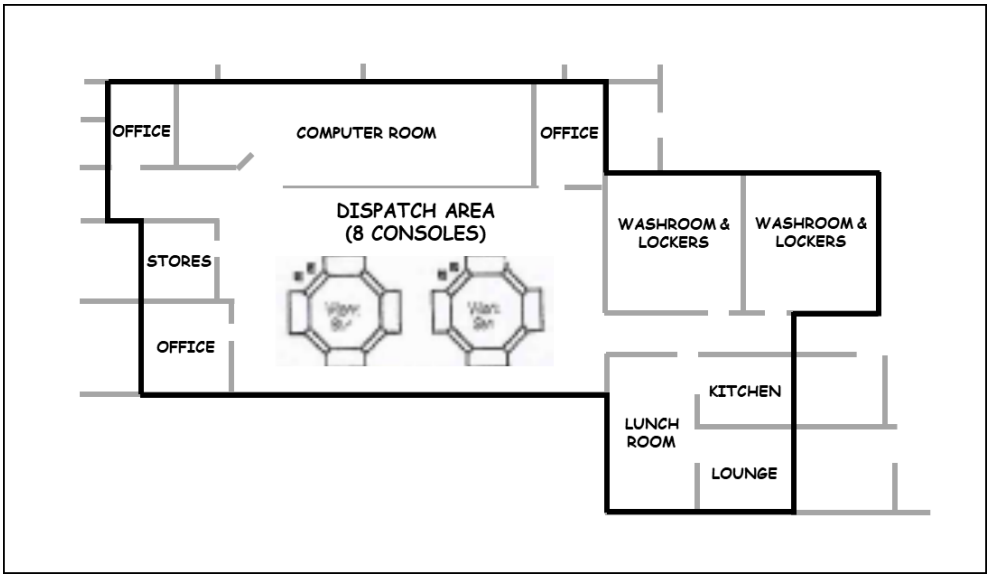
NACS is situated in Niagara EMS headquarters, at 509 Glendale Avenue East, Niagara-on-the-Lake. We estimate that the center occupies approximately 2,300 SF, with about 1,000 SF for the communications floor.

NACS is outfitted with a total of 8 communications consoles - 7 for call taking and dispatch and 1 for the on-duty Supervisor.

As shown by Exhibit 4.3, ancillary spaces include 3 offices, computer room (housing mechanical and servers), male and female washrooms (with lockers and showers), kitchen, lunchroom, lounge, and a small storage area.

The communications floor is situated roughly 12 inches above a concrete sub-floor. The ceiling height in the communications area is about 9 feet.

**Exhibit 4.3: Ambulance Communications Center Layout (NEMS)**




## Technology

All provincial land ambulance communications services, including NACS, operate using the provincial government FleetNet VHF trunked radio system for voice communications and a TriTech CAD system integrated with an E911 interface for caller location, ambulance dispatch and incident record management.

Provisions for emergency backup / continuity of coverage are embedded within the province wide land ambulance communications system. When NACS goes offline (e.g., due to power failure, emergency evacuation, etc), continuity of emergency medical dispatch coverage is provided by the neighbouring Hamilton ambulance communications service.

### Communications Staffing

NACS is staffed with about 45 personnel, including 34 communicators (25 full-time and 9 part-time), 5 Supervisors, Training Supervisor, Quality Assurance (QA) Supervisor, and several clinicians.

NACS operates 24/7/365. Shifts are of 12 hours duration. Daytime peak staffing is 7 communicators, 1 Supervisor and 1 clinician.

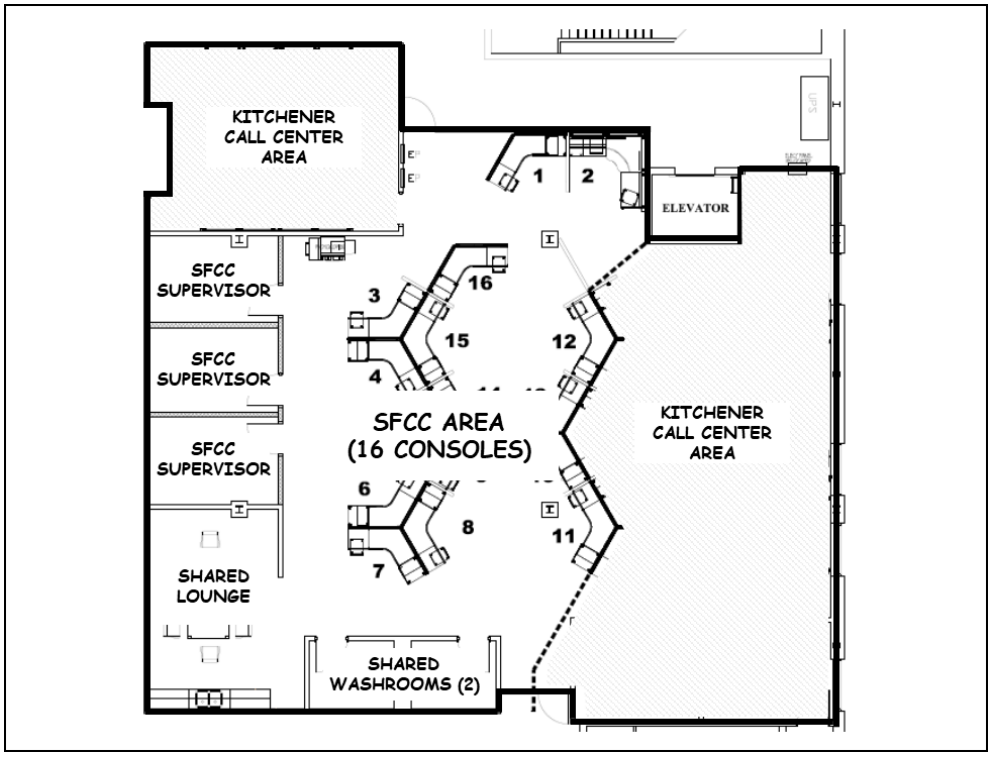
## 4.4 ROW Service First Call Center

ROW Service First Call Center (SFCC) was established in 2012 as a region-wide centralized call handling centre to provide the public with quick and consistent responses to frequently asked questions through one easily recognized telephone number.

Using Customer Relationship Management software (CRM) designed specifically to support call-center call taking functions, SFCC customer representatives address most routine service requests on the first contact and more technical / specialist level responses on first transfer.

ROW SFCC is co-located with the City of Kitchener call center in a shared space at the Kitchener Operations Facility, 131 Goodrich Drive, Kitchener. The floor layout is shown in Exhibit 4.4.

**Exhibit 4.4: Existing SFCC Layout**



The co-located call centers jointly occupy a total floor area of about 3,800 SF. ROW SFCC customer service representative consoles and 3 Supervisor offices occupy about 1,750 SF. The Kitchener call center occupies about 1,550 SF. The remaining area consists of a shared lounge and two shared washrooms.

The existing SFCC center does not operate on a raised floor. The ceiling height is about 10 feet.

### Technology

SFCC is outfitted with a total of 16 workstations - 15 for customer service representatives and 1 for use by Supervisors.

Each work station is equipped with telephone for call taking and Customer Relationship Management (CRM) software which enables staff to manage service requests from start to finish through integration with work order and other back-of-house systems; to accurately and consistently respond to requests for information and services through documented knowledge management and tracking of public consultations, event participation and course registrations.

SFCC relies on ROW Corporate for telephone and IT systems support.

### SFCC Staffing

SFCC is staffed with about 40 personnel, including Director, Manager, 3 Supervisors and 35 customer service representatives (10 full-time and 25 part-time).

The Director and Manager work remotely from ROW Corporate headquarters. Also, due to space restrictions at SFCC, 6 customer service representatives work off-site from various regional facilities.

SFCC operates 24/7/365. Typical staffing levels are 15 customer service representatives on weekday days; up to 5 customer service representatives on weekday evenings; and 1 customer service representative at night.

### Additional Observations

Reasons to consider re-locating SFCC to a larger floor area space, are discussed below.

The current SFCC center, whose floor area averages out to approximately 90 SF per workstation, is overcrowded. [5]

[5] This is not surprising given that the current dedicated area of 1,750 SF is substantially short of the originally estimated floor space requirement of 2,500 to 4,000 SF. For additional detail, refer to ROW Council report CR-CLK-12-009, May 2012.

There is not enough space to accommodate all existing customer service representatives, some of whom must work from off-site locations.

The center does not conform to AODA standards. The center lacks natural lighting (i.e., no windows). The center lacks storage for administration and equipment.

Access to a meeting room is limited. There is no on-site communications training space.

Nor is there any space within the existing building to accommodate future growth. Our analysis (in Section 6.5 of this report) indicates that additional center space / consoles will be needed to accommodate service demand growth over the next 10-15 years and beyond.

In addition, SFCC management have identified a need for the following additional resourcing and floor area space: dedicated Trainer with an office; and a hotel office for visiting management and Corporate IT support.

# 5 Call Volume Forecasts

Population growth is the primary driver of communications services demand and resourcing needs.

APEXPRO's analysis of future services demands and resourcing needs is based on the following population forecasts for Region of Waterloo: 624,000 residents by 2021, 742,000 by 2031 and 835,000 residents by 2041.

These forecasts are extracted from the "Places to Grow Growth Plan for the Greater Golden Horseshoe", Ministry of Municipal Affairs, updated May 2017.

We are aware that the Places to Grow forecasts are higher than the "moderate forecasts", which Region of Waterloo has adopted for other long-term planning studies. [6] Regardless, we adopted the Places to Grow forecasts mainly for the following reason – to be consistent with the recently published WRPS Facilities Master Plan (Feb 2018), which also is predicated on the Places to Grow forecasts.

Further, we chose to forecast emergency communications service demands to 2041 – this, in lieu of a 2036 timeframe used by the WRPS Facilities Master Plan. In this, our purpose is to provide a buffer for additional resourcing requirements that may potentially arise (e.g., due to technological or other changes beyond the Region's control).

While we understand that the forecasts within this report are intended to serve as basis for future capital planning decisions, we are not concerned that our projections may be overly aggressive – this because, in keeping with common practice, we expect WRPS and Region of Waterloo to monitor year-over-year changes in population and call volumes, and to periodically adjust future resourcing levels in tandem.

## 5.1 911 Communications (WRPS)

Exhibit 4.1 (next page) presents the 911 communications center event volumes recorded by CAD, for the period 2016 to 2018. [7]

In 2018, the 911 communications center handled a volume of approximately 340,000 events. This includes about 135,000 incoming 911 calls and 205,000 non-emergency calls, received on 10-digit phone lines.

[6] We are advised that the "moderate forecast" projects an increase in population to 742,000 residents in 2041 - which is 11% lower than the Places to Grow forecast of 835,000 in 2041.

[7] Source: WRPS

As shown by Exhibit 5.1, event volumes over the past three years (2016 to 2018) have averaged about 590 calls per 1,000 residents. Applying this per capita ratio to future population forecasts generates a 911 communications center call forecast of 368,000 in 2021, 438,000 by 2031, and 493,000 by 2041.

**Exhibit 5.1: Call Volume Forecasts (WRPS)**

| YEAR | POPULATION | ANNUAL CALLS | % INCREASE OVER CURRENT | CALLS PER 1,000 RESIDENTS |
|---|---|---|---|---|
| 2016 | 535,154 | 311,556 | -- | 582 |
| 2017 | 551,800 | 328,275 | -- | 595 |
| 2018 | 569,000 | 339,379 | -- | 596 |
| AVG. 2016-18 | | | | 590 |
| Forecasts | | | | |
| 2021 | 624,000 | 368,000 | 8% | 590 |
| 2026 | 681,000 | 402,000 | 18% | 590 |
| 2031 | 742,000 | 438,000 | 29% | 590 |
| 2036 | 789,000 | 466,000 | 37% | 590 |
| 2041 | 835,000 | 493,000 | 45% | 590 |

## 5.2 Fire Dispatch

In 2018, the Region of Waterloo generated approximately 29,100 calls that required a fire department response. This figure includes approximately 21,000 calls that were dispatched by KFD and about 8,100 calls dispatched by Cambridge Fire Department. [8]

As shown by Exhibit 5.2 (next page), 29,100 calls equate to an average annual call volume of about 50 fire calls per 1,000 residents.

[8] Source: Kitchener Fire Department. These figures include structure fires, outdoor fires, multi-vehicle collisions, and medical assist calls.

Applying this per capita ratio to future population forecasts generates a fire call forecast of 31,000 in 2021, 37,000 by 2031, and 42,000 by 2041.

**Exhibit 5.2: Call Volume Forecasts (Fire)**

| YEAR | ROW POPULATION | ANNUAL CALLS | CALLS PER 1,000 RESIDENTS |
|---|---|---|---|
| 2018 | 569,000 | 29,100 | 50 |
| Forecasts | | | |
| 2021 | 624,000 | 31,000 | 50 |
| 2026 | 681,000 | 34,000 | 50 |
| 2031 | 742,000 | 37,000 | 50 |
| 2036 | 789,000 | 39,000 | 50 |
| 2041 | 835,000 | 42,000 | 50 |

## 5.3 Paramedic Services Communications

In 2018, ROW Paramedic Services responded to 114,894 events. [9] This included:

- 55,550 emergency medical responses dispatched as Priority 1 to 4, where Priority 1 is defined as a low priority and Priority 4 is an urgent / life threatening call requiring a rapid response with flashing lights and siren; and
- 59,344 standby (Priority 8) responses involving temporary repositioning of Paramedic Service resources to maintain emergency coverage.

**Exhibit 5.3: Call Volume Forecasts (Paramedic Services)**

| YEAR | ROW POPULATION | ANNUAL CALLS | CALLS PER 1,000 RESIDENTS |
|---|---|---|---|
| 2018 | 569,000 | 114,894 | 200 |
| Forecasts | | | |
| 2021 | 624,000 | 123,000 | 200 |
| 2026 | 681,000 | 141,000 | 210 |
| 2031 | 742,000 | 156,000 | 210 |
| 2036 | 789,000 | 161,000 | 200 |
| 2041 | 835,000 | 163,000 | 200 |

[9] Source: Ambulance Dispatch Response System (ADRS) maintained by Ontario MOHLTC.

As shown by Exhibit 5.3, 114,894 events equate to an average annual volume of about 200 paramedic service events per 1,000 residents.

Region of Waterloo's rapidly aging population is the primary driver of paramedic service call volumes. Rapidly aging population is not unique to Region of Waterloo.

According to figures published by Ontario Ministry of Finance, seniors' population (65+) is increasing rapidly throughout Ontario, and this trend is expected to continue to approximately 2026, after which the rate of increase will plateau and begin to decline. [10]

Applying these trends to Region of Waterloo, we estimate that paramedic service call volumes will increase to 123,000 in 2021, 156,000 by 2031, and 163,000 by 2041. These figures include all call priorities (Pr 1-4 and 8).

## 5.4 ROW Service First Call Center

In 2018, SFCC managed approximately 350,000 service enquiries. As shown by Exhibit 5.4, this averages out to an annual 615 service enquiries per 1,000 residents. [11]

Applying this per capita ratio to future population forecasts generates an SFCC call forecast of 384,000 in 2021, 456,000 by 2031, and 514,000 by 2041.

**Exhibit 5.4: Call Volume Forecasts (SFCC)**

| YEAR | ROW POPULATION | ANNUAL CALLS | CALLS PER 1,000 RESIDENTS |
|---|---|---|---|
| 2018 | 569,000 | 350,000 | 615 |
| Forecasts | | | |
| 2021 | 624,000 | 384,000 | 615 |
| 2026 | 681,000 | 419,000 | 615 |
| 2031 | 742,000 | 456,000 | 615 |
| 2036 | 789,000 | 485,000 | 615 |
| 2041 | 835,000 | 514,000 | 615 |

[10] Source: "Ontario Population Projections Update", Ontario Ministry of Finance, Spring 2018.

[11] Source: Region of Waterloo Service First Call Center.

# 6 Resourcing Forecasts

## 6.1 911 Communications

Exhibit 6.1 presents APEXPRO's forecasts of WRPS' communications resourcing requirements to 2041. The resourcing forecasts are based on the call volume projections presented previously in Section 5. They also are predicated on the following performance metrics derived from our survey of peer 911 centers: 4,500 calls per annum per communicator FTE and 18,000 per communications console. [12]

**Exhibit 6.1: Resourcing Forecasts (911 Comm.)**

| | WRPS 2018 | WRPS 2021 | WRPS 2031 | WRPS 2041 |
|---|---|---|---|---|
| **Projected Call Volume** | **339,379** | **368,000** | **438,000** | **493,000** |
| **Calls per Communicator (FTE)** | **--** | **4,500** | **4,500** | **4,500** |
| **Calls per Console** | **--** | **18,000** | **18,000** | **18,000** |
| **Proj'd Communicator Req't (FTE)** | **76** | **82** | **97** | **110** |
| **Projected Staffing Requirements** | | | | |
| **Staff Sergeant** | **1** | **1** | **1** | **1** |
| **Supervisors** | **10** | **10** | **10** | **10** |
| **Communicators (full-time)** | **70** | **75** | **90** | **101** |
| **Communicators (part-time)** | **11** | **13** | **15** | **18** |
| **Switchboard (full-time)** | **3** | **3** | **4** | **4** |
| **Switchboard (part-time)** | **3** | **3** | **4** | **4** |
| **Trainers** | **2** | **2** | **2** | **2** |
| **Total** | **100** | **107** | **126** | **140** |
| **Projected Console Requirements** | | | | |
| **Supervisors** | **2** | **2** | **2** | **2** |
| **Communicators (12-hr shifts)** | **19** | **20** | **24** | **27** |
| **Total** | **21** | **22** | **26** | **29** |

Note: Figures shown for 2018 are current values - with one exception, that being the number of communicator consoles. The existing number is increased by 3 additional consoles to accommodate a change to a 12-hour shift.

[12] FTE stands for full time equivalent. Current FTE staffing assumes that 2 part-time staff are equivalent to 1 staff working full-time. Forecast full-time and part-time staffing are derived by apportioning FTE projections to the current ratio.

The 911 communications center is currently outfitted with 16 communicator consoles. The figure shown for 2018 is 19 communicator consoles, which includes 3 additional consoles to accommodate a change to a 12-hour shift.

Our forecast requirement for 2021 is 20 communicator consoles. The forecast requirement for 2031 is 24 communicator consoles, and for 2041 it is 27 communicator consoles.

## 6.2 Real Time Operating Center (RTOC)

Real Time Operations Centers (RTOC) managed by police services, are outfitted with video surveillance and business intelligence systems, to enhance dispatch / policing operations.

Drawing from peers and available literature, the role of an RTOC may be described as follows – to ensure that:

- Resources are effectively managed and deployed in real time.
- Calls/operations that pose a risk to the community or the organization are appropriately managed in real time.
- Responses to policing emergencies are effectively coordinated in real time.

Source: RTOC Presentation, York Regional Police Service, June 2016

Our assumptions pertaining to the proposed co-location of an RTOC at the former provincial courthouse building, are listed below. They are based mainly on the RTOC facility managed by York Regional Police Services.

- RTOC should be situated immediately adjacent to the emergency communications floor (i.e., call takers and dispatchers); this, to enhance interoperability.
- RTOC should be of size capable of supporting at least 2 fully equipped communications consoles tied into multiple video feeds, 2 work desks, and an on-duty shift of about 4 to 5 staff. RTOC managed by York Regional Police Services has approximately 750 SF of floor area.
- Real-time video feeds should include police vehicle cameras and cameras managed by other organizations, e.g., provincial highways, municipal roads, public transit systems, etc.

- IT personnel should be available round-the-clock to support the RTOC (as well as other 911 call taking/police dispatch needs).

Numerous personnel may be required to manage a major occurrence (often 20 or more). So as not to hinder other emergency communications activities it is useful to have available, a separate working area in which personnel can gather to work the occurrence.

The separate working area which York Regional Police Services has set aside, is referred to as the Major Incident Support Center (MISC). This working area:

- Is outfitted with additional communications consoles and business intelligence systems like those in the RTOC.
- Is staffed only when needed, drawing requisite personnel from RTOC, the 911 communications center and the organization's extensive talent pool.
- Is situated immediately adjacent to a relatively large meeting room separated only by a panelled partition. The panelled partition is opened when management of a major incident requires additional working area.

Listed below are our assumptions pertaining to a separate MISC working area.

- We assume that adjoining the RTOC there will be a separate MISC working area. Further, this working area will be outfitted with 8 additional fully equipped communications consoles tied into multiple video feeds, and with 2-3 additional work desks.
- In lieu of the York Region approach, we assumed that if management of a major incident requires additional working area, then personnel will commandeer the on-site meeting room.

## 6.3 Fire Dispatch

Exhibit 6.2 presents APEXPRO's forecasts of Fire communications resourcing requirements to 2041.

These resourcing forecasts also are based on the call volume projections presented previously in Section 5. Further, they are predicated on the following performance metrics which are derived from peer fire communications centers: 1,800 calls per annum per communicator FTE and 7,700 per communications console. [13]

KFD's communications center is currently outfitted with a total of 5 communications consoles - 4 for call taking and dispatch and 1 for the Supervisor. Our forecast requirement for 2021 is a total of 5 communications consoles, and for 2031 and 2041 it is a total of 6 communications consoles.

**Exhibit 6.2: Resourcing Forecasts (Fire)**

| | KFD 2018 | KFD 2021 | KFD 2031 | KFD 2041 |
|---|---|---|---|---|
| **Projected Call Volume** | **29,100** | **31,000** | **37,000** | **42,000** |
| **Calls per Communicator (FTE)** | **--** | **1,800** | **1,800** | **1,800** |
| **Calls per Console** | **--** | **7,700** | **7,700** | **7,700** |
| **Proj'd Communicator Req't (FTE)** | **17** | **17** | **21** | **23** |
| **Projected Staffing Requirements** | | | | |
| **Manager** | **1** | **1** | **1** | **1** |
| **Supervisors** | **1** | **1** | **1** | **1** |
| **Communicators (full-time)** | **16** | **16** | **19** | **22** |
| **Communicators (part-time)** | **2** | **3** | **2** | **3** |
| **Total** | **20** | **21** | **23** | **27** |
| **Projected Console Requirements** | | | | |
| **Supervisors** | **1** | **1** | **1** | **1** |
| **Communicators** | **4** | **4** | **5** | **5** |
| **Total** | **5** | **5** | **6** | **6** |

[13] FTE stands for full time equivalent. Current FTE staffing assumes that 2 part-time staff are equivalent to 1 staff working full-time. Forecast full-time and part-time staffing are derived by apportioning FTE projections to the current ratio.

## 6.4 Paramedic Services Communications

Exhibit 6.3 presents APEXPRO's forecasts of the Paramedic Services communications resourcing requirements to 2041. These resourcing forecasts also are based on the call volume projections presented previously in Section 5; however, we derived current resourcing from NACS which was adopted as surrogate for this analysis – this, in lieu of the former Cambridge CACC (with its staffing challenges).

The forecasts are predicated on the following performance metrics which are consistent with MOHLTC's ambulance communications services: 4,200 calls per annum per communicator FTE and 18,000 per communications console. [14]

**Exhibit 6.3: Resourcing Forecasts (Paramedic Services)**

| | ROW PS 2018 | ROW PS 2021 | ROW PS 2031 | ROW PS 2041 |
|---|---|---|---|---|
| **Projected Call Volume** | **114,894** | **123,000** | **156,000** | **163,000** |
| **Calls per Communicator (FTE)** | **--** | **4,200** | **4,200** | **4,200** |
| **Calls per Console** | **--** | **18,000** | **18,000** | **18,000** |
| **Proj'd Communicator Req't (FTE)** | **29** | **29** | **37** | **39** |
| **Projected Staffing Requirements** | | | | |
| **Supervisors** | **5** | **5** | **5** | **5** |
| **Communicators (full-time)** | **25** | **25** | **31** | **33** |
| **Communicators (part-time)** | **9** | **9** | **11** | **11** |
| **Training Supervisor** | **1** | **1** | **1** | **1** |
| **QA Supervisor** | **1** | **1** | **1** | **1** |
| **Other** | **4** | **4** | **4** | **4** |
| **Total** | **45** | **45** | **53** | **55** |
| **Projected Console Requirements** | | | | |
| **Supervisors** | **1** | **1** | **1** | **1** |
| **Communicators** | **7** | **7** | **9** | **9** |
| **Total** | **8** | **8** | **10** | **10** |

Note: Current resourcing is derived from Niagara Ambulance Communications Services (NACS) which was used as a surrogate for this analysis (in lieu of the former Cambridge CACC).

[14] FTE stands for full time equivalent. Current FTE staffing assumes that 2 part-time staff are equivalent to 1 staff working full-time. Forecast full-time and part-time staffing are derived by apportioning FTE projections to the current ratio.

NACS is outfitted with a total of 8 communications consoles - 7 for call taking and dispatch and 1 for the Supervisor. Our forecast 2021 requirement for a ROW Paramedic Services communications center is a total of 8 communications consoles, and for 2031 and 2041 it is a total of 10 communications consoles.

## 6.5 ROW Service First Call Center

Exhibit 6.4 presents APEXPRO's forecasts of ROW SFCC resourcing requirements to 2041. These resourcing forecasts also are based on the call volume projections presented previously in Section 5. Further, they are predicated on the following performance metrics, derived from SFCC's current operations: 15,550 calls per annum per customer service representative FTE and 16,650 per communications console.

SFCC is currently outfitted with a total of 16 communications consoles - 15 for customer service representatives and 1 for the Supervisor. An additional 6 consoles are situated off-site at various regional facilities. The overall total is 22 communications consoles.

Our forecast SFCC requirement for 2021 – assuming all customer service representatives are consolidated to a single center - is a total of 24 communications consoles. The forecast requirement for 2031 is 28 communications consoles, and for 2041 it is 32 communications consoles.

**Exhibit 6.4: Resourcing Forecasts (SFCC)**

| | SFCC 2018 | SFCC 2021 | SFCC 2031 | SFCC 2041 |
|---|---|---|---|---|
| **Projected Call Volume** | 350,000 | 384,000 | 456,000 | 514,000 |
| **Calls per Cust. Service Rep (FTE)** | -- | 15,550 | 15,550 | 15,550 |
| **Calls per Work Station** | -- | 16,650 | 16,650 | 16,650 |
| **Proj'd Cust. Serv. Rep. Req't (FTE)** | 23 | 25 | 29 | 33 |
| **Projected Staffing Requirements** | | | | |
| Supervisors | 3 | 3 | 3 | 3 |
| CSRs (full-time) | 10 | 10 | 11 | 12 |
| CSRs (part-time) | 25 | 28 | 36 | 41 |
| Total | 38 | 41 | 50 | 56 |
| **Projected Console Requirements** | | | | |
| Supervisors | 1 | 1 | 1 | 1 |
| CSRs (on-site) | 15 | 23 | 27 | 31 |
| CSRs (off-site) | 6 | 0 | 0 | 0 |
| Total | 22 | 24 | 28 | 32 |

# 7 Floor Area & Capital Cost Estimates

Detailed estimates of floor space requirements and capital costs for all communications functions that are being considered for co-location at the former provincial courthouse building, are presented in Appendices A to C.

Appendix A presents the estimated floor space requirements to 2041 (i.e., to accommodate growth for the next 20-25 years). Appendix B presents the estimated capital costs at full build out which is assumed to be 2041; and Appendix C presents the estimated capital costs at move in (which is assumed to occur in or about 2022).

A high-level summary of the floor space and capital cost estimates broken down by major communications function, is presented in Exhibit 7.1 (next page).

High level assumptions underlying our assessment were presented previously in Section 2.3. Assumptions pertaining to detailed calculations of floor area and costs, are included in the appendices. Below is an additional commentary that underscores our assessment.

Additional square footage may be needed to make layouts work in an "existing" building – the issue being that efficient design configurations may not be achievable resulting in wasted space, e.g., difficulty to arrange workstations in efficiently configured pods or rows due to existing building infrastructure.

Specifics concerning wasted space are difficult to ascertain prior to building 'detailed design', which is still several months away. We addressed this by adjusting most floor area estimates by +20%.

**Main Findings**

- Floor area requirement for all communications functions under consideration is estimated at 22,903 SF (21,253 SF on the 3rd floor and 1,650 SF on the 2nd floor).
- Capital cost at move in (in or about 2022) is about $21 million in current 2019 dollars. Capital cost at full build out in 2041 is about $23 million.
- Costs include technology infrastructure for the building, e.g.: Motorola radio reconfiguration, redundant Bell 911 trunk, network connections, UPS, firewall infrastructure, and security and access control. They also include technology costs to outfit 911 Communications and RTOC.
- Costs exclude technology for Fire Dispatch, Paramedic Communications Services and ROW SFCC. It is assumed that these services will determine their own technology costs during their respective re-location planning.

## Exhibit 7.1: Floor Area & Capital Cost Estimates

| | EST'D FLOOR SPACE REQ'TS (SF) | | | EST'D CAPITAL COSTS - FULL BUILD OUT (2041) | | | | | EST'D CAPITAL COSTS - MOVE IN (CIRCA 2022) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2021 | 2031 | 2041 | Refurbishing | Furniture | Technology | Total | % | Refurbishing | Furniture | Technology | Total | % |
| 911 COMMUNICATIONS | 5,572 | 6,800 | 7,376 | $1,475,200 | $1,053,000 | $2,365,100 | $4,893,300 | 21% | $1,475,200 | $792,800 | $1,871,750 | $4,139,750 | 20% |
| *Comm. Floor* | *4,450* | *5,480* | *6,020* | *$1,204,000* | *$967,000* | *$2,346,700* | *$4,517,700* | | *$1,204,000* | *$723,500* | *$1,857,750* | *$3,785,250* | |
| *Offices & Other* | *1,122* | *1,320* | *1,356* | *$271,200* | *$86,000* | *$18,400* | *$375,600* | | *$271,200* | *$69,300* | *$14,000* | *$354,500* | |
| RTOC | 750 | 750 | 750 | $150,000 | $67,000 | $3,912,000 | $4,129,000 | 18% | $150,000 | $67,000 | $3,912,000 | $4,129,000 | 20% |
| MISC | 750 | 750 | 750 | $150,000 | $247,000 | $806,985 | $1,203,985 | 5% | $150,000 | $247,000 | $806,985 | $1,203,985 | 6% |
| MEETING ROOM | 375 | 375 | 375 | $75,000 | $20,000 | $11,000 | $106,000 | 0% | $75,000 | $20,000 | $11,000 | $106,000 | 1% |
| DEDICATED TRAINING ROOM | 1,650 | 1,650 | 1,650 | $330,000 | $225,000 | $308,250 | $863,250 | 4% | $330,000 | $225,000 | $308,250 | $863,250 | 4% |
| FIRE COMMUNICATIONS | 1,380 | 1,566 | 1,578 | $315,600 | $202,800 | TBD | $518,400 | 2% | $315,600 | $0 | $0 | $315,600 | 2% |
| *Comm. Floor* | *900* | *1,080* | *1,080* | *$216,000* | *$180,000* | *TBD* | *$396,000* | | *$216,000* | *$0* | *$0* | *$216,000* | |
| *Offices & Other* | *480* | *486* | *498* | *$99,600* | *$22,800* | *TBD* | *$122,400* | | *$99,600* | *$0* | *$0* | *$99,600* | |
| PARAMEDIC SERV'S COMM'S | 2,448 | 2,826 | 2,832 | $566,400 | $344,500 | TBD | $910,900 | 4% | $566,400 | $0 | $0 | $566,400 | 3% |
| *Comm. Floor* | *1,440* | *1,800* | *1,800* | *$360,000* | *$300,000* | *TBD* | *$660,000* | | *$360,000* | *$0* | *$0* | *$360,000* | |
| *Offices & Other* | *1,008* | *1,026* | *1,032* | *$206,400* | *$44,500* | *TBD* | *$250,900* | | *$206,400* | *$0* | *$0* | *$206,400* | |
| ROW SFCC | 4,116 | 4,660 | 5,192 | $1,038,400 | $684,900 | TBD | $1,723,300 | 8% | $1,038,400 | $0 | $0 | $1,038,400 | 5% |
| *Comm. Floor* | *3,120* | *3,640* | *4,160* | *$832,000* | *$640,000* | *TBD* | *$1,472,000* | | *$832,000* | *$0* | *$0* | *$832,000* | |
| *Offices & Other* | *996* | *1,020* | *1,032* | *$206,400* | *$44,900* | *TBD* | *$251,300* | | *$206,400* | *$0* | *$0* | *$206,400* | |
| SHARED AMENITIES | 750 | 750 | 750 | $150,000 | $17,000 | $0 | $167,000 | 1% | $150,000 | $17,000 | $0 | $167,000 | 1% |
| TOTAL (3RD FL) | 17,791 | 20,127 | 21,253 | $4,250,600 | $2,861,200 | $7,403,335 | $14,515,135 | 63% | $4,250,600 | $1,368,800 | $6,909,985 | $12,529,385 | 61% |
| IT & SERVER ROOM (2ND FL) | 1,650 | 1,650 | 1,650 | $330,000 | $38,500 | $85,500 | $454,000 | 2% | $330,000 | $38,500 | $85,500 | $454,000 | 2% |
| BLDG. TECH'GY INFRA. | | | | $0 | $0 | $4,982,000 | $4,982,000 | 22% | $0 | $0 | $4,976,500 | $4,976,500 | 24% |
| COST CONTINGENCY | | | | $687,090 | $434,955 | $1,870,625 | $2,992,670 | 13% | $687,090 | $211,095 | $1,795,798 | $2,693,983 | 13% |
| TOTAL | 19,441 | 21,777 | 22,903 | $5,267,690 | $3,334,655 | $14,341,460 | $22,943,805 | 100% | $5,267,690 | $1,618,395 | $13,767,783 | $20,653,868 | 100% |

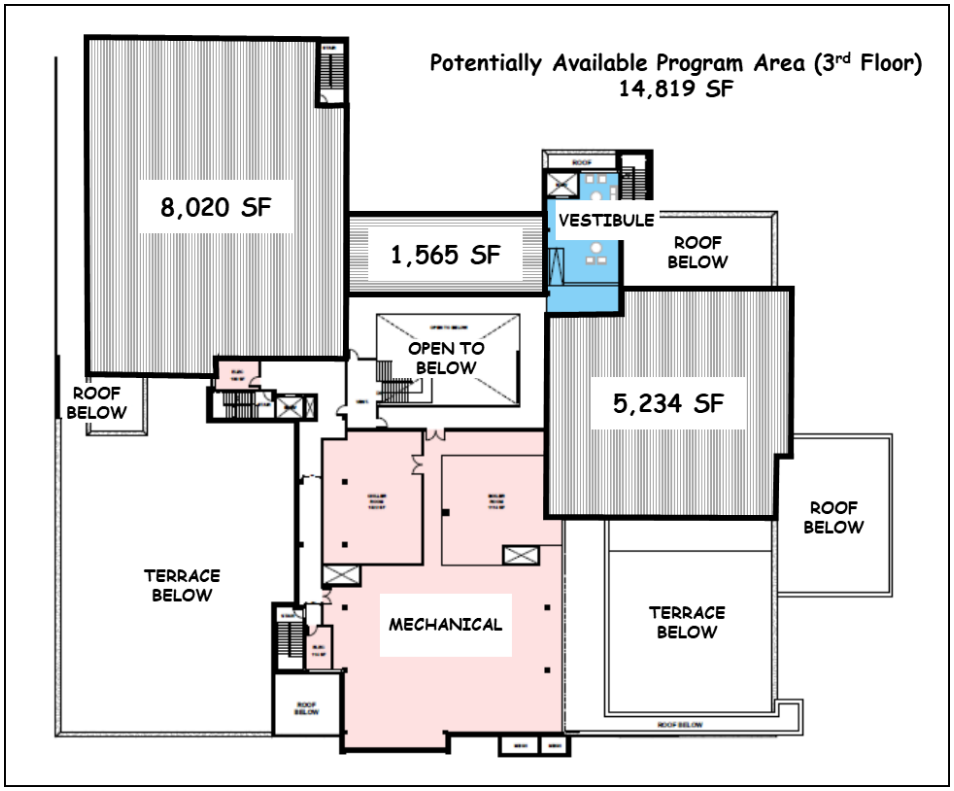
# 8 Program Area Assessment

## 8.1 Potentially Available Program Area

Preliminary plans for the 3rd floor of the former courthouse building show a floor area of approximately 14,819 SF of potentially available program area for the proposed co-located communications center. [15]

The potentially available program area includes a relatively large contiguous floor space area of 8,020 SF and two smaller contiguous floor space areas of 5,234 SF and 1,565 SF.

**Exhibit 8.1: Potentially Available Program Area**




## 8.2 Floor Area Assessment – All Functions

Exhibit 8.2 (next page) presents the projected floor area requirements for the 3rd floor of the former courthouse building relative to the potentially available program area.

[15] Source: Preliminary plans by Dialog Design, May 13, 2019.

## Exhibit 8.2: Floor Area Assessment – All Functions

| | Pot'l Prog. Area (SF) | Proj'd 3rd Floor Req'ts (SF) | | |
|---|---|---|---|---|
| | | 2021 | 2031 | 2041 |
| **PUBLIC SAFETY COMMUNICATIONS** | 8,020 | 6,790 | 8,360 | 8,900 |
| **Comm. Consoles in a Contiguous Space** | | | | |
| 911 Communications | | 4,450 | 5,480 | 6,020 |
| Fire Dispatch | | 900 | 1,080 | 1,080 |
| Paramedic Services Communications | | 1,440 | 1,800 | 1,800 |
| **PUBLIC SAFETY COMMUNICATIONS** | | 2,610 | 2,832 | 2,886 |
| **Offices & Other Functional Spaces** | | | | |
| 911 Communications | | 1,122 | 1,320 | 1,356 |
| Fire Dispatch | | 480 | 486 | 498 |
| Paramedic Services Communications | | 1,008 | 1,026 | 1,032 |
| **RTOC & MISC** | | 1,500 | 1,500 | 1,500 |
| **MEETING ROOM** | | 375 | 375 | 375 |
| **DEDICATED TRAINING ROOM** | | 1,650 | 1,650 | 1,650 |
| **ROW SFCC** (in a contiguous space) | | 4,116 | 4,660 | 5,192 |
| **SHARED AMENITIES** | | 750 | 750 | 750 |
| **TOTAL** | 14,819 | 17,791 | 20,127 | 21,253 |
| ***PROJECTED SHORTFALL*** | *--* | *-2,972* | *-5,308* | *-6,434* |

Our assessment concludes that the potentially available program area falls short of the total floor area requirement by about -2,972 SF in 2021, -5,308 SF in 2031 and -6,434 SF in 2041.

Note - our assessment does not examine the floor area requirements of a fully integrated public safety communications system. In a fully integrated system, some communications staff will be cross trained to dispatch multiple agencies and by extension, the service will require fewer staff and less floor area space.

We have assumed that when a decision is made to transition to a fully integrated service then at that time, the resourcing requirements will be re-visited in tandem.

## 8.3 Program Co-Location Options

In consideration of the floor area shortfalls identified in Section 8.2, we investigated the following options.

- Option 1 - 911/Police & Fire Dispatch. *This option excludes paramedic communications services and ROW SFCC.*
- Option 2 - 911/Police & Fire Dispatch plus ROW SFCC. *This option excludes paramedic communications services.*
- Option 3 - 911/Police & Fire Dispatch plus Paramedic Communications. *This option excludes ROW SFCC.*

Floor area requirements for these options are summarized in Exhibit 8.3 and are discussed on the next page.

**Exhibit 8.3: Floor Area Assessment - Options**

| | Pot'l Prog. Area (SF) | Proj'd 3rd Floor Req'ts (SF) | | |
|---|---|---|---|---|
| | | 2021 | 2031 | 2041 |
| **OPTION 1 - 911/Police & Fire** | | | | |
| 911/Police & Fire Comm. | 8,020 | 5,350 | 6,560 | 7,100 |
| *Proj'd Residual / Shortfall* | -- | *2,670* | *1,460* | *920* |
| Total Req't | 14,819 | 11,227 | 12,641 | 13,229 |
| *Proj'd Residual / Shortfall* | -- | *3,592* | *2,178* | *1,590* |
| **OPTION 2 - 911/Police & Fire plus ROW SFCC** | | | | |
| 911/Police & Fire Comm. | 8,020 | 5,350 | 6,560 | 7,100 |
| *Proj'd Residual / Shortfall* | -- | *2,670* | *1,460* | *920* |
| ROW SFCC | 5,234 | 4,116 | 4,660 | 5,192 |
| *Proj'd Residual / Shortfall* | -- | *1,118* | *574* | *42* |
| Total Req't | 14,819 | 15,343 | 17,301 | 18,421 |
| *Proj'd Residual / Shortfall* | -- | *-524* | *-2,482* | *-3,602* |
| **OPTION 3 - 911/Police & Fire plus Paramedic Comm. Service** | | | | |
| Comm. | 8,020 | 6,790 | 8,360 | 8,900 |
| *Proj'd Residual / Shortfall* | -- | *1,230* | *-340* | *-880* |
| Total Req't | 14,819 | 13,675 | 15,467 | 16,061 |
| *Proj'd Residual / Shortfall* | -- | *1,144* | *-648* | *-1,242* |

**Option 1 - 911/Police & Fire Dispatch**

- There appears to be enough program area space to accommodate a police and fire communications center's needs to 2041.
- In addition, the current floor layout (in Exhibit 8.1) should be capable of accommodating all police and fire call takers/dispatchers in a single contiguous space arrangement (as would be required for eventual transition to a fully integrated communications service).

**Option 2 - 911/Police & Fire Dispatch plus ROW SFCC**

- This option is intended to resolve a pressing space constraint at the current SFCC location.
- Operationally, in our opinion, it is not a good fit for the Frederick St location. There is no interaction with public safety functions. SFCC requires its own distinct technology systems; and downside challenges include space and additional costs to segregate portions of the building, and to implement access and security.
- Based on current drawings (per Exhibit 8.1), there will not be enough program area space on the 3rd floor of the building to accommodate all functions proposed under this option – and the arguments cited above may be mute points.
- We estimate floor area shortfalls at about -524 SF in 2021, -2,482 SF in 2031 and -3,602 SF in 2041 – albeit they could become worse if municipal and regional call centers are consolidated by current provincial review.

**Option 3 - 911/Police & Fire Dispatch plus Paramedic Comm.**

- This option aligns to best practices for public safety communications.
- Based on current drawings (per Exhibit 8.1), there appears to be enough program area space on the 3rd floor of the building to accommodate the 2021 requirements for all functions proposed under this option.
- Small floor area shortfalls are forecast beyond 2021 – these, contingent on:
  - Actual population growth which may occur more slowly than presently anticipated – deferring shortfalls to later dates.
  - Transition to a fully integrated service (possibly within a few years) which will require less staff and floor area space than projected by this report.
- This option also is incumbered by tentative provincial uploading of paramedic services into Ontario's health care system, in which case there may be no need to plan for a future region-managed paramedic communications facility.

## 8.4 Building Suitability for Use as a Comm. Center

APEXPRO was asked to comment on the former courthouse building's suitability for use as a communications center. In this regard, we offer the following commentary.

Best practices suggest that emergency communications centers should be housed in secure purpose-built facilities. It is our understanding that in keeping with best practices, the 3rd floor of the former courthouse building is being re-furbished as a purpose-built facility to house a fully outfitted communications center of contemporary design and technology in a secure environment.

Additionally, Section 3 of this report presents a selection of attributes for contemporary communications center design; and Section 8.3 presents program co-location options and estimated floor space requirements.

Clear ceiling height is a key consideration. Contemporary communications centers are designed with a clear ceiling height of at least 9 feet – higher where feasible, for sound dampening, climate control and to accommodate large wall-mounted video screens. Analysis of current drawings for the former courthouse building suggests that a clear ceiling height of 10 feet should be achievable – perhaps higher, depending on final design.

Governance while housed in a police facility is another consideration. In the co-location model, governance should not be an issue since each agency will continue to manage their own communications service – albeit, clarity will be needed as it relates to such items as security, access, shared amenities, and cost apportionment.

In a fully integrated public safety communications (PSC) model, PSC serves as "provider" of emergency communications services for its clientele, i.e., police, fire and paramedic services. Best practices dictate that governance oversight of PSC should be by way of an executive level Committee or a Board of Directors that should include representatives of the respective agencies. In this arrangement, governance while housed in a police facility should not be an issue, if the clients (police, fire and EMS) abide by the terms of the arrangement.

Employee parking is another consideration - more specifically, lack of employee parking at the former courthouse building. For communications staff who for many years have had access to free on-site parking at their communications center locations, this can be a sensitive issue. We understand that WRPS and Region of Waterloo are investigating the situation by way of a separate study.

# 9 Backup Emergency Communications

As stated at the outset of this report, one of the scope elements of this project is to assess whether the existing 911 communications center in WRPS headquarters at 200 Maple Grove Road, is suitable to function as a back-up emergency communications center. To address this question, we offer the following.

- Our assessment assumes that during the "co-location" period each participating agency will continue to maintain their own off-site backup communications centers.
- Full integrated emergency communications services generally maintain off-site backup solutions – suitably sized and outfitted to ensure uninterrupted emergency communications services on an integrated basis during short-term outages at the primary center.
- Primary and backup communications centers tend to be outfitted with the same CAD-COM systems.
- However, for financial and other reasons, many backup centers are smaller (typically by up to 50%) in terms of floor area and communications consoles, as they are intended to make do during a short-term outage at the primary center.
- Exhibit 9.1 presents our projected floor area and communications console requirements by function, to 2041.

**Exhibit 9.1: Summary of Projected Requirements**

| | CURRENT AT WRPS HQ | PROJ'D REQUIREMENTS | | |
|---|---|---|---|---|
| | | 2021 | 2031 | 2041 |
| **COMMUNICATIONS CONSOLES** | | | | |
| 911 Communications | 18 | 24 | 29 | 32 |
| Fire Communications | -- | 5 | 6 | 6 |
| Paramedic Services Comm's | -- | 8 | 10 | 10 |
| Total | 18 | 37 | 45 | 48 |
| **FLOOR SPACE (SF)** | | | | |
| 911 Communications | 1,565 | 4,450 | 5,480 | 6,020 |
| Fire Communications | -- | 900 | 1,080 | 1,080 |
| Paramedic Services Comm's | -- | 1,440 | 1,800 | 1,800 |
| Total | 1,565 | 6,790 | 8,360 | 8,900 |

- Exhibit 9.1 also shows the floor area and number of communications consoles at the current 911 communications center in WRPS headquarters at 200 Maple Grove Road. At this location, the communications floor area is 1,565 SF and the center is currently outfitted with 18 communications consoles.
- Based on the information shown in Exhibit 9.1, it is our opinion that the current Maple Grove communications center (at 1,565 SF):
  - Is suitable to function as back-up communications center for 911/police dispatch in the short term.
  - However, to continue to function as backup communications center for 911/police dispatch in the long term, it would need to be expanded to 2,740 SF by 2031 and to 3,010 SF by 2041. [16]
- For Maple Grove to function as back-up emergency communications center for 911/police dispatch and fire communications, it would need to be expanded as follows: to 2,675 SF by 2021; to 3,280 SF by 2031; and to 3,550 SF by 2041. [17]
- For Maple Grove to function as back-up emergency communications center for 911/police dispatch, fire dispatch and paramedic communications, it would need to be expanded as follows: to 3,395 SF by 2021; to 4,180 SF by 2031; and to 4,450 SF by 2041. [18]

[16] These estimates assume a 50% backup to primary ratio in terms of floor area.
[17] Ibid.
[18] Ibid.

# Appendix A – Floor Area Forecasts

# Appendix A: Floor Area Forecasts

| Space Description | Unit Sq. Ft. | 2021 | | 2031 | | 2041 | | Comment |
|---|---|---|---|---|---|---|---|---|
| | | Units | Total Sq. Ft. | Units | Total Sq. Ft. | Units | Total Sq. Ft. | |
| **911 COMMUNICATIONS** | | | **5,572** | | **6,800** | | **7,376** | |
| **COMM. FLOOR** | | | **4,450** | | **5,480** | | **6,020** | |
| Supervisor Consoles | 180 | 2 | 360 | 2 | 360 | 2 | 360 | Replacem't |
| Communicator Consoles (current) | 180 | 16 | 2,880 | 16 | 2,880 | 16 | 2,880 | Replacem't |
| Communicator Consoles (12-hour shifts) | 180 | 3 | 540 | 3 | 540 | 3 | 540 | Shift Adjm't |
| Communicator Consoles (growth) | 180 | 1 | 180 | 5 | 900 | 8 | 1,440 | Growth Inc. |
| Communicator Consoles (NG911) | 180 | 2 | 360 | 3 | 540 | 3 | 540 | New Req't |
| Switchboard | 130 | 1 | 130 | 2 | 260 | 2 | 260 | Growth Inc. |
| Application Software & Screens | | | | | | | | |
| **OFFICES & OTHER** | | | **1,122** | | **1,320** | | **1,356** | |
| Management Offices | 130 | 1 | 130 | 2 | 260 | 2 | 260 | Prop'd Inc. |
| Trainer's Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Replacem't |
| QA/Trainer's Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Replacem't |
| Admin Filing | 100 | 1 | 100 | 1 | 100 | 1 | 100 | Replacem't |
| Training Supplies & Storage | 100 | 1 | 100 | 1 | 100 | 1 | 100 | Prop'd New |
| Storage (Equipment & Furniture) | 100 | 1 | 100 | 1 | 100 | 1 | 100 | Prop'd New |
| Entry Lockers (half-height) | 2.0 | 122 | 245 | 141 | 280 | 155 | 310 | Prop'd New |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 187 | | 220 | | 226 | |
| **REAL TIME OPERATIONS CENTRE (RTOC)** | | | **750** | | **750** | | **750** | |
| Communicator Consoles | 250 | 2 | 500 | 2 | 500 | 2 | 500 | Prop'd New |
| Staffed Desks | 125 | 2 | 250 | 2 | 250 | 2 | 250 | Prop'd New |
| Application Software & Screens | | | | | | | | |
| **MAJOR INCID. SUPPORT CNTR (MISC)** | | | **750** | | **750** | | **750** | |
| Outfitted Desks | 75 | 8 | 600 | 8 | 600 | 8 | 600 | Prop'd New |
| Office Desks | 75 | 2 | 150 | 2 | 150 | 2 | 150 | Prop'd New |
| EOC (use 911 Comm meeting room) | | | | | | | | Prop'd New |
| Application Software & Screens | | | | | | | | |
| **MEETING ROOM** | 25 | 15 | 375 | 15 | 375 | 15 | 375 | Prop'd New |
| **DEDICATED TRAINING ROOM** | 110 | 15 | 1,650 | 15 | 1,650 | 15 | 1,650 | Prop'd New |
| **FIRE COMMUNICATIONS** | | | **1,380** | | **1,566** | | **1,578** | |
| **COMM. FLOOR** | | | **900** | | **1,080** | | **1,080** | |
| Supervisor Console | 180 | 1 | 180 | 1 | 180 | 1 | 180 | Replacem't |
| Communicator Consoles (current) | 180 | 4 | 720 | 4 | 720 | 4 | 720 | Replacem't |
| Communicator Consoles (growth) | 180 | 0 | 0 | 1 | 180 | 1 | 180 | Growth Inc. |
| **OFFICES & OTHER** | | | **480** | | **486** | | **498** | |
| Supervisor Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Replacem't |
| Direct Detect Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Replacem't |
| Filing & Storage | 100 | 1 | 100 | 1 | 100 | 1 | 100 | Prop'd New |
| Entry Lockers (half-height) | 2.0 | 21 | 40 | 23 | 45 | 27 | 55 | Prop'd New |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 80 | | 81 | | 83 | |

*…. Cont'd*

# Appendix A: Floor Area Forecasts *(cont'd)*

| Space Description | Unit Sq. Ft. | 2021 | | 2031 | | 2041 | | Comment |
|---|---|---|---|---|---|---|---|---|
| | | Units | Total Sq. Ft. | Units | Total Sq. Ft. | Units | Total Sq. Ft. | |
| **PARAMEDIC SERVICE COMM'NS** | | | **2,448** | | **2,826** | | **2,832** | |
| **COMM. FLOOR** | | | **1,440** | | **1,800** | | **1,800** | |
| Supervisor Consoles | 180 | 1 | 180 | 1 | 180 | 1 | 180 | Prop'd New |
| Communicator Consoles (current need) | 180 | 7 | 1,260 | 7 | 1,260 | 7 | 1,260 | Prop'd New |
| Communicator Consoles (growth) | 180 | 0 | 0 | 2 | 360 | 2 | 360 | Growth Inc. |
| **OFFICES & OTHER** | | | **1,008** | | **1,026** | | **1,032** | |
| Manager's Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Prop'd New |
| Supervisor's Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Prop'd New |
| Training Supervisor's Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Prop'd New |
| QA /Trainer's Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Prop'd New |
| Clinician Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Prop'd New |
| Filing & Storage | 100 | 1 | 100 | 1 | 100 | 1 | 100 | Prop'd New |
| Entry Lockers (half-height) | 2.0 | 45 | 90 | 53 | 105 | 55 | 110 | Prop'd New |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 168 | | 171 | | 172 | |
| **ROW SFCC** | | | **4,116** | | **4,660** | | **5,192** | |
| **COMM. FLOOR** | | | **3,120** | | **3,640** | | **4,160** | |
| Supervisor Console | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Replacem't |
| Communicator Consoles (current) | 130 | 15 | 1,950 | 15 | 1,950 | 15 | 1,950 | Replacem't |
| Communicator Consoles (off-site) | 130 | 6 | 780 | 6 | 780 | 6 | 780 | Consolid'n |
| Communicator Consoles (growth) | 130 | 2 | 260 | 6 | 780 | 10 | 1,300 | Growth Inc. |
| **OFFICES & OTHER** | | | **996** | | **1,020** | | **1,032** | |
| Supervisor Offices | 130 | 3 | 390 | 3 | 390 | 3 | 390 | Replacem't |
| Trainer's Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Prop'd New |
| Hotel Office | 130 | 1 | 130 | 1 | 130 | 1 | 130 | Prop'd New |
| Filing & Storage | 100 | 1 | 100 | 1 | 100 | 1 | 100 | Prop'd New |
| Entry Lockers (half-height) | 2.0 | 41 | 80 | 50 | 100 | 56 | 110 | Prop'd New |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 166 | | 170 | | 172 | |
| **SHARED AMENITIES** | | | **750** | | **750** | | **750** | |
| **KITCHENETTE** | 150 | 1 | 150 | 1 | 150 | 1 | 150 | Replacem't |
| **WASHROOMS** | 100 | 4 | 400 | 4 | 400 | 4 | 400 | Replacem't |
| **QUIET ROOMS** | 100 | 2 | 200 | 2 | 200 | 2 | 200 | Prop'd New |
| **TOTAL - 3RD FLOOR** | | | **17,791** | | **20,127** | | **21,253** | |
| **TOTAL - 2ND FLOOR** | | | **1,650** | | **1,650** | | **1,650** | |
| **IT SUPPORT** | 150 | 3 | 450 | 3 | 450 | 3 | 450 | Prop'd New |
| **SERVER ROOM** (red. from 4 / save 340 SF) | 1,200 | 1 | 1,200 | 1 | 1,200 | 1 | 1,200 | Prop'd New |
| 911 servers - cabinets & technology | | | | | | | | |
| Fire servers - cabinets & technology | | | | | | | | |
| Paramedic Service servers - cab's & tech'gy | | | | | | | | |
| SFCC - tel. wiring | | | | | | | | |
| **TOTAL** | | | **19,441** | | **21,777** | | **22,903** | |

## ASSUMPTIONS

### General

- Re-location of 911 Communications, Fire Dispatch, Paramedic Services communications and ROW SFCC to the former provincial courthouse building at 200 Frederick St, Kitchener.
- All functions, except the following, are assumed to be situated on the 3rd floor of the building: server room for on-site data and communications network servers, and office space for 2 to 3 WRPS IT staff who will be stationed on the premises to provide round-the-clock emergency communications service support.
- The latter 2 functions are assumed to be situated on the 2nd floor.
- 911 Communications, Fire Dispatch and ROW SFCC are relocated from existing premises.
- In lieu of the dispatch arrangement at the former Cambridge CACC (with its staffing shortcomings), we adopted as surrogate, the dispatch arrangement used by Niagara EMS in its operation of a contracted land ambulance communications service to MOHLTC.
- As suggested by WRPS IT management, our analysis assumes that the Hexagon CAD servers (for 911, police, fire and potentially paramedic services) will remain at WRPS headquarters and be accessed by way of Bell fiber cable.
- Our analysis also assumes that SFCC servers will remain at Region of Waterloo headquarters and they will continue to be accessed by way of Bell fiber cable.

### Replacement Based on Contemporary Standards

- Each communications center is re-located in their entirety, i.e., one-to-one replacement of communications workstations, offices, server rooms, storage areas, and amenities – with some exceptions as described below.
- Unit floor area is adjusted to contemporary standards (derived from peer surveys).
- Current deficiencies relative to contemporary standards are rectified, i.e., with provision of floor area space for a meeting room, dedicated training room, quiet rooms, equipment storage, entry lockers, etc.
- Meeting room is sized to accommodate large groups (of about 15 persons) and dedicated training room is outfitted for groups, also of about 15 students.
- Floor area is adjusted to accommodate growth to 2041 (i.e., 20-25 years) – this, based on the future demand forecasts presented in Section 5 of this report.

### Adjustments for Entry, Circulation and Potential Wasted Space

- Additional square footage may be needed to make layouts work in an "existing" building – the issue being that efficient design configurations may not be achievable resulting in wasted space, e.g., difficulty to arrange workstations in efficiently configured pods or rows due to existing building infrastructure.
- Specifics are difficult to ascertain prior to building ‘detailed design’, which is still several months away. The concern was addressed by including a +20% adjustment in most floor area estimates, as below.
    - Best practices suggest that 150 SF of floor area per workstation is typically enough for entry and circulation within the communications floor. To account for potential wasted

space due to building foundation / layout impediments, the unit value is increased by 20% to 180 SF.

- We estimate that the current SFCC is configured at about 90 SF per workstation. We had initially suggested that this figure be increased to 110 SF; this, to attain a more conducive working environment. To account for potential wasted space – also for additional SFCC space requirements such as security and access control –the unit value is increased a further 20% to 130 SF.
- We also applied a +20% adjustment to the floor area requirements of most other office and other use spaces.

**Floor Layout**

· Since the long-term objective is an eventual consolidation to a fully integrated public safety communications system, we have assumed that all call taking and dispatch consoles for 911 and for police, fire and paramedic services emergency communications, will be co-located in a single contiguous space arrangement.

· SFCC customer service representatives will be co-located in a contiguous space arrangement of their own.

· Related functional requirements, such as the following, may be situated in separate areas of the 3rd floor: offices, meeting rooms, training rooms, quiet rooms, filing, storage, kitchenettes, washrooms, entry lockers, etc.

· Co-located communications services will have shared access to the new meeting and training rooms; also, to common amenities, i.e., kitchenette, washrooms and quiet rooms.

**911 Communications**

· 911 Communications includes resourcing provision for Next Generation 911 (NG 911).

**Real Time Operations Center (RTOC)**

· RTOC assumptions are based mainly on the RTOC facility managed by York Regional Police Services.

· It is assumed that the RTOC will be situated immediately adjacent to the emergency communications floor - this, to enhance interoperability. Also, that the RTOC will have a floor area of approximately 750 SF and be outfitted with 2 fully equipped communications consoles tied into multiple video feeds, and 2 work desks.

**Major Incident Support Center (MISC)**

· We have assumed that adjoining the RTOC there will be a separate working area in which numerous personnel can assemble to manage a major occurrence when the need arises.

· The separate working area, generally referred to as the Major Incident Support Center (MISC), will be outfitted with 8 additional fully equipped communications consoles tied into multiple video feeds, and with 2-3 additional work desks.

· If management of a major incident requires additional working area, then personnel will commandeer the on-site meeting room (which as suggested above should be sized to accommodate about 15 persons).

**Server Room**

- It is assumed that the server room will be about 1,200 SF, as suggested by WRPS IT management.
- Proposed server room replaces the following existing spaces: telephone room at 911 Communications (about 600 SF); telephone/computer room at KFD (about 400 SF); computer room at NACS (about 400SF); and telephone wiring room used by SFCC (150 SF).

**Shared Amenities**

- Kitchenette: It is assumed that 1 shared kitchenette will replace multiple kitchens/break rooms currently situated at the various emergency communications facilities, since communications staff will have access to the Frederick St building's contemporary cafeteria / break room. Floor area shown in the chart (150 SF) is intended to be a placeholder figure – until the building architects have had a chance to develop a more appropriate number.
- Washrooms: Numbers shown in the chart (4 washrooms w' combined floor area of 400 SF) are intended to be placeholder figures – until the building architects have had a chance to develop more appropriate numbers.
- Quiet Rooms: We have assumed that there will be at least 2 quiet rooms, each w' a floor area of about 100 SF.

**Other Assumptions**

- No additional offices other than those listed in the chart. Inspector Field Support WRPS will remain at WRPS HQ. Assistant Deputy Fire Chief / Manager Emergency Communications KFD will remain at KFD HQ. Director Citizen Services and Manager SFCC will remain at ROW HQ.
- Region of Waterloo IT will continue to support ROW SFCC.
- Uninterrupted Power Supply (UPS) will be situated in the building's mechanical room.
- Entry lockers are assumed to be dedicated to staff (not first come / first served). Lockers are assumed to be half-height.
- Entry lockers shown for 911 Communications includes provision for personnel assigned to RTOC.

# Appendix B – Total Capital Cost Forecast

# Appendix B: Total Capital Cost Forecast

| Space Description | Unit Sq. Ft. | 2041 | | TOTAL CAPITAL COSTS | | | |
|---|---|---|---|---|---|---|---|
| | | Units | Total Sq. Ft. | Refurbishing | Furniture | Technology | TOTAL |
| **911 COMMUNICATIONS** | | | **7,376** | **$1,475,200** | **$1,053,000** | **$2,365,100** | **$4,893,300** |
| **COMM. FLOOR** | | | 6,020 | $1,204,000 | $967,000 | $2,346,700 | $4,517,700 |
| Supervisor Consoles | 180 | 2 | 360 | $72,000 | $60,000 | $313,500 | |
| Communicator Consoles (current) | 180 | 16 | 2,880 | $576,000 | $480,000 | $870,800 | |
| Communicator Consoles (12-hour shifts) | 180 | 3 | 540 | $108,000 | $90,000 | $275,250 | |
| Communicator Consoles (growth) | 180 | 8 | 1,440 | $288,000 | $240,000 | $484,000 | |
| Communicator Consoles (NG911) | 180 | 3 | 540 | $108,000 | $90,000 | $305,250 | |
| Switchboard | 130 | 2 | 260 | $52,000 | $7,000 | $9,900 | |
| Application Software & Screens | | | | $0 | $0 | $88,000 | |
| **OFFICES & OTHER** | | | 1,356 | $271,200 | $86,000 | $18,400 | $375,600 |
| Management Offices | 130 | 2 | 260 | $52,000 | $7,000 | $8,800 | |
| Trainer's Office | 130 | 1 | 130 | $26,000 | $3,500 | $4,800 | |
| QA/Trainer's Office | 130 | 1 | 130 | $26,000 | $3,500 | $4,800 | |
| Admin Filing | 100 | 1 | 100 | $20,000 | $5,000 | $0 | |
| Training Supplies & Storage | 100 | 1 | 100 | $20,000 | $2,500 | $0 | |
| Storage (Equipment & Furniture) | 100 | 1 | 100 | $20,000 | $2,500 | $0 | |
| Entry Lockers (half-height) | 2.0 | 155 | 310 | $62,000 | $62,000 | $0 | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 226 | $45,200 | $0 | $0 | |
| **REAL TIME OPERATIONS CENTRE (RTOC)** | | | **750** | **$150,000** | **$67,000** | **$3,912,000** | **$4,129,000** |
| Communicator Consoles | 250 | 2 | 500 | $100,000 | $60,000 | $383,500 | |
| Staffed Desks | 125 | 2 | 250 | $50,000 | $7,000 | $83,500 | |
| Application Software & Screens | | | | $0 | $0 | $3,445,000 | |
| **MAJOR INCID. SUPPORT CNTR (MISC)** | | | **750** | **$150,000** | **$247,000** | **$806,985** | **$1,203,985** |
| Outfitted Desks | 75 | 8 | 600 | $120,000 | $240,000 | $179,200 | |
| Office Desks | 75 | 2 | 150 | $30,000 | $7,000 | $0 | |
| EOC (use 911 Comm meeting room) | | | | $0 | $0 | $0 | |
| Application Software & Screens | | | | $0 | $0 | $627,785 | |
| **MEETING ROOM** | 25 | **15** | **375** | **$75,000** | **$20,000** | **$11,000** | **$106,000** |
| **DEDICATED TRAINING ROOM** | 110 | **15** | **1,650** | **$330,000** | **$225,000** | **$308,250** | **$863,250** |
| **FIRE COMMUNICATIONS** | | | **1,578** | **$315,600** | **$202,800** | **TBD** | **$518,400** |
| **COMM. FLOOR** | | | 1,080 | $216,000 | $180,000 | TBD | $396,000 |
| Supervisor Console | 180 | 1 | 180 | $36,000 | $30,000 | | |
| Communicator Consoles (current) | 180 | 4 | 720 | $144,000 | $120,000 | | |
| Communicator Consoles (growth) | 180 | 1 | 180 | $36,000 | $30,000 | | |
| **OFFICES & OTHER** | | | 498 | $99,600 | $22,800 | TBD | $122,400 |
| Supervisor Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Direct Detect Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Filing & Storage | 100 | 1 | 100 | $20,000 | $5,000 | | |
| Entry Lockers (half-height) | 2.0 | 27 | 55 | $11,000 | $10,800 | | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 83 | $16,600 | $0 | | |

*…. Cont'd*

# Appendix B: Total Capital Cost Forecast *(cont'd)*

| Space Description | Unit Sq. Ft. | 2041 | | TOTAL CAPITAL COSTS | | | |
|---|---|---|---|---|---|---|---|
| | | Units | Total Sq. Ft. | Refurbishing | Furniture | Technology | TOTAL |
| **PARAMEDIC SERVICE COMM'NS** | | | **2,832** | **$566,400** | **$344,500** | **TBD** | **$910,900** |
| **COMM. FLOOR** | | | **1,800** | **$360,000** | **$300,000** | **TBD** | **$660,000** |
| Supervisor Consoles | 180 | 1 | 180 | $36,000 | $30,000 | | |
| Communicator Consoles (current need) | 180 | 7 | 1,260 | $252,000 | $210,000 | | |
| Communicator Consoles (growth) | 180 | 2 | 360 | $72,000 | $60,000 | | |
| **OFFICES & OTHER** | | | **1,032** | **$206,400** | **$44,500** | **TBD** | **$250,900** |
| Manager's Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Supervisor's Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Training Supervisor's Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| QA /Trainer's Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Clinician Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Filing & Storage | 100 | 1 | 100 | $20,000 | $5,000 | | |
| Entry Lockers (half-height) | 2.0 | 55 | 110 | $22,000 | $22,000 | | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 172 | $34,400 | $0 | | |
| **ROW SFCC** | | | **5,192** | **$1,038,400** | **$684,900** | **TBD** | **$1,723,300** |
| **COMM. FLOOR** | | | **4,160** | **$832,000** | **$640,000** | **TBD** | **$1,472,000** |
| Supervisor Console | 130 | 1 | 130 | $26,000 | $20,000 | | |
| Communicator Consoles (current) | 130 | 15 | 1,950 | $390,000 | $300,000 | | |
| Communicator Consoles (off-site) | 130 | 6 | 780 | $156,000 | $120,000 | | |
| Communicator Consoles (growth) | 130 | 10 | 1,300 | $260,000 | $200,000 | | |
| **OFFICES & OTHER** | | | **1,032** | **$206,400** | **$44,900** | **TBD** | **$251,300** |
| Supervisor Offices | 130 | 3 | 390 | $78,000 | $10,500 | | |
| Trainer's Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Hotel Office | 130 | 1 | 130 | $26,000 | $3,500 | | |
| Filing & Storage | 100 | 1 | 100 | $20,000 | $5,000 | | |
| Entry Lockers (half-height) | 2.0 | 56 | 110 | $22,000 | $22,400 | | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 172 | $34,400 | $0 | | |
| **SHARED AMENITIES** | | | **750** | **$150,000** | **$17,000** | **$0** | **$167,000** |
| **KITCHENETTE** | 150 | 1 | 150 | **$30,000** | **$10,000** | **$0** | **$40,000** |
| **WASHROOMS** | 100 | 4 | 400 | **$80,000** | **$0** | **$0** | **$80,000** |
| **QUIET ROOMS** | 100 | 2 | 200 | **$40,000** | **$7,000** | **$0** | **$47,000** |
| **TOTAL - 3RD FLOOR** | | | **21,253** | **$4,250,600** | **$2,861,200** | **$7,403,335** | **$14,515,135** |
| **TOTAL - 2ND FLOOR** | | | **1,650** | **$330,000** | **$38,500** | **$85,500** | **$454,000** |
| **IT SUPPORT** | 150 | 3 | 450 | **$90,000** | **$10,500** | **$40,500** | **$141,000** |
| **SERVER ROOM** (red. from 4 / save 340 SF) | 1,200 | 1 | 1,200 | **$240,000** | **$28,000** | **$45,000** | **$313,000** |
| 911 servers - cabinets & technology | | | | | $28,000 | $45,000 | $73,000 |
| Fire servers - cabinets & technology | | | | | TBD | TBD | $0 |
| Paramedic Service servers - cab's & tech'gy | | | | | TBD | TBD | $0 |
| SFCC - tel. wiring | | | | | TBD | TBD | $0 |
| **TECHNOLOGY INFRA. FOR BUILDING** | | | **0** | **$0** | **$0** | **$4,982,000** | **$4,982,000** |
| **TECHNOLOGY INFRASTRUCTURE** | | | **0** | **$0** | **$0** | **$4,322,000** | **$4,322,000** |
| Motorola Radio Reconfiguration | | | | $0 | $0 | $2,350,000 | |
| Redundant Bell 911 Trunk | | | | $0 | $0 | $1,000,000 | |
| Network Connections, Switches & Licenses | | | | $0 | $0 | $303,500 | |
| UPS for Comm. Center & Phone System | | | | $0 | $0 | $80,000 | |
| Firewall Infrastructure | | | | $0 | $0 | $65,000 | |
| Security & Access Control | | | | $0 | $0 | $500,000 | |
| Alternate Power Supply at Workstations | | | | $0 | $0 | $23,500 | |
| **PROJECT IMPLEMENTATION** | | | **0** | **$0** | **$0** | **$660,000** | **$660,000** |
| 3-4 persons @ 18 mon's | | | | | | | |
| **SUB-TOTAL** | | | **22,903** | **$4,580,600** | **$2,899,700** | **$12,470,835** | **$19,951,135** |
| **15% CONTINGENCY** | | | | **$687,090** | **$434,955** | **$1,870,625** | **$2,992,670** |
| **TOTAL** | | | **22,903** | **$5,267,690** | **$3,334,655** | **$14,341,460** | **$22,943,805** |

## ASSUMPTIONS

### General

- Total capital costs shown in the above chart are based on floor area and resourcing forecasts for year 2041.
- The capital costs are expressed in current 2019 dollars. They exclude HST and/or other applicable taxes.
- Operating costs are excluded from the costing analysis.

### Refurbishing Costs

- APEXPRO assumed the following unit cost for refurbishing a standing building to accommodate police and emergency communications center functions: $200 per SF.
- ROW Facilities confirm that $200 per SF is a reasonably conservative assumption for base building renovation costs based on past construction cost estimates. Further, they assume that this figure includes demolition, interior fit out, mechanical, and base electrical work.
- ROW Facilities have engaged a cost consultant. As building designs progress, the cost consultant will commence development of more detailed cost estimates. The consultant's more detailed cost estimates will likely vary from the $200 per SF estimate used in this assessment.

### Furniture Costs

- Cost analysis assumes that workstations used by emergency communications (911, police, fire and paramedic services) will be Bramic Creative Business Products Limited or equivalent. The workstations will include the following comfort features: sit/stand height adjustable, focal distance adjustable, at station personal storage, personalized environmental control, and individual task access lighting.
- Cost analysis assumes that SFCC workstations will also be upgraded to include personal storage, and personalized environmental control. Workstation are assumed to be Xybix Systems Inc. or equivalent (mid to top level).
- Training room workstations are also assumed to be Xybix Systems Inc. or equivalent (basic to mid level).
- Costs for office workstations (desk, chair, floor mat, etc) were extracted from a November 2018 document entitled "WRPS Furniture Standardization", by Prestige Business Interiors.

### Technology Costs

- Technology cost estimates were provided by the Director of IT, WRPS. The cost estimates include both hardware and software.
- It is assumed that security and access control will be required for communications personnel other than WRPS employees, i.e., to access cafeteria, meeting room, dedicated training room, etc).
- The above chart includes technology cost estimates for 911 Communications, RTOC and MISC.

- The above chart also includes cost estimates for technology infrastructure common to the building, e.g.: Motorola radio reconfiguration, network connections, switches, licensing, UPS, firewall infrastructure, security and access control, etc.
- The above chart excludes technology cost estimates for Fire Dispatch, Paramedic Services Communications and ROW SFCC. It is assumed that these costs will be developed individually by each service, during their respective re-location planning.
- RTOC technology costs account for video integration of multiple real-time video feeds, business intelligence software systems, and multiple interactive video screens (of various sizes).

**Project Implementation**

- Assumes 3-4 persons for 18 months planning, preparing and implementing the re-location project, with specific focus on the technology aspects.

**Specific Cost Estimate Assumptions**

- Refurbishing per S.F.: $200
- Workstation for emergency communicator (911, police, fire and paramedic services): $30,000
- Workstation for SFCC communicator: $20,000
- Training room workstation: $15,000
- Office furniture: $3,500
- Boardroom furniture: 12' boardroom table w' 16 chairs and side table: $20,000
- Kitchenette w' cupboards, counter and small appliances: $10,000
- Admin filing (in sets of 5 laterals w’ 5 drawers each): $5,000
- Quiet room recliner: $3,500
- Shelving for storage room supplies storage: $2,500
- Cost of an entry locker: $400

# Appendix C – Capital Costs on Move In

# Appendix C: Capital Costs on Move In

| Space Description | Unit Sq. Ft. | 2021 | | CAPITAL COSTS - ON MOVE IN | | | |
|---|---|---|---|---|---|---|---|
| | | Units | Total Sq. Ft. | Refurbishing | Furniture | Technology | TOTAL |
| **911 COMMUNICATIONS** | | | **5,572** | **$1,475,200** | **$792,800** | **$1,871,750** | **$4,139,750** |
| **COMM. FLOOR** | | | **4,450** | **$1,204,000** | **$723,500** | **$1,857,750** | **$3,785,250** |
| Supervisor Consoles | 180 | 2 | 360 | $72,000 | $60,000 | $313,500 | |
| Communicator Consoles (current) | 180 | 16 | 2,880 | $576,000 | $480,000 | $870,800 | |
| Communicator Consoles (12-hour shifts) | 180 | 3 | 540 | $108,000 | $90,000 | $275,250 | |
| Communicator Consoles (growth) | 180 | 1 | 180 | $288,000 | $30,000 | $41,750 | |
| Communicator Consoles (NG911) | 180 | 2 | 360 | $108,000 | $60,000 | $263,500 | |
| Switchboard | 130 | 1 | 130 | $52,000 | $3,500 | $4,950 | |
| Application Software & Screens | | | | $0 | $0 | $88,000 | |
| **OFFICES & OTHER** | | | **1,122** | **$271,200** | **$69,300** | **$14,000** | **$354,500** |
| Management Offices | 130 | 1 | 130 | $52,000 | $3,500 | $4,400 | |
| Trainer's Office | 130 | 1 | 130 | $26,000 | $3,500 | $4,800 | |
| QA/Trainer's Office | 130 | 1 | 130 | $26,000 | $3,500 | $4,800 | |
| Admin Filing | 100 | 1 | 100 | $20,000 | $5,000 | $0 | |
| Training Supplies & Storage | 100 | 1 | 100 | $20,000 | $2,500 | $0 | |
| Storage (Equipment & Furniture) | 100 | 1 | 100 | $20,000 | $2,500 | $0 | |
| Entry Lockers (half-height) | 2.0 | 122 | 245 | $62,000 | $48,800 | $0 | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 187 | $45,200 | $0 | $0 | |
| **REAL TIME OPERATIONS CENTRE (RTOC)** | | | **750** | **$150,000** | **$67,000** | **$3,912,000** | **$4,129,000** |
| Communicator Consoles | 250 | 2 | 500 | $100,000 | $60,000 | $383,500 | |
| Staffed Desks | 125 | 2 | 250 | $50,000 | $7,000 | $83,500 | |
| Application Software & Screens | | | | $0 | $0 | $3,445,000 | |
| **MAJOR INCID. SUPPORT CNTR (MISC)** | | | **750** | **$150,000** | **$247,000** | **$806,985** | **$1,203,985** |
| Outfitted Desks | 75 | 8 | 600 | $120,000 | $240,000 | $179,200 | |
| Office Desks | 75 | 2 | 150 | $30,000 | $7,000 | $0 | |
| EOC (use 911 Comm meeting room) | | | | $0 | $0 | $0 | |
| Application Software & Screens | | | | $0 | $0 | $627,785 | |
| **MEETING ROOM** | 25 | 15 | 375 | $75,000 | $20,000 | $11,000 | $106,000 |
| **DEDICATED TRAINING ROOM** | 110 | 15 | 1,650 | $330,000 | $225,000 | $308,250 | $863,250 |
| **FIRE COMMUNICATIONS** | | | **1,380** | **$315,600** | **$0** | **$0** | **$315,600** |
| **COMM. FLOOR** | | | **900** | **$216,000** | **$0** | **$0** | **$216,000** |
| Supervisor Console | 180 | 1 | 180 | $36,000 | | | |
| Communicator Consoles (current) | 180 | 4 | 720 | $144,000 | | | |
| Communicator Consoles (growth) | 180 | 0 | 0 | $36,000 | | | |
| **OFFICES & OTHER** | | | **480** | **$99,600** | **$0** | **$0** | **$99,600** |
| Supervisor Office | 130 | 1 | 130 | $26,000 | | | |
| Direct Detect Office | 130 | 1 | 130 | $26,000 | | | |
| Filing & Storage | 100 | 1 | 100 | $20,000 | | | |
| Entry Lockers (half-height) | 2.0 | 21 | 40 | $11,000 | | | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 80 | $16,600 | | | |

*…. Cont'd*

# Appendix C: Capital Costs on Move In *(cont'd)*

| Space Description | Unit Sq. Ft. | 2021 | | CAPITAL COSTS - ON MOVE IN | | | |
|---|---|---|---|---|---|---|---|
| | | Units | Total Sq. Ft. | Refurbishing | Furniture | Technology | TOTAL |
| **PARAMEDIC SERVICE COMM'NS** | | | 2,448 | $566,400 | $0 | $0 | $566,400 |
| COMM. FLOOR | | | 1,440 | $360,000 | $0 | $0 | $360,000 |
| Supervisor Consoles | 180 | 1 | 180 | $36,000 | | | |
| Communicator Consoles (current need) | 180 | 7 | 1,260 | $252,000 | | | |
| Communicator Consoles (growth) | 180 | 0 | 0 | $72,000 | | | |
| OFFICES & OTHER | | | 1,008 | $206,400 | $0 | $0 | $206,400 |
| Manager's Office | 130 | 1 | 130 | $26,000 | | | |
| Supervisor's Office | 130 | 1 | 130 | $26,000 | | | |
| Training Supervisor's Office | 130 | 1 | 130 | $26,000 | | | |
| QA /Trainer's Office | 130 | 1 | 130 | $26,000 | | | |
| Clinician Office | 130 | 1 | 130 | $26,000 | | | |
| Filing & Storage | 100 | 1 | 100 | $20,000 | | | |
| Entry Lockers (half-height) | 2.0 | 45 | 90 | $22,000 | | | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 168 | $34,400 | | | |
| **ROW SFCC** | | | 4,116 | $1,038,400 | $0 | $0 | $1,038,400 |
| COMM. FLOOR | | | 3,120 | $832,000 | $0 | $0 | $832,000 |
| Supervisor Console | 130 | 1 | 130 | $26,000 | | | |
| Communicator Consoles (current) | 130 | 15 | 1,950 | $390,000 | | | |
| Communicator Consoles (off-site) | 130 | 6 | 780 | $156,000 | | | |
| Communicator Consoles (growth) | 130 | 2 | 260 | $260,000 | | | |
| OFFICES & OTHER | | | 996 | $206,400 | $0 | $0 | $206,400 |
| Supervisor Offices | 130 | 3 | 390 | $78,000 | | | |
| Trainer's Office | 130 | 1 | 130 | $26,000 | | | |
| Hotel Office | 130 | 1 | 130 | $26,000 | | | |
| Filing & Storage | 100 | 1 | 100 | $20,000 | | | |
| Entry Lockers (half-height) | 2.0 | 41 | 80 | $22,000 | | | |
| 20% Adjustment (entry, circ'n & ineffic.) | | | 166 | $34,400 | | | |
| **SHARED AMENITIES** | | | 750 | $150,000 | $17,000 | $0 | $167,000 |
| KITCHENETTE | 150 | 1 | 150 | $30,000 | $10,000 | $0 | $40,000 |
| WASHROOMS | 100 | 4 | 400 | $80,000 | $0 | $0 | $80,000 |
| QUIET ROOMS | 100 | 2 | 200 | $40,000 | $7,000 | $0 | $47,000 |
| **TOTAL - 3RD FLOOR** | | | 17,791 | $4,250,600 | $1,368,800 | $6,909,985 | $12,529,385 |
| **TOTAL - 2ND FLOOR** | | | 1,650 | $330,000 | $38,500 | $85,500 | $454,000 |
| IT SUPPORT | 150 | 3 | 450 | $90,000 | $10,500 | $40,500 | $141,000 |
| SERVER ROOM (red. from 4 / save 340 SF) | 1,200 | 1 | 1,200 | $240,000 | $28,000 | $45,000 | $313,000 |
| 911 servers - cabinets & technology | | | | $0 | $28,000 | $45,000 | $73,000 |
| Fire servers - cabinets & technology | | | | $0 | $0 | $0 | $0 |
| Paramedic Service servers - cab's & tech'gy | | | | $0 | $0 | $0 | $0 |
| SFCC - tel. wiring | | | | $0 | $0 | $0 | $0 |
| **TECHNOLOGY INFRA. FOR BUILDING** | | | 0 | $0 | $0 | $4,976,500 | $4,976,500 |
| TECHNOLOGY INFRASTRUCTURE | | | 0 | $0 | $0 | $4,316,500 | $4,316,500 |
| Motorola Radio Reconfiguration | | | | $0 | $0 | $2,350,000 | |
| Redundant Bell 911 Trunk | | | | $0 | $0 | $1,000,000 | |
| Network Connections, Switches & Licenses | | | | $0 | $0 | $303,500 | |
| UPS for Comm. Center & Phone System | | | | $0 | $0 | $80,000 | |
| Firewall Infrastructure | | | | $0 | $0 | $65,000 | |
| Security & Access Control | | | | $0 | $0 | $500,000 | |
| Alternate Power Supply at Workstations | | | | $0 | $0 | $18,000 | |
| PROJECT IMPLEMENTATION | | | 0 | $0 | $0 | $660,000 | $660,000 |
| 3-4 persons @ 18 mon's | | | | | | | |
| **SUB-TOTAL** | | | 19,441 | $4,580,600 | $1,407,300 | $11,971,985 | $17,959,885 |
| 15% CONTINGENCY | | | | $687,090 | $211,095 | $1,795,798 | $2,693,983 |
| **TOTAL** | | | 19,441 | $5,267,690 | $1,618,395 | $13,767,783 | $20,653,868 |

**ASSUMPTIONS**

- Occupancy is assumed to occur in or about 2022, this based on the 2018 WRPS Facilities Master Plan which tentatively suggests that construction will be completed in 2022
- Analysis assumes same unit costs shown previously in Appendix B.
- Refurbishing costs at "move in" are based on floor area at full buildout (shown previously in Appendix B based on 2041 forecast).
- Furniture costs at "move in" are based on resourcing forecasts for 2021.
- Technology costs at "move in" are based on technology forecasts for 2021.