Emergency Service Planning

The Regional Municipality of Waterloo

Paramedic Services Master Plan (2026 to 2035)

Final Report

July 22, 2025
ORH/RWP/2

PLAN. PREPARE. **PERFORM.**

ASSOCIATION OF AMBULANCE CHIEF EXECUTIVES

EXECUTIVE SUMMARY

0.1 Operational Research in Health Limited (ORH) was commissioned to prepare an updated Paramedic Services Master Plan through to 2035 for the Regional Municipality of Waterloo (the Region). **This is the Final Report for the review**.

0.2 ORH partnered with the Association of Ambulance Chief Executives (AACE) who advise paramedic services on organizational best practice, focusing on support services and broader service considerations within this review.

0.3 The approach to the review involved a combination of quantitative and qualitative analysis, modelling, and stakeholder consultation. A Steering Group, with representation from RoWPS, the Region, ORH, and AACE, was set up to oversee the inputs and outputs of the review.

0.4 A glossary of terms is provided in Appendix **G1**.

Service Analysis and Progress Review

0.5 ORH was well supported by RoWPS staff and the regional Epidemiology and Health Analytics (EHA) team in collecting an array of different datasets to enable a quantitative and qualitative analysis of RoWPS.

0.6 Average daily demand has continually increased over the six-year sample period, from 132 incidents per day in 2019 to 166 incidents per day in 2024. This is equivalent to a 4.7% increase per year. All Local Area Municipalities (LAMs) experienced an increase in demand during this period.

0.7 Across the sample, around 72% of incidents resulted in a patient being transported to hospital, with variation by category.

0.8 Between 2019 and 2024, CTAS performance targets were met (70% for CTAS1, 80% for CTAS2 through CTAS5), though performance was lower in 2023 than in 2019. The mean response time for P4 incidents was around 7 minutes, and the 80th percentile response time was around 9 minutes (having improved in 2024).

0.9 The average occupied time (from vehicle enroute to vehicle clear) per incident for P4 and P3 incidents was almost two hours. Time at hospital is by far the largest contributor to the overall occupied time.

0.10 As of 2025, RoWPS planned to deploy 4,788 PTU hours per week and 252 ERU hours per week. In early 2022 the filled shift rate was around 100%, but this fell to around 90% in 2024. Clearly RoWPS is facing challenges in filling their planned shifts, largely due to an increase in sickness-related absences and a corresponding lack of relief staff to cover these absences. Across the last two years of the sample, average PTU utilization was around 44% and ERU utilization was around 9%.

0.11 A qualitative evaluation of current organizational structures and support services arrangements has been provided, encompassing a wide range of topics including: response models; staffing, scheduling and management; clinical supervision; community paramedicine; and fleet, logistics, and other support services.

0.12 AACE were asked to review the current organizational structures and support services arrangements within RoWPS in parallel with the quantitative analysis of operations undertaken by ORH. Information was gathered during a site visit and involved interviews with key individuals, and a review of pertinent documentation. A qualitative evaluation has been provided which encompasses the following topics: leadership and current organizational structure, healthcare strategy, clinical response model, frontline staffing and scheduling, frontline management, clinical supervision, community paramedicine, fleet and logistics, additional support services, and emergency management.

The Model Base Position (2025)

0.13 ORH uses sophisticated predictive modelling tools that have been developed in-house to assist with the development of master plans for paramedic services. A virtual replica of RoWPS operations was created within AmbSim by populating inputs using parameters derived from the most recent two years of analysis. A 2025 Base Position was then created to provide a comparison for future scenarios.

The Do Nothing Scenario (2026 to 2035)

0.14 To understand resource requirements for the next ten years, a demand projection was required. Demand projections were initially created using a population-based projection method with the underlying hypothesis that demand is strongly related to the population age profile.

0.15 The population-based projection was used to create a low growth demand projection, representing a 3.9% increase per annum between 2024 and 2035. A high growth demand projection was also created, using the 5.2% increase per annum observed in demand between 2015 and 2024. Finally, a core growth projection was created by taking an average of the high and low growth projections, which represents a 4.6% increase per annum.

0.16 To highlight the impact on future performance if no investment is made to RoWPS frontline operations, the demand projections were applied to the Base Position in AmbSim. No other operational changes or deployment enhancements were made (a 'Do Nothing' scenario). P4 response performance would degrade significantly for all LAMs against all measures, including an almost 6-minute reduction in overall 80th percentile response times, from 09m03s in the Base Position to 14m44s in 2035.

Frontline Resource and Facility Recommendations (2035)

0.17 To offset the projected demand increases and negative impacts on response performance outlined in the previous section, RoWPS will need to deploy additional resources by 2035. An additional 1,344 PTU planned weekly vehicle hours are recommended by 2035 to maintain overall Base Position response performance (with an 80th percentile response time of 08m55s). This is equivalent to a 27% increase in planned vehicle hours to meet a 57% increase in demand.

0.18 All existing sites already have challenges with capacity and limited ability to expand, and there is no space to accommodate the resources that are required to offset demand increases. Both DCM and AmbSim were therefore used to identify a recommended facility configuration that involves: retaining both hub sites and seven existing stations; relocating four stations to more optimal locations (02 Waterloo, 05 Pinebush, 08 Weber and Water, and 09 Conestoga); adding four new sites, one of which is already planned (651 Concession, Elmira, Williamsburg, and Centreville); and adding a third hub in Breslau.

0.19 With these facility enhancements and the recommended 1,344 weekly vehicle hours, response performance in 2035 is now set to be maintained or improved in all LAMs (with an 80th percentile response time of 08m18s). However, PTU utilization would reach 53%, compared to 44% in the Base Position.

0.20 A secondary objective was set to maintain PTU utilization at Base Position levels. To do so, an additional 2,352 PTU planned weekly vehicle hours are required by 2035 (including the 1,344 hours identified to maintain performance), equivalent to a 47% increase in planned vehicle hours. P4 response performance is significantly improved for all LAMs (with an 80th percentile response time of 07m45s).

Frontline Sensitivity Modelling (2035)

0.21 Frontline sensitivity modelling was undertaken to test assumptions about the parameters included in the Maintain Performance scenario for 2035, including: MPDS and alternative operating models, call mitigation strategies, the new hospital, alternative growth scenarios, alternative facility locations, and alternative relief rate scenarios.

Support Services Recommendations

0.22 This report forecasts a significant uplift in activity for RoWPS over the next ten years, and this will require increases in frontline resources and assets as well as proportionate growth in management structures and support services. A comprehensive list of recommendations has been compiled in Summary Figure **A**.

Summary Figure A: Support and Management Services Recommendations

Recommendations	
1A	Initiate strategic discussions around the **future ownership of call answering, clinical triage, and dispatch functions**
1B	Seek agreement to enable the **placement of an experienced Paramedic Operations Superintendent into the CACC** to work in partnership with the leadership team and dispatchers to support operational delivery as soon as is practicable.
2	Co-design a new **regional clinical response model** incorporating alternative care pathways, and including **expansion of the CP program**
3A	Develop a Commander level **strategic workforce planning role**
3B	Undertake an in-depth review to identify the **primary drivers for staff retention** and sickness absence challenges
3C	Consider requesting **additional Regional HR support** or recruit an additional RTW co-ordinator
4A	Consider creating an **ACP bursary scheme** to encourage professional development
4B	Develop an **ACP deployment plan** targeting ACPs based on MPDS determinant
5	Seek funding to establish a formalized **Emergency Management lead role**
6A	Procure a **replacement ePCR system**
6B	Fund and appoint a **fixed term IT professional** (to support 6C and 6D)
6C	Scope and deliver a **comprehensive review of IT systems** and future needs
6D	Develop a dedicated **digital enabling strategy**
7	Develop an internal **business intelligence role**
8A	Develop mutually agreed **Service Level Agreements** across support services
8B	Consider developing a **Business Support Manager role**
9A	Undertake a more in-depth **review of the scheduling function**
9B	Procure a more agile and intuitive **scheduling software product**
10	Adopt **a 20:1 ratio of Operations Superintendents** to frontline staff, therefore requiring an additional 7 FTE (Maintain Performance) or 10 FTE (Maintain Utilization) by 2035
11A	**Extend Logistics Support provision** to provide 24-hour coverage (by working differently within the existing funded establishment)
11B	Maintain the existing **10:1 ratio of Logistics Support** staff to frontline vehicles, therefore requiring an additional 6 FTE (Maintain Performance) or 9 FTE (Maintain Utilization) by 2035
11C	Phased increase in the operating hours for **Logistics Superintendents with full 24/7 coverage** in place by 2033 (when the Third Hub is operational), requiring an additional 4 FTE
12A	Establish a **Professional Standards Commander role**
12B	Establish an **additional funded QA Specialist** role as soon as is practicable, rising to a total of 4 FTE by 2035
12C	Utilize some of the existing program management support resources to undertake an **options appraisal for clinical supervision**
13	Develop and deliver a funded **programme of leadership, education and training** across the entire leadership group within RoWPS

0.23 The organization will also need to develop enabling strategies to support them in continuing to deliver high-quality services. Digitalization will play a significantly increased role in supporting existing staff and leadership, as well as in maximizing the efficiency of any additional functions or roles that may be required in the future.

Phasing of Recommendations (2026 to 2035)

0.24 The resource and facility requirements recommendations for 2035 are proposed to be implemented gradually over the next ten years. The process for determining an appropriate trajectory aims to stagger increases so that the financial impacts are as evenly spread across the ten years as possible, while balancing this with the need to improve performance in an equitable fashion across all LAMs.

0.25 Following consultation with the Steering Group, the phasing of frontline changes has been set out according to the trajectory outlined in Summary Figure **B**.

0.26 Assuming a 42-hour working week, two staff per PTU, and an increase in relief capacity to 40% for all FTE by 2035, an additional 116 (Maintain Performance) or 185 (Maintain Utilization) frontline FTE will be required. It should be noted that, if the drivers of sickness and absence could be identified and reduced, then the FTE requirements will be lower than those quoted here as the assumed relief requirement can be reduced.

0.27 Assuming a 30% spare rate, an additional 13 (Maintain Performance) or 28 (Maintain Utilization) PTU vehicles will be required.

0.28 Further to this, short-term expansion of the ERU program is recommended in 2026, with the addition of two 12/7 urban ERUs (requiring an additional four core FTE plus 40% relief). While maximizing the use of ERUs through enhanced treat and release programs may still be some years away, this expansion would enable ERUs to respond to the sickest patients as quickly as possible in urban areas (alongside a PTU response) and, if staffed by ACPs, provide clinical support for more complex incidents. Treat and release efficiency should then be explored further in future as RoWPS' clinical strategy develops, building on this initial ERU expansion.

0.29 In a similar fashion, the phasing of support and management resource changes has been set out according to the trajectory outlined in Summary Figure **C**.

0.30 While not assigned to particular years, the phased resource enhancements should be supplemented by a number of reviews and the development of enabling strategies.

0.31 As demand continues to increase, the CP program will be an integral part of RoWPS' clinical strategy and will therefore need to expand accordingly. The exact timings of this expansion will be dependent on the implementation of the recommended new clinical response model.

Summary Figure B: Frontline Resources and Facilities Phasing Plan

Maintain Performance Scenario

Year(*)	Facility Changes		Peak PTUs		Total PTUs	Weekly Vehicle Hours	Frontline FTE	Relief Rate
	Opened	Closed	Day	Night				
2025	-	-	38	20	55	5,040	301	28%
2026	-	-	38	21	55	5,208	315	30%
2027	651 Concession	-	39	21	56	5,292	322	31%
2028	Williamsburg	-	40	22	58	5,460	337	33%
2029	King St N / Columbia St	02 Waterloo	41	23	60	5,628	351	34%
2030	Elmira	-	41	24	60	5,712	359	35%
2031	Can-Amera Pkwy / Franklin Blvd	05 Pinebush	43	25	62	5,964	381	37%
2032	Centreville	-	44	25	64	6,048	388	38%
2033	**Third Hub**	-	46	25	67	6,216	402	39%
2034	Doon South Dr / Doon Mills Dr	09 Conestoga	46	26	67	6,300	410	39%
2035	King St E / Benton St	08 Weber & Water	47	26	68	6,384	417	40%

Maintain Utilization Scenario

Year(*)	Facility Changes		Peak PTUs		Total PTUs	Weekly Vehicle Hours	Frontline FTE	Relief Rate
	Opened	Closed	Day	Night				
2025	-	-	38	20	55	5,040	301	28%
2026	-	-	38	21	55	5,208	314	30%
2027	651 Concession	-	40	21	58	5,376	327	31%
2028	Williamsburg	-	42	22	61	5,628	347	32%
2029	King St N / Columbia St	02 Waterloo	44	24	64	5,964	373	34%
2030	Elmira	-	46	25	67	6,216	393	35%
2031	Can-Amera Pkwy / Franklin Blvd	05 Pinebush	49	26	71	6,552	419	37%
2032	Centreville	-	51	27	74	6,804	439	38%
2033	**Third Hub**	-	53	27	77	6,972	452	39%
2034	Doon South Dr / Doon Mills Dr	09 Conestoga	55	28	80	7,224	472	40%
2035	King St E / Benton St	08 Weber & Water	57	28	83	7,392	485	40%

Note: redeployment of SNorth shifts in 2026: 07:00-19:00, 08:00-20:00, 09:00-21:00 and 17:00-05:00 at 00 Maplegrove, 12:00-00:00 and 17:00-05:00 (converted to 20:00-08:00) at 14 Headquarters

Note: redeployment in 2033 of 6 x 24/7 and 2 x 12/7 shifts from 14 Headquarters to Third Hub for Maintain Performance scenario
redeployment in 2033 of 7 x 24/7 and 6 x 12/7 shifts from 14 Headquarters to Third Hub for Maintain Utilization scenario

Note: Weekly Vehicle Hours and Frontline FTE includes rural ERUs (as deployed in the 2025 Base Position)

(*) Phasing year refers to the year of full implementation, not necessarily the year they are included in the budget (for example, staffing enhancements could be added late in the prior calendar year)

Summary Figure C: Support and Management Resources Phasing Plan

Year (*)	Operations Superintendents		Logistics Support Staff		Other Staff Enhancements	
	Maintain Performance	Maintain Utilization	Maintain Performance	Maintain Utilization		
2025	15	15	15	15	-	-
2026	16	16	16	16	+ Paramedic Operations Superintendent in CACC (3 FTE), 12/7 coverage + QA Specialist (1 FTE)	+ Additional HR Support / RTW Co-Ordinator + Fixed Term IT Professional (1 FTE)
2027	16	17	17	17	+ Paramedic Operations Superintendent in CACC (3 FTE), 24/7 coverage + Logistics Superintendents (2 FTE), 16/7 coverage + Workforce Planning Lead (1 FTE)	
2028	17	18	17	18		
2029	18	19	18	19		
2030	18	20	18	20	+ QA Specialist (1 FTE)	
2031	19	21	19	21		+ Professional Standards Commander (1 FTE) + Emergency Management Lead (1 FTE) + Business Intelligence Analyst (1 FTE) + Business Support Manager (1 FTE)
2032	20	22	19	22		
2033	21	23	20	22	+ Logistics Superintendents (2 FTE), 24/7 coverage	
2034	21	24	20	23		
2035	22	25	21	24	+ QA Specialist (1 FTE)	

(*) Phasing year refers to the year of full implementation, not necessarily the year they are included in the budget (for example, staffing enhancements could be added late in the prior calendar year)

Note: 'Other Staff Enhancements' with no defined phasing year should be implemented as soon as is financially and operationally practicable

Contents

1 Introduction

1.1 Operational Research in Health Limited (ORH) was commissioned to prepare an updated Paramedic Services Master Plan through to 2035 for the Regional Municipality of Waterloo (the Region). **This is the Final Report for the review**.

1.2 The Master Plan was required to encompass the following focus areas for the Region of Waterloo Paramedic Services (RoWPS):

(a) Service drivers such as call volumes and population projections

(b) Service targets such as response times considering urban and rural differences

(c) Resources including facility locations, frontline staff and vehicle requirements, and support staff and organizational wellness

(d) Optimizing overall response including triage and destination protocols given the pending implementation of the Medical Priority Dispatch System (MPDS)

1.3 ORH partnered with the Association of Ambulance Chief Executives (AACE) who advise paramedic services on organizational best practice, focusing on support services and broader service considerations within this review.

1.4 The approach to the review involved a combination of quantitative and qualitative analysis, modelling, and stakeholder consultation. A Steering Group, with representation from RoWPS, the Region, ORH and AACE, was set up to oversee the inputs and outputs of the review.

1.5 ORH collected and analyzed detailed workload, resourcing and organizational data to review existing and historical frontline operations and support services against the recommendations of the previous master plans (see Section 2).

1.6 ORH's optimization and simulation models were set up and validated to create a 'Base Position' for future scenarios to be tested against (see Section 3).

1.7 Demand projections were created to quantify the impact of population and demographic changes through to 2035 on paramedic service call volumes. These were modelled under a 'Do Nothing' scenario to understand the potential response time deterioration (see Section 4).

1.8 The optimization and simulation models were then used to make frontline resource and facility recommendations for 2035 (see Section 5) and to also test the impact of a range of alternative sensitivity modelling scenarios (see Section 6). Through consultation, benchmarking, and literature reviews, a series of support and management service recommendations have been made (see Section 7).

1.9 These recommendations have then been incorporated into a phasing plan for 2026 to 2035 (see Section 8).

2 Service Analysis and Progress Review

ORH was well supported by RoWPS staff and the regional Epidemiology and Health Analytics (EHA) team in collecting an array of different datasets to enable a quantitative and qualitative analysis of RoWPS.

Average daily demand has continually increased over the six-year sample period, from 132 incidents per day in 2019 to 166 incidents per day in 2024. This is equivalent to a 4.7% increase per year. All Local Area Municipalities (LAMs) have experienced an increase in demand during this period.

Across the sample, around 72% of incidents resulted in a patient being transported to hospital, with variation by category.

Between 2019 and 2024, CTAS performance targets were met (70% for CTAS1, 80% for CTAS2 through CTAS5), though performance was lower in 2023 than in 2019. The mean response time for P4 incidents was around 7 minutes, and the 80th percentile response time was around 9 minutes (having improved in 2024).

The average occupied time (from vehicle enroute to vehicle clear) per incident for P4 and P3 incidents was almost two hours. Time at hospital is by far the largest contributor to the overall occupied time.

As of 2025, RoWPS planned to deploy 4,788 Patient Transport Unit (PTU) hours per week and 252 Emergency Response Unit (ERU) hours per week. In early 2022 the filled shift rate was around 100%, but this fell to around 90% in 2024. Clearly RoWPS is facing challenges in filling their planned shifts, largely due to an increase in sickness-related absences and a corresponding lack of relief staff to cover these absences. Across the last two years of the sample, average PTU utilization was around 44%, and ERU utilization around 9%.

A qualitative evaluation of current organizational structures and support service arrangements has been provided, encompassing a wide range of topics such as: response models; staffing, scheduling and management; clinical supervision; community paramedicine; and fleet, logistics, and other support services.

Frontline Service Analysis

Data Collection and Review

2.1 ORH was well supported by RoWPS staff and the regional Epidemiology and Health Analytics (EHA) team in collecting an array of different datasets to enable a quantitative and qualitative analysis of RoWPS:

- Ambulance Dispatch Reporting System (ADRS) call and workload data (from January 2019 to October 2024)
- Electronic Patient Care Record (ePCR) data for the same period with supplementary fields not present in ADRS, such as patient age group and destination bypass outcomes
- VisiCAD data (from January 2022 to October 2024) which was processed to identify actual vehicle shift start and end times, system coverage deployments (standby moves), meal breaks, and other reasons for vehicle unavailability
- Planned resourcing data (from January 2019 to October 2024) and upstaffing/downstaffing data
- Operational policies and procedures (deployment protocols, meal break policies, destination bypass protocols, etc)
- Planning data such as historical and projected population demographics and traffic zone population allocations
- Organizational structure information such as staff establishments, job descriptions, and an organizational chart
- Literature such as previous master plan reports, reports to Council, and the Ambulance Service Review report, etc

2.1 RoWPS also provided demand and performance reports for ORH to replicate. ORH was successful in replicating these, which suggests that the data provided was complete and the interpretation of the data was correct.

2.2 There were some minor differences in the way ORH calculates 80th percentile performance for its reports compared to the reports provided by the EHA team. ORH excludes calls where another service responded to the call first, even if RoWPS also responded. However, the EHA team includes calls where another service responded to the call first, but only captures the response time of the RoWPS vehicle.

2.3 It should be noted that in most cases there is little variation between the outputs of the two approaches (a difference of one or two seconds), however in some rural areas with low call volumes the inclusion/exclusion of a handful of incidents can have a greater impact on response performance. For example, for Wellesley in 2023 there was a 35-second difference in 80th percentile response performance between the two approaches (16m31s vs 17m06s).

2.4 Some ADRS data issues were identified and discussed with RoWPS and the EHA team. For example, prior to June 2023, around 65% of mobilization locations were from a station, 5% were from a hospital, and the remaining 30% were from other locations. However, post-June 2023, this suddenly changed to around 20% from a station and 55% from a hospital. It was therefore concluded that, in some cases, mobilization coordinates were being overwritten with destination coordinates.

2.5 This was fed back to the Cambridge Central Ambulance Communications Centre (CACC) who are responsible for the data, and it was agreed that ORH would exclude these entries from any mobilization-specific analysis.

2.6 Some incidents in ADRS were excluded from ORH's analysis as they were deemed to be duplicates. Typically, this occurs for 'incident transfers' where a call passes from one CACC to another (when enroute to hospital for an out-of-area transfer) and a second incident is created in the new CACC. These can usually be identified using a Cancel Reason field, however it was noted that there were some incidents that were suspected to be incident transfers but not flagged as such.

2.7 VisiCAD data is provided in a fairly unwieldy format and, for this reason, is understandably not a data source that is routinely used by the EHA team. To be useful, it needs to go through significant processing and cleaning, and therefore its use comes with a range of caveats. However, once processed, it provides exact vehicle shift start and end times, as well as the start and end times of vehicle unavailability within shifts (for meal breaks, paperwork, vehicle cleaning or servicing). ORH can share details of the VisiCAD data process, should the EHA team wish to adopt any part of this going forward.

2.8 Currently, the EHA team combines planned vehicle shift information with downstaffing data to calculate actual resourcing figures. This is a suitable methodology for reporting overall and hourly available staff, and produces similar staff hours as the VisiCAD approach.

2.9 However, it is not always easy to interpret exactly what has happened for individual vehicle shifts (something that ORH requires for modelling purposes). For example, if one paramedic on a Patient Transport Unit (PTU) shift is downstaffed, this process cannot clearly show whether the remaining paramedic was paired up with another (if possible), whether they were deployed as an Emergency Response Unit (ERU), or whether they were unable to be utilized at all.

Demand

2.10 Unless otherwise specified, demand is defined in this report as RoWPS-responded incidents, that is, where at least one RoWPS vehicle arrives on scene. If two vehicles mobilize to or attend the scene of the same incident, this unique incident is only counted once. This includes out-of-area incidents.

2.11 Average daily responded demand has continually increased over the six-year sample period, from 132 incidents per day in 2019 to 166 incidents per day in 2024. This is equivalent to a 4.7% increase per year. The only year with no increase was 2020, which is influenced by the early stages of the COVID-19 pandemic (see Appendix **A1**).

2.12 Demand is grouped into the four main priority categories (Priority 4 through Priority 1) or the five main Canadian Triage Acuity Scale (CTAS) categories (1 through 5). Across the whole sample, 70% of demand was categorized as the highest Priority 4 (P4) category, and 26% of demand as the second highest Priority 3 (P3) category (see Figure **2-1**).

Figure 2-1: Demand by Priority and Year

Average Daily Demand

Category	2019	2020	2021	2022	2023	2024	Overall
P4	93.9	91.5	101.1	107.8	110.3	114.0	102.8
P4T	3.0	2.5	2.3	2.2	1.9	2.3	2.4
P3	32.0	31.4	35.3	43.9	45.6	47.0	39.0
P3T	2.5	2.7	3.3	3.1	2.6	2.5	2.8
P2	0.2	0.2	0.3	0.3	0.2	0.1	0.2
P1	0.3	0.4	0.5	0.5	0.3	0.3	0.4
Overall	**131.8**	**128.8**	**142.9**	**157.8**	**160.9**	**166.1**	**147.5**

% Increase	**-**	**-2%**	**11%**	**10%**	**2%**	**3%**

T = Inter-facility **T**ransfers

2.13 Most demand occurs within the urban Local Area Municipalities (LAMs) of Kitchener, Cambridge and Waterloo (see Appendix **A2**). All LAMs have seen a demand increase between 2019 and 2024, with Kitchener experiencing the largest increase, rising from 64 incidents per day in 2019 to 81 incidents per day in 2024.

2.14 In ORH's experience, demand by day and hour for RoWPS shows a similar pattern to that observed in other services (see Appendix **A3**). Demand rises quickly from 06:00, peaks at around 12:00, and gradually reduces throughout the rest of the day. Demand during the day on Saturday and Sunday is generally lower than on Monday to Friday, but demand between 21:00 and 04:00 on Friday into Saturday and on Saturday into Sunday is higher than on the other days of the week.

2.15 There are three main hospitals in the Region: Waterloo Regional Health Network (WRHN) @ Queen's Blvd (previously St. Mary's General Hospital), WRHN @ Midtown (previously Grand River Hospital) and Cambridge Memorial Hospital (CMH). Generally, patients are transported to their closest suitable hospital (see Appendix **A4**). However, given that the two WRHN sites are in close proximity to one another, there is a significant overlap between their catchment areas.

2.16 Across the sample, around 825 incidents per week involve a patient being transported to hospital (see Figure **2-2**). This results in an overall conveyance rate of around 72%, with variation by category. Over 95% of patients are sent to one of three main hospitals.

2.17 There are around 30 inter-facility transfer (IFT) incidents per week where a patient is transported between hospitals, including to out-of-area hospitals such as Hamilton General Hospital.

Figure 2-2: Hospital Transports by Category

Weekly Transported Incidents

Destination Hospital	Category						Overall
	P1	P2	P3	P3T	P4	P4T	
WRHN @ Midtown	0.5	0.3	98.5	7.4	208.2	3.1	318.0
WRHN @ Queen's Blvd	0.2	0.4	59.6	3.1	199.7	2.3	265.4
Cambridge Memorial	0.2	0.1	55.7	0.5	155.9	0.1	212.5
Hamilton General	0.0	0.0	0.2	1.1	4.0	3.8	9.2
McMaster Childrens	0.2	0.0	0.1	2.5	0.3	1.2	4.3
Stratford General	0.0	0.0	0.9	0.0	2.3	0.0	3.3
Guelph General	0.0	0.1	0.2	0.4	1.5	1.1	3.2
Other/Unknown	0.4	0	1.4	1.8	4.6	0.9	8.8
Overall	1.5	0.9	216.6	16.8	576.5	12.5	824.7
Transported Rate	85%	91%	67%	94%	73%	92%	72%

T = Inter-facility **T**ransfers

Performance and Call Components

2.18 Mandated reporting of response performance to the Ministry of Health (MoH) calculates Region-wide performance from the time the first arriving vehicle is notified to the time it arrives on scene. Targets are set by CTAS code but not by priority. Between 2019 and 2024, CTAS performance targets were met (70% for CTAS1, 80% for CTAS2 through CTAS5), though performance was lower in 2023 than in 2019 (see Appendix **A5**).

2.19 The CTAS code for each incident is not known at the time of dispatch and is only assigned when a paramedic arrives on scene and assesses the patient. However, as the priority code is known at the time of dispatch, ORH also necessarily reports performance against these categories.

2.20 The mean response time for P4 incidents was around 7 minutes, and the 80th percentile response time was around 9 minutes (see Figure **2-3**). This varies considerably by LAM. For example, the three urban LAMs achieved an 80th percentile response time similar to the Region-wide measurement. This is contrasted with the rural LAMs of North Dumfries, Wilmot and Woolwich that achieve an 80th percentile response time of around 14 minutes. Wellesley has the longest 80th percentile response time at around 16 minutes, as this LAM does not have a station.

Figure 2-3: P4 Response Performance by LAM

P4 Performance (Excludes Transfers and Out-of-Area)

LAM	Within 8 Mins	Within 10 Mins	Within 12 Mins	Mean (mm:ss)	80th %ile (mm:ss)
Cambridge	66%	86%	94%	07:20	09:10
Kitchener	74%	89%	95%	06:42	08:41
North Dumfries	26%	47%	66%	10:56	14:04
Waterloo	73%	90%	96%	06:48	08:40
Wellesley	12%	26%	46%	12:51	16:18
Wilmot	34%	57%	69%	10:20	14:02
Woolwich	36%	60%	73%	09:53	13:26
Overall	**68.3%**	**86.0%**	**93.6%**	**07:11**	**09:12**

2.21 Naturally, the areas closest to stations have the best mean response times of 0 to 8 minutes (see Appendix **A6**). Some areas have longer mean response times of 8 to 14 minutes despite being in proximity to a station; for example, 11 North Dumfries, as this station has no PTU (only an ERU). When overlaying incident locations, there are some clear 'gaps' in coverage where there are higher concentrations of incidents with longer mean response times. For example, Elmira, the area between 03 Queen and 09 Conestoga, and the northeast area of Waterloo.

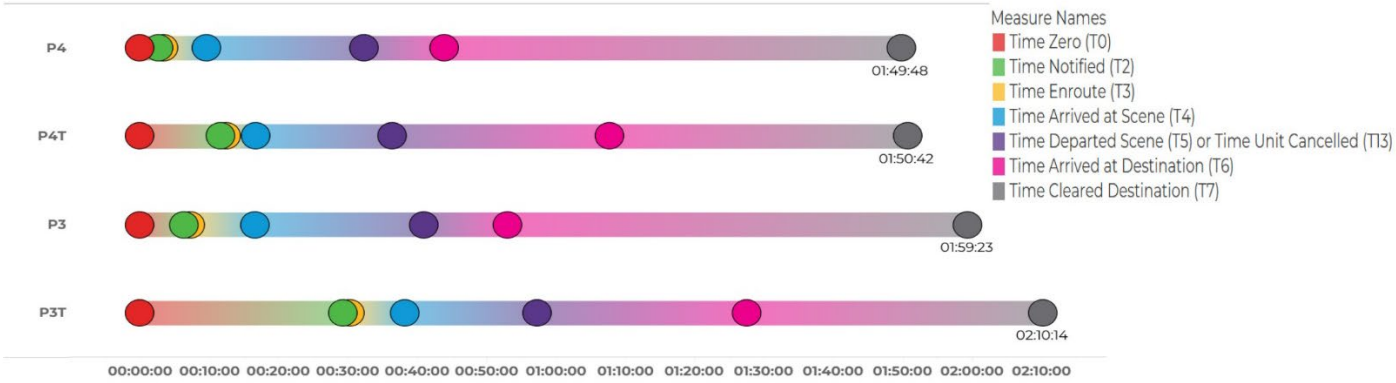
2.22 Overall P4 80th percentile response times have varied by month across the sample, with improvements in 2024 compared with 2023 and 2022 (see Appendix **A7**). The months with the longest response times tend to be towards the end of each calendar year likely in line with the timing of the respiratory season.

2.23 ORH calculates each 'call component' of the incident cycle separately and analyzes these to understand how they may vary (see Figure **2-4**). The average occupied time (from vehicle enroute to vehicle clear) per incident for P4 and P3 incidents was almost two hours.

2.24 There is variation within the call components by category, for example:

- IFT incidents tend to have a longer time to hospital but a shorter time at hospital than non-IFT incidents
- While not included within the occupied time calculation, IFT incidents tend to have a much longer call handling time than non-IFT incidents
- P3 incidents tend to have a longer time to scene than P4 incidents because crews do not drive with lights and sirens for P3 and may respond from further away (whereas CACC will always assign the closest available vehicle for P4 incidents)

Figure 2-4: Call Component Averages



Category	Call Handling Time (T0 to T2)	Mobilization Time (T2 to T3)	Time to Scene (T3 to T4)	Time at Scene (T4 to T5 / T13)	Time to Hospital (T5 to T6)	Time at Hospital (T6 to T7)	Occupied Time (T3 to T7 / T13)
P4 Non-IFTs (P4)	02:34	00:52	06:12	22:43	11:31	65:56	109:48
P4 IFTs (P4T)	11:37	00:45	04:19	19:44	31:19	42:58	110:42
P3 Non-IFTs (P3)	06:18	00:55	09:25	24:18	12:03	66:24	119:23
P3 IFTs (P3T)	29:13	01:01	07:52	19:09	30:14	42:45	130:14

Note: all times are measured in mm:ss for the first vehicle on scene

2.25 Average occupied time increased between 2019 and 2023 and then decreased slightly in 2024 (see Appendix **A8**). The increase was largely driven by an increase in average time at hospital (from 59 minutes in 2019 to 68 minutes in 2022) alongside a smaller increase in average time at scene (from 17 minutes in 2019 to 20 minutes in 2023).

2.26 Time at hospital is by far the largest contributor to the overall occupied time, and this call component varied considerably across the sample (see Appendix **A9**). This graph also shows how the component is split into its two elements: arrival at hospital to handover of patient care, and handover of patient care to clearing at hospital ready for another call. The increases and decreases are driven by the arrival to handover element, as handover to clear has remained at a stable average of 20 minutes throughout the sample.

2.27 Between 2019 and 2021, average time at hospital (although variable by month) was reasonably consistent across the three main hospitals (see Appendix **A10**). However, from 2022 onwards there was more variation between the three, with WRHN @ Queen's Blvd typically having the shortest time at hospital and CMH typically having the longest time at hospital.

Resources and Resource Use

2.28 Across the last three years of the sample period, RoWPS planned to deploy an average of around 4,000 PTU hours per week, but actually filled 92% of these (see Appendix **A11**). RoWPS also planned to deploy an average of around 250 ERU hours per week, but actually filled 95% of these.

2.29 In early 2022 the filled shift rate was around 100%, but this fell to around 90% in 2024. Clearly RoWPS is facing challenges in filling their planned shifts, largely due to an increase in sickness-related absences (often for mental health conditions) and a corresponding lack of relief staff to cover these absences.

2.30 All vehicles book on at one of two hubs: 00 Maplegrove and 14 Headquarters. They are generally considered part of the North division (fed from 14 Headquarters) or the South division (fed from 00 Maplegrove), though there are some 'SNorth' shifts that deploy from the South hub into the North zone. There are seven stations currently associated with the North division (02 Waterloo, 03 Queen, 06 St Jacobs, 07 Ottawa St, 08 Weber and Water, 10 Phillipsburg and 12 Breslau), and four associated with the South division (04 St Andrews, 05 Pinebush, 09 Conestoga and 11 North Dumfries).

2.31 As of 2025, RoWPS planned to deploy 4,788 PTU hours per week and 252 ERU hours per week (see Figure **2-5**). This excludes the two 12/7 PTU shifts budgeted for a November 2025 start.

Figure 2-5: 2025 Planned Shifts

Hour	00 Maplegrove		(SNORTH)	14 Headquarters		**Overall**	
	PTU	ERU	PTU	PTU	ERU	**PTU**	**ERU**
0	7	0	2	11	0	**20**	**0**
1	7	0	2	11	0	**20**	**0**
2	7	0	2	11	0	**20**	**0**
3	7	0	2	11	0	**20**	**0**
4	7	0	2	11	0	**20**	**0**
5	9	0	0	11	0	**20**	**0**
6	9	1	0	11	0	**20**	**1**
7	8	1	1	11	0	**20**	**1**
8	9	1	2	14	0	**25**	**1**
9	10	1	3	17	0	**30**	**1**
10	10	1	3	17	0	**30**	**1**
11	10	1	3	17	0	**30**	**1**
12	13	1	4	20	2	**37**	**3**
13	13	1	4	20	2	**37**	**3**
14	13	1	4	20	2	**37**	**3**
15	13	1	4	20	2	**37**	**3**
16	13	1	4	20	2	**37**	**3**
17	11	1	6	20	2	**37**	**3**
18	11	0	6	20	2	**37**	**2**
19	12	0	5	20	2	**37**	**2**
20	11	0	4	17	2	**32**	**2**
21	10	0	3	14	2	**27**	**2**
22	10	0	3	14	2	**27**	**2**
23	10	0	3	14	2	**27**	**2**
Overall	240	12	72	372	24	**684**	**36**

Hours per Week	1,680	84	504	2,604	168	**4,788**	**252**

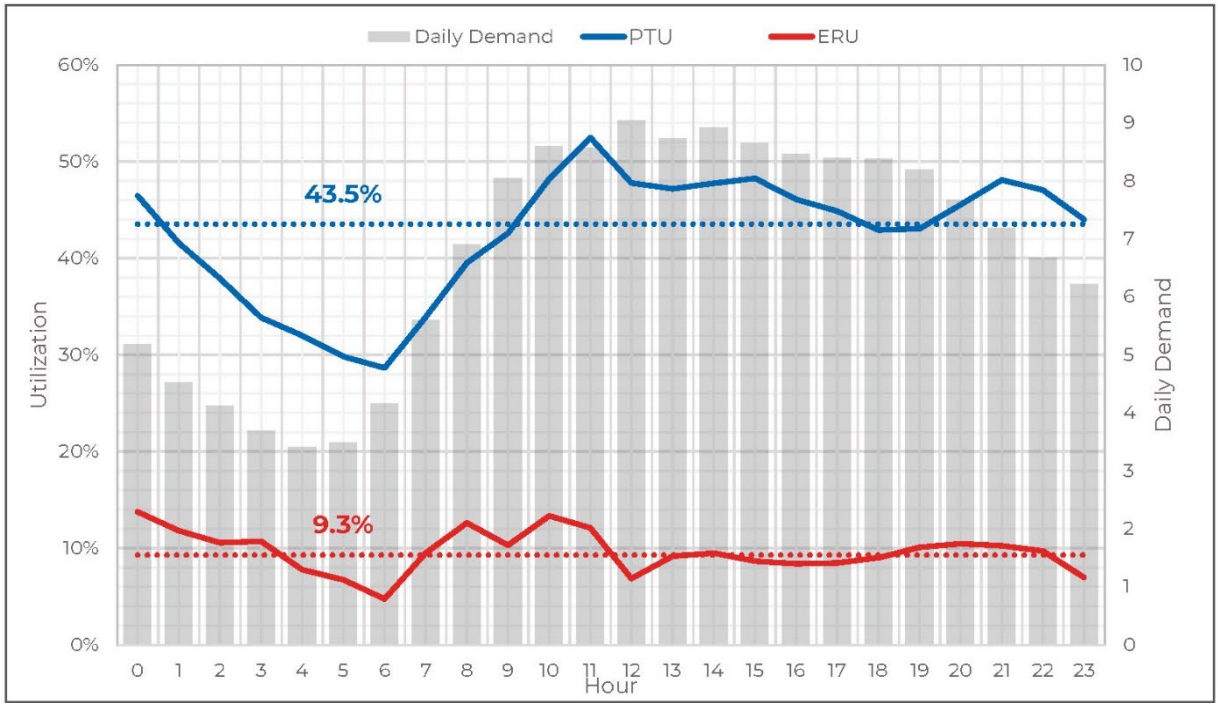
2.32 Assuming a 42-hour working week and two staff per PTU, this therefore requires 234 full-time equivalent (FTE) core frontline staff, assuming no absences. Historically, RoWPS has built in 25% relief for every core FTE to cover absences, but this is no longer sustainable as evidenced through the dropped shift rate. Enhancements in 2024 were added with a 50% relief rate. There is therefore effectively a 28% relief rate as of 2025, equivalent to 67 FTE relief staff, giving a total of 301 FTE. This is aligned with the current budgeted FTE.

2.33 To deploy the 2025 planned shifts, a total of 38 peak PTUs are required. Peak vehicles are a measure of the absolute minimum number of physical vehicles required to deploy the recommended shifts, not accounting for spare vehicles. For example, a day shift of 07:00 to 19:00 followed by a night shift of 19:00 to 07:00 could technically be deployed utilizing one physical vehicle. Alternatively, a day shift of 07:00 to 19:00 along with a day shift of 08:00 to 20:00 would require a minimum of two physical vehicles for at least the 08:00 to 19:00 period.

2.34 As of November 2024, RoWPS had 53 in-service PTUs. This therefore allows for a spare ratio of around 28%. There are a further 9 PTUs scheduled for delivery and in-servicing between November 2024 and May 2025.

2.35 Utilization is defined by ORH as the proportion of a vehicle's actual on-shift time that is spent responding and dealing with patient care (measured from time enroute to posting clear). Across the last two years of the sample, average PTU patient care utilization was around 44% and ERU utilization was around 9% (see Figure **2-6**). PTU utilization peaks at around 11:00 and remains high until the late evening, before falling during the night. These figures do not represent the true total utilization for paramedic crews.

Figure 2-6: Utilization by Hour



2.36 This utilization definition excludes time spent on rest breaks, returning to base, standby moves, and other duties such as completing paperwork and extra cleaning. Despite being necessary duties, these elements are only captured within the VisiCAD data and cannot be easily calculated by the EHA team.

2.37 Most vehicle mobilizations occur within the same LAM as the incident they respond to (see Appendix **A12**). For example, 81% of all vehicles mobilizing within Cambridge respond to incidents within Cambridge. However, high-demand urban areas also frequently draw significant support from surrounding townships. For example, 17% of mobilizations that occur in Wilmot are for incidents in Kitchener, while 23% are for incidents in Waterloo. Wellesley shows the most dispersed mobilization pattern, as it lacks a dedicated station and therefore relies heavily on neighboring LAMs for coverage. Mobilizations that fall under the 'unknown' category are those where mobilization coordinates are suspected to be incorrect, as discussed in the Data Collection and Review sub-section.

2.38 A similar table has been produced showing mobilization facility compared with incident LAM (see Appendix **A13**). For example, 3% of all mobilizations originate at 00 Maplegrove, though again it should be noted that these proportions will be skewed by the number of unknown mobilization locations. When mobilizations do occur at 00 Maplegrove, 54% respond to incidents in Cambridge and 40% respond to incidents in Kitchener.

2.39 The occurrences and durations of vehicle unavailability within a shift were calculated from the VisiCAD data (see Appendix **A14**). The most frequently occurring unavailability reason was Paperwork (at around 155 instances per day), with a median duration of around 20 minutes per occurrence. Cross-referencing these occurrences with the ADRS dataset would suggest that a significant proportion of these overlap with the handover to clear element of time at hospital.

2.40 Typically, we would expect offload delays to be captured within the unavailability reasons. However, due to the low instances per day recorded for the Patient Handover reason, it is suspected that this is not the case. Despite this issue, the ADRS data provides the required information to calculate time at hospital including offload delays.

2.41 The second most frequently occurring unavailability reason was Meal Breaks (at around 65 instances per day), with a median duration of around 30 minutes per occurrence. Other unavailability reasons (Out of Service, End of Shift, etc) tended to have a median duration of around 10 minutes per occurrence, though with relatively low instances per day.

2.42 The number of standby moves undertaken by RoWPS was also calculated from the VisiCAD data (see Appendix **A15**). On average, 310 moves were attempted per day, including moves where a vehicle is returning to base following an incident, where a vehicle is deployed from hub to station, and where a vehicle is moved between stations for coverage purposes. Around 75% of these moves are recorded as 'completed' (having an arrive on scene time), and around 18% were interrupted (stood down from the standby move before completing) due to being assigned to respond to an incident.

Support and Management Services Analysis

Overview

2.43 AACE were asked to review the current organizational structures and support services arrangements within RoWPS in parallel with the quantitative analysis of operations undertaken by ORH.

2.44 This review has necessarily taken a high-level view of current operations and support service arrangements based on a time-limited site visit (four days), interviews with key individuals, and a limited review of pertinent documentation.

2.45 Considerations taken by AACE have therefore focused on the organizational structures and effectiveness of support functions that will be required to continue to support the achievement of RoWPS regional and organizational strategic objectives over the next ten years.

Leadership and Current Organizational Structure

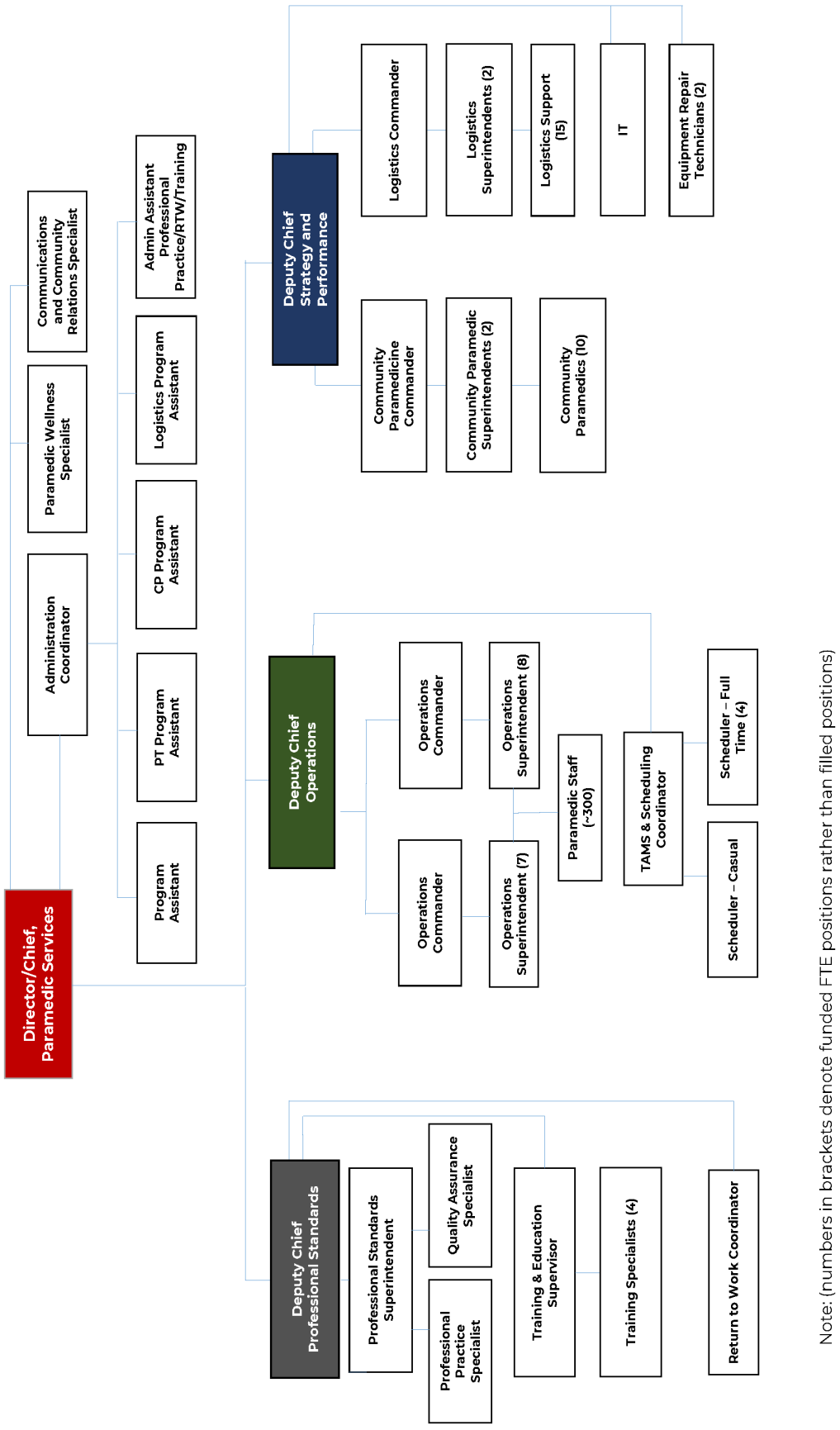
2.46 RoWPS is led by a Chief of Paramedic Services who has overall accountability for the organization and reports to the Commissioner and Medical Officer for Health, who in turn reports to Chief Administration Officer (CAO) of Waterloo Region. The Chief has been in post for about two and a half years and is an experienced and passionate Paramedic Services leader. It is clear from the review that he can articulate a clear and compelling vision for the organization and that he and his senior leadership team are focused on prioritizing the future clinical needs of patients and the physical and psychological wellbeing and job satisfaction of staff.

2.47 The RoWPS organizational structure (see Figure **2-7**) has continually evolved, in part driven by the implementation of recommendations from the previous Ten-year Master Plan, but also by the Chief as he creates the senior leadership team required to support the ongoing delivery of strategic objectives and meet the future needs of the organization.

2.48 The Chief currently has six direct line management reports of differing levels of seniority for several clinical and non-clinical functions. The current organizational structure is predominantly divided into three functional areas, namely, Operations, Professional Standards, and Strategy and Performance. A Deputy Chief (DC) role leads each of these three functions and reports directly to the Chief.

2.49 These three core functions, and the structures within each, are principally led by uniformed staff with a previous clinical background (paramedic or nurse) who have in some cases progressed up through the organization through internal promotions. It is acknowledged that some of these organizational leaders may have additional skills, qualifications, and experience in other fields of industry and management that they apply to their existing roles.

Figure 2-7: Organizational Structure



Note: (numbers in brackets denote funded FTE positions rather than filled positions)

2.50 The three additional roles that report directly to the Chief are the Administration Coordinator, Paramedic Wellness Specialist, and a Communication and Community Relations Specialist. The organization also receives other traditional support services through regional shared services or other contractual mechanisms, examples of this being the provision of Human Resources (HR) and Information and Technology (IT) services. There is also some limited organizational support through Program Assistants distributed across business functions.

2.51 It should be noted that the frontline clinical support and supervision structure within the Operations function is extremely lean. There can be some potential advantages in being an organization with a lean management structure where, inevitably, leadership roles can involve 'wearing more than one hat'. However, this can also pose challenges in terms of having robust and transparent assurance and governance arrangements in place.

2.52 It can also create difficulties and conflicts in resilience and maintaining clear oversight with the appropriate levels of internal challenge and scrutiny. As a result, it can constrain the ability of the senior leadership team to strategically develop, innovate and transform services.

2.53 A historical lack of investment in leadership and management development and training was raised during the consultation process. It was expressed that this is needed more than ever due to challenges that exist within a more complex operating environment, combined with a workforce that has increasingly high levels of expectation and more complex needs to consider. Effective succession planning is also reliant on leaders acquiring and developing the levels of competence required to achieve leadership progression.

2.54 Feedback received from stakeholders would indicate that, while the senior leadership team is relatively small, there is a lack of collaborative working across business functions, and a lack of understanding of the impact of actions taken when done so unilaterally and without communication to others who may be impacted by any such action. This is in part caused by capacity issues and a sense of constantly having to react to issues instead of planning and proactively managing either current issues or future organizational risks.

2.55 One very important organizational area that does not appear as a standalone function within the current organizational structure is the HR or People and Organizational Development (OD) function. Recruitment, induction, onboarding and associated processes are very resource intensive and are not always well coordinated. While there is some external assistance provided by Regional HR Support, this is somewhat limited due to capacity constraints and other transactional HR work that must be maintained.

2.56 This review has identified the lack of a dedicated senior leadership role with the sole ownership and accountability for organizational workforce planning, recruitment, absence management and organizational development, along with the other associated responsibilities of this function. This broad, but very important portfolio currently does not sit within one defined function, and various elements of the associated systems and processes are devolved to numerous managers within differing functions.

2.57 This results in a lack of a cohesive workforce strategy and the associated enabling actions and organizational oversight. In turn this creates an environment where the senior leadership team are too often reactive instead of being proactive, and ultimately can hinder the ability of the service to produce the necessary capacity required to meet patient demands.

Healthcare Strategy

2.58 Due to the time-limited duration of this element of the review, we were unable to comprehensively review a documented long-term strategy for healthcare across the Region.

2.59 However, from experience we do know that such strategies are now routinely referring to the rapid development of alternatives models of care, supported by advances in clinical practice and extending the skill sets of paramedics. The increased use of digital solutions and the inter-operability of existing systems also feature prominently.

2.60 It is also clear that looking forward it is essential to achieve full integration of care across all associated providers. We would fully expect to see RoWPS being an integral part of such a strategy.

2.61 The Cambridge and North Dumfries (CND) and Kitchener-Waterloo, Wellesley, Woolwich, and Wilmot (KW4) Ontario Health Teams (OHTs) have developed strategic visioning documents which describe the vision of fully integrated care and the following strategic objectives:

- Reduce health inequities
- Transform care with patients, families and caregivers at the centre
- Enhance clinical care and service excellence
- Maximize service value by applying evidence
- Strengthen Ontario Health's ability to lead

2.62 A new state-of-the-art hospital is being built in the Waterloo Region, on land owned by the University of Waterloo. This new facility will be located on the David Johnston Research and Technology Park on the University's North Campus.

2.63 The new hospital aims to provide more hospital beds and acute care capacity to the Waterloo-Wellington region and beyond, introduce new services, and bring more care closer to home for patients. It is expected to open in 2034 and will result in wider transformation in the healthcare landscape of the region.

Clinical Response Model

2.64 Despite the ever-increasing challenges for the regional health system, it would appear that externally RoWPS is still somewhat considered a pre-hospital response and transportation service rather than a critical integral partner of the wider regional health system. With appropriate support RoWPS could be capable of providing clinical navigation to patients at the point of entry to the system, as well as referring more patients to alternative care pathways, therefore relieving pressure on hospital emergency departments and ensuring that patients receive the right care, in the right place, at the right time.

2.65 The most significant constraint for RoWPS to be able to deliver high-quality and efficient care to all patients is the lack of direct ownership and management oversight of the CACC at Cambridge. It is currently operated directly by the Ministry of Health, and both Guelph-Wellington and Dufferin County Paramedic Services are also managed through this facility.

2.66 The Cambridge CACC, with support from the paramedic services it dispatches, is aiming to transition to Medical Priority Dispatch System (MPDS) as the primary call triage platform by December 2025. This transition is expected to improve triaging accuracy and priority categorization for RoWPS, based on evidence from other paramedic services in Ontario that have already adopted this triage system.

2.67 However, having this as a separately managed entity has a negative impact on the efficient and effective use of current and future levels of ambulance and other clinical response resources. In addition to this, there are currently no clinicians based within the current CACC environment, nor is there any other form of access to a robust enhanced Clinical Assessment Service (CAS) for the staff who work within the CACC.

2.68 In an operating environment where evidence-based modelling indicates a sustained increase in activity, this current constraint will inhibit the ability of RoWPS to provide clinically appropriate alternative responses. This will result in increased inappropriate ambulance dispatch to patients who could potentially be managed differently and more clinically appropriately.

2.69 The current pre-hospital system of care and the RoWPS clinical response model do not necessarily provide clinical benefits and a good experience for all their patients, or indeed, create the requisite system operating efficiencies which are seen in high performance pre-hospital care systems elsewhere in the world.

2.70 This was raised as an issue in the previous Master Plan update undertaken in 2019.

Frontline Staffing and Scheduling

2.71 As we have previously reflected, RoWPS currently operates a traditional pre-hospital response and transport model.

2.72 The number of frontline staff in post at the time of our visit in November 2024 was 237 full-time (FT) paramedics against a funded establishment of 246 (9 vacancies) and 56 FTE part-time (PT) paramedics. The frontline workforce is currently made up of Primary Care Paramedics (PCPs) and Advanced Care Paramedics (ACPs). The current roster patterns for frontline crews are all 12-hour shifts with single start and finish times.

2.73 It is has become increasingly difficult to recruit paramedics into the organization, and these challenges are driven by a number of reasons that are not directly within its control. RoWPS is also experiencing challenges with the retention of staff, although this is not specifically related to the organization but is more to do with a shift in the mindset of the new generation of paramedics who often do not see the role as a career for life.

2.74 The Chief must be recognized for his commitment to staff health and wellbeing, evidenced by his appointment of a Paramedic Wellness Specialist as part of his senior leadership team. Despite this commitment, there remains a relatively high level of absence attributed to psychological health issues (stress and anxiety).

2.75 There are currently significantly more PCPs than ACPs employed by RoWPS. Ideally the organization would like to be in a position where the majority of dual-crewed transport units are staffed with paramedics who possess each of these skill sets, so as to provide the most clinically effective response to all patients. In reality, transport units are frequently crewed by two PCPs, which potentially limits their clinical capabilities for certain groups of high acuity patients.

2.76 It appeared, when questioned, that this was predominantly due to limitations in the availability of ACPs that could be recruited into the service. Currently individuals have to self-finance their advancement from a PCP to ACP. This is also another driver for establishing better workforce planning functionality for RoWPS.

2.77 Staff are currently distributed across two hubs with an additional 12 stations within the Region. Frontline crews are briefed at the beginning of their shift by an Operations Superintendent, which provides an opportunity for information to be shared with the crews, and for crews to provide feedback to operational management. This system and opportunity for face-to-face communication with a dispersed workforce should be applauded and is in line with best practice.

2.78 Given the sustained increase in activity and offload delay at hospitals, there were increasing incidences of crews in some areas struggling to receive their rest breaks and finishing late after their duty time is complete. We heard that this was beginning to compromise frontline crews' health and wellbeing, and exhibiting itself in higher levels of absence. However, there is evidence that offload delays are stabilizing and starting to reduce, which has contributed to a recent reduction in end of shift overruns and missed meal breaks.

2.79 The existing rota patterns are now clearly presenting some challenges to the operational management teams and the schedulers. The operating environment is constantly shifting and a more agile future approach to rostering frontline resources will be required to ensure that these challenges are met.

2.80 In published academic research into the health and wellbeing impacts of 12-hour shift working, it is strongly recommended that the optimum shift length is 10 hours. We do, however, recognize that shortening the duration of any shifts means that compromises do need to be agreed with trade unions and staff on the number of days worked through the cycle of a roster pattern.

2.81 Scheduling is historically one of the most complex and challenging functions within paramedic services. The task of scheduling crews to rota patterns is currently allocated to a team of five FT and three casual staff who are managed by a FT Scheduling Coordinator. This team is also responsible for time management sheets and payroll coordination.

2.82 The operating hours of the scheduling team are 06:00 to 23:00 seven days a week through the use of two shifts: 06:00 to 17:00 and 12:00 to 23:00. The responsibility for scheduling outside of these hours falls to the on-duty Operations Superintendents. It was clear from feedback that this contributes to the burdensome administrative tasks taking more of their focus away from their core role (discussed in the following sub-section).

2.83 The team are reliant on dated and cumbersome software for both scheduling and time management and attendance. This creates additional challenges for the team who are having to work with these systems and those who are reliant on the output. Operational variables such as sickness and other abstractions create further operational complexities for the team.

2.84 Despite the evident challenges the scheduling team face on a daily basis, it is clear from the feedback received that there are levels of dissatisfaction across the organization on how the function currently operates. We heard from some stakeholders that there is little accountability within the function, and not much focus given to addressing the existing issues.

Frontline Management

2.85 Operational supervision and first line management of frontline staff is principally delivered through the Operations Superintendent role. There are currently 15 FTE in the funded establishment across the two operational reporting hubs. All Operations Superintendents work a 12-hour rota pattern alongside the frontline paramedic staff.

2.86 The principal responsibilities of the Operations Superintendent are to supervise paramedic operations 24/7, ensuring timely, competent responses in compliance with performance standards. Their role embraces many elements, including:

- Briefing frontline staff at the commencement of the shift

- Patrolling the coverage area performing first response activities and general paramedic duties according to basic and advanced life support standards
- Coordinating with hospitals to manage offload delays of paramedic crews and re-establish emergency coverage during peak periods
- Liaising with staff at the CACC
- Investigating unusual occurrences and complaints during shifts
- Investigating vehicle accidents, ensuring that CACC are notified and that accident reports are completed and submitted
- Serving as the primary Paramedic Services Site Officer in Command during multi-casualty, significant, prolonged, or potential incidents when management is not present, as needed

2.87 The Operations Superintendent role is the only role in the organization that operates 24/7 alongside frontline staff. Support services are not on duty across these hours, with the next longest cover provided spanning 18 hours per day.

2.88 The role was regarded as one of the most stretched and at times appears, through albeit limited observation, overburdened with the requirement to undertake other support services tasks. At times this hampers their ability to undertake their primary functions and responsibilities as first line management and support of frontline staff. This is particularly noticeable when there are no support services available to fall back on due to current operating hours. Feedback was also received about the increasing amount of time they are utilized to manage hospital issues, though this has been decreasing throughout 2024 and 2025.

2.89 Some of these capacity constraints are compounded by either frustrations with existing computer software systems in use, or the fact that there is not enough digital development within the organization to support them to undertake their role more efficiently.

2.90 As a result of their primary roles and responsibilities in the management of operations, and the capacity constraints that exist in fulfilling other support roles out-of-hours, there is insufficient time to be dedicated to the clinical support of the frontline workforce.

2.91 Based on feedback from a wide range of stakeholders, we have concluded that it is extremely difficult for the Operations Superintendents to be able to currently deliver a consistent and sustainable offer of meaningful clinical supervision to all frontline ambulance staff in this current model. This creates frustrations for this group of managers and results in a sub-optimal experience for members of their teams.

Clinical Supervision

2.92 Clinical supervision does not seek to replace managerial supervision. However, the role of the line manager in providing leadership and management of their staff is an important part of ensuring that effective organizational performance is maintained.

2.93 Clinical supervision is a term used to describe a formal process of professional support and learning which enables individual practitioners to develop knowledge and competence, assume responsibility for their own practice, and enhance consumer protection and safety of care in complex situations.

2.94 An additional layer of dedicated formalized 'clinical supervision' has not been routinely developed within paramedic services in Ontario in the same way it has in the UK and Australasia, for example. Provision of a sustainable clinical supervision framework is integral to delivering safe and effective, high-quality care, and is essential for achieving effective clinical governance as well as promoting professional practice.

2.95 There are currently two existing additional roles within RoWPS that do provide some elements of clinical supervision. These are the roles of Training Specialist and Quality Assurance Specialist.

2.96 The Field Training Paramedic reports to the Education and Training Superintendent and is a role where existing frontline paramedics are selected to act as role models for peers. Their primary responsibilities include, but are not limited to, undertaking mentoring and teaching peers and students. The Superintendent makes the decision as to when these selected staff are deployed into the role of Field Training Paramedic.

2.97 The Quality Assurance (QA) Specialist role works with the Professional Standards Superintendent to develop, maintain, monitor, and coordinate quality assurance activities to support compliance with regulations, legislation, standards, and delivery of high-quality patient care and performance. Duties include, but are not limited to, auditing call reports, supporting the electronic patient reporting software, conducting in-field paramedic observations, and training /onboarding. The current establishment of one FTE makes it impossible to fully achieve the sustainable delivery of these responsibilities or the desired qualitative benefits for the organization.

Community Paramedicine

2.98 RoWPS has a provincially funded Community Paramedicine (CP) program, the funding for which is only currently secured until the end of March 2026.

2.99 The CP program was originally developed in 2018 with an initial focus on high intensity users of RoWPS. Now the bulk of the funding is focused on supporting patients on waiting lists for Long Term Care (LTC), or those with crisis needs. This includes a model for delivering in-home health monitoring for registered LTC patients who are on waiting lists for nursing home placement. There remains a

marginal amount of funding to support the management of high intensity users. There is currently no 24/7 community nursing provision in place across the Region.

2.100 In feedback received, there was a feeling that the CP felt somewhat isolated from the rest of the organization. At times views were expressed as to what benefits it delivered for the organization while removing paramedics from the road to staff the program, although some of these could be linked to a lack of understanding around the aims and objectives of the program.

2.101 The current funding mechanism creates a funded establishment of 10 FTE for CP, with five of these positions currently filled. The current FTE should provide 14 hours of CP coverage a day, but without sufficient relief cover there are often challenges in providing this level of resourcing due to absenteeism and vacation.

2.102 Recruitment and retention are a challenge for the program and there are several reasons for this, including the entry requirements, which require at least three years' seniority, and the mandatory PCP-IV skill level requirements. The CP Commander also felt there was a lack of understanding of the program within the organization, along with a feeling from some that the current funding mechanisms did not make the CP role feel like a secure career move.

2.103 At the time of our discussions with the CP Commander, there were approximately 160 CP clients, 50 of which were receiving remote patient monitoring. Clients generally transition out of the program after they enter LTC or if they pass away while on the LTC waiting list. The vast majority of referrals for CP are from frontline paramedics, with 1,200 referrals being made in 2023/24; this was the highest number of referrals since the program started. In addition to paramedic referrals, there are approximately two referrals per week from family doctors and geriatric nurses.

2.104 One of the biggest challenges for the CP program is in accessing patients' clinical records. Every system and community partner operates on independent systems that are not inter-operable, and this leads to much duplication and inefficiency.

2.105 The ambition of the CP Commander is to recruit to full establishment and then extend the operating hours within the current provision of services. There is also work ongoing to develop regional senior residential clinics, and we were informed that CP facilities are being included in the design process for new build senior residential homes.

2.106 There would be organizational benefits in ensuring that the CP program is more structured and integrated in the organization. A review of which operating function it sits within would also be worth undertaking, as it appears inextricably linked to Operations but sits outside of this function currently.

Fleet and Logistics

2.107 The current logistics function sits in the portfolio of the DC of Strategy and Performance. The function is led by a Logistics Commander who leads a team that consists of two Logistics Superintendents, one based at each reporting hub. There is an Equipment Repair Technician post established at each hub, although one of these posts is currently vacant.

2.108 There is currently the equivalent of 15.35 FTE logistics support staff, nine of which are FT and the remaining staff are PT. The logistics support staff have the responsibility of cleaning and restocking vehicles, restocking hospital stores, undertaking minor repairs, and narcotics management. They are also required to undertake a deep clean of each vehicle every four weeks. The quality of service they deliver is measured by auditing three vehicles every 24 hours.

2.109 It was established that there are no formally agreed Key Performance Indicators (KPIs) in place for this support function, and the reason cited for this was issues with data quality. It was also noted that members of the logistics team get very little time to meet with their managers.

2.110 The logistics function currently provides services across 18 hours a day, with the earliest shift beginning at 05:00 and the latest shift finishing at 23:00. The Logistics Superintendents are not on duty throughout the entire period that these services are offered. Outside of these hours it is principally the Operations Superintendents who are required to manage any logistics issues that arise, which again can often remove them from their core duties and responsibilities.

2.111 While there was great appreciation of the challenges that exist within the existing logistics team, the majority of people we spoke to in Operations gave feedback that the level of service delivered by the team often fell below expectations for a 24/7 frontline emergency operation.

2.112 RoWPS have an Equipment and Repair Technician based in the South hub (00 Maplegrove) and work in conjunction with the Region of Waterloo to manage these assets. The technician covers 08:30 to 16:30 Monday to Friday. We were unable to look at this particular area in detail but there were concerns raised as part of the stakeholder feedback received that, as the requirements of the fleet have increased due to the increase in frontline capacity, the timeliness of available fleet capacity has come under pressure. There may be some respite from this given that current operational vacancies and levels of absence are resulting in dropped shifts.

Additional Support Services

2.113 The current RoWPS organizational structure includes additional business support functions provided through a shared services/business partner model by the Region of Waterloo. This approach is consistent with other paramedic services in Ontario. RoWPS has some dedicated management positions internally for these functions, while other support, such as facilities management, is solely provided

by the Region. Where internal roles exist, such as Fleet and IT, they serve as internal conduits for the organization to the regional support services leads.

2.114 The time-limited scope of this review did not sufficiently allow us to examine these regional support services in specific detail. We found no evidence that appropriate jointly agreed service level agreements for these services were in place or, indeed, whether performance management monitoring was being routinely applied to ensure the achievement of KPIs for these services.

2.115 There is currently no dedicated management role within RoWPS reporting directly to the Chief as the 'Accountable Officer' who has management oversight and leadership of the organizational business support functions, whether they be delivered internally, via shared services, or through other external contract mechanisms.

2.116 The current IT infrastructure within RoWPS is problematic and provides some real challenges for the delivery of the unique range of services RoWPS delivers to the population of the Region. There are far too many manual, and administratively burdensome, tasks being undertaken by higher paid grades of management staff just to keep the organization running on a day-by-day basis. There are digital products, such as the ePCR system and scheduling system, that are no longer fit for purpose. It would also appear that there are multiple software applications in use across the organization with very little inter-operability, either internally or regionally, with effective governance arrangements in place.

2.117 There were significant concerns about the level and quality of real time operational data available to those who are reliant on the intelligence these systems should provide to manage the organization effectively on a day-to-day basis. There is also a significant reliance on the manual creation and use of Excel data sheets currently to manage some aspects of the organization. This inhibits proactive management of service delivery disruption and hinders advance operational planning.

2.118 It is unclear as to what the digital strategy is for RoWPS currently, and we were not able to examine the broader regional digital strategy due to the scope and time constraints of the review. We did identify that the Region takes the lead for Cyber Security, although there is some delegated authority for the internal IT Technician to release patches and have responsibility for password protection. Despite this autonomy, there are specific concerns about how robust the business continuity arrangements are for RoWPS critical systems.

2.119 Feedback from a wide range of internal stakeholders would suggest that the level of regional understanding as to the unique nature of the work undertaken in RoWPS could be improved. Their requirements are just as complex and essential as other areas of regional health and have the need for bespoke aspects of IT hardware and software and dedicated support.

2.120 Health data analytics is principally provided by a very experienced regional EHA team. They provide a broad range of datasets and reports for RoWPS. Currently there is very limited internal capacity and capability within this speciality at RoWPS, though the analysts and their outputs are undoubtably a significant asset to the organization.

2.121 RoWPS is a relatively data-rich organization. Currently there is a lot of focus given to retrospective data for reporting purposes. There are, however, some challenges in translating this data and presenting it as real business intelligence that is clearly understood across the organization. Capability is required internally to support the senior leadership team in looking forward and being more proactive in operational planning; for example, by developing an operational performance forecasting tool.

2.122 There are other organizational areas where internal agile data analysis would support business process changes and ensure that value for money is achieved.

Emergency Management

2.123 It is acknowledged that RoWPS has a small specialist operations capability which is delivered through their Hazardous Response Team. This has an establishment of 16 dedicated members of staff with four dedicated Superintendents.

2.124 RoWPS also have additional assets available to deploy as part of their specialist capability and Major Incident management response. It was not within the scope of this review to undertake a more comprehensive examination of RoWPS major incident or business continuity preparedness and specialist capabilities.

Previous Master Plan Implementation Progress

2.125 In 2016, the Region engaged a consultant to develop a 10-year Master Plan for the delivery of paramedic services through to 2027. An update to this plan was produced by the same consultant in 2019 to review progress and update the plan to a new horizon year of 2031.

Population and Demand Growth

2.126 The population of Waterloo was anticipated to be 605,000 in 2019, per the previous 2019 Master Plan. This is slightly higher than the data sources used in ORH's report which put it at around 595,000. However, by 2023 the population was previously anticipated to be 635,000, which is lower than the Statistics Canada (675,000) or Planning Department (643,000) sources in this report. The data sources used, and the differences between them, are discussed in Section 4.

2.127 Population at the 2031 horizon year was projected to grow to 690,000, whereas the two data sources used in this report are significantly higher at around 790,000 (Ministry of Finance) or 742,000 (Planning Department).

2.128 Despite the differences in total population between the 2019 Master Plan and this report, the senior population (those aged 65 and over) is not significantly different. For example, in 2023 it was anticipated to be 104,000 compared with 105,000 in the latest Planning Department figures. Similarly, in 2031, senior population was projected to grow to 138,000 compared with 139,000 in the latest Planning Department figures.

2.129 The 2019 Master Plan projected that the resulting RoWPS demand would grow between 2019 and 2031 by 4.5% per annum under an updated low growth scenario, or by 5.9% per annum under an updated high growth scenario.

2.130 In reality, growth between 2019 and 2024 has been varied (see Figure **2-1**). Demand reduced by 2% in 2020 compared to 2019 due to the COVID-19 pandemic, which could not have been predicted. This was followed by significant growth in 2021 and 2022 (each around 10% higher than their previous year), and slower growth in 2023 and 2024 (each around 3% higher than their previous year).

2.131 Between 2019 and 2024, this therefore equates to an increase of 4.7% per year. Given that it has been a tumultuous period, it is difficult to say with absolute certainty whether the more recent growth trends of 2023 and 2024 are more likely to continue than, say, the growth trends pre-2019 or the growth trends of 2021 and 2022.

Staff, Fleet and Facility Enhancements

2.132 The second hub at 1001A Erb's Road opened successfully in 2020. This state-of-the-art facility has been a great asset to RoWPS operations and operations support. However, in 2025 it is already close to full capacity.

2.133 RoWPS is also developing a new station in Cambridge at 651 Concession Rd to provide additional capacity in the South zone, as recommended. However, the 2016 Master Plan identified several other station enhancements that have not yet been actioned. For example, 02 Waterloo station which was identified as requiring replacement for reasons of age, condition, and environment.

2.134 As of early 2025, RoWPS are budgeted for around 300 frontline paramedic FTE, with a planned increase to 322 by the end of 2025 (including some Council-supported additions to begin to address the gap in relief staff). The 2019 Master Plan recommended that 303 FTE would be required by the end of 2024 under the high growth scenario, assuming a 25% relief rate. However, RoWPS has correctly identified that the historical assumption of 25% for relief capacity is no longer adequate and should continue to be addressed going forward.

2.135 As of early 2025, there are 37 peak PTUs which is in line with the 2023 high growth or 2025 low growth scenario from the 2019 Master Plan. However, even in comparison with these positions, there are fewer at night (20) than recommended (22). Spare PTU capacity has improved in line with recommendations, from 24% to 28% (against a target of 30% by 2031).

2.136 Between 2019 and 2024, there have been a range of other staffing enhancements to bolster supporting services (see Figure **2-8**). A full review of the organizational structure has been provided in the Support and Management Services Analysis sub-section of this report.

Figure 2-8: Staffing Enhancements, 2019 to 2024

Year	Enhancements
2019	10 Paramedic FTE for 2 x 12/7 ambulances with 25% relief assumption 1 FTE Logistics Support 1 FTE Logistics Superintendent
2020	10 Paramedic FTE for 2 x 12/7 ambulances with 25% relief assumption
2021	15 Paramedic FTE for 3 x 12/7 ambulances with 25% relief assumption 1.3 FTE Logistics Support
2022	July 2022 10 Paramedic FTE for 2 x 12/7 ambulances with 25% relief assumption 1 Training Specialist October 2022 15 Paramedic FTE for 3 x 12/7 ambulances with 25% relief assumption 1 FTE Program Assistant 1 FTE Training Specialist 1.3 FTE Fleet Support 1 FTE Scheduler 1 FTE Operations Superintendent
2023	20 Paramedic FTE for 4 x 12/7 ambulances with 25% relief assumption with July 2024 start 1 FTE Operations Superintendent 1.3 FTE Logistics Support 1 FTE Professional Practice Specialist *4 Paramedic FTE (Move 4 x COVID Temp to Permanent)*
2024	20 Paramedic FTE for 4 x 12/7 ambulances with 25% relief assumption with January 2024 start 20 Paramedic FTE for 4 x 12/7 ambulances with 25% relief assumption with November 2024 start 2 FTE Operations Superintendent (1 January 2024 and 1 November 2024) 2.6 FTE Logistics Support (1.3 January 2024 and 1.3 November 2024) 2 FTE Training Specialist 1 FTE Paramedic Wellness Specialist 1 FTE Return to Work Co-ordinator 1 FTE Scheduler 1 FTE Logistics Commander 1 FTE Logistics Program Assistant 1 FTE Admin Assistant, Professional Practice
2025	8 Paramedic FTE to increase previous year addition to 50% relief 1 FTE Operations Superintendent 1.3 FTE Logistics Support 0.7 FTE Equipment Repair Technician 1 FTE Technology & Systems Administrator *12 Paramedic FTE for 2 x 12/7 ambulances with 50% relief assumption with November 2025 start*

Note: excludes Community Paramedicine

Utilization and Time on Task

2.137 However, despite the increases in paramedic FTE and peak PTUs, utilization has not reached the 2019 Master Plan target rate of 35%.

2.138 The rate of absences significantly outstrips the 25% relief capacity that has historically been built into frontline paramedic enhancements. As a result, despite there being 37 peak PTUs in the planned deployments, only around 90% of these are being delivered on the road. The denominator of ORH's utilization is calculated from the dropped shift rate rather than the planned shift rate, and so this in part leads to the higher than anticipated utilization.

2.139 As discussed in the Frontline Service Analysis sub-section of this report, average occupied time (or time on task) increased between 2019 and 2023 and then decreased slightly in 2024. The increase was largely driven by an increase in average time at hospital (from 59 minutes in 2019 to 68 minutes in 2022) alongside a smaller increase in average time at scene (from 17 minutes in 2019 to 20 minutes in 2023).

2.140 RoWPS has continued to work closely with their hospital partners to try and reduce offload delays, and there is evidence that this has started to reduce in 2024. However, this element of time on task is still high compared to other paramedic services.

3 The Model Base Position (2025)

ORH uses sophisticated predictive modelling tools that have been developed in-house to assist with the development of master plans for paramedic services.

A virtual replica of RoWPS operations was created within AmbSim by populating inputs using parameters derived from the most recent two years of analysis (September 2022 to October 2024) referenced in Section 2. A 2025 Base Position was then created to provide a comparison for future scenarios.

Modelling Capabilities

Simulation

3.1 ORH has developed a sophisticated simulation model, AmbSim, for modelling the operations of emergency medical services. AmbSim is a discrete event simulation model that replicates the key characteristics of an emergency medical service and can be used to predict future behaviour under a variety of different scenarios.

3.2 AmbSim can be described as 'off-the-shelf', as it has been developed by ORH and is used both by ORH and our clients. It does, however, require customization to reflect the geography, demand and operations of the service in which it is to be used.

3.3 Once customized, AmbSim can provide evidence-based answers to a wide range of 'what if' questions. The model can assess the impact of changes to several factors, such as station locations and resource deployments, dispatch protocols and resource use, or demand increases or decreases. AmbSim reports operational performance in terms of response times, resource workload and utilization. It can simulate multiple vehicle types and incident types with specified response rules.

Location Optimization

3.4 ORH can also utilize its Demand Coverage Model (DCM), a powerful model that evaluates response time coverage and optimizes the locations of emergency service resources. The software uses a substitution algorithm to assess millions of options in minutes, quickly identifying optimum solutions given agreed criteria.

3.5 The DCM is a flexible model, ideally suited to identifying the scope for operational efficiencies, improving service delivery, and optimizing the use of resources. Only travel time to incidents is accounted for in the optimization process; the exact impact of changing resource deployments within a changed station configuration is therefore fully evaluated in AmbSim to check that optimal locations deliver service improvements.

Model Setup and Base Position

3.6 A virtual replica of RoWPS operations was created within AmbSim by populating inputs using parameters derived from the most recent two years of analysis (September 2022 to October 2024) referenced in Section 2.

3.7 The model was validated by comparing a wide range of outputs from the model, such as response performance, utilization, and hospital workload, to the corresponding analyzed figures for these factors based on actual data (see Appendix **B**). The comparison of outputs, including others not listed here, showed that the model replicated historical operations accurately and therefore was appropriate to use for different 'what if' modelling scenarios.

3.8 Once the model was validated using historical data, a more up-to-date Base Position for 2025 was created to provide a basis for comparison with future scenarios. Moving from the validated position to the Base Position involved:

- Applying a slight uplift to demand in line with projections (see Section 4)
- Updating the vehicle shift pattern to reflect 2025 planned deployments (not accounting for the shifts due to be added in November 2025)
- Assuming that the same proportion of frontline shifts are dropped as in the latest 12 months of analyzed shift data (90% of planned deployments are actually filled and available to respond to incidents)

3.9 The P4 response performance results for the 2025 Base Position are given in Figure **3-1**, including a 9-minute 80th percentile response time. PTU utilization in the Base Position is 44%.

Figure 3-1: Base Position Performance Summary

Priority 4 Performance

Local Area Municipality	% P4 responded within X minutes			Mean (mm:ss)	80th %ile (mm:ss)
	8	10	12		
Cambridge	66.0%	86.2%	93.5%	07:18	09:13
Kitchener	77.3%	91.3%	96.8%	06:22	08:19
North Dumfries	25.2%	46.4%	65.3%	11:04	14:28
Waterloo	75.3%	91.9%	97.9%	06:31	08:29
Wellesley	12.7%	29.7%	52.8%	12:06	15:13
Wilmot	39.9%	64.9%	75.7%	09:39	12:58
Woolwich	43.3%	70.2%	82.6%	08:56	11:27
Overall	69.7%	86.5%	93.3%	07:05	09:03

4 The Do Nothing Scenario (2026 to 2035)

To understand resource requirements for the next ten years, a demand projection was required. Demand projections were initially created using a population-based projection method with the underlying hypothesis that demand is strongly related to the population age profile.

Total population has been increasing steadily from around 540,000 in 2015 to around 675,000 in 2023 (according to Statistics Canada estimates). All individual age groups have seen increases in total volumes, and these trends are expected to continue into the future. By 2035, the total population is expected to reach 850,000 or 780,000 depending on which projection dataset is used. However, these do not generate significantly different demand projections (see paragraph 4.13).

The population-based projection was used to create a low growth demand projection, representing a 3.9% increase per annum between 2024 and 2035. A high growth demand projection was also created, using the 5.2% increase per annum observed in demand between 2015 and 2024. Finally, a core growth projection was created by taking an average of the high and low growth projections, which represents a 4.6% increase per annum.

To highlight the impact on future performance if no investment is made to RoWPS frontline operations, the demand projections were applied to the Base Position in AmbSim. No other operational changes or deployment enhancements were made (a 'Do Nothing' scenario). P4 response performance would degrade significantly for all LAMs against all measures. This includes an almost 6-minute reduction in overall 80th percentile response times, from 09m03s in the Base Position to 14m44s in 2035.

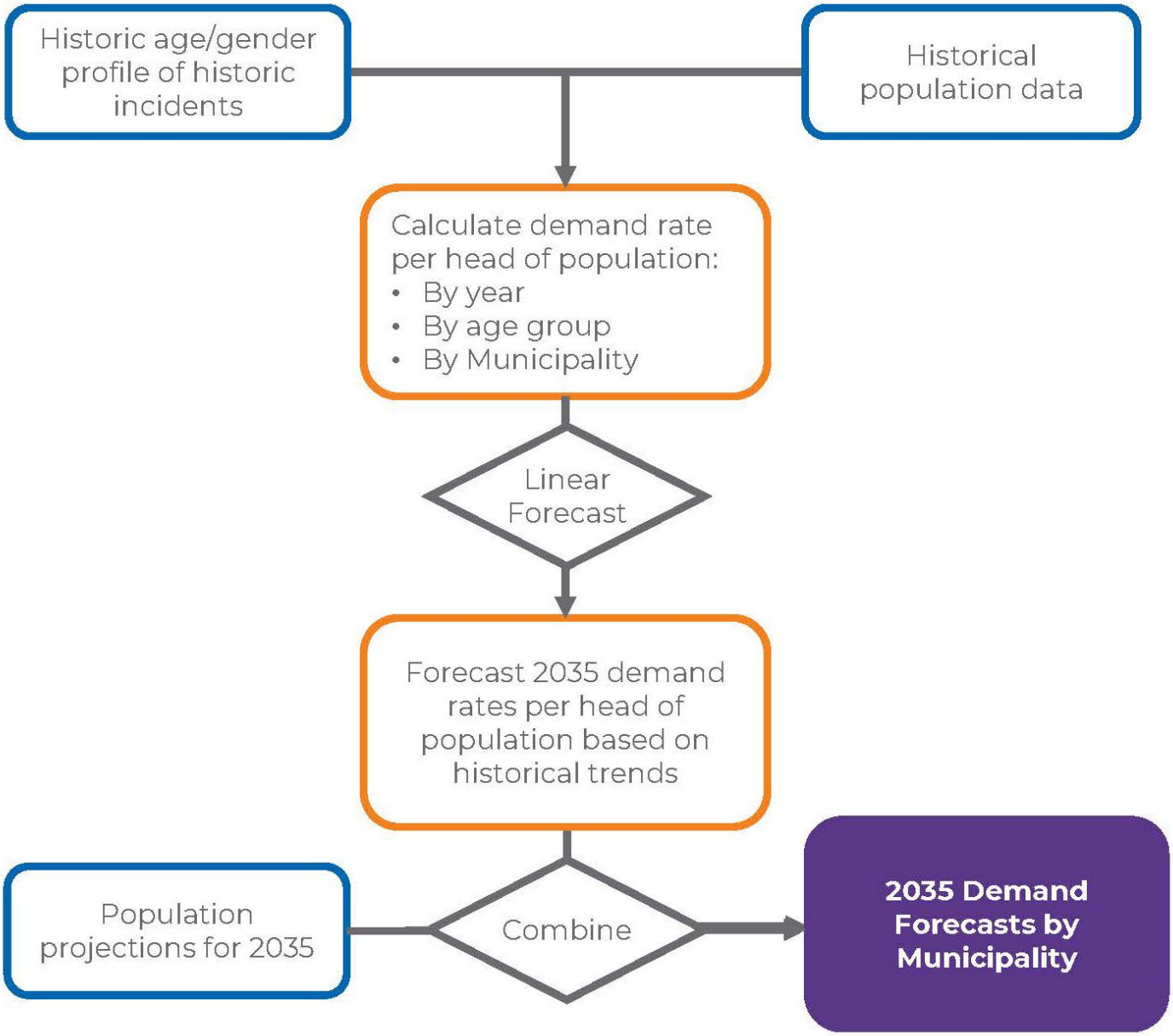
Demand Projections

Methodology Overview

4.1 To understand resource requirements for the next ten years, a demand projection was required.

4.2 Demand projections were initially created using a population-based projection method (see Figure **4-1**). This method is based on the hypothesis that demand is strongly related to the population age profile, and that there is an underlying trend for increased demand at all age groups due to unquantifiable factors such as the overall level of health provision and public expectation which, it is assumed, will continue into the foreseeable future.

Figure 4-1: Demand Projection Methodology



4.3 Historical population is compared with historical demand to calculate demand rates per head of population for different age and area combinations. These are then investigated to understand how they have changed over time, and combined with future population projections to calculate expected future demand levels. This method captures three factors that impact demand:

- Changes to the population size
- Changes to the age profile of the population (e.g. an aging population)
- Changes to the base demand rates per head of population

Historical and Projected Population

4.4 Population figures by year, age, and LAM for each year from 2015 to 2035 were required to feed into the demand projection calculation. ORH was provided with several datasets regarding the historical and projected population for the Region (see Appendix **C1**); no single dataset contained every element required.

4.5 Sources of historical data by area and by age aligned well. In agreement with the Steering Group, historical population by LAM from Statistics Canada was used for 2015 to 2023. Census data was used to calculate the appropriate split by age group for each LAM.

4.6 According to the Statistics Canada data, overall population for Waterloo region increased from around 540,000 in 2015 to around 675,000 in 2023 (according to Statistics Canada estimates). By 2035, the total population is expected to reach 850,000 according to Ministry of Finance (MoF) projections, and 780,000 according to the Region of Waterloo Official Plan Review by Watson and Associates Economists supplied by the Region's Planning Department ('Planning Department' data).

4.7 Given the differences in the total population between the two datasets, ORH initially looked to create separate demand projections, using each dataset in turn.

4.8 All age groups have seen increases in total volumes, and these trends are expected to continue into the future under both the MoF and Planning Department projections (see Appendix **C2**). Although the two datasets have different totals from 2023 onwards, most of the difference is in younger age groups of 20-29, 30-39 and 40-49.

4.9 At the time of publication of this report, Statistics Canada had released an updated estimate for 2024 (707,000). This is slightly lower than the Ministry of Finance figure used in this report but is still higher than the Planning Department data.

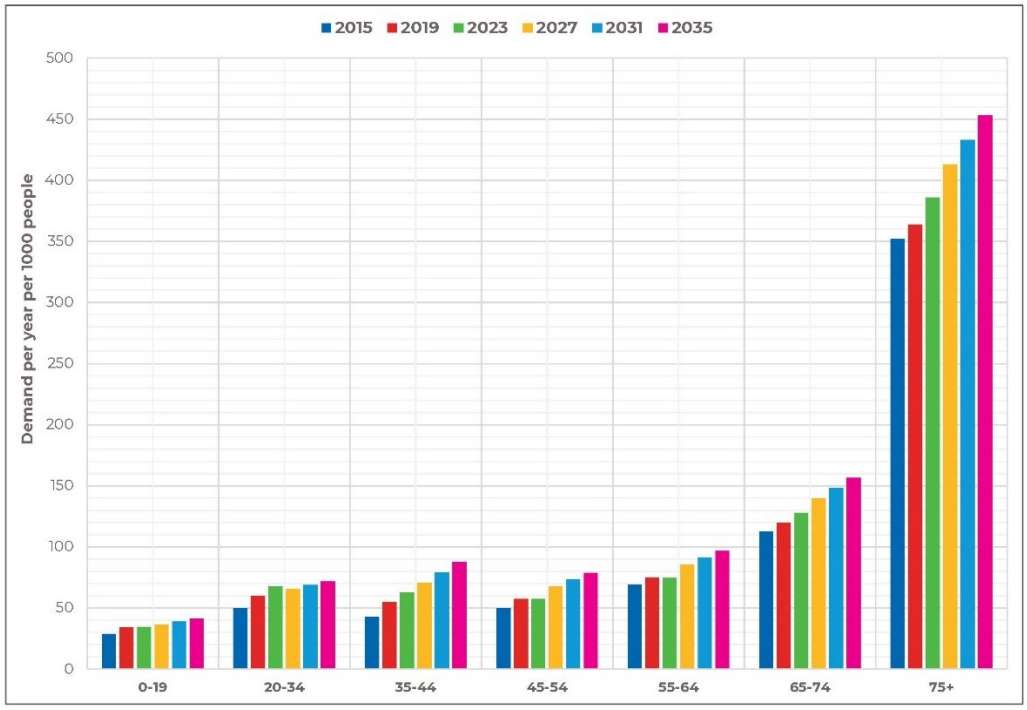
Historical and Projected Demand

4.10 Historical demand figures by year, age, and LAM for each year from 2015 to 2024 were also required to feed into the demand projection calculation. P3 and P4 demand increased from 105 incidents per day in 2015 to 165 incidents per day in 2024. This equates to a 5.2% increase per annum, differing by LAM.

4.11 Patients aged 75 and over account for 30% of all incidents (see Appendix **C3**), despite accounting for only 7% of the population. All age groups have seen an increase in demand between 2015 and 2024, with the 75+ age group seeing the largest total increase.

4.12 There is a clear correlation between age and demand, with the older age groups generating the most incidents. As a result, when comparing historical population and historical demand, demand rates per 1,000 population are substantially higher for the 75+ age group than for other age groups (see Figure **4-2**).

Figure 4-2: Demand Rate Projections



4.13 The predicted increasing and ageing population, coupled with increasing demand rates, suggest that the number of P3 and P4 incidents per day (excluding out-of-area demand) will increase from approximately 165 in 2024 to 252 in 2035. This represents a 3.9% increase per annum, and is considered the low growth projection.

4.14 Despite the differences in 2035 population between the MoF and Planning Department datasets, both resulted in projected demand increases of around 4% per year. This is because the MoF dataset had a much larger younger population (but which generates relatively few RoWPS incidents) and a slightly lower older population (which generates significantly more RoWPS incidents).

4.15 If, alternatively, the historical increase per annum of 5.2% is applied through to 2035, the number of P3 and P4 incidents per day will increase to 289 in 2035. This is considered the high growth projection.

4.16 In agreement with the Steering Group, a core growth projection was created by taking an average of the high and low growth projections (see Figure **4-3**). In this scenario, the number of P3 and P4 incidents per day will increase to 271 in 2035. This represents a 4.6% increase per annum.

4.17 In addition, ORH collected traffic zone population data to inform how the additional demand will be distributed geographically within each LAM (see Appendix **C4**). There will be an intensification of demand in already urban areas, plus a much higher likelihood of incidents occurring in Erbsville, Trussler, Dundee and southwest of the airport, due to new developments in those areas (see Appendix **C5**).

Figure 4-3: Demand Projection Results

Average Daily Incidents (P3 + P4)

Area	2024	2035			Difference to 2024		
		Low Projection Using ORH Methodology	**Core Projection** Average of high and low projections	**High Projection** Take 2015-24 Annual % Uplift	**Low Projection** Using ORH Methodology	**Core Projection** Average of high and low projections	**High Projection** Take 2015-24 Annual % Uplift
Cambridge	42.4	65.6	69.1	72.6	23.2	26.7	30.2
North Dumfries	1.6	2.2	2.2	2.2	0.6	0.6	0.6
Kitchener	79.1	121.5	130.5	139.5	42.4	51.4	60.4
Waterloo	30.7	44.8	50.1	55.4	14.2	19.5	24.8
Wellesley	1.3	1.9	2.0	2.1	0.6	0.7	0.8
Wilmot	4.2	7.5	7.5	7.5	3.3	3.3	3.3
Woolwich	5.8	8.7	9.1	9.5	3.0	3.3	3.7
Overall	**164.9**	**252.2**	**270.5**	**288.8**	**87.3**	**105.6**	**123.8**

Average Annual % Increase

Area	2015 to 2024	2024 to 2035		
Cambridge	5.0%	4.1%	4.5%	5.0%
North Dumfries	2.3%	3.1%	3.1%	3.1%
Kitchener	5.3%	4.0%	4.7%	5.3%
Waterloo	5.5%	3.5%	4.6%	5.5%
Wellesley	4.6%	3.7%	4.2%	4.6%
Wilmot	4.5%	5.4%	5.4%	5.4%
Woolwich	4.6%	3.8%	4.3%	4.6%
Overall	**5.2%**	**3.9%**	**4.6%**	**5.2%**

2015 to 2024	**2019** to 2024	**2022** to 2024
5.2%	**4.8%**	**2.7%**

'Do Nothing' Response Performance Impact

4.18 To provide meaningful context for future resource recommendations, it was important to model a 'Do Nothing' scenario through to 2035. This helps to highlight the impact on performance if no investment is made to RoWPS frontline operations. The core growth demand projections were therefore applied to the 2025 Base Position in AmbSim, and no other operational changes or deployment enhancements were made.

4.19 In the Do Nothing scenario for 2035, P4 response performance would degrade significantly compared to the Base Position for all LAMs against all measures (see Figure **4-4**). This includes an almost 6-minute reduction in overall 80th percentile response times, from 09m03s to 14m44s.

4.20 The 80th percentile response performance by year degrades more significantly for some LAMs than for others when compared to the Base Position (see Appendix **C6**). The most pronounced deterioration among the townships is observed in Wellesley, where it increased by approximately 10 minutes by 2035, and among the cities in Cambridge, where it increased by approximately 6 minutes by 2035.

Figure 4-4: 2035 Do Nothing Performance Summary

Core Growth Scenario of 4.6% per Year (90% Filled Shifts)

Modelled Scenario

Local Area Municipality	% P4 responded within X minutes			Mean (mm:ss)	80th %ile (mm:ss)
	8	10	12		
Cambridge	48.9%	64.0%	72.0%	10:57	15:17
Kitchener	51.6%	66.1%	75.7%	09:31	13:20
North Dumfries	16.1%	29.6%	43.7%	15:18	21:02
Waterloo	51.3%	67.8%	76.6%	09:48	13:15
Wellesley	10.3%	21.3%	33.0%	17:56	25:46
Wilmot	31.5%	51.2%	60.3%	12:56	17:19
Woolwich	18.6%	32.4%	43.9%	15:08	21:18
Overall	47.8%	62.8%	72.0%	10:31	14:44

Difference to 2025 Base Position

Local Area Municipality	% P4 responded within X minutes			Mean (mm:ss)	80th %ile (mm:ss)
	8	10	12		
Cambridge	-17.2%	-22.1%	-21.5%	03:38	06:04
Kitchener	-25.7%	-25.3%	-21.1%	03:09	05:01
North Dumfries	-9.1%	-16.8%	-21.6%	04:15	06:34
Waterloo	-24.0%	-24.2%	-21.3%	03:17	04:46
Wellesley	-2.4%	-8.4%	-19.7%	05:50	10:34
Wilmot	-8.4%	-13.8%	-15.4%	03:17	04:21
Woolwich	-24.7%	-37.8%	-38.8%	06:12	09:50
Overall	-21.8%	-23.7%	-21.3%	03:26	05:41

5 Frontline Resource and Facility Recommendations (2035)

To offset the projected demand increases and negative impacts on response performance outlined in the previous section, RoWPS will need to deploy additional resources by 2035.

An additional 1,344 PTU planned weekly vehicle hours are recommended by 2035 to maintain overall Base Position response performance (with an 80th percentile response time of 08m55s). This is equivalent to a 27% increase in planned vehicle hours to meet a 57% increase in demand.

All existing sites already have challenges with capacity, and limited ability to expand, and there is no space to accommodate the resources that are required to offset demand increases. Both DCM and AmbSim were therefore used to identify a recommended facility configuration that involves: retaining both hub sites and seven existing stations; relocating four stations to more optimal locations (02 Waterloo, 05 Pinebush, 08 Weber and Water, and 09 Conestoga); adding four new sites, one of which is already planned (651 Concession, Elmira, Williamsburg, and Centreville); and adding a third hub in Breslau.

With these facility enhancements and the recommended 1,344 weekly vehicle hours, response performance in 2035 is now set to be maintained or improved in all LAMs (with an 80th percentile response time of 08m18s). However, PTU utilization would reach 53%, compared to 44% in the Base Position.

A secondary objective was set to keep PTU utilization at Base Position levels. To do so, an additional 2,352 PTU planned weekly vehicle hours are required by 2035 (including the 1,344 hours identified to maintain performance), equivalent to a 47% increase in planned vehicle hours. P4 response performance is significantly improved for all LAMs (with an 80th percentile response time of 07m45s).

Minimum Resource Requirements to Maintain Performance

5.1 To offset the projected demand increases and negative impacts on response performance outlined in the previous section, RoWPS will need to deploy additional frontline resources by 2035. Modelling was therefore initially undertaken to determine the resource requirements to maintain overall Base Position response performance with no changes to facility locations.

5.2 It was agreed with the Steering Group that an improved relief rate would be targeted by 2035 to allow 100% of the planned shifts to be deployed rather than 90%. However, it should be noted that the '100% filled shifts' scenario is modelled at a more realistic filled shift rate of 98%, given that there will be some very short-notice absences that cannot be covered no matter what relief rate is applied.

5.3 There was a total of 4,788 PTU and 252 ERU planned weekly vehicle hours in the Base Position. Assuming that these shifts and any additional shifts are deployed at a 100% filled rate, an additional 1,344 PTU planned weekly vehicle hours are required by 2035. This is equivalent to a 27% increase in planned vehicle hours to meet a 57% increase in demand.

5.4 P4 response performance in this scenario for 2035 is close to the 2025 Base Position overall, though some LAMs are slightly worse (see Figure **5-1**). The overall 80th percentile response time is 08m55s compared to 09m03s in the Base Position.

Figure 5-1: 2035 Maintaining Performance using Existing Facilities

Core Growth Scenario of 4.6% per Year (100% Filled Shifts)

Modelled Scenario

Local Area Municipality	% P4 responded within X minutes			Mean (mm:ss)	80th %ile (mm:ss)
	8	10	12		
Cambridge	69.5%	88.3%	95.0%	07:02	08:54
Kitchener	78.0%	91.8%	97.3%	06:13	08:15
North Dumfries	28.2%	47.3%	64.9%	10:50	14:38
Waterloo	75.6%	92.0%	98.1%	06:25	08:28
Wellesley	14.7%	34.5%	57.1%	11:39	14:41
Wilmot	46.2%	72.5%	82.0%	09:00	11:27
Woolwich	43.4%	70.0%	83.7%	08:50	11:18
Overall	71.3%	87.6%	94.2%	06:55	08:55

Difference to 2025 Base Position

Local Area Municipality	% P4 responded within X minutes			Mean (mm:ss)	80th %ile (mm:ss)
	8	10	12		
Cambridge	1.2%	-0.8%	-1.2%	00:01	-00:01
Kitchener	-1.4%	-1.3%	-0.7%	00:03	00:11
North Dumfries	-0.5%	-3.3%	-4.2%	00:22	00:50
Waterloo	-0.6%	-0.7%	-0.4%	00:01	00:05
Wellesley	1.0%	0.9%	-2.0%	00:10	00:22
Wilmot	2.0%	0.5%	-0.3%	-00:01	00:01
Woolwich	-5.3%	-7.3%	-5.0%	00:35	00:56
Overall	-0.5%	-1.1%	-0.8%	00:02	00:06

5.5 The number of peak PTUs required to deploy the recommended shifts would increase by 9, from 38 to 47.

5.6 While this scenario allows response performance to be maintained, it does not address facility risks or capacity constraints. It was therefore modelled to provide context to improvements that can be achieved when introducing new facilities where required. All existing sites already have challenges with capacity, and limited ability to expand, and there is no space to accommodate the resources that have been identified to offset demand increases.

Facility Configuration Recommendations

5.7 To address capacity challenges, ORH tested a range of facility location optimization scenarios to determine a recommended facility configuration for the future. The optimization criteria used was to either minimize average travel time to P4 incidents in 2035, or to maximize travel time coverage within X minutes.

5.8 Optimal facility locations were identified using DCM and tested in AmbSim to understand the response performance impacts. This involved an iterative approach whereby results were routinely fed back to RoWPS management to understand the feasibility of using identified sites.

5.9 The first stage of the process involved 'blank canvas' modelling, whereby optimal locations are identified taking no account of where current stations are located and applying no other constraints. Only 00 Maple Grove, 14 Headquarters, and 651 Concession were initially assumed to be retained at their existing (or planned) locations.

5.10 The blank canvas optimization showed that, while many facilities are well located, several could be more optimally located and that some additional sites would be beneficial to address gaps in response time coverage (see Appendix **D1**).

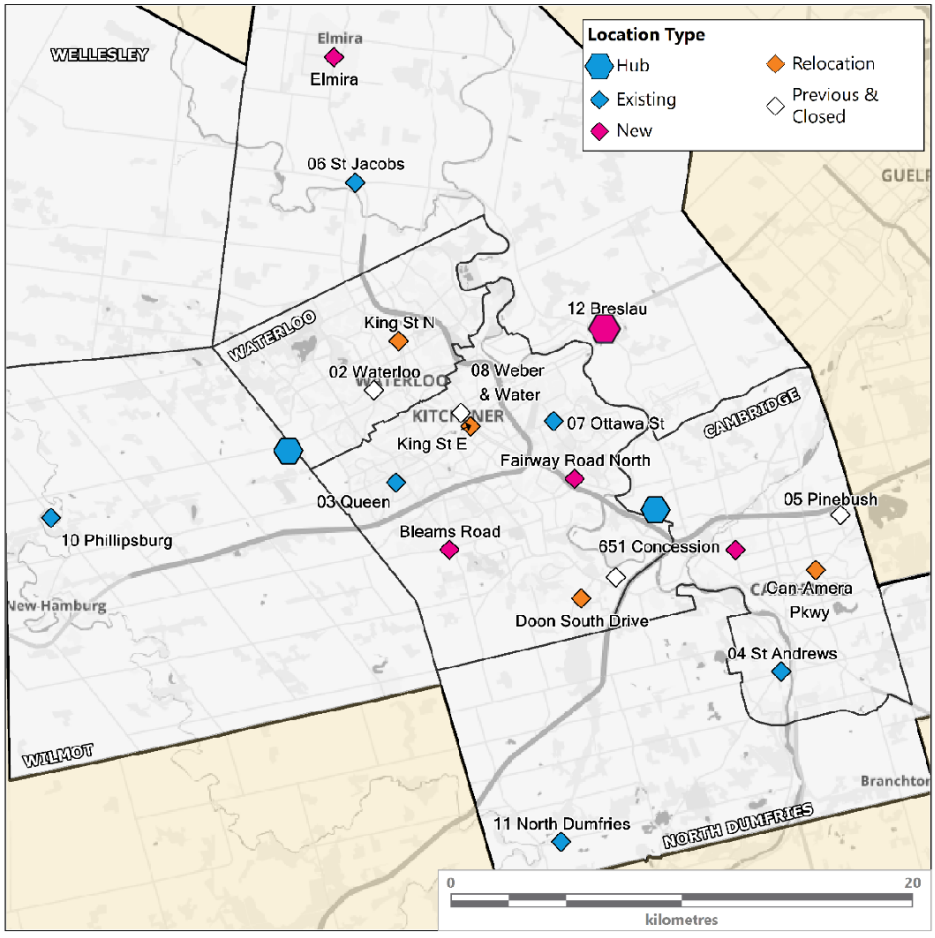
5.11 Based on the initial optimization results, various configurations were tested in AmbSim to understand the response performance impacts. Where required, further targeted optimization was undertaken. The results were then consolidated into a final recommended facility configuration (see Figure **5-2**) that involves:

- Retaining both hub sites
- Retaining seven existing stations
- Relocating four stations to more optimal locations (02 Waterloo, 05 Pinebush, 08 Weber and Water, and 09 Conestoga)
- Adding four new sites, one of which is already planned (651 Concession, Elmira, Williamsburg, and Centreville)

5.12 One of the sites to be retained, 03 Queen, is in relatively poor condition despite being optimally located, and RoWPS may wish to consider this for replacement.

Figure 5-2: Recommended Facility Configuration

Station	Outcome	Capacity Rating	Ability to Expand?	Condition Rating	Location Rating?
00 Maplegrove	**Retain** Existing Site				-
02 Waterloo	**Relocate** to Optimal (King St N / Columbia St)				
03 Queen	**Retain** Existing Site				
04 St Andrews	**Retain** Existing Site				
05 Pinebush	**Relocate** to Optimal (Can-Amera Pkwy / Franklin Blvd)				
06 St Jacobs	**Retain** Existing Site				
07 Ottawa St	**Retain** Existing Site				
08 Weber & Water	**Relocate** to Optimal (King St E / Benton St)				
09 Conestoga	**Relocate** to Optimal (Doon South Dr / Doon Mills Dr)				
10 Phillipsburg	**Retain** Existing Site				
11 North Dumfries	**Retain** Existing Site				-
12 Breslau	**Upgrade** to Hub in Breslau area				
14 Headquarters	**Retain** Existing Site				-
651 Concession	**New** Site				-
Elmira	**New** Site (1st St W / Arthur St S)	*assumed*	-	*assumed*	*assumed*
Williamsburg	**New** Site (Bleams Rd / Fischer-Hallman Rd)	*assumed*	-	*assumed*	*assumed*
Centreville	**New** Site (Fairway Rd / King St E)	*assumed*	-	*assumed*	*assumed*



5.13 The response performance impacts of implementing this facility configuration are discussed in the next sub-section.

5.14 While this configuration allows for improved capacity at stations, it does not address capacity issues at the two existing hubs, which are both physically full. DCM was therefore further utilized to identify the optimal location for a third hub, with the aim of minimizing drive times from hubs to stations, rather than to incident locations (although it was also verified that the results would not vary significantly if incident locations were used instead).

5.15 Several options were assessed and reviewed by the Steering Group, and it was agreed that a third hub would be best located in the vicinity of the existing 12 Breslau facility:

- Access from a hub to stations in the centre and west of Kitchener would be improved
- This area is currently relatively under-developed, so it will be more feasible to find available land than in more built-up areas
- Significant housing development is expected in this area in the 2036 to 2051 period, so it will be well positioned for future growth

5.16 In this scenario, resources booking on from 00 Maplegrove will feed stations in Cambridge, North Dumfries and the relocated 09 Conestoga site; resources booking on from 14 Headquarters and the Third Hub will feed all other stations including the new Williamsburg and Centreville sites (see Appendix **D2**).

5.17 The impacts of using locations other than those included in the recommended facility configuration are discussed as part of the sensitivity modelling scenario outcomes in Section 6.

Frontline Resource Requirement Recommendations

5.18 With the recommended facility configuration and the additional 1,344 weekly vehicle hours previously identified to maintain overall Base Position performance, response performance in 2035 is now set to be maintained or improved in all LAMs. For example, the 80th percentile response time has improved to 08m18s compared to 09m03s in the Base Position (see Appendix **D3**).

5.19 Assuming a 42-hour working week, a total of 298 core FTE is required in 2035. This is an increase of 64 core FTE when compared to the Base Position. To achieve a filled shift rate of 100% (98%), a 40% relief rate has been applied for all staff. Therefore, a total of 119 relief FTE is required in 2035. This is an increase of 52 relief FTE when compared to the Base Position and so, to achieve this 40% relief rate by 2035, a higher relief rate will need to be applied to the additional staff (around 80%).

5.20 The number of peak PTUs required to deploy the recommended shifts would increase by 9, from 38 to 47. Including spares (at a rate of 30% at each hub), space is therefore required for a total of 26 PTUs at 00 Maplegrove, 26 at 14 Headquarters and 16 at the Third Hub.

5.21 However, in this scenario PTU utilization increases to 53% compared to 44% in the Base Position.

5.22 Given that RoWPS is committed to supporting staff health and wellbeing, a secondary objective was set to maintain PTU utilization at Base Position levels. To do so, an additional 2,352 PTU planned weekly vehicle hours are required by 2035 (including the 1,344 hours identified to maintain performance). This is equivalent to a 47% increase in planned vehicle hours to meet a 57% increase in demand.

5.23 P4 response performance in this scenario for 2035 is significantly improved for all LAMs when compared to the Base Position. For example, the 80th percentile response time has further improved to 07m45s compared to 09m03s in the Base Position (see Appendix **D4**).

5.24 Assuming a 42-hour working week, a total of 346 core FTE is required in 2035. This is an increase of 112 core FTE when compared to the Base Position. To achieve a filled shift rate of 100% (98%), a 40% relief rate has been applied for all staff. Therefore, a total of 138 relief FTE is required in 2035. This is an increase of 72 relief FTE when compared to the Base Position and so, to achieve this 40% relief rate by 2035, a higher relief rate will need to be applied to the additional staff (around 65%).

5.25 The number of peak PTUs required to deploy the recommended shifts to maintain utilization levels would increase by 19, from 38 to 57. Including spares (at a rate of 30% at each hub), space is therefore required for a total of 26 PTUs at 00 Maplegrove, 29 at 14 Headquarters, and 28 at the Third Hub.

5.26 A summary of the two scenarios ('Maintain Performance' and 'Maintain Utilization') is provided in Figure **5-3**, with an additional 116 or 184 FTE frontline staff required respectively.

5.27 It should be noted that, if the drivers of sickness and absence could be identified and reduced, the FTE requirements will be lower than those quoted here as the assumed relief requirement (40%) can be reduced.

Figure 5-3: Recommended Resource Requirements Summary

Scenarios	Facilities Used	Planned Weekly Hours		Assumed Availability	Actual Weekly PTU Hours	Planned Peak PTUs	PTU Utilization	Overall 80th %ile (mm:ss)	FTE			Overall Relief %
		PTU	ERU						Core	Relief	Total	
2025 Base Position	Existing	4,788	252	90% (88%)	4,214	38	44%	09:03	234	67	**301**	**28%**
2035 Maintain Performance	Recommended *(Existing)*	6,132	252	100% (98%)	5,997	47	53%	08:18 *(08:55)*	298	119	**417**	**40%**
2035 Maintain Utilization	Recommended	7,140	252	100% (98%)	6,983	57	45%	07:45	346	138	**484**	**40%**

Difference to 2025 Base Position

Note: to achieve 40% overall relief by 2035, a higher relief ratio will need to be applied to additional staff

2035 Maintain Performance	Recommended *(Existing)*	1,344	0	10%	1,783	9	9%	-00:45 *(-00:08)*	64	52	116	12%
2035 Maintain Utilization	Recommended	2,352	0	10%	2,769	19	1%	-01:18	112	72	184	12%

Note: Planned Weekly Hours and FTE includes rural ERUs (as deployed in the 2025 Base Position)

6 Frontline Sensitivity Modelling (2035)

Frontline sensitivity modelling was undertaken to test assumptions about the parameters included in the 'Maintain Performance' scenario for 2035, including:

- MPDS and potential alternative operating models (hear and treat, treat and release, etc)
- The new hospital
- Alternative growth scenarios
- Alternative facility locations
- Alternative relief rate scenarios

MPDS and Alternative Operating Models

Converting to MPDS

6.1 The Cambridge CACC will implement MPDS for dispatching RoWPS vehicles in December 2025. MPDS provides greater differentiation of patient categories than the current Dispatch Card Priority Index (DPCI) II system and enables greater prioritization of treatment for patients most in need.

6.2 MPDS alone does not change the response-and-transport model operated across Ontario. The current paramedic services operating environment in Ontario limits the autonomy of services to develop clinical programs such as 'treat and release', 'treat and refer' and secondary clinical triage in the dispatch centre ('hear and treat'). If these were implemented, it is anticipated that this would lead to reductions in inappropriate ambulance response, introducing more appropriate patient care, and reduced ambulance requirements; some of which are discussed in the next sub-section.

6.3 ORH configured a version of AmbSim under the MPDS operating model based on various assumptions (utilizing information from providers who use MPDS in the UK, Australia, and elsewhere in Canada).

6.4 ORH has previously worked with Halton Region Paramedic Service (HRPS). This service uses the Mississauga CACC, which transitioned from DPCI II to MPDS in December 2022. ORH is therefore able to compare HRPS pre-MPDS (January 2022 to November 2022) and post-MPDS (December 2022 to December 2023) data samples, to create assumptions regarding how service time components and operations may change for RoWPS.

6.5 An overview of assumptions is given in Appendix **E1**. Broadly, it is assumed that the profile of the new Purple, Red, and Orange categories will initially follow the profile of P4 incidents, and the profile of Yellow and Green categories will initially follow the profile of P3 incidents, with some caveats.

6.6 For example, as the proportion of P4 incidents was slightly higher for RoWPS (70%) than for HRPS (67%), the proportion of Purple, Red and Orange incidents is anticipated to be slightly higher for RoWPS than for HRPS (see Appendix **E2**). The overall average number of responses per incident remained unchanged for HRPS when comparing pre- and post-MPDS but was significantly higher than average for Purple. Therefore, this type of change was mirrored for RoWPS.

6.7 While overall conveyance rates and time at scene did not change significantly for HRPS between the pre- and post-MPDS samples, there is some expected variation by category which was reflected in the RoWPS inputs (see Appendix **E3**). There is no obvious variation in time at hospital by category.

6.8 It is recommended that Purple and Red response times be measured from time vehicle notified (T2). However, to accurately capture the patient experience in a model which allows lower priority calls to be held where appropriate, Orange, Yellow and Green should be measured from time of call (T0). Niagara EMS, who operate under MPDS, use this approach.

6.9 The range of assumptions was applied to the Base Position and to the 2035 Maintain Performance and Maintain Utilization scenarios described in the previous section. For the MPDS Maintain Performance scenario, Purple, Red and Orange response performance is slightly improved compared to the MPDS Base Position, maintained for Yellow, and slightly reduced for Green (see Figure **6-1**). This is to be expected since MPDS enables increased prioritization for patients in most need. For the MPDS Maintain Utilization scenario, all categories are improved compared to the MPDS Base Position.

6.10 Simply moving to the new categorization system does not fundamentally reduce the resource requirement in 2035.

Figure 6-1: 2035 Response Performance under MPDS

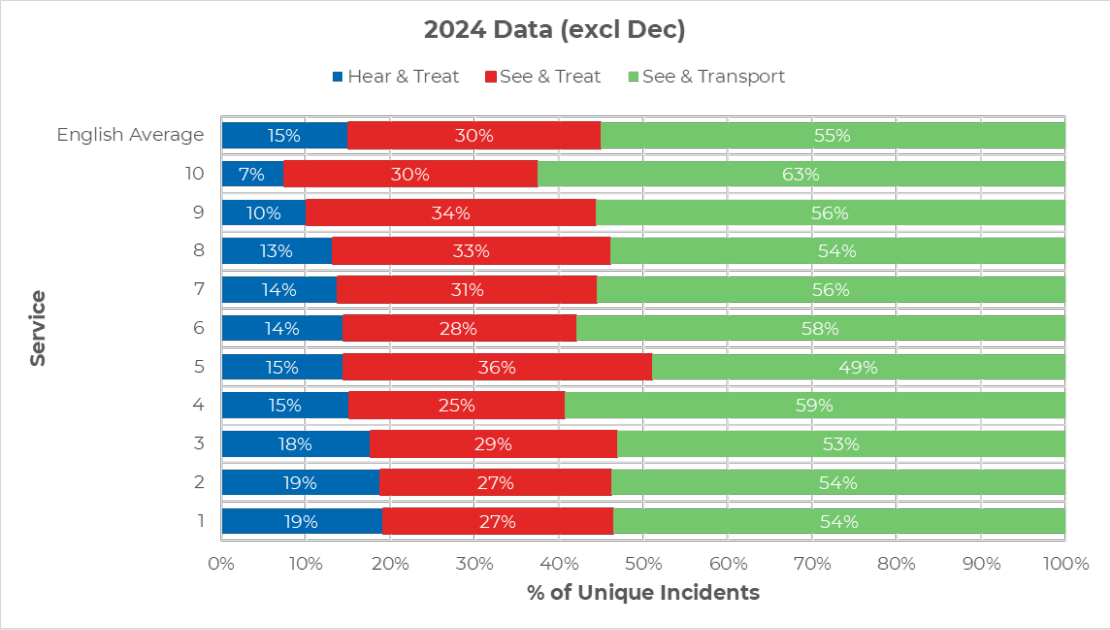
80th Percentile (mm:ss) **Difference**

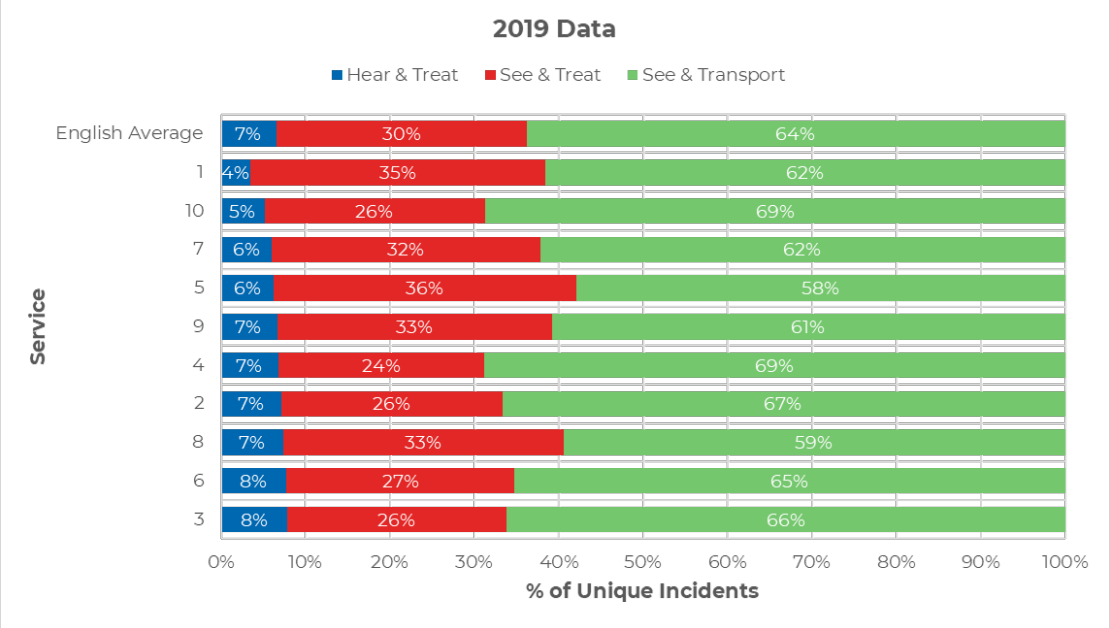
Category	Base	Do Nothing	Maintain Performance	Maintain Utilization	Do Nothing	Maintain Performance	Maintain Utilization
Purple	08:54	00:12:19	00:08:05	00:07:38	03:25	-00:49	-01:15
Red	09:05	00:13:20	00:08:20	00:07:46	04:15	-00:45	-01:18
Orange	17:03	01:40:27	00:16:44	00:14:56	83:24	-00:19	-02:07
Yellow	18:09	02:15:42	00:18:14	00:15:58	117:33	00:05	-02:12
Green	20:19	02:45:33	00:25:04	00:17:57	145:14	04:46	-02:22

Hear and Treat and Treat and Release

6.11 The practice of 'hear and treat' involves an ambulance service triaging certain calls over the telephone, with the aim of resolving that call without the need for a vehicle response. This is used by other ambulance services across the world, including in England where the average hear and treat rate in 2024 was 15% (see Figure **6-2**). Services in England have been working towards this robust hear and treat position for some time. For example, in 2019 the average hear and treat rate was much lower, at 7%.

Figure 6-2: English Ambulance Incident Outcomes





Incidents = calls that receive a face-to-face response from the ambulance service at the scene of the incident and calls that are successfully resolved with telephone advice with any appropriate action agreed with the patient. If there have been multiple calls about a single incident, only one incident is counted.
Excludes duplicate, hoax, test, cancelled/abandoned by caller, information, etc type calls

6.12 In the benchmarked English ambulance service outcomes, treat and release or 'see and treat' rates are at an average of 30%. When a treat and release outcome is appropriately applied to a patient, this patient can be treated on scene without the need for transport to hospital. This would save more than half of the total occupied time for each RoWPS incident.

6.13 ORH has investigated how a 7% hear and treat rate could hypothetically be achieved by RoWPS (see Appendix **E4**). In this example, using MPDS call classifications and projected 2035 demand levels, 60% of Yellow and Green calls would need to be triaged with a 33% success rate (that is, for every three calls that are triaged over the phone, two will still receive a vehicle response).

6.14 This is the equivalent of triaging 57 calls per day in 2035, with 19 being successfully resolved without the need for a vehicle response.

6.15 Additional clinical triage staff would be required in the CACC to manage these calls. ORH has undertaken a relatively simplistic estimation of the number of staff required to triage the 57 calls per day using the following assumptions:

- A clinician can triage an average of three calls per hour
- Each clinician is unavailable for approximately 15% of their on-shift time, for meal breaks and comfort breaks
- Therefore, additional clinicians will be required to provide cover for meal and comfort breaks (also with 15% unavailable time)

6.16 The requirement for triaging clinicians in any given hour is then appropriately rounded to the nearest whole clinician. In this case, clinicians would therefore need to be deployed for 33 hours per day. Assuming a 42-hour working week, 5.5 core FTE clinicians would be required. These would need to be supported by relief FTE to account for absences such as vacation and sickness.

6.17 If 19 calls per day no longer require a vehicle response in 2035, then three 12-hour PTUs (or 252 weekly hours) can be removed from the Maintain Performance scenario. This is equivalent to 12.0 core FTE paramedics plus relief FTE to account for absences such as vacation and sickness.

6.18 ORH has also investigated how a more proactive hear and treat rate of 15% could hypothetically be achieved by RoWPS. In this example, the percentage of Orange, Yellow, and Green calls triaged would be 50% with a 25% success rate, 75% with a 33% success rate, and 100% with a 50% success rate, respectively. This is the equivalent of triaging 107 calls per day in 2035, with 45 being successfully resolved without the need for a vehicle response.

6.19 To facilitate this level of triage using the same assumptions as for the 7% hear and treat scenario, clinicians would need to be deployed for 53 hours of the day. Assuming a 42-hour working week, this would therefore require 8.8 core FTE clinicians. These would need to be supported by relief FTE to account for absences such as vacation and sickness.

6.20 If 45 responses per day no longer require a vehicle response in 2035, then seven 12-hour PTUs could be removed (or 588 weekly hours). This is equivalent to 28 core FTE paramedics plus relief FTE to account for absences such as vacation and sickness.

6.21 There is therefore a net reduction in the additional staffing required by 2035 in both the 7% and 15% hear and treat scenarios. However, it should be noted that these scenarios require a fundamental change to the way calls are processed by the CACC to achieve this efficiency saving.

6.22 ORH also implemented a 30% treat and release rate within the MPDS Maintain Performance scenario for 2035, in addition to the increased hear and treat levels, to identify further potential resource savings. This gives two scenarios in which only 63% and 55% of the original projected demand for 2035 requires transport to hospital, respectively.

6.23 A summary of the potential frontline resource implications is given in Figure **6-3**.

Figure 6-3: Hear and Treat and Treat and Release Frontline Resource Impacts

		Weekly PTU Hours		Difference to Maintain Perf. Scenario	
Hear & Treat Rate	Maintain Performance in 2035	See & Treat Rate		See & Treat Rate	
		No change	30%	No change	30%
7%	6,132	5,880	5,628	-252	-504
15%	6,132	5,544	5,292	-588	-840

ERU Expansion

6.24 RoWPS currently operates three rural ERUs. In other jurisdictions that operate under an MPDS or similar dispatching model, solo responders are targeted at the highest acuity calls (to provide the quickest possible response and additional support) and at the lowest acuity calls (where they can treat and release patients on scene without the need for a PTU).

6.25 ORH therefore investigated the impact of expanding the ERU program into urban areas, independently of the hear and treat and treat and release modelling described in the previous sub-section. Three 12-hour ERUs were deployed in the MPDS Maintain Performance scenario for 2035 to cover three zones across Waterloo, Kitchener, and Cambridge (with centre points close to WRHN @ Midtown, close to the new Centreville site, and close to CMH).

6.26 These ERUs were made available to respond to all calls but a new dispatching protocol was set up for Yellow and Green calls (for both rural and urban ERUs). For these calls, if the ERU is the closest responder it will attend and a PTU will not be immediately dispatched. Instead, a PTU will only be summoned to scene by the ERU if it is determined that the patient needs conveying to hospital after initial assessment by the ERU. If conveyance is not required, then a PTU will not be dispatched. In cases where the ERU is closest and attends, we have assumed that they can treat and release 33% of the time.

6.27 In this scenario, the three urban ERUs collectively respond to 20 calls per day including 2.5 Yellow calls per day (8% of all Yellow) and 8 Green calls per day (13% of all Green). Their utilization rate is around 38%. The three rural ERUs collectively respond to 11 calls per day (increased from 5 per day prior to the new dispatching protocol for Yellow and Green).

6.28 This allows PTUs to respond to 10 fewer calls per day, and the overall conveyance rate drops from 72% to 70%. As a result, a 12/7 PTU shift could be removed and performance could still be maintained (see Appendix **E5**). With the three urban ERUs in place, the reduction in PTU responses is still relatively low, though it is easy to see how this could be scaled upwards with greater efficiency savings.

Short-term ERU Expansion

6.29 While maximizing the use of ERUs through enhanced treat and release programs may still be some years away, there would also be benefits in enhancing the ERU program in the short term. These ERUs would be available to respond to the sickest patients as quickly as possible (alongside a PTU response) and, if staffed by ACPs, provide clinical support for more complex incidents.

6.30 ORH tested deploying two 12/7 urban ERUs in 2026 to the Kitchener and Cambridge zones, without the changes to dispatching protocols described in the previous sub-section (under MPDS). P4 response performance in Cambridge and Kitchener LAMs would improve by between 3% and 4% at the 8-minute target.

6.31 Treat and release efficiency should then be explored further in future as RoWPS' clinical strategy develops, building on this initial ERU expansion.

New Hospital

6.32 With a new hospital in the Region proposed to open by 2035, it is important to understand the potential impacts on patient flows and RoWPS response times. The hospital is expected to be located at David Johnston Research and Technology Park near the University of Waterloo.

6.33 ORH has been advised by multiple stakeholders, including the Waterloo Regional Health Network. This combined stakeholder input has lead to the following list of assumptions for the new hospital:

- WRHN @ Queen's Blvd will close entirely
- By 2035 the new hospital will have in-patient beds, maternity, cardiac, operating facilities, a full emergency department (ED), and will continue to operate an Urgent Care Centre (UCC) which will initially open in 2032
- It is likely that WRHN @ Midtown will remain open with a full ED in the span of this Master Plan, however alternative scenarios where this operates as a UCC only, or closes entirely, have been tested
- It is estimated that, of the combined ED patient volumes for WRHN @ Midtown and the new hospital, one-third will go to WRHN @ Midtown and two-thirds will go to the new hospital

6.34 In terms of patient flows for 2035 (see Appendix **E6**):

- CMH still takes most patients from Cambridge; however, its catchment is now slightly larger and it receives more patients from the south Kitchener area than before
- WRHN @ Midtown takes fewer patients than it did under the previous 2035 setup, particularly from Waterloo
- The new hospital takes more patients than both WRHN @ Midtown and WRHN @ Queen's Blvd did under the previous hospital configuration in 2035; it still takes a large proportion of patients who are closer to WRHN @ Midtown, however this is not unexpected given the overlap in hospital catchments

6.35 In the latest two-year sample of analyzed data, average time at hospital across the three major hospitals was 65 minutes. By 2035 (prior to any hospital reconfiguration) this is expected to increase to around 84 minutes given the projected demand volumes. This is an inherent assumption automatically calculated within AmbSim given demand levels; the more patients that are brought into the hospital by RoWPS, the longer RoWPS vehicles will have to wait to be able to transfer patient care to the hospital. The new hospital was also assumed to have an average time at hospital of 84 minutes in 2035.

6.36 The assumptions outlined above were built into the Maintain Performance scenario for 2035 with the three different WRHN @ Midtown scenarios (ED open, UCC only, or closes entirely). In each scenario, Waterloo response performance improves slightly, and Kitchener response performance worsens slightly (see Appendix **E7**). These changes are not large enough to warrant a change to the recommended resources. If WRHN @ Midtown were to close entirely, then there is more of a deterioration in performance for all LAMs except for Waterloo.

6.37 ORH also tested how the resource requirement would change, with WRHN @ Midtown ED open, given variations to average time at hospital at all hospitals. Two scenarios were tested, one with a more optimistic average of 65 minutes (in line with the analyzed data), and one with a more pessimistic average of 102 minutes (double the analyzed data).

6.38 With the more optimistic time at hospital, 504 weekly PTU hours can be removed from the Maintain Performance scenario. Conversely, with the more pessimistic time at hospital, an additional 420 weekly vehicle hours would be required in addition to the Maintain Performance scenario.

Alternative Growth Scenarios

6.39 As discussed in Section 4, three demand projections were created:

- Core growth projection of 4.6% per year (used throughout Section 5)
- Low growth projection of 3.9% per year
- High growth projection of 5.2% per year

6.40 With the high growth projection applied to the Maintain Performance scenario, four additional 12-hour shifts, or 336 weekly PTU hours, are required.

6.41 Conversely, with the low growth projection applied to the Maintain Performance scenario, the requirements can be reduced by four 12-hour shifts, or 336 weekly PTU hours.

Alternative Facility Locations

6.42 The optimization process undertaken to identify the recommended facility configuration finds the mathematically optimal locations for opened or re-located facilities. However, it is recognized that these exact locations do not always have available land, and/or RoWPS may wish to test the viability of other potential locations. With that in mind, a series of alternative locations for certain sites were tested against the 2035 Maintain Performance and are discussed in more detail below.

Third Hub

6.43 Several alternative locations for a third hub were tested, including relocating the hub to:

- Land at Shirley Ave near Conestoga Pkwy in Kitchener
- The relocated 08 Weber and Water site (though this is unlikely to be feasible given that this area is already well built up)
- The relocated 05 Pinebush site at Can-Amera Pkwy in Cambridge
- Land at Conestoga Blvd in Cambridge
- As above, but also consolidating the Can-Amera Pkwy location at Conestoga Blvd given its proximity to the alternative hub location

6.44 In the third, fourth and fifth scenarios listed above, resources booking on from the third hub in Cambridge will now feed stations in Cambridge, North Dumfries, and the relocated 09 Conestoga site; resources booking on from 00 Maplegrove and 14 Headquarters will feed all other stations including the new Williamsburg and Centreville sites.

6.45 None of these scenarios resulted in a significant change in response performance (see Appendix **E8**) as this is driven more by the station locations than the hub locations.

Retained Stations

6.46 Seven existing stations (and two hubs) are recommended to be retained at their current locations. However, alternative locations for several of these were also explored:

- Relocating 03 Queen to the optimal site at Highland Rd W and Fischer-Hallman Rd
- Relocating 04 St Andrews to the optimal site at Bruce St and Main St
- Closing 06 St Jacob (with the new Elmira site open)
- Relocating 07 Ottawa to the optimal site at Lorraine Av and Confederation Dr
- Relocating 10 Phillipsburg to an optimal site identified in Luxemburg
- Relocating 10 Phillipsburg to an alternative optimal site in New Hamburg

6.47 The majority of these scenarios result in little change in response performance (see Appendix **E9**).

6.48 While relocating 10 Phillipsburg to Luxemburg or New Hamburg would give performance improvements for Wilmot LAM at the 8-minute target, 80th percentile response performance is largely unchanged and in fact gets significantly worse for Wellesley LAM.

Relocated Stations

6.49 Four existing stations are recommended to be relocated to more optimal locations (02 Waterloo, 05 Pinebush, 08 Weber and Water, and 09 Conestoga). Given that land may not be available at the exact locations of each optimal site, a range of alternatives were tested.

6.50 For 02 Waterloo, instead of moving to the optimal site at King St N and Columbia St, the following scenarios were explored:

- Retaining 02 Waterloo at its current site
- Retaining 02 Waterloo at its current site and building an additional North Waterloo site at Northfield Dr W/Weber St N

- Relocating 02 Waterloo to Seagram Dr
- Relocating 02 Waterloo to the New Hospital site
- Relocating 02 Waterloo to 403 Albert St
- Relocating 02 Waterloo to 300 Hemlock St
- Relocating 02 Waterloo to Hagey Blvd/Bearinger Rd

6.51 All of these scenarios result in longer 80th percentile response times for Waterloo LAM than the recommended site, though most are better than simply retaining 02 Waterloo at its current site (see Appendix **E10**).

6.52 For 05 Pinebush, instead of moving to the optimal site at Can-Amera Pkwy and Franklin Blvd, the following scenarios were explored:

- Retaining 05 Pinebush at its current site
- Relocating 05 Pinebush to 651 Concession
- Relocating 05 Pinebush to 221 Avenue Road

6.53 For 08 Weber and Water, instead of moving to the optimal site at King St E and Benton St, the following scenarios were explored:

- Retaining 08 Weber and Water at its current site
- Relocating 08 Weber and Water to 225 Weber St W
- Relocating 08 Weber and Water to 450 King St E

6.54 Finally, retaining 09 Conestoga at its current site instead of moving to the optimal site at Doon South Dr and Doon Mills Dr was tested.

Alternative Relief Rate Scenarios

6.55 It was agreed with the Steering Group that an improved relief rate would be targeted by 2035 to allow 100% of the planned shifts to be deployed rather than 90% in the Base Position. Relief rates therefore need to increase from 28% in the Base Position to 40% by 2035.

6.56 However, ORH also tested a 34% relief rate scenario, halfway between the Base Position rate and the target rate. This assumes that the required relief rate is still 40%, but only 34% is provided. By 2035, this therefore allows approximately 95% of the planned shifts to be deployed.

6.57 Compared with the 40% relief rate scenario, fewer of the planned shifts will ultimately be deployed on the road due to the reduced availability. Therefore, RoWPS would be required to plan more shift lines in order to achieve the same actual hours on the road:

- For the Maintain Performance scenario, an additional 1,596 planned weekly vehicle hours are required rather than 1,344 with the 40% relief rate
- For the Maintain Utilization scenario, an additional 2,688 planned weekly vehicle hours are required rather than 2,352 with the 40% relief rate

6.58 The total FTE required by 2035 under the 34% and 40% relief rate scenarios is very similar, but with a different proportion of core and relief FTE (see Figure **6-4**). However, under the 34% relief rate scenario, there are more shift lines and more physical PTUs to manage.

Figure 6-4: Alternative Relief Rate Summary

Scenarios		Facilities Used	Planned Weekly Hours		Assumed Availability	Actual Weekly PTU Hours	Planned Peak PTUs	PTU Utilization	Overall 80th %ile (mm:ss)	FTE			Overall Relief %
			PTU	ERU						Core	Relief	Total	
2025 Base Position		Existing	4,788	252	90% (88%)	4,214	38	44%	09:03	234	67	**301**	**28%**
2035 Maintain Performance	Recommended		6,132	252	100% (98%)	5,997	47	53%	08:18	298	119	**417**	**40%**
			6,384	252	95% (93%)	5,949	48	53%	08:19	310	105	**415**	**34%**
Difference between Scenarios			252	0	-5%	-49	2	0%	00:01	12	-14	-2	-6%
2035 Maintain Utilization	Recommended		7,140	252	100% (98%)	6,983	57	45%	07:44	346	138	**484**	**40%**
			7,476	252	95% (93%)	6,975	61	46%	07:44	362	123	**485**	**34%**
Difference between Scenarios			336	0	-5%	-8	4	0%	00:00	16	-15	1	-6%

7 Support and Management Services Recommendations

This report forecasts a significant uplift in activity for RoWPS over the next ten years, and this will require increases in frontline resources and assets as well as proportionate growth in management structures and support services. A comprehensive list of recommendations has been compiled (see Figure **7-1**).

The organization will also need to develop enabling strategies to support them in continuing to deliver high-quality services. Digitalization will play a significantly increased role in supporting existing staff and leadership, as well as in maximizing the efficiency of any additional functions or roles that may be required in the future.

7.1 This report forecasts a significant uplift in activity for RoWPS over the next ten years, and this will require increases in frontline resources and assets as well as proportionate growth in management structures and support services to meet this forecasted patient demand.

7.2 A comprehensive list of recommendations has been compiled (see Figure **7-1**), each of which is discussed in more detail in the sub-sections below.

7.3 The organization will also need to develop enabling strategies to support them in continuing to deliver high-quality services. Digitalization will play a significantly increased role in supporting existing staff and leadership, as well as in maximizing the efficiency of any additional functions or roles that may be required in the future.

1) Future Ownership of Call Answering, Clinical Triage, and Dispatch Functions

7.4 It is recommended that strategic discussions are initiated between all relevant external stakeholders, including the Ministry of Health and the senior leadership of Guelph-Wellington and County of Dufferin, around the future ownership of the call answering, clinical triage, and dispatch functions within the current CACC.

7.5 This needs to be carefully considered at regional level in terms of the overall management of RoWPS demand going forward. Access to clinical advice and enhanced secondary clinical assessment by an experienced multi-disciplinary team of clinicians, including paramedics, is now a fundamental part of ambulance communication centres across the UK and further afield.

Figure 7-1: Support and Management Services Recommendations Summary

	Recommendations
1A	Initiate strategic discussions around the **future ownership of call answering, clinical triage, and dispatch functions**
1B	Seek agreement to enable the **placement of an experienced Paramedic Operations Superintendent into the CACC** to work in partnership with the leadership team and dispatchers to support operational delivery as soon as is practicable.
2	Co-design a new **regional clinical response model** incorporating alternative care pathways, and including **expansion of the CP program**
3A	Develop a Commander level **strategic workforce planning role**
3B	Undertake an in-depth review to identify the **primary drivers for staff retention** and sickness absence challenges
3C	Consider requesting **additional Regional HR support** or recruit an additional RTW co-ordinator
4A	Consider creating an **ACP bursary scheme** to encourage professional development
4B	Develop an **ACP deployment plan** targeting ACPs based on MPDS determinant
5	Seek funding to establish a formalized **Emergency Management lead role**
6A	Procure a **replacement ePCR system**
6B	Fund and appoint a **fixed term IT professional** (to support 6C and 6D)
6C	Scope and deliver a **comprehensive review of IT systems** and future needs
6D	Develop a dedicated **digital enabling strategy**
7	Develop an internal **business intelligence role**
8A	Develop mutually agreed **Service Level Agreements** across support services
8B	Consider developing a **Business Support Manager role**
9A	Undertake a more in-depth **review of the scheduling function**
9B	Procure a more agile and intuitive **scheduling software product**
10	Adopt **a 20:1 ratio of Operations Superintendents** to frontline staff, therefore requiring an additional 7 FTE (Maintain Performance) or 10 FTE (Maintain Utilization) by 2035
11A	**Extend Logistics Support provision** to provide 24-hour coverage (by working differently within the existing funded establishment)
11B	Maintain the existing **10:1 ratio of Logistics Support** staff to frontline vehicles, therefore requiring an additional 6 FTE (Maintain Performance) or 9 FTE (Maintain Utilization) by 2035
11C	Phased increase in the operating hours for **Logistics Superintendents with full 24/7 coverage** in place by 2033 (when the Third Hub is operational), requiring an additional 4 FTE
12A	Establish a **Professional Standards Commander role**
12B	Establish an **additional funded QA Specialist** role as soon as is practicable, rising to a total of 4 FTE by 2035
12C	Utilize some of the existing program management support resources to undertake an **options appraisal for clinical supervision**
13	Develop and deliver a funded **programme of leadership, education and training** across the entire leadership group within RoWPS

7.6 Where this model is adopted, evidence shows that it is responsible for, as an example, a reduction in the dispatch of a transport unit resource by up to 15% of total emergency call (911) activity through the use of hear and treat clinical advice. This clinical advice is provided by healthcare professionals with differing skill sets using advanced clinical assessment algorithms, ensuring that high-quality patient care is always maintained. There are other benefits to be gained, such as the increased use of ERUs staffed by more highly skilled and experienced solo paramedics offering patients clinical advice and support when they attend calls.

7.7 ORH and AACE strongly encourage RoWPS to seek to formalize a coalition of support to develop a strategic outline case for the ownership and management of the CACC function. This should be done as part of their future strategic planning and will be critical if transport unit response resources are to be used more efficiently and effectively moving forwards through the cycle of the new Ten-year Master Plan. Any proposal to achieve this objective would also rapidly solve some of the long-standing issues within the CACC operating environment, such as:

- Enabling a unified system (paramedics and communications officers operating in unison)
- Implementation and oversight of long overdue technology and re-engineered systems and processes to increase system efficiencies and reduce costs
- Optimizing the benefits of the implementation of the MPDS principal triage system
- More effective management of calls entering the CACC by acting more like a 'System Navigator', ensuring that the right resource is provided to the right patient at the right time
- Stabilizing and improving staff recruitment and retention within the CACC environment

7.8 It is recognized that this type of operational transformation could take some time to be agreed and, more importantly, implemented. It is therefore recommended that RoWPS seeks agreement to enable the placement of an experienced paramedic Operations Superintendent into the CACC to work in partnership with the leadership team and the dispatchers to support operational delivery as soon as is practicable (with 12/7 coverage in 2026 and 24/7 coverage in 2027).

7.9 As an example, Essex-Windsor Emergency Medical Services (EWEMS) have an agreed Paramedic Patent Navigator (PPN) role fully established within their CACC which has delivered significant benefits since it has been in place and is an illustration of best practice that could be applied in RoWPS.

2) New Regional Clinical Response Model

7.10 One of the risks in undertaking sophisticated simulation and optimization modelling through updating master plans when demand on services increases is to focus purely on increasing capacity in terms of physical numbers of people and assets. Adopting that approach subsequently misses the opportunity to manage increased demand by working differently.

7.11 The appetite for transforming services can only be fulfilled as part of the whole health system vision, including paramedic services, through wider regional and provincial government agendas. The conundrum for RoWPS and the paramedic profession itself in Ontario is how to add value and improve clinical quality in a financially constrained environment.

7.12 The core remit of any paramedic service will always be to provide emergency response to those who have a life-threatening health need. However, when the new MPDS triage platform is adopted in December 2025, evidence will emerge that this is a relatively small proportion of the incidents that RoWPS currently responds to. The much larger volume of overall activity involves 911 responses to urgent care needs in the out-of-hospital environment, and in many cases, this is to support other parts of the regional health system where there are unmet urgent care needs.

7.13 In our experience public education campaigns that are used in an attempt to suppress 'inappropriate' calls to 911 often, except in extremis, have the inverse effect and drive up the number of calls. We would therefore encourage RoWPS and its stakeholders to consider that no call is inappropriate, however, some of our operational responses are. Focus should instead be placed on navigating callers to the most clinically appropriate pathway, which may not involve a physical vehicle or paramedic response.

7.14 Within the lifespan of this latest Master Plan there is greater potential for RoWPS to develop new clinical models of care and new ways of working, within the following two remits:

- To develop a lead coordinator and navigator role (for example, a PPN) for access to Emergency and Urgent Care and support agencies, making efficient use of multi-professional, integrated clinical hubs and assessment services at system level
- Paramedics responding to patients needing out-of-hospital care, with more direct referral pathways to other parts of the system, and advanced skill sets and CP models to safely keep more patients at home

7.15 Such developments are predicated on the basis that a clinically safe reduction in the number of patients transported to ED through the further clinical development of treat and release and treat and refer care pathways in the Region will provide financial benefits for the wider healthcare system, as well as being the most clinically appropriate course of action for the patient, improving clinical outcomes and their overall experience.

7.16 By acknowledging the potential for change and co-designing regional system emergency and urgent care strategies with all partners and stakeholders, RoWPS can play a pivotal part in helping to alleviate many of the system pressures and capacity issues, rather than contributing to them. By rebalancing the focus of resources in more efficient and effective ways, we can improve out-of-hospital services and experiences for patients.

7.17 This would also facilitate the development of a more positive culture, as well as supportive and productive working environments for RoWPS and across the wider regional health system; creating attractive and fulfilling remits and cross-sector career paths for the workforce, and addressing many of the challenges that are leading to the current levels of dissatisfaction and attrition across RoWPS' most valuable assets, its staff.

7.18 RoWPS should be encouraged and supported regionally and provincially to design their complementary medium-to-long-term strategy, with and through the engagement of staff, trade unions, healthcare partners and other appropriate stakeholders, to shape how they will develop their clinical operating model, workforce plan, digital systems and processes to support the objectives of the wider regional health strategy.

7.19 While this provision will go some way to alleviating demand on 911, there are more opportunities to develop further CP models of care (frail elderly fallers, for example) with greater integration into the wider healthcare system. As demand continues to increase, the CP program will be an integral part of RoWPS clinical strategy and will therefore need to expand accordingly.

7.20 There are further opportunities with these types of initiatives, as part of a wider health strategy, to develop attractive career pathways for paramedics by developing their clinical skillset to better support urgent and primary care needs of patients and enhance clinical decision-making and improve clinical outcomes. This would also support better recruitment and retention of the workforce. It is acknowledged that achieving this would require legislative changes but, given the overall challenges the system will face over the next ten years, it warrants careful consideration.

3) Workforce Planning

7.21 Consideration should be given to developing a senior (Commander level) internal strategic workforce planning role to provide overall organizational visibility and oversight of workforce planning, recruitment and retention, and skill mix optimization. This role would act as the primary conduit to the Regional HR Support lead on recruitment and retention initiatives for the whole of the service.

7.22 Given that the workforce is one of the most valuable assets of the organization, it is recommended that the establishment of such a function within the leadership structure is funded and delivered as soon as is practicable. A secondary benefit to this action would be to create additional capacity in the numerous roles across other functions that are routinely dipping in and out of this area of responsibility, allowing them to focus more on their individual core roles.

7.23 There are other existing roles that could report into this new role if established, such as the Return to Work (RTW) Coordinator role and potentially the Paramedic Wellness Specialist role.

7.24 The establishment of this new role would also free up additional capacity within the Education and Training portfolio to enable them, along with digitalization, to absorb the additional numbers of new staff that will be recruited throughout the life of the Master Plan.

7.25 It is recommended that an in-depth review is undertaken to identify the primary drivers for the challenges with staff retention and high levels of sickness absence. A particular focus of this review needs to be the root cause analysis of such high levels of absence attributed to psychological health issues (stress and anxiety), as the current levels of absence of this nature are not routinely seen in services in other parts of the world with this level of unit utilization.

7.26 Consideration should be given to requesting additional existing Regional HR Support or developing a case to recruit an additional RTW Coordinator to meet current and future demand of staff requiring this service. This additional support will continue to ensure that staff can be fully supported to return to full operational duties after extended sick leave periods in a timely manner, so as to maximize efficiency by ensuring that optimal operational capacity can be delivered to maintain response time performance and improved clinical outcomes for patients.

4) ACP Incentivization and Deployment

7.27 Due to the recruitment constraints of qualified ACPs directly into the service, consideration should be given to creating a form of bursary scheme to encourage existing PCPs to professionally develop themselves, with some support from their employer, to achieve ACP status.

7.28 Additionally, due to the limited number of ACPs available, the organization needs to optimize their use in their operational response model prior to implementing MPDS. It is recommended that senior operational leadership develops a deployment plan that in future targets an ACP to the most critical cases as determined by final determinant in the MPDS triage platform.

5) Emergency Management Role

7.29 It is recommended that RoWPS seeks funding to establish a formalized Emergency Management lead role.

7.30 The post holder should be suitably qualified and would have several key areas of responsibility, including management oversight of the RoWPS specialist response capabilities such as the Hazardous Response Team, the development, implementation and maintenance of emergency preparedness and business continuity response plans, and to take the organizational lead for the planning and deployment of resources for large scale special events.

7.31 This role would ensure that the organization is appropriately prepared for major incident emergencies, complex and hazardous incidents, and planned large-scale special events. It would also enable RoWPS to provide suitable assurance that they have appropriate emergency preparedness and business continuity response plans, and that staff and leaders alike are fully trained to implement these when required.

7.32 This role would ensure that RoWPS is fully compliant with all aspects of Ontario's Emergency Management and Civil Protection Act (EMCPA), provincial guidelines, and other relevant legislation.

6) Digital Strategy and IT Support

7.33 We recommend the procurement of a replacement ePCR system to enable the withdrawal of the current product which has reached end of life.

7.34 It is recommended that a suitably skilled and experienced IT professional is funded and appointed for a fixed term (to be determined). This role should work with RoWPS and the Region of Waterloo IT team to scope and deliver a comprehensive review of existing IT hardware and software systems currently in use, as well as a forensic IT needs analysis for the organization over the next ten years.

7.35 This will form the basis of the development of a dedicated digital enabling strategy for the organization.

7.36 The strategy should be written to deliver organizational objectives that will progressively allow them to become digitally (patient care records) fully integrated and able to work more effectively with the wider health system as a respected system partner; thus improving their real time operational performance visibility, business intelligence, and management information function through the use of high-quality data reporting.

7.37 It should also set out meaningful and timely objectives as to how digitalization will support existing staff in realizing cash-releasing efficiency gains across the range of support services as the organization sets itself on a footing to become paperless in as many areas as possible over the lifetime of this Master Plan.

7) In-house Data Analyst Support

7.38 It is recommended that RoWPS seeks to internally supplement the existing data analytical support it receives from the Region with an internal business intelligence role. This role would complement the existing capabilities but would be more agile and would interpret data received by the organization and translate it into evidence-based intelligence. Such intelligence can be used to understand what is happening within Operations, but more importantly help the organization to forecast and plan effectively into the future.

7.39 Having this capability internally available will also drive visibility of organization-wide performance and efficiency across all areas of the business to support quality improvement and transformation programs. More importantly, it will support an existing gap in the provision of assurance to the senior leadership team relating to the qualitative aspects of clinical care and experience for patients.

8) Service Level Agreements

7.40 We would recommend that mutually developed and agreed Service Level Agreements (SLAs) with the appropriate KPIs are put in place across the range of support services provided by the Region as soon as is practicable. This would ensure appropriate levels of performance and value for money are achieved through these formalized support arrangements.

7.41 These agreements will provide much needed transparency as to what levels of service should be expected from support services. They should be used to encourage the discipline of good customer-supplier relationships, to include working collaboratively to overcome identified challenges as they arise. Performance against these should be regularly reported on, reviewed and, where appropriate, managed against delivery criteria agreed within such agreements.

7.42 Regular management and oversight meetings would also foster stronger working relationships and effective collaboration on the development of these services as requirements change over the life cycle of this Master Plan.

7.43 Consideration could be given to establishing a Business Support Manager role with responsibility for RoWPS business support functions. This role, staffed by someone with the appropriate knowledge and skills in business and contract management, could also be responsible for developing further future opportunities to deliver additional business support functions, systems and processes differently within the organization. This could reduce potential organizational risk, improve efficiency and create significant additional capacity in the Clinical Operations function.

7.44 Feedback received would indicate that joint work needs to be done to improve the working relationship between RoWPS and the Regional Digital Team. The effective development of a joint SLA could be part of this improvement work.

7.45 Similarly, covenant of expectation agreements should be set up internally between operations and support (logistics, quality assurance) functions.

9) Scheduling Systems and Process Review

7.46 Due to capacity constraints within the scope of the review it has not been possible to do an in-depth review of why there are levels of dissatisfaction with scheduling, or indeed, identify compelling evidence to support this feedback. However, it would appear that, on the balance of probability, there have been sufficient concerns raised about the performance of this function that should warrant a more in-depth internal review of the whole function and ensure the engagement of all relevant stakeholders.

7.47 Regardless of the outcome of any further internal review, the creation of an internal covenant agreement may support the management of expectation placed on the function. This, along with the procurement of a more agile and intuitive scheduling software product, could improve the overall satisfaction of all staff who work within the scheduling team and those who are reliant on their outputs. If an internal covenant agreement were to be put in place, consideration could also be given to perhaps moving this portfolio under the Workforce Planning function if this were to be introduced.

10) Operations Superintendent Staff Ratios

7.48 The previous Master Plan recommended an operating ratio of 25 staff to 1 Operations Superintendent. Following the global pandemic and the significant increases in the requirements to ensure that people are psychologically safe at work and feel supported, it is recognized that the ratio needed to change.

7.49 A ratio of 20:1 is now recognized as the ideal size of a team, although there still remains some minor variability across providers. We recommend that RoWPS continues to adopt that ratio as the frontline workforce grows over the lifespan of the Master Plan.

7.50 This means that an additional 7 FTE Operations Superintendents will be required by 2035 under the Maintain Performance scenario, or an additional 10 FTE under the Maintain Utilization scenario (see Figure **7-2**). This assumes that Operations Superintendents continue to work 12-hour shifts, and that the 20:1 ratio is required at each of the three hubs; therefore, in providing rosterable cover, the final ratio ends up at around 19:1.

11) Fleet and Logistics Enhancements

7.51 It is recommended that the logistics support provision be extended to provide 24-hour coverage, particularly with the introduction of a third hub. This is a critical support function, and it is normal practice elsewhere when operating a hub and spoke operational deployment model.

7.52 There is no industry standard ratio for Logistics Support staff to ambulance assets, due to a wide range of variables in how these models are delivered and the amount of digitalization used to support them. However, thought has been given to how this expansion of operating hours could be achieved for the existing two hubs as cost-effectively as possible, including potentially working differently with the existing funded establishment before any additionality is considered.

7.53 There are currently approximately 15 FTE Logistics Support staff. Assuming a relief rate in line with the current frontline FTE relief (28%), this translates into around 72 hours of on-duty time per day, 7 days per week, across all Logistics Support staff. Based on the planned frontline shifts for 2025, this is therefore equivalent to a 10:1 ratio of Logistics Support staff per vehicle on shift. Assuming Logistics Support staff work 8-hour (or 12-hour) shifts, the 72 hours per day could be deployed in such a way that would allow for a 10:1 ratio to be broadly achieved across a 24-hour period in each of the two current hubs (see first table in Figure **7-3**).

Figure 7-2: Operations Superintendent Requirements

2035 Maintain Performance Scenario		Hour																								Total
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
00 Maplegrove	Frontline Staff	18	18	18	18	18	20	21	21	25	29	31	31	37	37	37	37	37	35	34	34	30	26	24	24	660
	Ops Superintendents (20:1 Ratio)	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.3	1.5	1.6	1.6	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.7	1.5	1.3	1.2	1.2	33
	Ops Sup Adjusted for 12-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**36**
14 Headquarters	Frontline Staff	20	20	20	20	20	20	20	20	24	30	30	30	38	38	38	38	38	38	38	38	34	28	28	28	696
	Ops Superintendents (20:1 Ratio)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.5	1.5	1.5	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.7	1.4	1.4	1.4	35
	Ops Sup Adjusted for 12-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**36**
Third Hub	Frontline Staff	14	14	14	14	14	14	14	14	14	14	15	20	22	22	22	22	22	22	22	22	22	22	21	16	432
	Ops Superintendents (20:1 Ratio)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.8	22
	Ops Sup Adjusted for 12-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**24**
Overall	Frontline Staff	52	52	52	52	52	54	55	55	63	73	76	81	97	97	97	97	97	95	94	94	86	76	73	68	1,788
	Ops Superintendents (20:1 Ratio)	2.6	2.6	2.6	2.6	2.6	2.7	2.8	2.8	3.2	3.7	3.8	4.1	4.9	4.9	4.9	4.9	4.9	4.8	4.7	4.7	4.3	3.8	3.7	3.4	89
	Ops Sup Adjusted for 12-hr Shifts	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**3**	**3**	**3**	**96**

Note: 96 hours per day, operated 7 days per week, with a 42-hour working week gives 16 Core FTE plus 6 Relief FTE (40% Relief) = 22 FTE

2035 Maintain Utilization Scenario		Hour																								Total
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
00 Maplegrove	Frontline Staff	20	20	20	20	20	22	23	23	27	31	31	31	37	37	37	37	37	35	34	34	30	26	26	26	684
	Ops Superintendents (20:1 Ratio)	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.4	1.6	1.6	1.6	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.7	1.5	1.3	1.3	1.3	34
	Ops Sup Adjusted for 12-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**36**
14 Headquarters	Frontline Staff	21	20	20	20	20	20	20	20	24	30	32	32	41	42	42	42	42	42	42	42	38	32	30	30	744
	Ops Superintendents (20:1 Ratio)	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.5	1.6	1.6	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.9	1.6	1.5	1.5	37
	Ops Sup Adjusted for 12-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**36**
Third Hub	Frontline Staff	19	16	16	16	16	16	16	16	18	20	23	31	35	38	38	38	38	38	38	38	36	34	31	23	648
	Ops Superintendents (20:1 Ratio)	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.2	1.6	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.2	32
	Ops Sup Adjusted for 12-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**36**
Overall	Frontline Staff	60	56	56	56	56	58	59	59	69	81	86	94	113	117	117	117	117	115	114	114	104	92	87	79	2,076
	Ops Superintendents (20:1 Ratio)	3.0	2.8	2.8	2.8	2.8	2.9	3.0	3.0	3.5	4.1	4.3	4.7	5.7	5.9	5.9	5.9	5.9	5.8	5.7	5.7	5.2	4.6	4.4	4.0	104
	Ops Sup Adjusted for 12-hr Shifts	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**5**	**5**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**4**	**4**	**3**	**108**

Note: 108 hours per day, operated 7 days per week, with a 42-hour working week gives 18 Core FTE plus 7 Relief FTE (40% Relief) = 25 FTE

Base Position		Hour																							Total
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
00 Maplegrove	Vehicles (including ERUs)	9	9	9	9	9	9	10	10	12	14	14	14	18	18	18	18	18	18	17	17	15	13	13	13	324
	Logistics Support (10:1 Ratio)	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.2	1.4	1.4	1.4	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.5	1.3	1.3	1.3	32
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**32**
14 Headquarters	Vehicles (including ERUs)	11	11	11	11	11	11	11	11	14	17	17	17	22	22	22	22	22	22	22	22	19	16	16	16	396
	Logistics Support (10:1 Ratio)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.4	1.7	1.7	1.7	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.9	1.6	1.6	1.6	40
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**40**

Note: Vehicles based on Planned Shifts, in reality this will be lower due to abstractions

2035 Maintain Performance Scenario		Hour																							Total
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
00 Maplegrove	Vehicles (including ERUs)	9	9	9	9	9	10	11	11	13	15	16	16	19	19	19	19	19	18	17	17	15	13	12	12	336
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**32**
14 Headquarters	Vehicles (including ERUs)	10	10	10	10	10	10	10	10	12	15	15	15	20	20	20	20	20	20	20	20	18	15	15	15	360
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**40**
Third Hub	Vehicles (including ERUs)	7	7	7	7	7	7	7	7	7	7	8	10	11	11	11	11	11	11	11	11	11	11	11	8	216
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**24**
Overall	Vehicles (including ERUs)	26	26	26	26	26	27	28	28	32	37	39	41	50	50	50	50	50	49	48	48	44	39	38	35	912
	Log Sup Adjusted for 8-hr Shifts	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**4**	**5**	**5**	**5**	**6**	**6**	**6**	**5**	**5**	**4**	**4**	**4**	**4**	**96**

Note: 96 hours per day, operated 7 days per week, with a 42-hour working week gives 16 Core FTE plus 6 Relief FTE (40% Relief) = 22 FTE

2035 Maintain Utilization Scenario		Hour																							Total
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
00 Maplegrove	Vehicles (including ERUs)	10	10	10	10	10	11	12	12	14	16	16	16	19	19	19	19	19	18	17	17	15	13	13	13	348
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**32**
14 Headquarters	Vehicles (including ERUs)	11	10	10	10	10	10	10	10	12	15	16	16	22	22	22	22	22	22	22	22	20	17	16	16	384
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**40**
Third Hub	Vehicles (including ERUs)	10	8	8	8	8	8	8	8	9	10	12	16	18	19	19	19	19	19	19	19	18	17	16	12	324
	Log Sup Adjusted for 8-hr Shifts	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**32**
Overall	Vehicles (including ERUs)	30	28	28	28	28	29	30	30	35	41	44	48	58	60	60	60	60	59	58	58	53	47	45	41	1,056
	Log Sup Adjusted for 8-hr Shifts	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**4**	**6**	**6**	**6**	**7**	**7**	**7**	**6**	**6**	**4**	**4**	**4**	**4**	**104**

Note: 104 hours per day, operated 7 days per week, with a 42-hour working week gives 17 Core FTE plus 7 Relief FTE (40% Relief) = 24 FTE

7.54 If this 10:1 ratio is maintained over the next ten years, this means that an additional 6 FTE Logistics Support staff will be required by 2035 under the Maintain Performance scenario, or an additional 9 FTE under the Maintain Utilization scenario (see second table in Figure **7-3**). This assumes that Logistics Staff continue to work 8-hour (or 12-hour) shifts, and that the 10:1 ratio is required at each of the three hubs.

7.55 There should also be a phased increase in the operating hours for Logistics Superintendents. It is recommended that cover should be available for 16 hours per day by 2027, with full 24/7 coverage in place by the time the third hub is commissioned. This would require an additional 4 FTE by 2033.

7.56 It is important that the fleet strategy for the organization recognizes the future vehicle requirements as the level of frontline resources continues to grow. It should also consider the potential future changes to the clinical response model and the type of response assets that may be used as part of that model.

7.57 Organizational consideration will also need to be given to the development of the necessary infrastructure to support the transition to the electrification of the fleet. The target date for this transition is currently 2032.

12) Clinical Supervision Options Appraisal

7.58 It is recommended that, in line with the other primary organizational divisions, a Commander level role within the Professional Standards division is developed. This development work is suggested in preparation for the other recommendations within this division; that is, the increases in the establishment of QA Specialists and the requirements to internally develop an options appraisal to implement a suitable clinical supervision framework for the frontline workforce.

7.59 It is envisaged that the role would be primarily responsible for the day-to-day operating of the division and drive the organizational quality agenda with the delivery of associated KPIs and statutory and regulatory standards. The role would also provide additional support to the DC in the future development of the division in alignment with the objectives of the broader organizational and regional strategies.

7.60 Given the broader interdependencies associated with the establishment of this new role, it is further recommended that the Chief makes the decision on the phasing of this enhancement.

7.61 An effective clinical supervision framework is a structured process that creates an environment that promotes shared learning and allows participants to reflect, evaluate, evolve, and refine their own clinical practice. It encourages staff to support one another, promoting teamwork, creating a positive and just culture by celebrating good practice and demonstrating that the organization values its people. It also provides a safe space for staff to explore and discuss personal and emotional responses to their work, with a strong focus on supporting staff health and wellbeing.

7.62 Clinical supervision is an additional level of support and development to that of line management. The evidence suggests that, while it may be useful to integrate some aspects of clinical and managerial supervision, it is recommended that the roles of line manager and clinical supervisor remain separate to avoid conflict within the duality of the role and the impact on the success of the clinical supervision process.

7.63 The out-of-hospital clinical environment presents unique challenges in providing adequate clinical supervision opportunities. The supervision model therefore needs to be suitably flexible to provide appropriate access, while being able to align to different organizational structures. To overcome logistical and geographical barriers, RoWPS must be regionally supported to embrace digital technology enablers wherever possible.

7.64 It is acknowledged that introducing a separate clinical supervision layer within RoWPS could be potentially challenging. However, the current challenges of recruitment and retention along with relatively high levels of absence attributable to psychological health issues, suggest that changes to the way that frontline staff are operationally managed and clinically led warrant consideration by the Chief and his senior leadership team.

7.65 It is recommended that an additional funded QA Specialist role is established as soon as is practicable, rising to a total of four FTE by 2035, to ensure that delivery of their organizational responsibilities is sustainable.

7.66 It is recommended that RoWPS utilizes some of its existing program management support resources to undertake a critical review of existing leadership capacity to develop an options appraisal for clinical supervision. This should include the Field Training Paramedics and QA Specialist. The aim would be to identify an alternative way to deliver an effective operational model that provides sustainable first line operational management, and a clinical supervision and quality assurance framework that meets the current and, more importantly, future clinical supervision requirements of the paramedic workforce.

7.67 Specific FTE enhancements to the Training Specialist and Professional Practice Specialist roles have not been recommended within this Master Plan, as other recommendations should provide enabling strategies to reduce workload and increase capacity for existing staff (improved clinical supervision, digitalization, etc). However, this should be re-evaluated after five years depending on how successfully the other recommendations have been implemented.

13) Leadership and Management Training

7.68 Based on observations and feedback from a wide range of stakeholders it is recommended that a funded programme of leadership, education and training is developed and delivered right across the entire leadership group within RoWPS.

7.69 This is urgently required to give the senior leadership team and other management and superintendent grades the competence and confidence to manage the challenges that exist within an ever more complex operating environment, and a workforce that has increasingly high levels of expectation and more complex demands that need to be managed. Leadership development is also a critical part of succession planning for the organization.

8 Phasing of Recommendations (2026 to 2035)

8.1 The resource and facility requirements recommended for 2035 are proposed to be implemented gradually over the next ten years.

8.2 The process for determining an appropriate trajectory aims to stagger increases so that the financial impacts are as evenly spread across the ten years as possible, while balancing this with the need to improve performance in an equitable fashion across all LAMs.

8.3 Following consultation with the Steering Group, the phasing of frontline changes has been set out according to the trajectory outlined in Figure **8-1**.

8.4 The key frontline recommendations are summarized as follows:

- As part of the recommended facility configuration, both hub sites and seven existing stations should be retained, four stations should be relocated to more optimal locations, and four new sites should be added (one of which is already planned)
- To address capacity challenges, a third hub should be built (realistically assumed to be achieved no earlier than 2033)
- Under the Maintain Performance scenario, an additional 1,344 weekly PTU vehicle hours are required by 2035 (increasing by 27%); under the Maintain Utilization scenario, an additional 2,352 PTU weekly vehicle hours are required (increasing by 47%)
- Assuming a 42-hour working week, two staff per PTU, and an increase in relief capacity to 40% for all FTE by 2035, an additional 116 (Maintain Performance) or 185 (Maintain Utilization) frontline FTE will be required
- Assuming a 30% spare rate, an additional 13 (Maintain Performance) or 28 (Maintain Utilization) PTU vehicles will be required

8.5 A more detailed breakdown of each element included in the trajectory summary is given in Appendix **F1** to Appendix **F5**.

8.6 Using the recommended phasing plan ensures that performance is maintained or improved in each year through to 2035 (see Appendix **F6**).

8.7 Further to this, short-term expansion of the ERU program is recommended in 2026 with the addition of two 12/7 urban ERUs (requiring an additional four core FTE plus 40% relief). While maximizing the use of ERUs through enhanced treat and release programs may still be some years away, this expansion would enable ERUs to respond to the sickest patients as quickly as possible in urban areas (alongside a PTU response) and, if staffed by ACPs, provide clinical support for more complex incidents. Treat and release efficiency should then be explored further in future as RoWPS' clinical strategy develops, building on this initial ERU expansion.

Figure 8-1: Frontline Resources and Facilities Phasing Plan

Maintain Performance Scenario

Year(*)	Facility Changes		Peak PTUs		Total PTUs	Weekly Vehicle Hours	Frontline FTE	Relief Rate
	Opened	Closed	Day	Night				
2025	-	-	38	20	55	5,040	301	28%
2026	-	-	38	21	55	5,208	315	30%
2027	651 Concession	-	39	21	56	5,292	322	31%
2028	Williamsburg	-	40	22	58	5,460	337	33%
2029	King St N / Columbia St	02 Waterloo	41	23	60	5,628	351	34%
2030	Elmira	-	41	24	60	5,712	359	35%
2031	Can-Amera Pkwy / Franklin Blvd	05 Pinebush	43	25	62	5,964	381	37%
2032	Centreville	-	44	25	64	6,048	388	38%
2033	**Third Hub**	-	46	25	67	6,216	402	39%
2034	Doon South Dr / Doon Mills Dr	09 Conestoga	46	26	67	6,300	410	39%
2035	King St E / Benton St	08 Weber & Water	47	26	68	6,384	417	40%

Maintain Utilization Scenario

Year(*)	Facility Changes		Peak PTUs		Total PTUs	Weekly Vehicle Hours	Frontline FTE	Relief Rate
	Opened	Closed	Day	Night				
2025	-	-	38	20	55	5,040	301	28%
2026	-	-	38	21	55	5,208	314	30%
2027	651 Concession	-	40	21	58	5,376	327	31%
2028	Williamsburg	-	42	22	61	5,628	347	32%
2029	King St N / Columbia St	02 Waterloo	44	24	64	5,964	373	34%
2030	Elmira	-	46	25	67	6,216	393	35%
2031	Can-Amera Pkwy / Franklin Blvd	05 Pinebush	49	26	71	6,552	419	37%
2032	Centreville	-	51	27	74	6,804	439	38%
2033	**Third Hub**	-	53	27	77	6,972	452	39%
2034	Doon South Dr / Doon Mills Dr	09 Conestoga	55	28	80	7,224	472	40%
2035	King St E / Benton St	08 Weber & Water	57	28	83	7,392	485	40%

Note: redeployment of SNorth shifts in 2026: 07:00-19:00, 08:00-20:00, 09:00-21:00 and 17:00-05:00 at 00 Maplegrove, 12:00-00:00 and 17:00-05:00 (converted to 20:00-08:00) at 14 Headquarters

Note: redeployment in 2033 of 6 x 24/7 and 2 x 12/7 shifts from 14 Headquarters to Third Hub for Maintain Performance scenario
redeployment in 2033 of 7 x 24/7 and 6 x 12/7 shifts from 14 Headquarters to Third Hub for Maintain Utilization scenario

Note: Weekly Vehicle Hours and Frontline FTE includes rural ERUs (as deployed in the 2025 Base Position)

(*) Phasing year refers to the year of full implementation, not necessarily the year they are included in the budget (for example, staffing enhancements could be added late in the prior calendar year)

8.8 The support and management resources recommendations are summarized as follows:

- Under the Maintain Performance scenario, an additional 7 FTE Operations Superintendents and 6 FTE Logistics Support Staff are required by 2035
- Under the Maintain Utilization scenario, an additional 10 FTE Operations Superintendents and 9 FTE Logistics Support Staff are required by 2035
- An additional 6 FTE Operations Superintendents are required by 2027 to allow 24/7 coverage in the CACC
- An additional 4 FTE Logistics Superintendents are required by 2033 to allow 24/7 coverage
- An additional 3 FTE QA Specialists are required by 2035
- A range of other enhancements are recommended including: a Workforce Planning lead, additional HR support, a fixed term IT professional, a Professional Standards Commander, an Emergency Management lead, a Business Intelligence Analyst, and a Business Support Manager

8.9 The phasing of these resource changes has been set out according to the trajectory outlined in Figure **8-2**.

8.10 While not assigned to particular years, the phased resource enhancements should be supplemented by a number of reviews and the development of enabling strategies, including:

- Strategic discussions around the ownership of the call answering, clinical triage, and dispatch functions
- Development of a new clinical response model
- A review of primary drivers for staff retention and absence
- Development of an ACP bursary scheme and an ACP deployment plan
- A review of IT systems and future needs (including a replacement ePCR system and more intuitive scheduling software product)
- Development of a digital strategy
- Development of Service Level Agreements across support services
- A review of the scheduling function
- Development of an options appraisal for clinical supervision
- Development of a leadership, education and training programme

Figure 8-2: Support and Management Resources Phasing Plan

Year (*)	Operations Superintendents		Logistics Support Staff		Other Staff Enhancements	
	Maintain Performance	Maintain Utilization	Maintain Performance	Maintain Utilization		
2025	15	15	15	15	-	-
2026	16	16	16	16	+ Paramedic Operations Superintendent in CACC (3 FTE), 12/7 coverage + QA Specialist (1 FTE)	+ Additional HR Support / RTW Co-Ordinator + Fixed Term IT Professional (1 FTE)
2027	16	17	17	17	+ Paramedic Operations Superintendent in CACC (3 FTE), 24/7 coverage + Logistics Superintendents (2 FTE), 16/7 coverage + Workforce Planning Lead (1 FTE)	
2028	17	18	17	18		
2029	18	19	18	19		
2030	18	20	18	20	+ QA Specialist (1 FTE)	
2031	19	21	19	21		+ Professional Standards Commander (1 FTE) + Emergency Management Lead (1 FTE) + Business Intelligence Analyst (1 FTE) + Business Support Manager (1 FTE)
2032	20	22	19	22		
2033	21	23	20	22	+ Logistics Superintendents (2 FTE), 24/7 coverage	
2034	21	24	20	23		
2035	22	25	21	24	+ QA Specialist (1 FTE)	

(*) Phasing year refers to the year of full implementation, not necessarily the year they are included in the budget (for example, staffing enhancements could be added late in the prior calendar year)

Note: 'Other Staff Enhancements' with no defined phasing year should be implemented as soon as is financially and operationally practicable

8.11 As demand continues to increase, the CP program will be an integral part of RoWPS' clinical strategy and will therefore need to expand accordingly. The exact timings of this expansion will be dependent on the implementation of the recommended new clinical response model.

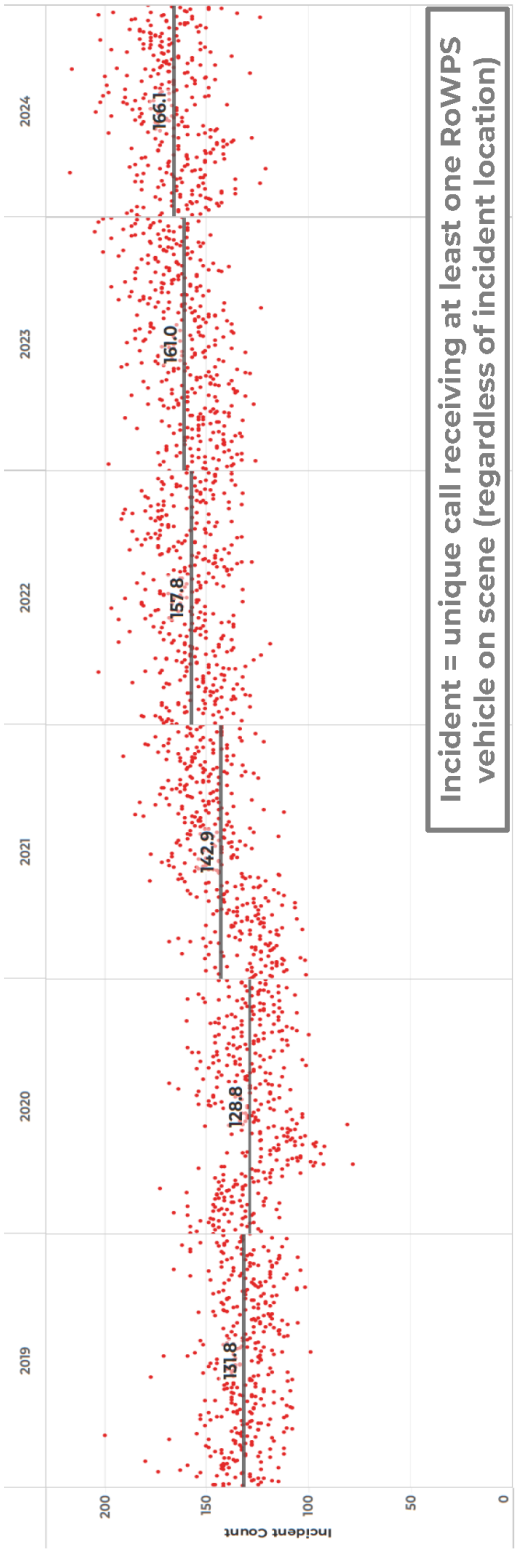
8.12 It is important that several key metrics are monitored in future to ensure that the approach can be adapted to changing factors. These include:

- Call volumes and whether these increase at expected rates
- Residential and commercial development growth and location
- Land availability for areas identified as beneficial for additional stations and station relocations
- Changing paramedic service frameworks in the wider healthcare system to ensure that any new initiatives can be capitalized upon
- Offload delay levels to ascertain whether performance and staffing requirements could be impacted
- Changes to MPDS categorization and response time standards

9 Appendices

A Service Analysis

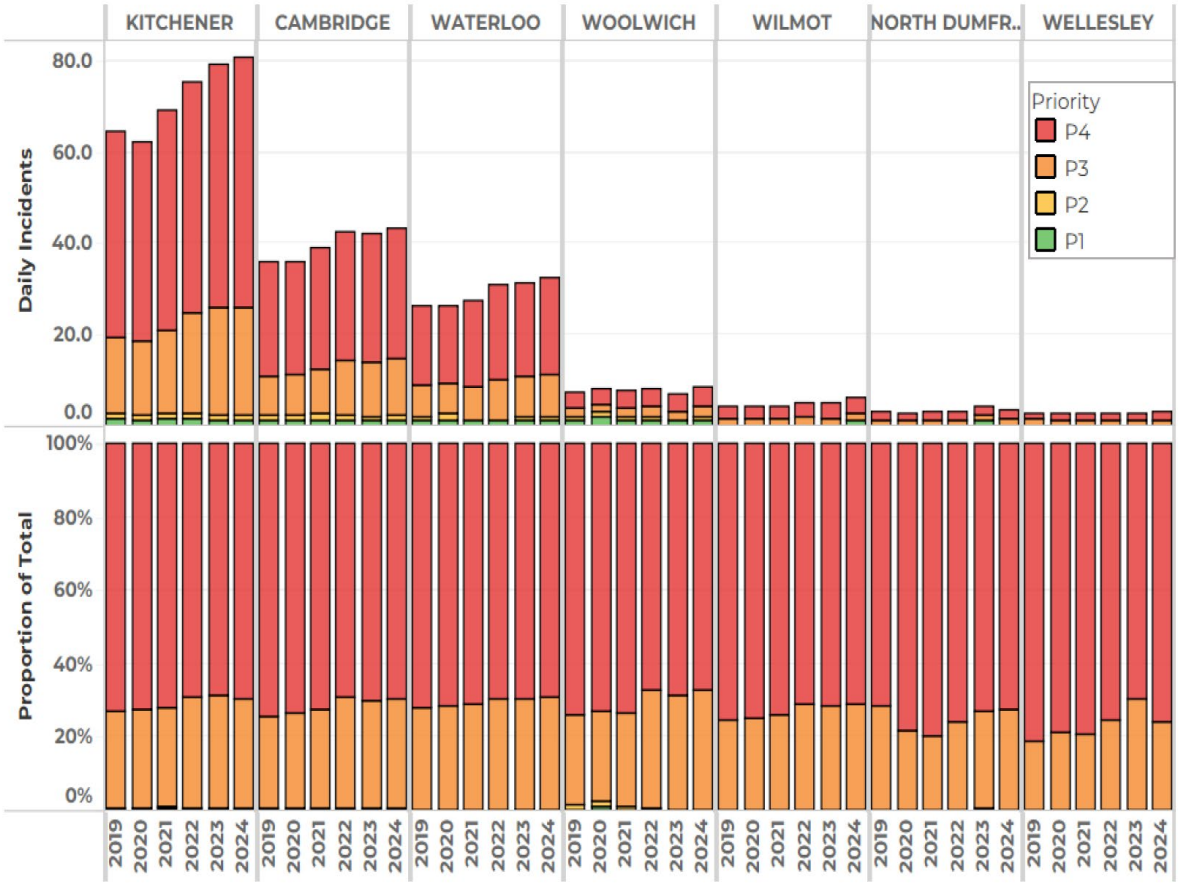
Appendix A1 Demand by Day and Month (Full Sample)



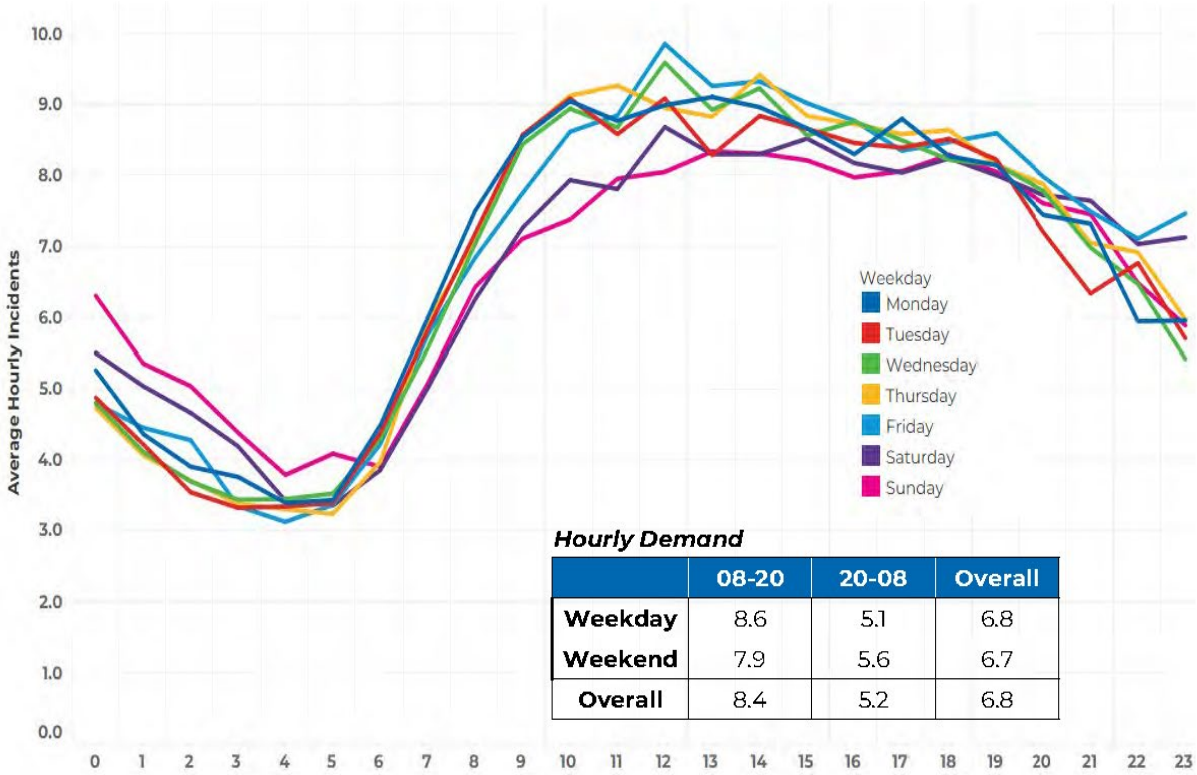
Average Daily Responded Demand

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall
2019	136.3	136.5	134.2	130.4	131.2	133.8	133.0	124.5	131.2	126.8	128.5	135.7	**131.8**
2020	140.7	137.4	132.4	115.6	112.4	123.2	134.3	131.5	134.7	127.9	125.9	129.2	**128.8**
2021	123.0	134.9	127.2	131.2	139.4	152.2	145.0	150.3	154.6	151.3	154.3	151.8	**142.9**
2022	158.7	148.0	154.9	154.1	156.8	164.2	162.5	150.7	162.0	164.5	160.7	155.7	**157.8**
2023	152.4	151.1	154.1	156.6	154.2	161.3	163.5	157.9	170.6	163.7	169.6	176.4	**161.0**
2024	163.1	158.0	164.9	157.0	169.6	174.0	167.7	169.3	172.4	164.7	-	-	**166.1**
Overall	**145.7**	**144.3**	**144.6**	**140.8**	**143.9**	**151.5**	**151.0**	**147.4**	**154.2**	**149.8**	**147.8**	**149.8**	**147.5**

Appendix A2 Demand by Area and Year (Full Sample)



Appendix A3 Demand by Hour and Weekday

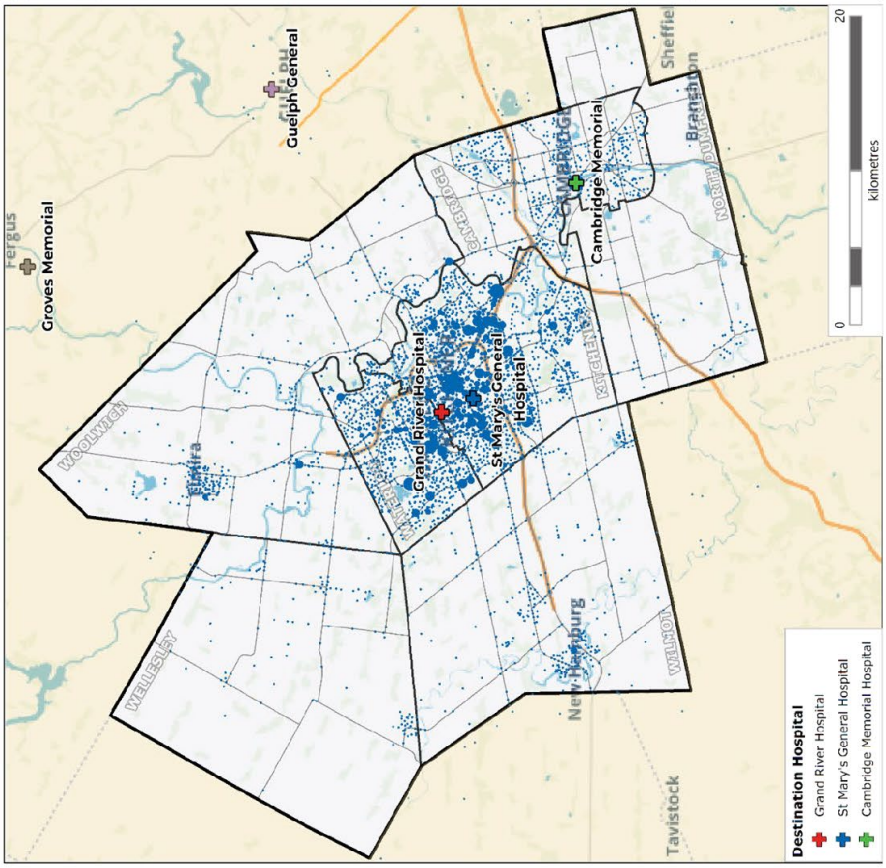


Hourly Demand

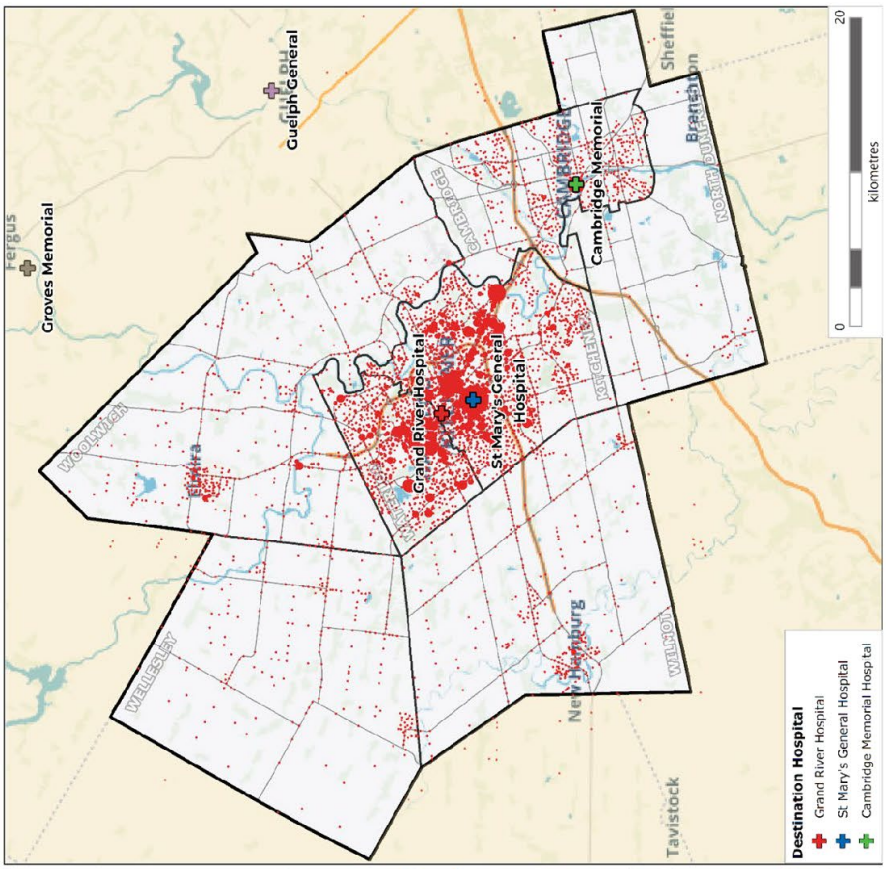
	08-20	20-08	Overall
Weekday	8.6	5.1	6.8
Weekend	7.9	5.6	6.7
Overall	8.4	5.2	6.8

Appendix A4 Destination Map for Hospital Transports

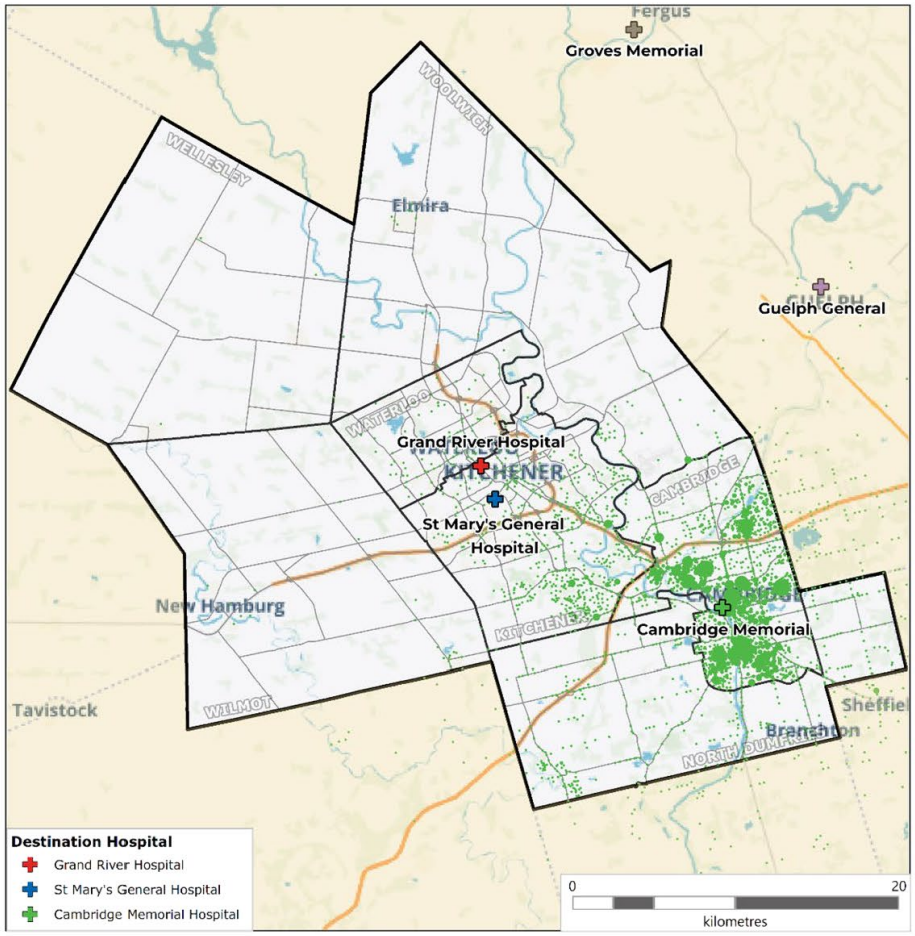
WRHN @ Queen's Blvd (St. Mary's General Hospital)



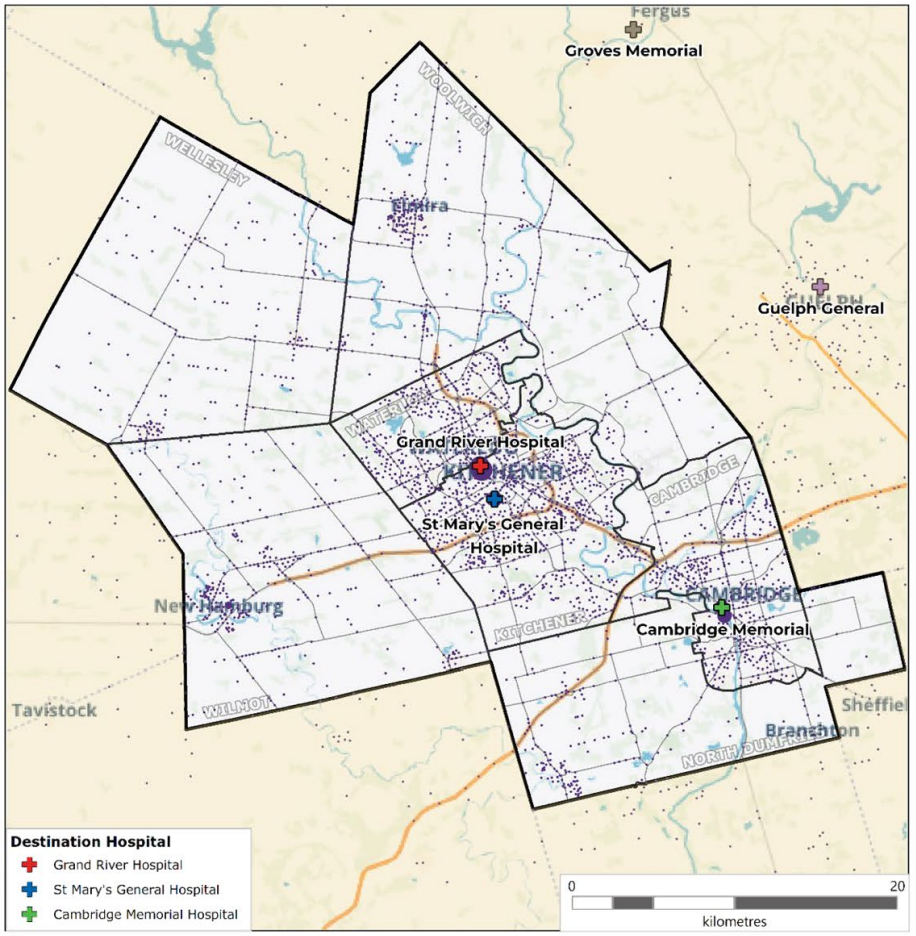
WRHN @ Midtown (Grand River Hospital)



Cambridge Memorial Hospital



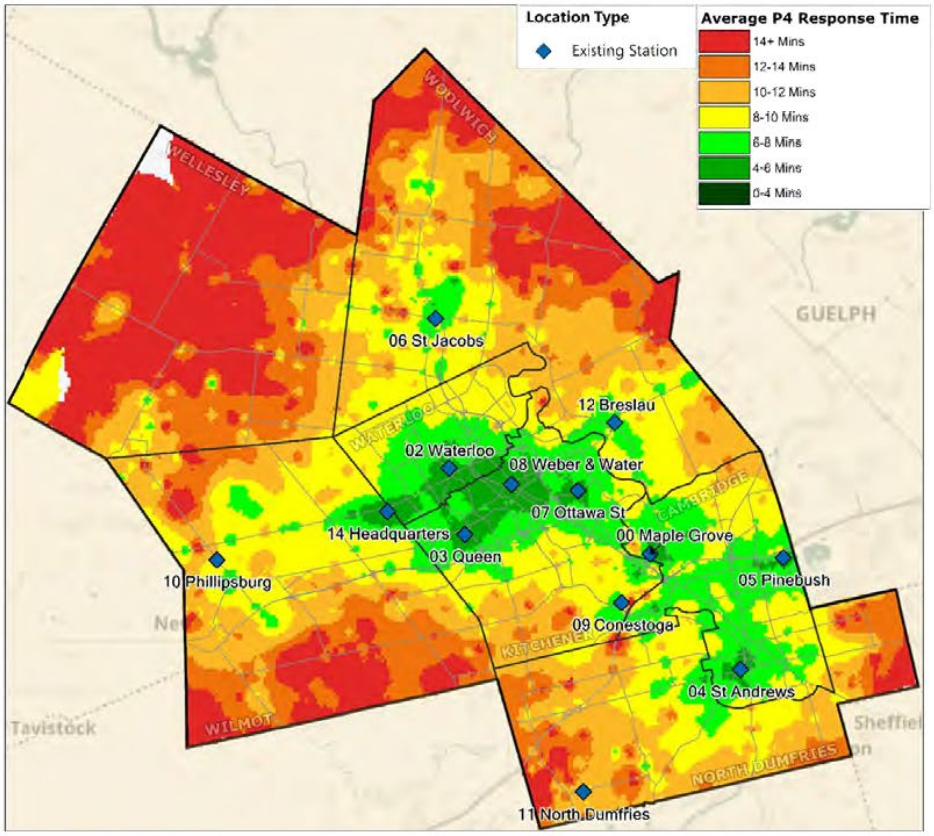
Out of Area Hospitals

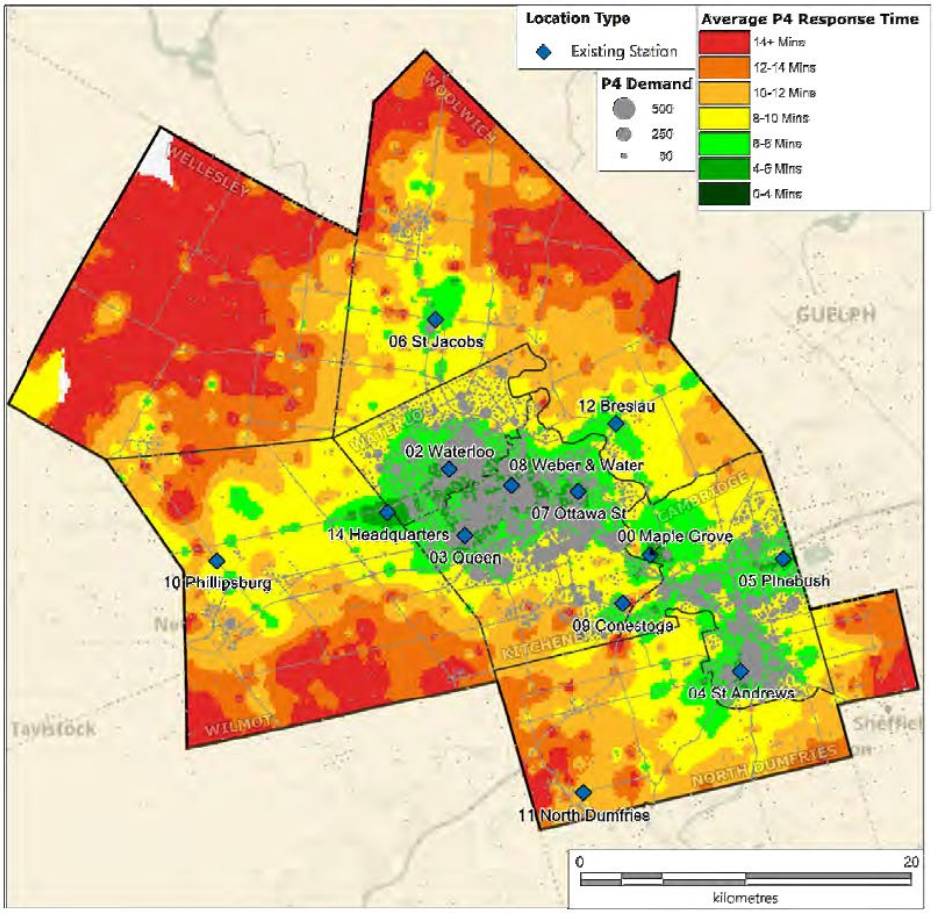


Appendix A5 CTAS Reported Performance by Year

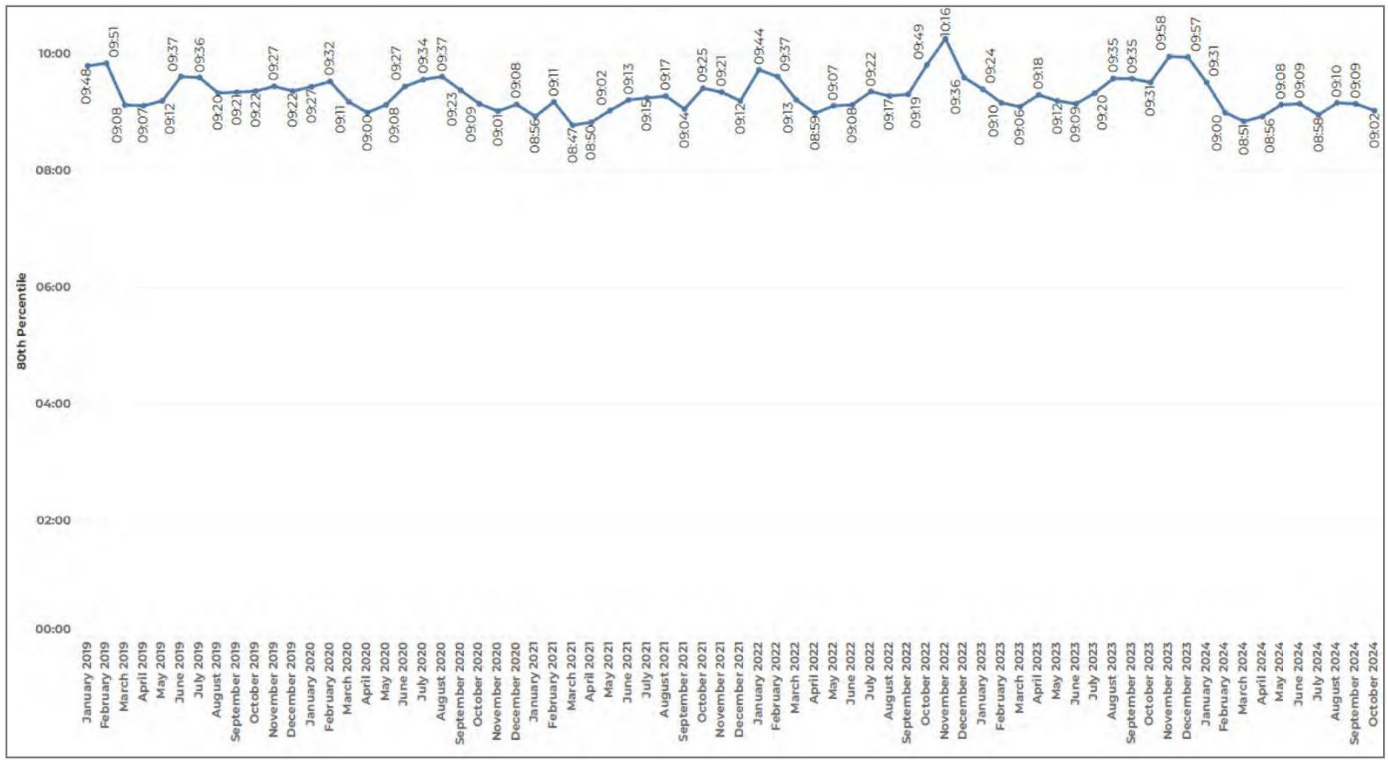
Responded within X%					
Year	1 within 8mins	2 within 10mins	3 within 11mins	4 within 12mins	5 within 12mins
2019	78.0%	81.5%	82.9%	84.9%	81.8%
2020	75.0%	83.2%	82.9%	85.0%	81.7%
2021	78.9%	83.0%	84.1%	86.3%	83.6%
2022	74.2%	81.0%	80.6%	82.9%	80.3%
2023	74.0%	81.0%	81.0%	83.0%	82.0%
2024 (Jan-June)	73%	80%	80%	82%	80%

Appendix A6 Mean Response Time Map

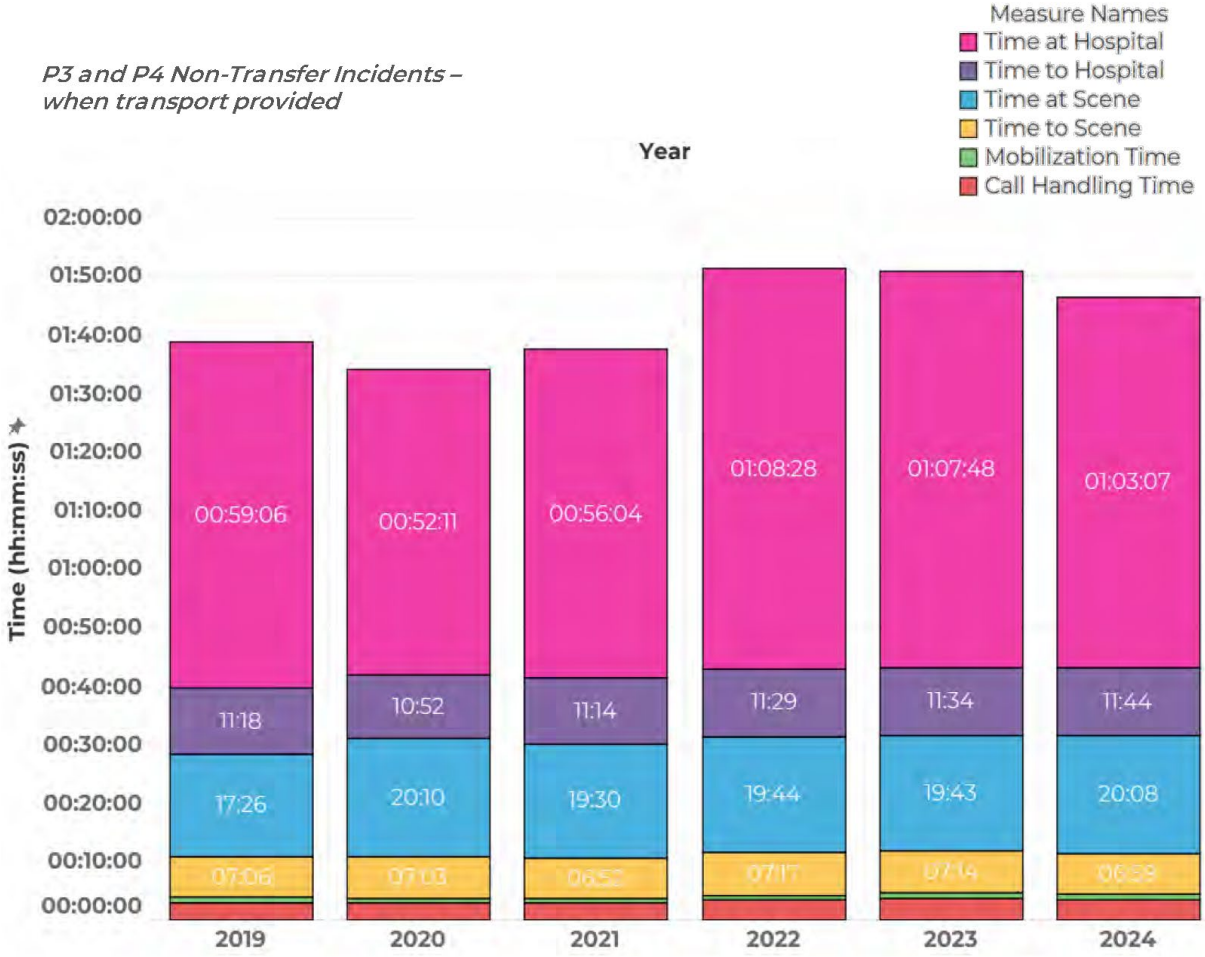




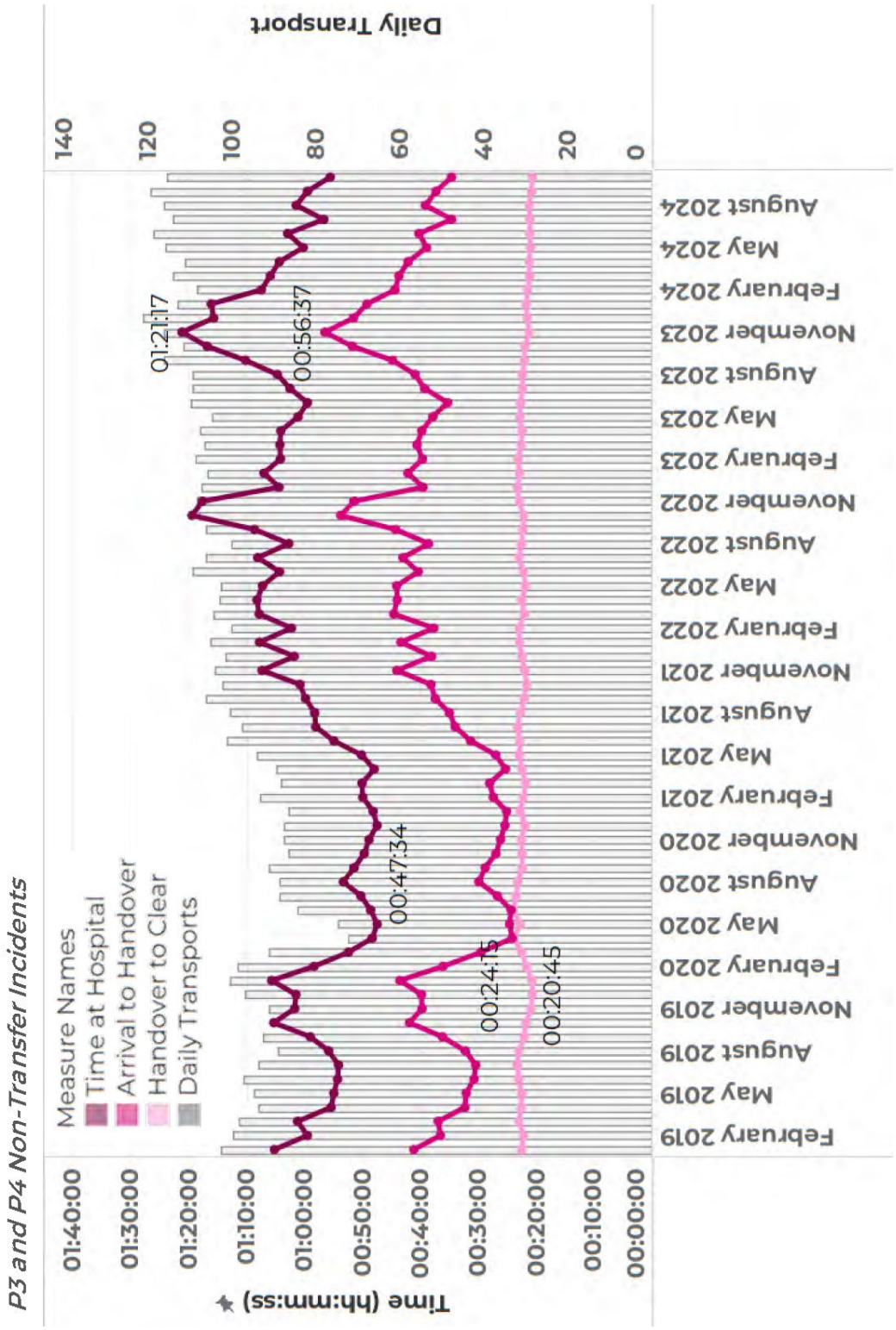
Appendix A7 P4 80th Percentile Response Time by Month



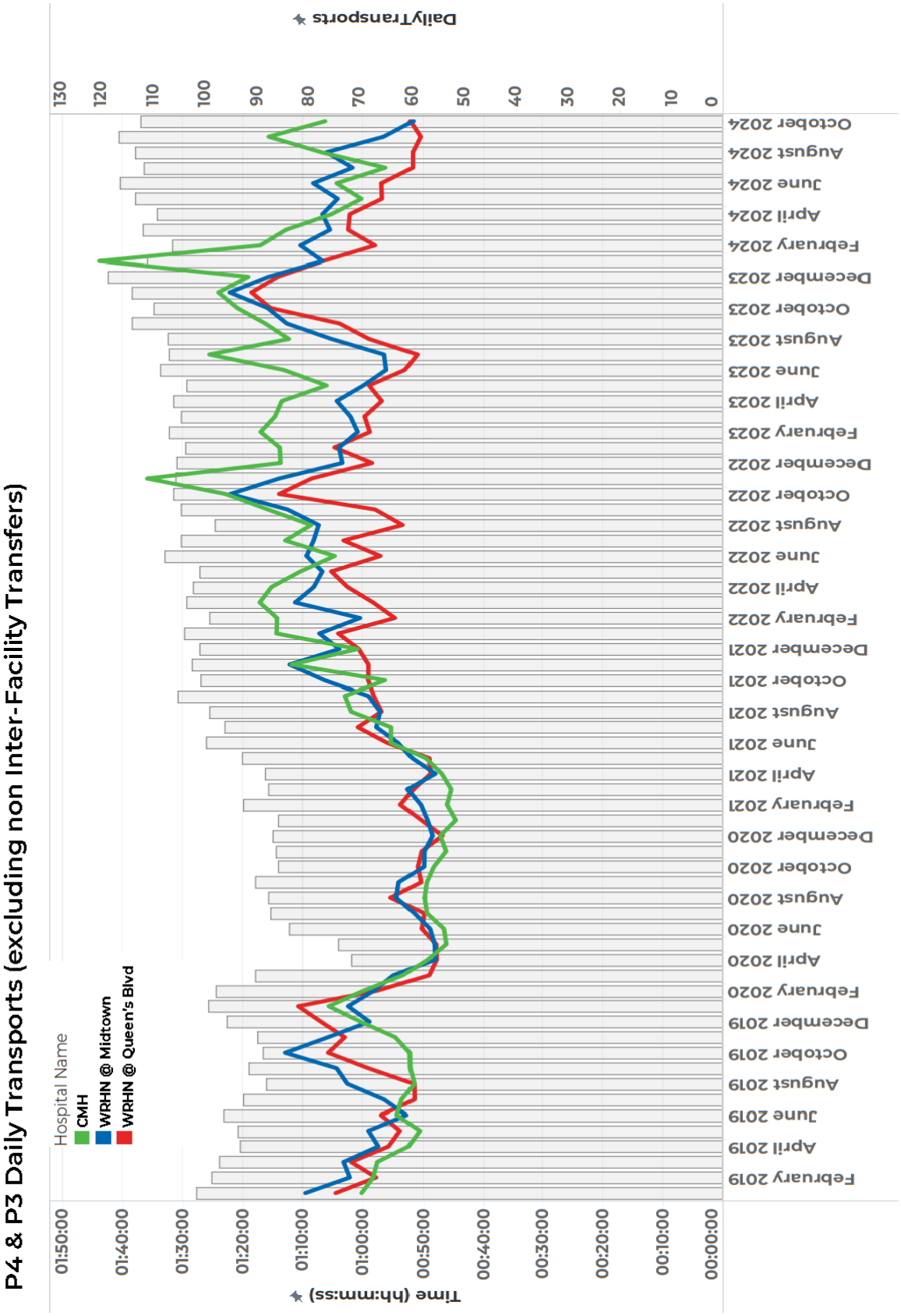
Appendix A8 Call Components by Year (Fall Sample)



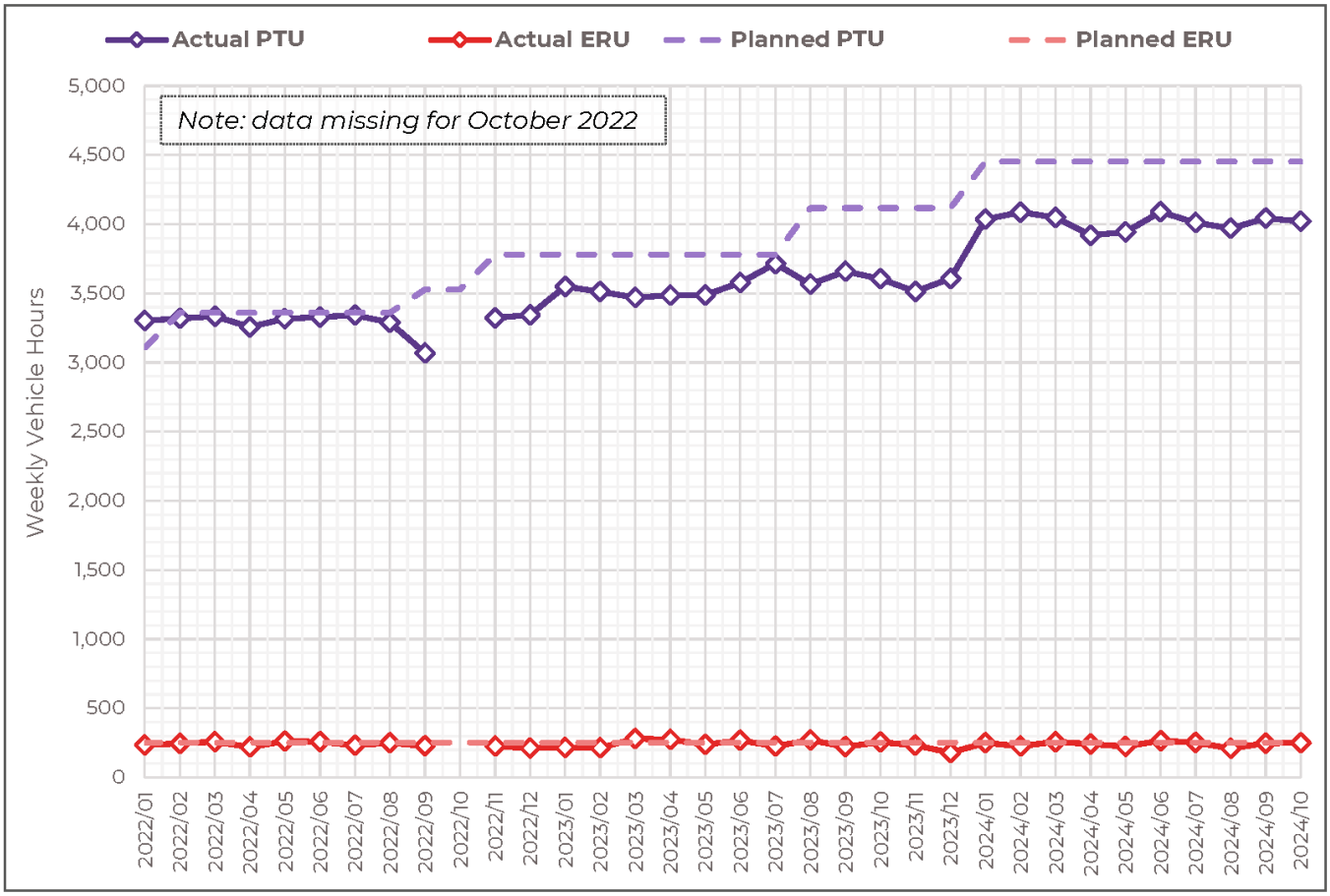
Appendix A9 Time at Hospital by Month (Full Sample) - Arrival to Clear



Appendix A10 Time at Hospital by Month and Destination Facility (Full Sample)



Appendix A11 Planned vs Actual Vehicle Hours by Month



Percentage of Shifts Filled

Month	PTU	ERU
2022	96%	95%
2023	91%	95%
2024	90%	96%
Overall	92%	95%

Proportion of Responses by Mobilization LAM

Mobilization LAM	Incident LAM								Overall
	CAMBRIDGE	KITCHENER	NORTH DUMFRIES	WATERLOO	WELLESLEY	WILMOT	WOOLWICH	Out of Area	
CAMBRIDGE	81%	12%	3%	0%		0%	1%	3%	100%
KITCHENER	4%	76%	0%	14%	0%	2%	2%	0%	100%
NORTH DUMFRIES	27%	7%	44%			2%		20%	100%
WATERLOO	0%	16%	0%	75%	1%	2%	6%	0%	100%
WELLESLEY				2%	59%	18%	8%	12%	100%
WILMOT	0%	17%	0%	23%	9%	44%	1%	5%	100%
WOOLWICH	1%	7%		19%	6%	0%	65%	2%	100%
Out of Area	17%	35%	3%	1%	2%	5%	2%	34%	100%
Unknown	29%	48%	1%	14%	1%	3%	4%	1%	100%
Overall	24%	47%	1%	18%	1%	3%	4%	1%	100%

Proportion of Responses by Incident LAM

Mobilization LAM	Incident LAM								Overall
	CAMBRIDGE	KITCHENER	NORTH DUMFRIES	WATERLOO	WELLESLEY	WILMOT	WOOLWICH	Out of Area	
CAMBRIDGE	58%	5%	43%	0%		1%	4%	40%	18%
KITCHENER	6%	60%	12%	29%	17%	28%	22%	6%	37%
NORTH DUMFRIES	1%	0%	19%			0%		7%	1%
WATERLOO	0%	3%	0%	42%	12%	6%	15%	1%	10%
WELLESLEY				0%	12%	1%	0%	2%	0%
WILMOT	0%	1%	0%	3%	24%	37%	1%	9%	3%
WOOLWICH	0%	0%		2%	13%	0%	31%	3%	2%
Out of Area	0%	0%	2%	0%	1%	1%	0%	14%	1%
Unknown	35%	30%	25%	23%	21%	26%	27%	20%	30%
Overall	100%	100%	100%	100%	100%	100%	100%	100%	100%

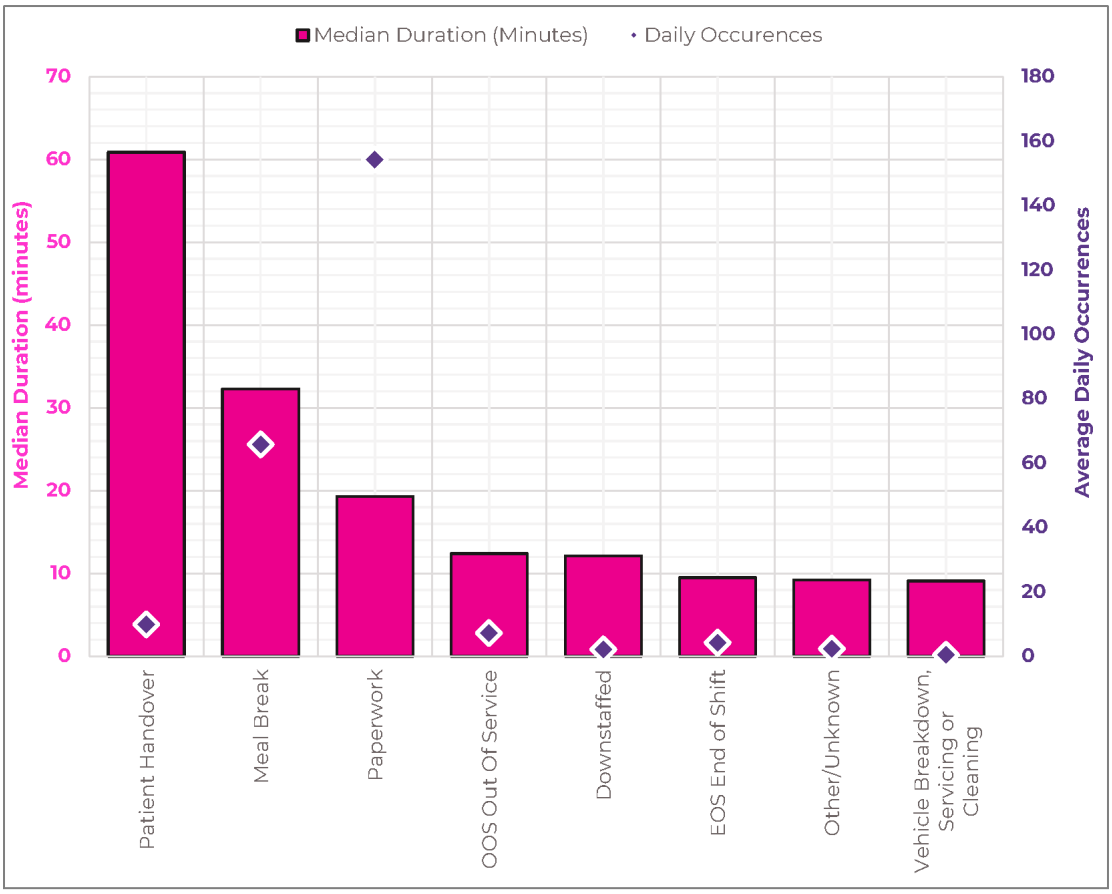
Proportion of Facility Responses by Mobilization Facility

Mobilization Facility	Incident LAM								Overall
	CAMBRIDGE	KITCHENER	NORTH DUMFRIES	WATERLOO	WELLESLEY	WILMOT	WOOLWICH	Out of Area	
00 Maple Grove	54%	40%	2%	0%		0%	3%	1%	100%
02 Waterloo	0%	11%		83%	1%	1%	4%	0%	100%
03 Queen	0%	90%	0%	4%	0%	6%	0%	0%	100%
04 St Andrews	89%	1%	6%			0%	0%	5%	100%
05 Pinebush	92%	2%	1%	0%			0%	5%	100%
06 St Jacobs		1%		25%	8%		65%	1%	100%
07 Ottawa St	1%	95%	0%	1%	0%	0%	2%	0%	100%
08 Weber & Water	0%	87%		11%	0%	0%	2%	0%	100%
09 Conestoga	14%	78%	6%			1%		1%	100%
10 Phillipsburg		1%		1%	14%	74%		11%	100%
11 North Dumfries	3%	1%	64%			2%		31%	100%
12 Breslau	1%	44%		4%			47%	4%	100%
14 Headquarters	0%	28%		47%	4%	18%	3%	1%	100%
Cambridge Memorial	77%	18%	2%	0%		0%	2%	1%	100%
Grand River Hospital	2%	60%	0%	29%	1%	3%	4%	0%	100%
St Marys General	0%	67%	0%	27%	1%	4%	1%	0%	100%
Other	22%	46%	1%	21%	1%	3%	5%	2%	100%
Unknown	29%	48%	1%	14%	1%	3%	4%	1%	100%
Overall	24%	47%	1%	18%	1%	3%	4%	1%	100%

Proportion of Facility Responses by Incident LAM

Mobilization Facility	Incident LAM								Overall
	CAMBRIDGE	KITCHENER	NORTH DUMFRIES	WATERLOO	WELLESLEY	WILMOT	WOOLWICH	Out of Area	
00 Maple Grove	7%	3%	4%	0%		0%	2%	2%	3%
02 Waterloo	0%	1%		23%	3%	2%	6%	0%	5%
03 Queen	0%	6%	0%	1%	0%	7%	0%	0%	3%
04 St Andrews	16%	0%	21%			0%	0%	16%	4%
05 Pinebush	10%	0%	2%	0%			0%	10%	3%
06 St Jacobs		0%		2%	10%		18%	1%	1%
07 Ottawa St	0%	6%	0%	0%	0%	0%	2%	0%	3%
08 Weber & Water	0%	13%		4%	0%	1%	3%	0%	7%
09 Conestoga	1%	2%	5%			0%		1%	1%
10 Phillipsburg		0%		0%	14%	22%		6%	1%
11 North Dumfries	0%	0%	11%			0%		5%	0%
12 Breslau	0%	0%		0%			2%	0%	0%
14 Headquarters	0%	1%		2%	4%	5%	1%	0%	1%
Cambridge Memorial	6%	1%	4%	0%		0%	1%	1%	2%
Grand River Hospital	0%	7%	1%	9%	7%	5%	6%	1%	5%
St Marys General	0%	4%	1%	4%	2%	4%	0%	0%	3%
Other	25%	27%	27%	32%	39%	28%	33%	35%	28%
Unknown	35%	30%	25%	23%	21%	26%	27%	20%	30%
Overall	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix A14 PTU Unavailability Reasons



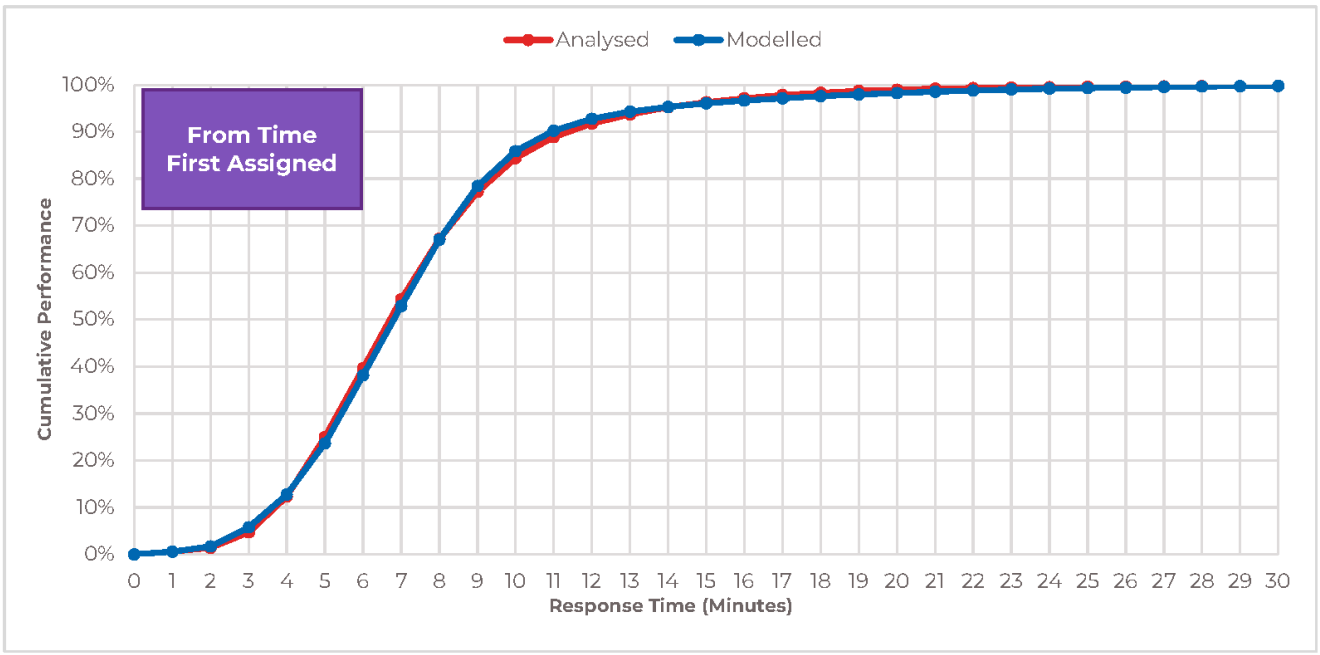
Note: instances of Offload Delay unavailability seems low, suspect it is falling under Paperwork reasons. Some, but not all, of the Offload Delay and Paperwork unavailability is included in ADRS Occupied Time.

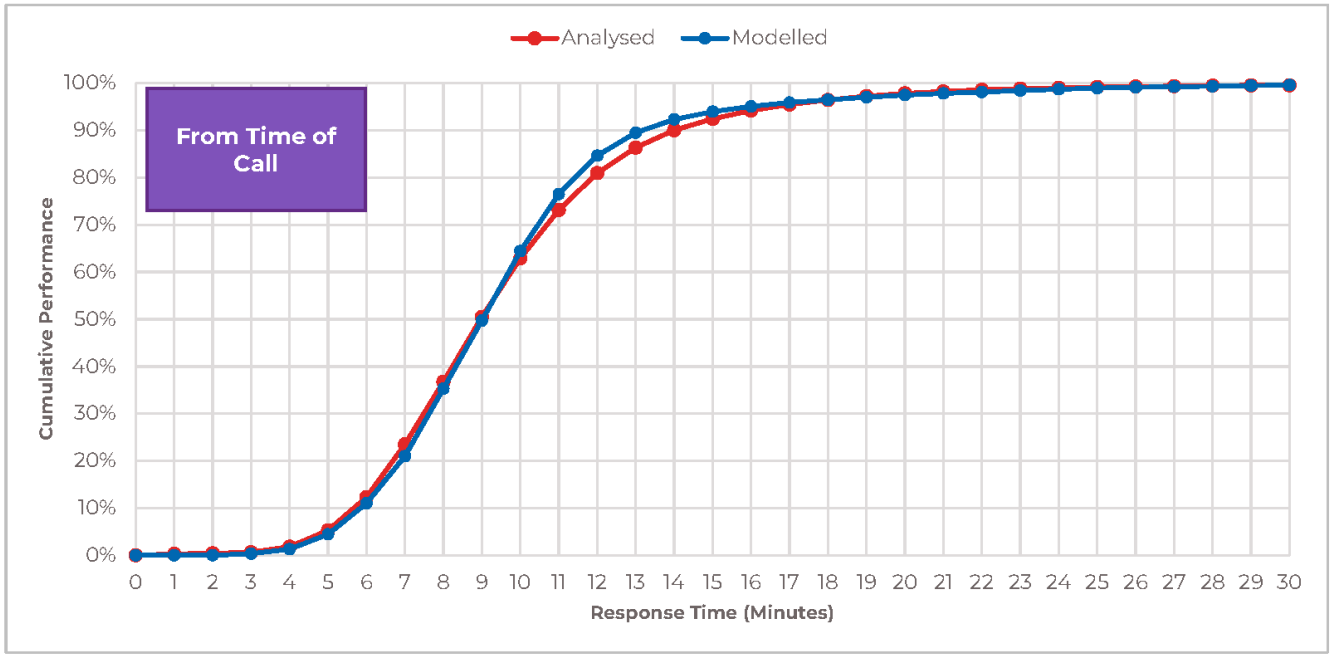
Appendix A15 Ambulance Standby Move Summary

Starting Location	Attempted moves per day	Result			
		Completed Move	Made available or conditionally unavailable	Ended at same location	Interrupted - assigned to incident
14 Headquarters	33.1	70%	1%	6%	23%
00 Maple Grove	27.8	65%	1%	9%	25%
08 Weber & Water	7.1	74%	2%	7%	18%
05 Pinebush	7.1	73%	1%	6%	20%
02 Waterloo	6.7	81%	1%	5%	14%
07 Ottawa St	6.6	70%	1%	6%	22%
09 Conestoga	6.4	75%	1%	5%	19%
06 St Jacobs	5.1	73%	1%	3%	22%
10 Phillipsburg	4.9	76%	1%	4%	20%
12 Breslau	4.0	71%	1%	4%	23%
04 St Andrews	3.7	80%	2%	5%	13%
03 Queen	2.7	76%	2%	6%	16%
11 North Dumfries	0.1	82%	0%	0%	18%
Waterloo Roam	0.9	83%	0%	0%	17%
Cambridge Roam	0.9	82%	0%	1%	17%
Finished Incident / Hospital	174.1	78%	6%	1%	16%
Other/Unknown	18.7	76%	6%	0%	18%
Total	309.9	75%	4%	3%	18%

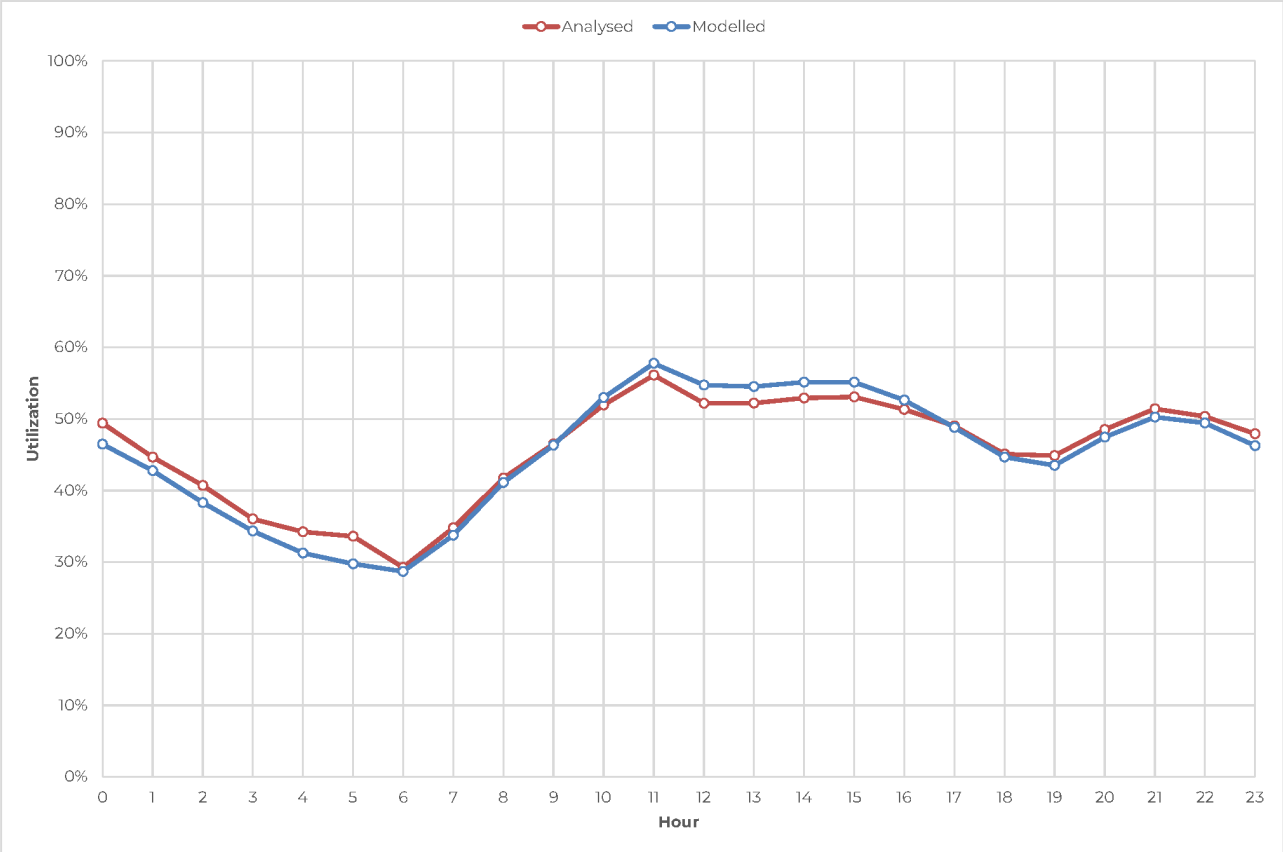
B Model Validation Examples

Appendix B1 P4 Response Performance Distribution

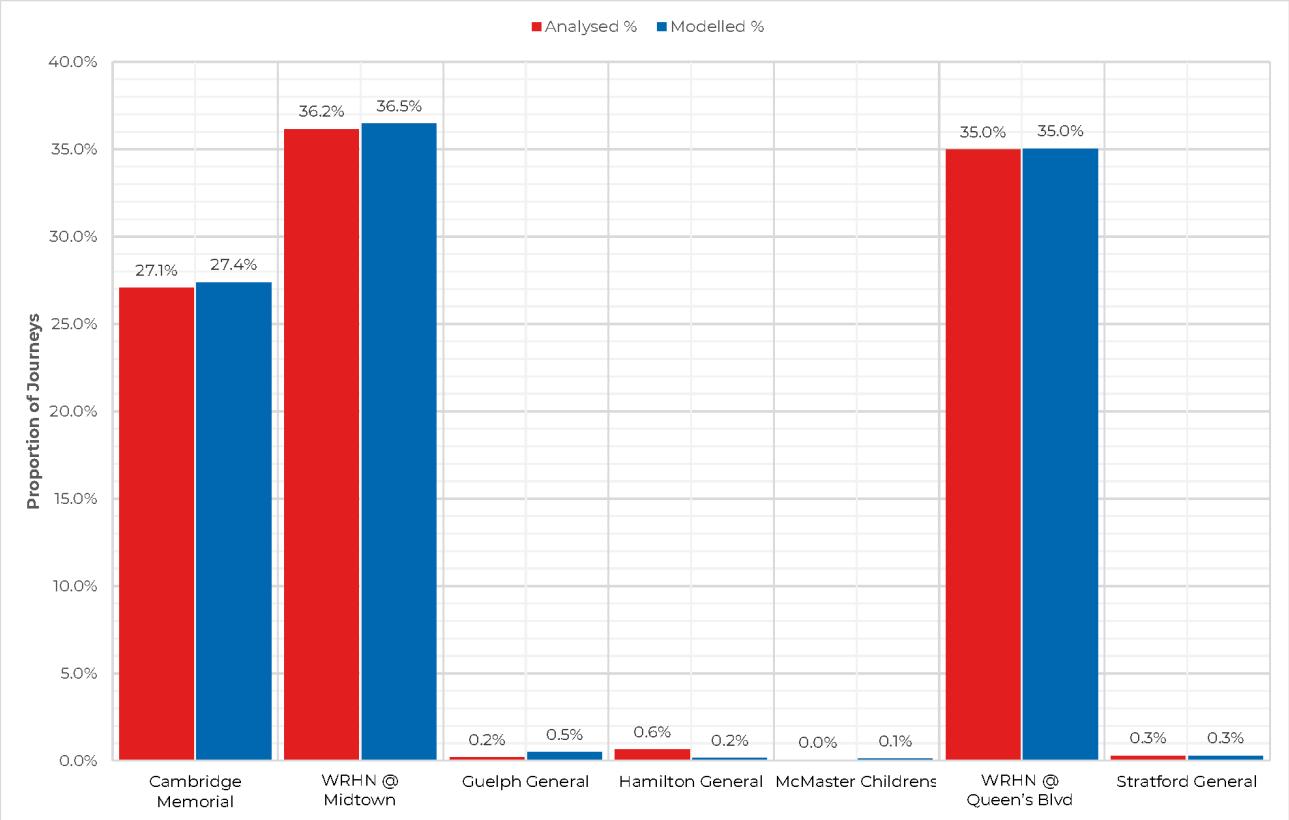




Appendix B2 PTU Utilization by Hour

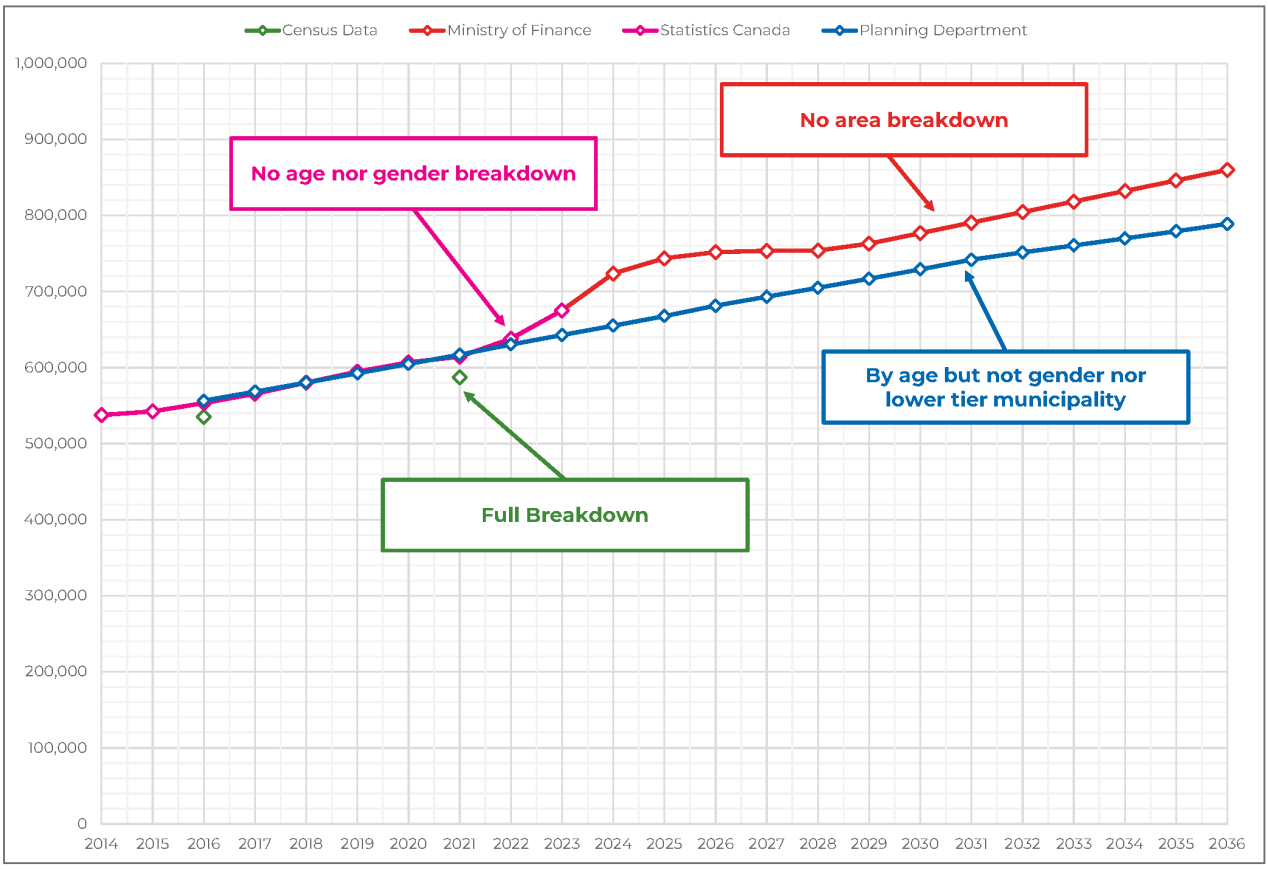


Appendix B3 Patient Journeys by Destination Hospital

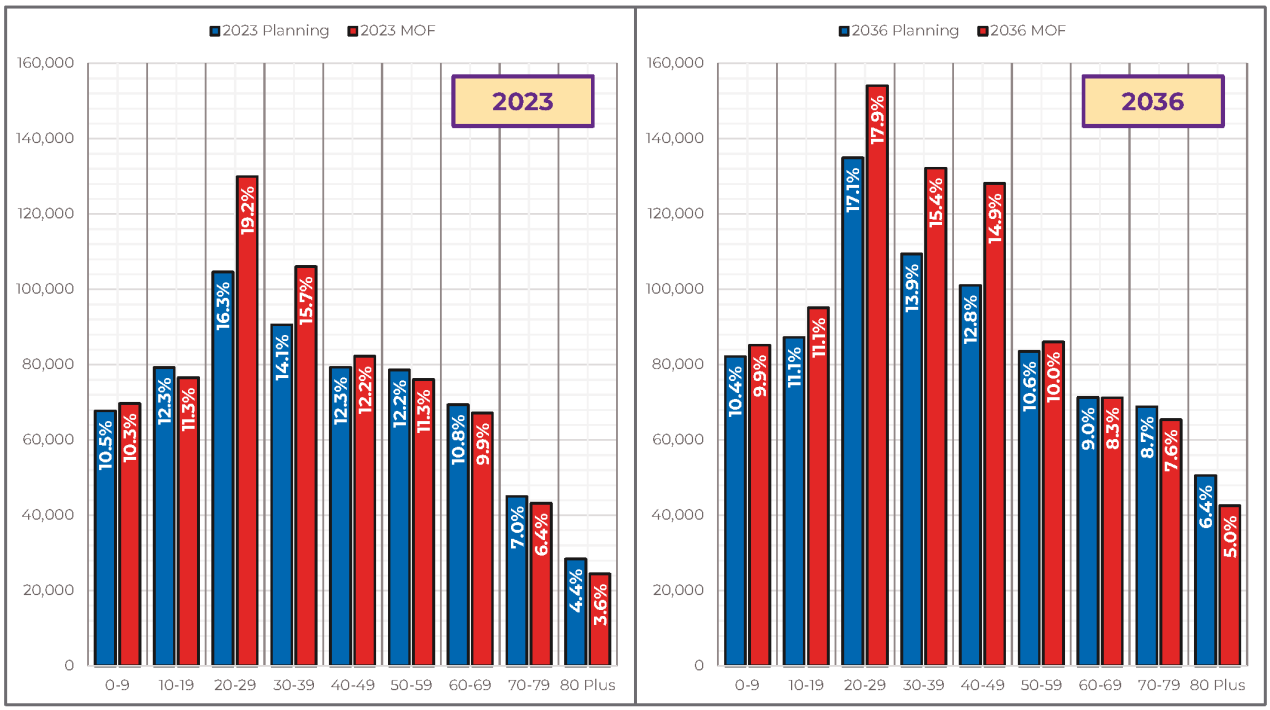


C The Do Nothing Scenario (2025 to 2035)

Appendix C1 Population Data Sources

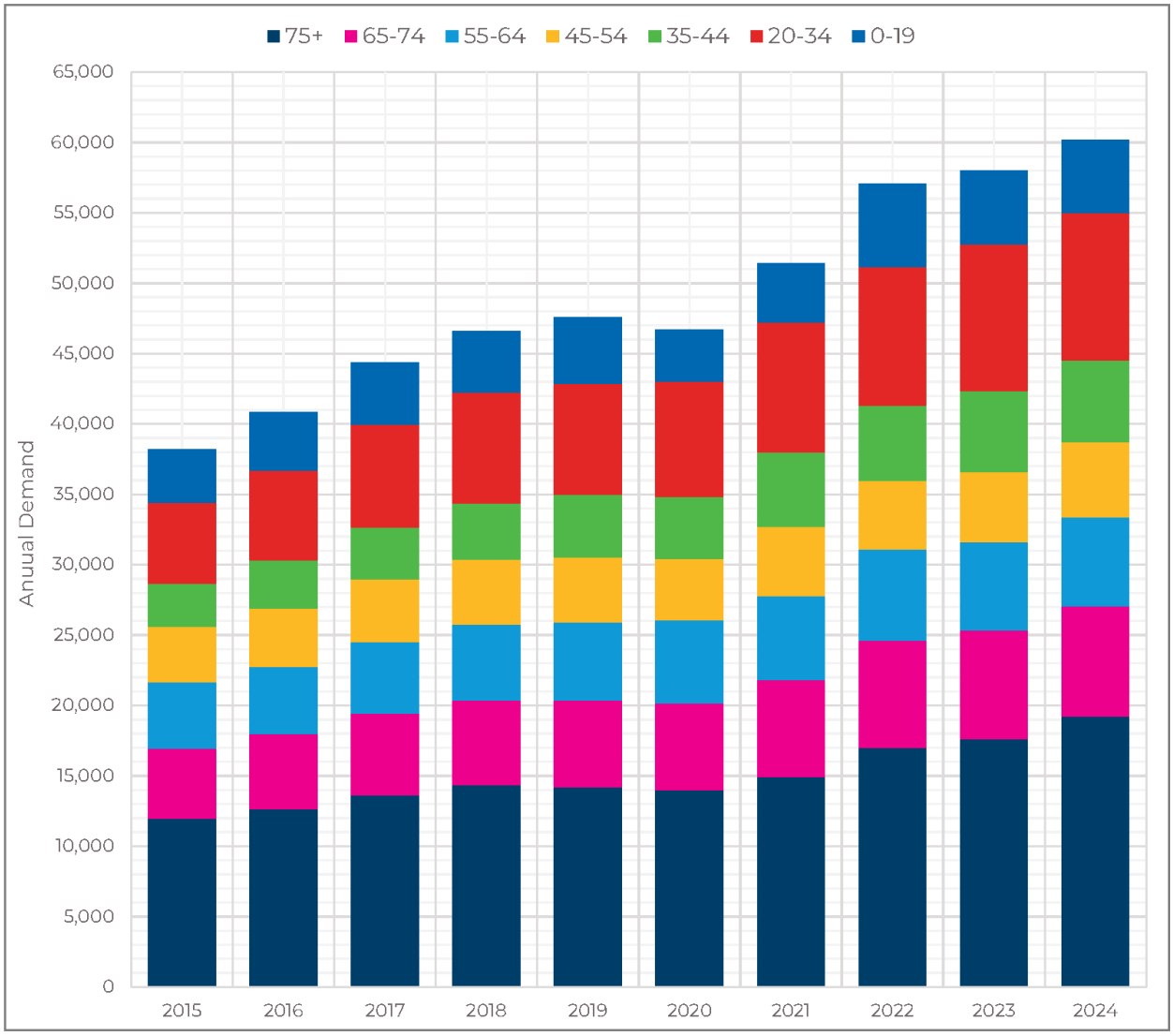


Appendix C2 Population by Age Group



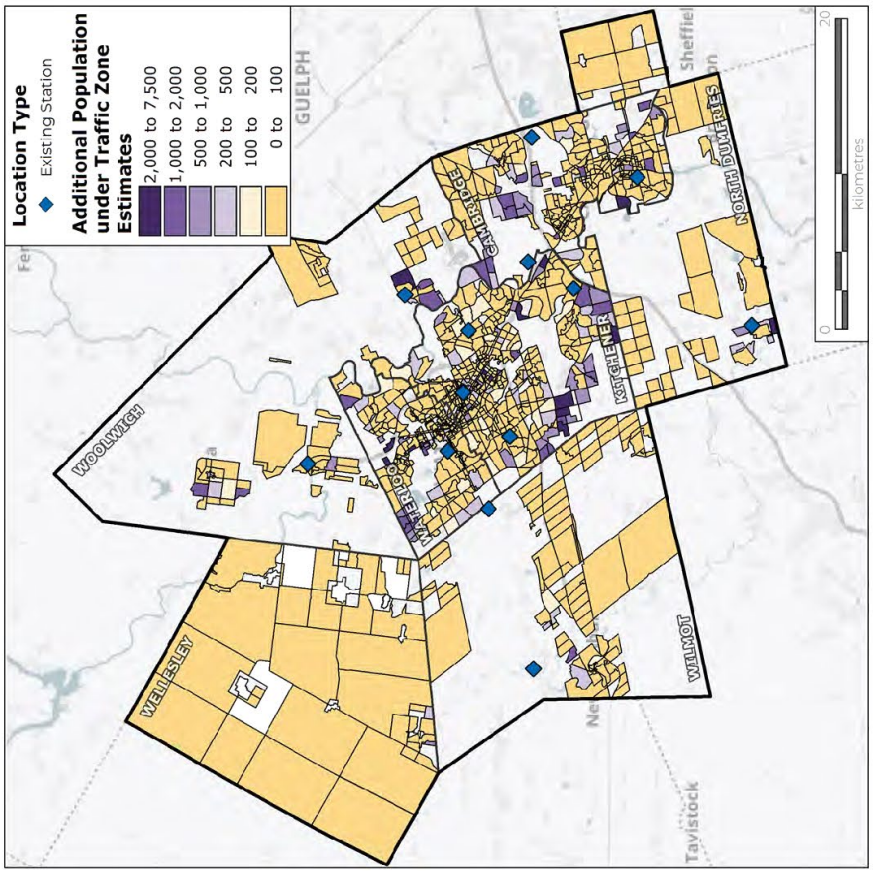
Note: percentages show the proportion of the total population which falls into the given age group, for each dataset and year.

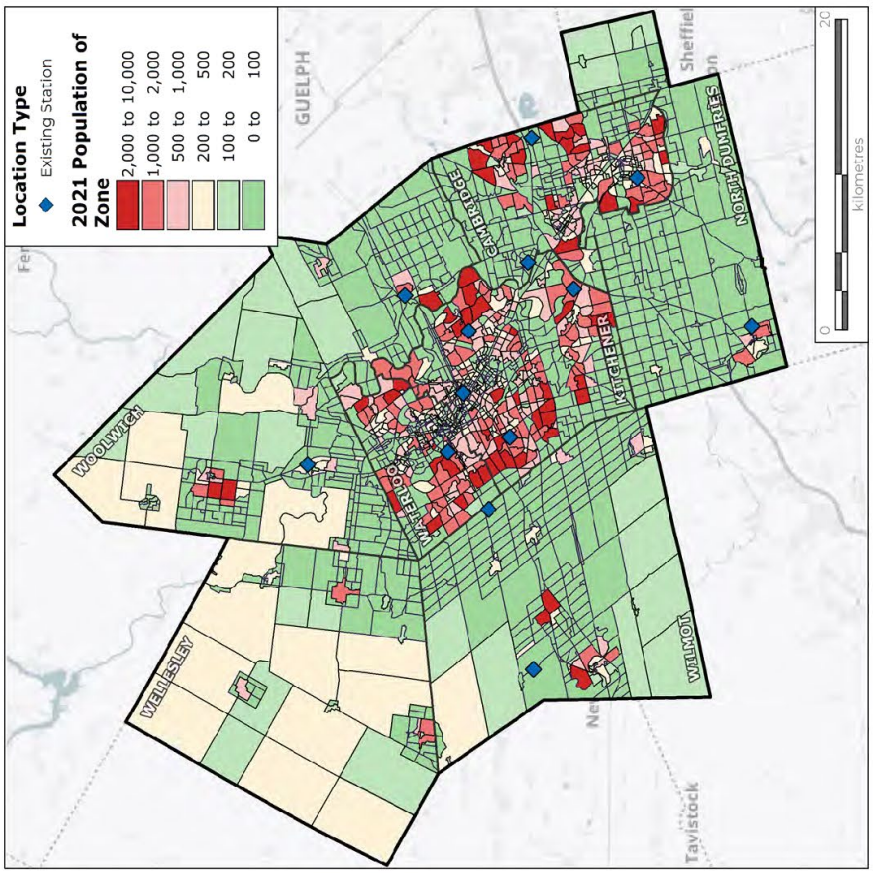
Appendix C3 Historical Demand by Age Group



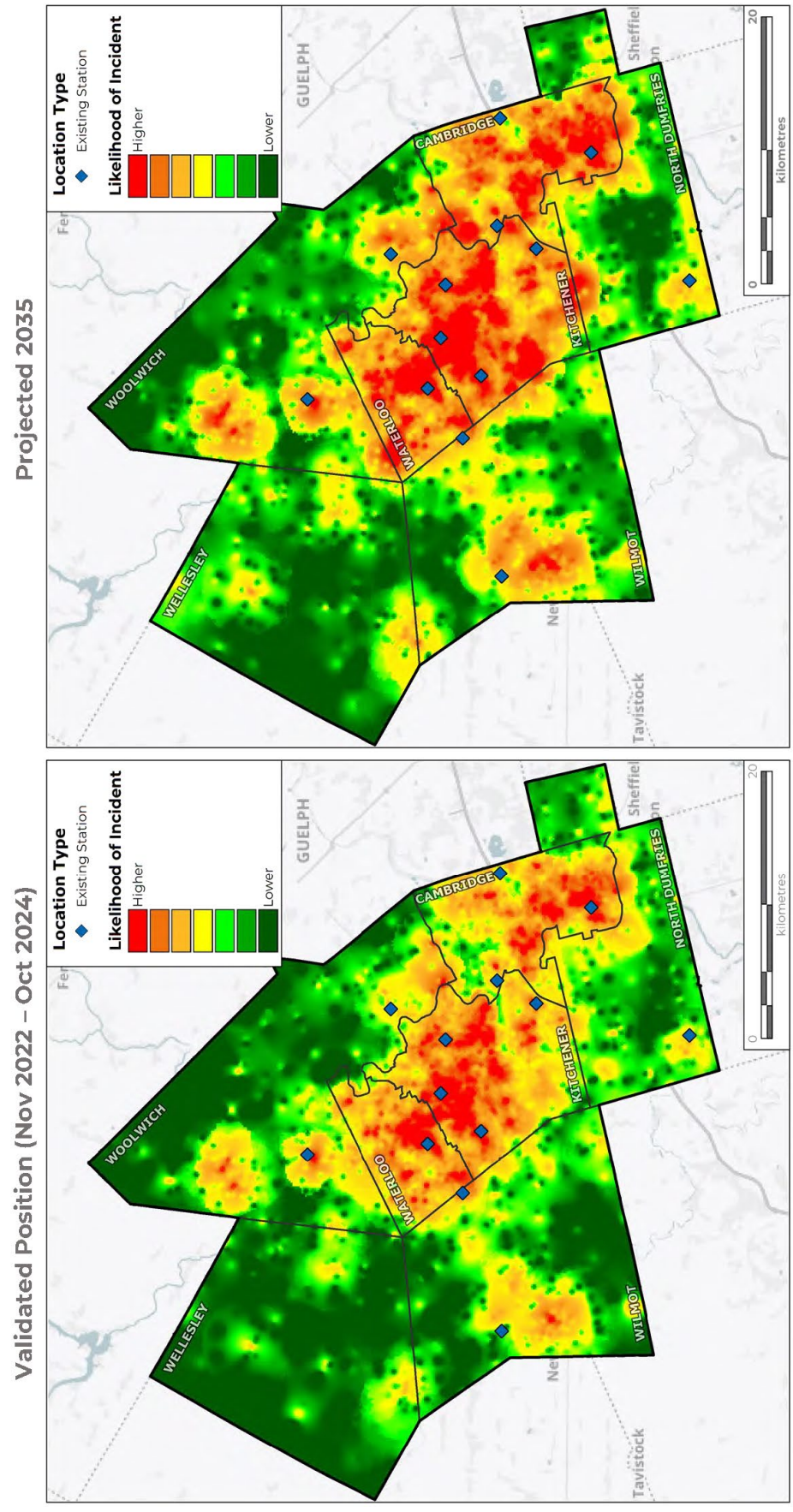
Note: estimates made for demand in November and December 2024 based off previous data.

Appendix C4 Population by Traffic Zone

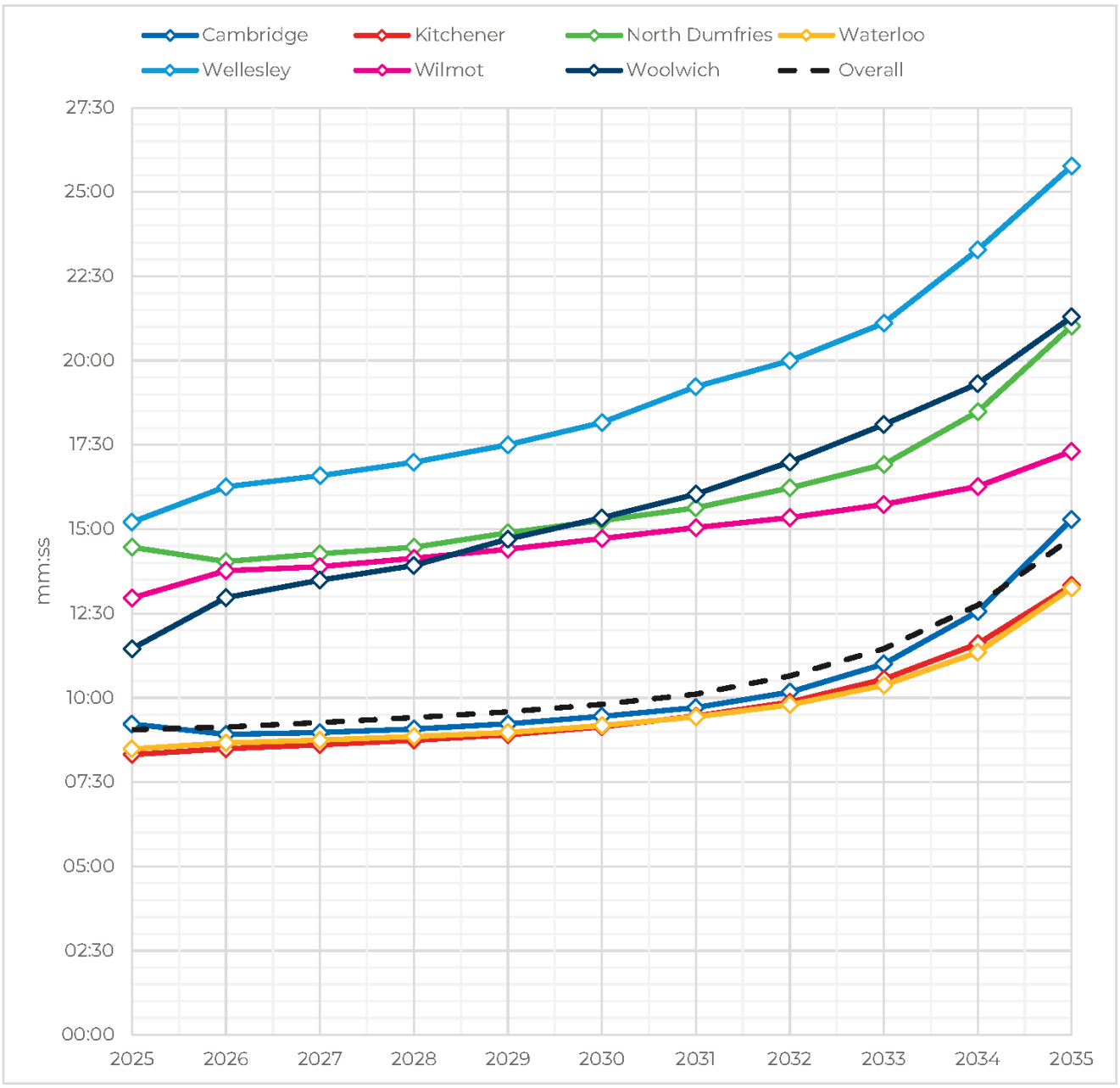




Appendix C5 'Likelihood' of Incident Map



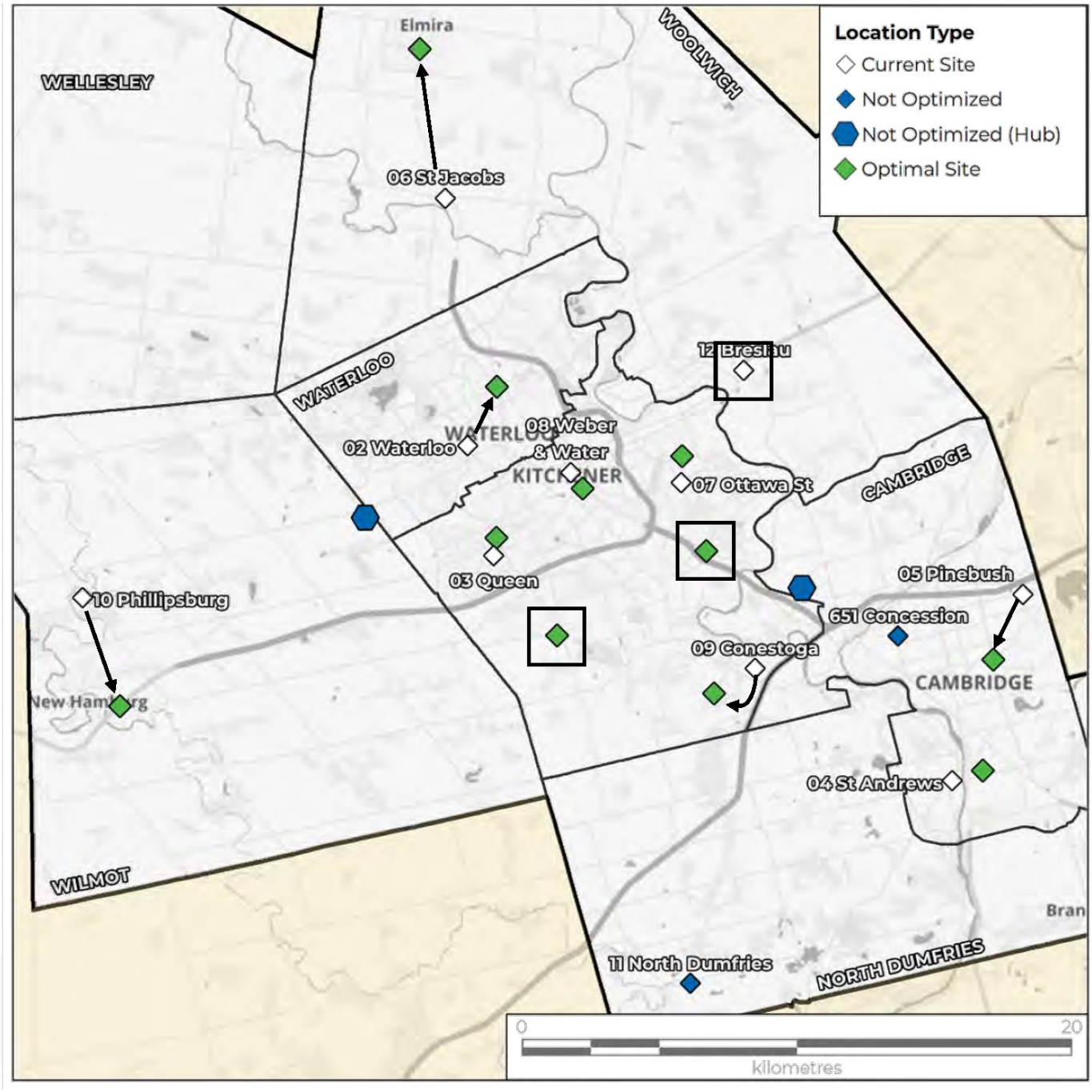
Appendix C6 Do Nothing P4 80th Percentile Response Times by Year



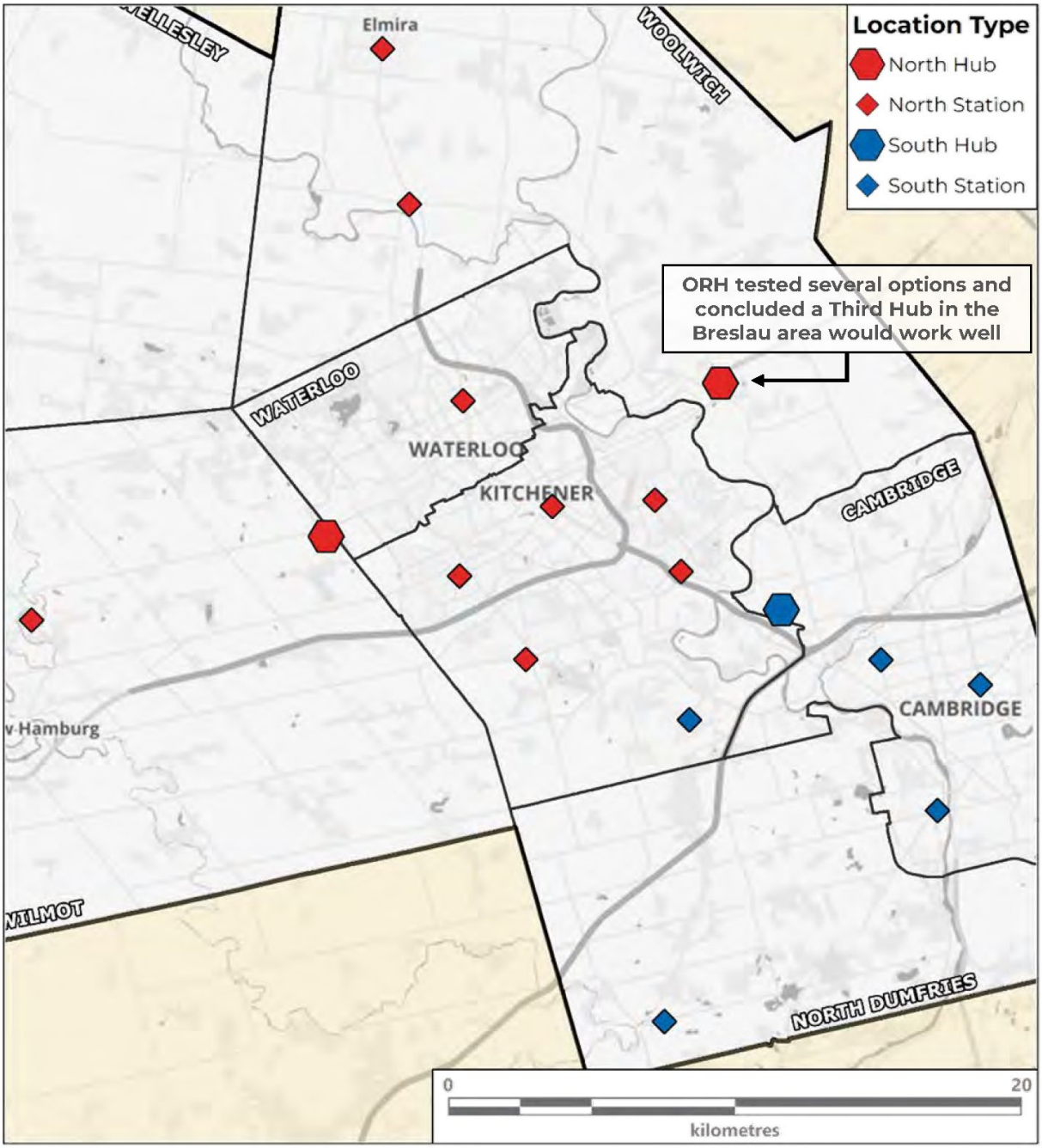
Note: SNORTH Redistributed 2026 Onwards.

D Frontline Resource and Facility Recommendations (2035)

Appendix D1 Blank Canvas Optimization Process Example



Appendix D2 Third Hub Configuration



Appendix D3 Performance Summary for 2035 Maintain Performance Scenario

Modelled Scenario

Local Area Municipality	% P4 responded within X minutes			Mean	80th Percentile
	8	10	12		
Cambridge	78.7%	91.4%	96.4%	06:25	08:10
Kitchener	83.6%	94.1%	97.8%	05:50	07:38
North Dumfries	29.4%	49.2%	66.4%	10:43	14:48
Waterloo	80.6%	93.1%	97.9%	06:13	07:57
Wellesley	14.3%	31.4%	51.6%	11:55	15:01
Wilmot	45.3%	71.1%	81.0%	09:07	11:44
Woolwich	65.3%	79.8%	88.8%	07:10	10:03
Overall	77.8%	89.8%	94.7%	06:30	08:18

Difference to 2025 Base Position

Local Area Municipality	% P4 responded within X minutes			Mean	80th Percentile
	8	10	12		
Cambridge	12.6%	5.2%	2.9%	-00:53	-01:03
Kitchener	6.3%	2.7%	1.0%	-00:32	-00:41
North Dumfries	4.2%	2.8%	1.1%	-00:21	00:20
Waterloo	5.4%	1.2%	0.0%	-00:18	-00:32
Wellesley	1.6%	1.7%	-1.2%	-00:11	-00:11
Wilmot	5.4%	6.2%	5.3%	-00:31	-01:13
Woolwich	21.9%	9.6%	6.2%	-01:46	-01:25
Overall	8.1%	3.3%	1.4%	-00:36	-00:45

Appendix D4 Performance Summary for 2035 Maintain Utilization Scenario

Modelled Scenario

Local Area Municipality	% P4 responded within X minutes			Mean	80th Percentile
	8	10	12		
Cambridge	80.5%	93.1%	97.7%	06:15	07:57
Kitchener	90.1%	97.3%	99.2%	05:24	06:55
North Dumfries	31.9%	51.5%	68.2%	10:26	14:19
Waterloo	83.8%	95.3%	99.1%	05:58	07:41
Wellesley	15.4%	37.5%	61.2%	11:07	13:57
Wilmot	49.1%	78.0%	87.7%	08:32	10:21
Woolwich	81.4%	91.9%	96.5%	05:51	07:46
Overall	82.6%	92.8%	96.3%	06:08	07:45

Difference to 2025 Base Position

Local Area Municipality	% P4 responded within X minutes			Mean	80th Percentile
	8	10	12		
Cambridge	14.5%	6.9%	4.2%	-01:03	-01:16
Kitchener	12.8%	6.0%	2.4%	-00:58	-01:23
North Dumfries	6.7%	5.1%	2.9%	-00:38	-00:08
Waterloo	8.6%	3.4%	1.1%	-00:32	-00:48
Wellesley	2.7%	7.8%	8.4%	-00:59	-01:16
Wilmot	9.2%	13.0%	12.0%	-01:07	-02:37
Woolwich	38.1%	21.8%	13.9%	-03:05	-03:42
Overall	12.9%	6.3%	3.0%	-00:57	-01:18

E Frontline Sensitivity Modelling (2035)

Appendix E1 MPDS Assumptions Overview

- **Demand**: use recent Halton proportions by category (Purple to Green) since pre-MPDS proportions similar to RoWPS.
- **Demand**: assume transfers will continue, but within new categorization system
- **Demand**: for hourly profile and geographical profile, assume broadly that Purple to Orange mirror P4, and Yellow to Green mirror P3

- **Dispatching**: increased responses per incident for Purple, ~1 response per incident for other categories (broadly in line with Halton)
- **Dispatching**: assume responses to lower acuity calls can be diverted to higher acuity calls
- **Dispatching**: assume lights and sirens used for Purple and Red calls

- **Conveyance**: broadly map Halton changes, but with similar overall conveyance as under DPCII (Purple lowest conveyance, Red and Orange similar to P4, Yellow and Green lower than P3/P4)

- **Mobilization times**: assume broadly that Purple to Orange mirror P4, and Yellow to Green mirror P3
- **Time at scene**: assume broadly that Red to Orange mirror P4, and Yellow to Green mirror P3, Purple to mirror P4 + 5 minutes
- **Time at hospital**: assume broadly that Purple to Orange mirror P4, and Yellow to Green mirror P3

- **Performance**: lower acuity categories measured from time of call rather than time notified

Appendix E2 MPDS Assumptions for Incidents and Responses

Daily Incidents

Halton pre MPDS:

Category	Jan 22 - Nov 22	Proportions
P4	83.1	66.7%
P3	41.1	33.0%
P2	0.1	0.1%
P1	0.2	0.2%
Total	**124.5**	**100%**

Halton post MPDS:

Category	Dec 22 - Dec 23	2024 Updated Proportions
Purple	3.2	3.1%
Red	58.2	45.4%
Orange	14.9	13.4%
Yellow	12.4	12.4%
Green	26.2	25.8%
Total	**114.9**	**100%**

RoWPS pre MPDS:

Category	Jan 22 - Nov 22	Proportion
P4	110.2	69.8%
P3	47.0	29.7%
P2	0.3	0.2%
P1	0.5	0.3%
Total	**158.0**	**100%**

RoWPS with MPDS:

Category	2025 Base	Proportions
Purple	5.6	3.2%
Red	83.4	47.7%
Orange	25.2	14.4%
Yellow	18.7	10.7%
Green	42.0	24.0%
Total	**174.9**	**100%**

Responses per Incident

Halton pre MPDS:

Category	Jan 22 - Nov 22
P4	1.2
P3	1.0
Average	**1.1**

Halton post MPDS:

Category	Dec 22 - Dec 23
Purple	1.7
Red	1.1
Orange	1
Yellow	1
Green	1
Average	**1.1**

RoWPS pre MPDS:

Category	Jan 22 - Nov 22
P4	1.1
P3	1.0
Overall	**1.1**

RoWPS with MPDS:

Category	2025 Base
Purple	1.4
Red	1.1
Orange	1.0
Yellow	1.0
Green	1.0
Total	**1.1**

Appendix E3 MPDS Assumptions for Conveyance Rates and Call Components

Conveyance Rates

Halton pre MPDS:

Category	Jan 22 - Nov 22
P4	80.3%
P3	73.9%
Average	**78.2%**

Halton post MPDS:

Category	Dec 22 - Dec 23
Purple	57.4%
Red	83.2%
Orange	84.1%
Yellow	65.7%
Green	74.2%
Total	**78.7%**

RoWPS pre MPDS

Category	Jan 22 - Nov 22
P4	71.0%
P3	65.1%
Overall	**69.2%**

RoWPS with MPDS:

Category	2025 Base
Purple	51.7%
Red	75.2%
Orange	76.1%
Yellow	59.4%
Green	67.3%
Total	**71.0%**

Time at Scene

Halton pre MPDS:

Category	Jan 22 - Nov 22
P4	23.0
P3	23.1
Average	**23.0**

Halton post MPDS:

Category	Dec 22 - Dec 23
Purple	29.7
Red	22.6
Orange	22.2
Yellow	23.6
Green	23.4
Average	**22.9**

RoWPS pre MPDS:

Category	Jan 22 - Nov 22
P4	24.0
P3	25.1
Overall	**24.3**

RoWPS with MPDS:

Category	2025 Base
Purple	30.3
Red	22.8
Orange	22.7
Yellow	25.8
Green	24.7
Total	**23.7**

Time at Hospital

Halton pre MPDS:

Category	Jan 22 - Nov 22
P4	56.0
P3	53.8
Average	**55.3**

Halton post MPDS:

Category	Dec 22 - Dec 23
Purple	57.4
Red	55.2
Orange	54
Yellow	55.2
Green	53.4
Average	**54.7**

RoWPS pre MPDS:

Category	Jan 22 - Nov 22
P4	67.6
P3	68.4
Average	**67.9**

RoWPS with MPDS:

Category	2025 Base
Purple	69.7
Red	69.8
Orange	70.3
Yellow	71.4
Green	71.5
Total	**70.4**

Appendix E4 Worked Example of Hear and Treat under MPDS

Estimating Potential H&T Rates

Category	Category Proportion	2035 Daily Incidents	Triage	Success Rate	Daily Triaged	Daily Hear & Treat
Purple	3%	8.8	0%	-	-	-
Red	48%	130.7	0%	-	-	-
Orange	14%	39.4	0%	-	-	-
Yellow	11%	29.2	60%	33%	17.5	5.8
Green	24%	65.8	60%	33%	39.5	13.0
Overall	100%	274.0	21%	33%	57.0	18.8

Equivalent H&T Rate	**7%**

Estimating Corresponding Clinician Requirements

Hour	Hourly Incidents	Hourly Triaged	Clinicians Required		
			Assuming 3 Calls per Hour	Rest/Comfort Break Cover	Total
0	8.7	1.8	0.6	0.1	1
1	7.6	1.6	0.5	0.1	1
2	6.9	1.4	0.5	0.1	1
3	6.2	1.3	0.4	0.1	1
4	5.7	1.2	0.4	0.1	1
5	5.9	1.2	0.4	0.1	1
6	7.0	1.5	0.5	0.1	1
7	9.4	2.0	0.7	0.1	1
8	11.6	2.4	0.8	0.2	1
9	13.5	2.8	0.9	0.2	1
10	14.5	3.0	1.0	0.2	2
11	14.4	3.0	1.0	0.2	2
12	15.2	3.2	1.1	0.2	2
13	14.7	3.1	1.0	0.2	2
14	15.0	3.1	1.0	0.2	2
15	14.5	3.0	1.0	0.2	2
16	14.2	3.0	1.0	0.2	2
17	14.1	2.9	1.0	0.2	2
18	14.1	2.9	1.0	0.2	2
19	13.8	2.9	1.0	0.2	1
20	12.9	2.7	0.9	0.2	1
21	12.1	2.5	0.8	0.2	1
22	11.2	2.3	0.8	0.2	1
23	10.5	2.2	0.7	0.1	1

Assumptions:

Each clinician can undertake 3 calls per hour

Each clinician is unavailable for approximately 15% of their on-shift time (rest break + comfort breaks)

Additional clinicians are required to provide cover for rest/comfort breaks (also with 15% unavailable time)

Total requirement is appropriately rounded to nearest whole clinician

Appendix E5 Performance Summary for ERU Expansion under MPDS

Modelled Scenario – 80th Percentile (mm:ss)

LAM	Purple	Red	Orange	Yellow	Green
Cambridge	07:55	08:09	15:38	16:44	20:07
Kitchener	07:11	07:27	15:37	16:54	20:40
North Dumfries	14:50	15:01	23:26	25:49	28:10
Waterloo	07:35	07:43	16:06	17:37	20:27
Wellesley	14:50	15:03	21:55	22:38	24:17
Wilmot	11:55	12:35	20:36	19:26	21:01
Woolwich	10:13	10:28	18:42	19:28	26:08
Overall	07:55	08:10	16:21	17:20	20:50

Difference to 2035 Maintain Performance Position

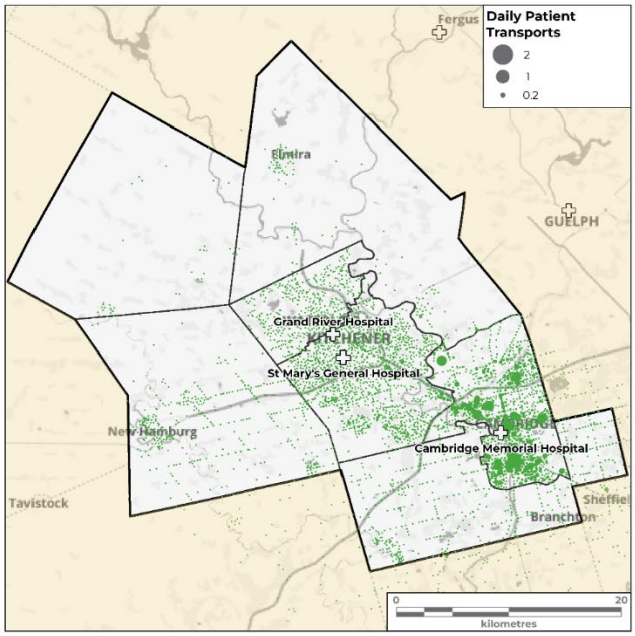
LAM	Purple	Red	Orange	Yellow	Green
Cambridge	-00:03	-00:04	-00:12	-00:42	-03:53
Kitchener	-00:17	-00:15	-00:27	-00:51	-03:54
North Dumfries	00:22	00:26	00:18	00:00	-03:13
Waterloo	-00:07	-00:06	-00:24	-00:39	-02:50
Wellesley	00:08	00:06	-00:15	-02:57	-07:44
Wilmot	01:00	01:08	00:24	-04:34	-09:50
Woolwich	00:01	-00:05	-00:13	-00:27	-09:01
Overall	-00:09	-00:09	-00:22	-00:54	-04:14

Note: Purple & Red measured from T2. Orange, Yellow and Green measured from T0.

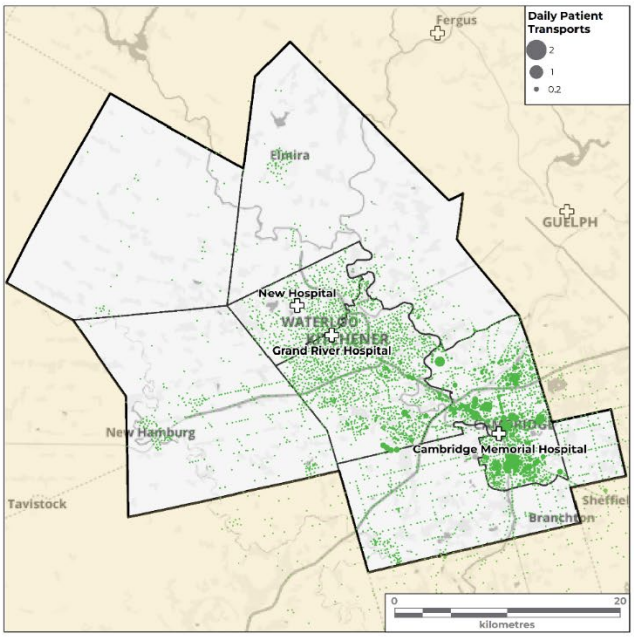
Appendix E6 Patient Flow Maps for Hospital Reconfiguration

Cambridge Memorial Hospital

Current Configuration

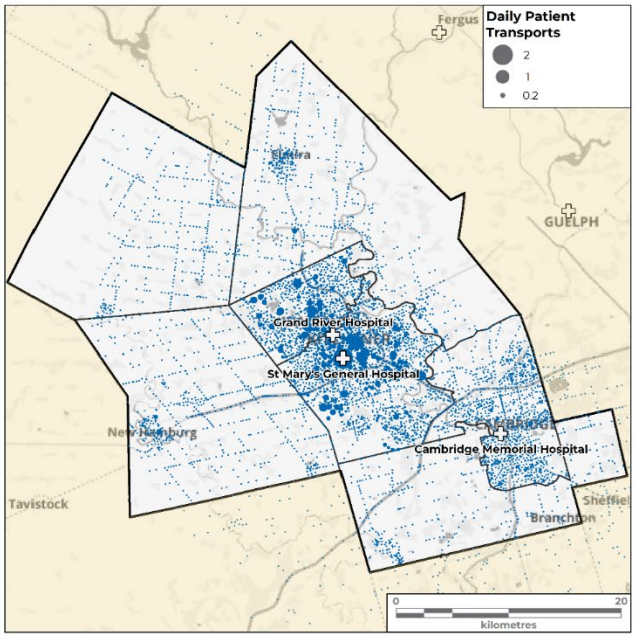


New Configuration

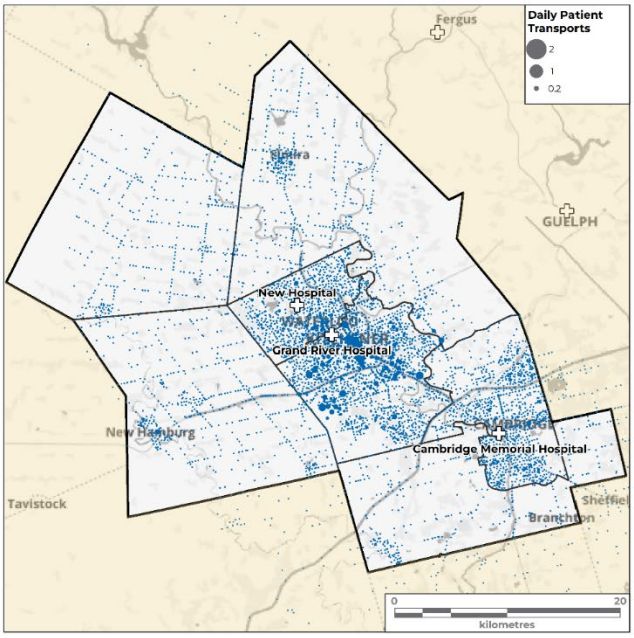


WRHN @ Midtown (previously GRH)

Current Configuration

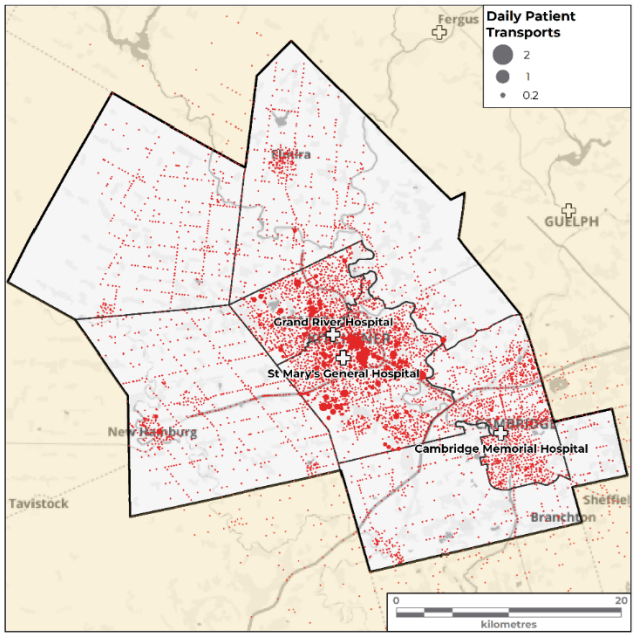


New Configuration

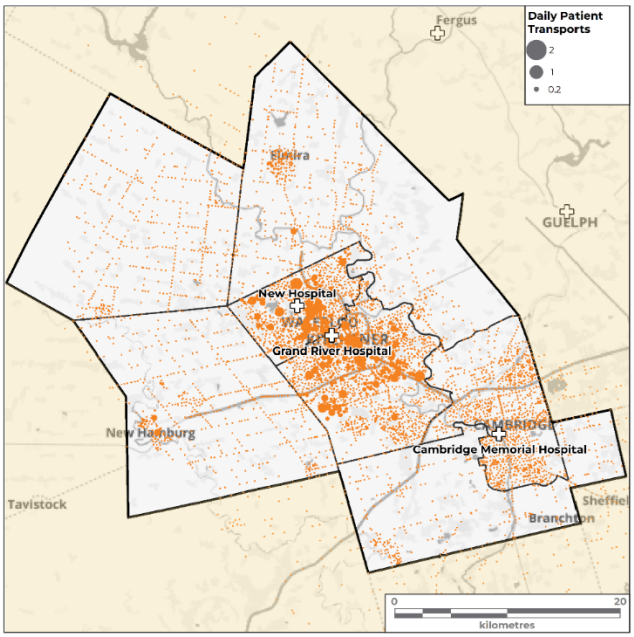


WRHN @ Queen's Blvd (previously St. Mary's General Hospital) and the New Hospital

WRHN @ Queen's Blvd - Current Configuration



New Hospital Configuration



Priority 4 10-minute performance

Difference to Maintain Perf. Scenario

Municipality	Base Position (2025)	Maintain Base Perf. in 2035 Current Hospital Configuration	Status of **Grand River** in New Hospital Configuration			Status of **Grand River** in New Hospital Configuration		
			Remains Open with ED	Remains Open as a UCC Only	Closes Entirely	Remains Open with ED	Remains Open as a UCC Only	Closes Entirely
Cambridge	86.1%	91.4%	91.0%	91.0%	89.6%	-0.4%	-0.4%	-1.7%
Kitchener	91.4%	94.0%	92.8%	92.3%	90.3%	-1.2%	-1.7%	-3.7%
North Dumfries	46.4%	49.2%	48.8%	48.7%	47.2%	-0.3%	-0.5%	-1.9%
Waterloo	91.9%	93.6%	95.6%	95.5%	95.3%	2.0%	1.9%	1.7%
Wellesley	30.7%	32.6%	33.0%	32.4%	31.1%	0.4%	-0.2%	-1.6%
Wilmot	64.3%	72.2%	71.7%	70.9%	68.6%	-0.4%	-1.3%	-3.6%
Woolwich	70.2%	77.4%	77.9%	76.9%	72.8%	0.5%	-0.5%	-4.5%
Overall	86.5%	89.8%	89.5%	89.3%	87.8%	-0.2%	-0.5%	-2.0%

LAM	Recommended Configuration (with Third Hub at 12 Breslau)	Difference to Recommended Configuration				
		Third Hub at Shirley Ave near Conestoga Pkwy (Kitchener)	Third Hub at Relocated 08 Weber & Water site	Third Hub at 460 Conestoga Blvd (Cambridge)	Third Hub at 460 Conestoga Blvd (Cambridge), remove Can-Amera	Third Hub at Can-Amera (relocated 05 Pinebush site)
Cambridge	08:10	-00:00	-00:00	-00:07	00:15	-00:09
Kitchener	07:38	-00:01	-00:02	-00:01	-00:01	-00:02
North Dumfries	14:48	-00:02	-00:02	-00:05	00:00	-00:05
Waterloo	07:57	-00:01	-00:01	00:01	00:02	00:02
Wellesley	15:01	-00:02	-00:02	00:03	00:03	00:04
Wilmot	11:44	-00:05	-00:07	00:05	00:05	00:05
Woolwich	10:03	00:11	00:16	00:25	00:26	00:26
Overall	08:18	-00:01	-00:01	-00:01	00:05	-00:02

LAM	Recommended Configuration	Difference to Recommended Configuration					
		Close 06 St Jacob	Relocate 10 Philipsburg to Luxemburg	Relocate 10 Philipsburg to New Hamburg	Relocate 03 Queen to Optimal	Relocate 07 Ottawa to Optimal	Relocate 04 St Andrews to Optimal
Cambridge	08:10	-00:00	-00:00	-00:00	-00:00	00:02	-00:12
Kitchener	07:38	00:00	-00:01	-00:01	-00:01	00:07	00:01
North Dumfries	14:48	00:01	-00:02	-00:04	-00:01	00:02	00:34
Waterloo	07:57	00:00	00:01	00:01	-00:02	-00:02	00:00
Wellesley	15:01	00:07	00:30	01:26	00:01	-00:03	00:01
Wilmot	11:44	-00:01	-00:02	00:21	-00:03	-00:04	-00:01
Woolwich	10:03	00:02	00:02	-00:00	-00:01	-00:25	00:01
Overall	08:18	00:00	-00:02	-00:01	-00:01	00:04	-00:03

02 Waterloo Alternatives

LAM	Recommended Configuration	Difference to Recommended Configuration						
		Keep 02 Waterloo (instead of relocation)	Keep 02 Waterloo and Add North Waterloo	Relocate 02 Waterloo to 300 Hemlock St	Relocate 02 Waterloo to 403 Albert St	Relocate 02 Waterloo to Bearinger Rd	Relocate 02 Waterloo to New Hospital	Relocate 02 Waterloo to Seagram Dr
Cambridge	08:10	-00:00	-00:00	-00:00	-00:00	00:00	00:00	-00:00
Kitchener	07:38	-00:01	-00:01	00:00	00:00	00:00	00:00	-00:01
North Dumfries	14:48	-00:01	-00:02	-00:00	00:00	-00:01	-00:01	-00:01
Waterloo	07:57	00:48	00:43	00:08	00:07	00:16	00:17	00:38
Wellesley	15:01	00:05	00:06	00:04	-00:01	-00:01	-00:01	00:07
Wilmot	11:44	-00:05	-00:05	-00:02	-00:02	-00:04	-00:03	-00:05
Woolwich	10:03	00:26	00:26	00:07	00:01	00:05	00:06	00:19
Overall	08:18	00:10	00:09	00:02	00:02	00:03	00:04	00:08

Other Relocated Stations Alternatives

LAM	Recommended Configuration	Difference to Recommended Configuration						
		Keep 05 Pinebush (instead of relocation)	Relocate 05 Pinebush to 651 Concession	Relocate 05 Pinebush to 221 Ave Rd	Keep 08 Weber & Water (instead of relocation)	Relocate 08 Weber & Water to 225 Weber St W	Relocate 08 Weber & Water to 450 King St E	Keep 09 Conestoga (instead of relocation)
Cambridge	08:10	00:18	01:19	00:06	00:01	00:02	-00:01	-00:02
Kitchener	07:38	-00:00	-00:00	00:00	00:06	00:12	-00:01	00:07
North Dumfries	14:48	00:06	00:17	-00:11	00:01	00:01	-00:01	-00:35
Waterloo	07:57	-00:00	-00:00	-00:00	-00:02	-00:05	00:01	00:00
Wellesley	15:01	00:01	00:00	00:00	-00:02	-00:03	00:02	-00:00
Wilmot	11:44	00:00	-00:01	-00:00	-00:04	-00:03	-00:01	-00:00
Woolwich	10:03	00:00	-00:01	00:01	-00:03	-00:05	00:02	00:00
Overall	08:18	00:05	00:22	00:02	00:02	00:05	-00:01	00:03

F Phasing of Frontline Recommendations (2025 to 2035)

Appendix F1 Phasing of Peak PTUs

Year	Maintain Performance							
	00 Maplegrove		14 Headquarters		Third Hub		**Total**	
	Day	Night	Day	Night	Day	Night	**Day**	**Night**
2025	18	9	20	11	0	0	**38**	**20**
2026	16	8	22	13	0	0	**38**	**21**
2027	16	8	23	13	0	0	**39**	**21**
2028	17	8	23	14	0	0	**40**	**22**
2029	17	9	24	14	0	0	**41**	**23**
2030	17	9	24	15	0	0	**41**	**24**
2031	18	9	25	16	0	0	**43**	**25**
2032	18	9	26	16	0	0	**44**	**25**
2033	18	9	18	10	10	6	**46**	**25**
2034	18	9	18	10	10	7	**46**	**26**
2035	18	9	18	10	11	7	**47**	**26**

Year	Maintain Utilization							
	00 Maplegrove		14 Headquarters		Third Hub		**Total**	
	Day	Night	Day	Night	Day	Night	**Day**	**Night**
2025	18	9	20	11	0	0	**38**	**20**
2026	16	8	22	13	0	0	**38**	**21**
2027	16	8	24	13	0	0	**40**	**21**
2028	17	8	25	14	0	0	**42**	**22**
2029	17	9	27	15	0	0	**44**	**24**
2030	17	9	29	16	0	0	**46**	**25**
2031	18	9	31	17	0	0	**49**	**26**
2032	18	10	33	17	0	0	**51**	**27**
2033	18	10	20	10	15	7	**53**	**27**
2034	18	10	20	10	17	8	**55**	**28**
2035	18	10	20	10	19	8	**57**	**28**

Note: Redeployment of SNorth shifts in 2026: 07:00-19:00, 08:00-20:00, 09:00-21:00 and 17:00-05: at 00 Maplegrove, 12:00-00:00 and 17:00-05:00 (converted to 20:00-08:00) at 14 Headquarters

Appendix F2 Phasing of Total PTUs (30% Spare Rate)

	Maintain Performance			
Year	00 Maplegrove	14 Headquarters	Third Hub	**Total**
2025	26	29	0	**55**
2026	23	32	0	**55**
2027	23	33	0	**56**
2028	25	33	0	**58**
2029	25	35	0	**60**
2030	25	35	0	**60**
2031	26	36	0	**62**
2032	26	38	0	**64**
2033	26	26	15	**67**
2034	26	26	15	**67**
2035	26	26	16	**68**

	Maintain Utilization			
Year	00 Maplegrove	14 Headquarters	Third Hub	**Total**
2025	26	29	0	**55**
2026	23	32	0	**55**
2027	23	35	0	**58**
2028	25	36	0	**61**
2029	25	39	0	**64**
2030	25	42	0	**67**
2031	26	45	0	**71**
2032	26	48	0	**74**
2033	26	29	22	**77**
2034	26	29	25	**80**
2035	26	29	28	**83**

Appendix F3 Phasing of Additional PTU Shifts

(n) = Night	Maintain Performance		
Year	00 Maplegrove	14 Headquarters	Third Hub
2025	-	-	-
2026		24/7	
2027		12/7	
2028	12/7	12/7 (n)	
2029	12/7 (n)	12/7	
2030		12/7 (n)	
2031		24/7	
2032	12/7	12/7	
2033			2 x 12/7
2034			12/7 (n)
2035			12/7

Note: Redeployment in 2033 of 6 x 24/7 and 2 x 12/7 shifts from 14 Headquarters to Third Hub for Maintain Performance scenario

(n) = Night	Maintain Utilization		
Year	00 Maplegrove	14 Headquarters	Third Hub
2025	-	-	-
2026		24/7	
2027		2 x 12/7	
2028	12/7	24/7	
2029	12/7 (n)	24/7 & 12/7	
2030		24/7 & 12/7	
2031		24/7 & 12/7	
2032	12/7	2 x 12/7	
2033	12/7 (n)		2 x 12/7
2034			2 x 12/7 & 12/7 (n)
2035			2 x 12/7

Note: Redeployment in 2033 of 7 x 24/7 and 6 x 12/7 shifts from 14 Headquarters to Third Hub for Maintain Utilization scenario

Appendix F4 Phasing of Weekly Vehicle Hours

	Maintain Performance			
Year	00 Maplegrove	14 Headquarters	Third Hub	**Total**
2025	2,268	2,772	0	**5,040**
2026	2,100	3,108	0	**5,208**
2027	2,100	3,192	0	**5,292**
2028	2,184	3,276	0	**5,460**
2029	2,268	3,360	0	**5,628**
2030	2,268	3,444	0	**5,712**
2031	2,352	3,612	0	**5,964**
2032	2,352	3,696	0	**6,048**
2033	2,352	2,520	1,344	**6,216**
2034	2,352	2,520	1,428	**6,300**
2035	2,352	2,520	1,512	**6,384**

	Maintain Utilization			
Year	00 Maplegrove	14 Headquarters	Third Hub	**Total**
2025	2,268	2,772	0	**5,040**
2026	2,100	3,108	0	**5,208**
2027	2,100	3,276	0	**5,376**
2028	2,184	3,444	0	**5,628**
2029	2,268	3,696	0	**5,964**
2030	2,268	3,948	0	**6,216**
2031	2,352	4,200	0	**6,552**
2032	2,436	4,368	0	**6,804**
2033	2,436	2,688	1,848	**6,972**
2034	2,436	2,688	2,100	**7,224**
2035	2,436	2,688	2,268	**7,392**

Note: Includes rural ERUs (as deployed in 2025 Base Position)

Appendix F5 Phasing of FTE

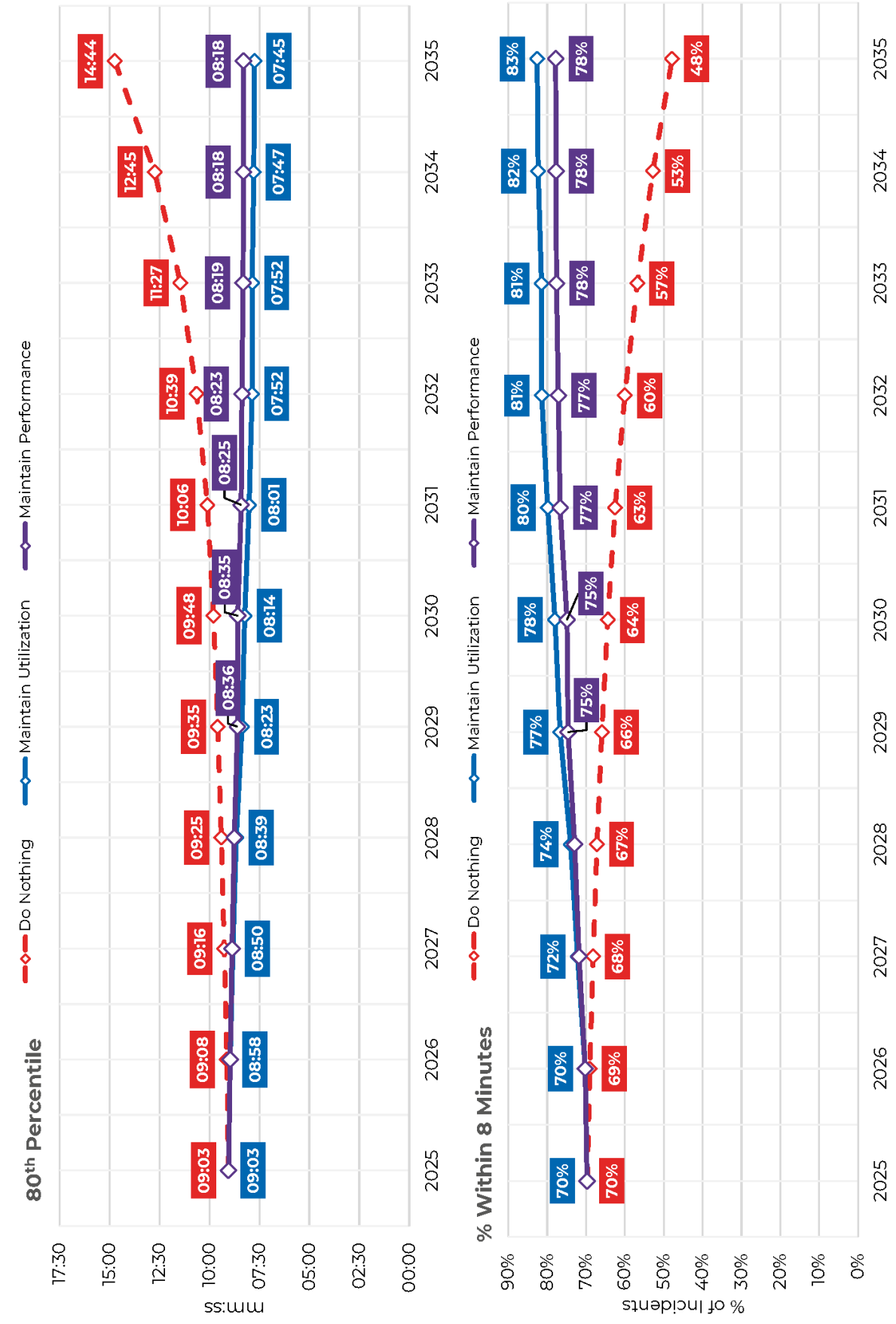
	Maintain Performance						
Year	Overall FTE			Relief Rate	Year-on-Year Difference		
	Core	Relief	Total		Core	Relief	Total
2025	234	67	301	28%	-	-	-
2026	242	73	315	30%	8	7	15
2027	246	76	322	31%	4	3	7
2028	254	83	337	33%	8	7	15
2029	262	89	351	34%	8	7	15
2030	266	93	359	35%	4	3	7
2031	278	103	381	37%	12	10	22
2032	282	106	388	38%	4	3	7
2033	290	112	402	39%	8	7	15
2034	294	116	410	39%	4	3	7
2035	298	119	417	40%	4	3	7

	Maintain Utilization						
Year	Overall FTE			Relief Rate	Year-on-Year Difference		
	Core	Relief	Total		Core	Relief	Total
2025	234	67	301	28%	-	-	-
2026	242	72	314	30%	8	5	13
2027	250	77	327	31%	8	5	13
2028	262	85	347	32%	12	8	20
2029	278	95	373	34%	16	10	26
2030	290	103	393	35%	12	8	20
2031	306	113	419	37%	16	10	26
2032	318	121	439	38%	12	8	20
2033	326	126	452	39%	8	5	13
2034	338	134	472	40%	12	8	20
2035	346	139	485	40%	8	5	13

Note: in order to achieve a 40% relief rate for all core FTE by 2035, a higher relief percentage needs to be applied to additional core FTE between 2026 and 2035.

Includes rural ERUs (as deployed in 2025 Base Position)

Appendix F6 P4 Response Performance Trajectory



G Glossary

Appendix G1 Glossary of Terms

Term	Definition
AACE	Association of Ambulance Chief Executives
ACP	Advanced Care Paramedic
ADRS	Ambulance Dispatch Reporting System
AmbSim	ORH's bespoke simulation model that replicates paramedic service operations
CACC	Central Ambulance Communications Centre, run by the Ministry of Health and responsible for call taking and dispatching and co-ordinating unit responses
Call Component: Call Handling Time	Time measured from T0 (time zero) to T2 (time unit notified)
Call Component: Mobilization Time	Time measured from T2 (time unit notified) to T3 (time unit enroute)
Call Component: Time to Scene	Time measured from T3 (time unit enroute) to T4 (time unit arrived at scene)
Call Component: Time at Scene	Time measured from T4 (time unit arrived at scene) to T5 (time unit departed scene) or T13 (time unit cancelled)
Call Component: Time to Hospital	Time measured from T5 (time unit departed scene) to T6 (time unit arrived at destination)
Call Component: Time at Hospital	Time measured from T6 (time unit arrived at destination) to T7 (time unit cleared destination)
Call Component: Arrival to Handover	Time measured from T6 (time unit arrived at destination) to PTOC (time of patient transfer of care at destination)
Call Component: Handover to Clear	Time measured from PTOC (time of patient transfer of care at destination) to T7 (time unit cleared destination)
Conveyance Rate	The percentage of incidents that involve a patient being transported (conveyed) to a destination facility
CMH	Cambridge Memorial Hospital
CP	Community Paramedicine
CTAS	Canadian Triage and Acuity Scale
CTAS1	Resuscitation: Conditions that are threats to life or limb (or imminent risk of deterioration) requiring immediate aggressive interventions
CTAS2	Emergent: Conditions that are a potential threat to life, limb or function requiring rapid medical intervention or delegated acts
CTAS3	Urgent: Conditions that could potentially progress to a serious problem requiring emergency intervention
CTAS4	Less Urgent: Conditions that are related to patient age, distress, or potential for deterioration or complications which would benefit from intervention or reassurance

Term	Definition
CTAS5	Non Urgent: Conditions that may be acute but non-urgent as well as conditions which may be part of a chronic problem with or without evidence of deterioration
DC	Deputy Chief
DCM	ORH's bespoke location optimization software, the Demand Coverage Model
Demand or Incident	A unique P1 to P4 call resulting in at least one RoWPS unit response (arriving on scene)
DPCI	Dispatch Priority Card Index, the current call categorization system
ED	Emergency Department
EHA	Epidemiology and Health Analytics
ePCR	Electronic Patient Care Record
ERU	Emergency Response Unit, staffed by one paramedic
Filled Shift Rate	The percentage of planned unit hours that are actually deployed on the road
FT	Full-time
FTE	Full-time equivalent
Hear and Treat	The practice of triaging 911 calls over the telephone, with the aim of resolving the call without the need for a unit response where appropriate
HR	Human Resources
IFT	Inter-facility transfer
IT	Information and Technology
KPI	Key Performance Indicator
LAM	Local Area Municipality
LTC	Long-term Care
Mobilization	A unit being mobilized to an incident (may be more than one unit mobilization for an incident and may not reach scene)
MoH	Ontario Ministry of Health
MPDS	Medical Priority Dispatch System, the new call categorization system to be implemented in December 2025
Occupied Time	Time measured from T3 (time unit enroute) to T7 (time unit cleared destination) or T13 (time unit cancelled)
Optimization	Using a sophisticated, geographically based algorithm to evaluate multiple configurations of locations and identify best options (dependent on the optimization criteria).
ORH	Operational Research in Health Limited
P1	Priority 1 (Deferrable): A routine call that may be delayed without detriment to the patient (for example, a non-scheduled transfer; a minor injury)

Term	Definition
P2	Priority 2 (Scheduled): A call which must be done at a specific time, for example because of special treatment or diagnostic facility requirement (for example, inter-hospital transfers or a scheduled meet with an air ambulance)
P3	Priority 3 (Prompt): A call that should be performed without delay (for example,, serious injury or illness)
P4	Priority 4 (Urgent): A call that must be performed immediately where the patients 'life or limb' may be at risk (for example, Vital Signs Absent patient or unconscious head injury)
Peak PTUs	A measure of the absolute minimum number of physical PTUs required to deploy a set of shifts, not accounting for spare vehicles; for example, a day shift of 07:00 to 19:00 followed by a night shift of 19:00 to 07:00 could technically be deployed utilizing one physical vehicle
PCP	Primary Care Paramedic
PCP-IV	Primary Care Paramedic with Intravenous Access/Therapy authorization
PT	Part-time
PTU	Patient Transport Unit, staffed by two paramedics
QA	Quality Assurance
Relief Rate	The rate of additional staff required in order to cover absences such as vacation, sickness, and training; for example, if a 12/7 PTU shift (168 staff hours per week) requires 4 FT staff each working a 42-hour working week with no absences, then a further 1.6 FTE staff would be required under a 40% relief rate to cover their absences
Response	An RoWPS unit arriving at the scene of an incident (there may be more than one unit response to an incident)
Response Time / Response Performance	Time measured from T2 (time unit notified) for the first notified unit to T4 (time unit arrived at scene) for the first arriving unit, which may be two different units; in some cases, response time is measured from T0 (when the call is answered)
RoWPS	Region of Waterloo Paramedic Services
RTW	Return to Work
Sensitivity Modelling	Simulation modelling that tests changes to the assumptions included in the frontline recommendations (for example, demand projections) to determine the potential impact on response times and utilization
Simulation	Using a discrete event simulation model, which replicates the key characteristics of an emergency service, to predict future behaviour under a variety of different scenarios
SLA	Service Level Agreement
Standby	Typically moving a crew from one station to another station to maintain coverage

Term	Definition
Time Event T0	Time Zero (when the call is answered)
Time Event T1	Time Call Received (when call details are confirmed and the call becomes available for dispatch)
Time Event T2	Time Unit Notified
Time Event T3	Time Unit Enroute
Time Event T4	Time Unit Arrived at Scene
Time Event T5	Time Unit Departed Scene
Time Event T6	Time Unit Arrived at Destination
Time Event PTOC	Time of Patient Transfer of Care at Destination
Time Event T7	Time Unit Cleared Destination
Time Event T13	Time Unit Cancelled
Treat and Release	The practice of treating a patient on scene without the need for transport to hospital, where appropriate; this is also known as See and Treat
UCC	Urgent Care Centre
Utilization	The combined occupied time of all units on P1 to P4 jobs divided by the combined total actual unit hours (shift start to shift end); this definition therefore excludes time spent on rest breaks, returning to base, standby moves, and other duties such as completing paperwork and extra cleaning
WRHN	Waterloo Regional Health Network

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