WATERLOO REGIONAL POLICE SERVICE BOARD

December 2, 2025

Dear Members of Regional Council,

On behalf of the Waterloo Regional Police Service Board, we would like to thank you for your time on November 26th as we presented the 2026 Approved Operating and Capital Budget Estimates. Please find below, follow-up information that was requested by members of Council.

At that meeting, significant attention was placed on the Region of Waterloo's Public Safety Communication Centre (PSCC). To be built over five years, the PSCC is a generational facility that will include a modern Communications Centre and bring together the Real Time Operations Centre and Major Incident Response Centre under one roof. WRPS' vision for the PSCC is supported by consecutive expert reports since 2012 (all outlined below), as well as local dispatch reviews dating back to 2007. The PSCC will also provide essential operational capacity for the Service that will, in turn, defer other capital expenditures. As such, the Waterloo Regional Police Service Board approved a $174 million budget in September 2024 for the PSCC.

We appreciate the fiscal constraints and competing priorities that RoW Council is facing. Since 2020, WRPS have been engaging with RoW staff to advance the PSCC project and have been diligently preparing from a financial perspective. This includes utilizing RoW's pay-as-you-go capital financing model, which includes prioritizing use of reserves and other non-debt financing options.

By approving the 2026 Budget Estimates, the Police Service Board has made it clear that the PSCC project is essential to WRPS' ongoing and future operations and emergency response capabilities. As well, the PSCC is critical for emergency preparedness in the unfortunate event of a mass casualty or mass disaster incident. For these reasons, any delay regarding this project is not an option. Additionally, every year of delay would add an extra $5 million in costs as a result of inflationary increases.

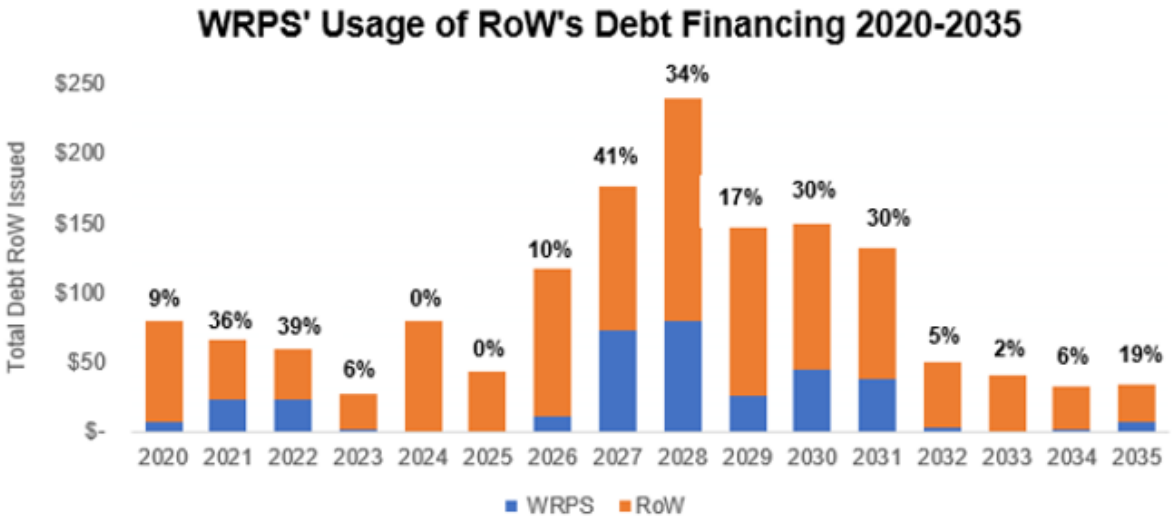
The Police Service Board is ultimately responsible for ensuring that the WRPS has the required facilities necessary for its 24/7 public safety operations. Under the Community Safety and Policing Act (CSPA), members of Regional Council are not permitted to disapprove specific line items in either the Operating or Capital Budget but instead are permitted to approve an overall budgetary amount. Section 50 of the CSPA further outlines the process if the Police Service Board and Regional Council do not agree on the specific budget amount required to provide adequate and effective policing in the Region of Waterloo.

As a Police Service Board, we are confident that the completed PSCC will greatly benefit all first responders, as well as current and future generations of Waterloo Region residents.

We appreciate your collective understanding on this matter.

Best,

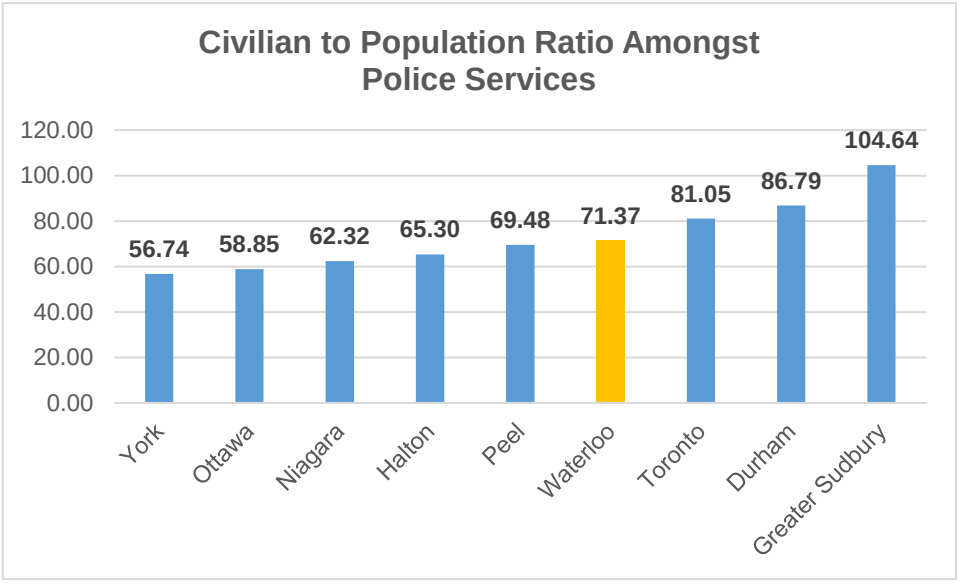
Ian McLean
Chair of the Waterloo Regional Police Service Board

Topic	Response
Capital Debt Financing	WRPS is committed to our shared financial arrangement with the RoW. This includes utilizing a shared capital funding approach and funding renewal projects solely through Reserves as opposed to debt. WRPS' capital plan comprises 6% of the RoW Capital Plan for 2026-2035. Collaboratively with RoW Staff, WRPS plans out all upcoming expenditures requiring debt financing for large capital projects. For example, recognizing that 2027/2028 presents challenges for debt levels, WRPS deferred $4.4 million in capital projects beyond those years and reduced $1.3M across the ten years. The above chart illustrates the level of debt utilized by WRPS out of the full RoW debt allocation.  Traditionally, WRPS has not used its full respective debt allocation, which is approximately 30% of the RoW's total debt financing. From 2020-2025, WRPS accounted for **16%** of the total debt issued by RoW and is projected at **25%** in the ten-year Capital Plan.
Comparable Capital Projects	In Ontario, police service buildings are built to post-disaster standards and with a heavy focus on redundancy and resiliency of systems, to ensure the facility will continue to provide critical 911 services in all but the worst of circumstances. These are standards under the National Emergency Number Association (NENA). Please find two comparable capital projects from other police services in Ontario. **Region of Peel – $368 million:** • Peel Regional Police (PRP) is constructing a new replacement Operational Support Facility in Brampton. The new 296,000 square foot facility will house the PRP Communications Centre, which includes co-location with Fire Communications. **City of Ottawa – $187 million:** • Ottawa Police Service's (OPS) South Facility will include the 9-1-1 Communications Centre as well as their South Division operations and other support units.

Topic	Response
Funding of Capital Projects	A recent survey of police services in Ontario noted all mid-to-large sized municipal police services receive Operating and/or Capital funding from their Municipal or Regional government. 5 Police Services did not receive funding: WRPS, the Ontario Provincial Police (different funding arrangement) and 3 small police services.
PSCC Scope (75,000-SF)	From 2019 to 2024, expert consultants in emergency response examined and continually refined the size of the PSCC, using future population and demand for service estimations to determine space needs for 9-1-1 operations, as well as growth space for the WRPS. With each review, an expanded total square footage was recommended. For example, space and technology constraints at WRPS Central Division is why that option was not pursued. The current, approved size of 75,000 SF will accomplish the following objectives: • As WRPS buildings are at capacity and are facing significant growth pressures, which the PSCC will accommodate in the mid-term. • Architects RPL +VG recommended intensification of space – adding growth space to all future builds to providing capacity and flexibility • Accommodate future partnerships based on the long-standing vision for the PSCC. • Defray the need to expand the PSCC in future, which would have significant potential to disrupt critical operations.

Amendments in Growth Plans for the PSCC	• Using service demand modelling up to 2051, WRPS and the Region determined that it was prudent to build additional space as future renovations or expansions would be extremely disruptive to the operations of the Communications Centre.
	• The primary drivers behind the growth in the size of the PSCC were:
	  ○ In 2021, analysis conducted by Pomax Consulting recommended a consolidated communications centre to generate cost savings over time and position the Region to offer services to other municipalities.
	  ○ In 2022, the figure was refined to **50,000 SF** by Apex Pro Consulting based on projected population and demand for service growth out to 2051.
	  ○ In 2024, RPL and +VG Architects recommended that WRPS include additional space, for a total of **75,000 SF**, to accommodate their future growth requirements, as well as space for the inclusion of potential future partnerships, and other shared service arrangements.
	• WRPS facilities are currently at capacity and the cost of construction escalates approximately 5 percent year-over-year due to inflation.

Topic	Response
Impact of PSCC on WRPS' Capital Budget	The size of the PSCC is allowing for the deferral of necessary capital projects listed in the updated 2024 WRPS Facilities Master Plan. Examples of projects, which total **$23.4 million**, that were deferred include: • The construction of a new evidence building – estimated at $13M. • The expansion of Emergency Response Team facilities – estimated at $1.3M. • The expansion of the Police Reporting Centre – estimated at $2.6M. • The expansion of the Investigative Services building – estimated at $6.5M.
Sworn Member Staffing	The proposed 2026 Operating Budget makes critical investments in public safety across Waterloo Region. This includes the addition of 28 uniform officers for high demand policing areas, including frontline, investigative services, road safety and court security. The Adequate and Effective Policing Regulation (392/23), under the CSPA, outlines the areas that a Police Service should consider when assessing its staffing complement. The Generally Applicable Standards are: • The policing needs of the community. • The geographic and socio-demographic characteristics of the police service's area of policing responsibility. • The extent to and manner in which the policing function is effectively provided in similar communities in Ontario. • The extent to which past provision of the policing function by the police service has been effective in addressing the policing needs of the community. • Best practices respecting the policing function. In collaboration with Operational Research in Health (ORH), WRPS has shifted away from staffing to population and instead are staffing based on workload and Regional priorities. During their examination, ORH found that that WRPS patrol constables have been busier in the last 2 years than they were at any point in the previous 5-year time period. ORH also found that from 2026-2030, calls for service are expected to increase **3%** year over year.
Road Safety Team	In 2024, a total of 22,777 road safety charges occurred in Waterloo Region. Approximately, this equates to 342,000 hours of personnel time by WRPS officers.

Topic	Response
Budget Efficiencies	The following provides an outline for how the WRPS 2026 Budget was developed and how staff were focused on cost containment: • Starting in Spring 2026, extensive budget review processes commenced, reviewing prior year, current year, forecast for future 2 years post 2026, business case review for all "new" capital assets added and material operating budget increases. • $2.15 million in reductions were made to the 2026 Operating Budget estimates and $691K of reductions to the 2026 Capital Request. • The Staff Planning Committee required all units to do a workload analysis, review alternative service delivery methods, re-prioritization of workload and technology options before requesting any additional FTE. • The Staff Planning Committee turned down **41 percent** of all new civilian staffing requests during the 2026 Budget Process. • In 2026, negotiated changes to process for administering Workplace Safety and Insurance Board (WSIB) pay advancements will result in substantial savings to the operating budget.
Civilian Staffing Comparison	
Integrated Mobile Police & Crisis Team (IMPACT)	IMPACT consists of specially trained Mental Health Clinicians and WRPS officers to provide immediate and comprehensive care to mental health and addiction related calls. IMPACT has transformed how mental health related calls for service in the Region of Waterloo are handled by providing a collaborative, immediate, and comprehensive crisis response for individuals and their families. In 2025, WRPS helped secure three-year provincial funding for IMPACT in partnership the Canadian Mental Health Association.

Emergency Communications and Dispatch Expert Review	
Summary: For almost 20 years, the Region of Waterloo has been exploring the potential for improved interoperability for Police, Fire, and Paramedic Services emergency communications. In 2011, there was a fatal helicopter crash that acted as a catalyst for change, given the issues identified in the collective response to that major incident. The following is a comprehensive collection of consultant reports on this topic, as well as relevant academic papers.	
"Helicopter Crash – November 28, 2011 Region of Waterloo International Airport" **(R. Larry Gravill Report, 2012).** Link.	• "The exact location of the crash was known to the 9-1-1 Dispatch Centre (WRPS) AT 11:35 a.m. but not relayed to Fire and EMS until 11:46/11:47 a.m." • Recommendation: "The Fire Departments, WRPS, and Waterloo Regional Emergency Medical Service, need to have one common dispatch model to ensure resources are quickly dispatched during emergencies."
"Public Safety Answering Point Consolidation Feasibility" **(L.R. Kimball Report, 2014).** Link.	• "Sharing of physical space enables communications between call takers, law enforcement and fire dispatchers to be virtually instantaneous. This improved communication enables field personnel to receive information more quickly and accurately which is particularly important in multi-jurisdictional incidents.
"Common Technology Platform for Police and Fire Dispatch in Waterloo Region" **(ApexPro Consulting, 2017)** Report Attached	• "The development of a contemporary, emergency dispatch system for the Region of Waterloo – one that full integrates 9-1-1 call taking with dispatch services for police, fire and EMS – has been a recommendation advocated repeatedly by elected officials, public safety leaders, consultants and stakeholders across the Region, for over 20 years." • "The separation of police, fire and EMS communications creates a disjointed environment where 9-1-1 calls are often transferred one or more times to receive required services from police, fire and EMS." • "The physical, management and technological separation of communications centres hinders interoperability and coordination among agencies."
"Planning for a New & Expanded Public Safety Communication Centre" **(ApexPro Consulting, 2019)** Report Attached	• Finding that space at Central Division falls far short of the total floor area required for all communications functions under consideration. • "Favour Option 3 "911/Police & Fire Dispatch plus Paramedic 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."

"A Review of Fire and Police Communications and Dispatch in Waterloo Region" (Pomax Report, 2021). Link.	• "A co-located dispatch model is one where the agencies would be located in the same building but operate separately, whereas a consolidated model is one where all staff work for the same organization and, upon being fully trained, are able to serve as call taker or dispatcher for police, fire and ambulance." • "Co-located communications centres – the police service and fire service would be located in the same building but operate separately. Technical and building infrastructure would be shared, but operations and governance would remain distinct." • "A co-located communications centre may achieve some efficiencies by reducing the overall capital infrastructure, and possibly operating cost, requirements compared to separate communications centres: Meeting rooms, lunchrooms, climate control, parking, reserve power and backup power, etc." • "Co-locating may have a benefit of separate communications supervisors having the opportunity to exchange ideas and working more closely, thus achieving improved efficiency and effectiveness." • "There may be qualitative advantages in enhanced operational relationships and interaction since staff may be able to use common amenities."
"911 Communications Centre Needs Assessment for Waterloo Regional Police Service" (ApexPro Consulting, 2022). Report Attached.	• "The primary 911 center (Maplegrove) needs to be replaced at the earliest, if essential 911 communications and service quality are to be maintained." • "WRPS and Region of Waterloo have advocated for over 25 years, for eventual consolidation of 911, police, fire, and ambulance dispatch into a fully integrated public safety communications system."
"From Trivial to Critical. Emergent Interagency Collaboration Through Co-Location of Emergency Call Centrals" (The Norwegian Directorate of Health, 2024). Link.	• "In 2017, the police, fire and health emergency call centrals in a region in Norway were co-located. This was done largely retaining their formal structures and responsibilities, which follows strict sectorial boundaries. However, the proximity afforded by co-location − placing the centrals in the same building− led to the emergence of informal interactional patterns among the operators." • "Our study…shows that it formed a basis for improved collaboration and development within the centrals."

WATERLOO REGIONAL POLICE SERVICE

FINAL REPORT

911 COMMUNICATIONS CENTER NEEDS ASSESSMENT FOR WATERLOO REGIONAL POLICE SERVICE

APEXPRO CONSULTING INC.

JUNE 10, 2022

APEXPRO CONSULTING INC.

EXCELLENCE COMMITMENT PARTNERSHIP – EVERY CLIENT! EVERY TIME!

30 KARL CRT., THORNHILL ON L4J 8H7 CANADA

June 10, 2022

Mark Crowell
Deputy Chief
Administration and Member Services
Waterloo Regional Police Service
200 Maplegrove Road
Cambridge, ON N3H 5M1

Dear Deputy Chief Crowell:

911 COMMUNICATIONS CENTER NEEDS ASSESSMENT FOR WATERLOO REGIONAL POLICE SERVICE

It is with great pleasure that we submit our Final Report on the above project. Our main findings are summarized below.

- The 911 communications function is well managed by WRPS. This notwithstanding, the primary 911 center (Maplegrove) operates beyond capacity and cannot readily accommodate additional call volume growth or newly evolving service requirements including NG 911.
- In our opinion, the primary 911 center needs to be replaced at the earliest, if essential 911 communications and service quality are to be maintained. The emergency backup 911 center also needs to be relocated.
- Preferred locations for new primary and backup 911 centers, floor space estimates, and order of magnitude costs, are presented in the report.

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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Appendices

Acknowledgements

ApexPro Consulting Inc. acknowledges and thanks the law enforcement officers and civilian employees of WRPS, and Region of Waterloo staff, whose participation, assistance, and insights have contributed to the success of this engagement.

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Mark Crowell	Deputy Chief, Administration and Member Services, WRPS *(Project Manager)*
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Kirsten Hand	Director of Finance and Assets, WRPS
Chris Gibson	Manager, Facilities, WRPS
Jamie Sheridan	Inspector, Field Support Branch, WRPS
John Costa	Staff Sergeant, Communications, WRPS
John Goodman	Staff Superintendent, WRPS
Mark Bullock	Inspector, Information Technology-Radio, WRPS
Sharon Havill	Superintendent, Neighbourhood Policing, WRPS
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Zaman Alkhafagi	Supervisor, Citizen Service, ROW

Executive Summary

The investigation under this consulting engagement is set out comprehensively in the body of the report. Principal findings and recommendations are summarized below.

E.1 Project Objectives

WRPS, on behalf of Region of Waterloo, retained ApexPro Consulting Inc. to carry out a needs assessment of the Region's 911 communications center requirements, with the following as principal deliverables.

1) Investigate current and future 911 communications center requirements
2) Investigate costs to expand / replace both the primary and backup 911 centers.
3) Recommend preferred locations for both the primary and backup 911 centers.

E.2 Context

WRPS and Region of Waterloo have advocated for over 25 years, for eventual consolidation of 911, police, fire, and ambulance dispatch into a fully integrated public safety communications system. It may be several more years before consolidation may eventually be achieved.

The primary 911 center (Maplegrove) needs to be replaced at the earliest, if essential 911 communications and service quality are to be maintained. The main reasons for this are discussed on the following page (under the heading "current challenges").

The emergency backup 911 center also needs to be relocated. The current premises (134 Frederick St., Kitchener) are at end-of-life, and ROW is actively pursuing prospective new occupants.

E.3 Current Strengths

The 911 communications function is well managed by WRPS. Communications staff are well-trained. Service quality is assured by rigorous training and pro-active performance monitoring.

911 communications is supported by ROW's recently implemented Motorola P25 public safety voice radio system. The radio system is entirely IP-based with advanced call processing capabilities designed to meet the needs of public safety agencies. Mission-critical reliability is assured by the system's fault-tolerant architecture and built-in redundancies.

911 communications is also supported by a leading-edge Hexagon CAD with interfaces to critical systems including radio and Niche records management. The CAD is used on a shared basis by members of PRIDE.

Mission-critical 911 systems are well maintained by WRPS Facilities and IT personnel. 911 service continuity is assured by built-in redundancies including backup generators, dedicated HVAC, and uninterrupted power supply (UPS).

Safety and security is assured by on-site lighting, camera coverage, entry intercom system, locked (card access) entries, and visitor screening.

E.4 Current Challenges

The above notwithstanding, the primary 911 center (Maplegrove) needs to be replaced at the earliest, if essential 911 communications and service quality are to be maintained. The five (5) main reasons for this, are as follows.

1. The center operates beyond capacity. It cannot readily accommodate additional call volume growth.
2. Additional workstations are currently needed but cannot be added due to existing spatial constraints.
3. The center also cannot readily accommodate newly evolving service requirements including NG 911. NG 911 is a federally “mandated” replacement of the 30+ year-old Canadian 911 network by March 4, 2025.
4. The center is over 25 years old, and its design is acutely outdated relative to contemporary best practices, e.g.:
   - Not AODA compliant. Overcrowded.
   - Communications workstation footprint of 90 SF versus contemporary of 150 to 160 SF. Crowding (and noise) is worse at shift change.
   - Climate variations within the center must be monitored daily.
   - No natural lighting. Relatively dark. Not conducive to 12-hour shifts.
   - Workstations are ergonomically friendly, but consoles require update.
   - No on-site training room. No in-center meeting rooms.
   - Also deficient in office space, files and supplies storage, kitchen, break area, quiet room, and lockers for personal belongings storage.
5. Existing spatial constraints are impeding WRPS’ ability to implement two integral extensions to 911 communications, a Real Time Operations Center (RTOC) and Major Incident Support Center (MISC).

The purpose of an RTOC is to provide a law enforcement agency with the ability to capitalize on a wide and expanding range of technologies, including video streaming and social media, for efficient and effective policing.

RTOC should be situated immediately adjacent to the 911 center, not on a separate floor as is currently the case. RTOC should also be augmented with a fully outfitted MISC capable of accommodating the personnel required to manage a major emergency incident.

E.5 911 Service Demand Drivers

Listed below are the principal drivers of 911 service demand growth.

- Population growth
- Federally mandated migration to NG 911 by March 2025
- Video streaming and other leveraged technologies
- Community-based mental health crisis response initiatives
- 911 communications (dispatch) services for PRIDE.

These service demand drivers, and their potential impacts on 911 center resourcing, are discussed in the body of the report.

E.6 Potential 911 Center Sites

The needs assessment investigated the following potential 911 center sites.

1. Expansion within WRPS headquarters (Maplegrove)

   This scenario was discarded because of existing spatial constraints within the existing building.

2. Relocation to alternative regional premises

   Discussed multiple region-owned buildings with ROW Facilities Management. All facilities but one - 99 Regina St., S. (Waterloo) - were discarded, either due to insufficient space, or concerns over reliable connectivity to public safety voice radio system.

   99 Regina St., South, was retained as a potential backup 911 center site following discussions with ROW Facilities Management, in which they advise that up to 30,000 SF can be made available on floors 4 and 5 of the building.

3. Construction of a new purpose-built facility

   The following 3 locations were shortlisted as candidate sites on which to construct a “new build” option, for either a primary or backup 911 center. (a) new build co-located at WRPS headquarters campus (Maplegrove); (b) new

build in the vicinity of WRESTRC; and (c) new build near Baden Tower in Township of Wilmot.

E.7 Communications Center Scenarios

The needs assessment investigated 6 communications center scenarios.

Exhibit E.1: Communications Center Scenarios

	Primary 911 Center				Backup 911 Center	
Scenario / Components	P1	P2	P3	P4	B1	B2
	Core	Core + PRIDE	Core + PRIDE + SFCC	Core + PRIDE + SFCC + KFD	New Build	99 Regina St., S.
Sized to accommodate ROW long-term growth (2051)	√	√	√	√	√	√
Includes RTOC & MISC	√	√	√	√	√	√
Includes NG 911	√	√	√	√	√	√
Includes community-based mental health crisis response initiatives	√	√	√	√	√	√
Includes dispatching for PRIDE	x	√	√	√	x	x
ROW Service First Call Center (SFCC) is co-located on premises	x	x	√	√	x	x
Kitchener Fire "main" dispatch is co-located on premises	x	x	x	√	x	x

All scenarios (primary and backup) include the following core elements: growth-driven service demand, RTOC and MISC, NG 911, and community-based mental health crisis response.

Scenarios P2-P4 includes dispatching for PRIDE. Scenarios P3 and P4 include co-location with the Region's Service First Call Center (SFCC). Scenario P4 includes co-location with fire dispatch managed by Kitchener Fire (KFD).

Scenario B1 assumes construction of a new purpose-built facility. Scenario B2 assumes use of an existing ROW-owned building (99 Regina St., South, Waterloo). This scenario was developed following discussions with ROW Facilities Management, in which they advise that up to 30,000 SF can be made available on floors 4 and 5 of the building.

In the context of this investigation, co-location is intended to mean … all groups to occupy the same facility, but each continues to operate as an independent entity with their own staff, work areas, and amenities.

Co-location of ground ambulance dispatch (i.e., the Central Ambulance Communications Center managed by Ministry of Health) is excluded from the investigation.

E.8 Floor Space Estimates and Costs

Order of magnitude costs for each site/scenario are presented in Exhibit E.2.

Cost for a new primary 911 center at WRESTRC and Baden ranges from $50 M (Sc. P1) to $70 M (Sc. P4), whereas the cost at Maplegrove campus is lower, ranging from $45 M to $65 M.

The lower cost of a new build at Maplegrove is attributed to the following:

- Lower floor space requirement of about 2,000 SF, by leaving CAD at WRPS HQ and connecting to the new build by fiber.
- Lower technology costs by using the existing underground fiber line infrastructure (i.e., the existing dedicated fiber lines for CAD and radio).

Cost for a new backup 911 center at 99 Regina is about $20 M, i.e., about one-half the cost of a “new build” ($40 M).

Exhibit E.2: Floor Space Estimates and Costs (in $M)

	GROSS SF	PRIMARY 911 CENTER		
	Full Build Out 2051	Maplegrove	WRESTRC	Baden Tower
		New Build	New Build	New Build
P1: Core	28,100	$45	--	--
	30,100	--	$50	$50
P2: Core + PRIDE	31,450	$50	--	--
	33,450	--	$55	$55
P3: Core + PRIDE + SFCC	33,950	$55	--	--
	35,950	--	$60	$60
P4: Core + PRIDE + SFCC + KFD	45,450	$65	--	--
	47,450	--	$70	$70

	GROSS SF	EMERGENCY BACKUP CENTER		
	Full Build Out 2051	99 Regina, S.	WRESTRC	Baden Tower
		Renovation	New Build	New Build
B1: New Build	26,000	--	$40	$40
B2: 99 Regina St.	17,000	$20	--	--

Cost estimates are rounded to the nearest $5 M.

Main assumptions on which the cost estimates are based, are listed below.

- Costs include construction, furnishings, and technology.
- Costs are in 2022 dollars. HST and other applicable taxes are excluded.
- Floor space requirements and construction costs are for full build out (2051).
- Furnishings and technology costs are based on resourcing requirements in 2031. This accounts for NG 911 (go live in 2025) and short-term growth beyond the go live date.
- Assumed cost for “new build” construction is $800 per SF. Assumed cost for “renovation” of the 99 Regina St. South building is $400 per SF.
- Assessment assumes that the new primary center will be outfitted with new workstations and communications consoles. Workstations and consoles currently at Maplegrove will be transferred to the new backup center.
- Furnishings and technology costs for SFCC and KFD are excluded.
- Figures include cost estimates for building technology infrastructure, i.e., Bell 911 trunk, fiber lines, network connections, licenses, UPS, firewall infrastructure, and security and access control.
- Figures include 10% for design and 15% for contingency.
- Figures include salaries (and benefit) costs for WRPS / ROW staff who will be dedicated to project implementation.
- Backup center and primary 911 center are assumed to house the same number of communications workstations. Assessing call taking workload relative to NENA standards may reduce the backup 911 center workstation requirements. Such analysis is excluded.

E.9 Site Selection Criteria

Site selection criteria that were adopted for this assessment are listed below. Site findings are summarized in the body of the report (Exhibit 10.2).

- Floor Space
- Radio Connectivity
- Disaster Relief Fiber (Radio)
- CAD Connectivity
- Hazards / Operational Conflicts
- Best Practice Features
- Employee Commuting & Parking
- Safety and Security
- Value Added
- Cost

E.10 Preferred Location for Primary 911 Center

For the primary 911 center, the assessment favours a new build co-located at WRPS campus (Maplegrove), mainly for the reasons below.

- Ample space for a 2-storey building of up to 50,000 SF
- Co-located adjacent to the primary radio tower guarantees reliable connectivity to ROW's mission critical public safety voice radio system
- Lower cost option (about $5 M less)
  - No land cost. Property is owned by ROW.
  - Lower floor space requirement (and construction costs) by leaving CAD at WRPS HQ and connecting to the new build by fiber
  - Lower technology costs by tapping into existing fiber trunks
- Operational benefits to having 911 center (including RTOC and MISC) on campus adjacent to WRPS HQ.

E.11 Preferred Location for Backup 911 Center

For the backup 911 center, the assessment favours the existing ROW-owned building at 99 Regina St., S. (Waterloo), mainly for the reasons below.

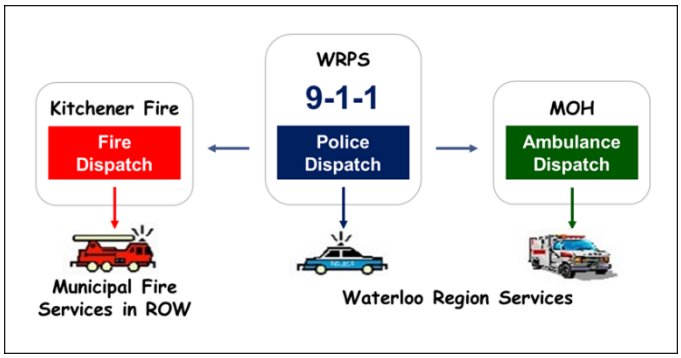
- Significantly lower cost option ($20 M vs. $40 M for new build).
  - No land cost. Building is owned by ROW.
  - Renovation costs less than new build
  - 17,000 SF vs. 26,000 SF for new build. No need for meeting rooms, mechanical area, loading area, or secure main entry / reception, beyond those in the existing building.
- Ample space on floors 4 and 5 for a backup 911 center
- Readily accessible by public transit including the ION rapid transit line
- Nearby light use rail spur does not appear to be an obstacle. Nearby water pumping station also does not appear to be an obstacle.
- Access to the building's existing meeting rooms (on a shared basis with other building tenants).
- Use of on-site amenities including workout area (gym) and change rooms.
- *Connectivity to the Region's public safety voice radio system needs to be investigated / confirmed by a professional with radio expertise.*

1 Introduction

1.1 Context

Waterloo Regional Police Service (WRPS) manages 911 communications for Region of Waterloo (ROW), from a communications center situated in WRPS headquarters, at 200 Maplegrove Road, Cambridge.

911 call-taking and police dispatch functions are carried out by WRPS communications personnel. Calls requiring a Fire response are routed to an off-site fire dispatch center managed by Kitchener Fire Department. Calls requiring an ambulance response are routed to an off-site Central Ambulance Communications Center (CACC) managed by Ministry of Health.



WRPS, ROW elected officials, senior management, and public safety leaders have for over 25 years advocated for eventual consolidation of 911, police, fire, and ambulance dispatch, into a fully integrated public safety communications system; this, to improve response times, interoperability, and coordination. [1]

Consultant reports including those by Kimball (2014), ApexPro (2017 & 2019), and Pomax (2021) have repeatedly reinforced the proposed consolidation as an appropriate course of action.

It may be several more years before consolidation may eventually be achieved.

However, for the reasons discussed in the body of this report, the primary 911 center (Maplegrove) needs to be replaced at the earliest, if essential 911 communications and service quality are to be maintained.

The emergency backup 911 center also needs to be relocated. The current premises (134 Frederick St., Kitchener) are at end-of-life, and ROW is actively pursuing prospective new occupants.

[1] Chronology of events and actions supporting eventual consolidation of emergency communications in ROW, is appended at Appendix A.

1.2 Project Objectives & Scope

WRPS, on behalf of Region of Waterloo, retained ApexPro Consulting Inc. to carry out a needs assessment of the Region's 911 communications center requirements, with the following as principal deliverables.

1) Investigate current and future 911 communications center requirements (i.e., to accommodate service demand growth, and NG 911).
2) Investigate costs to expand / replace both the primary and backup 911 centers. Cost considerations to include land, construction, furnishings, and technology.
3) Recommend preferred locations for both the primary and backup 911 centers. Location options to include expansion within WRPS headquarters; relocation to alternative regional premises; or construction of a new purpose-built facility.

The needs assessment is based on planning and operational data supplied by the clients; on-site surveys of the existing primary and emergency backup 911 centers; survey of alternative regional premises and vacant lands; and prior research including previous surveys of several contemporary 911 centers (Appendix B).

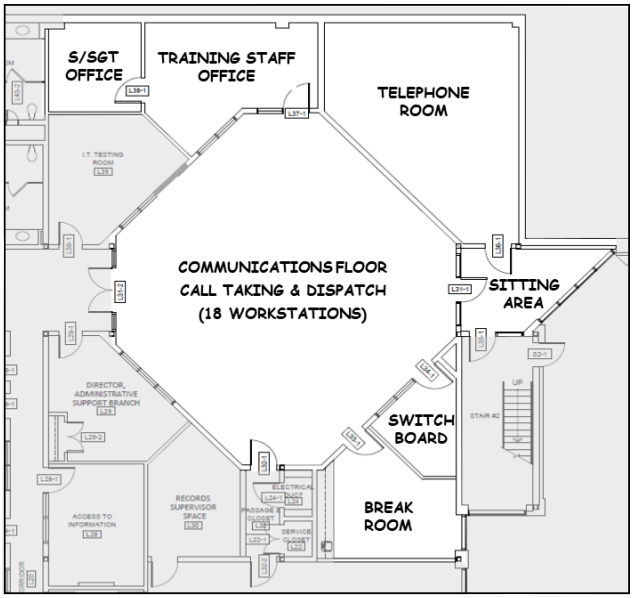
ApexPro acknowledges the law enforcement officers and civilian employees of WRPS, and Region of Waterloo staff, whose participation, assistance, and insights contributed to the successful completion of this engagement.

2 Maplegrove 911 Communications Center

2.1 911 Center Layout

The 911 center floor layout is shown in Exhibit 2.1.

Exhibit 2.1: Communications Center



The floor area of the center totals approximately 3,200 SF, of which 1,565 SF is dedicated to the communications floor call taking/dispatching functions.

In addition to the communications floor, the center also features a Staff Sergeant office, an office for communications training staff, telephone server room, switchboard room, small break room (kitchenette), and sitting area.

The communications floor is situated roughly 12 inches above a concrete sub-floor. Supervisor workstation is situated on a platform (elevated about 8 inches). The floor to 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.

The communications workstations layout is shown in Exhibit 2.2 (next page).

The communications floor is equipped with 18 workstations: 9 that are outfitted for call taking; 4 workstations that are outfitted w' radio consoles for dispatching; 4 workstations that can be used for both call taking and dispatch; and a workstation for the Supervisor.

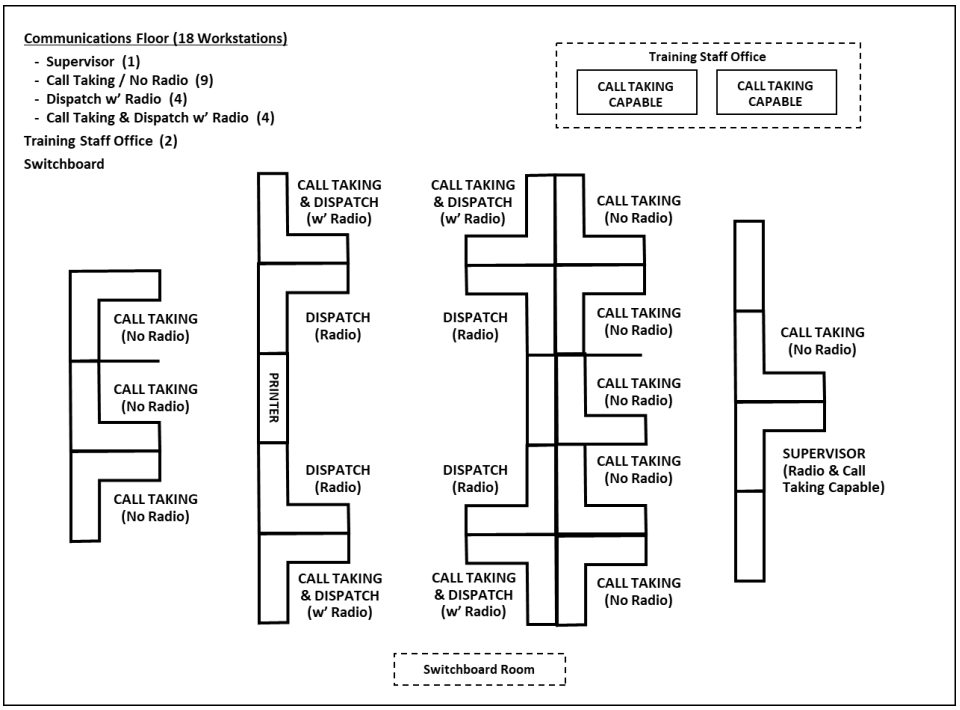
The Supervisor's workstation is outfitted for 911 and non-urgent call taking, and for radio dispatching. However, it is seldom used for such purposes.

The training staff's office, adjacent to the communications floor, is equipped with two (2) additional workstations. Both are call taking capable. [2]

[2] One workstation is also outfitted with radio for dispatching. However, the radio console will soon be relocated to the emergency backup center.

There is also a switchboard to handle non-emergency calls that come in over a 10-digit telephone line.

Exhibit 2.2: Communications Workstations Layout



2.2 Communications Staffing

Communications staffing is shown in Exhibit 2.3 (next page). The communications center is staffed with an approved complement of 97 full-time and 18 part-time employees. [3] Staff positions are described briefly below.

Staff Sergeant

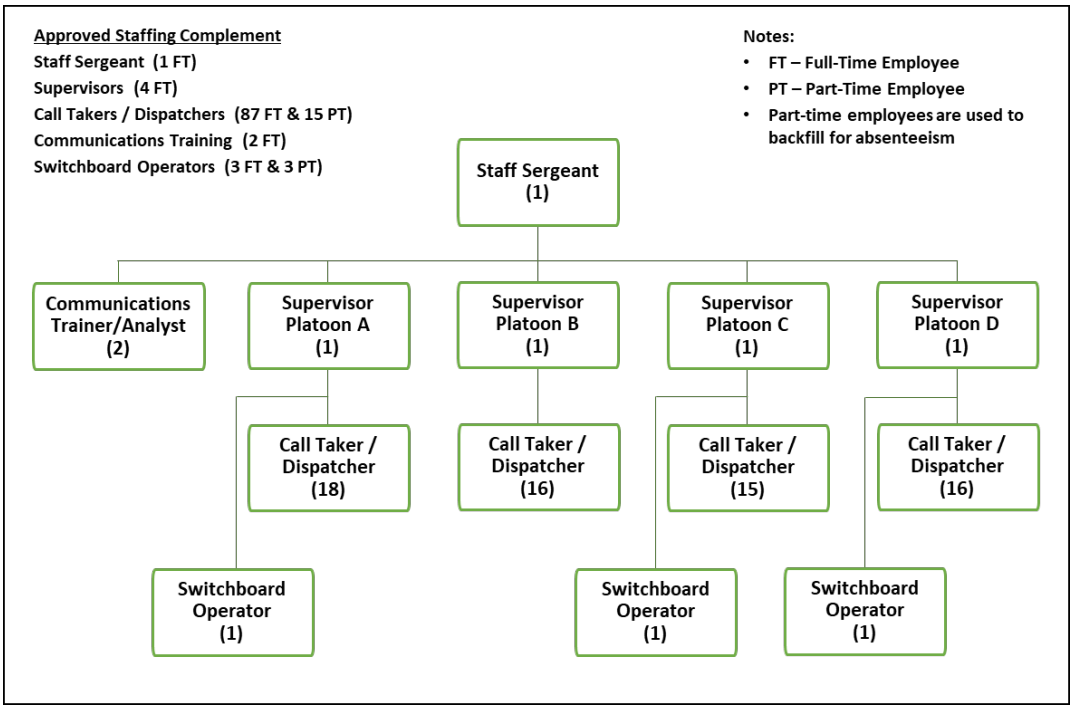
Staff Sergeant is responsible for day-to-day management of the communications function, including staffing and budget. They work a 40-hour week.

Supervisor

Supervisor is responsible for overseeing and supporting the needs of the on-duty communications staff. Supervisor works a 12-hour shift, with shift changes at 7:00 am and 7:00 pm.

[3] Approved complement includes 12 relatively recent hires who are completing their training and will soon be assigned to the platoon staffing roster as call takers.

Exhibit 2.3: Existing Communications Staffing



Call Taker / Police Dispatcher

WRPS call takers are responsible for answering 911 calls (and non-urgent calls) and routing the caller to the correct emergency service. Calls requiring a police response are assigned to on-site WRPS dispatchers. Calls requiring a Fire response are routed to an off-site fire dispatch center managed by Kitchener Fire Department. Calls requiring an ambulance response are routed to an off-site Central Ambulance Communications Center (CACC) managed by Ministry of Health.

WRPS dispatchers are responsible for dispatching the closest, available, and most appropriate police resource. Also, to provide in-the-field officers with support, and to coordinate allied emergency responders when their services are needed. WRPS dispatchers carry out these functions using ROW's recently upgraded Motorola public safety voice radio network, and leading-edge computer aided dispatch (CAD) system by Hexagon (formerly Intergraph).

WRPS call takers and dispatchers work the same shifts as Supervisors (12-hour shifts, with shift changes at 7:00 am and 7:00 pm).

The approved number of call takers / dispatchers is 87 full-time and 15 part-time. However, due to supported leaves and position vacancies, the number currently available for shift assignments is 65 full-time and 4 part-time.

Communications Training Staff

There are 2 full-time communications training staff: a Communications Trainer and a Training Analyst. These staff are responsible for staff training, performance analysis, and quality control of the communications function. Communications training staff work a 40-hour week.

Switchboard Operator

Switchboard, which is staffed by one operator per shift, is responsible for answering non-emergency calls. Switchboard is staffed weekdays from 7:00 am to 11:00 pm, and on weekends from 9:45 am to 10 pm. Outside these hours, non-emergency calls are redirected to communications floor personnel by an automated attendant.

2.3 Communications Training

Service quality is assured by a rigorous communications training program involving group sessions, individual instruction, and mentoring.

Group training is held at the Frederick St. backup center. The backup center can accommodate groups of up to 8 students per session. There are about 3 to 4 group training sessions a year.

Individual instruction and mentoring take place at Maplegrove communications center.

New hires are initially trained as call takers. Over time, they are cross trained to also serve as dispatchers. Currently, 62% of all communicator staff are fully cross trained as call takers and dispatchers. WRPS' target is to fully cross-train all communicator staff.

Training is also provided for staff progression to *acting* Supervisor, and subsequently for progression to full-time Supervisor.

Techniques used to inform / update staff of changes to CAD, radio, operating protocols et al, include group training sessions and training bulletins. Techniques used for skills retention, include rotating call-taker and dispatcher assignments by shift.

2.4 Communications Systems & Other Technology

911 communications is supported by ROW's recently implemented Motorola P25 public safety voice radio system. The radio system is entirely IP-based, with advanced call processing capabilities designed to meet the needs of public safety agencies.

911 communications is also supported by a leading-edge Hexagon CAD with interfaces to critical systems including: e-911, GIS/mapping, GPS/AVL, Radio consoles, mobile wireless mapping, data, and messaging, text/alphanumeric paging, and Niche records management.

The CAD is used on a shared basis by members of the PRIDE co-operative which includes WRPS, Kitchener Fire, and the Guelph, Brantford, Stratford, and South Simcoe police departments.

Mission-critical 911 communications systems are well maintained by WRPS Facilities and IT personnel (analysts, programmers, and technicians) whose expertise includes software applications, business systems, data security, fiber optic networks, radio, and mobile workstations.

911 service continuity is further assured by multiple built-in redundancies including backup generators, dedicated HVAC, uninterrupted power supply, and disaster relief fiber-optic data lines (as described further in Section 5).

2.5 Safety and Security

Safety and security of the premises (including access, egress, and parking) is assured by on-site lighting, camera coverage, entry intercom system, locked (card access) entries, and visitor screening.

2.6 Communications Workload

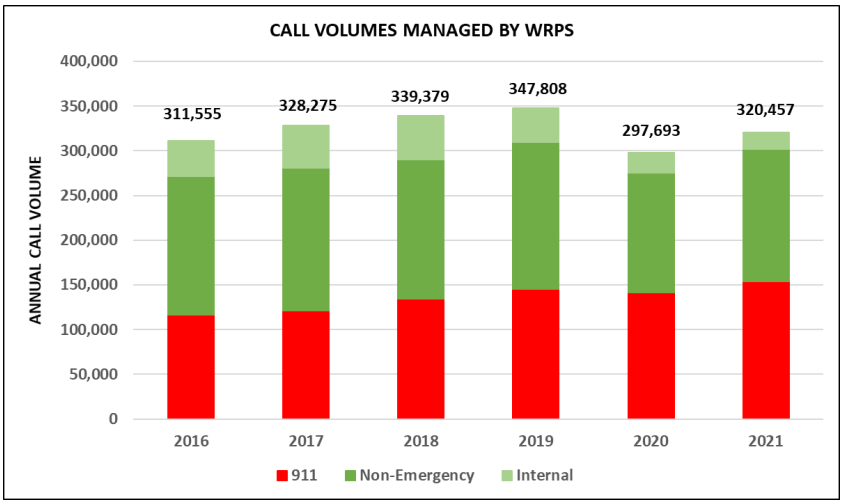
Exhibit 2.4 shows recent call volume trends for WRPS 911 communications.

Incoming calls for service increased at about 3.7% per annum between 2016 and 2019.

They decreased in 2020 due to COVID-19.

In 2021 they rebounded prominently, reaching a total volume of 320,457 for the year.

Exhibit 2.4: Call Volumes Managed by WRPS



About 50% of the incoming calls are 911 emergency calls; 45% are non-emergency calls; and 5% are internal calls.

911 emergency calls go directly to the floor of the 911 communications center (at Maplegrove) where they are answered by a WRPS 911 call taker.

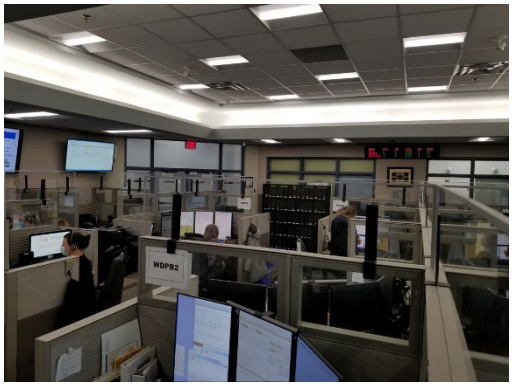
Non-emergency calls (10-digit phone line calls) are answered by a switchboard operator, or an automated attendant. Calls requiring an emergency services response are routed to a WRPS 911 call taker / dispatcher.

Internal calls are calls from in-the-field WRPS officers who are calling the 911 center for one of many reasons including, to inform of change in status, to request call support, etc.

2.7 Work Environment Challenges

Presented below are the work environment challenges at the primary 911 center (Maplegrove).

1. The center operates beyond capacity. It cannot readily accommodate additional call volume growth.
2. Additional workstations are currently needed but cannot be added due to existing spatial constraints.
3. The 911 center also cannot readily accommodate newly evolving service requirements including NG 911. NG 911 is a federally "mandated" replacement of the 30+ year-old Canadian 911 network by March 4, 2025.



4. The center is over 25 years old, and its design is acutely outdated relative to contemporary best practices. [4] [5]
   - Not AODA compliant. [6] Overcrowded.
   - Communications workstation footprint of 90 SF versus contemporary of 150 to 160 SF. Crowding (and noise) is worse at shift change.
   - Climate variations within the center must be monitored daily.
   - No natural lighting. Relatively dark. Not conducive to 12-hour shifts.

[4] Best practices are intended to mean operating structures, business processes, or outcomes measurement systems that have been validated through experience or shown to function well (or reliably) when measured against peers.

[5] Refer to Appendix C for photos of contemporary communications centers (Niagara and Halton).

[6] Accessibility for Ontarians with Disabilities Act (AODA)

- Workstations are ergonomically friendly, but consoles require update.
- No on-site training room. No in-center meeting rooms.
- Also deficient in office space, files and supplies storage, kitchen, break area, quiet room, and lockers for personal belongings storage.

2.8 911 Operating Estimates

911 operating estimates are summarized in Exhibit 2.5. The total annual expense is approximately $13.5 M, which includes:

- Communications account budget (2022) of $12.1 M which was provided by WRPS Finance.
- IT staff support of $0.8 M which was provided by WRPS IT.
- Technology replacement of $0.6 M. Technology replacement expenses were estimated by ApexPro using an assumed 7-year replacement cycle. The figure includes allowances for replacement of all existing workstation consoles situated in both the primary and backup 911 centers. It also includes an assumed 20% allowance for replacement of licenses, switches, and other related components.

The estimated operating expense excludes refurbishing costs (i.e., for facilities and furnishings).

Exhibit 2.5: 911 Operating Estimates

	911 Operating Estimates ($ M)		
	2021 Budget	**2021 Actual**	**2022 Budget**
Communications Account			
Communications Staffing	$11.8	$10.9	$12.0
Communications Operating	$0.1	$0.1	$0.1
Subtotal	**$11.9**	**$11.0**	**$12.1**
IT Support Estimates			
IT Staff Support	$0.8	$0.8	$0.8
Technology Replacement	$0.6	$0.6	$0.6
Subtotal	**$1.4**	**$1.4**	**$1.4**
Total	**$13.3**	**$12.4**	**$13.5**

3 RTOC & MISC

3.1 Real Time Operations Center (RTOC)

WRPS recently implemented a Real Time Operations Center (RTOC) at Maplegrove headquarters. The RTOC is an integral extension of 911 communications, intended to serve as a regionalized hub for managing risk by:

- Monitoring calls and reallocating front-line and investigative resources to meet real-time changing demands and staffing needs across the Region,
- Leveraging technology to increase situational awareness,
- Overseeing unplanned major events and critical calls, and
- Providing actionable intelligence to field operations. [7]

In addition, the RTOC ensures complex TAMS timecard compliance reviews are completed regularly to reduce potential errors or historical edits that could have a financial impact both on the Service and its members. [8]

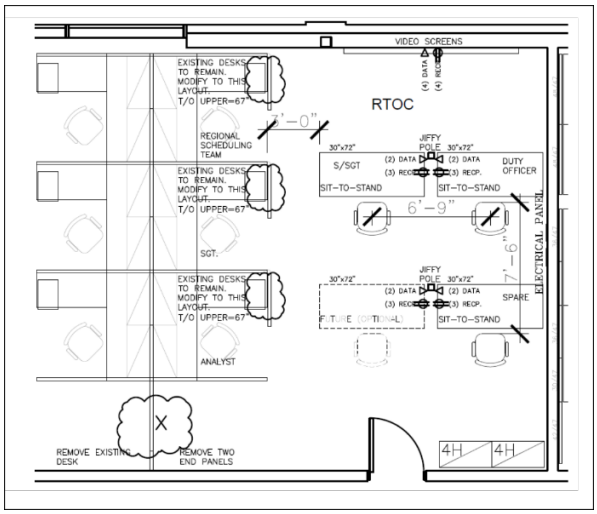
As an integral extension of 911 communications, the RTOC should be situated immediately adjacent to the 911 center. However, due to spatial constraints, the RTOC is located one floor above the 911 center. It occupies about 580 SF. The floor layout and major furnishings of the RTOC are shown in Exhibit 3.1.

Current Best Practices

The mission of a Real Time Operations Center (RTOC) is to provide a law enforcement agency with the ability to capitalize on a wide and expanding range of technologies for efficient and effective policing. [9]

RTOC models vary among law enforcement agencies, in terms of personnel decisions, technology choices, and chain of command.

Exhibit 3.1: Recently Implemented RTOC



[7] Source: WRPS Proposed 2022 Budget Information Package, November 2021.

[8] TAMS stands for Time and Attendance Management System

[9] Source: "The Mission of a Real Time Crime Center", Bureau of Justice Assistance, US Department of Justice.

Regardless, functional responsibilities are relatively consistent, as below.

RTOC leverages a wide and expanding range of technologies including video streaming, social media, and business intelligence systems; and uses these technologies, and the operational intelligence derived there from, to efficiently, effectively, and decisively:

- Co-ordinate frontline and investigative resources
- React to emergency incidents with proactive emphasis on officer, citizen, and community safety
- Provide frontline and investigative resources with real-time analytical intelligence and investigative support
- Manage emergency incidents and threats in real time.

Police video streaming sources include in-vehicle and body-worn cameras, also cameras used by air support and remote piloted drones. Other video feed sources may include roadside and other cameras managed by public sector organizations, and cameras installed at public assembly premises, i.e., shopping malls, theatres, arenas, and stadiums. Agreements for the use of these feeds are generally established in advance.

On-site management of the RTOC should rest with a law enforcement officer having authority to make actionable decisions, i.e., of Inspector rank or higher.

RTOC should be staffed round-the-clock (per the 911 center). Each platoon would typically be staffed with an Inspector, staff sergeants, and a data analyst. Additional expertise should be available on standby; this to be drawn from pre-established law enforcement and civilian talent pools that include social media, and business intelligence expertise.

IT personnel should also be available (round-the-clock standby) to support the resident technology systems.

3.2 Major Incident Support Center (MISC)

A team effort is often required to manage a major emergency incident (i.e., law-enforcement officers, allied emergency and health care responders, civilian analysts, elected officials, and others).

It is not unusual, during a major emergency incident, for the numbers assembling on site to exceed 10-15, or more persons. These individuals require a dedicated workspace, with access to one or more meeting rooms, in which to manage the emergency incident.

The dedicated workspace, which in this document is referred to as a Major Incident Support Center (MISC), should be outfitted with telephones,

workstations, computers, video monitors, voice radio communications, and business intelligence systems, for use by the persons assembled.

3.3 Design Features Adopted by this Investigation

It is generally acknowledged that establishing and outfitting an RTOC is an evolving process that will change over time, as lessons are learned, and as new resources and technologies become available. In this context, one may safely assume that the RTOC recently implemented by WRPS will evolve over time in terms of both mission and design.

For such reasons, this investigation of ROW's 911 communications needs adopts the features of a "more mature" RTOC, as basis for planning. [10] The features are listed below.

- RTOC to be situated immediately adjacent to the 911 center.
- RTOC to be augmented with a Major Incident Support Center (MISC) with adjoining large meeting room to serve as emergency operations center (EOC) during major emergency incidents.
- MISC to be situated reasonably close to the 911 center and RTOC; but not so close as to hinder the operations therein.
- Floor area assumptions: RTOC floor area of up to 1,000 SF (of net floor space). MISC floor area of up to 1,800 SF (of net floor space). These spaces to accommodate communications workstations, analyst stations, meeting room, and equipment and supplies storage, as appropriate.
- RTOC workstation assumptions: At least 4 workstations. All to be outfitted with telephones and desktop computers. Two (2) to also be outfitted with voice radio communications, CAD, and control over multiple video feeds.
- MISC workstation assumptions: Up to 10 workstations. All to be outfitted with telephones and desktop computers. Six to eight to also be outfitted with voice radio communications, CAD, and control over multiple video feeds.
- Both RTOC and MISC to be outfitted with business intelligence software, and wall mounted video screens of assorted sizes.

[10] Design features are based on the RTOC managed by York Regional Police Services (YRPS), which was implemented over 5 years ago, and has since evolved. ApexPro has adjusted some features for planning purposes.

4 Emergency Backup 911 Center

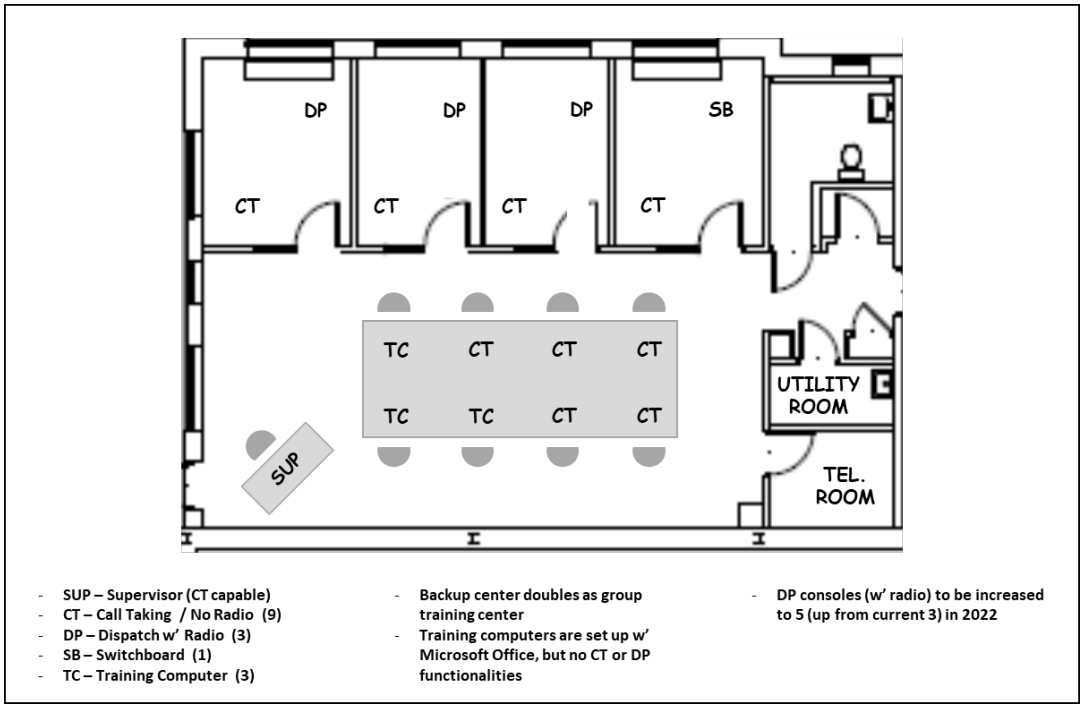
The emergency backup 911 center needs to be relocated to an alternate, secure off-site location. The current premises (134 Frederick St., Kitchener) are at end-of-life, and ROW is actively pursuing prospective new occupants.

Presented below is a brief description of the existing emergency backup 911 center.

The layout of the existing emergency backup 911 center is shown in Exhibit 4.1. The floor area is about 1,800 SF. The major features include four offices, telephone server room, utility room, washroom, and an open floor that doubles as both communications floor and group training center for WRPS communications staff.

The floor of the backup center is poured concrete. It is not a raised floor. The floor to ceiling height is about 8 feet.

Exhibit 4.1: Emergency Backup Center



The emergency backup center is equipped with 17 workstations:

- 9 workstations for call taking (no radio)
- 3 workstations for dispatching (w' radio)
- Supervisor workstation capable of taking calls
- A switchboard to handle incoming 10-digit non-emergency calls
- 3 training computers that are not set up for live call taking or dispatch.

The default setting for software applications at the backup center (e.g., CAD and Niche records management) is live mode. The applications are taken off-line for group training and subsequently, are restored to live mode once the training session is complete.

Procedures for emergency backup center operations require WRPS IT to notify Bell when communications services at the primary 911 center are disrupted, and request that they temporarily route 911 calls to the back up center. WRPS IT is also responsible to notify Bell when the primary center's communications capabilities are restored.

Procedures also require that the shift Supervisor transport 4 portable radios to the backup center; this, to augment the center's limited radio dispatching capability (i.e., 3 radio outfitted workstations). One portable radio is set to WRPS north division operations, two others are set to WRPS central and south. Shift Supervisor uses the fourth portable radio to monitor ongoing events.

Since the backup center doubles as group training center, WRPS communications staff are familiar with / at ease operating from this location.

Additional experience operating at the backup center is gained during major events, i.e., homecoming, St. Patrick's Day. For events such as these, WRPS staffs both the primary and backup communications centers. Backup center staffing during these events typically includes a minimum of 2 call takers and 2 dispatchers.

Equipment at the backup center is tested periodically (at roughly 5 to 6-week intervals). The communications trainer is responsible to test and confirm that workstations are functioning properly. IT staff are responsible for testing phones and recording equipment.

Approved plans for fiscal 2022 include increasing the number of desktop radio consoles at the backup center, by an additional 2 consoles (to a total of five). One of the additional consoles will be a new purchase. The other will be relocated from the training staff office at Maplegrove.

5 Critical Systems Infrastructure

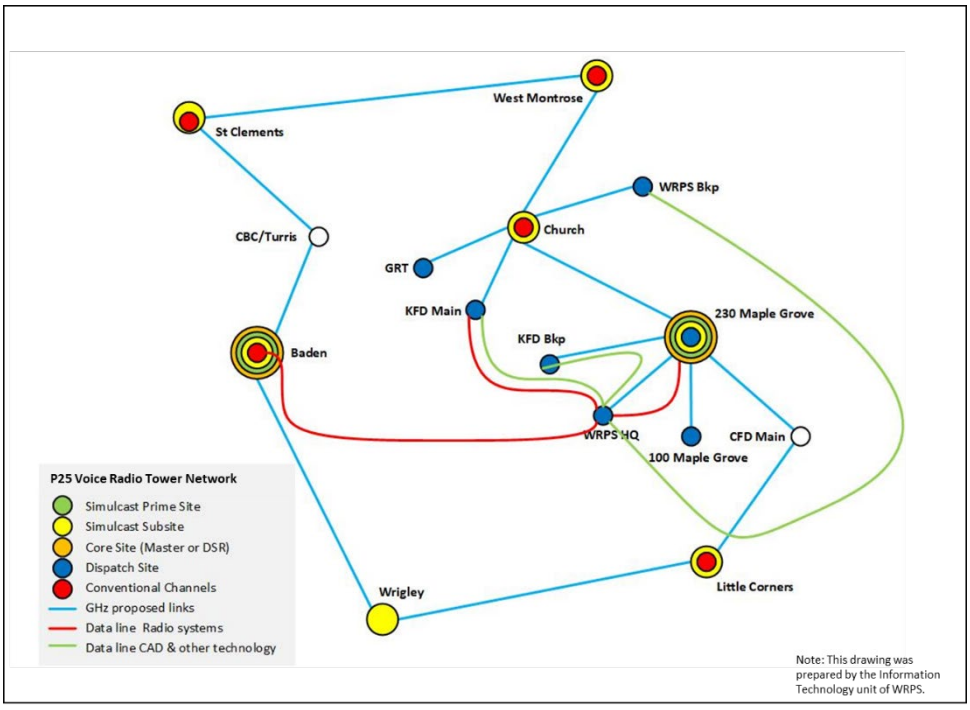
5.1 Motorola P25 Voice Radio

911 communications is supported by ROW's recently implemented Motorola P25 public safety voice radio system. The radio system is entirely IP-based with advanced call processing capabilities designed to meet the needs of public safety agencies.

Exhibit 5.1 shows the tower and fiber network infrastructure that supports voice radio communications. The infrastructure includes 9 voice radio network towers. Primary radio tower is situated at 230 Maplegrove. Primary backup radio tower is at Baden (in Wilmot Twp). Other towers are located at West Montrose, St. Clements, CBC/Turris, 81 Church St (Kitchener), CFD headquarters, Little Corners, and Wrigley.

All locally based emergency communications centers (both primary and backup) are tied to at least one radio tower, either by direct sight line or by way of a microwave hop workaround.

Exhibit 5.1: Radio Tower Network



Mission-critical reliability is assured by the system's fault-tolerant architecture and built-in redundancies. Connecting each radio tower to the adjacent two (via microwave) is one such feature. Should a tower fail, then by design, one of the

adjacent two towers will endeavor to pick up the load and preserve geographic coverage (as may be feasible) until the damaged tower is repaired.

This feature is represented by the lines in blue. The closed network formed by these lines is loosely referred to as the “voice radio ring”.

As an additional fail-safe, dedicated fiber optic data lines (shown in red) connect Maplegrove 911 to the primary radio tower (230 Maplegrove), to Kitchener Fire main dispatch, and to the primary backup radio tower (Baden). If the radio tower (at Maplegrove) fails, Maplegrove 911 center still maintains connectivity to the radio system by way of these fiber data line connections.

5.2 Computer Aided Dispatch (CAD)

911 communications is also supported by a leading-edge Hexagon CAD with interfaces to critical systems including radio and Niche records management.

The CAD, which resides at Maplegrove HQ, is used on a shared basis by members of the PRIDE co-operative which includes WRPS, Kitchener Fire, and the Guelph, Brantford, Stratford, and South Simcoe police departments.

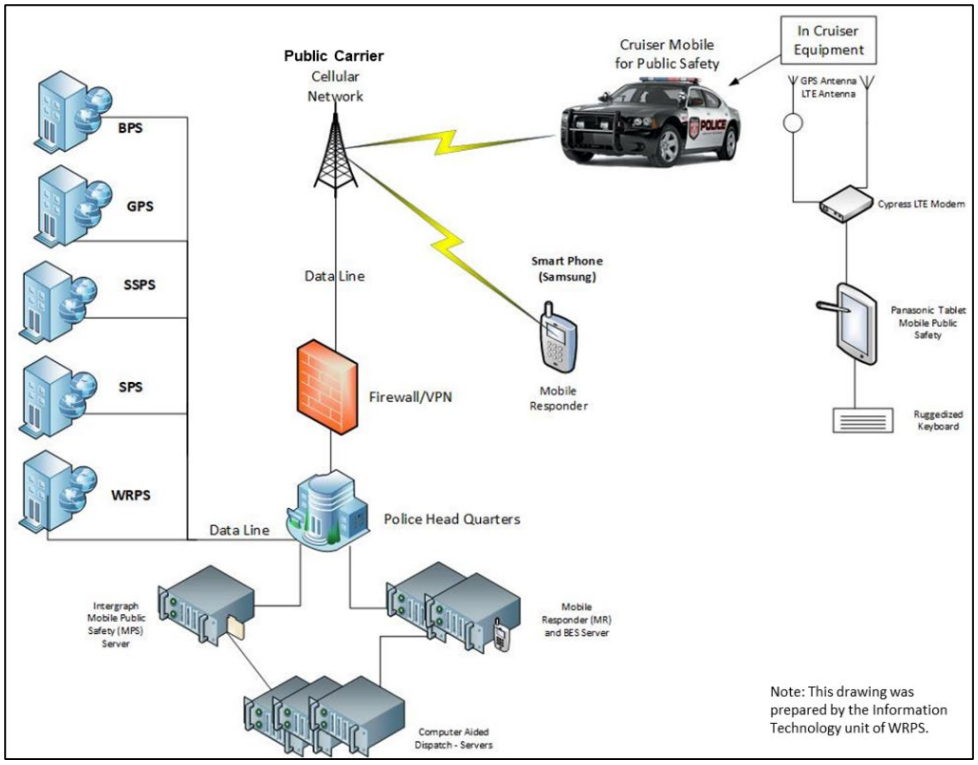
Dedicated fiber optic data lines shown previously in Exhibit 5.1 (in green) connect the CAD at Maplegrove HQ to WRPS backup (Frederick), to Kitchener Fire main dispatch, and to Kitchener Fire backup dispatch.

For security, all data transmissions are encrypted by the CAD network.

The police mobile environment within PRIDE is shown in Exhibit 5.2 (next page). The police mobile environment relies on public carrier cellular networks (Bell & Rogers).

WRPS IT advises that ROW has outstanding public carrier cellular network coverage.

Exhibit 5.2: Police Mobile Environment



5.3 911 Service Continuity Provisions

911 service continuity provisions are summarized in Exhibit 5.3 (next page). They include backup generators, dedicated HVAC, and uninterrupted power supply.

Exhibit 5.3: Services Continuity Provisions for 911 Communications

	PRIMARY 911 CENTER (MAPLEGROVE)	EMERGENCY BACKUP CENTER (FREDERICK ST.)
Electric Utility Power	**Energy+ Inc. delivers electricity to the primary center (Maplegrove). Power is fed from one substation (single power feed).** **For service continuity, the primary center relies on a backup generator and large UPS bank (as below).**	**Kitchener-Wilmot Hydro Inc. delivers electricity to the emergency backup center. Power is fed from 2 substations (dual power feeds).** **Backup center is also equipped with a backup generator and small UPS units (as below).**
Backup Generator	**Primary center is equipped with a "diesel-powered" backup generator.** **Plans underway, to replace the current backup generator with a "natural gas-powered" backup generator system in 2023.**	**Emergency backup center is equipped with a "diesel-powered" backup generator.**
Uninterrupted Power Supply (UPS)	**Primary center is equipped with a large UPS bank.**	**Communications workstations at the backup center are individually equipped with small UPS units.**
Telephone	**Primary center is served by a single telephone trunk for administration, and incoming 911 and non-emergency calls.** **Diverse routing is currently the 2 separate locations (primary and backup).**	**Emergency backup center is served by a single telephone trunk for administration, and incoming 911 and non-emergency calls.** **Diverse routing is currently the 2 separate locations (primary and backup).**
HVAC	**Maplegrove headquarters is equipped with an HVAC system that is dedicated to the 911 communications center.** **Plans underway to implement full redundancy, i.e., a 2nd HVAC system which will mirror the first.**	**Emergency backup center relies on the building's HVAC system.**

	PRIMARY 911 CENTER (MAPLEGROVE)	EMERGENCY BACKUP CENTER (FREDERICK ST.)
Motorola P25 System (Voice Radio)	**Maplegrove 911 center has direct sight line to the radio tower at Maplegrove.** **Dedicated fiber optic data lines connect Maplegrove 911 to the primary radio tower (230 Maplegrove), to Kitchener Fire main dispatch, and to the primary backup radio tower (Baden). This, as shown previously in Exhibit 5.1.** **If the radio tower (at Maplegrove) fails, Maplegrove 911 center still maintains connectivity to the radio system by way of these fiber data line connections.**	**The backup center has direct sight line to the Church St. radio tower.** **Given the radio system's fault-tolerant architecture and built-in redundancies, the likelihood that both the Maplegrove tower and Church St. tower fail simultaneously, is exceptionally low.**
Hexagon CAD System (Data/Text)	**Dedicated fiber optic data lines shown previously in Exhibit 5.1 connect the CAD at Maplegrove HQ to WRPS backup (Frederick), to Kitchener Fire main dispatch, and to Kitchener Fire backup dispatch.** **For security, all data transmissions are encrypted by the CAD network.** **The police mobile environment relies on public carrier cellular networks (Bell & Rogers). WRPS IT advises that ROW has outstanding public carrier cellular network coverage.**	**Dedicated fiber optic data line connects the emergency backup center (Frederick) to the CAD at Maplegrove HQ.**

6 Service Demand Drivers

Listed below are the principal drivers of 911 service demand growth.

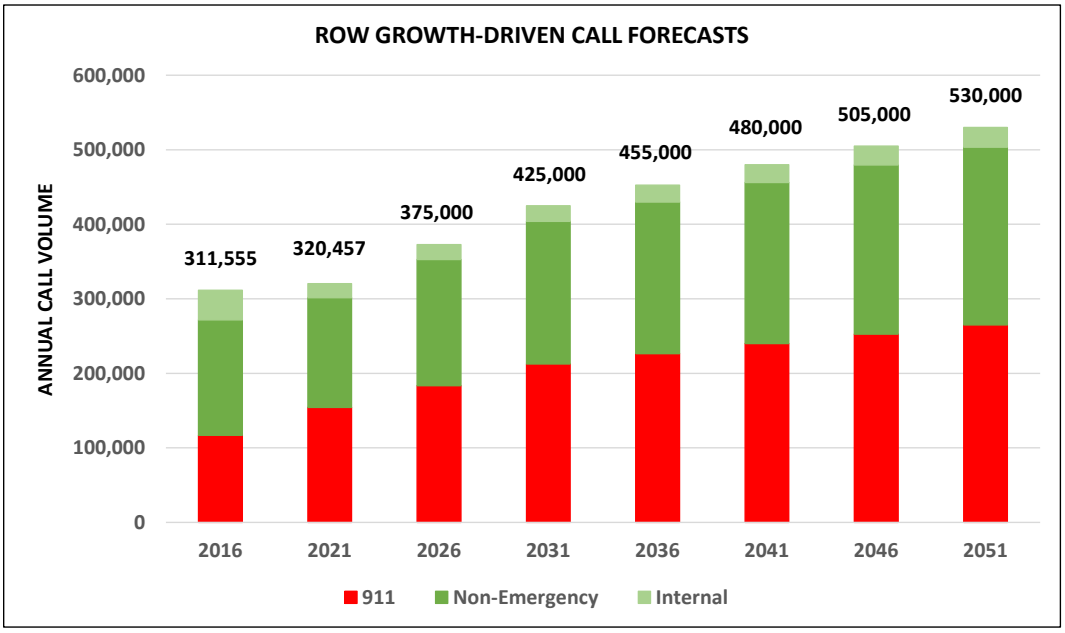
- Population growth
- Federally mandated migration to NG 911 by March 2025
- Video streaming and other leveraged technologies
- Community-based mental health crisis response initiatives
- 911 communications (dispatch) services for PRIDE.

These service demand drivers, and their potential impacts on 911 center resourcing, are discussed below.

6.1 Growth-Driven Service Demand

Exhibit 6.1 presents a 30-year forecast of 911 service demand growth for ROW. ApexPro developed this forecast using the following population projections extracted from the Ministry of Municipal Affairs' *Places to Grow Growth Plan for the Greater Golden Horseshoe*: 624,000 residents in 2021, 742,000 by 2031, 835,000 by 2041, and 923,000 by 2051. [11]

Exhibit 6.1: Growth-Driven Service Demand Forecast



[11] This investigation's use of the *Places to Grow Growth Plan* population projections is consistent with the approach taken by other planning initiatives commissioned by WRPS, including the 2018 "Facilities Master Plan" by WalterFedy Architects.

Service demand is forecast to increase steadily, in pace with population growth, to a volume of 530,000 incoming calls for service in 2051.

The call breakdown is not expected to vary appreciably from the current split, with 911 emergencies running at about 50% of total, non-emergency calls at 45%, and internal calls at 5%.

Exhibit 6.2 presents the projected 911 communications resourcing requirements that correspond to the growth-driven call forecasts. These projections were also developed by ApexPro.

The projected staffing requirement for 2031 is 151. For 2041 it is 168, and for 2051 it is 179.

The primary 911 center (Maplegrove) is currently outfitted with 18 communications workstations. The projected growth-driven requirement for 2021 is 19 workstations; however, the additional workstation cannot be accommodated due to existing spatial constraints.

The projected growth-driven requirement for 2031 is 25 communications workstations. For 2041 it is 28, and for 2051 it is 30 communications workstations.

Exhibit 6.2: Growth-Driven 911 Communications Requirements

	2021 APPROVED	PROJ'D GROWTH-DRIVEN REQ'TS		
		2031	2041	2051
Call Volume	320,457	425,000	480,000	530,000
Staffing Requirements				
Staff Sergeant	1	1	1	1
Supervisors	4	4	4	4
Call Taker / Dispatchers (full-time)	87	96	108	116
Call Taker / Dispatchers (part-time)	15	34	38	41
Switchboard (full-time)	3	6	6	6
Switchboard (part-time)	3	6	6	6
Trainers	2	4	5	5
Total	115	151	168	179
Workstation Requirements				
Supervisor Workstation	1	1	1	1
Call Taker/ Dispatcher Workstations	17	24	27	29
Total	18	25	28	30
Switchboard Desks	1	2	2	2

6.2 911 Resourcing Requirements w' NG 911

NG 911 is a federally "mandated" replacement of the 30+ year-old Canadian 911 network that is intended to provide better location accuracy for calls, more ways to contact 911 (text, photo, and video streaming), greater interoperability with other agencies, and improved responder and community safety. CRTC requires NG 911 network providers to be operable by March 4, 2025.

"Canadians depend on the provision of reliable and effective 9-1-1 services to seek help in an emergency. As technology and consumers' needs evolve, so do consumers' expectations related to 9-1-1 services.

In the coming years, telecommunications networks across Canada, including the networks used to make 9-1-1 calls, will continue to transition to Internet Protocol (IP) technology. This will enable Canadians to access new, enhanced, and innovative 9-1-1 services with IP-based capabilities, referred to as next-generation 9-1-1 (NG9-1-1) services.

Canadians could stream video from an emergency incident, send photos of accident damage or a fleeing suspect, or send personal medical information, including accessibility needs, which could greatly aid emergency responders." [12]

WRPS, on behalf of ROW, is actively implementing the requisite NG 911 technology, targeting to have it in place by mid-to-late 2024 (i.e., at least 3 to 6 months in advance of the federally mandated go live date of March 4, 2025).

ApexPro consulted with WRPS IT on the potential impacts of NG 911, as they pertain to future emergency communications services demand.

WRPS IT suggest that the 911 call taking workload could increase by up to 30%, for the following reasons. 911 centers typically receive between 3 and 5 voice telephone notifications for a major occurrence. With the advent of text messaging the number of notifications is likely to be higher. Also, text exchanges can take up to 3 times longer than a voice call. Staffing, training, and quality assurance requirements could increase proportionately.

ApexPro has adopted the above suggestion of 30% as an upper end estimate to account for the impacts of NG 911 on future communications services demand.

ApexPro's forecasts of future 911 communications requirements, with NG 911, are shown in Exhibit 6.3 (next page).

[12] Source: Telecom Regulatory Policy, CRTC 2017-182, June 1, 2017

Exhibit 6.3: Forecast 911 Communications Requirements w' NG 911

	2021 APPROVED	PROJECTED REQUIREMENTS w' NG 911		
		2031	2041	2051
Call Volume	320,457	425,000	480,000	530,000
Staffing Requirements				
Staff Sergeant	1	1	1	1
Supervisors	4	4	4	4
Call Taker / Dispatchers (full-time)	87	108	124	136
Call Taker / Dispatchers (part-time)	15	38	43	48
Switchboard (full-time)	3	6	6	6
Switchboard (part-time)	3	6	6	6
Trainers	2	5	6	7
Total	115	168	190	208
Workstation Requirements				
Supervisor Workstation	1	1	1	1
Call Taker/ Dispatcher Workstations	17	27	31	34
Total	18	28	32	35
Switchboard Desks	1	2	2	2

The reader is reminded that the above figures are total resourcing requirements accounting for service demand growth and NG 911.

With NG 911, the anticipated communications staffing requirement for 2051 is 208 (29 higher than the growth-driven requirement of 179 shown previously in Exhibit 6.2), and the anticipated communications workstations requirement for 2051 is 35 (5 higher than the growth-driven requirement of 30 shown previously in Exhibit 6.2).

6.3 Video Streaming

Law enforcement departments are leveraging a wide and expanding range of technologies, including video streaming, to effectively co-ordinate front-line and investigative resources.

Video streaming sources include in-vehicle and body-worn cameras, cameras mounted on aircraft and remote piloted drones, and video feeds managed by public and private sector organizations.

ApexPro discussed the use of video streaming with WRPS IT. General view is that the RTOC will continue to leverage an expanding range of video feeds but that large scale video streaming will not be introduced into the 911 center.

6.4 Community-Based Mental Health Crisis Response

The mental health community has highlighted the need for diverse responses to individuals suffering from a mental health crisis.

WRPS, in collaboration with ROW PHSS and others, is pursuing multiple initiatives that are intended to improve the way that mental health related calls for service are handled. The initiatives (described briefly below) share the following common goal: to ensure individuals suffering from a mental health crisis of better health outcomes by providing the most appropriate community-based crisis response at the time of need.

Integrated Mobile Police and Crisis Team (IMPACT)

Launched in 2021, IMPACT is a joint undertaking by WRPS and the Canadian Mental Health Association Waterloo Wellington (CMHA WW). It also involves Guelph Police, Wellington OPP, and the University of Guelph Campus Community Police.

It consists of 3 mobile teams, staffed with MHA clinicians, that operate across the Region seven days a week, generally between the hours of 9 am and 11 pm.

Any WRPS Officer (or 911 Communicator) can request that an MHA clinician attend a call for service. Requests that are made by police officers in-the-field are channeled through the 911 center.

IMPACT is transforming the way mental health related calls for service are handled by providing a collaborative, immediate and comprehensive crisis response for individuals and their families. Where appropriate, IMPACT will also provide police officers with post-traumatic support.

Crisis Call Diversion Pilot Project

WRPS has received provincial funding to implement a “Crisis Call Diversion” pilot project. The funds will be used to co-locate a crisis response coordinator, with specialized training in mental health crisis response, in the 911 call center.

If a 911 call taker determines that the caller is experiencing a non-emergent mental health-related issue that may benefit from a non-police response, they will transfer the call to the resident crisis response coordinator.

Crisis response coordinator will be responsible to rapidly assess, and respond effectively and compassionately, to the caller’s needs. This, potentially to include immediate crisis intervention and connecting the caller to additional community-based crisis response services appropriate to the callers needs.

By diverting non-emergent mental health-related calls to a crisis response coordinator, this initiative will also directly benefit 911 communications, in that

911 call takers/dispatchers will be freed up to deal with emergency incidents requiring a police response.

Mobile Crisis Team

WRPS is participating with ROW PHSS, ROW Corporate, and ROW Paramedic Services, to design and launch an additional crisis support service for individuals suffering from a mental health crisis. The proposed initiative is expected to be launched later this year.

The initiative, which is based on a recommendation put forward by ROW's Anti-Racism Advisory Working Group, will establish an in-the-field mobile crisis team (an outreach resource) that will routinely check on individuals known to be suffering from mental health issues, e.g., repeat callers for assistance, homeless encampments, etc. [13] As currently envisaged, a Crisis Response Coordinator co-located in the 911 center, will serve as principal communications officer for the mobile crisis teams.

Assumptions Adopted by this Investigation

- 911 center will serve as principal communications hub for these (and like) initiatives.
- Crisis Response Coordinator(s) will be co-located in the 911 center.
- They will require 1-2 workstations, each to be outfitted with telephone, computer, CAD, and portable radio.

[13] ROW Press Release (Dec 15, 2021): ROW Plan and Budget for 2022 includes implementing the recommendations of the Anti-Racism Advisory Working Group, including "launch an alternative crisis support service for mental health".

6.5 Estimated Dispatch Requirements for PRIDE

PRIDE (Police Regionalized Information Data Entry) is a cooperative involving WRPS; Guelph, Brantford, Stratford, and South Simcoe police departments; and City of Kitchener Fire (which is responsible for all fire dispatching in ROW).

As illustrated by Exhibit 4.1 (next page), PRIDE members manage their own dispatch centers, deploying their organization's emergency responders using a common computer aided dispatch (CAD) system, on a shared basis.

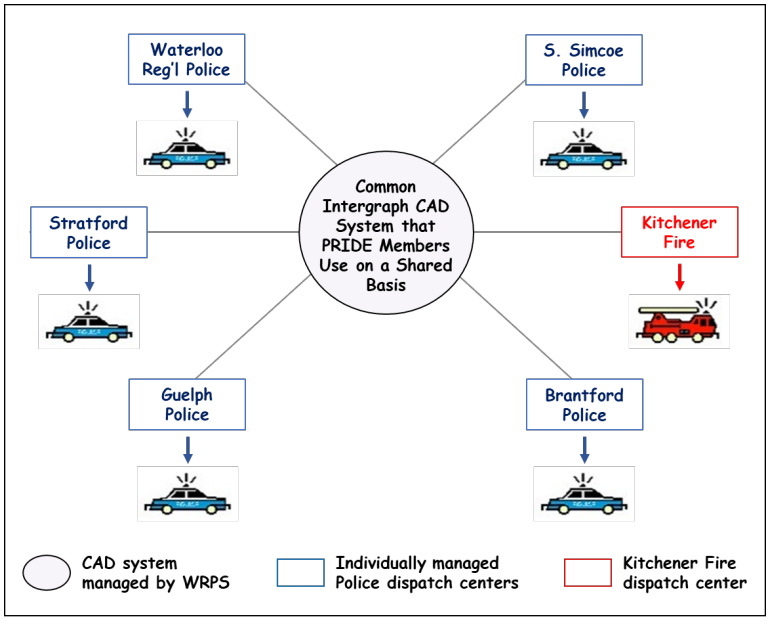
The CAD (manufactured by Hexagon / formerly Intergraph) is housed at WRPS headquarters. WRPS is accountable (on behalf of PRIDE) for the integrity and security of the resident CAD, and interconnected network devices.

The systems are managed and maintained by WRPS IT personnel whose expertise includes software applications, business systems, data security, fiber optic networks, radio, and mobile workstations.

WRPS IT is also responsible for database management to ensure up-to-date mapping and consistency of mission critical information.

Advantages afforded to members of PRIDE are listed below.

Exhibit 6.4: PRIDE Cooperative



- Autonomy over their own call-taking and dispatching operations.
- Reliable and resilient CAD and other technologies (with built-in emergency backup), managed round-the-clock by dedicated WRPS IT personnel.
- Coordinated data management ensures regular, consistent, and timely mapping and mission critical information updates.
- Large cost savings. Members don't have to implement, staff, operate, or maintain costly individual CAD systems.
- Costs on a shared basis are lower for each member. Hence, there's greater willingness by members to invest periodically in requisite systems upgrades.

Given current trends to consolidate common public sector services, WRPS anticipates:

a) That PRIDE membership is likely to expand over time. WRPS has already received several enquiries. PRIDE members are currently working on a business plan that will address the question of future expansion.

   General view is that, even if PRIDE membership were to expand, the 911 communications center should not be adversely impacted. Albeit WRPS IT would require additional staffing to manage the expanded operation.

b) That one or more PRIDE members may ask WRPS to consider taking on their organization's dispatch function. ApexPro was asked to briefly assess the potential implications vis-à-vis additional dispatch resourcing requirements.

   - Dispatch centers managed by Brantford, Stratford, and South Simcoe police departments are secondary PSAP's. They are included in this assessment.
   - Guelph police department's dispatch center is a primary PSAP. It is excluded from this assessment.
   - Service demand is based on recorded CAD events for 2021. Future service demand growth is assumed to keep pace with that of ROW.
   - Presented below are preliminary estimates of dispatch requirements for PRIDE. Going forward, these estimates will need to be refined.

Exhibit 6.5: Preliminary Dispatch Estimates for PRIDE

	DISPATCH REQUIREMENTS FOR PRIDE			
	2021	2031	2041	2051
Call Volume				
Stratford	25,000	33,000	38,000	41,000
Brantford	52,000	68,000	78,000	86,000
S. Simcoe	26,000	34,000	39,000	43,000
Total	103,000	135,000	155,000	170,000
Call Taker/ Dispatcher Workstations	7	11	11	12
Call Taker / Dispatchers (full-time)	28	44	44	48
Call Taker / Dispatchers (part-time)	10	15	15	16
Training Staff	1	2	2	2
Switchboard Operators (full-time)	1	1	2	2
Switchboard Operators (part-time)	1	1	2	2

Includes NG 911

7 Potential 911 Center Sites

The needs assessment investigated the following potential 911 center sites.

1. Expansion within WRPS headquarters (Maplegrove)

   This option was discarded because of existing spatial constraints within the existing building.

2. Relocation to alternative regional premises

   ROW Facilities Management identified the following regional facilities, where space could potentially be made available: 134, 150 and 200 Frederick Street (Kitchener); 20 Weber Street (Kitchener); 150 Main Street (Cambridge); and 99 Regina Street South (Waterloo).

   All facilities (except for 99 Regina) were discarded from consideration, either by way of review or discussions with ROW Facilities Management, mainly for the following reasons: insufficient space, or concerns over reliable connectivity to public safety voice radio system

   99 Regina St., South, was retained as a potential backup 911 center site following discussions with ROW Facilities Management, in which they advise that up to 30,000 SF can be made available on floors 4 and 5 of the building. A map showing the site's location is appended at Appendix G, Exhibit G.2.

3. Construction of a new purpose-built facility.

   The following 3 locations were shortlisted as candidate sites on which to construct a "new build" option, for either a primary or backup 911 center.

   a) New build co-located at WRPS headquarters campus (Maplegrove).

      A map showing the site's location is appended at Appendix G, Exhibit G.3. As illustrated therein, there is ample space on campus to accommodate a 2-storey building of up to 50,000 SF.

   b) New build in the vicinity of WRESTRC

      Waterloo Region Emergency Services Training Center (WRESTRC) is located on a large tract of land situated on the south side of Erbs Road in Wilmot Township (immediately to the west of its jurisdictional boundary with City of Waterloo). The location is shown in Appendix G, Exhibit G.4.

      The property, much of which is owned by ROW, currently houses WRESTRC (including administration and emergency services training building, multiple burn buildings for fire training, and an emergency vehicle operations course for emergency personnel driver training). The property also houses a newly built (2020) Regional Paramedic Services headquarters / fleet center.

Given the current on-site occupants, one might generally describe the property as an evolving emergency services campus.

Surrounding lands to the north, south, and west are mainly agricultural. An inactive land fill (that is currently capped) and a methane capture and co-generation plant is situated to the east of the property. A stone quarry is situated about 0.5 km to the south.

c) New build near Baden radio network tower.

Baden Tower is a 291 metres (958 ft) television transmission tower located near the community of Baden, in the Township of Wilmot. The location is shown in Appendix G, Exhibit G.5.

Baden Tower also serves as primary backup tower for ROW's mission critical P25 public safety voice radio network.

The tower sits on top of Baden Hill which, at an elevation of about 430 metres (1,400 ft), is one of the highest elevations in the Region. The tower can be seen from practically anywhere in the Township of Wilmot. Potential communities within direct line of sight of Baden Tower (i.e., potential candidate sites for a 911 center) include Baden, New Hamburg, Luxemburg, Petersburg, Philipsburg, and St. Agatha.

8 Communications Center Scenarios

The needs assessment investigated the 6 communications center scenarios shown in Exhibit 8.1.

All scenarios (primary and backup) include the following core elements: growth-driven service demand, RTOC and MISC, NG 911, and community-based mental health crisis response.

Scenarios P2-P4 includes dispatching for PRIDE. Scenarios P3 and P4 include co-location with the Region's Service First Call Center (SFCC). Scenario P4 includes co-location with fire dispatch managed by Kitchener Fire (KFD).

Scenario B1 assumes construction of a new purpose-built facility. Scenario B2 assumes use of an existing ROW-owned building (99 Regina St., South, Waterloo).

In the context of this investigation, co-location is intended to mean … all groups to occupy the same facility, but each continues to operate as an independent entity with their own staff, work areas, and amenities.

Co-location of ground ambulance dispatch (i.e., the Central Ambulance Communications Center managed by Ministry of Health) is excluded from the investigation.

Exhibit 8.1: Communications Center Scenarios

	Primary 911 Center				Backup 911 Center	
Scenario / Components	P1	P2	P3	P4	B1	B2
	Core	Core + PRIDE	Core + PRIDE + SFCC	Core + PRIDE + SFCC + KFD	New Build	99 Regina St., S.
Sized to accommodate ROW long-term growth (2051)	√	√	√	√	√	√
Includes RTOC & MISC	√	√	√	√	√	√
Includes NG 911	√	√	√	√	√	√
Includes community-based mental health crisis response initiatives	√	√	√	√	√	√
Includes dispatching for PRIDE	x	√	√	√	x	x
ROW Service First Call Center (SFCC) is co-located on premises	x	x	√	√	x	x
Kitchener Fire "main" dispatch is co-located on premises	x	x	x	√	x	x

9 Floor Space Estimates and Costs

9.1 Floor Space Requirements - Primary 911 Center

Floor space estimates for the primary 911 center are presented in Exhibit 9.1. Figures shown are for full build out 2051. Assessment details and floor area estimates at 10-year intervals (2021, 2031, 2041 and 2051) are appended at Appendix E.

Exhibit 9.1: Floor Space Estimates – Primary 911 Center

Scenario	P1 Core	P2 Core + PRIDE	P3 Core + PRIDE + SFCC	P4 Core + PRIDE + SFCC + KFD
COMMUNICATIONS CENTER	7,000	8,800	8,800	8,800
TRAINING AREA	2,900	3,150	3,150	3,150
RTOC & MISC	2,800	2,800	2,800	2,800
COMMON SUPPORT	3,650	4,000	4,000	4,000
MEETING SPACE	650	650	650	650
INFORMATION TECHNOLOGY	1,750	1,750	1,750	1,750
SECURE ENTRY	750	750	750	750
MECHANICAL	2,000	2,000	2,000	2,000
GROSS UP (40%)	8,600	9,550	9,550	9,550
WRPS TOTAL SQ. FT. (GROSS)	30,100	33,450	33,450	33,450
SFCC	0	0	2,500	2,500
KITCHENER FIRE (CO-LOCATED)	0	0	0	11,500
BUILDING TOTAL SQ. FT. (GROSS)	30,100	33,450	35,950	47,450

Commentary

The above figures assume construction of a new purpose-built facility and therefore include floor area provisions for secure entry/reception, mechanical room, loading area, etc.

The above figures apply to new builds at locations other than Maplegrove campus. Potential floor space savings of about 2,000 SF if the new build is constructed at Maplegrove campus. This, by leaving CAD at WRPS HQ and connecting it to the new build by fiber.

If a decision is made to have the backup 911 center double as training center (as is the current practice), then the above figures for the primary center would be lower by about 2,000 SF.

Scenario P4 assumes co-location with KFD's "main" fire dispatch. The floor area estimate for fire dispatch is taken from the Pomax 2021 report. [14] That document estimates that fire dispatch, as stand-alone, will require 8,835 SF net space (11,046 SF gross) by 2041. ApexPro increased this figure by 3% to reflect 2051.

If Scenario P4 were based on co-location with KFD's "backup" fire dispatch, then the figure shown would be lower by about 4,000-6,000 SF.

9.2 Floor Space Requirements - Backup 911 Center

Floor space estimates for the backup 911 center are presented in Exhibit 9.2. These figures are also for full build out (2051). Assessment details and floor area estimates at 10-year intervals (2021, 2031, 2041 and 2051) are appended at Appendix E

Exhibit 9.2: Floor Space Estimates - Backup 911 Center

Scenario	B1 New Build	B2 99 Regina St. S.
COMMUNICATIONS CENTER	7,000	7,000
TRAINING AREA	400	400
RTOC & MISC	2,800	2,800
COMMON SUPPORT	3,200	2,200
MEETING SPACE	700	0
INFORMATION TECHNOLOGY	1,800	1,800
SECURE ENTRY	700	0
MECHANICAL	2,000	0
GROSS UP	7,400	2,800
TOTAL REQ'T SQ. FT. (GROSS)	26,000	17,000

Commentary

Backup center and primary 911 center are assumed to house the same number of communications workstations. Assessing call taking workload relative to

[14] A Review of Fire and Police Communications and Dispatch in Waterloo Region, Pomax Consulting, November 2021.

NENA standards may reduce the backup 911 center workstation requirements. Such analysis is excluded from this investigation.

Backup 911 center is assumed to exclude co-locations with SFCC or KFD.

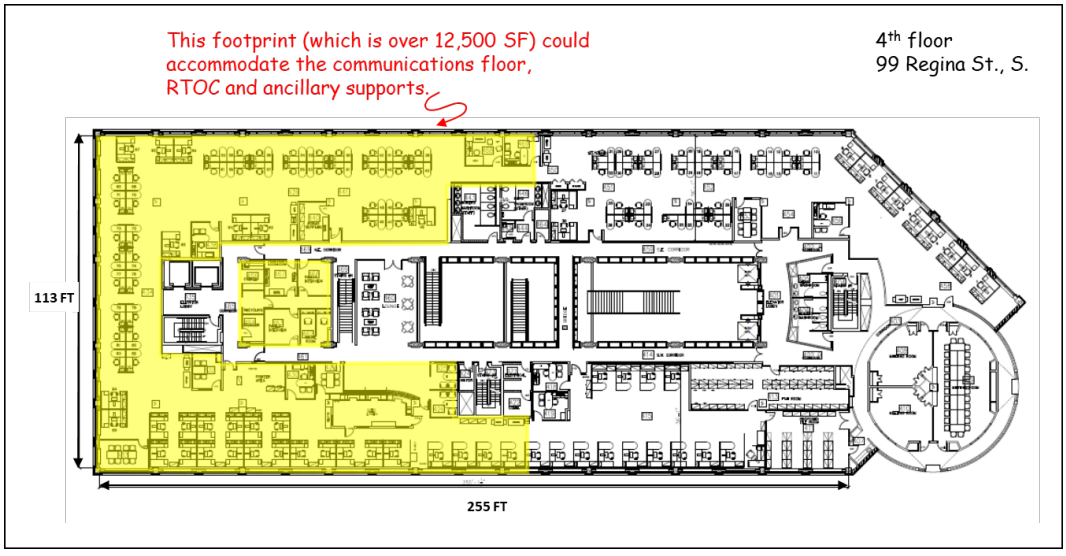
Backup 911 center is also assumed to exclude dispatch for PRIDE. If this were included, then the center's footprint would need to be about 2,000-2,500 SF larger.

Assessment assumes a gross up of 40% for new build (Scenario B1), and a lower gross up of 20% for renovations at the existing 99 Regina St. building (Scenario B2).

Waterloo Facilities Management advises that up to 30,000 SF can be made available on floors 4 and 5 of the building at 99 Regina St. S. (i.e., up to 15,000 SF per floor).

From a spatial perspective, this accommodation provides ample space for a backup 911 center, with the communications floor, RTOC, and ancillary supports located on one floor (as illustrated in Exhibit 9.3); and training staff space, MISC and IT support located on another.

Exhibit 9.3: Potential Backup Center Footprint



9.3 Order of Magnitude Costs

Order of magnitude costs for each site/scenario are presented in Exhibit 9.4 (next page).

Cost for a new primary 911 center at WRESTRC and Baden ranges from $50 M (Sc. P1) to $70 M (Sc. P4), whereas the cost at Maplegrove campus is lower, ranging from $45 M to $65 M.

The lower cost of a new build at Maplegrove is attributed to the following:

- Lower floor space requirement of about 2,000 SF, by leaving CAD at WRPS HQ and connecting to the new build by fiber.
- Lower technology costs by using the existing underground fiber line infrastructure (i.e., the existing dedicated fiber lines for CAD and radio).

Cost for a new backup 911 center at 99 Regina is about $20 M, i.e., about one-half the cost of a "new build" ($40 M).

Exhibit 9.4: Order of Magnitude Costs ($ M)

	GROSS SF	PRIMARY 911 CENTER		
	Full Build Out 2051	Maplegrove	WRESTRC	Baden Tower
		New Build	New Build	New Build
P1: Core	28,100	$45	--	--
	30,100	--	$50	$50
P2: Core + PRIDE	31,450	$50	--	--
	33,450	--	$55	$55
P3: Core + PRIDE + SFCC	33,950	$55	--	--
	35,950	--	$60	$60
P4: Core + PRIDE + SFCC + KFD	45,450	$65	--	--
	47,450	--	$70	$70

	GROSS SF	EMERGENCY BACKUP CENTER		
	Full Build Out 2051	99 Regina, S.	WRESTRC	Baden Tower
		Renovation	New Build	New Build
B1: New Build	26,000	--	$40	$40
B2: 99 Regina St.	17,000	$20	--	--

Cost estimates are rounded to the nearest $5 M.

Main assumptions on which the cost estimates are based, are listed below. Additional costing details are presented in Appendix F.

- Costs include construction, furnishings, and technology. Cost of land is excluded.
- Costs are in 2022 dollars. HST and other applicable taxes are excluded.
- Floor space requirements and construction costs are for full build out (2051).

- Furnishings and technology costs are based on resourcing requirements in 2031. This accounts for NG 911 (go live in 2025) and short-term growth beyond the go live date.
- Assumed cost for “new build” construction is $800 per SF. Assumed cost for “renovation” of the 99 Regina St. South building is $400 per SF.
- Assessment assumes that the new primary center will be outfitted with new workstations and communications consoles. Workstations and consoles currently at Maplegrove will be transferred to the new backup center.
- Furnishings and technology costs for SFCC and KFD are excluded.
- Figures include cost estimates for building technology infrastructure, i.e., Bell 911 trunk, fiber lines, network connections, licenses, UPS, firewall infrastructure, and security and access control.
- Figures include 10% for design and 15% for contingency.
- Figures include salaries (and benefit) costs for WRPS / ROW staff who will be dedicated to project implementation.
- Backup center and primary 911 center are assumed to house the same number of communications workstations. Assessing call taking workload relative to NENA standards may reduce the backup 911 center workstation requirements. Such analysis is excluded.

10 Preferred 911 Center Sites

10.1 Site Selection Criteria

A principal objective of this needs assessment is to recommend preferred locations for an expanded primary 911 center, and for an emergency backup 911 center.

Site selection criteria that were adopted for this assessment are listed below.

The criteria were assembled from the following sources: NENA Public Safety Answering Point Site Selection Criteria Information Document (2018); best practice surveys of contemporary emergency communications centers; and suggestions presented by WRPS personnel responsible for facilities management and IT.

- *Floor Space*: Site's capability to accommodate requisite floor space
- *Radio Connectivity*: Reasonable assurance of reliable connectivity to the Region's public safety voice radio system
- *Disaster Relief Fiber (Radio)*: Need for additional dedicated fiber (for radio).
- *CAD Connectivity*: Need for additional dedicated fiber (for CAD).
- *Hazards / Operational Conflicts*: Site's potential vulnerabilities to natural or man-made hazards, and mitigation strategies
- *Best Practice Features*: Capability to accommodate best practice features
- *Employee Commuting & Parking*: Employee accessibility to the site by auto and public transit
- *Safety and Security*: Site's existing access-control, and safety and security features (or site's capability to incorporate requisite requirements)
- *Value Added*: Identify additional features of relevance to the investigation.
- *Cost*: This to include cost of land, construction, furnishings, and technology.

10.2 Assessment of Potential 911 Centre Sites

The shortlisted sites (Maplegrove campus, WRESTRC, Baden Tower, and 99 Regina) are assessed using the above-listed site selection criteria.

The assessment is presented in Exhibit 10.1 (beginning on the next page).

Exhibit 10.1: Assessment of Potential 911 Center Sites

Maplegrove Campus	WRESTRC Campus	Baden Tower Area	99 Regina St., S.
New Build (primary 911 center)	**New Build** (primary or backup 911 center)	**New Build** (primary or backup 911 center)	**Renovation of Existing Building** (backup 911 center)
Floor Space			
Ample space on campus to accommodate a 2-storey building of up to 50,000 SF (for an all inclusive primary 911 center)	Likely to be several properties in the area that can accommodate a 2-storey building of up to 50,000 SF (for an all inclusive primary 911 center)	Likely to be several properties in the area that can accommodate a 2-storey building of up to 50,000 SF (for an all inclusive primary 911 center)	Waterloo Facilities Management advises that up to 30,000 SF can be made available on floors 4 and 5 of the building. This is more than ample space for a backup 911 center.
Radio Connectivity			
Currently, the primary 911 center and the primary radio tower are co-located (with direct sight line) at Maplegrove campus. This assures 911 communications of reliable mission critical connectivity to ROW's public safety voice radio system. The same would apply to a new primary 911 center at Maplegrove campus, adjacent to the primary radio tower.	CBC/Turris voice radio tower is situated in a rural field about 2 km to the north of WRESTRC. There is an unobstructed line of sight between WRESTRC campus and the tower. This will assure a 911 center at WRESTRC of reliable mission critical connectivity to the Region's public safety voice radio system.	An unobstructed line of sight extends for several kilometers in all directions from Baden Tower. A 911 center situated within the general environs of Baden tower would be assured of reliable mission critical connectivity to the Region's public safety voice radio system.	Connectivity to the Region's public safety voice radio system needs to be investigated / confirmed by a professional with radio expertise.
Disaster Relief Fiber (Radio)			
As shown in Exhibit 5.1, Maplegrove 911 is connected by underground fiber to the primary radio tower (230 Maplegrove), to Kitchener Fire main dispatch, and to the primary backup radio tower (Baden).	Disaster relief fiber lines like those in Exhibit 5.1 will need to be included in the critical infrastructure supporting a new primary 911 center at WRESTRC.	A new primary 911 center at Baden tower will benefit from the existing fiber connections to the primary radio tower (230 Maplegrove) and to Kitchener Fire main dispatch (per Exhibit 5.1).	Does not apply to scenario involving a new backup 911 center at 99 Regina.

Maplegrove Campus	WRESTRC Campus	Baden Tower Area	99 Regina St., S.
New Build (primary 911 center)	**New Build** (primary or backup 911 center)	**New Build** (primary or backup 911 center)	**Renovation of Existing Building** (backup 911 center)
A new primary 911 center at Maplegrove campus will benefit from these existing lines.	Does not apply to scenario involving a new backup 911 center at WRESTRC.	Does not apply to scenario involving a new backup 911 center at Baden.	
CAD Connectivity			
If CAD is relocated to a new primary 911 center at Maplegrove campus, then the existing underground fiber lines to Kitchener Fire main dispatch, and Kitchener Fire backup dispatch, will need to be extended. CAD may be maintained at WRPS HQ and connected to a new 'on-campus' primary 911 center by fiber. In this case, new fiber connections to KFD (main or backup) will not be needed. New fiber connection will also be needed to any future relocation of WRPS backup dispatch.	If CAD is maintained at WRPS HQ, a new underground CAD fiber connection to WRESTRC will be needed. This applies to both WRESTRC scenarios (as primary or backup 911 center). If CAD is relocated to a new primary 911 center at WRESTRC, then new underground CAD fiber connections to Kitchener Fire main dispatch, and Kitchener Fire backup dispatch, will be needed. A new fiber connection to any future relocation of WRPS backup dispatch will also be needed.	If CAD is maintained at WRPS HQ, a new underground CAD fiber connection to Baden will be needed. This applies to both Baden scenarios (as primary or backup 911 center). If CAD is relocated to a new primary 911 center at Baden, then new underground CAD fiber connections to Kitchener Fire main dispatch, and Kitchener Fire backup dispatch, will be needed. A new fiber connection to any future relocation of WRPS backup dispatch will also be needed. Fiber routings to Baden may be longer than those to sites situated in / closer to more urban settings (i.e., Maplegrove, WRESTRC, and 99 Regina).	A dedicated underground CAD fiber connection to WRPS backup at 99 Regina will be needed. This applies to all primary 911 center scenarios (i.e., CAD maintained at Maplegrove HQ or CAD relocated to a new primary 911 center). It is understood that 99 Regina is already serviced by Region of Waterloo's fiber network. It may be feasible to utilize ROW fiber network to connect to CAD.
Hazards / Operational Conflicts			
Red Cross parks 4 shipping containers on the former test track at Maplegrove. If a new 911 center is to be built on the former test track (as per Appendix G, Exhibit G.3), then	An inactive land fill (that is currently capped) and a methane capture and co-generation plant is situated to the east of WRESTRC (per Appendix G, Exhibit G.4).	None identified; albeit this should be confirmed in conjunction with any future property search.	Surrounding land uses include a rail spur line and William Street pumping station. The spur line is a relatively light use rail line servicing about 4-5 companies in Woolwich Twp. It

Maplegrove Campus	WRESTRC Campus	Baden Tower Area	99 Regina St., S.
New Build (primary 911 center)	**New Build** (primary or backup 911 center)	**New Build** (primary or backup 911 center)	**Renovation of Existing Building** (backup 911 center)
alternate arrangements for container storage will have to be made. WRPS should be able to find alternate space on campus.	Since WRESTRC is a large tract of land, situating a new 911 center at a distance from the plant (as per the Paramedic Services HQ) may be feasible. This, and other mitigations, would need to be confirmed.		carries 4-5 train movements per week (about 900 railway cars annually), mainly in the evening and at night. [15] Situated 420 feet to the north and separated from 99 Regina by an above grade multi-level parking garage (and given the relatively light rail traffic) the rail spur does not appear to be an obstacle. William Street pumping station, situated immediately to the south of the building, is also not an obstacle; this, according to a 2016 Environmental Assessment, which investigated possible impacts to public health and safety. [16]
Best Practice Features			
As a new build, it should be relatively simple to incorporate best practices into the primary 911 center design.	As a new build, it should be relatively simple to incorporate best practices into the 911 center design.	As a new build, it should be relatively simple to incorporate best practices into the 911 center design.	As a renovation of an existing building, it will not be feasible to include all best practice features (i.e., raised floor). If a primary 911 center were being considered, then this would be a shortcoming. Since the subject is a backup 911 center (for occasional

[15] Source: ROW Corporate Resources Report "CR-RS-14-029/E-14-074", May 27, 2014.

[16] "William Street and Strange Street Water Supply Systems Class Environmental Assessment Environmental Study Report", prepared for ROW, by XCG Consultants with Associated Engineering and D.C. Damman and Associates, September 2016. Refer to pages 60-63.

Maplegrove Campus	WRESTRC Campus	Baden Tower Area	99 Regina St., S.
New Build (primary 911 center)	**New Build** (primary or backup 911 center)	**New Build** (primary or backup 911 center)	**Renovation of Existing Building** (backup 911 center)
			short-term use), this is not considered significant.
Employee Commuting & Parking			
Campus commute is mainly by car, but employees are accustomed to it. Ample on-site parking	Commute would also be mainly by car. Center's design should be able to incorporate ample on-site parking.	Commute would also be mainly by car. Center's design should be able to incorporate ample on-site parking. Time spent commuting to Baden tower area (i.e., a relatively long commute) would be a drawback.	99 Regina is readily accessible by public transit including the recently built ION rapid transit line. For those commuting by car, parking will be an issue. There's relatively little on-site parking. Nearby parking lots will require employees to pay for parking.
Safety and Security			
Safety and security features at current HQ (including access, egress, and parking) include lighting, camera coverage, entry intercom system, locked (card access) entries, and visitor screening. As a new build project, it should be relatively simple to incorporate similar features into a new 911 center.	As a new build, it should be relatively simple to incorporate high-level safety and security into a new 911 center.	As a new build, it should be relatively simple to incorporate high-level safety and security into a new 911 center.	Safety and security features at 99 Regina include lighting, camera coverage, locked (card access) entries, on-site security personnel, staffed ground floor reception, and visitor screening.
Value Added			
Operational benefits to having 911 center, RTOC, and MISC on campus adjacent to WRPS headquarters.	Potential to increase "rural patrol" presence in Wilmot Township (by co-locating rural patrol administration and command,	Potential to re-institute "rural patrol" presence in Wellesley Township (by co-locating rural patrol administration and command,	Smaller overall floor footprint. No need for separate mechanical area, loading area, or separate secure main entry / reception.

Maplegrove Campus	WRESTRC Campus	Baden Tower Area	99 Regina St., S.
New Build (primary 911 center)	**New Build** (primary or backup 911 center)	**New Build** (primary or backup 911 center)	**Renovation of Existing Building** (backup 911 center)
Lower floor space requirement of about 2,000 SF, by leaving CAD at WRPS HQ and connecting to the new build by fiber. Lower technology costs by using the existing underground fiber line infrastructure (i.e., the existing dedicated fiber lines for CAD and radio).	either in the same building, or in an adjacent on-site facility).	either in the same building, or in an adjacent on-site facility).	Backup 911 center will have access to the building's existing meeting rooms (on a shared basis with other building tenants). Center's employees will have use of the building's existing amenities which include workout area (gym) and change rooms.
Cost – Land			
No land cost. Property is owned by ROW	Cost of land will need to be confirmed. No cost if property is owned by ROW. Additional cost if property must be purchased from 3rd party.	Cost of land will need to be confirmed. No cost if property is owned by ROW. Additional cost if property must be purchased from 3rd party.	No land cost. Building is owned by ROW
Cost - Construction			
Construction cost for a new primary 911 center at Maplegrove campus ranges from $28 M (Sc. P1) to $45 M (Sc. P4).	Construction cost for a new primary 911 center at WRESTRC ranges from $31 M (Sc. P1) to $48M (Sc. P4). Construction cost for a new backup 911 center is estimated at $27 M.	Construction cost for a new primary 911 center at Baden ranges from $31 M (Sc. P1) to $48M (Sc. P4). Construction cost for a new backup 911 center is estimated at $27 M.	Construction cost for a new backup 911 center at 99 Regina is estimated at $9 M. This is 1/3 the construction cost of a "new build" backup 911 center.
Cost - Furnishings			
Cost to furnish a new primary 911 center is $2 to $3 M (w' slight savings if CAD is maintained at WRPS HQ).	Cost to furnish a new primary 911 center is $2 to $3 M. Cost to furnish a new backup 911 center is about $1 M.	Cost to furnish a new primary 911 center is $2 to $3 M. Cost to furnish a new backup 911 center is about $1 M.	Cost to furnish a new backup 911 center is about $1 M. This cost estimate excludes furnishings for SFCC & KFD.

Maplegrove Campus	WRESTRC Campus	Baden Tower Area	99 Regina St., S.
New Build (primary 911 center)	**New Build** (primary or backup 911 center)	**New Build** (primary or backup 911 center)	**Renovation of Existing Building** (backup 911 center)
These cost estimates exclude furnishings for SFCC & KFD.	These cost estimates exclude furnishings for SFCC & KFD.	These cost estimates exclude furnishings for SFCC & KFD.	
Cost - Technology			
Cost to outfit a new primary 911 center at Maplegrove campus is $17 to $18 M. This estimate excludes cost to outfit SFCC & KFD.	Cost to outfit a new primary 911 center at WRESTRC is $19 - $20M. Cost to outfit a new backup 911 center is about $13 M. These estimates exclude cost to outfit SFCC & KFD.	Cost to outfit a new primary 911 center at Baden is $19 - $20 M. Cost to outfit a new backup 911 center is less than $13 M. These estimates exclude cost to outfit SFCC & KFD.	Cost to outfit a new backup 911 center at 99 Regina St., South, is about $12 M. This estimate excludes cost to outfit SFCC & KFD.

10.3 Assessment Summary

The assessment presented on the prior six pages is summarized below, in Exhibit 10.2.

For the primary 911 center, the assessment favours a new build co-located at WRPS campus (Maplegrove). For the backup 911 center, the assessment favours the existing ROW-owned building at 99 Regina St., S. (Waterloo). The preferred 911 center locations are discussed further in Sections 10.4 and 10.5.

Exhibit 10.2: Assessment Summary

	PRIMARY 911 CENTER			EMERGENCY BACKUP CENTER		
	Maplegrove	WRESTRC	Baden Tower	99 Regina, S.	WRESTRC	Baden Tower
	New Build	New Build	New Build	Renovation	New Build	New Build
Floor Space						
Radio Connectivity						
Disaster Relief Fiber (Radio)						
CAD Connectivity						
Hazards / Operational Conflicts						
Best Practice Features						
Employee Commuting / Parking						
Safety and Security						
Value Added						
Cost - Land						
Cost - Construction						
Cost - Furnishings						
Cost - Technology						
Overall Ranking (1 - highest)	1	2	3	1	2	3

Most Favourable — TBD — Least Favourable

10.4 Preferred Location for Primary 911 Center

For the primary 911 center, the assessment favours a new build co-located at WRPS campus (Maplegrove), mainly for the reasons below.

- Ample space for a 2-storey building of up to 50,000 SF
- Co-located adjacent to the primary radio tower guarantees reliable connectivity to ROW's mission critical public safety voice radio system
- Lower cost option (about $5 M less)

  - No land cost. Property is owned by ROW.
  - Lower floor space requirement (and construction costs) by maintaining CAD at WRPS HQ and connecting to the new build by fiber
  - Lower technology costs by tapping into existing fiber trunks
- Operational benefits to having 911 center (including RTOC and MISC) on campus adjacent to WRPS HQ.

10.5 Preferred Location for Backup 911 Center

For the backup 911 center, the assessment favours the existing ROW-owned building at 99 Regina St., S. (Waterloo), mainly for the reasons below.

- Significantly lower cost option ($20 M vs. $40 M for new build).
  - No land cost. Building is owned by ROW.
  - Renovation costs less than new build
  - 17,000 SF vs. 26,000 SF for new build. No need for meeting rooms, mechanical area, loading area, or secure main entry / reception, beyond those in the existing building.
- Waterloo Facilities Management advises that up to 30,000 SF can be made available on floors 4 and 5 of the building. This is more than ample space for a backup 911 center.
- 99 Regina is readily accessible by public transit including the recently built ION rapid transit line.
- Nearby light use rail spur does not appear to be an obstacle. Nearby water pumping station also does not appear to be an obstacle.
- Backup 911 center will have access to the building's existing meeting rooms (on a shared basis with other building tenants).
- Center's employees will have use of the building's existing amenities which include workout area (gym) and change rooms.
- *Connectivity to the Region's public safety voice radio system needs to be investigated / confirmed by a professional with radio expertise*.

Appendix A: Consolidated Emergency Communications for ROW

Appendix A: Consolidated Emergency Communications for ROW

Set out below is the 25-year chronology of events and actions supporting eventual consolidation of 911, police, fire, and ambulance emergency communications in ROW.

- 1996: Regional dispatch services are discussed in the context of local government reform. Kitchener Fire assumes responsibility for dispatching Waterloo Fire, and for all fire dispatching north of Highway 401.

- 1998-99: Area Chiefs undertake and present the findings of a road tour of multiple, consolidated dispatch services.

- 2001: September 11 terrorist attacks elevate awareness to improve interoperability of communications between emergency responder agencies.

- 2007-09: A Dispatch Model Working Group is formed. PSTG Consulting reviews options for decreasing emergency services response times.

- 2012: Transportation Safety Board releases its report on a fatal 2011 helicopter crash, which includes recommendations for improving inter-agency communications in the Region

- 2014: A feasibility report by L.R. Kimball Consulting concludes that full integration of emergency dispatch services in Waterloo Region is feasible; albeit governance, labour, funding, and cost-sharing are challenges that need to be addressed. Kimball also concludes that, although MOHLTC is not prepared to participate, significant benefits can still be achieved by consolidating 9-1-1 with police and fire dispatch.

- June 2014: A recommendation to implement a common technology platform for Police and Fire dispatch is tabled at an All-Council Meeting. The recommendation is supported, as the first step forward in establishing a fully integrated emergency dispatch centre.

- 2015-16: Kimball performs a functional review of fire CAD, which concludes that all fire CAD capabilities can be retained, or enhanced, if fire migrates on a shared basis, to WRPS' CAD platform.

- 2016: Waterloo Region's 10-Year Paramedic Services Master Plan supports migration over time, to a fully integrated emergency dispatch system.

- 2017: On behalf of WRPS and the fire departments of Kitchener, Cambridge, and Waterloo, ApexPro Consulting Inc. develops an implementation plan and timetable for transitioning fire dispatch to the PRIDE CAD platform managed by WRPS.

- 2018: WalterFedy Architects prepare a Facilities Master Plan for Waterloo Regional Police Service. The plan assumes that a consolidated police and fire emergency communications center will be included in a new Central Division facility at 200

Frederick St., Kitchener. The existing 911 center at WRPS headquarters will remain as backup facility.

- March 25, 2019: Kitchener Fire assumes responsibility for dispatching all fire departments in Region of Waterloo. Before this date, Kitchener Fire dispatched fire departments north of Highway 401, and Cambridge Fire dispatched fire departments to the south.

- April 24, 2019: Kitchener Fire transitions to the PRIDE CAD platform managed by WRPS. The CAD, manufactured by Hexagon (formerly Intergraph), is managed by WRPS.

- May 2019: On behalf of WRPS, ApexPro Consulting Inc. investigates the feasibility for establishing a consolidated communications center (for 911; police, fire, and ambulance dispatch; and ROW 311 services) at the new Central Division facility, 200 Frederick St., Kitchener (former provincial courthouse building). The investigation concludes that the available space will accommodate only 911, and dispatch for police and Fire.

- October 2019: Motorola undertakes a voice radio system feasibility review for the new Central Division facility (at 200 Frederick St). Initial outcomes identify a requirement for full re-design of the voice radio perimeter tower system, and for a large tower on the building's roof. Also, that the new communication centre would not be operational until the review is complete (minimum 2 to 3 years). Considering these findings (and the above findings by ApexPro), an informed decision is made to not move 911 Communications to 200 Frederick.

- 2021: Pomax Consulting reviews the future provision of fire and police communications/dispatch in Waterloo Region, within the broader context of NG 911. The review reinforces prior recommendations for consolidating emergency services communications stating that this model "offers the greatest potential for cost savings, makes best use of staff resources, and strategically positions the region and municipalities to provide service to other municipalities and entities".

- December 2021: Fire/Police Dispatch Review Steering Committee (a regional / municipal committee) meets to review the Pomax report. The Committee requests WRPS/Fire to jointly follow up on the potential cost savings and efficiency improvements identified in the consultant's report.

Appendix B: Data Sources

Appendix B: Data Sources

Reports

- *Places to Grow Growth Plan for the Greater Golden Horseshoe*, Ministry of Municipal Affairs, May 2017 (updated August 2020).
- *Public Safety Answering Point (PSAP) Consolidation Feasibility Report for Region of Waterloo*, L.R. Kimball Consulting, May 2014.
- *Implementation Report: Common Technology Platform for Police and Fire Dispatch in Region of Waterloo*, ApexPro Consulting Inc., April 2017.
- *Waterloo Regional Police Service Facilities Master Plan*, WalterFedy Architects, February 2018.
- *Planning for a New & Expanded Public Safety Communications Center in Waterloo Region*, ApexPro Consulting Inc., May 28, 2019.
- *A Review of Fire and Police Communications and Dispatch in Waterloo Region*, Pomax Consulting, November 2021.

On-Site Surveys of Communications Centers (by ApexPro).

- 911 Communications, Halton Regional Police Services *(2018)* [17]
- 911 Communications, Niagara Regional Police Services *(2016)*
- 911 Communications, York Regional Police Services *(2014)*
- 911 Communications, City of Barrie Police Services *(2019)* [18]
- OPP Emergency Communications, London Ontario *(2019)* [19]
- Integrated Emergency Services, Halifax Nova Scotia *(1999)*
- Public Safety Communications, Calgary Alberta *(2006)*
- E-Comm, Vancouver British Columbia *(1999)*
- Denver 911, Denver Colorado *(2007)*
- Bureau of Emergency Communications, Portland Oregon
- Public Safety Communications, Fairfax County Virginia *(2009)*

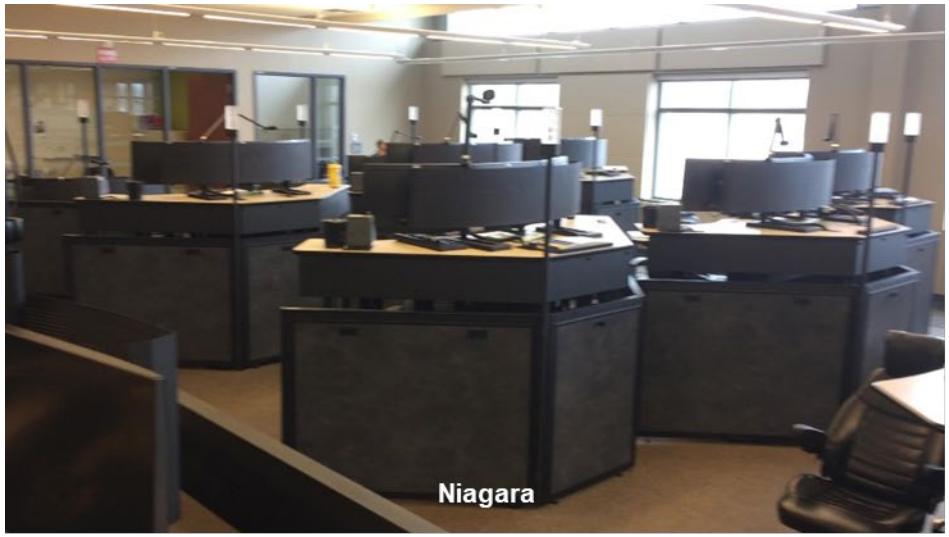
[17] Dates shown refer to year of construction / implementation. Some are approximations.

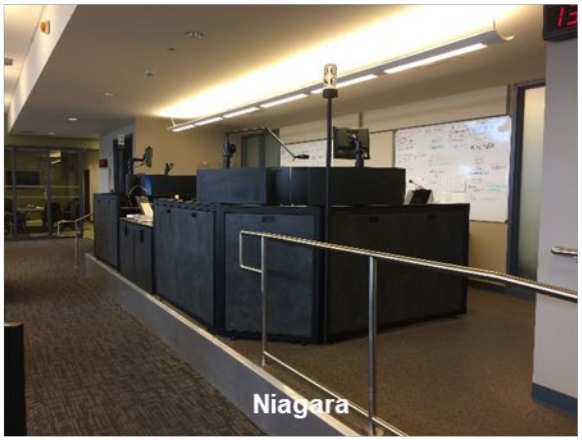
[18] On-site survey of the new facility under construction.

[19] Meeting with OPP at a location adjacent to the new facility under construction.

Appendix C – Photos of Contemporary Communications Centers

Exhibit C.1: Best Practices - Floor Layouts





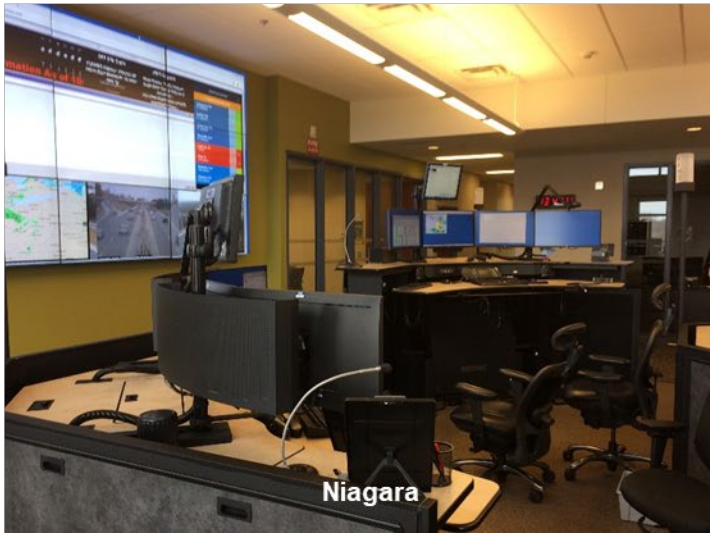
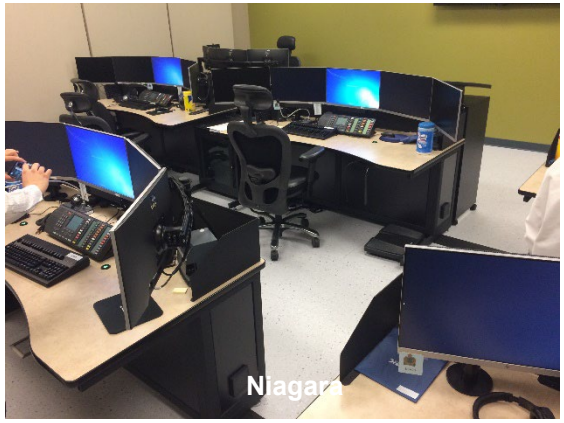


Exhibit C.2: Best Practices - Training Room


Niagara


Niagara

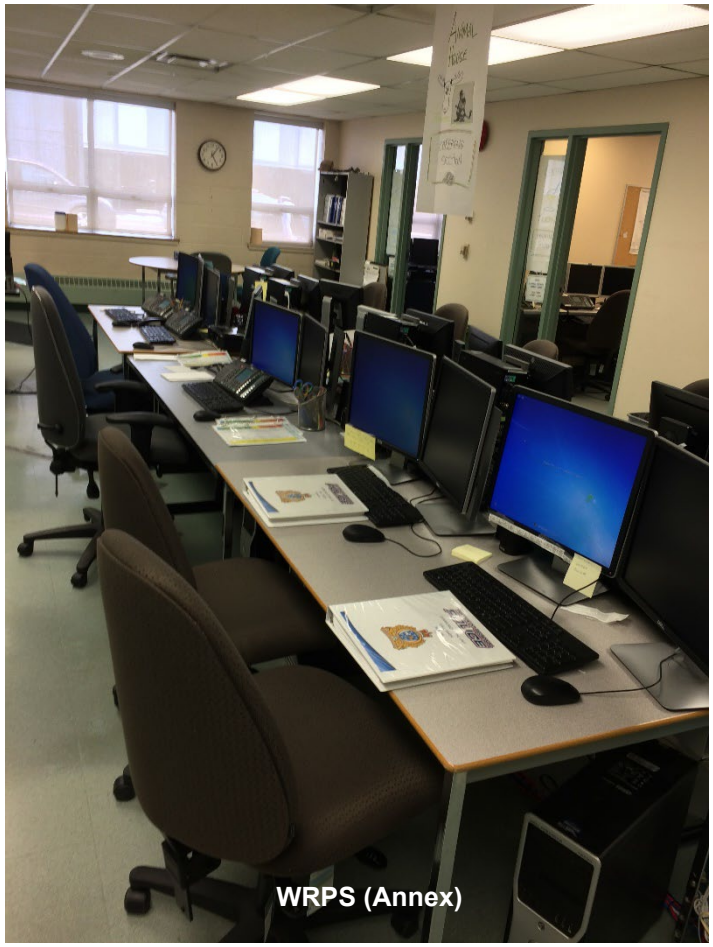
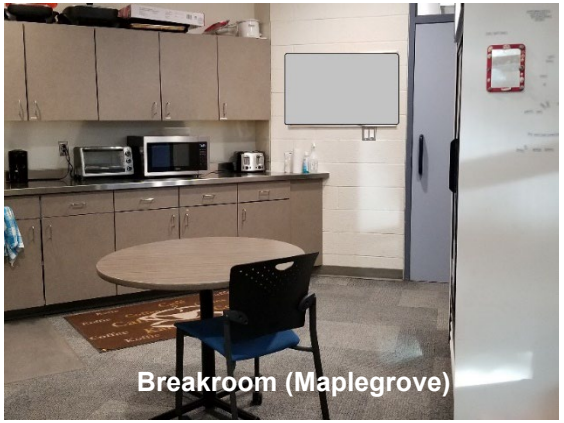

WRPS (Annex)

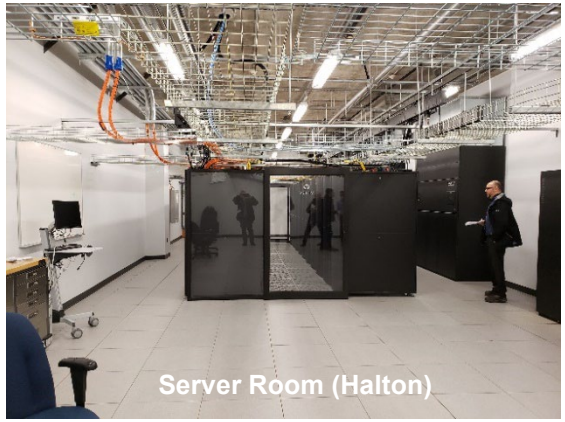
Exhibit C.3: Best Practices - Supports



Breakroom (Maplegrove)

Meeting Room (Niagara)

Breakroom (Niagara)



Server Room (Halton)

Appendix D – Service First Call Center (SFCC)

Appendix D: Service First Call Center (SFCC)

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.

SFCC uses Customer Relationship Management software (CRM) specifically designed to support call-center call taking functions.

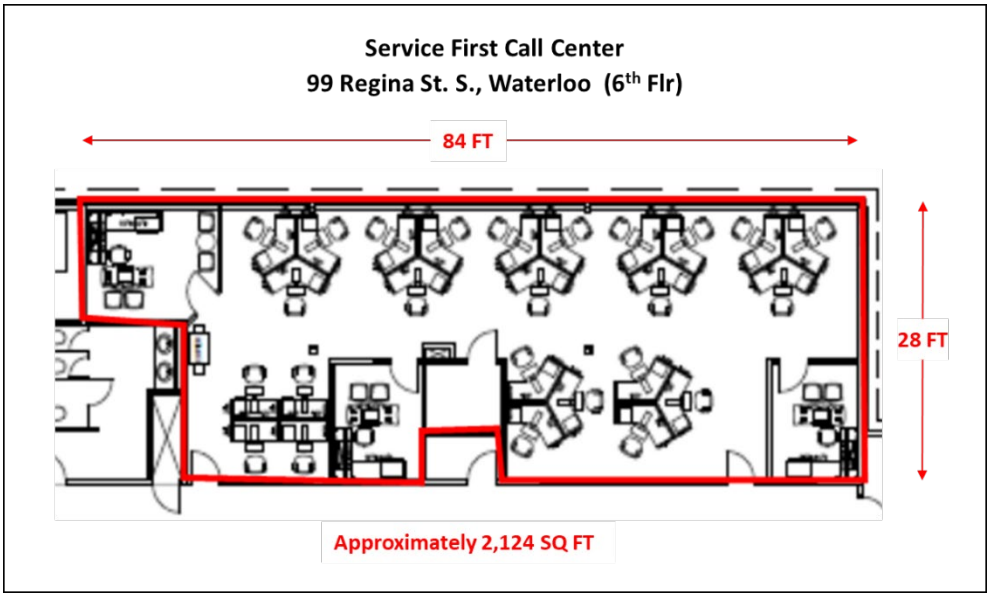
In 2021 SFCC responded to 350,000 to 375,000 incoming requests for information (up from 325,000 pre-covid).

SFCC customer service representatives (CSR) address most routine service requests on first contact. Questions that they cannot answer are transferred to the appropriate department for more in-depth information.

The center was relocated to the present location on the sixth floor, 99 Regina St., South, Waterloo in late 2019. The former location was 131 Goodrich Dr., Kitchener.

- Center is roughly 84 feet by 28 feet (per Exhibit D.1). Total floor area is about 2,124 SF.
- Has natural lighting (windows). Standard office ceiling height. There's no raised floor.
- Center includes 25 CRM-outfitted workstations, 3 offices and an IT (server) closet.

Exhibit D.1: Service First Call Center



- SFCC staffing consists of:
  - 3 Supervisors (each with their own office)
  - 35 CSR's (about 50% are full-time / rest are part-time), and
  - Manager (operates from an office on the main floor, and from ROW headquarters (150 Frederick St., Kitchener).
- Service is available 24/7, albeit the center is only staffed on day shifts, from 7 am to 6 pm. Evenings and at night, CSR's work only from home.
- Each day shift is staffed with about 15 CSR's. Day shift staffing is split between:
  - The 6th floor call center
  - Ground floor reception desks at the following Regional facilities: 99 Regina Street South, Waterloo; 150 Frederick St., Kitchener; and 150 Main St., Cambridge
  - Staff working from home.

Employees of the center have access to a gym and change rooms, which were in place for building tenants prior to the SFCC move. Washrooms are situated outside, but immediately adjacent to the center.

Back up operations: SFCC staff can work remotely (i.e., from home). This provides good backup for their operations at 99 Regina.

SFCC center is outfitted with 25 workstations but is staffed by only 15 staff per shift. There appears to be available capacity for future growth.

Appendix E – Estimated Floor Area Requirements (2021 to 2051)

Exhibit E.1 **Primary 911 Center** **Sc. P1: "Core"**

Space Description	Unit Sq. Ft.	2021		2031		2041		2051	
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.
WRPS			**25,172**		**27,986**		**29,218**		**30,100**
COMMUNICATIONS CENTER			**4,435**		**5,935**		**6,535**		**6,985**
Staff Sergeant Office	130	1	130	1	130	1	130	1	130
Supervisor Workstation	150	1	150	1	150	1	150	1	150
Call Taker Workstations (current)	150	9	1,350	9	1,350	9	1,350	9	1,350
Dispatcher Workstations (current)	150	4	600	4	600	4	600	4	600
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	4	600	4	600
Communicator Workstations (growth)	150	1	150	6	900	8	1,200	10	1,500
Communicator Workstations (NG911)	150	0	0	3	450	4	600	5	750
Crisis Response Coordinator Workstations	150	1	150	2	300	3	450	3	450
Switchboard Workstations	150	1	150	2	300	2	300	2	300
Small Meeting Room	130	1	130	1	130	1	130	1	130
Ready (Shift Change) Room	225	1	225	1	225	1	225	1	225
Quiet Rooms	100	2	200	2	200	2	200	2	200
Files Storage	250	1	250	1	250	1	250	1	250
Chair Corral & Supplies Storage	250	1	250	1	250	1	250	1	250
Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens									
TRAINING AREA			**2,375**		**2,635**		**2,765**		**2,895**
Training Staff Office Space (current)	130	2	260	2	260	2	260	2	260
Training Staff Office Space (growth)	130	1	130	2	260	3	390	3	390
Training Staff Office Space (NG911)	130	0	0	1	130	1	130	2	260
Training Staff Workstations	0	3	0	5	0	6	0	7	0
Training Room	110	16	1,760	16	1,760	16	1,760	16	1,760
Training Room Workstations	0	16	0	16	0	16	0	16	0
A/V App's, Screens & Control	75	1	75	1	75	1	75	1	75
Training Supplies Storage	150	1	150	1	150	1	150	1	150
RTOC & MISC			**2,800**		**2,800**		**2,800**		**2,800**
Communicator Consoles (RTOC)	250	2	500	2	500	2	500	2	500
Staffed Desks (RTOC)	125	2	250	2	250	2	250	2	250
Outfitted Desks (MISC)	75	8	600	8	600	8	600	8	600
Office Desks (MISC)	75	2	150	2	150	2	150	2	150
EOC (MISC)	750	1	750	1	750	1	750	1	750

A/V Control	100	1	100	1	100	1	100	1	100
Reference Library	150	1	150	1	150	1	150	1	150
Equipment Storage / Staging	150	1	150	1	150	1	150	1	150
Closets / Coats / Storage	50	1	50	1	50	1	50	1	50
Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens (RTOC)									
Application Software & Screens (MISC)									
COMMON SUPPORT			**3,200**		**3,450**		**3,600**		**3,650**
Kitchen / Vending	200	1	200	1	200	1	200	1	200
Break Area / Lounge	400	1	400	1	400	1	400	1	400
Washrooms	100	2	200	2	200	2	200	2	200
Work Out Area	450	1	450	1	450	1	450	1	450
Lockers (personal / half-height)	5	130	650	180	900	210	1,050	220	1,100
Showers/Change/Washroom (Male)	350	1	350	1	350	1	350	1	350
Showers/Change/Washroom (Female)	350	1	350	1	350	1	350	1	350
Showers/Change/Washroom (Universal)	350	1	350	1	350	1	350	1	350
Housekeeping / Janitorial	250	1	250	1	250	1	250	1	250
MEETING SPACE			**650**		**650**		**650**		**650**
Conference Room	500	1	500	1	500	1	500	1	500
Meeting Room (small)	150	1	150	1	150	1	150	1	150
INFORMATION TECHNOLOGY			**1,750**		**1,750**		**1,750**		**1,750**
IT Technicians	150	3	450	3	450	3	450	3	450
Server Room	1,300	1	1,300	1	1,300	1	1,300	1	1,300
SECURE ENTRY			**750**		**750**		**750**		**750**
Entry / Lobby / Reception / Security	300	1	300	1	300	1	300	1	300
Meeting Room (small)	150	1	150	1	150	1	150	1	150
Washrooms (Universal)	100	2	200	2	200	2	200	2	200
Coat Room	100	1	100	1	100	1	100	1	100
MECHANICAL			**2,020**		**2,020**		**2,020**		**2,020**
Mechanical	800	1	800	1	800	1	800	1	800
Loading Area	100	1	100	1	100	1	100	1	100
Electrical / Main Power Dist'n	300	1	300	1	300	1	300	1	300
UPS / Emergency Generator	400	1	400	1	400	1	400	1	400
Telecom & Security	300	1	300	1	300	1	300	1	300
Fire Suppression	120	1	120	1	120	1	120	1	120

GROSS UP FROM NET (40%)			**7,192**		**7,996**		**8,348**		**8,600**

ASSUMPTIONS

- **Sized to accommodate ROW long-term growth (2051)**
- **Includes RTOC & MISC**
- **Includes NG911**
- **Includes community-based mental health crisis response initiatives**

Exhibit E.2 **Primary 911 Center** **Sc. P4: "All Inclusive"**

Space Description	Unit Sq. Ft.	2021		2031		2041		2051	
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.
WRPS			**27,111**		**31,101**		**32,347**		**33,474**
COMMUNICATIONS CENTER			**5,485**		**7,585**		**8,185**		**8,785**
Staff Sergeant Office	130	1	130	1	130	1	130	1	130
Supervisor Workstation	150	1	150	1	150	1	150	1	150
Call Taker Workstations (current)	150	9	1,350	9	1,350	9	1,350	9	1,350
Dispatcher Workstations (current)	150	4	600	4	600	4	600	4	600
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	4	600	4	600
Communicator Workstations (growth)	150	1	150	6	900	8	1,200	10	1,500
Communicator Workstations (NG911)	150	0	0	3	450	4	600	5	750
Communicator Workstations (PRIDE)	150	7	1,050	11	1,650	11	1,650	12	1,800
Crisis Response Coordinator Workstations	150	1	150	2	300	3	450	3	450
Switchboard Workstations	150	1	150	2	300	2	300	2	300
Small Meeting Room	130	1	130	1	130	1	130	1	130
Ready (Shift Change) Room	225	1	225	1	225	1	225	1	225
Quiet Rooms	100	2	200	2	200	2	200	2	200
Files Storage	250	1	250	1	250	1	250	1	250
Chair Corral & Supplies Storage	250	1	250	1	250	1	250	1	250
Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens									
TRAINING AREA			**2,505**		**2,895**		**3,025**		**3,155**
Training Staff Office Space (current)	130	2	260	2	260	2	260	2	260
Training Staff Office Space (growth)	130	1	130	2	260	3	390	3	390
Training Staff Office Space (NG911)	130	0	0	1	130	1	130	2	260
Training Staff Office Space (PRIDE)	130	1	130	2	260	2	260	2	260
Training Staff Workstations	0	4	0	7	0	8	0	9	0
Training Room	110	16	1,760	16	1,760	16	1,760	16	1,760
Training Room Workstations	0	16	0	16	0	16	0	16	0
A/V App's, Screens & Control	75	1	75	1	75	1	75	1	75
Training Supplies Storage	150	1	150	1	150	1	150	1	150
RTOC & MISC			**2,800**		**2,800**		**2,800**		**2,800**
Communicator Consoles (RTOC)	250	2	500	2	500	2	500	2	500

Staffed Desks (RTOC)	125	2	250	2	250	2	250	2	250
Outfitted Desks (MISC)	75	8	600	8	600	8	600	8	600
Office Desks (MISC)	75	2	150	2	150	2	150	2	150
EOC (MISC)	750	1	750	1	750	1	750	1	750
A/V Control	100	1	100	1	100	1	100	1	100
Reference Library	150	1	150	1	150	1	150	1	150
Equipment Storage / Staging	150	1	150	1	150	1	150	1	150
Closets / Coats / Storage	50	1	50	1	50	1	50	1	50
Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens (RTOC)									
Application Software & Screens (MISC)									
COMMON SUPPORT			**3,405**		**3,765**		**3,925**		**4,000**
Kitchen / Vending	200	1	200	1	200	1	200	1	200
Break Area / Lounge	400	1	400	1	400	1	400	1	400
Washrooms	100	2	200	2	200	2	200	2	200
Work Out Area	450	1	450	1	450	1	450	1	450
Lockers (personal / half-height)	5	130	650	180	900	210	1,050	220	1,100
Lockers (PRIDE)	5	41	205	63	315	65	325	70	350
Showers/Change/Washroom (Male)	350	1	350	1	350	1	350	1	350
Showers/Change/Washroom (Female)	350	1	350	1	350	1	350	1	350
Showers/Change/Washroom (Universal)	350	1	350	1	350	1	350	1	350
Housekeeping / Janitorial	250	1	250	1	250	1	250	1	250
MEETING SPACE			**650**		**650**		**650**		**650**
Conference Room	500	1	500	1	500	1	500	1	500
Meeting Room (small)	150	1	150	1	150	1	150	1	150
INFORMATION TECHNOLOGY			**1,750**		**1,750**		**1,750**		**1,750**
IT Technicians	150	3	450	3	450	3	450	3	450
Server Room	1,300	1	1,300	1	1,300	1	1,300	1	1,300
SECURE ENTRY			**750**		**750**		**750**		**750**
Entry / Lobby / Reception / Security	300	1	300	1	300	1	300	1	300
Meeting Room (small)	150	1	150	1	150	1	150	1	150
Washrooms (Universal)	100	2	200	2	200	2	200	2	200
Coat Room	100	1	100	1	100	1	100	1	100
MECHANICAL			**2,020**		**2,020**		**2,020**		**2,020**

Mechanical	800	1	800	1	800	1	800	1	800
Loading Area	100	1	100	1	100	1	100	1	100
Electrical / Main Power Dist'n	300	1	300	1	300	1	300	1	300
UPS / Emergency Generator	400	1	400	1	400	1	400	1	400
Telecom & Security	300	1	300	1	300	1	300	1	300
Fire Suppression	120	1	120	1	120	1	120	1	120
GROSS UP FROM NET (40%)			7,746		8,886		9,242		9,564
CO-LOCATIONS			14,000		14,000		14,000		14,000
SFCC			2,500		2,500		2,500		2,500
KFD MAIN DISPATCH			11,500		11,500		11,500		11,500
TOTAL			41,111		45,101		46,347		47,474

ASSUMPTIONS: "SCENARIO 4 - ALL INCLUSIVE"

1. Primary Center Requirements: “Core”

- Sized to accommodate ROW long-term growth (2051)
- Includes RTOC & MISC
- Includes NG911
- Includes community-based mental health crisis response initiatives

2. Primary Center Requirements: "Core + PRIDE"

- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Stratford, Brantford, and S. Simcoe police)

3. Primary Center Requirements: "Core + PRIDE + SFCC"

- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Scenario 2)
- ROW Service First Call Center (SFCC) is co-located on premises

4. Primary Center Requirements: "Core + PRIDE + SFCC + Kitchener Fire"

- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Scenario 2)
- Includes SFCC (Scenario 3)
- Kitchener Fire “main” dispatch is co-located on premises

Exhibit E.3 **Backup 911 Center** **Sc. B1 "New Build"**

Space Description	Unit Sq. Ft.	2021		2031		2041		2051	
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.
WRPS			**21,399**		**24,213**		**25,263**		**25,963**
BACKUP COMMUNICATIONS CENTER			**4,435**		**5,935**		**6,535**		**6,985**
Staff Sergeant Office	130	1	130	1	130	1	130	1	130
Supervisor Workstation w' radio - (2022)	150	1	150	1	150	1	150	1	150
Workstations - Call Taking (current)	150	9	1,350	9	1,350	9	1,350	9	1,350
Workstations - Dispatch (soon - 2022)	150	4	600	4	600	4	600	4	600
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	4	600	4	600
Communicator Workstations (growth)	150	1	150	6	900	8	1,200	10	1,500
Communicator Workstations (NG911)	150	0	0	3	450	4	600	5	750
Crisis Response Coordinator Workstations	150	1	150	2	300	3	450	3	450
Switchboard Workstations	150	1	150	2	300	2	300	2	300
Small Meeting Room	130	1	130	1	130	1	130	1	130
Ready (Shift Change) Room	225	1	225	1	225	1	225	1	225
Quiet Rooms	100	2	200	2	200	2	200	2	200
Files Storage	250	1	250	1	250	1	250	1	250
Chair Corral & Supplies Storage	250	1	250	1	250	1	250	1	250
Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens									
TRAINING STAFF OFFICE SPACE			**130**		**390**		**390**		**390**
Training Staff Office Space (current)	130	0	0	0	0	0	0	0	0
Training Staff Office Space (growth)	130	1	130	2	260	2	260	2	260
Training Staff Office Space (NG911)	130	0	0	1	130	1	130	1	130
Training Staff Workstations	0	1	0	3	0	3	0	3	0
RTOC & MISC			**2,800**		**2,800**		**2,800**		**2,800**
Communicator Consoles (RTOC)	250	2	500	2	500	2	500	2	500
Staffed Desks (RTOC)	125	2	250	2	250	2	250	2	250
Outfitted Desks (MISC)	75	8	600	8	600	8	600	8	600
Office Desks (MISC)	75	2	150	2	150	2	150	2	150
EOC (MISC)	750	1	750	1	750	1	750	1	750
A/V Control	100	1	100	1	100	1	100	1	100
Reference Library	150	1	150	1	150	1	150	1	150
Equipment Storage / Staging	150	1	150	1	150	1	150	1	150
Closets / Coats / Storage	50	1	50	1	50	1	50	1	50

Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens (RTOC)									
Application Software & Screens (MISC)									
COMMON SUPPORT			**2,750**		**3,000**		**3,150**		**3,200**
Kitchen / Vending	200	1	200	1	200	1	200	1	200
Break Area / Lounge	400	1	400	1	400	1	400	1	400
Washrooms	100	2	200	2	200	2	200	2	200
Work Out Area	450	0	0	0	0	0	0	0	0
Lockers (personal / half-height)	5	130	650	180	900	210	1,050	220	1,100
Showers/Change/Washroom (Male)	350	1	350	1	350	1	350	1	350
Showers/Change/Washroom (Female)	350	1	350	1	350	1	350	1	350
Showers/Change/Washroom (Universal)	350	1	350	1	350	1	350	1	350
Housekeeping / Janitorial	250	1	250	1	250	1	250	1	250
MEETING SPACE			**650**		**650**		**650**		**650**
Conference Room	500	1	500	1	500	1	500	1	500
Meeting Room (small)	150	1	150	1	150	1	150	1	150
INFORMATION TECHNOLOGY			**1,750**		**1,750**		**1,750**		**1,750**
IT Technicians	150	3	450	3	450	3	450	3	450
Server Room	1,300	1	1,300	1	1,300	1	1,300	1	1,300
SECURE ENTRY			**750**		**750**		**750**		**750**
Entry / Lobby / Reception / Security	300	1	300	1	300	1	300	1	300
Meeting Room (small)	150	1	150	1	150	1	150	1	150
Washrooms (Universal)	100	2	200	2	200	2	200	2	200
Coat Room	100	1	100	1	100	1	100	1	100
MECHANICAL			**2,020**		**2,020**		**2,020**		**2,020**
Mechanical	800	1	800	1	800	1	800	1	800
Loading Area	100	1	100	1	100	1	100	1	100
Electrical / Main Power Dist'n	300	1	300	1	300	1	300	1	300
UPS / Emergency Generator	400	1	400	1	400	1	400	1	400
Telecom & Security	300	1	300	1	300	1	300	1	300
Fire Suppression	120	1	120	1	120	1	120	1	120
GROSS UP FROM NET (40%)			**6,114**		**6,918**		**7,218**		**7,418**
TOTAL			**21,399**		**24,213**		**25,263**		**25,963**

ASSUMPTIONS: BACKUP 911 CENTER - NEW BUILD

- **Backup center to house the same number of communications workstations as in the primary 911 center**
- **Backup center does NOT double as training center**
- **Training staff to have office space at backup center**
- **Includes RTOC & MISC**
- **Includes NG911**
- **Includes community-based mental health crisis response initiatives**
- **Excludes dispatching for PRIDE**
- **Excludes SFCC and Kitchener Fire dispatch**

Exhibit E.4 **Backup 911 Center** **Sc. B2 "99 Regina St., S."**

Space Description	Unit Sq. Ft.	2021		2031		2041		2051	
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.	Units	Total Sq. Ft.
WRPS			**12,978**		**15,390**		**16,290**		**16,890**
BACKUP COMMUNICATIONS CENTER			**4,435**		**5,935**		**6,535**		**6,985**
Staff Sergeant Office	130	1	130	1	130	1	130	1	130
Supervisor Workstation w' radio - (2022)	150	1	150	1	150	1	150	1	150
Workstations - Call Taking (current)	150	9	1,350	9	1,350	9	1,350	9	1,350
Workstations - Dispatch (soon - 2022)	150	4	600	4	600	4	600	4	600
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	4	600	4	600
Communicator Workstations (growth)	150	1	150	6	900	8	1,200	10	1,500
Communicator Workstations (NG911)	150	0	0	3	450	4	600	5	750
Crisis Response Coordinator Workstations	150	1	150	2	300	3	450	3	450
Switchboard Workstations	150	1	150	2	300	2	300	2	300
Small Meeting Room	130	1	130	1	130	1	130	1	130
Ready (Shift Change) Room	225	1	225	1	225	1	225	1	225
Quiet Rooms	100	2	200	2	200	2	200	2	200
Files Storage	250	1	250	1	250	1	250	1	250
Chair Corral & Supplies Storage	250	1	250	1	250	1	250	1	250
Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens									
TRAINING STAFF OFFICE SPACE			**130**		**390**		**390**		**390**
Training Staff Office Space (current)	130	0	0	0	0	0	0	0	0
Training Staff Office Space (growth)	130	1	130	2	260	2	260	2	260
Training Staff Office Space (NG911)	130	0	0	1	130	1	130	1	130
Training Staff Workstations	0	1	0	3	0	3	0	3	0
RTOC & MISC			**2,800**		**2,800**		**2,800**		**2,800**
Communicator Consoles (RTOC)	250	2	500	2	500	2	500	2	500
Staffed Desks (RTOC)	125	2	250	2	250	2	250	2	250
Outfitted Desks (MISC)	75	8	600	8	600	8	600	8	600
Office Desks (MISC)	75	2	150	2	150	2	150	2	150
EOC (MISC)	750	1	750	1	750	1	750	1	750
A/V Control	100	1	100	1	100	1	100	1	100
Reference Library	150	1	150	1	150	1	150	1	150

Equipment Storage / Staging	150	1	150	1	150	1	150	1	150
Closets / Coats / Storage	50	1	50	1	50	1	50	1	50
Copier Work Area	100	1	100	1	100	1	100	1	100
Application Software & Screens (RTOC)									
Application Software & Screens (MISC)									
COMMON SUPPORT			1,700		1,950		2,100		2,150
Kitchen / Vending	200	1	200	1	200	1	200	1	200
Break Area / Lounge	400	1	400	1	400	1	400	1	400
Washrooms	100	2	200	2	200	2	200	2	200
Lockers (personal / half-height)	5	130	650	180	900	210	1,050	220	1,100
Housekeeping / Janitorial	250	1	250	1	250	1	250	1	250
MEETING SPACE			0		0		0		0
INFORMATION TECHNOLOGY			1,750		1,750		1,750		1,750
IT Technicians	150	3	450	3	450	3	450	3	450
Server Room	1,300	1	1,300	1	1,300	1	1,300	1	1,300
SECURE ENTRY			0		0		0		0
MECHANICAL			0		0		0		0
GROSS UP FROM NET (20%)			2,163		2,565		2,715		2,815
TOTAL			12,978		15,390		16,290		16,890

ASSUMPTIONS: BACKUP 911 CENTER - 99 REGINA ST., S.

- Backup center to house the same number of communications workstations as in the primary 911 center
- Backup center does NOT double as training center
- Training staff to have office space at backup center
- Includes RTOC & MISC
- Includes NG911
- Includes community-based mental health crisis response initiatives
- Excludes dispatching for PRIDE
- Excludes SFCC and Kitchener Fire dispatch
- Assumes access to the building's existing workout area, change rooms, meeting rooms, mechanical area, loading area, etc.
- No need for separate secure main entry / reception
- Requires less gross up for renovation of existing building / used 20%

Exhibit E.4 **Backup 911 Center** **Sc. B2 "99 Regina St., S."**

Backup center, RTOC, and common supprts on one floor	11,862
Traing staff space, MISC, and IT Support on another floor	5,028
Total	16,890

Appendix F – Cost Estimate Details

Exhibit F.1 **Primary 911 Center** **Sc. P1: "Core"**

Space Description	Unit Sq. Ft.	2031		2051		ORDER OF MAGNITUDE COSTS			
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Construction	Furniture	Technology	TOTAL
WRPS			**28,658**		**30,772**	**$24,617,600**	**$1,643,300**	**$10,112,000**	**$36,372,900**
COMMUNICATIONS CENTER			**5,935**		**6,985**	**$5,588,000**	**$847,300**	**$3,615,000**	**$10,050,300**
Staff Sergeant Office	130	1	130	1	130	$104,000	$3,500	$5,000	
Supervisor Workstation	150	1	150	1	150	$120,000	$30,000	$200,000	
Call Taker Workstations (current)	150	9	1,350	9	1,350	$1,080,000	$270,000	$450,000	
Dispatcher Workstations (current)	150	4	600	4	600	$480,000	$120,000	$800,000	
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	$480,000	$120,000	$800,000	
Communicator Workstations (growth)	150	6	900	10	1,500	$1,200,000	$180,000	$750,000	
Communicator Workstations (NG911)	150	3	450	5	750	$600,000	$90,000	$375,000	
Crisis Response Coordinator Workstations	150	2	300	3	450	$360,000	$7,000	$120,000	
Switchboard Workstations	150	2	300	2	300	$240,000	$7,000	$10,000	
Small Meeting Room	130	1	130	1	130	$104,000	$3,500		
Ready (Shift Change) Room	225	1	225	1	225	$180,000			
Quiet Rooms	100	2	200	2	200	$160,000	$7,000		
Admin Files Storage	250	1	250	1	250	$200,000	$5,000		
Chair Corral & Supplies Storage	250	1	250	1	250	$200,000	$4,300		
Copier Work Area	100	1	100	1	100	$80,000		$5,000	
Application Software & Screens		1				$0		$100,000	
TRAINING AREA			**2,635**		**2,895**	**$2,316,000**	**$257,500**	**$925,000**	**$3,498,500**
Training Staff Office Space (current)	130	2	260	2	260	$208,000	$7,000	$10,000	
Training Staff Office Space (growth)	130	2	260	3	390	$312,000	$7,000	$10,000	
Training Staff Office Space (NG911)	130	1	130	2	260	$208,000	$3,500	$5,000	
Training Staff Workstations	0	5	0	7	0	$0			
Training Room	110	16	1,760	16	1,760	$1,408,000			
Training Room Workstations	0	16	0	16	0	$0	$240,000	$800,000	
A/V App's, Screens & Control	75	1	75	1	75	$60,000		$100,000	
Training Supplies Storage	150	1	150	1	150	$120,000			
RTOC & MISC			**2,800**		**2,800**	**$2,240,000**	**$314,000**	**$5,455,000**	**$8,009,000**
Communicator Consoles (RTOC)	250	2	500	2	500	$400,000	$60,000	$400,000	
Staffed Desks (RTOC)	125	2	250	2	250	$200,000	$7,000	$40,000	
Outfitted Desks (MISC)	75	8	600	8	600	$480,000	$240,000	$1,000,000	
Office Desks (MISC)	75	2	150	2	150	$120,000	$7,000	$10,000	
EOC (MISC)	750	1	750	1	750	$600,000			
A/V Control	100	1	100	1	100	$80,000			
Reference Library	150	1	150	1	150	$120,000			
Equipment Storage / Staging	150	1	150	1	150	$120,000			
Closets / Coats / Storage	50	1	50	1	50	$40,000			

Copier Work Area	100	1	100	1	100	$80,000		$5,000	
Application Software & Screens (RTOC)		1				$0		$3,000,000	
Application Software & Screens (MISC)		1				$0		$1,000,000	
COMMON SUPPORT			3,450		3,650	$2,920,000	$145,000	$0	$3,065,000
Kitchen / Vending	200	1	200	1	200	$160,000	$15,000		
Break Area / Lounge	400	1	400	1	400	$320,000	$3,000		
Washrooms	100	2	200	2	200	$160,000	$5,000		
Work Out Area	450	1	450	1	450	$360,000	$20,000		
Lockers (personal / half-height)	5	180	900	220	1,100	$880,000	$72,000		
Showers/Change/Washroom (Male)	350	1	350	1	350	$280,000	$10,000		
Showers/Change/Washroom (Female)	350	1	350	1	350	$280,000	$10,000		
Showers/Change/Washroom (Universal)	350	1	350	1	350	$280,000	$10,000		
Housekeeping / Janitorial	250	1	250	1	250	$200,000			
MEETING SPACE			650		650	$520,000	$23,500	$12,000	$555,500
Conference Room	500	1	500	1	500	$400,000	$20,000	$12,000	
Meeting Room (small)	150	1	150	1	150	$120,000	$3,500		
INFORMATION TECHNOLOGY			1,750		1,750	$1,400,000	$40,500	$105,000	$1,545,500
IT Technicians	150	3	450	3	450	$360,000	$10,500	$45,000	
Server Room	1,300	1	1,300	1	1,300	$1,040,000	$30,000	$60,000	
SECURE ENTRY			750		750	$600,000	$15,500	$0	$615,500
Entry / Lobby / Reception	300	1	300	1	300	$240,000	$7,000		
Meeting Room (small)	150	1	150	1	150	$120,000	$3,500		
Washrooms (Universal)	100	2	200	2	200	$160,000	$5,000		
Coat Room	100	1	100	1	100	$80,000			
MECHANICAL			2,500		2,500	$2,000,000	$0	$0	$2,000,000
Mechanical area, loading area, electrical/main power distribution, UPS/emergency generator, telecom, security, fire suppression									
GROSS UP FROM NET (40%)			8,188		8,792	$7,033,600	$0	$0	$7,033,600
TECHNOLOGY INFRA. FOR BUILDING						$0	$0	$4,075,000	$4,075,000
SUB-TOTAL			28,658		30,772	$24,617,600	$1,643,300	$14,187,000	$40,447,900
10% DESIGN						$2,461,760	$164,330	$1,418,700	$4,044,790
15% CONTINGENCY (Construction)						$3,692,640	$246,495	$2,128,050	$6,067,185
PROJECT IMPLEMENTATION						$300,000	$300,000	$900,000	$1,500,000
TOTAL			28,658		30,772	$31,072,000	$2,354,125	$18,633,750	$52,059,875

ASSUMPTIONS: "SCENARIO 4 - ALL INCLUSIVE"

1. Primary Center Requirements: “Core”

- Sized to accommodate ROW long-term growth (2051)
- Includes RTOC & MISC
- Includes NG911
- Includes community-based mental health crisis response initiatives

2. Primary Center Requirements: "Core + PRIDE"

- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Stratford, Brantford, and S. Simcoe police)

3. Primary Center Requirements: "Core + PRIDE + SFCC"

- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Scenario 2)
- ROW Service First Call Center (SFCC) is co-located on premises

4. Primary Center Requirements: "Core + PRIDE + SFCC + Kitchener Fire"

- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Scenario 2)
- Includes SFCC (Scenario 3)
- Kitchener Fire “main” dispatch is co-located on premises

LAND COSTS

- Excluded

CONSTRUCTION COSTS

- Assumed unit capital cost for construction (per square foot):	$800

- Construction costs are based on full build out (2051) floor area requirements.
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.
- Assumes center to go operational in late 2024 at the earliest.
- Figure aligns with low end estimate by Pomax, i.e., they assumed $800 to $1,100 per SF for a new build police and emergency communications center
- For comparison, unit capital cost for new Central Division (at f' courthouse) is estimated at under $600 per SF
- 10% for design and 15% contingency for construction are per S2 Architects figures

FURNISHINGS COSTS

- Furniture costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.

- Work station for 911 communicator	$30,000
- Training room work station	$15,000
- Office furniture (desk, chair, chair mat & bookcase/filing cabinet)	$3,500

- 12' boardroom table (@ $1,000/ft) w' 16 chairs (@ $300 each) and side table (@ $3,200)	$20,000
- Kitchenette w' cupboards, counter, fridge & small appliances	$15,000
- Admin filing (5 * 5 drawer laterals @ $1,000)	$5,000
- Quiet room recliner	$3,500
- Shelving for supplies storage	$2,500
- Cost of an entry locker	$400
- Chair coral (assume 6 spare chairs @ $300 each)	$1,800
- Break area furniture (assume 2 recliners, table & chairs)	$3,000
- Washroom	$2,500
- Workout area (assume 3 major plus incidentals)	$20,000
- Showers/change room	$10,000
- Server room cabinetry	$30,000
- Entry lobby (recpetion desk, couch & chairs)	$7,000

TECHNOLOGY COSTS

- Technology costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).	
- In 2022 dollars.	
- Excludes HST and/or other applicable taxes.	
- Communicator console w' CAD	$50,000
- Communicator console w' CAD & radio	$200,000
- Future consoles - growth, NG911, PRIDE, (50% w' radio)	$125,000
- Crisis response coordinator console w' portable radio	$60,000
- Training room console	$50,000
- Switchboard	$5,000
- Copier	$5,000
- Applications software & screens (comm center)	$100,000
- Large meeting room	$12,000
- Office software setup	$5,000
- Training room A/V App's, Screens & Control	$100,000
- RTOC Console	$200,000
- MISC consoles (50% w' radio)	$125,000
- Applications software & screens (RTOC)	$3,000,000
- Applications software & screens (MISC)	$1,000,000
- IT Technicians	$15,000
- Server room	$60,000

	WRESTRC	Maplegrove (CAD at HQ)	Bayden
TECHNOLOGY INFRASTRUCTURE FOR BUILDING	$4,075,000	$2,075,000	$3,575,000
- Redundant Bell 911 Trunk (2 substation feeds)	$1,000,000	$500,000	$1,000,000
- CAD Fiber Lines	$1,000,000	$250,000	$1,000,000
- Radio Fiber Lines	$1,000,000	$250,000	$500,000
- Network Connections, Switches & Licenses	$300,000	$300,000	$300,000

- UPS for Comm. Center & Phone System	**$200,000**	**$200,000**	**$200,000**
- Firewall Infrastructure	**$75,000**	**$75,000**	**$75,000**
- Security & Access Control	**$500,000**	**$500,000**	**$500,000**
PROJECT IMPLEMENTATION (WRPS / ROW STAFF)			
- Construction (salary & benefits - 1 person for 24 mon's)	**$300,000**		
- Security & Furnishings (salary & benefits - 1 person for 24 mon's)	**$300,000**		
- Technology (salary & benefits - 3 persons for 24 mon's)	**$900,000**		

Exhibit F.2 **Primary 911 Center** **Sc. P4: "All Inclusive"**

Space Description	Unit Sq. Ft.	2031		2051		ORDER OF MAGNITUDE COSTS			
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Construction	Furniture	Technology	TOTAL
WRPS			**31,773**		**34,146**	**$27,316,800**	**$2,005,500**	**$11,497,000**	**$40,819,300**
COMMUNICATIONS CENTER			**7,585**		**8,785**	**$7,028,000**	**$1,177,300**	**$4,990,000**	**$13,195,300**
Staff Sergeant Office	130	1	130	1	130	$104,000	$3,500	$5,000	
Supervisor Workstation	150	1	150	1	150	$120,000	$30,000	$200,000	
Call Taker Workstations (current)	150	9	1,350	9	1,350	$1,080,000	$270,000	$450,000	
Dispatcher Workstations (current)	150	4	600	4	600	$480,000	$120,000	$800,000	
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	$480,000	$120,000	$800,000	
Communicator Workstations (growth)	150	6	900	10	1,500	$1,200,000	$180,000	$750,000	
Communicator Workstations (NG911)	150	3	450	5	750	$600,000	$90,000	$375,000	
Communicator Workstations (PRIDE)	150	11	1,650	12	1,800	$1,440,000	$330,000	$1,375,000	
Crisis Response Coordinator Workstations	150	2	300	3	450	$360,000	$7,000	$120,000	
Switchboard Workstations	150	2	300	2	300	$240,000	$7,000	$10,000	
Small Meeting Room	130	1	130	1	130	$104,000	$3,500		
Ready (Shift Change) Room	225	1	225	1	225	$180,000			
Quiet Rooms	100	2	200	2	200	$160,000	$7,000		
Admin Files Storage	250	1	250	1	250	$200,000	$5,000		
Chair Corral & Supplies Storage	250	1	250	1	250	$200,000	$4,300		
Copier Work Area	100	1	100	1	100	$80,000		$5,000	
Application Software & Screens		1				$0		$100,000	
TRAINING AREA			**2,895**		**3,155**	**$2,524,000**	**$264,500**	**$935,000**	**$3,723,500**
Training Staff Office Space (current)	130	2	260	2	260	$208,000	$7,000	$10,000	
Training Staff Office Space (growth)	130	2	260	3	390	$312,000	$7,000	$10,000	
Training Staff Office Space (NG911)	130	1	130	2	260	$208,000	$3,500	$5,000	
Training Staff Office Space (PRIDE)	130	2	260	2	260	$208,000	$7,000	$10,000	
Training Staff Workstations	0	7	0	9	0	$0			
Training Room	110	16	1,760	16	1,760	$1,408,000			
Training Room Workstations	0	16	0	16	0	$0	$240,000	$800,000	
A/V App's, Screens & Control	75	1	75	1	75	$60,000		$100,000	
Training Supplies Storage	150	1	150	1	150	$120,000			
RTOC & MISC			**2,800**		**2,800**	**$2,240,000**	**$314,000**	**$5,455,000**	**$8,009,000**
Communicator Consoles (RTOC)	250	2	500	2	500	$400,000	$60,000	$400,000	
Staffed Desks (RTOC)	125	2	250	2	250	$200,000	$7,000	$40,000	
Outfitted Desks (MISC)	75	8	600	8	600	$480,000	$240,000	$1,000,000	
Office Desks (MISC)	75	2	150	2	150	$120,000	$7,000	$10,000	
EOC (MISC)	750	1	750	1	750	$600,000			
A/V Control	100	1	100	1	100	$80,000			
Reference Library	150	1	150	1	150	$120,000			

Equipment Storage / Staging	150	1	150	1	150	$120,000			
Closets / Coats / Storage	50	1	50	1	50	$40,000			
Copier Work Area	100	1	100	1	100	$80,000		$5,000	
Application Software & Screens (RTOC)		1				$0		$3,000,000	
Application Software & Screens (MISC)		1				$0		$1,000,000	
COMMON SUPPORT			3,765		4,000	$3,200,000	$170,200	$0	$3,370,200
Kitchen / Vending	200	1	200	1	200	$160,000	$15,000		
Break Area / Lounge	400	1	400	1	400	$320,000	$3,000		
Washrooms	100	2	200	2	200	$160,000	$5,000		
Work Out Area	450	1	450	1	450	$360,000	$20,000		
Lockers (personal / half-height)	5	180	900	220	1,100	$880,000	$72,000		
Lockers (PRIDE)	5	63	315	70	350	$280,000	$25,200		
Showers/Change/Washroom (Male)	350	1	350	1	350	$280,000	$10,000		
Showers/Change/Washroom (Female)	350	1	350	1	350	$280,000	$10,000		
Showers/Change/Washroom (Universal)	350	1	350	1	350	$280,000	$10,000		
Housekeeping / Janitorial	250	1	250	1	250	$200,000			
MEETING SPACE			650		650	$520,000	$23,500	$12,000	$555,500
Conference Room	500	1	500	1	500	$400,000	$20,000	$12,000	
Meeting Room (small)	150	1	150	1	150	$120,000	$3,500		
INFORMATION TECHNOLOGY			1,750		1,750	$1,400,000	$40,500	$105,000	$1,545,500
IT Technicians	150	3	450	3	450	$360,000	$10,500	$45,000	
Server Room	1,300	1	1,300	1	1,300	$1,040,000	$30,000	$60,000	
SECURE ENTRY			750		750	$600,000	$15,500	$0	$615,500
Entry / Lobby / Reception	300	1	300	1	300	$240,000	$7,000		
Meeting Room (small)	150	1	150	1	150	$120,000	$3,500		
Washrooms (Universal)	100	2	200	2	200	$160,000	$5,000		
Coat Room	100	1	100	1	100	$80,000			
MECHANICAL			2,500		2,500	$2,000,000	$0	$0	$2,000,000
Mechanical area, loading area, electrical/main power distribution, UPS/emergency generator, telecom, security, fire suppression									
GROSS UP FROM NET (40%)			9,078		9,756	$7,804,800	$0	$0	$7,804,800
CO-LOCATIONS			14,000		14,000	$11,200,000	$0	$0	$11,200,000
SFCC			2,500		2,500	$2,000,000	$0	$0	
KFD MAIN DISPATCH			11,500		11,500	$9,200,000	$0	$0	
TECHNOLOGY INFRA. FOR BUILDING						$0	$0	$4,075,000	$4,075,000

SUB-TOTAL			**45,773**		**48,146**	**$38,516,800**	**$2,005,500**	**$15,572,000**	**$56,094,300**
10% DESIGN						**$3,851,680**	**$200,550**	**$1,557,200**	**$5,609,430**
15% CONTINGENCY (Construction)						**$5,777,520**	**$300,825**	**$2,335,800**	**$8,414,145**
PROJECT IMPLEMENTATION						**$300,000**	**$300,000**	**$900,000**	**$1,500,000**
TOTAL			**45,773**		**48,146**	**$48,446,000**	**$2,806,875**	**$20,365,000**	**$71,617,875**

ASSUMPTIONS: "SCENARIO 4 - ALL INCLUSIVE"

1. Primary Center Requirements: “Core”
- Sized to accommodate ROW long-term growth (2051)
- Includes RTOC & MISC
- Includes NG911
- Includes community-based mental health crisis response initiatives

2. Primary Center Requirements: "Core + PRIDE"
- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Stratford, Brantford, and S. Simcoe police)

3. Primary Center Requirements: "Core + PRIDE + SFCC"
- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Scenario 2)
- ROW Service First Call Center (SFCC) is co-located on premises

4. Primary Center Requirements: "Core + PRIDE + SFCC + Kitchener Fire"
- Includes core requirements (Scenario 1)
- Includes dispatching for PRIDE (Scenario 2)
- Includes SFCC (Scenario 3)
- Kitchener Fire “main” dispatch is co-located on premises

LAND COSTS
- Excluded

CONSTRUCTION COSTS
- Assumed unit capital cost for construction (per square foot): $800
- Construction costs are based on full build out (2051) floor area requirements.
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.
- Assumes center to go operational in late 2024 at the earliest.
- Figure aligns with low end estimate by Pomax, i.e., they assumed $800 to $1,100 per SF for a new build police and emergency communications center
- For comparison, unit capital cost for new Central Division (at f' courthouse) is estimated at under $600 per SF
- 10% for design and 15% contingency for construction are per S2 Architects figures

FURNISHINGS COSTS

- Furniture costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).	
- In 2022 dollars.	
- Excludes HST and/or other applicable taxes.	
- Work station for 911 communicator	$30,000
- Training room work station	$15,000
- Office furniture (desk, chair, chair mat & bookcase/filing cabinet)	$3,500
- 12' boardroom table (@ $1,000/ft) w' 16 chairs (@ $300 each) and side table (@ $3,200)	$20,000
- Kitchenette w' cupboards, counter, fridge & small appliances	$15,000
- Admin filing (5 * 5 drawer laterals @ $1,000)	$5,000
- Quiet room recliner	$3,500
- Shelving for supplies storage	$2,500
- Cost of an entry locker	$400
- Chair coral (assume 6 spare chairs @ $300 each)	$1,800
- Break area furniture (assume 2 recliners, table & chairs)	$3,000
- Washroom	$2,500
- Workout area (assume 3 major plus incidentals)	$20,000
- Showers/change room	$10,000
- Server room cabinetry	$30,000
- Entry lobby (recpetion desk, couch & chairs)	$7,000

TECHNOLOGY COSTS

- Technology costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).	
- In 2022 dollars.	
- Excludes HST and/or other applicable taxes.	
- Communicator console w' CAD	$50,000
- Communicator console w' CAD & radio	$200,000
- Future consoles - growth, NG911, PRIDE, (50% w' radio)	$125,000
- Crisis response coordinator console w' portable radio	$60,000
- Training room console	$50,000
- Switchboard	$5,000
- Copier	$5,000
- Applications software & screens (comm center)	$100,000
- Large meeting room	$12,000
- Office software setup	$5,000
- Training room A/V App's, Screens & Control	$100,000
- RTOC Console	$200,000
- MISC consoles (50% w' radio)	$125,000
- Applications software & screens (RTOC)	$3,000,000
- Applications software & screens (MISC)	$1,000,000
- IT Technicians	$15,000
- Server room	$60,000

	WRESTRC	Maplegrove (CAD at HQ)	Bayden
TECHNOLOGY INFRASTRUCTURE FOR BUILDING	**$4,075,000**	**$2,075,000**	**$3,575,000**
- Redundant Bell 911 Trunk (2 substation feeds)	**$1,000,000**	**$500,000**	**$1,000,000**
- CAD Fiber Lines	**$1,000,000**	**$250,000**	**$1,000,000**
- Radio Fiber Lines	**$1,000,000**	**$250,000**	**$500,000**
- Network Connections, Switches & Licenses	**$300,000**	**$300,000**	**$300,000**
- UPS for Comm. Center & Phone System	**$200,000**	**$200,000**	**$200,000**
- Firewall Infrastructure	**$75,000**	**$75,000**	**$75,000**
- Security & Access Control	**$500,000**	**$500,000**	**$500,000**
PROJECT IMPLEMENTATION (WRPS / ROW STAFF)			
- Construction (salary & benefits - 1 person for 24 mon's)	**$300,000**		
- Security & Furnishings (salary & benefits - 1 person for 24 mon's)	**$300,000**		
- Technology (salary & benefits - 3 persons for 24 mon's)	**$900,000**		

Exhibit F.3 **Backup 911 Center** **Sc. B1: "New Build"**

Space Description	Unit Sq. Ft.	2031		2051		ORDER OF MAGNITUDE COSTS			
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Construction	Furniture	Technology	TOTAL
WRPS			**24,885**		**26,635**	**$21,308,000**	**$836,300**	**$6,952,000**	**$29,096,300**
BACKUP COMMUNICATIONS CENTER			**5,935**		**6,985**	**$5,588,000**	**$307,300**	**$1,365,000**	**$7,260,300**
Staff Sergeant Office	130	1	130	1	130	$104,000	$3,500	$5,000	
Supervisor Workstation w' radio - (2022)	150	1	150	1	150	$120,000	$0	$0	
Workstations - Call Taking (current)	150	9	1,350	9	1,350	$1,080,000	$0	$0	
Workstations - Dispatch (soon - 2022)	150	4	600	4	600	$480,000	$0	$0	
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	$480,000	$0	$0	
Communicator Workstations (growth)	150	6	900	10	1,500	$1,200,000	$180,000	$750,000	
Communicator Workstations (NG911)	150	3	450	5	750	$600,000	$90,000	$375,000	
Crisis Response Coordinator Workstations	150	2	300	3	450	$360,000	$7,000	$120,000	
Switchboard Workstations	150	2	300	2	300	$240,000	$7,000	$10,000	
Small Meeting Room	130	1	130	1	130	$104,000	$3,500		
Ready (Shift Change) Room	225	1	225	1	225	$180,000			
Quiet Rooms	100	2	200	2	200	$160,000	$7,000		
Files Storage	250	1	250	1	250	$200,000	$5,000		
Chair Corral & Supplies Storage	250	1	250	1	250	$200,000	$4,300		
Copier Work Area	100	1	100	1	100	$80,000		$5,000	
Application Software & Screens		1		1		$0		$100,000	
TRAINING STAFF OFFICE SPACE			**390**		**390**	**$312,000**	**$10,500**	**$15,000**	**$337,500**
Training Staff Office Space (current)	130	0	0	0	0	$0	$0	$0	
Training Staff Office Space (growth)	130	2	260	2	260	$208,000	$7,000	$10,000	
Training Staff Office Space (NG911)	130	1	130	1	130	$104,000	$3,500	$5,000	
Training Staff Workstations	0	3	0	3	0	$0			
RTOC & MISC			**2,800**		**2,800**	**$2,240,000**	**$314,000**	**$5,455,000**	**$8,009,000**
Communicator Consoles (RTOC)	250	2	500	2	500	$400,000	$60,000	$400,000	
Staffed Desks (RTOC)	125	2	250	2	250	$200,000	$7,000	$40,000	
Outfitted Desks (MISC)	75	8	600	8	600	$480,000	$240,000	$1,000,000	
Office Desks (MISC)	75	2	150	2	150	$120,000	$7,000	$10,000	
EOC (MISC)	750	1	750	1	750	$600,000			
A/V Control	100	1	100	1	100	$80,000			
Reference Library	150	1	150	1	150	$120,000			
Equipment Storage / Staging	150	1	150	1	150	$120,000			
Closets / Coats / Storage	50	1	50	1	50	$40,000			
Copier Work Area	100	1	100	1	100	$80,000		$5,000	
Application Software & Screens (RTOC)		1				$0		$3,000,000	
Application Software & Screens (MISC)		1				$0		$1,000,000	

COMMON SUPPORT			**3,000**		**3,200**	**$2,560,000**	**$125,000**	**$0**	**$2,685,000**
Kitchen / Vending	200	1	200	1	200	$160,000	$15,000		
Break Area / Lounge	400	1	400	1	400	$320,000	$3,000		
Washrooms	100	2	200	2	200	$160,000	$5,000		
Work Out Area	450	0	0	0	0	$0			
Lockers (personal / half-height)	5	180	900	220	1,100	$880,000	$72,000		
Showers/Change/Washroom (Male)	350	1	350	1	350	$280,000	$10,000		
Showers/Change/Washroom (Female)	350	1	350	1	350	$280,000	$10,000		
Showers/Change/Washroom (Universal)	350	1	350	1	350	$280,000	$10,000		
Housekeeping / Janitorial	250	1	250	1	250	$200,000			
MEETING SPACE			**650**		**650**	**$520,000**	**$23,500**	**$12,000**	**$555,500**
Conference Room	500	1	500	1	500	$400,000	$20,000	$12,000	
Meeting Room (small)	150	1	150	1	150	$120,000	$3,500		
INFORMATION TECHNOLOGY			**1,750**		**1,750**	**$1,400,000**	**$40,500**	**$105,000**	**$1,545,500**
IT Technicians	150	3	450	3	450	$360,000	$10,500	$45,000	
Server Room	1,300	1	1,300	1	1,300	$1,040,000	$30,000	$60,000	
SECURE ENTRY			**750**		**750**	**$600,000**	**$15,500**	**$0**	**$615,500**
Entry / Lobby / Reception	300	1	300	1	300	$240,000	$7,000		
Meeting Room (small)	150	1	150	1	150	$120,000	$3,500		
Washrooms (Universal)	100	2	200	2	200	$160,000	$5,000		
Coat Room	100	1	100	1	100	$80,000			
MECHANICAL			**2,500**		**2,500**	**$2,000,000**	**$0**	**$0**	**$2,000,000**
Mechanical area, loading area, electrical/main power distribution, UPS/emergency generator, telecom, security, fire suppression									
GROSS UP FROM NET (40%)			**7,110**		**7,610**	**$6,088,000**	**$0**	**$0**	**$6,088,000**
TECHNOLOGY INFRA. FOR BUILDING						**$0**	**$0**	**$2,575,000**	**$2,575,000**
SUB-TOTAL			**24,885**		**26,635**	**$21,308,000**	**$836,300**	**$9,527,000**	**$31,671,300**
10% DESIGN						**$2,130,800**	**$83,630**	**$952,700**	**$3,167,130**
15% CONTINGENCY (Construction)						**$3,196,200**	**$125,445**	**$1,429,050**	**$4,750,695**
PROJECT IMPLEMENTATION						**$300,000**	**$300,000**	**$900,000**	**$1,500,000**
TOTAL			**24,885**		**26,635**	**$26,935,000**	**$1,345,375**	**$12,808,750**	**$41,089,125**

ASSUMPTIONS: BACKUP 911 CENTER - NEW BUILD

- Backup center to house the same number of communications workstations as in the primary 911 center

- Backup center does NOT double as training center
- Training staff to have office space at backup center
- Includes RTOC & MISC
- Includes NG911
- Includes community-based mental health crisis response initiatives
- Excludes dispatching for PRIDE
- Excludes SFCC and Kitchener Fire dispatch

LAND COSTS

- Excluded

CONSTRUCTION COSTS

- Assumed unit capital cost for construction (per square foot):	$800

- Construction costs are based on full build out (2051) floor area requirements.
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.
- Assumes center to go operational in late 2024 at the earliest.
- Figure aligns with low end estimate by Pomax, i.e., they assumed $800 to $1,100 per SF for a new build police and emergency communications center
- For comparison, unit capital cost for new Central Division (at f' courthouse) is estimated at under $600 per SF
- 10% for design and 15% contingency for construction are per S2 Architects figures

FURNISHINGS COSTS

- Furniture costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.

- Communicator workstations existing 18 to be transferred from Maplegrove to Backup	$0
- Work station for 911 communicator	$30,000
- Training room work station	$15,000
- Office furniture (desk, chair, chair mat & bookcase/filing cabinet)	$3,500
- 12' boardroom table (@ $1,000/ft) w' 16 chairs (@ $300 each) and side table (@ $3,200)	$20,000
- Kitchenette w' cupboards, counter, fridge & small appliances	$15,000
- Admin filing (5 * 5 drawer laterals @ $1,000)	$5,000
- Quiet room recliner	$3,500
- Shelving for supplies storage	$2,500
- Cost of an entry locker	$400
- Chair coral (assume 6 spare chairs @ $300 each)	$1,800
- Break area furniture (assume 2 recliners, table & chairs)	$3,000
- Washroom	$2,500
- Workout area (assume 3 major plus incidentals)	$20,000
- Showers/change room	$10,000
- Server room cabinetry	$30,000
- Entry lobby (recpetion desk, couch & chairs)	$7,000

TECHNOLOGY COSTS	
- Technology costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).	
- In 2022 dollars.	
- Excludes HST and/or other applicable taxes.	
- Communicator consoles existing 18 to be transferred from Maplegrove to Backup	$0
- Communicator console w' CAD	$50,000
- Communicator console w' CAD & radio	$200,000
- Future consoles - growth, NG911, PRIDE, (50% w' radio)	$125,000
- Crisis response coordinator console w' portable radio	$60,000
- Training room console	$50,000
- Switchboard	$5,000
- Copier	$5,000
- Applications software & screens (comm center)	$100,000
- Large meeting room	$12,000
- Office software setup	$5,000
- Training room A/V App's, Screens & Control	$100,000
- RTOC Console	$200,000
- MISC consoles (50% w' radio)	$125,000
- Applications software & screens (RTOC)	$3,000,000
- Applications software & screens (MISC)	$1,000,000
- IT Technicians	$15,000
- Server room	$60,000
TECHNOLOGY INFRASTRUCTURE FOR BUILDING	$2,575,000
- Redundant Bell 911 Trunk (2 substation feeds)	$1,000,000
- CAD Fiber Lines	$500,000
- Radio Fiber Lines	$0
- Network Connections, Switches & Licenses	$300,000
- UPS for Comm. Center & Phone System	$200,000
- Firewall Infrastructure	$75,000
- Security & Access Control	$500,000
PROJECT IMPLEMENTATION (WRPS / ROW STAFF)	
- Construction (salary & benefits - 1 person for 24 mon's)	$300,000
- Security & Furnishings (salary & benefits - 1 person for 24 mon's)	$300,000
- Technology (salary & benefits - 3 persons for 24 mon's)	$900,000

Exhibit F.4 **Backup 911 Center** **Sc. B2: "99 Regina St."**

Space Description	Unit Sq. Ft.	2031		2051		ORDER OF MAGNITUDE COSTS			
		Units	Total Sq. Ft.	Units	Total Sq. Ft.	Construction	Furniture	Technology	TOTAL
WRPS			**15,390**		**16,890**	**$6,756,000**	**$767,300**	**$6,940,000**	**$14,463,300**
BACKUP COMMUNICATIONS CENTER			**5,935**		**6,985**	**$2,794,000**	**$307,300**	**$1,365,000**	**$4,466,300**
Staff Sergeant Office	130	1	130	1	130	$52,000	$3,500	$5,000	
Supervisor Workstation w' radio - (2022)	150	1	150	1	150	$60,000	$0	$0	
Workstations - Call Taking (current)	150	9	1,350	9	1,350	$540,000	$0	$0	
Workstations - Dispatch (soon - 2022)	150	4	600	4	600	$240,000	$0	$0	
Call Taker / Dispatcher Workstations (current)	150	4	600	4	600	$240,000	$0	$0	
Communicator Workstations (growth)	150	6	900	10	1,500	$600,000	$180,000	$750,000	
Communicator Workstations (NG911)	150	3	450	5	750	$300,000	$90,000	$375,000	
Crisis Response Coordinator Workstations	150	2	300	3	450	$180,000	$7,000	$120,000	
Switchboard Workstations	150	2	300	2	300	$120,000	$7,000	$10,000	
Small Meeting Room	130	1	130	1	130	$52,000	$3,500		
Ready (Shift Change) Room	225	1	225	1	225	$90,000			
Quiet Rooms	100	2	200	2	200	$80,000	$7,000		
Files Storage	250	1	250	1	250	$100,000	$5,000		
Chair Corral & Supplies Storage	250	1	250	1	250	$100,000	$4,300		
Copier Work Area	100	1	100	1	100	$40,000		$5,000	
Application Software & Screens		1		1		$0		$100,000	
TRAINING STAFF OFFICE SPACE			**390**		**390**	**$156,000**	**$10,500**	**$15,000**	**$181,500**
Training Staff Office Space (current)	130	0	0	0	0	$0	$0	$0	
Training Staff Office Space (growth)	130	2	260	2	260	$104,000	$7,000	$10,000	
Training Staff Office Space (NG911)	130	1	130	1	130	$52,000	$3,500	$5,000	
Training Staff Workstations	0	3	0	3	0	$0			
RTOC & MISC			**2,800**		**2,800**	**$1,120,000**	**$314,000**	**$5,455,000**	**$6,889,000**
Communicator Consoles (RTOC)	250	2	500	2	500	$200,000	$60,000	$400,000	
Staffed Desks (RTOC)	125	2	250	2	250	$100,000	$7,000	$40,000	
Outfitted Desks (MISC)	75	8	600	8	600	$240,000	$240,000	$1,000,000	
Office Desks (MISC)	75	2	150	2	150	$60,000	$7,000	$10,000	
EOC (MISC)	750	1	750	1	750	$300,000			
A/V Control	100	1	100	1	100	$40,000			
Reference Library	150	1	150	1	150	$60,000			
Equipment Storage / Staging	150	1	150	1	150	$60,000			
Closets / Coats / Storage	50	1	50	1	50	$20,000			
Copier Work Area	100	1	100	1	100	$40,000		$5,000	
Application Software & Screens (RTOC)		1				$0		$3,000,000	
Application Software & Screens (MISC)		1				$0		$1,000,000	

COMMON SUPPORT			1,950		2,150	$860,000	$95,000	$0	$955,000
Kitchen / Vending	200	1	200	1	200	$80,000	$15,000		
Break Area / Lounge	400	1	400	1	400	$160,000	$3,000		
Washrooms	100	2	200	2	200	$80,000	$5,000		
Lockers (personal / half-height)	5	180	900	220	1,100	$440,000	$72,000		
Housekeeping / Janitorial	250	1	250	1	250	$100,000			
MEETING SPACE			0		0	$0	$0	$0	$0
INFORMATION TECHNOLOGY			1,750		1,750	$700,000	$40,500	$105,000	$845,500
IT Technicians	150	3	450	3	450	$180,000	$10,500	$45,000	
Server Room	1,300	1	1,300	1	1,300	$520,000	$30,000	$60,000	
SECURE ENTRY			0		0	$0	$0	$0	$0
MECHANICAL			0		0	$0	$0	$0	$0
GROSS UP FROM NET (20%)			2,565		2,815	$1,126,000	$0	$0	$1,126,000
TECHNOLOGY INFRA. FOR BUILDING						$0	$0	$2,225,000	$2,225,000
SUB-TOTAL			15,390		16,890	$6,756,000	$767,300	$9,165,000	$16,688,300
10% DESIGN						$675,600	$76,730	$916,500	$1,668,830
15% CONTINGENCY (Construction)						$1,013,400	$115,095	$1,374,750	$2,503,245
PROJECT IMPLEMENTATION						$225,000	$225,000	$675,000	$1,125,000
TOTAL			15,390		16,890	$8,670,000	$1,184,125	$12,131,250	$21,985,375

ASSUMPTIONS: BACKUP 911 CENTER - NEW BUILD

- Backup center to house the same number of communications workstations as in the primary 911 center
- Backup center does NOT double as training center
- Training staff to have office space at backup center
- Includes RTOC & MISC
- Includes NG911
- Includes community-based mental health crisis response initiatives
- Excludes dispatching for PRIDE
- Excludes SFCC and Kitchener Fire dispatch
- Assumes access to the building's existing workout area, change rooms, meeting rooms, mechanical area, loading area, etc.
- No need for separate secure main entry / reception
- Requires less gross up for renovation of existing building / used 20%

Backup center, RTOC, and common supprts on one floor	11,862
Traing staff space, MISC, and IT Support on another floor	5,028

Total	**16,890**

LAND COSTS

- Excluded

CONSTRUCTION COSTS

- Assumed unit capital cost for construction (per square foot): $400
- Construction costs are based on full build out (2051) floor area requirements.
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.
- Assumes center to go operational in late 2024 at the earliest.
- Figure aligns with low end estimate by Pomax, i.e., they assumed $800 to $1,100 per SF for a new build police and emergency communications center
- For comparison, unit capital cost for new Central Division (at f' courthouse) is estimated at under $600 per SF
- 10% for design and 15% contingency for construction are per S2 Architects figures

FURNISHINGS COSTS

- Furniture costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.

- Communicator workstations existing 18 to be transferred from Maplegrove to Backup	$0
- Work station for 911 communicator	$30,000
- Training room work station	$15,000
- Office furniture (desk, chair, chair mat & bookcase/filing cabinet)	$3,500
- 12' boardroom table (@ $1,000/ft) w' 16 chairs (@ $300 each) and side table (@ $3,200)	$20,000
- Kitchenette w' cupboards, counter, fridge & small appliances	$15,000
- Admin filing (5 * 5 drawer laterals @ $1,000)	$5,000
- Quiet room recliner	$3,500
- Shelving for supplies storage	$2,500
- Cost of an entry locker	$400
- Chair coral (assume 6 spare chairs @ $300 each)	$1,800
- Break area furniture (assume 2 recliners, table & chairs)	$3,000
- Washroom	$2,500
- Workout area (assume 3 major plus incidentals)	$20,000
- Showers/change room	$10,000
- Server room cabinetry	$30,000
- Entry lobby (recpetion desk, couch & chairs)	$7,000

TECHNOLOGY COSTS

- Technology costs are based on 2031 requirements (which includes NG 911 and provides for short-term growth).
- In 2022 dollars.
- Excludes HST and/or other applicable taxes.

- Communicator consoles existing 18 to be transferred from Maplegrove to Backup	$0
- Communicator console w' CAD	$50,000

- Communicator console w' CAD & radio	$200,000
- Future consoles - growth, NG911, PRIDE, (50% w' radio)	$125,000
- Crisis response coordinator console w' portable radio	$60,000
- Training room console	$50,000
- Switchboard	$5,000
- Copier	$5,000
- Applications software & screens (comm center)	$100,000
- Large meeting room	$12,000
- Office software setup	$5,000
- Training room A/V App's, Screens & Control	$100,000
- RTOC Console	$200,000
- MISC consoles (50% w' radio)	$125,000
- Applications software & screens (RTOC)	$3,000,000
- Applications software & screens (MISC)	$1,000,000
- IT Technicians	$15,000
- Server room	$60,000
TECHNOLOGY INFRASTRUCTURE FOR BUILDING	$2,225,000
- Redundant Bell 911 Trunk (2 substation feeds)	$1,000,000
- CAD Fiber Lines	$250,000
- Radio Fiber Lines	$0
- Network Connections, Switches & Licenses	$300,000
- UPS for Comm. Center & Phone System	$200,000
- Firewall Infrastructure	$75,000
- Redundant HVAC for Server Room	$100,000
- Redundant HVAC for Mechanical Room	$200,000
- Security & Access Control	$100,000
PROJECT IMPLEMENTATION (WRPS / ROW STAFF)	
- Construction (salary & benefits - 1 person for 18 mon's)	$225,000
- Security & Furnishings (salary & benefits - 1 person for 18 mon's)	$225,000
- Technology (salary & benefits - 3 persons for 18 mon's)	$675,000

Appendix G – Potential 911 Center Sites

Exhibit G.1

RADIO TOWERS	
West Montrose	519 Katherine St., N., Woolwich Twp
St. Clements	4480 Lobsinger Line, Wellesley Twp
CBC/Turris	1085 Wilby Rd., Wilmot
Baden	1209 Snyder's Rd., East, Wilmot Twp
Wrigley	1337 Wrigley Rd., N. Dumfries Twp
Little Corners	1049 Cheesefactory Rd., N. Dumfries Twp
CFD Main	1625 Bishop St., N., Cambridge
Maplegrove	230 Maplegrove Rd., Cambridge
Church	81 Church St., Kitchener

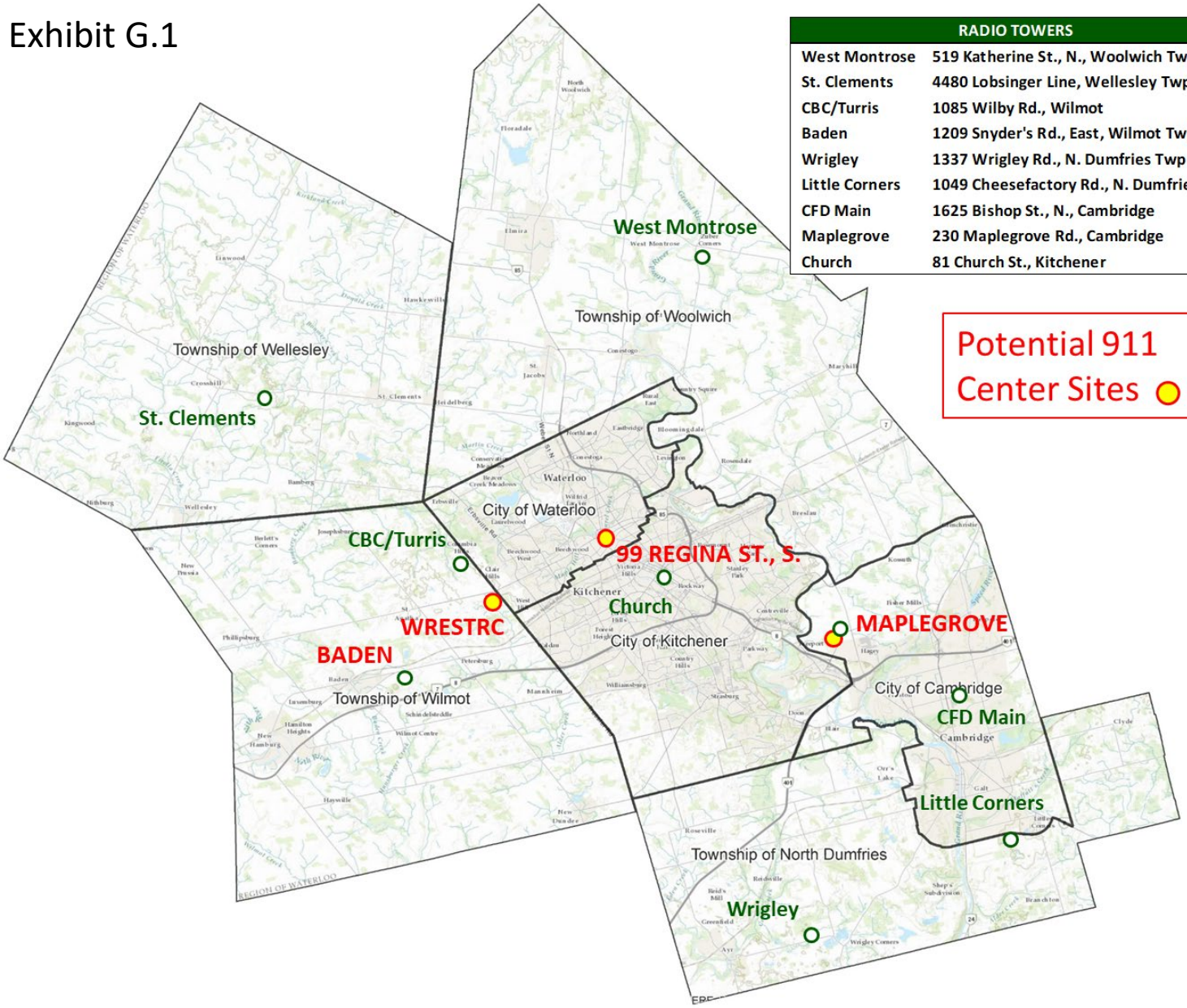



Exhibit G.2: 99 Regina St., S.
Regina St., S.
Rail Spur Line
Uptown Parkade
420 Ft
William St.
99 Regina St., S.
William St. Pumping St'n
0
200 Ft
400 Ft
Google

Exhibit G.3: Maplegrove Campus

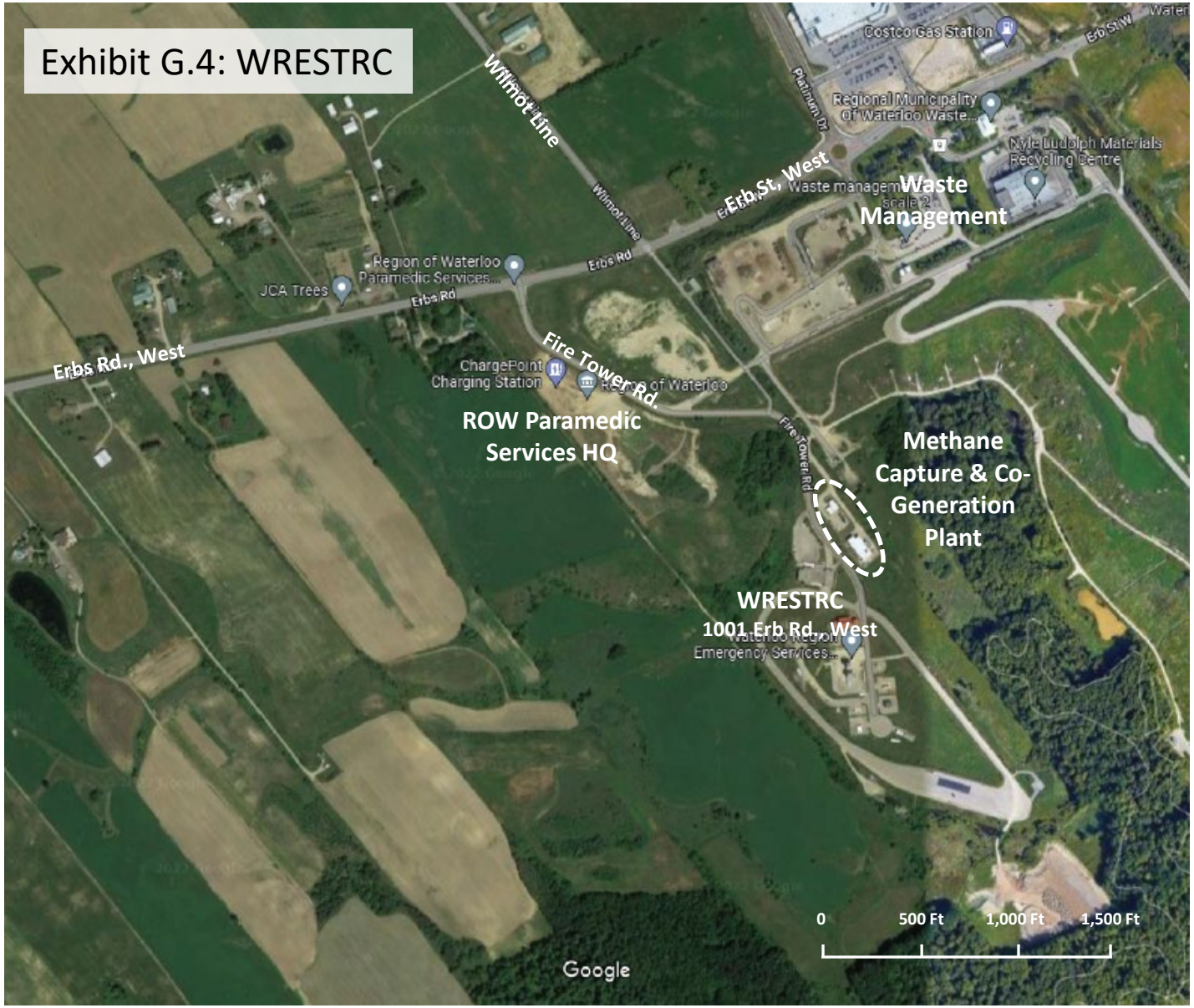


Exhibit G.4: WRESTRC
Wilmot Line
Erb St., West
Erbs Rd
Erbs Rd., West
Fire Tower Rd.
Costco Gas Station
Regional Municipality of Waterloo Waste...
Nyle Dudolph Materials Recycling Centre
Waste Management
Region of Waterloo Paramedic Services...
JCA Trees
ChargePoint Charging Station
ROW Paramedic Services HQ
Methane Capture & Co-Generation Plant
WRESTRC
1001 Erb Rd., West
Waterloo Region Emergency Services...
0
500 Ft
1,000 Ft
1,500 Ft
Google


Exhibit G.5: Baden Tower
CBC/Turris
Radio Tower
Regional Rd. 12
Costco Wholesale
WRESTRC
St. Agatha
Erbs Rd.
Sandhills Rd.
Foxwood Golf Club
Philipsburg
Region of Waterloo
Library Headquarters
Petersburg
1209 Snyder's Rd E,
Baden, ON N3A 3J5
Regional Rd. 5
Snyder's Rd., E.
Baden
Baden Radio Tower
1209 Snyder's Rd., East
Luxemburg
Hwy 8
Shantz Family Farm
Temporarily closed
Wilmot Recreation
Complex
Our Lady of Mount
Carmel Academy
Shingletown
Wilmot Centre
New
Hamburg
Bleams Rd.
Mackay's No Frills
0
2 Km
4 Km
6 Km
Google

WATERLOO REGIONAL POLICE SERVICE

FINAL REPORT

PLANNING FOR A NEW & EXPANDED PUBLIC SAFETY COMMUNICATIONS CENTER

APEXPRO CONSULTING INC.

MAY 28, 2019

APEXPRO CONSULTING INC.
EXCELLENCE COMMITMENT PARTNERSHIP – EVERY CLIENT! EVERY TIME!
30 KARL CRT., THORNHILL ON L4J 8H7 CANADA

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.

May 28, 2019
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.

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.

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.

- 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. [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.

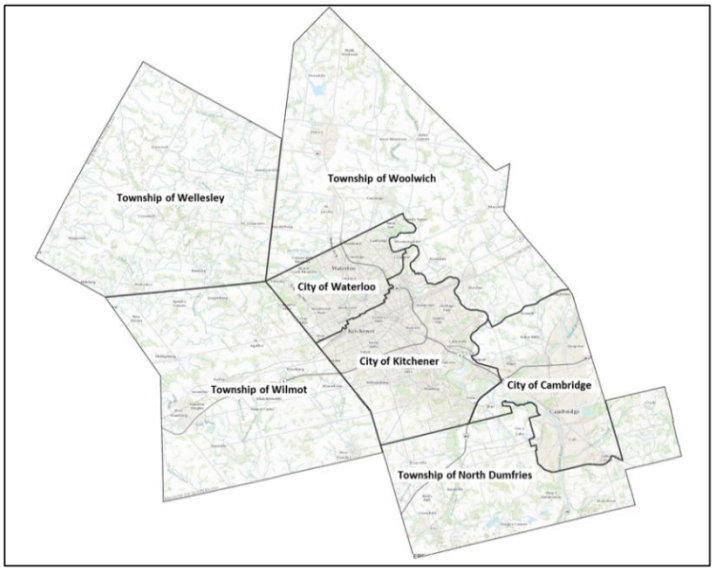
WRPS is responsible for policing operations throughout Region of Waterloo.

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. 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. 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. Training program covers the dispatch needs of all participating agencies. Some communicators are cross trained to dispatch multiple agencies.	Each agency employs own communications staff. Staff are uniquely trained to deliver on their agency's responder needs. 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. 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.

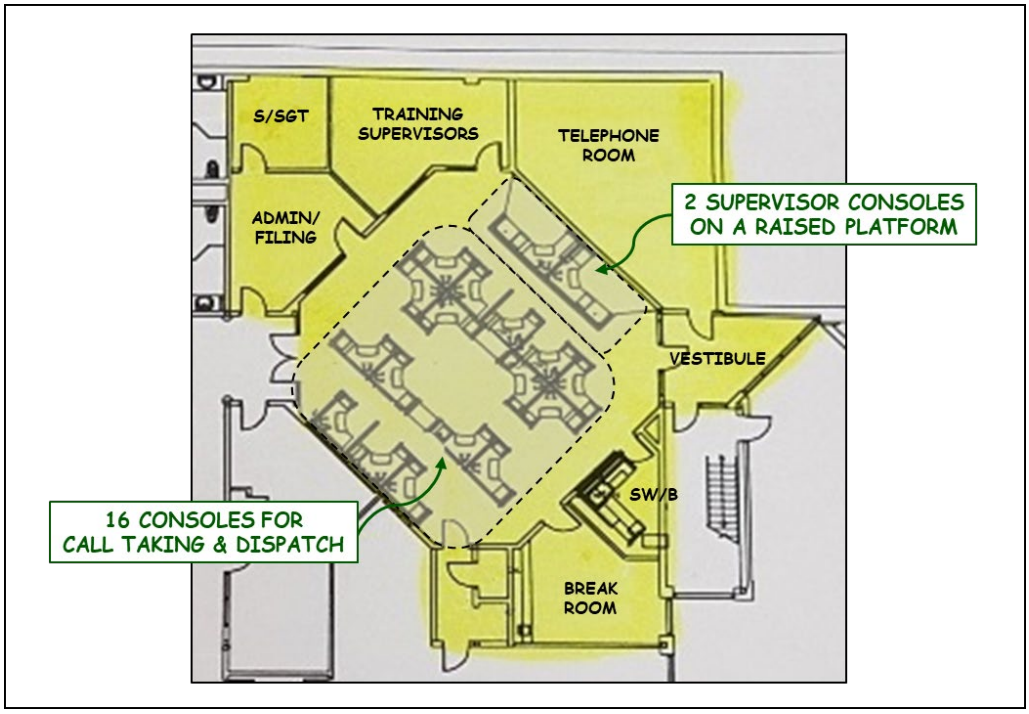
The center is outfitted with a total of 18 communications consoles, which include: 16 for call taking and dispatch, and 2 for on-duty Supervisors.

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.

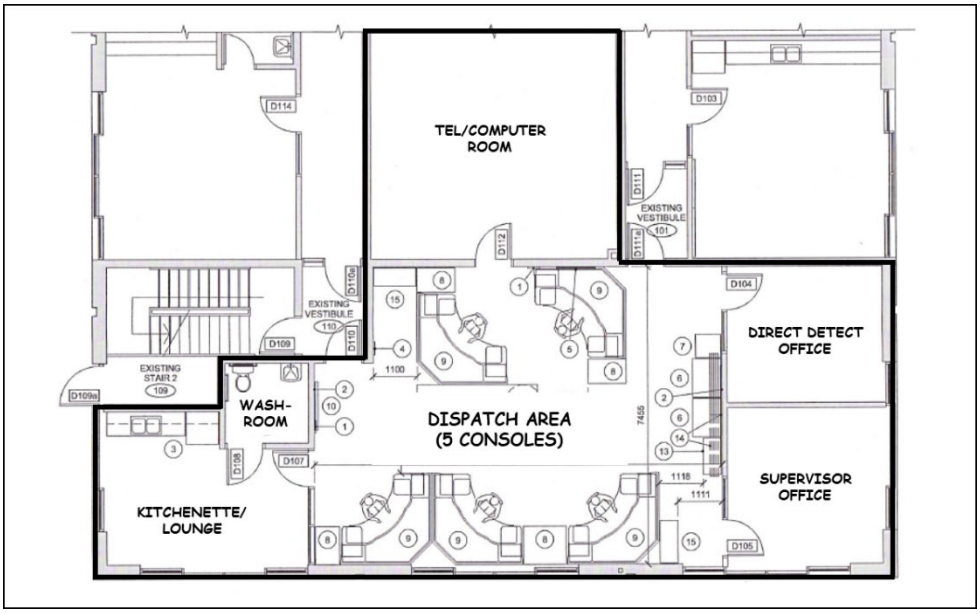
The fire communications center is situated in KFD headquarters, at 270 Strasburg Road in the City of Kitchener. We estimate that the center occupies about 1,800 SF, with about 800 SF dedicated to the communications floor.

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.

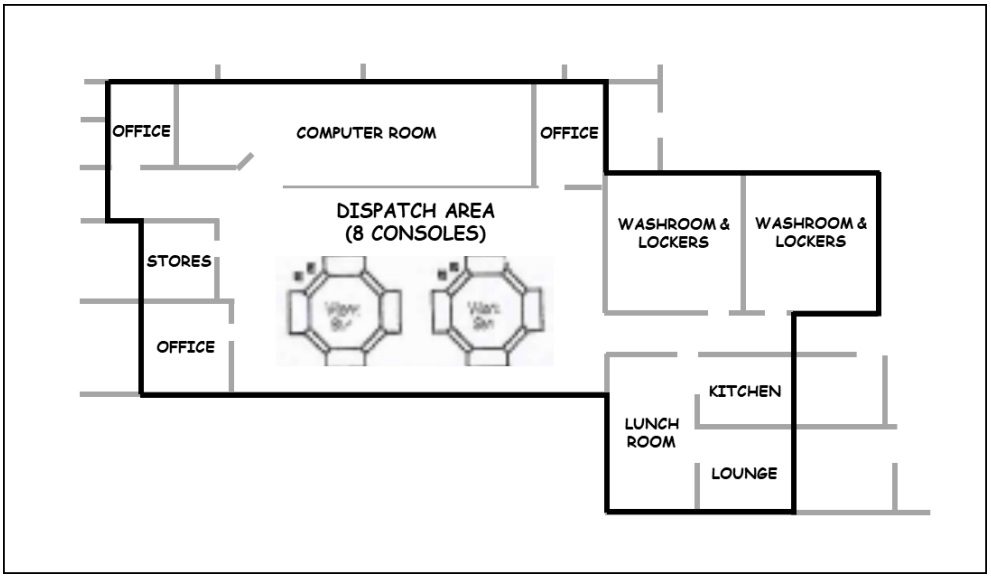
NACS is situated in Niagara EMS headquarters, at 509 Glendale Avenue East, Niagara-on-the-Lake. We estimate that the center occupies approximately 2,300 SF, with about 1,000 SF for the communications floor.

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.

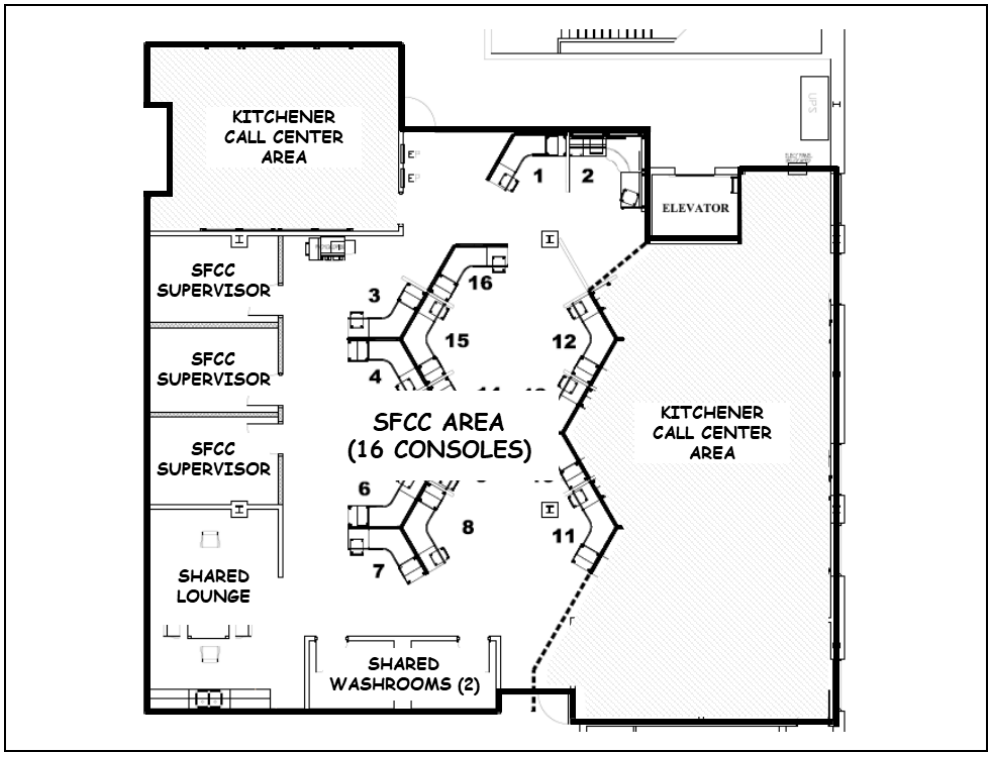
4.4 ROW Service First Call Center

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%

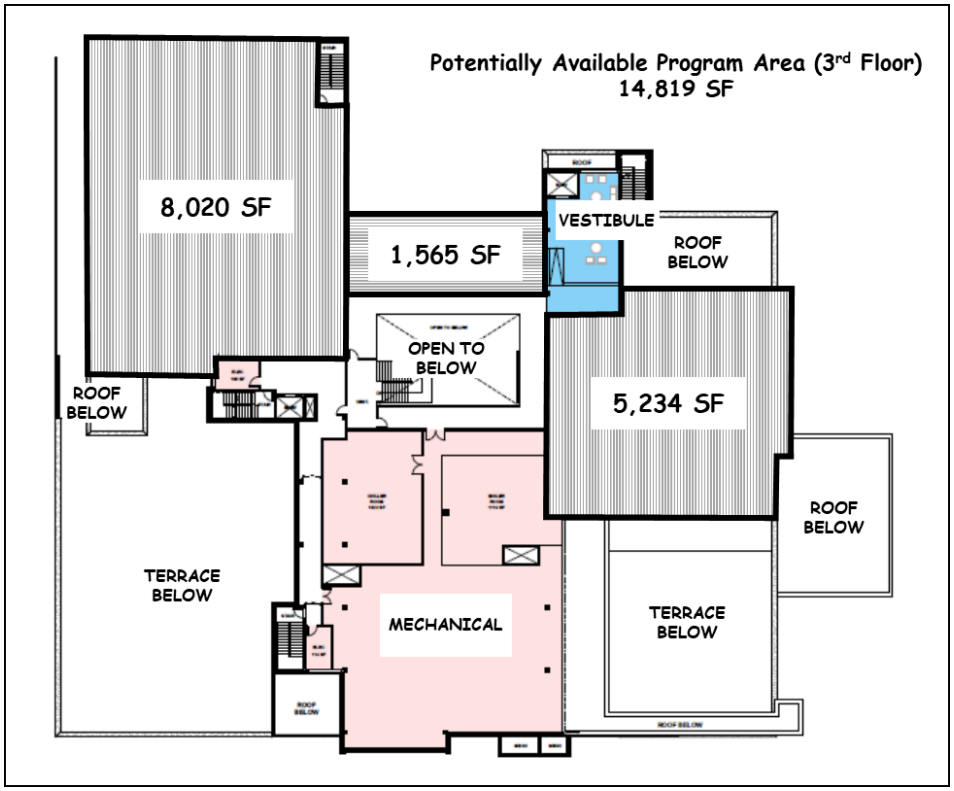
8 Program Area Assessment

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		

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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			

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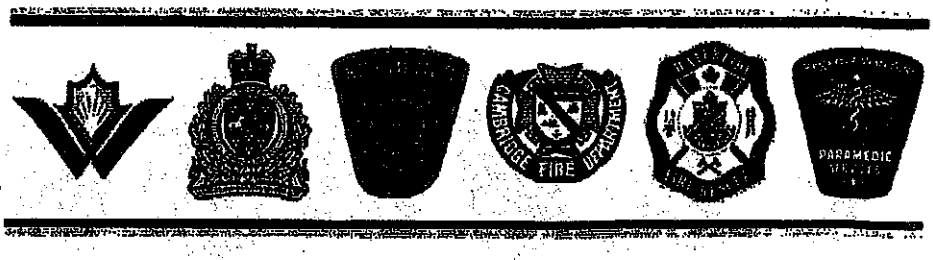
Appendix C: Capital Costs on Move In *(cont'd)*

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.



IMPLEMENTATION REPORT

COMMON TECHNOLOGY PLATFORM FOR POLICE AND FIRE DISPATCH IN WATERLOO REGION

CHIEF BRYAN LARKIN
WATERLOO REGIONAL POLICE SERVICE

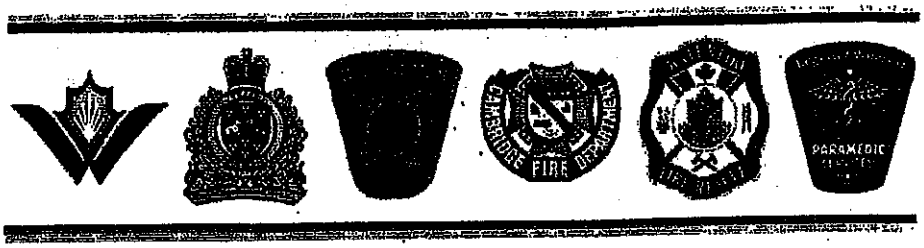
CHIEF JON REHILL
KITCHENER FIRE DEPARTMENT

CHIEF NEIL MAIN
CAMBRIDGE FIRE DEPARTMENT

CHIEF RICHARD HEPDITCH
WATERLOO FIRE RESCUE

CHIEF STEPHEN VAN VALKENBURG
REGION OF WATERLOO PARAMEDIC SERVICES

APRIL 4, 2017



IMPLEMENTATION REPORT:

COMMON TECHNOLOGY PLATFORM FOR POLICE AND FIRE DISPATCH IN WATERLOO REGION

APEXPRO CONSULTING INC.

APRIL 4, 2017

APEXPRO CONSULTING INC.

EXCELLENCE COMMITMENT PARTNERSHIP – EVERY CLIENT! EVERY TIME!

30 KARL CRT., THORNHILL ON L4J 8H7 CANADA

April 4, 2017

Mr. Mark Bullock
Inspector, Operational Support Division
Waterloo Regional Police Services
200 Maple Grove Road
Cambridge, ON N3H 5M1

Dear Sir:

IMPLEMENTATION REPORT: COMMON TECHNOLOGY PLATFORM FOR POLICE AND FIRE DISPATCH IN WATERLOO REGION

It is with great pleasure that we submit this report on behalf of the Project Implementation Team.

The report contains relevant information that will enable project participants - *Waterloo Region and the cities of Kitchener, Cambridge and Waterloo* - to implement a common technology platform for Police and Fire dispatch, based on an expansion of the Intergraph CAD system used by WRPS.

The report is supported by prior research sponsored by the Region of Waterloo; analyses and insights contributed by Project Team members; and a Statement of Work/Cost Proposal supplied by the Intergraph CAD vendor, HEXAGON Safety and Infrastructure.

The report contents include: a description of the proposed dispatch model; a project implementation plan; project resourcing and cost estimates; and a proposed cost apportionment arrangement.

The project implementation plan assumes that fire's transition to the Intergraph CAD will be undertaken concurrently with the project to replace the Region's public-safety grade voice radio communications system; this, to attain cost savings from concurrent project implementation.

The Fire CAD project will take about 16 months to implement. Since the new radio system is scheduled to go live by the end of 2018, commencement of the Fire CAD project will be targeted to June 1, 2017 (subject to budget approvals), with completion by September 2018.

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April 4, 2017

Mark Bullock, Inspector Operational Support, Waterloo Regional Police Services

Project oversight will be provided by a Steering Committee that includes senior management representation from WRPS, and the fire departments of Cambridge, Kitchener and Waterloo. WRPS will chair the Steering Committee.

WRPS will also lead the Project Implementation Team. The team will include subject matter experts from WRPS IT Division, and the Cambridge and Kitchener fire departments. They will interact extensively with all key stakeholders, including the four township fire departments (Woolwich, Wellesley, Wilmot and North Dumfries).

It is incumbent upon project participants to work with the information contained in this report in the development of their related business plans, to ensure the successful and timely implementation of the Fire CAD project.

Thank you for giving us the opportunity to serve as consultant facilitator for the development of this document.

APEXPRO CONSULTING INC.

Marvin Rubinstein
President

Enc.

c.c. Project Implementation Team

Mark Bullock, Inspector, Operational Support, Waterloo Regional Police Services (Project Manager)
Robert Hilhorst, Director, Information and Technology, Waterloo Regional Police Services
Jon Rehill, Fire Chief, Kitchener Fire
Dimetra Resendes, Manager Emergency Communications, Kitchener Fire
Neil Main, Fire Chief, Cambridge Fire
Brian Arnold, Deputy Fire Chief, Cambridge Fire
Richard Hepditch, Fire Chief, Waterloo Fire
Stephen Van Valkenburg, Chief, Waterloo Regional Paramedic Services

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1 INTRODUCTION

1.1 Historical Context

The development of a contemporary, emergency dispatch system for the Region of Waterloo – *one that fully integrates 9-1-1 call taking with dispatch services for police, fire and EMS* – has been a recommendation advocated repeatedly by elected officials, public safety leaders, consultants and stakeholders across the Region, for over 20 years.

- 1996: Regional dispatch services are discussed in the context of local government reform. Kitchener Fire assumes responsibility for dispatching Waterloo Fire, and becomes responsible for all fire dispatching north of Highway 401.
- 1998-99: Area Chiefs undertake and present the findings of a road tour of multiple, consolidated dispatch services.
- 2001: Terrorist attacks on September 11, 2001 elevate awareness to improve interoperability of communications between emergency responder agencies.
- 2007-09: A Dispatch Model Working Group is formed. A report by PSTG Consulting presents options for decreasing emergency services response times.
- 2012: Transportation Safety Board releases its report on a fatal 2011 helicopter crash, which includes recommendations for improving inter-agency communications in the region
- 2014: A feasibility report by L.R. Kimball Consulting concludes that full integration of emergency dispatch services in Waterloo Region is feasible; however, MOHLTC is not prepared to participate, and acceptable arrangements for governance, labour, funding and cost-sharing are major challenges that would need to be addressed.
- Kimball also concludes that, although MOHLTC is not prepared to participate, significant benefits can still be achieved by consolidating 9-1-1 with police and fire dispatch.
- **June 2014: A recommendation to implement a common technology platform for Police and Fire dispatch is tabled at an All Council Meeting. The recommendation is supported, as the first step forward in establishing a fully integrated emergency dispatch centre.**
- 2015-16: Kimball performs a functional review of fire CAD, which concludes that all fire CAD capabilities can be retained, or enhanced, if fire migrates on a shared basis, to the Intergraph CAD platform used by WRPS.
- 2016: Waterloo Region's 'Paramedic Services Master Plan (2017-2027)' supports migration over time, to a fully integrated emergency dispatch system.

1.2 Direction Forward

In January 2017, the CAOs and public safety leaders from Waterloo Region, and communities of Kitchener, Cambridge and Waterloo, convened to expedite *implementation of a common technology platform for Police and Fire dispatch*, as the first step forward in establishing a fully integrated emergency dispatch centre.

They agree on a model in which the Intergraph CAD system used by WRPS will be expanded to support the dispatch operations of the Cambridge and Kitchener fire departments, on a shared basis with WRPS. More specifically:

- Kitchener Fire will continue to dispatch fire resources for five municipalities north of Highway 401 (Kitchener, Waterloo, Woolwich, Wellesley and Wilmot). Cambridge Fire will continue to dispatch fire resources for two municipalities south of Highway 401 (Cambridge and North Dumfries).
- Kitchener and Cambridge fire departments will continue to dispatch individually, from their own facilities, using their own dispatch personnel, and their own established SOPs; however, going forward, they will deploy fire resources using the WRPS Intergraph CAD, on a shared basis with WRPS.

The proposed dispatch arrangement is sufficiently flexible to accommodate EMS dispatch as a potential future add-on.

In agreeing to move to *a common technology platform for Police and Fire dispatch* the group acknowledges that MOHLTC is not prepared to re-establish the EMS-TIF interface, currently used by Kitchener Fire, following the dispatch center's migration to the shared police-fire CAD platform; and that Waterloo Regional representatives will need to aggressively advocate the Ministry if access to TIF is to be maintained/re-established. [1]

1.3 Responsibility for Project Implementation

Responsibility for implementing the Fire CAD project is assigned to a Project Implementation Team represented by the following public safety organizations:

- Mark Bullock, Inspector, Operational Support, Waterloo Regional Police Services (serving as Project Manager)
- Robert Hilhorst, Director, Information and Technology, Waterloo Regional Police Services
- Jon Rehill, Fire Chief, Kitchener Fire
- Dimetra Resendes, Manager Emergency Communications, Kitchener Fire
- Neil Main, Fire Chief, Cambridge Fire
- Brian Arnold, Deputy Fire Chief, Cambridge Fire
- Richard Hepditch, Fire Chief, Waterloo Fire
- Stephen Van Valkenburg, Chief, Waterloo Regional Paramedic Services
- Marvin Rubinstein, APEXPRO Consulting Inc. (consultant facilitator).

[1] The Kitchener Fire dispatch center is equipped with EMS-TIF, a CAD-to-CAD interface that enables automatic transfer of EMS calls from the Ministry's Central Ambulance Communications Center (CACC) under defined Tiered Response criteria. The Cambridge Fire dispatch center receives such requests by telephone. Equipping both fire dispatch centers with EMS-TIF would be the optimum scenario.

1.4 Implementation Report

This Implementation Report, prepared by the Project Implementation Team, contains relevant information that will enable project participants - *Waterloo Region and the cities of Kitchener, Cambridge and Waterloo* - to implement a common technology platform for Police and Fire dispatch, based on an expansion of the Intergraph CAD system used by WRPS.

The report is supported by prior research sponsored by the Region of Waterloo; analyses and insights contributed by Project Team members; and a Statement of Work/Cost Proposal supplied by the Intergraph CAD vendor, HEXAGON Safety and Infrastructure.

The report contents include: a description of the proposed dispatch model; a project implementation plan; project resourcing and cost estimates; and a proposed cost apportionment arrangement.

The project implementation plan assumes that fire's transition to the Intergraph CAD will be undertaken concurrently with the project to replace the Region's public-safety grade voice radio communications system; this, to attain cost savings from concurrent project implementation.

The Fire CAD project will take about 16 months to implement. Since the new radio system is scheduled to go live by the end of 2018, commencement of the Fire CAD project will be targeted to June 1, 2017 (subject to budget approvals), with completion by September 2018.

Project oversight will be provided by a Steering Committee that includes senior management representation from WRPS, and the fire departments of Cambridge, Kitchener and Waterloo. WRPS will chair the Steering Committee.

WRPS will also lead the Project Implementation Team. The team will include subject matter experts from WRPS IT Division, and the Cambridge and Kitchener fire departments. They will interact extensively with all key stakeholders, including the four township fire departments (Woolwich, Wellesley, Wilmot and North Dumfries).

It is incumbent upon project participants to work with the information contained in this report in the development of their related business plans, to ensure the successful and timely implementation of the Fire CAD project.

575,440
+ 8718

2 CRITICAL ROLE OF A CONTEMPORARY EMERGENCY DISPATCH SYSTEM

Emergency communications plays a significant role within the continuum of police, fire and EMS public safety services.

As the 'first' of the first responders, communications center personnel serve as the critical link between callers and the emergency help they require.

Providing continuous coverage by way of telephone, radio and computer aided dispatch (CAD) systems, communications center personnel quickly and efficiently evaluate incoming 9-1-1 calls to determine the location, nature and urgency of each incident; and rapidly deploy critical emergency resources as required (i.e., police, fire and/or EMS).

In times of crisis it is not only the caller who relies on communications center personnel for assistance. Emergency service responders (police, fire and EMS) also rely heavily on communications center personnel for relevant information and auxiliary support that will ensure a rapid, effective, coordinated, and safe response.

Whether it is a police, fire or medical emergency, the dispatch system must meet the complex demands of an incident as it unfolds, and provide communications center personnel, as well as responders in the field, with the tools they require to:

- Rapidly answer emergency calls
- Create and update incident details
- Deploy critical emergency resources
- Import critical information from up-to-date mapping and other databases
- Coordinate a multi-agency response when required, and
- Manage / support multiple resources through real time interaction of live incident data.

Contemporary emergency dispatch systems are designed to fulfil these needs, by integrating and ensuring interoperability between a host of crucial components, including:

- Computer aided dispatch system (CAD)
- Radio and telephone systems
- In-vehicle mobile work stations (MWS)
- Portable communications devices (i.e., pagers and smartphones)
- Records management systems (RMS), and
- Reliable critical information interfaces, including GPS mapping, and GIS/AVL.

In short, a contemporary emergency dispatch system provides communications center personnel and responders in the field, with the tools and real time mission critical information, that enables them to respond together - rapidly, safely and effectively - to meet the complex demands of an emergency incident as it unfolds.

3 CURRENT EMERGENCY COMMUNICATIONS ENVIRONMENT

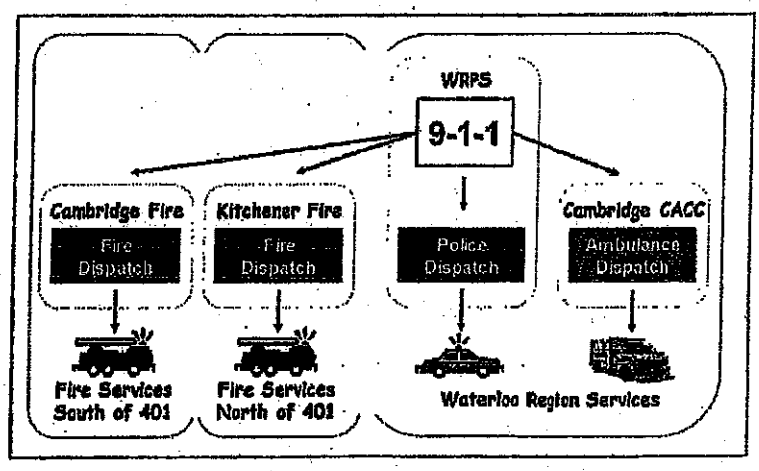
Waterloo Region is currently served by four (4) stand-alone, and independently managed emergency communications centers.

Waterloo Regional Police Services (WRPS) operates a fully integrated 9-1-1 / police communications center, which in addition to the 9-1-1 function, dispatches and coordinates the deployment of WRPS resources.

Emergency 9-1-1 calls requiring fire services are routed to the Kitchener Fire communications center, which dispatches fire resources for five municipalities north of Highway 401 (Kitchener, Waterloo, Woolwich, Wellesley and Wilmot), or to the Cambridge Fire communications center, which dispatches fire resources for two municipalities south of Highway 401 (Cambridge and North Dumfries).

Emergency 9-1-1 calls requiring paramedic services are routed to the Cambridge Central Ambulance Communications Center (CACC) operated by MOHLTC.

EXHIBIT 3.1: CURRENT 'STAND-ALONE' EMERGENCY COMMUNICATIONS ENVIRONMENT



3.1 WRPS 9-1-1 / Police Communications Center

Situated in WRPS headquarters, at 200 Maple Grove Road, in the City of Cambridge, this facility serves as primary Public Safety Answering Point (PSAP) for the Region, handling an annual call volume of about 130,000 incoming 9-1-1 emergency calls, and 170,000 non-emergency calls (that are received on 10-digit phone lines). The annual event volume, as recorded by CAD, is approximately 300,000 incidents a year.

Communications center staffing consists of: 2 managers; 5 supervisors; 2 training supervisors; 42 full-time communicators (call takers and dispatchers); and 16 part-time/temporary employees for communications backfill. Minimum staffing per shift is 10 communicators and 1 supervisor.

The center is outfitted with 21 work stations, which include: 12 for call taking; 4 for radio dispatch; 1 for backup radio dispatch; 2 for training; and 2 for supervisors. An additional 7 work stations, which are occasionally used for training, are located off site at an emergency backup communications center.

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

- E9-1-1
- 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.

3.2 Kitchener Fire Communications Center

Situated in the City of Kitchener Fire Department headquarters, at 270 Strasburg Road, this communications center dispatches the following fire resources north of Highway 401:

- Kitchener Fire – 7 stations staffed with career firefighters
- Waterloo Fire – 4 stations staffed with career firefighters
- Wellesley, Wilmot and Woolwich fire departments - 12 stations staffed by paid-on call firefighters.

The center handles approximately 19,650 fire and emergency incidents a year, including structure fires, outdoor fires, multi-vehicle collisions, and medical assist calls.

Most fire calls are routed from the primary PSAP at WRPS. Requests for medical assistance are received directly from Cambridge CACC, based on agreed upon tiered response arrangements. The Kitchener fire communications center is equipped with EMS-TIF, a CAD-to-CAD interface that enables automatic transfer of EMS calls from CACC under the tiered response criteria.

Communications center staffing consists of: 1 manager; 1 supervisor; and 12 full-time communicators serving as combined call taker/dispatcher. Minimum staffing is 2 communicators per shift.

The center is outfitted with 3 work stations; each equipped for call taking, and a CAD and radio dispatch console. It utilizes a Crisys Limited Xpert CAD and Fire software system for: call handling and dispatch; incident management; reporting; personnel and equipment management; and fire prevention. The CAD is equipped with an integrated GIS/mapping interface.

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

For IT support, Kitchener Fire relies on technology vendors; Corporate IT; a Program Manager, Fire Systems and Projects; and a Fire Systems Specialist.

There currently are no mobile data terminals (MDT) or mobile work stations (MWS) on the system. MWS that interface with CAD, and a full suite of CAD functions, are being considered by both the Kitchener and Waterloo fire departments. [2]

3.3 Cambridge Fire Communications Center

Situated in the City of Cambridge Fire Department headquarters, at 1625 Bishop Street North, this communications center dispatches the following fire resources south of Highway 401:

- Cambridge Fire – 5 stations staffed with career firefighters
- North Dumfries Fire Department – 1 station staffed with paid-on call firefighters.

The center handles approximately 7,000 fire and emergency incidents a year, including structure fires, outdoor fires, multi-vehicle collisions, and medical assist calls.

Most fire calls are routed from the primary PSAP at WRPS. Requests for medical assistance are received directly from Cambridge CACC, based on agreed upon tiered response arrangements. Cambridge Fire communications center is not equipped with EMS-TIF. Calls for tiered assistance are received by telephone.

Communications center staffing consists of: Division Chief of Communications serving as manager; 5 full-time communicators serving as combined call taker/dispatcher; and 1 support technician. Four (4) of the five communicators are assigned to a platoon rotation. The 5th is a floater who works daytime during the week; and backfills for scheduled absences including vacation, and for unplanned absences due to illness, etc. When additional backfill is required, the center relies on firefighters trained in the communications function. Shift staffing is typically 1 communicator per shift, and 2 on weekday days.

The center is outfitted with 2 work stations; each equipped for call taking, and a CAD and radio dispatch console. It utilizes a Crisys Limited Xpert CAD and Fire software system for: call handling / dispatch; incident management; reporting; personnel and equipment management; and fire prevention. The CAD is equipped with an integrated GIS/mapping interface.

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

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[2] Mobile Data Terminals (MDT) operate using stand-alone software applications that are not interfaced with CAD. They are used predominately for mapping, routing, provision of relevant incident data, and for vehicle tracking if equipped with GPS/AVL. Mobile Work Stations (MWS) are in-vehicle hardware devices (computers / tablets) that interface with CAD, and a full suite of CAD functions, using Mobile for Public Safety software.

The communications center relies on the technology vendors for technical IT support.

There currently are 5 stand-alone MDT on the system (i.e., 5 frontline vehicles that are equipped with computers), with a 6th MDT expected in the short term (i.e., a frontline vehicle which is soon to be equipped with a tablet). Cambridge Fire advises that it will require 7 MWS, as follows: 6 to replace the existing/planned MDT plus 1 additional MWS, which is to be installed on a command vehicle. [3]

3.4 Cambridge Central Ambulance Communications Center

MOHLTC manages a province-wide system of Central Ambulance Communications Centers (CACC) that are responsible for dispatching municipal paramedic (land ambulance) resources. The Cambridge CACC situated at 15 Reuter Drive in the City of Cambridge, is responsible for dispatching the Waterloo Regional Paramedic Service. This CACC also serves to dispatch land ambulance services for portions of Oxford, Wellington and Dufferin counties.

The Cambridge CACC operates with a TriTech CAD system which is integrated with an E9-1-1 interface for caller location, ambulance dispatch and incident record management. The system also has built in provisions for emergency backup. Should Cambridge CACC go offline, a neighbouring CACC will immediately step in to provide emergency medical dispatch coverage.

CACC communicators and supervisors are well-trained, and are committed to supporting in-the-field paramedic services provided by Waterloo Region. Overall, the CACC's relationship with Waterloo Regional Paramedic Services is good.

Supported by a CAD interface known as Dispatch Priority Card Index V2.0 (DPCI2), CACC communicators prioritize each request for medical assistance, on a scale ranging from 'non-urgent' to 'life threatening'. They dispatch the closest available, and most suitable ambulance, to each 'life threatening' call.

Cambridge CACC dispatches Waterloo Regional Paramedic Services to approximately 40,000 medical incidents a year, generating about 45,000 ambulance responses. About 70% of ambulance responses are dispatched as 'life threatening' with lights and siren.

Fire Departments operating in Waterloo Region assist with medical calls, in accordance with terms set out in agreed-upon Tiered Response Agreements. Fire services dispatched by Kitchener Fire are tiered automatically using EMS-TIF, a CAD-to-CAD interface that enables automatic transfer of EMS calls from CACC to the Kitchener CAD system when a fire response is required. Cambridge Fire communications center is not equipped with EMS-TIF. They receive calls for tiered assistance by way of telephone.

[3] Mobile Data Terminals (MDT) operate using stand-alone software applications that are not interfaced with CAD. They are used predominately for mapping, routing, provision of relevant incident data, and for vehicle tracking if equipped with GPS/AVL. Mobile Work Stations (MWS) are in-vehicle hardware devices (computers / tablets) that interface with CAD, and a full suite of CAD functions, using Mobile for Public Safety software.

3.5 Regional Voice Radio System for Police and Fire

The Waterloo Regional voice radio system, EDACS, is a public-safety grade two-way voice radio communications for Waterloo Regional Police Service, municipal fire departments, and various other regional and municipal operations departments (principally Grand River Transit). The radio system serves as the primary link between 9-1-1 dispatch and police and fire personnel for all day-to-day communications and provides critical interoperability between all users in the event of a Region-wide emergency.

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, and current challenges / difficulties include:

- Obtaining replacement parts and effective support services.
- System coverage and in-building penetration, particularly in the Cambridge area.
- The system will not readily accommodate NG9-1-1.
- The system does not support contemporary standards for interoperable, digital public safety radio communications, i.e., the Project 25 (P25) North American standards for public safety communication, established by the Association of Public-Safety Communications Officials (APCO).

The next evolution of the voice radio system is required by the end of 2018 to ensure system reliability. Waterloo Region is in the process of planning a full radio system replacement which will take advantage of the improvements associated with a digital system; provide increased functionality; and comply with P25 digital public safety radio communications standards established by APCO.

Motorola Solutions Canada Inc. was recently awarded the radio system replacement contract and the new radio system is scheduled to go live by the end of 2018.

3.6 Provincial Radio System for Ambulance Communications

Cambridge CACC and Waterloo Regional Paramedic Services use the Provincial Fleet NET trunked radio system for dispatch and day-to-day radio communications.

The system consists of a Motorola Smart Zone Type II system licensed and operated in the VHF radio spectrum. Waterloo Regional Paramedic Services units have some capabilities to operate on the Region's EDACS system, but in accordance with MOHLTC policy, that is not a common practice.

4 CASE FOR CONSOLIDATING POLICE & FIRE DISPATCH TECHNOLOGY

4.1 Challenges in the Current Emergency Communications Environment

Although each of the four communications centers is staffed with well trained, dedicated employees that perform excellent work, the current 'stand-alone' emergency communications environment is deficient in key areas including:

- The communications centers operate under autonomous governance structures and mandates, with training programs and operating procedures that are uniquely designed to attain and support their respective emergency responder activities.
- Their operations are supported by individual CAD systems and backup solutions that vary in age and technological capability.
- The separation of police, fire and EMS communications creates a disjointed environment where 9-1-1 calls are often transferred one or more times to receive required services from police, fire and EMS.
- Tiered call taking causes duplication, contributes to time delays, and adversely affects response times.
- The physical, management and technological separation of communications centers hinders interoperability and coordination among agencies.
- The more centers involved in responding to an incident, the more opportunity for human error, especially under high-stress conditions.
- Operating individually, there are limited opportunities for each center (particularly those of smaller scale) to upgrade technology, enhance training, or to improve QC/QA and business supports.

4.2 A Fully Integrated Dispatch Would Be the Optimum Model

Based on North American leading practices, a 'fully integrated' emergency communications services system designed to deliver 9-1-1 on an integrated basis with dispatch services for police, fire and EMS, would be the optimum model for Waterloo Region.

This also is the view that has been advocated repeatedly by elected officials, public safety leaders, consultants and stakeholders across Waterloo Region, for over 20 years.

Such models have been implemented in major centres across the USA, with several also in Canada. They include: Public Safety Communications, Calgary Alberta; Bureau of Emergency Communications, Portland Oregon; Public Safety Communications, Fairfax County Virginia; and Denver 911, Denver Colorado.

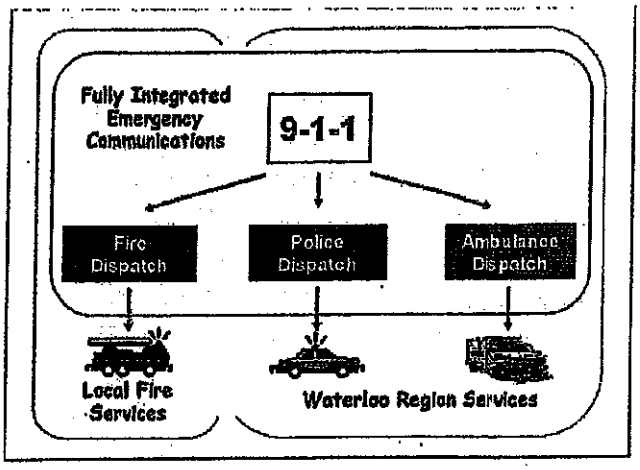
Partially integrated communications centers, delivering 9-1-1 with dispatch services for police and fire (but excluding dispatch for EMS) are also common, e.g.: Integrated Emergency Services, Halifax Nova Scotia, and E-Comm, Vancouver British Columbia.

The main features of 'fully integrated' emergency communications systems are listed below:

- Shared CAD, radio and telephone systems for maximum interoperability
- Co-location in a secure, purpose-built communications facility
- Integrated dispatch delivery by communications staff who are cross-trained to carry out multiple functions (9-1-1 and dispatch for police, fire and EMS)
- Organizational structure that supports effective management and operations
- Appropriate business and technological supports
- Accountability framework that promotes risk and quality management, including standardized SOPs, training and QC/QA procedures
- Governance framework that ensures client services, expectations, and reporting
- Functional independence, operating as a separate business unit
- Sustainable and stable source of capital and operating funds
- Agreed upon cost distribution arrangement
- Backup solutions to ensure uninterrupted delivery of critical services
- Responding agencies (police, fire and EMS) having direct access to their respective incident records.

Exhibit 4.1 is a concept drawing showing how such a model would apply to Waterloo Region.

EXHIBIT 4.1: FULLY INTEGRATED EMERGENCY COMMUNICATIONS



4.3 Moving Forward by Consolidating Dispatch Technology

A May 2014 feasibility report by L.R. Kimball Consulting concluded that full integration of emergency dispatch services in Waterloo Region is feasible; however, MOHLTC is not prepared to participate, and acceptable arrangements for governance, labour, funding and cost-sharing are major challenges that would need to be addressed.

The Kimball report also concluded that, although MOHLTC is not prepared to participate, significant benefits can still be achieved by consolidating 9-1-1 with police and fire dispatch.

A recommendation to implement a common technology platform for Police and Fire dispatch was tabled at an All Council Meeting in June 2014. The recommendation was supported, as the first step forward in establishing a fully integrated emergency dispatch centre.

In 2015-16, Kimball performed a functional review of fire CAD, which concluded that all fire CAD capabilities can be retained, or enhanced, if fire migrates on a shared basis, to the Intergraph CAD platform used by WRPS.

In January 2017, CAOs and public safety leaders from Waterloo Region, and communities of Kitchener, Cambridge and Waterloo, agreed on a model in which the Intergraph CAD system used by WRPS will be expanded to support the dispatch operations of the Cambridge and Kitchener fire departments, on a shared basis with WRPS. More specifically:

- Kitchener Fire will continue to dispatch fire resources for five municipalities north of Highway 401 (Kitchener, Waterloo, Woolwich, Wellesley and Wilmot). Cambridge Fire will continue to dispatch fire resources for two municipalities south of Highway 401 (Cambridge and North Dumfries).
- Kitchener and Cambridge fire departments will continue to dispatch independently, from their own facilities, using their own dispatch personnel, and their own established SOPs; however, going forward, they will deploy fire resources using the WRPS Intergraph CAD, on a shared basis with WRPS (i.e., using a common shared CAD platform configured in the same manner).

Other examples

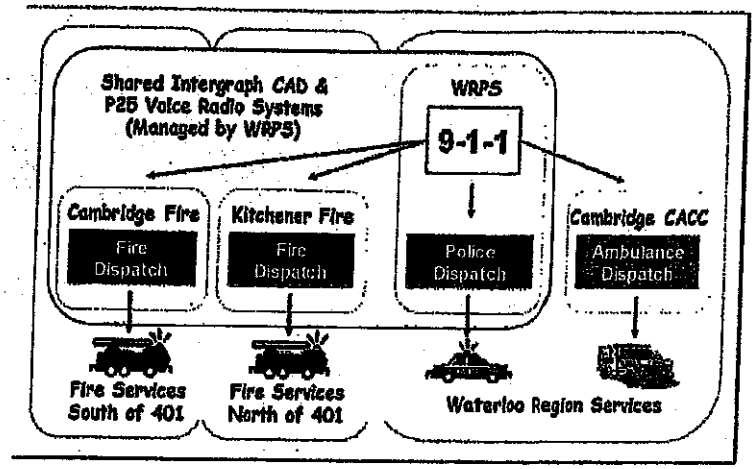
The proposed dispatch arrangement is similar to models implemented in many other North American jurisdictions, including:

- City of Ottawa, where the City's police and fire departments share CAD and radio systems (managed by the police department), but they continue to dispatch individually, from separately located stand-alone facilities, accessing the shared CAD system by way of a high-speed fibre optic network and wireless mobile devices.
- Region of York, where YRP, and the Vaughan and Richmond Hill fire departments, share CAD and radio systems managed by YRP, but they continue to dispatch individually, from separately located stand-alone facilities, accessing the shared CAD system by way of a high-speed fibre optic network and wireless mobile devices. Vaughan Fire dispatches two fire departments. Richmond Hill Fire dispatches six fire departments.

This proposed dispatch arrangement is sufficiently flexible to accommodate EMS dispatch as a potential future add-on.

A concept drawing showing how such a model will apply to Waterloo Region is shown in Exhibit 4.2 (next page).

EXHIBIT 4.2: COMMON TECHNOLOGY PLATFORM FOR POLICE AND FIRE DISPATCH



Listed below are the principal attributes for a model featuring a common technology platform for police and fire dispatch:

- Shared CAD, radio and telephone systems for maximum interoperability
- Primary server equipment and software reside at a secure communications center, situated in a police facility (the host)
- Clientele (fire and others) dispatch individually, from own facilities, accessing the shared CAD by way of a high-speed fibre optic network and wireless mobile devices
- Shared CAD system configured to client requirements, for confidentiality and security.
- Police IT personnel are responsible for system integrity and security. They manage the shared server equipment, software, and inter-connected devices on behalf of the clients.
- Data base management is centrally coordinated (by Police IT personnel) to ensure up-to-date mapping and consistency of other mission critical information
- Governance framework that ensures client services, expectations, and reporting
- Sustainable and stable source of capital and operating funds
- Agreed upon cost distribution arrangement
- Backup solutions to ensure uninterrupted delivery of critical services
- Responding agencies (clientele) having direct access to their respective incident records.

4.4 Potential Advantages / Benefits to Waterloo Region

Presented below (next page) are the potential advantages to Waterloo Region, from a 'fully integrated' emergency dispatch arrangement, and from a model featuring a 'common technology platform for police and fire dispatch'.

The information was assembled by the authors of this report, with some information coming from prior research, and some from interviews with senior management employed by full and partially-integrated dispatch centers in Canada and the U.S.A.

The assembled information affirms that significant benefits can be attained from a dispatch model featuring a 'common technology platform for police and fire dispatch'.

POTENTIAL ADVANTAGES / BENEFITS TO WATERLOO REGION	COMMON TECHNOLOGY (9-1-1, POLICE & FIRE)	FULLY INTEG'D DISPATCH (9-1-1, POLICE, FIRE & EMS)
Use of Shared Technology		
- Maximizes interoperability of communications, and improves utilization and coordination of police and fire resources.	√	√
- Contributes to functional streamlining, reduces duplication of call taker efforts, and expedites call processing and dispatch times, resulting in potentially faster on-scene times for police and fire.	√	√
- Increases response effectiveness by lowering the potential for human or technology errors.	√	√
- Enhances execution of a coordinated police/fire response to large scale incidents. Also, enhances an automatic aid or mutual aid.	√	√
- Facilitates information flow and exchange of mission critical information between responders in the field; thus, improving community and police/fire responder safety.	√	√
- Centrally coordinated data base management, ensuring up-to-date mapping and consistency of other relevant information.	√	√
Co-Location / Integrated Dispatch Delivery		
- Functional streamlining / elimination of call transfers between communications centers.	-	√
- Region-wide public safety focus. Improves situational awareness, and promotes a coordinated response.	-	√
- Helps to quickly identify and resolve conflicts, and confusion, that may arise during an emergency.	-	√
- Standardized SOPs, training and QC/QA procedures increase consistency and reliability of call taking and dispatching functions.	-	√
Advantages to Emergency Responding Agencies		
- Transfers responsibility for managing the technology systems to an organization dedicated to this purpose.	√	√
- Transfers responsibility for delivering emergency dispatch services to an organization dedicated to this purpose.	-	√
- Benefit from leading edge technological systems, and a stable source of funding that would not be otherwise feasible.	√	√
- High quality/reliable emergency dispatch services, that would not be otherwise financially or organizationally feasible.	-	√
- Dedicated IT support for: CAD; in-vehicle and portable mobile devices; and agency-specific technology add-ons (e.g., RMS).	√	√

POTENTIAL ADVANTAGES / BENEFITS TO WATERLOO REGION	COMMON TECHNOLOGY (9-1-1, POLICE & FIRE)	FULLY INTEG'D DISPATCH (9-1-1, POLICE, FIRE & EMS)
- Increased capability through collaboration and cost-sharing, to invest periodically in technology upgrades / new technology.	√	√
- Potential opportunities to standardize SOPs, training and QC/QA procedures, that would not be otherwise feasible.	-	√
- Expanded career opportunities for 'civilians' employed by communications centers, that would not be otherwise feasible.	-	√
Financial		
- Cost savings derived from shared technology (i.e., procurement, upgrades, connectivity, and maintenance).	√	√
- Shared systems will allow for new technology (i.e., P25 radio, NG 9-1-1, etc) to roll out seamlessly, without expensive interfaces.	√	√
- Cost savings derived from co-location and integrated dispatch delivery.	-	√

5 MAIN FEATURES OF THE PROPOSED DISPATCH ARRANGEMENT

5.1 Membership in the PRIDE Cooperative

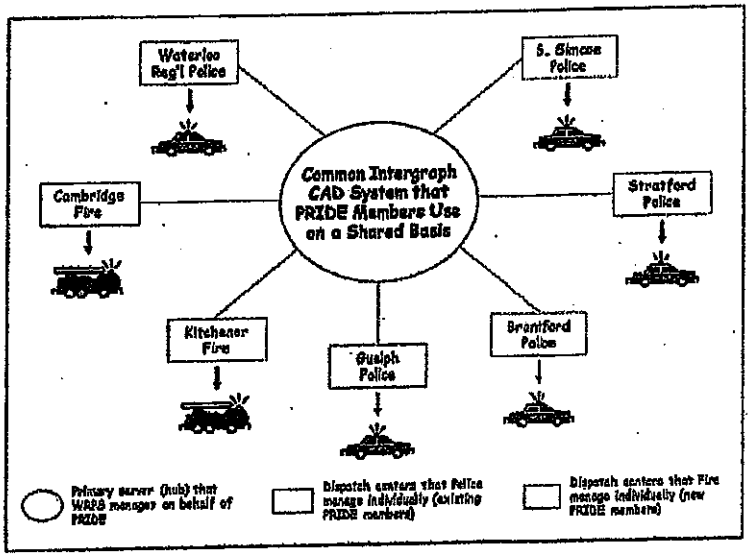
WRPS is a member of the Police Regionalized Information Data Entry (PRIDE) cooperative that deploys resources using a common Intergraph CAD platform, on a shared basis with the police departments of: Guelph, Brantford, Stratford, and South Simcoe.

Under the recommendation adopted by Waterloo Region, and communities of Kitchener, Cambridge and Waterloo, the PRIDE cooperative will be expanded to include Kitchener and Cambridge fire departments as new members, who will use the common Intergraph CAD infrastructure on a shared basis, to deploy fire resources throughout Waterloo Region.

5.2 Hub and Spoke Dispatch Arrangement

Exhibit 5.1 is a concept drawing showing the PRIDE cooperative arrangement with Kitchener and Cambridge fire departments as new members.

EXHIBIT 5.1: PRIDE COOPERATIVE ARRANGEMENT WITH THE ADDITION OF FIRE



Fundamentally, the PRIDE cooperative maintains a hub and spoke arrangement. The hub is where the primary server equipment and software reside. The resident systems are managed and maintained, round-the-clock, by WRPS IT personnel, who also coordinate database management to ensure up-to-date mapping and consistency of mission critical information.

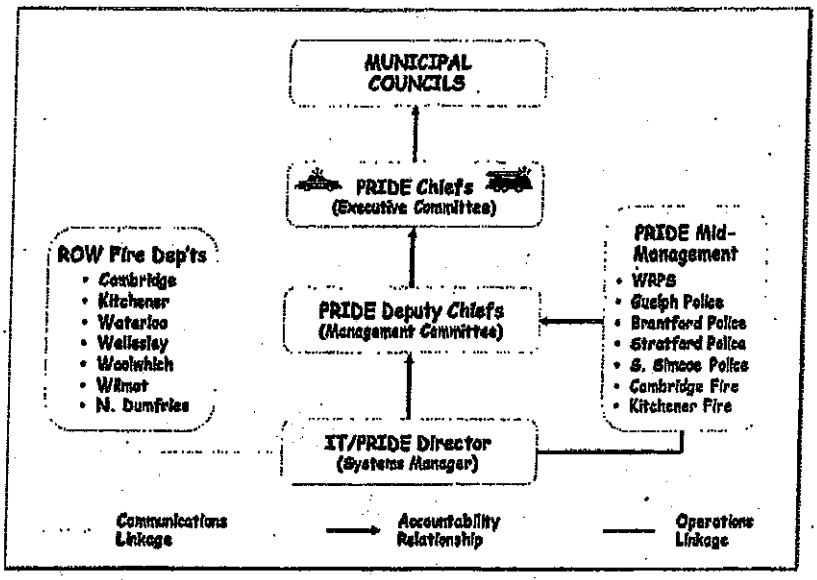
Dispatch centers that are managed individually by PRIDE agencies are the spoke installations, as they are fed by the WRPS infrastructure.

The spoke installations are connected to the hub by way of a high-speed fibre optic network and wireless mobile devices including laptops, smartphones and tablets. Individual dispatch centers are able to interact and share information electronically with both the hub, and the other centers on the system.

5.3 Governance Structure

The governance structure with the addition of Cambridge and Kitchener fire departments to the PRIDE cooperative is shown in Exhibit 5.2.

EXHIBIT 5.2: GOVERNANCE STRUCTURE WITH THE ADDITION OF FIRE



The current governance arrangement is as follows. WRPS is accountable for the integrity and security of the shared technology system, with the IT/PRIDE Director reporting to the Management Committee consisting of PRIDE Deputy Chiefs, and they in turn reporting to the Executive Committee consisting of PRIDE Chiefs. These accountability relationships are shown in blue.

The PRIDE Executive Committee recommends PRIDE policy for IT requirements, technology direction, budget and cost distribution. Budget recommendations are forwarded to the respective municipal councils for approval.

The PRIDE Management and Executive Committees will be expanded to include representatives from the Cambridge and Kitchener fire departments.

Kitchener Fire will continue to dispatch fire resources for five municipalities north of Highway 401 (Kitchener, Waterloo, Woolwich, Wellesley and Wilmot). Cambridge Fire will continue to dispatch fire resources for two municipalities south of Highway 401 (Cambridge and North Dumfries).

The WRPS IT unit will continue to manage and maintain the CAD server equipment, software and interconnected network devices, on behalf of the PRIDE cooperative, including Cambridge and Kitchener fire departments; this, as shown by the operations linkage in green.

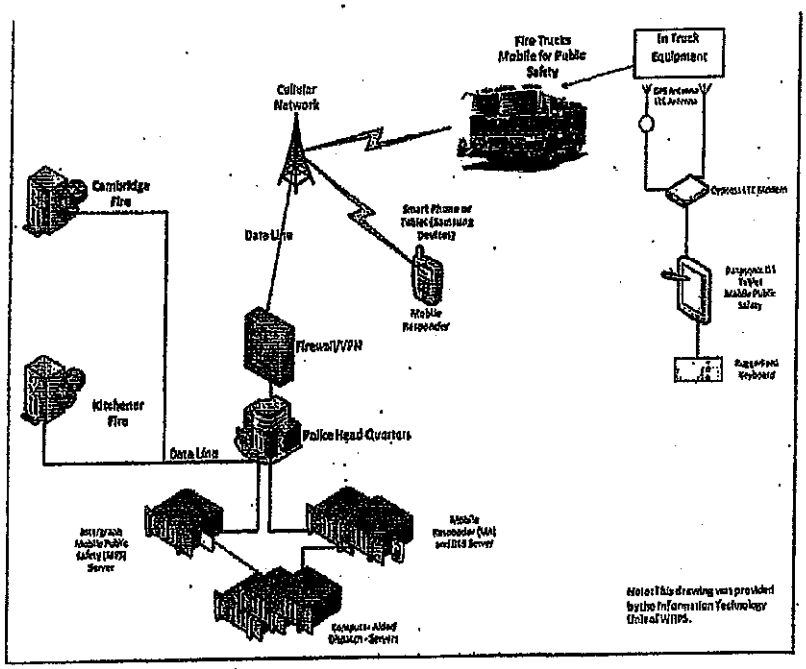
WRPS will continue to liaise with a host of stakeholders within the emergency services community, including the Intergraph CAD vendor, suppliers, consultants and other organizations.

Going forward, the stakeholders will include local fire services that are dispatched by Cambridge and Kitchener fire departments (i.e., the end users). WRPS will liaise with local fire services; this, in consultation with the Cambridge and Kitchener fire departments. Communications linkages are shown in yellow.

5.4 Fire Mobile Environment within the Hub and Spoke Arrangement

Exhibit 5.3 is a more detailed illustration of the Kitchener and Cambridge fire mobile environment within the hub and spoke arrangement.

EXHIBIT 5.3: FIRE MOBILE ENVIRONMENT



The main features of this fire mobile environment are listed below:

- Kitchener Fire will continue to dispatch fire resources for five municipalities north of Highway 401 (Kitchener, Waterloo, Woolwich, Wellesley and Wilmot). Cambridge Fire will continue to dispatch fire resources for two municipalities south of Highway 401 (Cambridge and North Dumfries).

- Kitchener and Cambridge fire departments will continue to dispatch individually, from their own facilities, using their own dispatch personnel, and their own established SOPs; however, going forward, they will deploy fire resources using the PRIDE Intergraph CAD, on a shared basis with WRPS and the other members of PRIDE.
- Primary server equipment and software will reside at a secure communications center (i.e., the hub) hosted by WRPS.
- Kitchener and Cambridge fire departments will access the shared CAD by way of a high-speed fibre optic network (i.e., high speed data lines that run from the individual spoke installations to the hub), and by in-vehicle and portable wireless mobile devices, including laptops, smartphones and tablets.
- WRPS IT personnel will be responsible for system integrity and security. They will continue to manage and maintain the primary server equipment and software; emergency backup solutions; the radio system; and the network inter-connected devices for all PRIDE members, including Kitchener and Cambridge fire departments. [4]
- WRPS IT personnel will also continue to centrally coordinate data base management, to ensure up-to-date mapping and consistency of mission critical information.

The main advantages of this hub and spoke dispatch arrangement are listed below.

- Kitchener and Cambridge fire departments will be secure in the knowledge that their emergency dispatch needs are sustained by reliable and resilient technology systems, with built-in emergency backup, that are managed and maintained by dedicated IT support, 24/7 – without having to maintain their own independent systems.
- Kitchener and Cambridge fire departments will maintain autonomy for call-taking and dispatch operations, using the common technology platform on a shared basis.
- Kitchener and Cambridge fire departments may continue to dispatch from existing fire response plans or, if there is agreement among participants, they may migrate to a common response plan for the Region; this, on the understanding that the systems are configured the same way for both fire dispatch centers.
- The common technology platform maximizes the sharing of information between Kitchener and Cambridge fire dispatch centers, while eliminating the need for each center to maintain their own independent system.
- Data base management is centrally coordinated on behalf of PRIDE members. This ensures that Kitchener and Cambridge fire departments will receive regular, consistent and timely mapping and mission critical information updates.

[4] City IT departments will be responsible for arranging feeds to fire sub-stations over City IT networks.

- Shared use of a common technology platform enhances redundancy and continuity of operations capability. Kitchener and Cambridge fire departments will be better positioned should they choose to serve as one-another's emergency backup.
- Shared use of a common technology platform enhances capabilities to train Kitchener and Cambridge fire personnel. Staff from any one of the member organizations can be used to train fire personnel, following a common training outline.

5.5 Buying Power of the Combined Group

As members of PRIDE, Kitchener and Cambridge fire departments will benefit financially from the buying power of the combined group, and a stable source of funding that would not be otherwise feasible. Benefits include:

- Cost savings from shared systems procurement, upgrades, connectivity, and maintenance.
- Increased capability through collaboration and cost-sharing, to invest in technology upgrades / new technology.
- Shared systems will also allow for new technology (i.e., P25 radio, NG 9-1-1, etc) to roll out seamlessly, without expensive interfaces.
- IT support personnel with expertise in many fields, are dedicated to the management and maintenance of the shared technology network and connected devices. IT resourcing to a similar level would not be otherwise feasible by individual agencies.

PRIDE members attain the above benefits, but avoid the complexities of having to negotiate new governance and labour relations arrangements, as would be required in the development of a fully-integrated dispatch model.

5.6 Configuration of CAD for Shared Use by WRPS and Fire

The Intergraph CAD system, which WRPS hosts on behalf of PRIDE, will be expanded to support the dispatch operations of the Cambridge and Kitchener fire departments. The expanded CAD system will include Fire communications servers, an integrated Fire CAD module, system interfaces, and incident management software.

The result will be an expanded CAD system for shared use by police and fire, similar to Intergraph CAD configurations currently in use in many Canadian and U.S. jurisdictions, including: Public Safety Communications Department, Calgary Alberta; and the Department of Public Safety Communications, Fairfax Virginia.

Hexagon Safety and Infrastructure will configure the Fire CAD module jointly with subject matter experts from Cambridge and Kitchener fire departments, by reviewing and aligning departmental workflows, graphical user interface needs, and other parameters. Workshop sessions dedicated to this objective are included in the Project Implementation Plan (in Section 6 of this document).

Following re-configuration, Cambridge and Kitchener fire departments will be supported by:

- Fire communications servers, and an integrated Fire CAD module (*ICAD*) that is specifically configured to the joint needs of Cambridge and Kitchener fire departments.
- *EdgeFrontier* (EF), an integration platform for interface development between systems, for integrating business processes, and for sharing data.
- Incident management software, including *Mobile for PublicSafety* (MPS) and *Intergraph Mobile Responder* (MR), which extend critical applications and information to field personnel on laptops, smartphones and tablets.

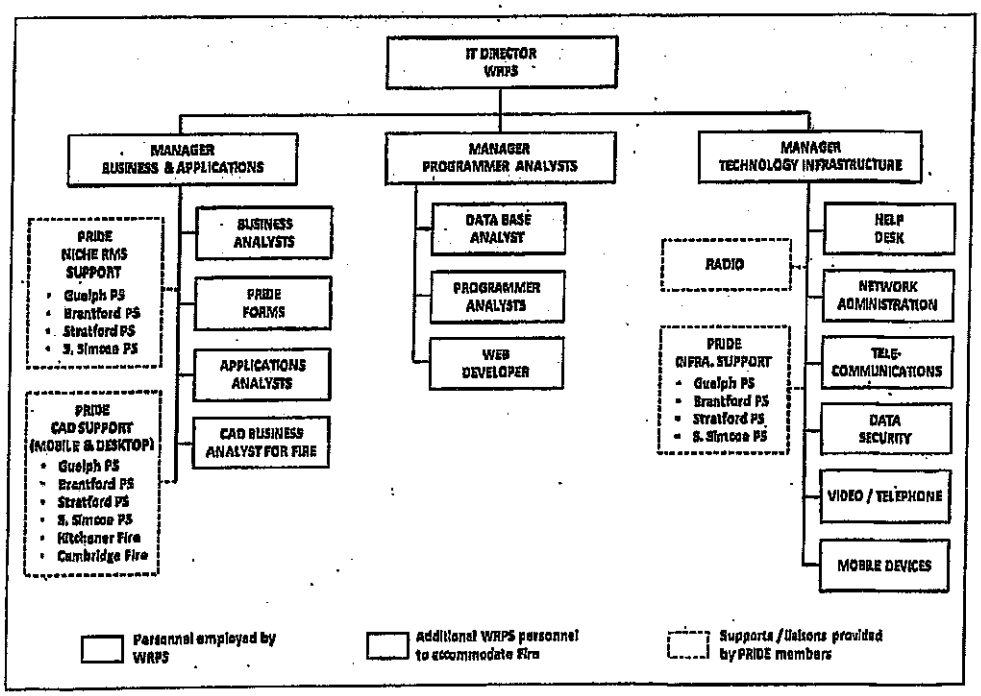
WRPS will be responsible for system integrity and security. They will ensure that the shared CAD system is configured to police (RCMP/CPIC) requirements for confidentiality and security.

5.7 Requirement for Increased IT Support

WRPS IT personnel manage and maintain the primary server equipment and software; emergency backup solutions; the radio system; and the network inter-connected devices. They centrally coordinate data base management, to ensure up-to-date mapping and consistency of mission critical information; and, in concert with members of the cooperative, they are responsible to ensure that the technologies in use, will support the cooperative's needs. They also staff a help desk, which provides members of the cooperative with technical support, 24/7.

For such purposes, WRPS employs IT personnel with a broad range of expertise, as illustrated by the schematic in Exhibit 5.4.

EXHIBIT 5.4: WRPS IT SUPPORT STRUCTURE WITH FIRE ADD-ON



Going forward, WRPS IT personnel will continue to manage and maintain the systems on behalf of the PRIDE cooperative, including the Kitchener and Cambridge fire departments.

To accommodate the work load increase attributed to Fire, WRPS IT Division will require at least one additional resource to serve as CAD Business Analyst (as shown by the above exhibit), and potentially a second additional resource, i.e.: Mobile Work Station Technician (not shown).

This opinion is derived from first-hand knowledge of present WRPS IT staffing levels and workloads; and from information supplied by York Regional Police (YRP), which manages a shared CAD arrangement for police and fire dispatch, for a service area of similar size and makeup to that of Waterloo Region.

YRP shares a common CAD platform with the fire departments of the City of Vaughan and Richmond Hill. Vaughan Fire deploys the fire resources of two municipalities. Richmond Hill Fire deploys the fire resources of six municipalities. The combined service area houses about 700,000 persons, which is only slightly larger than Waterloo Region's rapidly growing population base. [5]

The YRP IT Division is responsible to manage and maintain the shared CAD arrangement. The Vaughan and Richmond Hill fire departments have little in the way of internal IT support resources for the dispatch function. They rely extensively on YRP IT Division for dispatch technology support.

The YRP IT Division employs 2.5 personnel (FTE) who are dedicated to the needs of the fire services. One FTE is a CAD Business Analyst; one FTE is a MWS Technician; and the 0.5 FTE covers off a variety of work related to Fire servers, firewalls and security.

The 2.5 personnel are YRP employees; this, in accordance with RCMP/CPIC security requirements. YRP employs these 2.5 personnel on a full cost recovery basis, where the costs are apportioned between Vaughan and Richmond Hill fire departments, on behalf of their respective clientele.

Given the similarities between the YRP shared CAD arrangement for police and fire dispatch, and the shared CAD model proposed for Waterloo Region, and taking into consideration that Kitchener and Cambridge fire departments have little in the way of internal IT support resources for the dispatch function, and that they will rely extensively on WRPS IT support, the authors of this report support the following recommendations:

1) WRPS IT Division should recruit a CAD Business Analyst, to support fire dispatch operations in Waterloo Region.
    - The CAD Business Analyst (whose duties are summarized in Appendix C) will be dedicated to the dispatch needs of the local fire services - predominately, Kitchener

[5] The area served by Vaughan and Richmond Hill fire communications centers, excludes the City of Markham with a population of about 300,000 residents. The City of Markham Fire Department self-dispatches using stand-alone technology.

and Cambridge fire departments; but also, Waterloo Fire, and the paid-on call fire services operating in the four rural townships.

- The CAD Business Analyst should be recruited prior to the start of Phase 1 of the Fire CAD project, which is targeted to June 1, 2017 (subject to budget approvals); this, to assist with the implementation of the Fire CAD. [6]

2) The CAD Business Analyst should be an employee of WRPS; this to satisfy RCMP/CPIC security requirements. However, the position should be filled on a full cost recovery basis, where the costs will be apportioned between Kitchener and Cambridge fire departments, on behalf of their respective clientele.

3) The project Steering Committee should assess the need for a Mobile Work Station Technician, at a later date; possibly in Q3 of 2018 during Phase 2 of the project, or in Q4 of 2018 following project completion.

[6] For information on the phased project implementation plan, the reader is directed to Section 6 of this document.

6 PROJECT IMPLEMENTATION

The authors of this report support the Project Scope, Implementation Plan, Organizational Structure, Resourcing, Costs, and Cost Apportionment, set out below.

6.1 Project Scope

The Intergraph CAD system, which WRPS hosts on behalf of PRIDE, will be expanded to support the dispatch operations of the Cambridge and Kitchener fire departments. The expanded CAD system will include Fire communications servers, an integrated Fire CAD module, system interfaces, and incident management software.

Project oversight will be provided by a Steering Committee that includes senior management representation from WRPS, and the fire departments of Cambridge, Kitchener and Waterloo. WRPS will chair the Steering Committee.

WRPS will also lead the Project Implementation Team. The team will include subject matter experts from WRPS IT Division, and the Cambridge and Kitchener fire departments.

Hexagon Safety and Infrastructure (the Intergraph CAD vendor) will provide and configure hardware and software, as listed below. Software maintenance for the first year is included in Hexagon's pricing: [7]

- Fire communications servers, and an integrated Fire CAD module (*ICAD*) that is specifically configured to the joint needs of Cambridge and Kitchener fire departments.
- *EdgeFrontier* (EF), an integration platform for interface development between systems, for integrating business processes, and for sharing data.
- Incident management software, including *Mobile for Public Safety* (MPS) and *Intergraph Mobile Responder* (MR), which extend critical applications and information to field personnel on laptops, smartphones and tablets.

Hexagon Safety and Infrastructure will configure the Fire CAD module jointly with the subject matter experts from Cambridge and Kitchener fire departments, by reviewing and aligning departmental workflows, graphical user interface needs, and other parameters. Workshop sessions dedicated to this objective are included in the Project Implementation Plan.

The Project Implementation Team will:

- Participate in workshops and training
- Install hardware and software
- Supply and load base data
- Perform end-to-end user acceptance testing
- Train end users.

[7] For additional detail on Intergraph product deliverables and pricing, please refer to Appendix B.

WRPS will be responsible for system integrity and security. They will ensure that the shared CAD system is configured to police (RCMP/CPIC) requirements for confidentiality and security.

WRPS IT personnel will manage and maintain the system for all PRIDE members, including Kitchener and Cambridge fire departments. They will also centrally coordinate data base management, to ensure up-to-date mapping and consistency of mission critical information.

Project capital and annual operating costs, are set out in Section 6.4. Costs will be apportioned on a full cost recovery basis, to Kitchener and Cambridge fire departments (on behalf of their respective clientele).

6.2 Project Implementation Plan

Fire's transition to the Intergraph CAD will be undertaken concurrently with the project to replace the Region's public-safety grade voice radio communications system; this, to attain cost savings from concurrent project implementation.

The Fire CAD project will take about 16 months to implement. Since the new radio system is scheduled to go live by the end of 2018, commencement of the Fire CAD project will be targeted to June 1, 2017 (subject to budget approvals), with completion by September 2018.

The Project Implementation Plan, based on this timeframe, is shown in Exhibit 6.1 (next page).

The authors of this report acknowledge that the Exhibit 6.1 timelines are ambitious, and that they may need to be adjusted upon commencement of the project, in Task 1.1 "Project Kickoff / Review & Finalize Work Plan".

The project will be implemented in two phases.

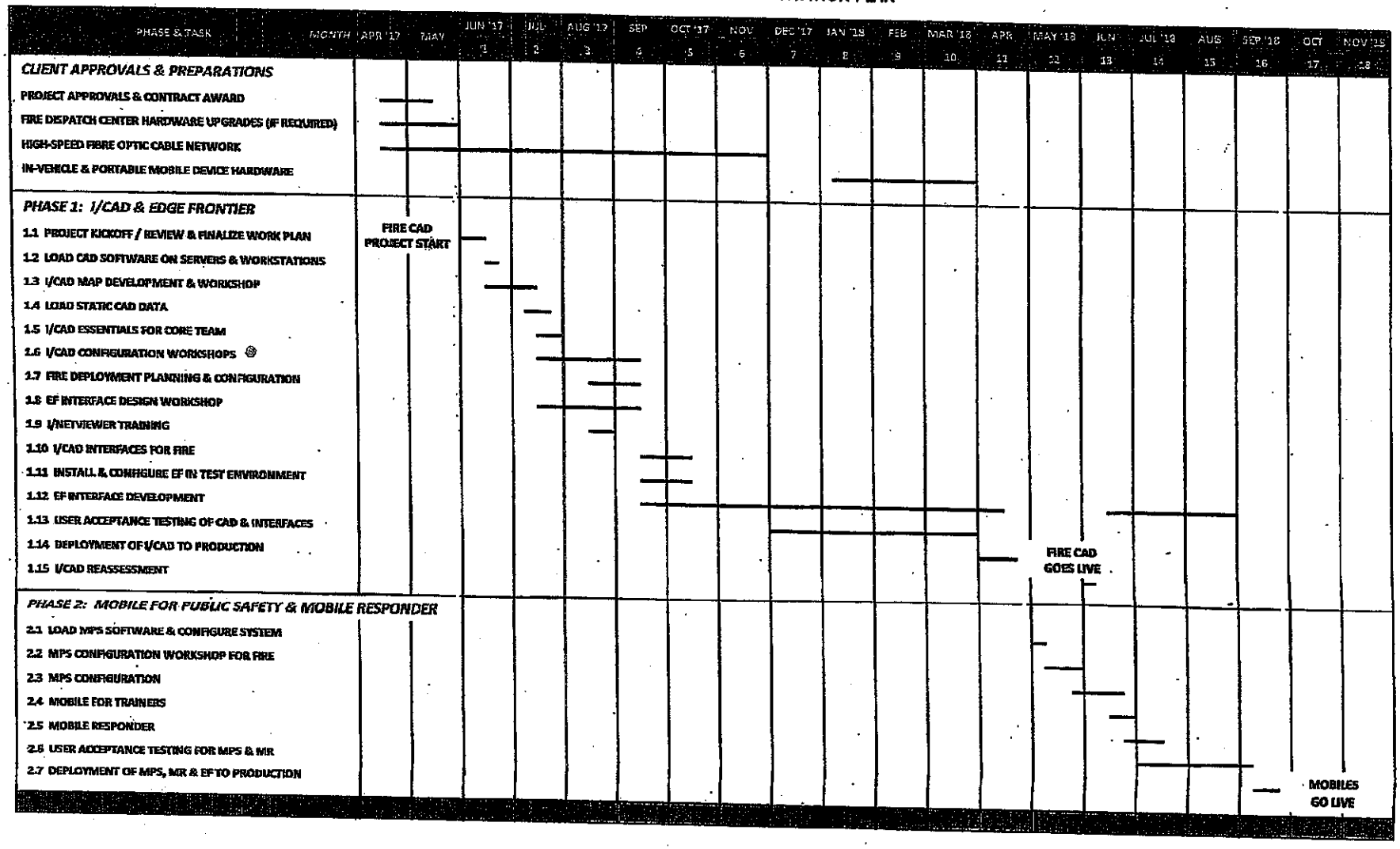
- Phase 1 will focus on implementing the I/CAD software and associated EdgeFrontier (EF) interfaces. This phase will be of about 11-months duration, with the Fire CAD targeted to go live by April 2018.
- Phase 2, which will commence immediately thereafter, will implement the Mobile for Public Safety (MPS) and Mobile Responder (MR) software on in-vehicle and portable mobile device hardware.[8] Phase 2 will be of 5-months duration, with mobile devices targeted to go live by September 2018.

The decision to adopt a 2-phased approach acknowledges that both Kitchener and Cambridge fire departments employ relatively few dispatchers; and to ensure continuous / uninterrupted delivery of fire dispatch services, staff training in the use of the new products will need to be staggered over an extended timeframe.

The 2-phased approach will provide sufficient time to train the staff appropriately in the use of each new product.

[8] To ensure network compatibility, and interoperability with other inter-connected devices, the fire mobile device hardware must comply to specifications set out by WRPS IT Division.

EXHIBIT 6.1: PROJECT IMPLEMENTATION PLAN



6.2.1 Client Approvals and Preparations

For the Fire CAD project to commence by June 1, 2017, client approvals and contract award to Hexagon Safety and Infrastructure must be completed by mid-May 2017.

Kitchener and Cambridge fire departments should complete any required upgrades to their dispatch centers prior to project start (i.e., work station or computer hardware upgrades). [8]

A high-speed fibre optic network connection to the Kitchener fire dispatch center is already in place. The Project Implementation Team will need to arrange a similar connection to the Cambridge fire dispatch center prior to the start of 'Task 1.13, User Acceptance Testing of CAD and Interfaces', which is scheduled to begin early in December 2017.

Phase 2 of the project, in which MPS and MR software is loaded onto the fire departments' in-vehicle and portable mobile device hardware (computers, tablets, smartphones), begins in May 2018. Kitchener and Cambridge fire departments will need to procure the mobile device hardware in advance. The Project Implementation Plan suggests that the procurement of mobile device hardware be commenced in January 2018, and that it be targeted for completion by March 2018 (at least one month in advance of the Phase 2 start). Fire departments, at their discretion, may commence and complete this task earlier.

Important note: To ensure network compatibility, and interoperability with other inter-connected devices, workstation computer hardware and fire mobile device hardware must comply to specifications set out by WRPS IT Division.

6.2.2 Phase 1: I/CAD & EdgeFrontier

Phase one of the project implements the I/CAD module and associated commercial off the shelf (COTS) software interfaces, as well as the EF custom developed interfaces. Services in this phase include: software installation; base configuration for COTS; workshops to define and develop custom configurations; and implementation of custom configurations and EF Systems.

Hexagon Safety and Infrastructure will work closely with subject matter experts assigned to the Client's Project Implementation Team, to configure the I/CAD module. The Project Implementation Team will: participate in workshops and training; supply and load base data; perform end-to-end user acceptance testing; and train end users.

If Phase 1 commences on June 1, 2017 (as currently anticipated), then user acceptance testing will be complete by end of March 2018; and I/CAD deployment to production will be completed in April 2018.

6.2.3 Phase 2: Mobile for Public Safety & Mobile Responder

Phase 2 will implement the MPS and MR software on in-vehicle and portable mobile device hardware procured by the fire departments (i.e., computers, tablets, smartphones). Services in

[8] To ensure network compatibility, and interoperability with other inter-connected devices, computer hardware must comply to specifications set out by WRPS IT Division.

this phase include: software installation; base configuration for COTS mobile software; workshops to develop custom configurations; and implementation of mobile EF Systems.

Hexagon Safety and Infrastructure will work closely with subject matter experts assigned to the Client's Project Implementation Team, to configure the mobile software applications. The Project Implementation Team will: participate in workshops and training; supply and load base data; perform end-to-end user acceptance testing; and train end users. The Project Implementation Team will also be responsible to supply and install the mobile device hardware for end users.

If Phase 2 commences in May 2018 (as currently anticipated), then user acceptance testing and deployment of mobile device software to production will be completed in September 2018.

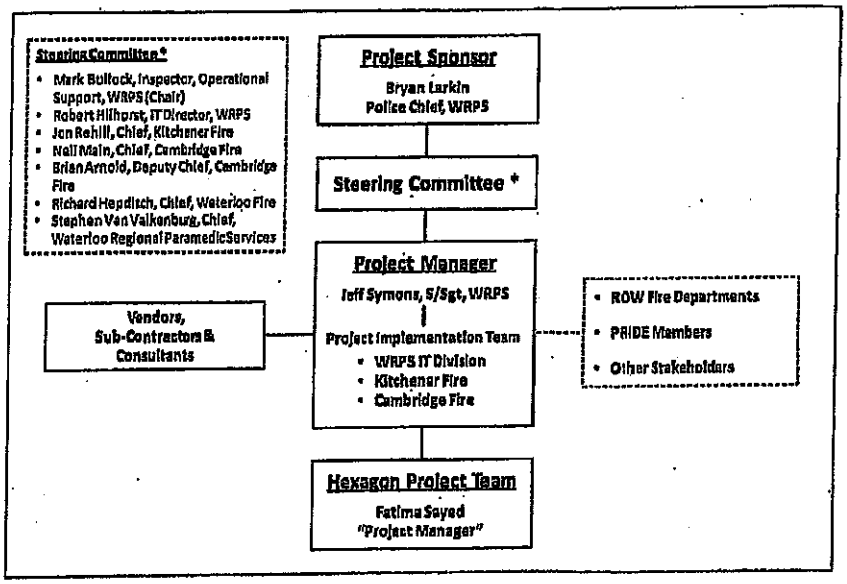
6.3 Project Organization and Resourcing

The Fire CAD Project Organization is shown in Exhibit 6.2. Project oversight will be provided by a Steering Committee that includes senior management representation from WRPS, and the fire departments of Cambridge, Kitchener and Waterloo.

Mark Bullock, Inspector, Operational Support WRPS, will serve as Steering Committee Chair, reporting to the Project Sponsor, Bryan Larkin, Police Chief WRPS.

Jeff Symons, S/Sgt. WRPS, will serve as Project Manager on behalf of the Client group. Jeff will be supported by a Project Implementation Team consisting of subject matter experts from WRPS IT Division, and the Cambridge and Kitchener fire departments.

EXHIBIT 6.2: PROJECT ORGANIZATION



Fatima Sayed will serve as Project Manager for the Hexagon Project Team. The Hexagon Team will be responsible to install and configure: Fire communications servers; ICAD module;

EdgeFrontier (EF) integrated interface platform; and incident management, Mobile for Public Safety (MPS), and Mobile Responder (MR) software.

The Project Implementation Team's responsibilities will be wide ranging, and include:

- Tasks for which the Client group is responsible, e.g.: project administration; project oversight management for the high-speed fibre optic network connection to the Cambridge fire dispatch center; procurement and distribution of mobile device hardware on behalf of Kitchener and Cambridge fire departments; etc.
- Working closely with the Hexagon Project Team throughout both phases of the Fire CAD project; participating in workshops and training, supplying and loading base data, performing end-to-end user acceptance testing, and training end users.
- Interacting as necessary with other members of the PRIDE cooperative; with stakeholders, including local fire departments.; and with other vendors, subcontractors and consultants.

To accommodate the above wide ranging responsibilities, the Project Implementation Team will require the following resourcing:

- A minimum of three (3) subject matter experts, dedicated to this project on a full-time basis for the project's entire 16-month duration, *i.e.: WRPS IT Division, Kitchener Fire and Cambridge Fire to assign one resource respectively.*
- Two (2) additional subject matter experts from December 2017 to April 2018, to support the user acceptance testing and product deployment activities (Tasks 1.13 and 1.14); and again, from July 2018 to September 2018, to support Tasks 2.6 and 2.7. *Kitchener Fire and Cambridge Fire to assign one additional resource respectively.*

These resourcing estimates are based on YRP's experience implementing a shared CAD arrangement for police and fire dispatch in York Region, and on Hexagon's intimate experience with multiple projects of similar scope. The authors of this report support these recommendations.

6.4 Project Costs

Project capital and annual operating costs are set out in Exhibit 6.3 (next page).

ASSUMPTIONS

- The expanded CAD system will include one Fire CAD module that is specifically configured to the joint needs of Cambridge and Kitchener fire departments (i.e., the application design will be the same for both fire dispatch centers).
- The Fire CAD module configuration will be established jointly by Hexagon and subject matter experts from the Cambridge and Kitchener fire departments, by reviewing and aligning departmental workflows, graphical user interface needs, and other parameters.
- Cambridge and Kitchener fire dispatch centers will deploy the new technology at roughly the same time (i.e., within a few days of one-another).

EXHIBIT 6.3: CAPITAL START UP & ANNUAL OPERATING COSTS

	CAPITAL START UP	ANNUAL OPERATING
1. I/CAD, MPS & MR FOR FIRE ADD-ON	**$1,150,000**	**$120,000**
Software Product / Licensing (Hexagon)	$577,000	–
Project Management Services (Hexagon)	$573,000	–
Software Maintenance (Hexagon)	–	$120,000
2. CAD BUSINESS ANALYST	**$67,000**	**$115,000**
3. HARDWARE INFRASTRUCTURE, DATA LINES & NG 911 INTERFACES	**$287,000**	**$70,000**
4. PROJECT IMPLEMENTATION / PROGRAM SUPPORT	**$210,000**	**$67,000**
TOTAL	**$1,714,000**	**$372,000**

6.4.1 I/CAD, MPS & MR for Fire Add-On

APT

These are Hexagon's costs for software product/licensing, project management services, and software maintenance, as detailed by their SOW, in Appendix B. Hexagon's software product fees apply to primary/main production licenses only. There are no costs associated with Backup and Test Licenses.

Hexagon will invoice maintenance when "Production Use" occurs. "Production Use" is defined as the day the software license is deployed in customer's production environment.

Hexagon's costing includes I/Fire Station Alerting software AND Station Pre-Alert software.

6.4.2 CAD Business Analyst

The cost to recruit a CAD Business Analyst, to support the dispatch operations of Fire, is assumed to be about $115,000 a year. This figure includes salary plus 30% in benefits.

It is assumed that the CAD Business Analyst will be in place in June 2017, therefore, capital start up includes 7-months' cost.

A second position in the form of a Mobile Work Station Technician may be needed downstream. It is suggested that the project Steering Committee re-assess the need for a Mobile Work Station Technician in Q3 or Q4 of 2018.

6.4.3 Hardware Infrastructure, Data Lines & NG911 Interfaces

HARDWARE INFRASTRUCTURE COSTS

- It costs about $600,000 a year to maintain the existing I/CAD infrastructure. The costs are apportioned to all PRIDE members. The costs shown in Exhibit 6.3 includes an apportionment to Fire of about $20,000 a year, for the use of existing I/CAD modules that they will require (i.e., $20,000 a year to be split between Kitchener and Cambridge Fire).

Tab 9I

- The costs shown in Exhibit 6.3 include additional servers and routers (in addition to the existing I/CAD infrastructure) to support the Fire add-on's.
- The costs shown include replacement of 3 workstation computers in the Kitchener Fire dispatch center, and 2 in the Cambridge Fire dispatch center, as part of capital start-up. Current cost per device is assumed to be about $3,000.
- The costs shown include provision of 27 MWS for Kitchener, Cambridge and Waterloo fire vehicles, as part of capital start-up. Kitchener Fire advises that they require 11 MWS; Cambridge Fire requires 7 MWS; and Waterloo requires 9 MWS. Current cost per device is assumed to be about $7,000.
- Exhibit 6.3 excludes the cost of in-vehicle mounts and installation costs for MWS, which could be an additional $1,500 per device.
- Exhibit 6.3 excludes annual costs for MODEM to support in-vehicle MWS. It is assumed that such costs are already covered by way of other corporate arrangements.
- The proposed system is sufficiently flexible to accommodate additional in-vehicle MWS (e.g., for Wellesley, Wilmot, Woolwich and North Dumfries fire vehicles). The costs shown in Exhibit 6.3 do not include such additional MWS.
- It is anticipated that workstation computers and in-vehicle MWS will be refreshed on a 5-year cycle. The costs shown in Exhibit 6.3 do not include refresh costs. It is advisable that each fire service should set aside an annual reserve equal to 20% of the replacement cost of such devices.
- Exhibit 6.3 excludes potential costs that existing the fire RMS vendor may charge to interface with I/CAD.

DATA LINES & NG911 INTERFACES

A high-speed fibre optic network connection to the Kitchener fire dispatch center is already in place. A similar connection to the Cambridge fire dispatch center needs to be implemented. Exhibit 6.3 excludes the front-end cost to install this high-speed fibre optic connection. Further research is needed to identify this cost.

The above notwithstanding, the exhibit includes an annual cost allowance to maintain high-speed fibre optic network connections to both the Kitchener and Cambridge fire dispatch centers. The exhibit also includes an annual cost allowance to maintain a data line connection to WRPS headquarters.

Exhibit 6.3 also includes a capital start-up and ongoing annual cost allowance to install NG911 interfaces.

6.4.4 Project Implementation / Program Support

Project implementation is assumed to be approximately 15% of total cost, which is reasonable for projects of similar scope. Annual program support is assumed to equal 0.5 FTE (or about $67,000 a year).

Kitchener Fire and Cambridge Fire will be expected to assign subject matter experts to the Project Implementation Team. Exhibit 6.3 excludes the internal costs to Kitchener and Cambridge fire, for the assignment of such personnel to the project.

Total costs shown in Exhibit 6.3 exclude applicable taxes.

6.5 Proposed Apportionment of Project Costs

The proposed apportionment of project costs is shown in Exhibit 6.4. Key assumptions / highlights are discussed below.

EXHIBIT 6.4: PROPOSED COST APPORTIONMENT

	CAPITAL START UP			ANNUAL OPERATING		
	TOTAL	KITCHENER	CAMBRIDGE	TOTAL	KITCHENER	CAMBRIDGE
1. I/CAD, MPS & MR FOR FIRE ADD-ON	**$1,150,000**	**$689,000**	**$461,000**	**$120,000**	**$72,000**	**$48,000**
Software Product / Licensing *(Hexagon)*	$577,000	$345,000	$232,000	--	--	--
Project Management Services *(Hexagon)*	$573,000	$344,000	$229,000	--	--	--
Software Maintenance *(Hexagon)*	--	--	--	$120,000	$72,000	$48,000
2. CAD BUSINESS ANALYST	**$67,000**	**$40,000**	**$27,000**	**$115,000**	**$69,000**	**$46,000**
3. HARDWARE INFRASTRUCTURE, DATA LINES & NG 911 INTERFACES	**$287,000**	**$194,000**	**$93,000**	**$70,000**	**$38,000**	**$32,000**
4. PROJECT IMPLEMENTATION / PROGRAM SUPPORT	**$210,000**	**$126,000**	**$84,000**	**$67,000**	**$40,000**	**$27,000**
TOTAL	**$1,714,000**	**$1,049,000**	**$665,000**	**$372,000**	**$219,000**	**$153,000**

1,610,794 — 30

Project costs will be apportioned on a full cost recovery basis, to Kitchener and Cambridge fire departments (on behalf of their respective clientele).

Kitchener Fire and the fire departments under contract to Kitchener (Wellesley, Wilmot and Woolwich), will be define their respective cost sharing and invoicing arrangements. Similarly, Cambridge Fire and North Dumfries fire department (which is under contract to Cambridge) will be define their respective cost sharing and invoicing arrangements.

I/CAD, MPS AND MR FOR FIRE ADD-ON

- Costs for the following components are apportioned to Kitchener and Cambridge based on the number of workstations in each fire dispatch center: I/CAD software product / licensing; project management services; and software maintenance. Since Kitchener is outfitted with 3 workstations and Cambridge with 2 workstations, the costs are apportioned as follows: Kitchener - 60%, and Cambridge - 40%.

- The cost for MPS software product / licensing is apportioned based on the number of MWS required by each service. Kitchener Fire advises that they require 11 MWS; Cambridge Fire requires 7 MWS; and Waterloo requires 9 MWS.
- Costs assigned to Kitchener in Exhibit 6.4, include 20 MPS software product / licenses (i.e., their 11 MWS plus the 9 MWS required by Waterloo Fire, which is under contract to Kitchener). It is assumed that Kitchener and Waterloo fire departments will define their cost sharing and invoicing arrangements.
- The cost for MR software product / licensing will be apportioned based on the number of portable communications devices required by each service.

CAD BUSINESS ANALYST

This cost is apportioned 60% to Kitchener and 40% to Cambridge, based on their respective number of dispatch workstations.

HARDWARE INFRASTRUCTURE, DATA LINES & NG911 INTERFACES

- It was previously mentioned that fire is apportioned about $20,000 a year, for the use of existing I/CAD modules. This cost is apportioned 60% to Kitchener and 40% to Cambridge, based on their respective number of dispatch workstations.
- Costs for additional servers and routers to support the Fire add-on's (in addition to the existing I/CAD infrastructure), are apportioned 60% to Kitchener and 40% to Cambridge, based on their respective number of dispatch workstations.
- Costs to replace workstation computers is based on the current number in each fire dispatch center (i.e., Kitchener - 3, and Cambridge - 2).
- The cost for MWS is based on the number of MWS required by each service (Kitchener - 11, Cambridge - 7, and Waterloo - 9). Costs assigned to Kitchener in Exhibit 6.4, include 20 MWS (i.e., their 11 plus the 9 required by Waterloo Fire).
- The cost to maintain a high-speed fibre optic connection to the Kitchener fire dispatch center is estimated at $12,600 a year. The cost for Cambridge will be the same.
- Fire is apportioned about $6,600 a year for the use of the data line connection to WRPS headquarters. This cost is apportioned 60% to Kitchener and 40% to Cambridge, based on their respective number of dispatch workstations.
- WRPS sourced the cost of NG911 interfaces from Bell, who advise that the capital start-up cost will be about $23,400 per dispatch center, and that the ongoing annual will be approximately $7,600 per dispatch center.

PROJECT IMPLEMENTATION / PROGRAM SUPPORT

These costs are apportioned 60% to Kitchener and 40% to Cambridge, based on their respective number of dispatch workstations.

APPENDIX A – LIST OF ACRONYMS

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APCO	Association of Public Safety Communications Officials
AVL	Automatic Vehicle Location
CACC	Central Ambulance Communications Centre
CAD	Computer Aided Dispatch
CAO	Chief Administrative Officer
COTS	Commercial Off the Shelf
CPIC	Canadian Police Information Center
DPCI2	Dispatch Priority Card System V2.0
E9-1-1	Enhanced 9-1-1
EDACS	Enhanced Digital Access Communications System
EF	EdgeFrontier
EMS	Emergency Medical Services
EMS-TIF	Emergency Medical Services – Technology Interoperability Framework
FTE	Full time equivalent
GIS	Geographic Information System
GPS	Global Positioning Systems
I/CAD	Intergraph Computer Aided Dispatch
IT	Information Technology
MDT	Mobile Data Terminal
MOHLTC	Ministry of Health and Long-Term Care
MPS	Mobile for Public Safety
MR	Mobile Responder
MWS	Mobile Work Station
NG9-1-1	Next Generation 9-1-1. Sometimes also shown as NG911.
PSAP	Public Safety Answering Point
PRIDE	Police Regionalized Information Data Entry
RCMP	Royal Canadian Mounted Police
RMS	Records Management System
SOP	Standard Operating Procedure
SOW	Statement of Work
QA	Quality Assurance
QC	Quality Control
WRPS	Waterloo Regional Police Services
YRP	York Regional Police

APPENDIX B – SOFTWARE PRODUCT INFORMATION

APPENDIX B: SOFTWARE PRODUCT INFORMATION

Source: "Statement of Work - Appendix B", Hexagon Safety & Infrastructure, February 2017, adjusted following a survey of fire department requirements by the Project Implementation Team. The adjusted figures are shown in italics.

B.1 Software for Kitchener & Cambridge Fire Add-On

DESCRIPTION	QTY.	NET PRICE	EXT PRICE
I/Dispatcher NL	5	$32,100	$160,500
I/Fire Station Alerting NL	2	$19,400	$38,800
I/Fire Station Printing NL	1	$19,400	$19,400
I/FRMS-CADlink NL	1	$19,400	$19,400
I/Page NL	2	$38,900	$77,800
I/NetViewer – 25 users	1	$77,800	$77,800
EdgeFrontier Runtime Engine	2	$34,900	$69,800
Intergraph ANI/ALI Interface for AQS	2	$10,000	$20,000
I/Push To Talk NL	1	$19,400	$19,400
Mobile for Public Safety CC *(Quantity increased from 20 to 27. Price adjusted proportionately)*	*27*	$2,000	*$54,000*
Intergraph Mobile Responder Client – *50 Tablet CALs (Quantity reduced from 100 to 50. Price adjusted proportionately)*	1	*$19,650*	*$19,650*
Product Total – Primary/Production Licenses			***$576,550***

Note: Software Product fees apply to primary/main production licenses only. There are no costs associated with Backup and Test Licenses.

B.2 Maintenance

DESCRIPTION	QTY.	# OF MTHS	MONTHLY UNIT NET PRICE	EXT PRICE
I/Dispatcher NL	5	12	$552	$33,120
I/Fire Station Alerting NL	2	12	$336	$8,064

I/Fire Station Printing NL	1	12	$336	$4,032
I/FRMS-CADlink NL	1	12	$336	$4,032
I/Page NL	2	12	$669	$16,056
I/NetViewer – 25 users	1	12	$1,337	$16,044
EdgeFrontier Runtime Engine	2	12	$698	$16,752
Intergraph ANI/ALI Interface for AQS	2	12	$0	$0
I/Push To Talk NL	1	12	$336	$4,032
Mobile for Public Safety CC *(Quantity increased from 20 to 27. Price adjusted proportionately)*	*27*	12	$40	*$12,960*
Intergraph Mobile Responder Client – *50 Tablet CALs (Quantity reduced from 100 to 50. Price adjusted proportionately)*	1	12	$751	*$4,506*
Maintenance Total – Primary/Production Licenses				***$119,598***

Note: Maintenance will be invoiced when "Production Use" occurs. "Production Use" is defined as the day the software license is deployed in CUSTOMER's production environment.

APPENDIX C – CAD BUSINESS ANALYST & MOBILE WORK STATION TECHNICIAN

APPENDIX C: CAD BUSINESS ANALYST & MOBILE WORK STATION TECHNICIAN

Section 5 of this report recommends that WRPS IT Division should recruit a CAD Business Analyst, to support fire dispatch operations in Waterloo Region. Also, that the project Steering Committee should assess the need for a Mobile Work Station Technician, at a later date.

The duties and responsibilities of these positions are summarized below. The information is intended to describe the general level and nature of each position. The information is not intended to represent a comprehensive listing of all duties and responsibilities.

C.1 CAD Business Analyst

The position is dedicated to Fire dispatch operations.

Assists in the design, development, implementation and maintenance of systems and project solutions for Fire members of the PRIDE cooperative.

Analyzes user requirements and generates alternative approaches to information systems design. Plans and prioritizes needs; explores available options, and recommends solutions.

Provides quality, client focused business process and technology support, while also working with Fire department staff to implement Business Applications initiatives and related system interfaces.

Investigates, analyzes, troubleshoots and manages issues in regard to Fire-related Business Applications.

Responsible for data management, system management and version installs in the Business Applications computing environment, including configuration, security, resource monitoring, reporting, troubleshooting and the development of specialized programs.

Manages the deployment, testing, training, modification and implementation of systems or system enhancements by way of new releases.

Works closely with other IT staff to coordinate current and future project plans and activities including coordination and technical assistance to facilitate specific development projects that involve the computing environment, the coordination of software upgrades and the installation of new products.

Assists in forecasting future utilization and equipment requirements. Designs, develops, sets standards and monitors the necessary infrastructure process associated with the application of the Business Applications, CAD and Mobile Work Station (MWS) system changes, implementations and maintenance.

Maintains working knowledge of all legislative changes which may impact Fire dispatch operations. Recommends changes to meet mandated requirements.

Assists in the development of IT-related annual plans for Fire dispatch, ensuring that major initiatives are in line with the Information Technology, Information Services and PRIDE strategic plan.

Assists in the research, design, development and delivery of systems-related training programs for Fire members of PRIDE.

Liaises with vendors and the Region of Waterloo to ensure schedules, guidelines and protocols are adhered to, and client requirements achieved.

Ensures that computer hardware and software applications used by Fire are to the high level of standards required for the entire PRIDE organization, and that they properly interface to the Business Applications.

C.2 Mobile Work Station Technician

The position is dedicated to Fire dispatch operations.

Answers calls from end-users experiencing problems with mobile computing and communications hardware.

Assists with Fire MDT and MR related issues.

Provides technical support and maintenance of voice and data communications equipment, RF equipment, instruments and peripherals to end-users.

Monitors alarm conditions on Radio infrastructure, environment, power and door alarms at all remote tower locations.

Maintains a daily log of maintenance and preventative measures conducted.

Maintains up to date systems documentation.

Installs, tests, troubleshoots, evaluates and repairs in-vehicle voice and data communications components and related equipment.

Maintains an inventory on all related assets, including related stakeholders.

Remains current with new developments in public safety communications standards, communications technology trends, networks, software and hardware.

Liaises with WRPS service contract partners, hardware and software vendors.

Writes, modifies, integrates and tests software code.

Creates and maintains corporate MWS image, including operating systems, enterprise and in-house applications.

Provides support, troubleshooting and repair of MWS computer hardware on front-line vehicles.

Provides preventative maintenance, cleaning and refurbishing of laptops, and cellular modems during the transfer process.

Prepares reports and other documentation on the status, operation and maintenance of software.

Evaluates and installs computer hardware, networking software and operating system software.

Implements data, software and hardware security procedures.

Maintains up to date documentation, as required.

Researches, evaluates and integrates new network system and data communication hardware and software.