



Halton Region Paramedic Services

Master Plan Update

Final Report

July 24, 2024
ORH/HRPS/1



ASSOCIATION OF
AMBULANCE
CHIEF EXECUTIVES

This document has been produced by ORH for Halton Region Paramedic Services on 24 July 2024. This document can be reproduced by Halton Region Paramedic Services, subject to it being used accurately and not in a misleading context. When the document is reproduced in whole or in part within another publication or service, the full title, date and accreditation to ORH must be included.

ORH is the trading name of Operational Research in Health Limited, a company registered in England with company number 02676859.

ORH's quality management system is ISO 9001:2015 certified: recognition of ORH's dedication to maintaining high quality services for its clients.



ORH's environmental management policy is ISO 14001:2015 certified: verification of ORH's desire to deliver its services and products in a sustainable way and to reduce ORH's impact on the environment.



ORH's information security management system is ISO 27001:2017 certified: evidence of ORH's commitment to implementing international best practice with regard to data security.



Disclaimer

The information in this document is presented in good faith using the information available to ORH at the time of preparation. It is provided on the basis that the authors of the report are not liable to any person or organisation for any damage or loss which may occur in relation to taking, or not taking, action in respect of any information or advice within the document.

Accreditations

Other than data provided by Halton Region Paramedic Services, this report also contains data from the following sources:

© 2024 HERE All rights reserved. © His Majesty the King in Right of Canada, © King's Printer for Ontario

© 2024 Ministry of Finance, Ontario

Adapted from Statistics Canada, Population Estimates by Subdivision, July 1, 2016 and 2021. This does not constitute an endorsement by Statistics Canada of this product.

EXECUTIVE SUMMARY

E.1 Operational Research in Health Limited (ORH) was commissioned to create a Ten-Year Master Plan for Halton Region Paramedic Services (Halton PS). The development of such a plan is complex as it embraces operational, estate and finance issues, and there will be wider issues in terms of how the service is positioned within the public sector.

Data Collection and Analysis

E.2 ORH collected detailed workload and resourcing data from 2019 to 2023, along with supporting information from Halton PS and Regional business areas. This was supplemented by interviews with internal and external stakeholders.

E.3 Detailed analysis was undertaken to understand historical trends, produce inputs for simulation and optimization models, and inform benchmarking to compare Halton PS with other Ontario services ORH has worked with.

E.4 The key analysis findings were as follows:

- The introduction of MPDS at Mississauga Central Ambulance Communications Centre (CACC) in December 2022 led to greater stratification of demand categories than the previous DPCI II system (see Appendix **B2b**). Lower acuity calls are now being held longer before allocation to allow the prioritization of high acuity calls (see Appendix **B4b**).
- Increases in time at hospital, particularly from 2021 to 2022, contributed to the total average occupied time being almost ten minutes longer in 2023 than in 2019 (see Appendix B4a). Time at hospital in Halton Region was the third-highest benchmarked of any Ontario service ORH has worked with (see Appendix **B10c**).
- There was relatively little disparity in performance between each LTM, particularly for lower acuity calls, with the Yellow 90th percentile varying from 23m40s in Oakville to 25m53s in Halton Hills (see Appendix **B5b**).
- On average, 95% of ambulance vehicle shifts were filled during the sample, varying from 84% in Milton to 136% at Brant (see Appendix **B6a**). Emergency response unit (ERU) hours were filled 64% of the time on average; in cases of short-staffing, ERU staff were paired onto ambulances.

Demand Projections

E.5 ORH used a population-based demand projection method to estimate future demand levels. There are three main causes of demand growth that this method

attempts to account for: a growing population, an ageing population and changes in demand rate trends (a growing propensity for a person to call emergency services).

- E.6 No single source could provide population figures by age group, LTM and year from 2014 to 2034. ORH combined historical Statistics Canada Census figures from 2016 and 2021 with Region-wide Ministry of Finance future projections to create future age profiles by LTM which reflect local differences. The totals were updated to reflect Regional Official Plan figures, and Joint Best Planning Estimate information provided by Regional planning departments was used to create geographical demand distributions at more granular areas within LTMs.
- E.7 Halton Region population is expected to increase by 32% from 2021 to 2034; the increase is at 65% in Milton (see Figure 3-2). Milton's demographic profile reflects a more dominant working age population than the other LTMs.
- E.8 Demand rate (annual calls per head) trends show an increase in most age groups from 2014 to 2023 with the largest increase observed in the more elderly age groups (see Appendix C1). Projecting this through to 2034 produces an expected demand rate of 751 annual incidents per 1,000 people in the 80-plus age group.
- E.9 Combining future population projections and demand rates gives an expected average annual demand increase of 4.7%, ranging from 4.2% in Burlington to 6.1% in Milton (see Figure 3-3). The main contributing cause of growth differed by LTM; overall population growth was the most notable factor in Milton.
- E.10 Historical and planning information was used to devise alternative annual demand growth figures of 4.0% and 6.2%, acting as low and high growth projections to ensure future scenarios devised in the 'core' projection are robust should demand growth change (see Appendix C2).

Model Setup

- E.11 The model was shown to be accurately reflecting 2022-23 Halton PS operations during the model validation stage, therefore it could be used with confidence to model different 'what if' modelling scenarios.
- E.12 The validated model was then updated to better reflect 2024, creating the 2024 Base position. In this position, Purple 8-minute response performance, when measured from time assigned, was 76.2%. Halton PS and ORH decided on further metrics for response performance measurement.

'Do Nothing' Scenario

- E.13 The aim of this scenario is not to recommend that no changes are made to Halton PS operations over the next ten years. It quantifies the impact of rising demand on the

service and provides a baseline position against which options for responding to the increased demand can be tested against.

- E.14 Increasing demand at the core projected rate of 58% over ten years would mean Region-wide Purple 8-minute response performance degrades from 76.2% in the 2024 Base Position to 60.5% in 2034. Low acuity response performance degrades at a much faster rate with the increased demand as higher acuity calls are prioritized.

Developing the Core Scenario

- E.15 Maintaining 2024 performance in 2034 would require an additional 1,512 ambulance hours per week. There would be capacity issues at nearly all stations thus it was important to understand whether a hub and spoke centralized reporting model could be implemented to alleviate these issues.
- E.16 The 'core' hub and spoke model improved response performance, allowing the total resourcing requirement to maintain 2024 performance to be reduced by 112 ambulance hours per week (see Figure 6-1). This is equivalent to 5.3 full-time and 2.4 part-time staff using a 0.45 part-time ratio. This configuration would alleviate capacity issues plus provide efficiencies for centralized logistics and supervisory arrangements.

Sensitivity Modelling

- E.17 The core hub and spoke scenario was altered to test the impact of:
- Changing operational locations (see Appendix G1)
 - Reduced transport rates for low acuity (see Figure 7-1)
 - Clinical assessment in the control room to reduce responses (see Figure 7-2)
 - Increases to offload delays (see Figure 7-3)

Broader Service Considerations

- E.18 ORH subcontracted AACE to review the organizational structures and support functions in place to deliver paramedic services across the Region.
- E.19 Key findings from this aspect of the study include:
- The current superintendent to frontline staff ratio of 20:1 is in-line with other similarly sized services. To maintain this ratio with a growing frontline workforce would require six additional posts across the next ten years.
 - Changes to the wider healthcare system are required to enable HRPS and other paramedic services to ensure the most appropriate care is delivered to the patient

through a variety of different and potentially non-vehicle responses. This is particularly true given the Mississauga CACC is managed as a separate entity with no access to a Clinical Assessment Service.

- Out-of-hours scheduling falls to operational superintendents and contributes to an administrative burden. Investment into the scheduling function to enhance operational hours would be beneficial.
- Moving to two deployment hubs would provide efficiencies for the superintendent role, plus enable improved delivery of effective fleet and logistics support services. Extending fleet and logistics services would require an additional six WTE minimum but would reduce the administrative burden on operational superintendents.
- A review of frontline management roles is suggested, with a view to introducing a clinical supervision element to existing or new roles.
- A separate review of the potential for a fully integrated vehicle preparation service is suggested, with the aim of improving the efficiency of fleet operations and ensuring the amount of time clinical staff spend with patients can be maximized.

Ten-Year Trajectory

- E.20 The hub and spoke scenario forms the core recommended 2034 position, requiring an additional 1,400 ambulance hours per week to maintain 2024 performance.
- E.21 The potential enhancements detailed in Sections 7 and 8 are not assumed to be in place within the core scenario, but opportunities to exploit these should be considered where possible.
- E.22 A gradual introduction of shifts was modelled across the ten years, with the new Bronte headquarters (and hub) operational from 2028 and the Hornby hub operational in 2029 (see Figure 9-1).
- E.23 Generally, a maximum of one additional 24/7 vehicle per year was required to maintain performance in each year for the majority of municipalities. Region-wide performance improves in each year.
- E.24 Internal and external factors and metrics should be monitored throughout the next ten years to ensure the implementation plan can be altered as necessary.
- E.25 Figure E-1 lists the additional staffing posts required by 2034.

Figure E-1: 2034 Frontline and Support Staffing Requirements

Position	Additional FTE by 2034
Operations Superintendent	6
Clinical Supervision	2
Accountability Officer	1
Education Superintendent	2
Recruitment Specialist/HR Support	1
Schedulers	3
Vehicle Preparation Technician	6
Logistics Officer	6
IT Support	1
Mechanic	1
Community Paramedicine	4
Administrative Co-ordinators	3
Total Additional Support Staff	36
Total Additional Frontline Paramedic Staff	72
Total Additional Staff	108
Total Relief Hours*	74,967

* Assuming 42-hour working week and 0.45 part-time ratio.