



Guelph-Wellington Paramedic Services

Paramedic Staffing and Deployment Needs Report

Final Report

November 04, 2024
ORH/GWPS/1

EXECUTIVE SUMMARY

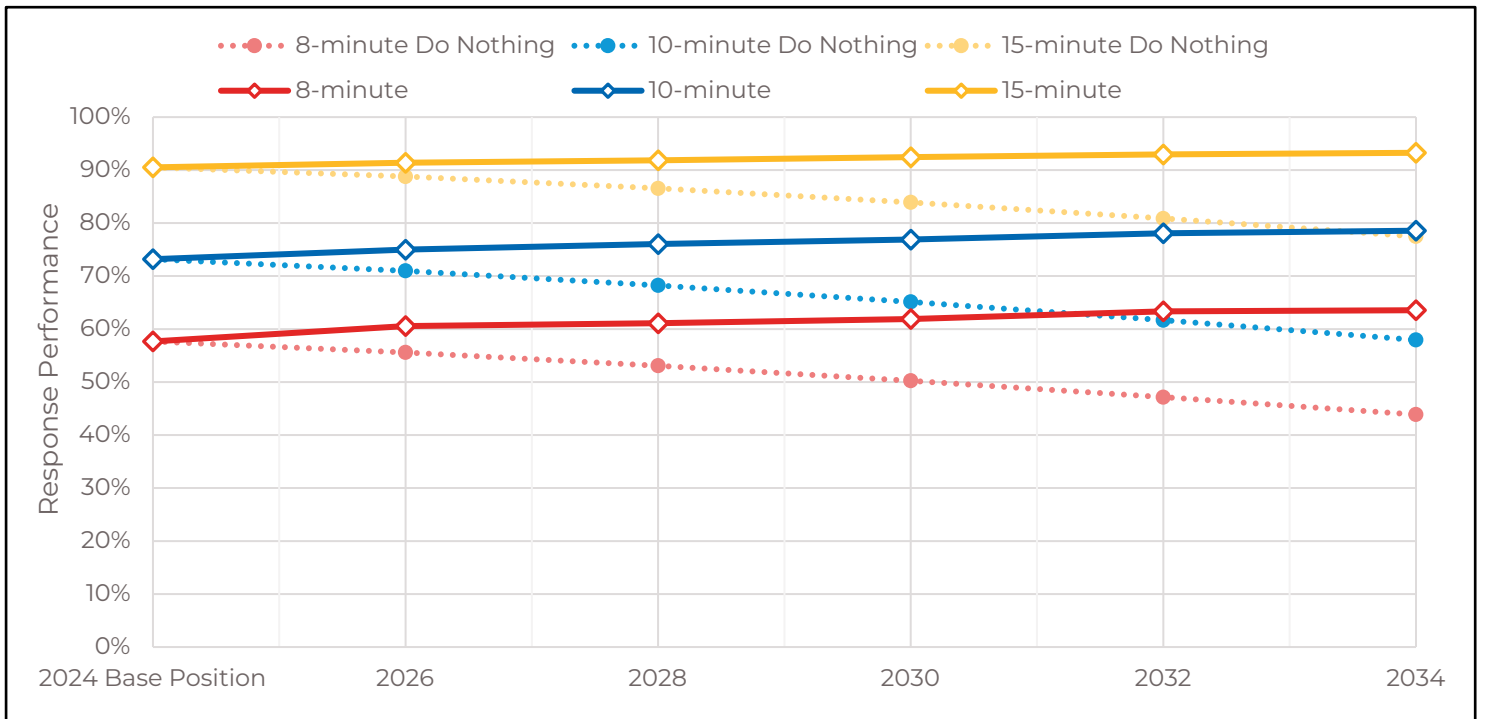
- E.1 Operational Research in Health Limited (ORH) was commissioned to update a Ten-Year Master Plan for Guelph-Wellington Paramedic Services (GWPS) originally undertaken in 2016. As the horizon year of the original review approaches, there is a requirement to update the master plan to evaluate how things have changed for GWPS and to extend station and staffing recommendations through the next ten years.
- E.2 The key analysis findings were as follows:
- a. Demand on the service is generally increasing. The average daily number of incidents increased from 60 in January 2019 to 71 in December 2023.
 - b. Response performance varies significantly between each Lower Tier Municipality (LTM), with Priority 4 (P4) 8-minute performance ranging from 11% in Puslinch to 71% in Guelph.
 - c. GWPS occupied time has increased from 64 minutes in 2015 to 75 minutes in 2023, mainly due to time at hospital increases.
 - d. P4 8-minute response performance in the City has improved considerably from 63% in 2015 to 74% in 2023. Meanwhile there has been a relatively minor deterioration in performance for most County LTMs. This means that service delivery has become less equitable.
- E.3 ORH used a population-based demand projection method to estimate future demand levels. The predicted increasing and ageing population, coupled with increasing demand rates, suggests that service-wide demand will increase by 4.3% per year on average. This means the service will have 45 more incidents to attend per day on average in 2034 than in 2023.
- E.4 ORH uses a sophisticated predictive modelling tool (AmbSim) that has been developed in-house to assist with the development of master plans for paramedic services. During the model validation stage, AmbSim was shown to accurately reflect GWPS operations from 2022 to 2023, and therefore could be used with confidence to test a range of 'what if' modelling scenarios. A 2024 Base Position was created to provide a comparison for future scenarios.
- E.5 To provide meaningful context for future resource recommendations, it was important to create a 'Do Nothing' position through to 2034. Increasing demand at the core projected rate of 52% over ten years means that overall P4 8-minute performance would fall from 58% in the 2024 Base Position to 44% in 2034.

- E.6 ORH sought to identify proposed targets for each LTM that would allow more appropriate and equitable service delivery. The proposed P4 90th percentile response time targets are: Guelph – 11 minutes; Centre Wellington – 12 minutes 30 seconds; Guelph/Eramosa, Wellington North and Minto – 16 minutes; Erin, Puslinch and Mapleton – 18 minutes.
- E.7 ORH used AmbSim to identify the minimum resource requirement to meet these standards in 2034. This required an additional 924 weekly ambulance hours (an increase of 41% from the Base Position). **However, it is not possible to house these additional resources within GWPS's current facilities due to capacity constraints.** This is true even if GWPS was aiming only to maintain performance at existing levels.
- E.8 ORH's optimization model was used to assess optimal station locations for the future. Blank canvas optimization suggested that many, though not all, current facilities are relatively well located, but are simply not appropriately sized. With the new Speedvale Avenue location under development, the City stations will have been relatively newly built with additional capacity, and were identified as well located; therefore it was agreed that these would be retained.
- E.9 For the County facilities, further targeted optimization was undertaken for each facility in turn, and response performance impacts assessed in AmbSim. Performance improvements of varying degree can be found through relocating 02 Fergus, 04 Mount Forest, 06 Harriston, 08 Rockwood, and, in particular, 10 Hillsburgh. Optimal locations for 05 Arthur and 07 Drayton were found to be close to their current sites.
- E.10 Due to the improved coverage through these relocations, the proposed targets could now be met in 2034 with 840 additional ambulance hours (an increase of 37% from the Base Position). The addition of an Aberfoyle post is also recommended to bring P4 8-minute response performance in Puslinch in line with other LTMs.
- E.11 It is recommended that all County facilities are relocated or rebuilt, even those that have minimal response performance benefits. The results of a 2022 facility needs assessment found that no County station was "purpose-built to provide amenities required by paramedics" and describes that the facilities do not meet the needs of the service. No changes to facilities in the County have been made since the previous ORH review and, without the relocation of all facilities, there are problems at all County stations regarding capacity, condition, staff amenities, and egress.
- E.12 Deployment and facility recommendations have been set out according to the trajectory outlined in Figure I. It was agreed that the introduction of both staffing and facilities should occur gradually, as this is more realistic in terms of the funding GWPS will be granted and allows for the service to acclimatize to the changes. Most importantly, it still means that performance can gradually improve each year, while ensuring that no LTM performs significantly worse than it is currently.

Figure I: Recommended Trajectory

Year	Additional Vehicles	Sites closed	Sites Built	Shifts redeployed	Shifts added *
2026	2	00 Elmira Road North	Speedvale	1 x 24Hr, 1 x 12Hr and peak ERU now deployed at Speedvale instead of 00 Elmira Road North	Peak shift at Speedvale
					Peak shift at 06 Harriston
2028	1	10 Hillsburgh	Hillsburgh optimal location	1 x 24Hr at 10 Hillsburgh to optimal location	Peak shift at Hillsburgh optimal location
		08 Rockwood	Rockwood optimal location	1 x 12Hr at 08 Rockwood to optimal location	Night shift at Rockwood optimal location
2030	2	06 Harriston	Harriston optimal location	1 x 24Hr and 1 x 12Hr at 06 Harriston to optimal location	Peak shift added books on at 03 Clair Road and forward deploys to 12 Gordon
		04 Mount Forest	Mount Forest optimal location	1 x 24Hr at 04 Mount Forest to optimal location	Peak shift added at Mount Forest optimal location
2032	1	02 Fergus	Fergus optimal location	2 x 24Hr at 02 Fergus to optimal location	Peak shift added at Fergus optimal location
			Aberfoyle post	Peak shift at 03 Clair Road books on as normal but forward deploys to Aberfoyle	Night shift at 03 Clair Road West
2034	2	05 Arthur	Arthur optimal location (nearby)	1 x 24Hr at 05 Arthur to optimal location	Peak shift at Arthur optimal location
		07 Drayton	Drayton optimal location (nearby)	1 x 24Hr at 07 Drayton to optimal location	Peak shift at Rockwood optimal location
		12 Gordon	Gordon replacement (nearby)	3 x 24Hr at 12 Gordon to replacement location 03 Clair Road peak shift now books on at Gordon (due to additional capacity)	

*168 weekly vehicle hours added in every two-year period



Contents

1	Introduction	1
2	Data Analysis and Benchmarking.....	2
	Data Collection	2
	Service Analysis.....	3
	Benchmarking.....	5
3	Demand Projections.....	8
	Methodology Overview.....	8
	Population	9
	Demand Rates.....	9
	Demand	10
	Development Data	10
	Alternative Demand Levels.....	10
4	Model Setup and Base Position	11
	Model Setup	11
	Base Position	12
5	‘Do Nothing’ Scenario	13
6	Performance Targets for Improved Equity of Service Delivery.....	15
	Identifying Proposed Performance Targets.....	15
	Resource Requirements to Achieve Targets in 2034.....	16
7	Identifying Facility Requirements.....	18
	ORH’s Optimization Model.....	18
	Location Optimization Results.....	19
	Resource Requirements with Recommended Sites	20
	Facility Issues and Risks	21
8	Final Recommendations and Trajectory.....	23
9	Sensitivity Modelling.....	25

1 Introduction

- 1.1 Operational Research in Health Limited (ORH) was commissioned to update a Ten-Year Master Plan for Guelph-Wellington Paramedic Services (GWPS). The review aims to update findings previously completed by ORH back in 2016, as well as a follow up in 2018, as the horizon of the original review approaches.
- 1.2 A steering committee, with representatives from the City of Guelph, the County of Wellington and the Ministry of Health Central Ambulance Communications Centre, met with ORH throughout the process to help guide the report.
- 1.3 This is the Final Report for the review.**
- 1.4 The scope of the review was to:
- Determine future paramedic service requirements
 - Extend staffing recommendations from those made in the original review
 - Identify optimal station configurations
 - Quantify the impact on response times given changes to the station configuration
 - Create a prioritized phasing plan for the implementation of recommendations
- 1.5 To undertake this review, ORH collected and analyzed workload, resourcing and organizational data to review the current service profile (see Section 2).
- 1.6 Demand projections were created to quantify the impact of population and demographic changes through to 2034 on paramedic service demand (see Section 3).
- 1.7 The demand projections were loaded into the simulation model to create a ‘do nothing’ scenario through to 2034 to understand the impact of demand growth (see Section 5).
- 1.8 Response performance targets were proposed for each LTM which reflected their differing demand distributions and geographies. Achieving these targets would improve both performance and equity of service delivery (see Section 6).
- 1.9 Optimization models were used to identify the optimal locations for GWPS to gain efficiencies and best respond to patients (see Section 7).
- 1.10 By considering the performance benefits offered by optimally located sites, and limitations with the current locations, a future station configuration was proposed enabling improved equity of service delivery. Using these sites the additional resourcing requirement, which allows targets to be met, was calculated.
- 1.11 A trajectory was created showing the ideal prioritization of changes over the next ten years to achieve the proposed 2034 scenario (see Section 8).

2 Data Analysis and Benchmarking

ORH collected a five-year sample of workload and resourcing data (January 2019 to December 2023). Detailed analysis was undertaken to understand historical trends, produce inputs for ORH's simulation and optimization models, and inform external and internal benchmarking.

The key analysis findings were as follows:

- Demand on the service has generally increased across the five-year sample period. The average daily number of Priority 1 (P1) to Priority 4 (P4) incidents increased from 60 in January 2019 to 71 in December 2023.
- Response performance varies significantly between each Lower Tier Municipality (LTM), with P4 8-minute performance ranging from 11% in Puslinch to 71% in Guelph.
- GWPS planned to deploy 2,184 weekly ambulance hours in 2022 and 2023.
- GWPS benchmarked relatively well compared to other Ontario-based services. It had the second shortest average occupied time for a P4 incident out of the six services compared. Internally however, GWPS occupied time has increased from 64 minutes in 2015 to 75 minutes in 2023, mainly due to time at hospital increases.
- P4 8-minute response performance in the City has improved considerably from 63% in 2015 to 74% in 2023. Meanwhile there has been a relatively minor deterioration in performance for most County LTMs. This means that service delivery has become less equitable.

Data Collection

2.1 ORH collected a five-year sample of workload and resourcing data (January 2019 to December 2023) to examine and analyze trends in demand and performance. Datasets collected include:

- Ambulance Dispatch Reporting System (ADRS) call and workload data
- Deployment plans
- Geographical data (station and hospital locations)
- Operational policies and procedures (deployment protocols, meal break and standby move policies)

2.2 ORH also collected counts of incidents by age, gender and Lower Tier Municipality (LTM) back to 2014 to inform demand projections. This was supported by the

collection of development data provided by the County of Wellington and City of Guelph planning departments.

Service Analysis

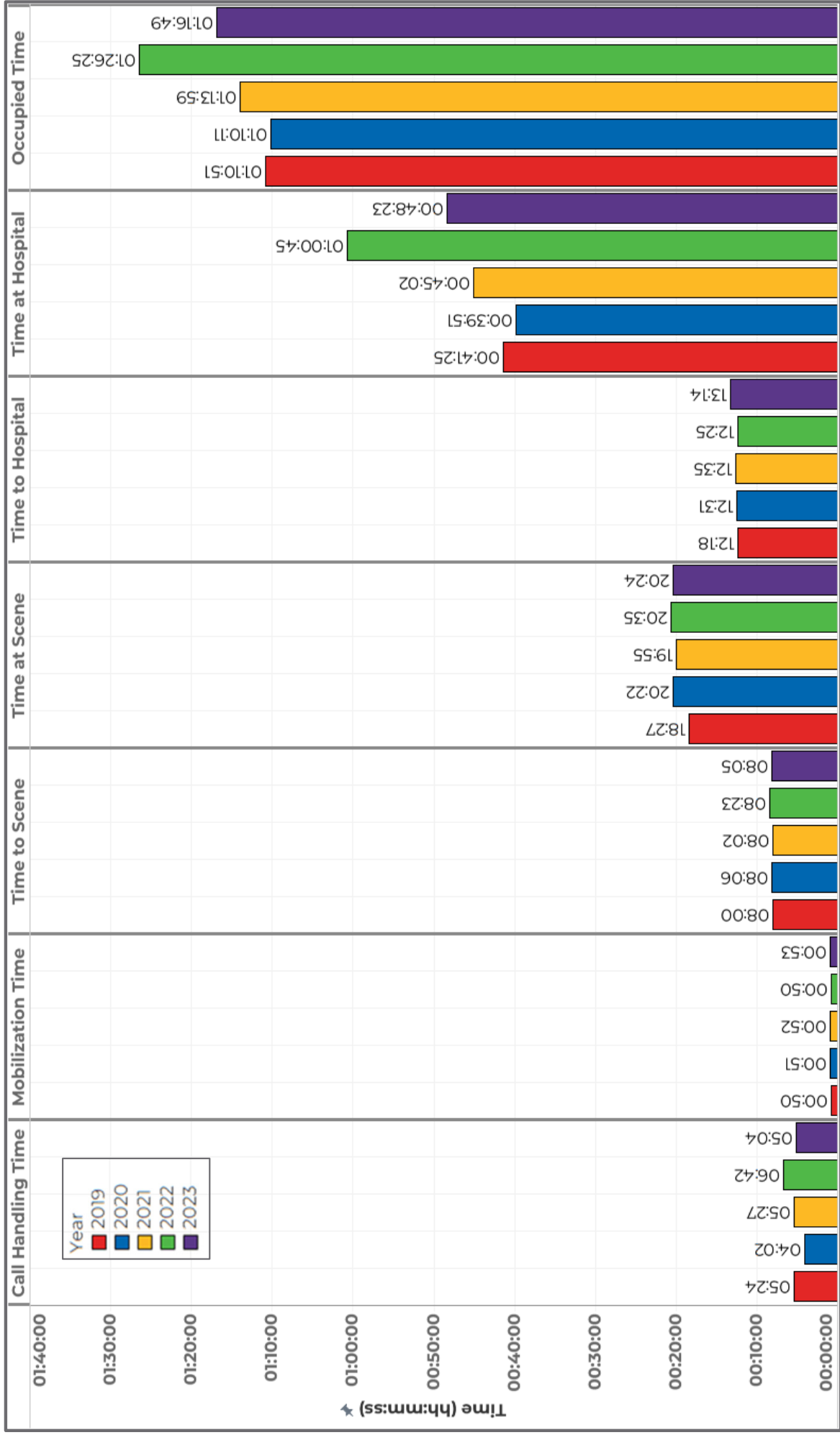
Demand

- 2.3 Unless otherwise specified, demand in this report is defined as incidents responded to by GWPS (regardless of whether the incident was inside or outside the service area), that is, where at least one GWPS arrives on scene. Average daily responded demand has increased over the five years, except for a reduction in 2020 influenced by the COVID-19 pandemic (see Appendix **A1a**).
- 2.4 There were 67 average daily Priority 1 (P1) to Priority 4 (P4) incidents in both 2023 and 2022. The average daily number of incidents increased from 59.5 in January 2019 to 71.4 in December 2023, an increase of 11.9 incidents per day.
- 2.5 Demand can be divided into four priorities based on the overall priority code assigned within the data, with P4 being the highest acuity and contributing to 70% of demand. P3 accounts for 29% of incidents, whereas P1 and P2 represent only 1% of incidents.
- 2.6 Demand by day and hour shows a similar pattern to that seen in other services (see Appendix **A1b**). Demand rises quickly from 06:00, peaking around 11:00 and gradually reducing throughout the rest of the day. Weekend demand is lower during the daytime and higher during the night compared to that of weekday demand.
- 2.7 The distribution of demand varies considerably across the service area (see Figure **2-1**). The majority of demand (59%) falls within the City of Guelph, which is a densely populated urban area. Each of the other seven LTMs hold considerably less demand, which is spread across a more sparse rural area. Out-of-area demand accounts for 3.7% of GWPS demand.
- 2.8 Most patients are transported to Guelph General Hospital at 33.2 per day (see Appendix **A2**). Generally, patients are transported to their closest suitable hospital, thus out-of-area hospitals receive a low proportion of patient transports. There are, on average, 3.8 inter-facility transfer (IFT) incidents per day where a patient is transported from one hospital to another.

Call Components and Response Performance

- 2.9 ORH calculates each 'call component' of the incident cycle separately and analyzes these to understand how they may vary (see Figure **2-2** for P1 to P4 averages). The most notable change in average call components is seen in the increasing time at hospital, particularly from 2021 to 2022, however this reduced again in 2023. The average occupied time (from time mobile to time clear) was around six minutes longer in 2023 than in 2019.

Figure 2-2: Call Components by Year (Ambulance First Responses)



- 2.10 Most other service time components remain fairly static during the sample.
- 2.11 Time at hospital varies considerably across the five-year sample (see Appendix **A3a**). In 2019 it was relatively stable at 41 minutes on average, however in Spring 2021 patient journeys rapidly increased and the arrival to handover component of time at hospital increased with this, up to a peak of 53 minutes in October 2022. In May 2023, time at hospital drops off and remains at lower levels for the remainder of the sample. This reduction is different to what ORH has seen for other Ontario based services where offload delays stay at high levels or continue to increase in 2023.
- 2.12 Time at hospital is longest for Guelph General Hospital at 55Mins 11s (see Appendix **A3b**). Typically, it is at busier hospitals where this component is longer, whereas Louise Marshall and Palmerston District Hospital are quieter and have the shortest times. Some of the out-of-area hospitals are still busy, however a larger proportion of their patient journeys are IFTs where time at hospital is shorter on average.
- 2.13 Mandated reporting of response performance to the Ministry of Health (MoH) calculates service-wide performance from the time the first arriving vehicle is notified to the time it arrives on scene. Targets are set by Canadian Triage Acuity Scale (CTAS) code, which is first assigned when a paramedic arrives on scene, but not by priority code (see Figure **2-3**).
- 2.14 ORH also reports response performance by priority code, since this is known at the time of dispatch. Overall P4 8-minute response performance for the sample was 62%.
- 2.15 Response performance varies significantly between each LTM, with P4 8-minute performance ranging from 11% in Puslinch to 71% in Guelph (see Appendix **A4**), although Puslinch does have considerably less demand. In Section 6, response performance targets are proposed for each LTM which reflect their differing demand distributions and geographies.
- 2.16 Naturally, the areas nearest each station have the best average response performance (0 to 8 minutes), however the impact of standby moves can be seen, with a corridor of good response performance between areas such as Guelph and Fergus, or between Guelph and Rockwood.
- 2.17 Some areas have average response times between 8 and 14 minutes despite being immediately outside a station; these stations include 08 Rockwood and 10 Hillsburgh. This is likely due to the fact that they only have one crew, so if this crew is already on a call, it takes longer for a neighbouring station to respond.

Resourcing and Resource Use

- 2.18 GWPS planned to deploy 2,184 weekly ambulance hours in 2022 and 2023 (see Figure **2-4**) with an Emergency Response Unit (ERU) deployed from 00 Elmira Road North.

Figure 2-3: CTAS Performance by year

GWPS Reports

Year	VSA within 6mins	1 within 8mins	2 within 10mins	3 within 15mins	4 within 15mins	5 within 20mins
2019	42.2%	67.9%	76.0%	89.0%	87.0%	92.0%
2020	38.0%	68.0%	73.0%	90.0%	87.0%	93.0%
2021	37.0%	65.0%	76.0%	89.0%	87.0%	94.0%
2022	33.0%	63.0%	71.0%	86.0%	83.0%	92.0%
2023	45.7%	71.0%	74.0%	88.0%	85.0%	91.0%

Figure 2-4: Resourcing Summary (2022-23)

Weekly Vehicle Hours

Station	Average Daily Responses	Average Ambulance Utilization	Weekly Vehicle Hours	
			Ambulance	ERUs
00 Elmira Rd North	11.8	47.2%	252	84
02 Fergus	8.2	32.6%	252	
03 Clair Rd West	11.9	48.2%	252	
04 Mount Forest	3.4	20.0%	168	
05 Arthur	3.3	28.8%	168	
06 Harriston	3	21.1%	168	
07 Drayton	2.5	20.7%	168	
08 Rockwood	2.1	33.7%	84	
10 Hillsburgh	3	28.0%	168	
12 Gordon	21.8	42.7%	504	
Overall	69	35%	2,184	84

- 2.19 A large proportion of this resourcing is focused within the City of Guelph (1,008 weekly ambulance hours) to deal with the high levels of demand there. All stations in the County except 02 Fergus and 08 Rockwood deploy one 24-hour vehicle (168 weekly ambulance hours). An extra peak shift operates out of 02 Fergus, since this area has higher demand, whereas 02 Rockwood is not covered during the night.
- 2.20 Ambulance utilization, defined as the total time from mobilization to posting clear from incidents (thus excluding meal breaks and standby moves) was 35% in the last two years of the sample (see Appendix **A5a**). Utilization peaked around 14:00 at 50%, not long after the peak in demand. ERU utilization was relatively low at 12% overall.
- 2.21 The hourly profile of ambulances matches relatively well to the hourly profile of demand (see Appendix **A5b**). As GWPS's collective agreement mandates 12-hour shifts, and the service must also maintain a base level of coverage in a relatively rural area, it is difficult for ambulance deployments to perfectly match the pattern of demand.
- 2.22 The workload data also included Priority 8 standby moves (see Appendix **A5c**). On average 43 standby moves were attempted per day; these moves do not include vehicles returning to base having finished an incident. The station attempting the most moves was 00 Elmira Road North at 7.4 per day. The station has multiple peak vehicles it can post to nearby stations if required and, prior to July 2022, five shifts per day would book on at 00 Elmira Road before being posted to 12 Gordon.
- 2.23 Of the attempted standby moves analyzed, 37% were interrupted mid-move or assigned to an incident less than two minutes after arriving. When this occurs, 50% of the interruptions or assignments were a subsequent standby move. This does not necessarily mean the initial move was worthless because it could be that a greater or fewer number of vehicles have since become available, therefore meaning that the configuration of vehicles (under GWPS's standby move policy) needs readjusting.
- 2.24 Vehicles in urban areas are more likely to have their standby moves interrupted by subsequent incidents. For example, when the vehicles rostered at 12 Gordon have their moves interrupted, 79% of the interruptions are to assign to another incident. However, this figure is only 23% for 06 Harriston vehicles.

Benchmarking

External Benchmarking

- 2.25 ORH has compiled an anonymized database of key operational parameters across recent Ontario paramedic service clients (see Figure **2-5**). The results of benchmarking can help to identify potential efficiencies for GWPS to target over the next ten years.

Figure 2-5: External Benchmarking Summary (Other Ontario Services)

Measure	GWPS Value	Rank	Min	Median	Max
<i>Conveyance Rate (all incidents)</i>	78.6%	5 out of 8	66.8%	78.5%	83.7%
Call Start to First Assigned	02:25	1 out of 7	02:25	03:16	05:16
Mobilization Time	00:46	3 out of 8	00:25	00:49	01:10
Travel Time to Scene	06:57	2 out of 8	06:47	07:21	09:30
Time at Scene	20:08	3 out of 6	18:38	20:33	23:30
Travel Time to Hospital	11:01	1 out of 6	11:01	13:11	15:08
Time at Hospital	49:21	3 out of 6	18:53	50:23	70:59
Arrival to Handover	31:56	3 out of 6	12:00	36:13	57:40
Handover to Clear	16:04	6 out of 6	06:45	13:45	16:04
Occupied Time	71:25	2 out of 6	55:00	75:01	85:28

Times shown in mm:ss format

First Response
All Responses

Figure 2-6: Internal Benchmarking Summary (2015 compared to 2023)

Measure	Service-Wide			City of Guelph			County of Wellington		
	2015	2023	Diff.	2015	2023	Diff.	2015	2023	Diff.
Call Start to First Assigned	03:02	05:04	02:02	01:27	04:24	02:57	05:33	06:15	00:42
Mobilization Time	00:48	00:52	00:04	00:39	00:41	00:02	01:01	01:11	00:10
Time to Scene	07:50	07:48	-00:02	07:14	06:50	-00:24	08:49	09:30	00:41
Time at Scene	17:16	20:23	03:07	16:31	20:15	03:44	18:11	20:35	02:24
Time to Hospital	12:08	12:58	00:50	08:17	10:02	01:45	15:34	17:42	02:08
Time at Hospital	33:02	48:33	15:31	36:16	55:49	19:33	27:04	36:49	09:45
Occupied Time	01:03:44	01:15:20	11:36	01:01:48	01:16:15	14:27	01:03:11	01:13:42	10:31

Times shown in hh:mm:ss format

- 2.26 For the external benchmarking, ORH consistently compares responses to all P4 incidents within the given service area, except for conveyance rate which looks at all P1 to P4 incidents. Time to hospital, time at hospital and occupied time consider all responses, while all other measures consider just first responses.
- 2.27 GWPS benchmarked relatively well compared to other Ontario based services and was not a particular outlier in any measure. The main points of interest from the benchmarking are that:
- GWPS had the shortest time from the start of the call to the first unit being assigned at 02m25s. How long it takes to assign a vehicle to an incident can depend on the CACC but also how under strain the service is; when a service is busier, fewer vehicles are available and it is less clear which vehicles should be assigned. Some of the other services in the sample have been under considerable strain thus it is expected that this component will be longer than that of GWPS.
 - GWPS ranked third out of six for time at hospital at 49m21s. There is huge variation for this measure, with the minimum being 18m53s and the maximum 71m59s, some of which is down to the sample period for each service (some sample periods do not go beyond 2021). As noted earlier, from May 2023 GWPS's time at hospital dropped considerably, which has not been the case for most services ORH has worked with.
 - GWPS handover to clear times were the longest of any service compared at 16m04s. However, services that have longer arrival to handover times generally experience shorter handover to clear times. Since GWPS's arrival to handover time is not particularly long, the handover to clear time is less likely to be as short as for other services.
 - GWPS had the second shortest occupied time of the benchmarked services at 71m25s. For most services, the biggest contributing call components to occupied time are time at scene, time to hospital, and time at hospital, each of which GWPS ranks quite well in.
- 2.28 On consultation with the GWPS management team it was decided that the benchmarking did not offer obvious potential efficiencies for testing. However, the performance impacts on changes to offload delays are modelled as part of sensitivity modelling in Section 9.

Internal Benchmarking

- 2.29 ORH also completed internal benchmarking by comparing the latest 2023 GWPS call components to those in 2015 from the previous department plan (see Figure 2-6). This considered all GWPS first responses to P1 to P4 incidents, except for the performance comparison which considered only P4.
- 2.30 The main points of interest from the internal benchmarking are that:

- P4 8-minute response performance in the City has improved considerably from 63% to 74% (see Appendix **A6a**). Meanwhile there has been a relatively minor deterioration in performance for most County LTMs. This means that service delivery has become less equitable.
- Call start to first assigned has increased by 2m2s. This is likely because, as the service becomes more stretched and vehicles more unavailable, it takes longer to decide which vehicle should be assigned, and also because lower acuity incidents will have to wait for longer while the service prioritizes other incidents.
- Time to scene for the County has increased by 0m41s (see Appendix **A6b**), most likely due to the population being more spread out and resources being less available. On the other hand, City of Guelph time to scene has decreased by 0m24s, possibly influenced by changes to one of the station locations.
- Time at scene has increased from 17m16s in 2015 to 20m23s in 2023. The largest increase in this call component occurred in 2020, most likely influenced by the increased use of PPE due to the COVID-19 pandemic.
- Time at hospital has increased by 15m01s. This has strongly influenced the increase in occupied time from 63m44s in 2015 to 75,20s in 2023.
- Average ambulance utilization has increased from 21.5% in 2015 to 33.1% in 2023 (see Appendix **A6c**), with a much larger increase seen during the daytime. This is a result of greater workload via an increased number of incidents and job cycle times, without resourcing increasing at the same rate.

3 Demand Projections

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).

ORH combined Watson & Associates Economists Limited figures, Census population data and Ministry of Finance estimates to create future age profiles by LTM. Key developments were also incorporated into the projection to determine the geographic distribution of demand within each LTM.

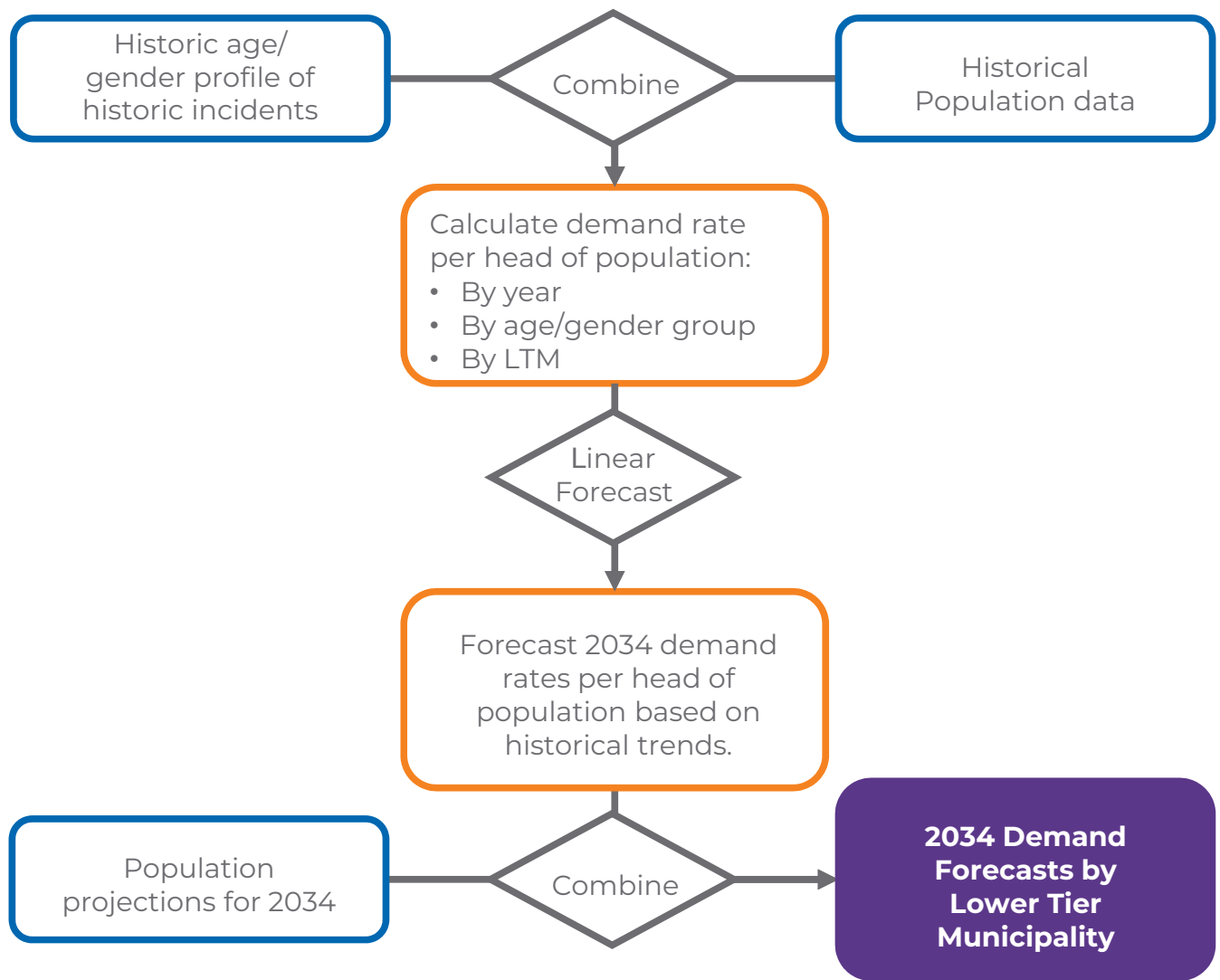
Combined County of Wellington and City of Guelph population is expected to increase by 21%, from 257,000 to 311,000, between 2023 to 2034. The 75+ age group is expected to increase at a higher rate of 66%, indicating an ageing population.

The predicted increasing and ageing population, coupled with increasing demand rates, suggests that service-wide demand will increase by 4.3% per year on average, ranging from 2.8% in Minto to 7.0% in Erin. This means the service will have 45 more incidents to attend per day on average in 2034 than in 2023.

Methodology Overview

- 3.1 Demand projections were required to identify facility and resource requirements over the next ten years.
- 3.2 The demand projections were created using a population-based projection method (see Figure 3-1). 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.
- 3.3 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:
 - A growing population
 - Changes to the age profile of the population (an ageing population)
 - Changes to demand rates (usually there is a growing propensity for a person to call emergency services)

Figure 3-1: Population-based Projection Method



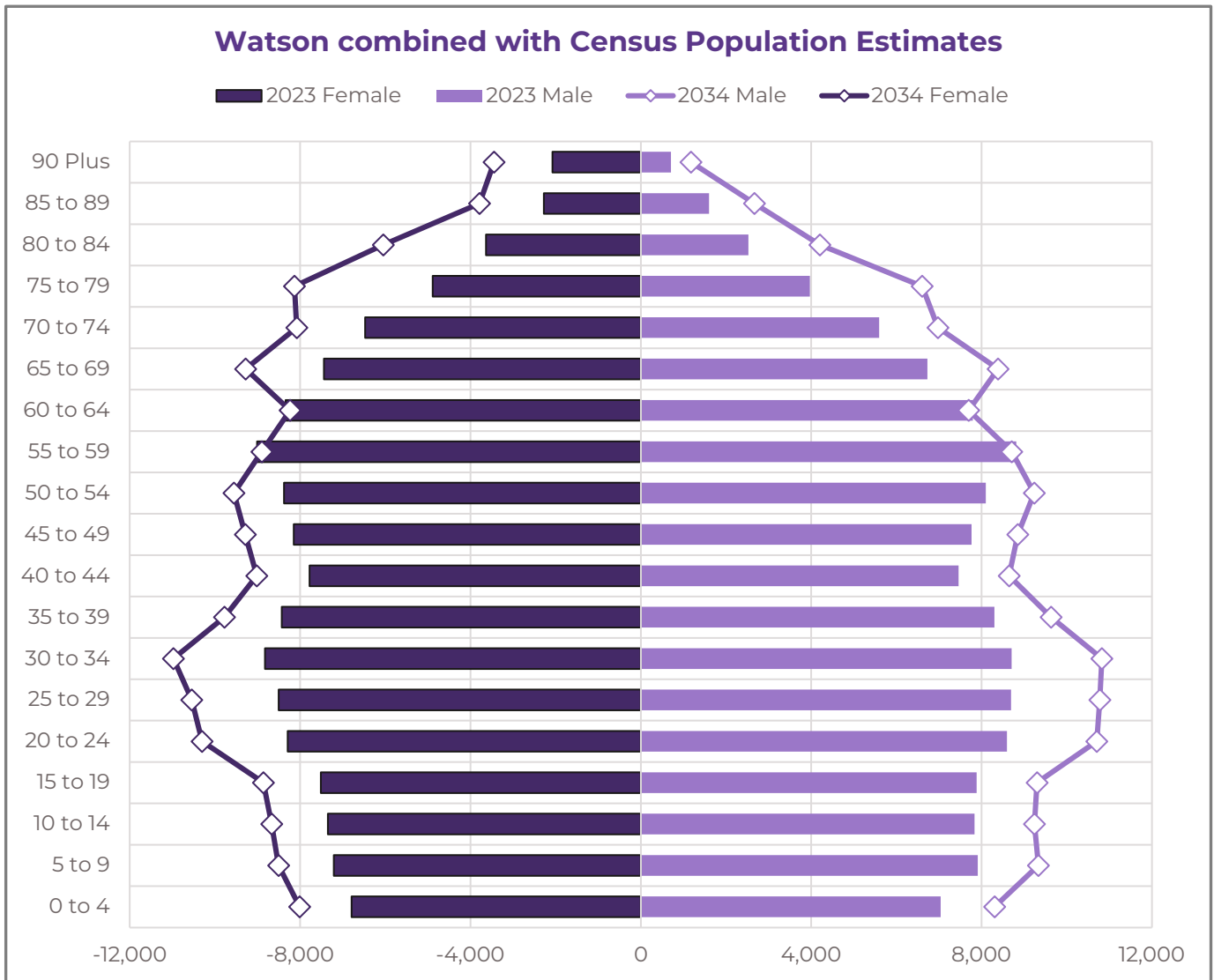
Population

- 3.4 This projection method requires historical and future population figures by age group, LTM and year, from 2014 to 2034. No single data source was able to provide this level of detail (see Appendix **B1**) so, in agreement with the GWPS management team, multiple data sources were combined.
- 3.5 Watson & Associates Economists Limited (Watson) historical and forecasted figures provided population by age group from 2016 to 2036. Combined County of Wellington and City of Guelph population is expected to increase by 21%, from 257,000 to 311,000, between 2023 to 2034. The 75+ age group is expected to increase at a higher rate of 66%, indicating an ageing population (see Figure **3-2**).
- 3.6 Using 2016 and 2021 Census population data, ORH found that the geographical profile of each age group has not changed significantly over the five years (see Appendix **B2**). For example, 60% of the 80+ age group population for 2016 resided in Guelph, which increased to only 61% in 2021. ORH therefore used these 2021 proportions to distribute the projected service-wide population into each area.

Demand Rates

- 3.7 ORH collected historical age and gender incident data for each year back to 2014. Dividing historical demand by historical population for each age group and LTM produced a demand rate (for each year), which was then linearly forecasted for future years.
- 3.8 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 Appendix **B3**). Demand rates in each age group have generally followed an upward trend and are therefore predicted to increase again between 2024 and 2034.
- 3.9 However, initially this calculation led to a projected drop in demand rates for the 75+ age group, which is contrary to what ORH has seen with other services. On further examination, although historical demand for this age group increases, the Watson projections increased at a particularly fast rate for 2022 and 2023 for this age group. It was therefore agreed that, for 2022 and 2023, Ministry of Finance age group proportions (which were different from the Watson proportions) would be used in the demand rate calculation.
- 3.10 The updated demand rate trends showed an increase in all age groups from 2014 to 2023, with the largest increase observed in the 65-74 age group. By 2034, a rate of 440 annual incidents per 1,000 people is expected for the 75+ age group; this rate is similar to that projected in such age groups in other reviews undertaken by ORH.

Figure 3-2: Overall Population Estimates



Age	2023	2024	Difference	% Increase
75+	21,660	36,040	14,380	66.4%
65-74	26,220	32,700	6,480	24.7%
55-64	33,980	33,560	-420	-1.2%
45-54	32,400	36,940	4,540	14.0%
35-44	31,940	37,040	5,100	16.0%
20-34	51,620	64,140	12,520	24.3%
0-19	59,540	70,240	10,700	18.0%
Overall	257,360	310,660	53,300	20.7%

Demand

- 3.11 The future population projection and forecasted demand rates were combined to produce a demand projection. Service-wide demand is projected to increase by 4.3% per year on average (core projection), ranging from 2.8% per year in Minto to 7.0% per year in Erin (see Figure **3-3**). This compares to a historical average increase of 4.9% per year.
- 3.12 This increase means that the service will have 45 more incidents to attend per day on average in 2034 than in 2023, equivalent to a 55% increase. The most notable increases from 2023 to 2034 are from 41 to 68 daily incidents in Guelph, and 9 to 17 daily incidents in Centre Wellington.
- 3.13 Erin experiences the largest proportional increase in demand at 7% per year. In Section 5 it is shown that this increase will be detrimental to response performance in what is already one of the service's worst performing LTMs.

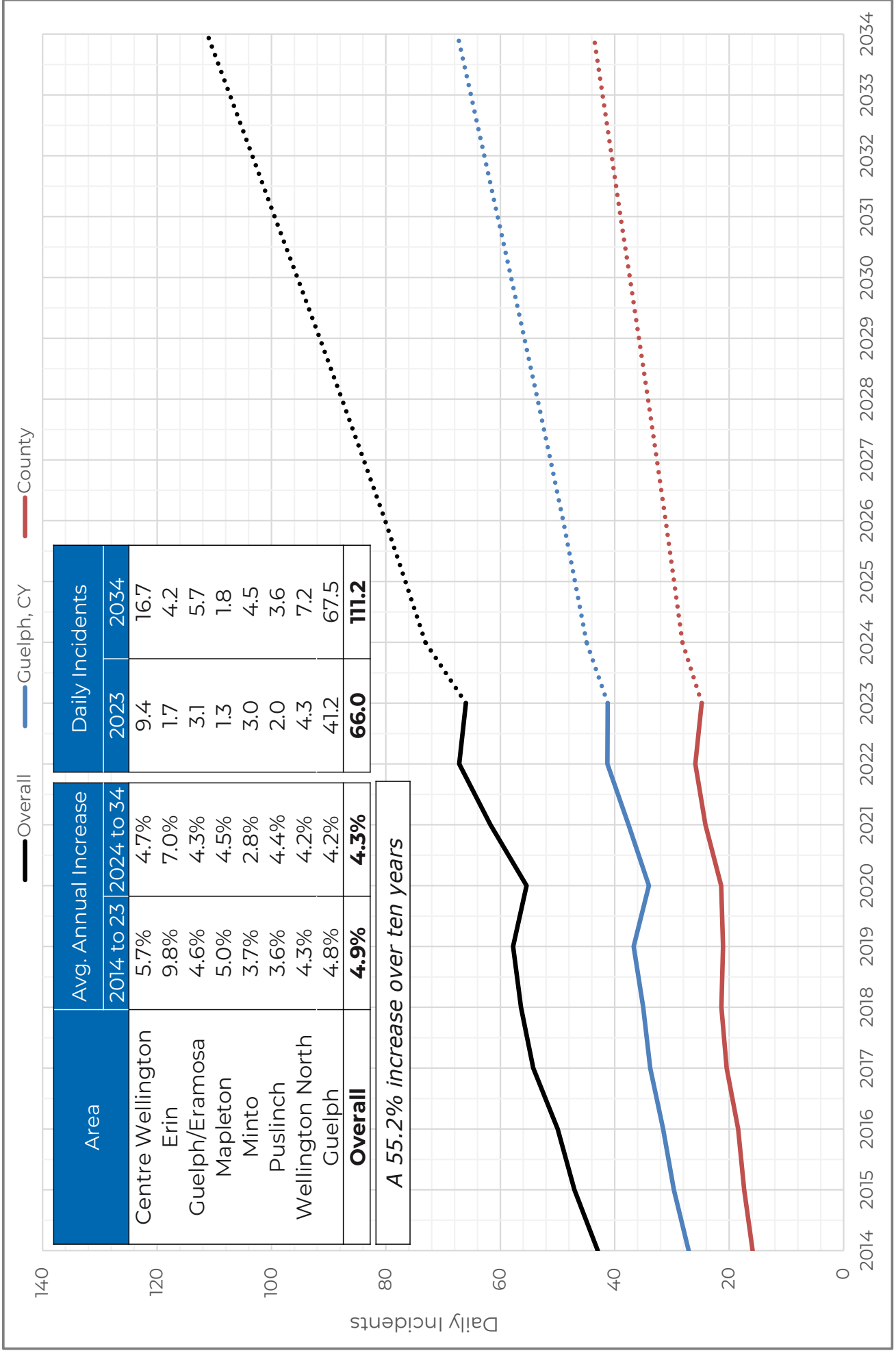
Development Data

- 3.14 ORH collected housing development data from the County of Wellington and City of Guelph planning departments (see Appendix **B4**). This information was incorporated into the projections to determine the geographic distribution of demand within each LTM.
- 3.15 An agreement was made as to the proportion of units within each development area that would likely be constructed by 2034, and these units were converted into anticipated 2034 demand. The main areas of County of Wellington development are in the towns of Mount Forest, Elora, Fergus, Hillsburgh and Erin. For the City of Guelph, the largest development areas can be found in the north-east, off Victoria Road South, and off Watson Parkway.

Alternative Demand Levels

- 3.16 With any demand projection method there will always be uncertainty. It was therefore important to create higher and lower growth projections to ensure that recommendations were robust given differing demand levels (see Appendix **B5**).
- 3.17 A low growth projection was created by applying the initial demand rate projections that showed the 75+ age group demand rate reducing; however as the population for this age group still increases, so does projected demand. Under this lower projection, overall demand is instead projected to increase by 4.1% per year.
- 3.18 A high growth projection was made by assuming that each LTM's annual growth is one percentage point higher than the core projection. Under this higher projection, overall demand is instead projected to increase by 5.3%. This would mean that the service responds to 56 more incidents per day on average in 2034 than in 2023.

Figure 3-3: Demand Projection



4 Model Setup and Base Position

ORH uses sophisticated predictive modelling tools that have been developed in-house to assist with the development of master plans for paramedic services. AmbSim is a simulation model that replicates the key characteristics of an emergency ambulance service.

During the model validation stage, AmbSim was shown to accurately reflect GWPS operations from 2022 to 2023, and therefore could be used with confidence to test a range of 'what if' scenarios.

A 2024 Base Position was created to provide a comparison for future scenarios. In this position overall P4 8-minute response performance was 58%, and the 90th percentile response time was 14m46s.

Model Setup

AmbSim

- 4.1 ORH has developed a sophisticated simulation model, AmbSim (see Appendix **C1**), for modelling the operations of ambulance services. AmbSim is a discrete event simulation model that replicates the key characteristics of an emergency ambulance service and can be used to predict future behaviour under a variety of different scenarios.
- 4.2 AmbSim takes account of the actual geographical and temporal distributions of demand and resources and incorporates travel times between locations. It reports operational performance in terms of response times, vehicle workload and utilization, and patient flows.
- 4.3 In the simulation, virtual incidents are generated in a way which considers the actual geographical and temporal distributions of demand. The model dispatches available resources to respond to these incidents and incorporates mobilization and travel times to scene, plus the other service time components associated (based on the incident type). Mirroring real life, multiple incidents are generated (often simultaneously) and so the model takes account of vehicles becoming unavailable, or crews responding from a location other than a station.
- 4.4 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.

Model Validation

- 4.5 AmbSim was populated using parameters derived from analysis of the last two years of provided ADRS data (January 2022 to December 2023). Analysis of GWPS data provided information on demand, call locations, job cycle times and hospital

transports. Service data was also used to provide ambulance numbers and deployed hours, deployment locations and operational policy for the model.

- 4.6 In addition to this, ORH developed a detailed travel time model of the GWPS area using commercially available data calibrated against information on journey times from workload data.
- 4.7 The model was then validated by comparing a range of outputs from the model such as response performance, vehicle workload and utilization, and hospital workload, to the corresponding analyzed figures.
- 4.8 The modelled P4 response time distribution, measured from the time first assigned, showed a close match to actual analyzed values (see Appendix **C2a**). Modelled ambulance utilization in AmbSim also closely followed the temporal profile analyzed and, similarly, hospital flows and vehicle responses aligned with those analyzed (see Appendix **C2b**).
- 4.9 Overall, the model replicated historical operations accurately and therefore could be used with confidence to model different 'what if' modelling scenarios.

Base Position

- 4.10 As discussed, the model was initially set up to reflect GWPS operations during the 2022 to 2023 sample period to provide a robust sample for model validation; however, it was then possible to switch to a more up-to-date Base Position for 2024.
- 4.11 In line with projections, demand was uplifted slightly in the model and the vehicle shift pattern was updated to reflect the latest 2024 position. This includes the enhancement of a 12-hour day shift at O2 Fergus to a 24-hour shift. All other model parameters were assumed to remain at analyzed levels, although variations to this assumption have been tested through sensitivity modelling and are reported in Section 9.
- 4.12 In the Base Position, P4 8-minute response performance was 57.7% (see Figure **4-1**). P4 8-minute performance varies significantly by LTM, with Guelph and Centre Wellington achieving 69% and 62% respectively, while Puslinch and Erin achieved 11% and 18% respectively. The overall P4 90th percentile response time was 14m46s.
- 4.13 The Base Position reflects how the service is currently performing and provides a baseline for modelling future scenarios.

Figure 4-1 – Base Position Priority 4 Performance

Lower Tier Municipality	% P4 responded within X minutes			Mean	90th Percentile
	8	10	15		
Centre Wellington	61.8%	78.4%	94.1%	07:43	12:41
Erin	18.3%	31.9%	74.0%	12:45	19:34
Guelph	69.0%	85.9%	96.7%	07:13	10:58
Guelph/Eramosa	28.3%	43.4%	77.5%	11:33	17:57
Mapleton	30.8%	44.2%	75.9%	11:30	19:17
Minto	29.9%	42.9%	83.4%	10:56	17:00
Puslinch	10.6%	31.9%	81.2%	12:17	17:30
Wellington North	57.9%	63.7%	80.0%	09:30	17:33
Overall	57.7%	73.2%	90.5%	08:31	14:46

Note: performance measured from time first vehicle assigned.

5 'Do Nothing' Scenario

To provide meaningful context for future resource recommendations, it was important to create a 'Do Nothing' position through to 2034. The aim of this scenario is not to recommend that no changes are made to GWPS operations over the next ten years, but instead to quantify the impact of rising demand on the service if no other changes are made.

Increasing demand at the core projected rate of 52% over ten years would mean that overall 8-minute performance for Priority 4 (P4) incidents would fall from 58% in the 2024 Base Position to 44% in 2034.

- 5.1 To provide meaningful context for future resource recommendations, it was important to create a 'Do Nothing' position through to 2034.
- 5.2 This involved using the core demand projection of 4.3% average growth per year, or 52% over ten years, with no other operational changes made. The assumption was made that over-the-border demand should be uplifted in line with overall Guelph-Wellington projections.
- 5.3 The aim of this scenario is not to recommend that no changes are made to GWPS operations over the next ten years, but instead to quantify the impact of rising demand on the service if no other changes are made. It also provides a future baseline position against which options for responding to the increased demand can be tested.
- 5.4 Increasing demand at the core projected rate over ten years would mean that overall P4 8-minute performance falls from 58% in the 2024 Base Position to 44% in 2034 (see Figure **5-1**).
- 5.5 Overall P4 90th percentile response times would fall from 14m46s in the 2024 Base Position to 21m43s in 2034. The performance of some LTMs falls more than others, with Erin's 90th percentile response time falling by 16m46s, from 19m34s to 36m20s, while already being the worst performing area in 2024.
- 5.6 Average ambulance utilization increases from 32% to 48%.
- 5.7 Modelling the 'Do Nothing' scenario at two-year intervals shows similar reductions in performance at each interval, although the increases to P4 90th percentile response times become larger over time. For example, there is a 51s increase from 2024 to 2026, but a 1m58s increase from 2032 to 2034 (see Appendix **D1**). This is because, when ambulances become increasingly unavailable, it is much less likely that a vehicle will be in close proximity to an incoming call.
- 5.8 Response performance for lower priority incidents, when measured from time of call, falls at a much faster rate than for higher priority incidents (see Appendix **D2**). For example, P4 15-minute response performance from time of call falls by 17%, from 90% to 73%, whereas P3 30-minute performance falls by 35%, from 91% to

56%. This is because, as the service becomes stretched, it must prioritize high acuity calls via diverts and/or queuing lower priority calls for longer periods; this behaviour is replicated within the simulation model.

Figure 5:1 – ‘Do Nothing’ Scenario (2034)

Modelled Scenario

Lower Tier Municipality	% P4 responded within X minutes			Mean	90th Percentile
	8	10	15		
Centre Wellington	47.5%	61.5%	77.8%	10:43	21:06
Erin	15.3%	22.9%	53.1%	18:13	36:20
Guelph	52.4%	68.8%	85.4%	09:44	18:13
Guelph/Eramosa	18.0%	28.1%	58.9%	14:36	23:57
Mapleton	27.4%	38.2%	63.1%	14:17	26:25
Minto	26.9%	37.8%	73.3%	13:19	22:36
Puslinch	7.9%	23.4%	64.0%	15:21	26:43
Wellington North	46.6%	53.8%	68.2%	12:23	22:49
Overall	43.9%	58.0%	77.5%	11:20	21:43

Difference to 2024 Base Position

Lower Tier Municipality	% P4 responded within X minutes			Mean	90th Percentile
	8	10	15		
Centre Wellington	-14.3%	-16.9%	-16.3%	02:59	08:26
Erin	-3.0%	-8.9%	-20.9%	05:28	16:46
Guelph	-16.6%	-17.1%	-11.3%	02:31	07:15
Guelph/Eramosa	-10.3%	-15.2%	-18.6%	03:03	06:00
Mapleton	-3.4%	-6.0%	-12.8%	02:46	07:08
Minto	-3.0%	-5.0%	-10.1%	02:24	05:36
Puslinch	-2.7%	-8.4%	-17.2%	03:04	09:14
Wellington North	-11.3%	-9.9%	-11.8%	02:53	05:17
Overall	-13.8%	-15.2%	-13.0%	02:49	06:57

6 Performance Targets for Improved Equity of Service Delivery

As discussed in the service analysis, each LTM within the service area has very different performance levels. Rather than hold every LTM to the same performance standards, ORH sought to identify proposed targets that would allow for more appropriate and equitable service delivery in each area.

The proposed Priority 4 90th percentile response time targets are:

- Guelph – 11 minutes
- Centre Wellington – 12 minutes 30 seconds
- Guelph/Eramosa, Wellington North and Minto – 16 minutes
- Erin, Puslinch and Mapleton – 18 minutes

ORH used AmbSim to identify the minimum resource requirement to meet these standards in 2034. This required an additional 924 weekly ambulance hours (an increase of 41% from the Base Position). **However, it is not possible to house these additional resources within GWPS's current facilities due to capacity constraints.** This is true even if GWPS was aiming only to maintain performance at existing levels.

Identifying Proposed Performance Targets

- 6.1 As discussed in the service analysis, each LTM within the service area has very different performance levels. It is expected that some areas will have better performance than others due to having very different geographical population distributions.
- 6.2 Rather than hold every LTM to the same performance standards, ORH sought to identify proposed targets that would allow more appropriate response performance for each LTM and make service delivery more equitable, thus improving performance and efficiency.
- 6.3 ORH calculated the 'Total Weighted Geometric Mean' (TWGM) for population by LTM and Census dissemination area, considering not only population density but also 'clustering' (see Figure **6-1**).
- 6.4 For example, two areas could have the same population density, but one may be made up of one or two clustered population centres, whereas the other may have its population spread across many small localities. It is typically much harder to obtain a high level of response performance in the latter scenario than the former, but this would not be reflected in a measure of population density. However, the

Figure 6-1: Proposed Targets based on Total Weighted Geometric Mean

LTM	Population	Area (sq km)	Population Density	TWGM	TWGM Rank	Base Position Performance		Proposed
						P4 % in 8 mins	P4 90th %ile	P4 90th %ile
Guelph	147,100	86.2	1,633.9	2,586.7	1	69.0%	10:58	11:00
Centre Wellington	32,204	415.3	74.9	354.2	2	61.8%	12:41	12:30
Guelph/Eramosa	14,297	297.4	56.5	156.9	3	28.3%	17:57	16:00
Wellington North	13,012	534.4	23.3	136.0	4	57.9%	17:33	16:00
Minto	9,572	301.2	30.2	122.4	5	29.9%	17:00	16:00
Erin	12,270	299.2	40.0	67.4	6	18.3%	19:34	18:00
Puslinch	8,166	219.2	36.2	41.9	7	10.6%	17:30	18:00
Mapleton	11,179	541.7	20.0	32.0	8	30.8%	19:17	18:00

TWGM measure takes account of this, with the latter scenario having a lower TWGM score than the former.

- 6.5 The TWGM score for each LTM correlates well with 90th percentile response performance. For example, Guelph/Eramosa, Wellington North and Minto all have a TWGM score of between 120 and 160, and a 90th percentile response time in the Base Position between 17 and 18 minutes.
- 6.6 ORH has therefore used the P4 90th percentile metric to propose an achievable target for each area, with LTMs with similar TWGM figures receiving the same proposed target. The proposed P4 90th percentile targets are:
- Guelph – 11 minutes
 - Centre Wellington – 12 minutes 30 seconds
 - Guelph/Eramosa, Wellington North and Minto – 16 minutes
 - Erin, Puslinch and Mapleton – 18 minutes
- 6.7 Meeting these targets would mean a large improvement in performance for five LTMs. The most improved areas currently have the worst performance, thus equity of service delivery is improved. Performance in Centre Wellington would also improve slightly under these proposed targets.
- 6.8 Despite its low TWGM score, Puslinch is currently already able to meet the proposed target due to being so close to a high TWGM scoring area and receiving residual coverage provided by vehicles at 03 Clair Road West. This does not necessarily mean that an alternative target should be set for Puslinch to improve its performance further and, for the core scenario, ORH has set the target at 18 minutes to align with LTMs with similar TWGM scores. In Section 7, decisions are made concerning 8-minute performance in Puslinch.
- 6.9 Guelph's target maintains Base Position performance in the City. This is appropriate as performance in Guelph has improved significantly since 2015, as shown in the internal benchmarking (Section 2).

Resource Requirements to Achieve Targets in 2034

- 6.10 ORH used AmbSim to identify the minimum resource requirements to meet these standards in 2034. Additional vehicles were modelled at locations and times of day which would minimize the additional resourcing requirement as far as possible, using 12-hour shifts.
- 6.11 In this scenario, overall P4 90th percentile response performance has improved by 1m1s when compared to the Base Position, from 14m46s to 13m45s (see Appendix **E1**). P4 8-minute response performance has increased by 3.6%.
- 6.12 Equity of service delivery is improved, with LTMs with the lowest Base Position performance receiving the most significant response time improvements. For

example, Erin and Mapleton's P4 90th percentile response times have decreased by 2m27s and 3m11s respectively.

- 6.13 To achieve this, 924 additional weekly ambulance hours are required by 2034. This represents a 41% increase in ambulance hours, compared to a 52% increase in responded demand. An additional 12-hour shift per day would be required at every station, with two added at 08 Rockwood (one enhancing the current day shift to a 24-hour shift).
- 6.14 However, it is not possible to house these additional resources within GWPS's current facilities due to capacity constraints. This is true even if GWPS was aiming only to maintain performance at existing levels.
- 6.15 With the vehicles required to meet proposed targets, there would be capacity constraints at all stations except 03 Clair Road West, 06 Harriston, and 05 Arthur. That is, the peak number of ambulances on shift at a station is greater than the number of bays.
- 6.16 Peak ambulances are a measure of the absolute minimum number of physical ambulances required to deploy the recommended shifts. For example, a day shift of 07:00 to 19:00 followed by a night shift of 19:00 to 07:00 technically only requires one physical ambulance under the optimistic assumption that neither shift overruns. 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 ambulances for at least the 08:00 to 19:00 period.
- 6.17 Both 05 Arthur and 06 Harriston would be at capacity and would have no room for further enhancements. To achieve improved equity of service delivery in 2034, GWPS would need to expand most stations or replacement facilities.
- 6.18 Furthermore, this does not account for additional bays required at stations for spares, supervisors and community paramedic vehicles.

7 Identifying Facility Requirements

ORH's optimization model was used to assess optimal station locations for the future. Blank canvas optimization suggested that many, though not all, current facilities are relatively well located, but are simply not appropriately sized. With the new Speedvale Avenue location under development, the City stations will have been relatively newly built with additional capacity, and were identified as well located. It was therefore agreed that the City stations would be retained in the final recommended configuration.

For the County facilities, further targeted optimization was undertaken for each facility in turn and the response performance impacts were assessed in AmbSim. In each case, a heat map has also been provided that shows the general optimal area as well as the exact optimal site.

Performance improvements of varying degree can be found through relocating 02 Fergus, 04 Mount Forest, 06 Harriston, 08 Rockwood, and, in particular, 10 Hillsburgh. Optimal locations for 05 Arthur and 07 Drayton were found to be particularly close to their current sites.

Due to improved coverage through these relocations, the proposed targets could now be met in 2034 with 840 additional ambulance hours (an increase of 37% from the Base Position). The addition of an Aberfoyle post is also recommended to bring Priority 4 (P4) 8-minute response performance in Puslinch in line with other LTMs.

It is recommended that all County facilities are relocated or rebuilt, even those that have minimal response performance benefits. The results of a 2022 facility needs assessment found that no County station was “purpose-built to provide amenities required by paramedics” and describes that the facilities do not meet the needs of the service. No changes to facilities in the County have been made since the previous ORH review and, without the relocation of all facilities, there are issues at all County stations regarding capacity, condition, staff amenities and egress.

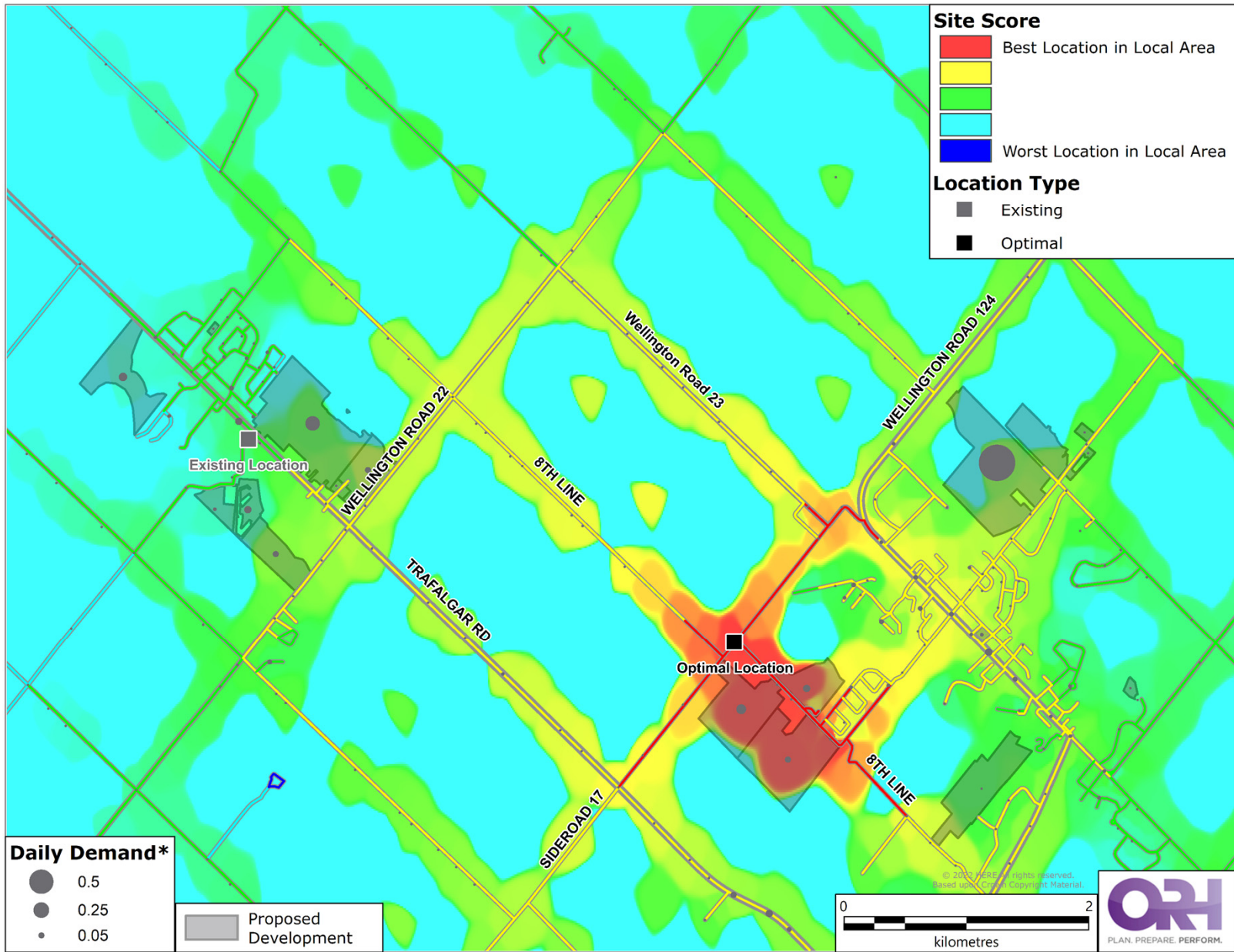
ORH's Optimization Model

- 7.1 ORH's optimization model, the Demand Coverage Model (DCM), evaluates response time coverage and optimizes the locations of emergency service resources. It uses a substitution algorithm to assess millions of options in minutes, quickly identifying optimum solutions.
- 7.2 DCM results are fully evaluated in AmbSim to quantify the extent to which the optimal locations deliver service improvements.

Location Optimization Results

- 7.3 In Section 6 it was found that most GWPS facilities do not have adequate capacity to accommodate the additional vehicles required to achieve improved equity of service delivery in 2034. Alternative facilities therefore needed to be identified.
- 7.4 Exploratory runs were undertaken using a ‘blank canvas’ optimization methodology, which identifies optimum locations taking no account of where current stations are located or other constraints.
- 7.5 These runs were completed separately for the County of Wellington, and the City of Guelph combined with Puslinch. A range of optimization criteria were tested, including minimizing average response times and maximizing responses within X minutes to P4 non-IFT incidents.
- 7.6 Blank canvas optimization suggested that many, though not all, current facilities are relatively well located, but are simply not appropriately sized. In the City of Guelph, the optimal configuration of facilities was found to closely resemble the sites that GWPS will have in place by 2026, with Speedvale Avenue replacing 03 Clair Road West. Because of this, and as the City stations will have been relatively newly built with additional capacity, it was agreed that these would be retained in the final recommended configuration.
- 7.7 For the County facilities, further targeted optimization was undertaken for each facility in turn. To quantify the response performance impacts, each potential site replacement was tested in the 2034 scenario with the additional resourcing to improve performance and equity of service delivery. In each case, a heat map has also been provided that shows the general optimal area as well as the exact optimal site.
- 7.8 Relocating 10 Hillsburgh to its optimal site results in huge performance improvements in Erin as shown in Figure **7-1** (all other station heatmaps can be found in the Appendices). P4 10-minute response performance improves by 34.3% in Erin, and consequently 1.2% overall. This would mean that Erin’s P4 8-minute performance is now on par with Minto, Mapleton and Guelph/Eramosa.
- 7.9 Compared with the previous ORH review, the optimal location for 10 Hillsburgh is now slightly closer to Erin, as proportionally more developments are proposed for this area than for Hillsburgh. The previous optimal location still falls within the ‘red area’ of the heat map, therefore indicating that it is still a good location for 10 Hillsburgh.
- 7.10 Moving 04 Mount Forest to its optimal site improves the P4 Wellington North mean response time by 54s, and P4 8-minute response performance by 6.6% (see Appendix **F1a**). This is the same site that was identified in the previous ORH review.
- 7.11 Using the optimal location for 06 Harriston instead of its current site brings slight improvements in Minto (see Appendix **F1b**). P4 8-, 10-, and 15-minute response

Figure 7-1: Optimal Location - 10 Hillsburgh



Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	64.4%	81.4%	95.5%	07:32	11:58
Erin	36.7%	68.8%	88.5%	09:50	16:03
Guelph	72.9%	88.5%	97.6%	06:46	10:24
Guelph/Eramosa	35.6%	53.5%	85.9%	10:15	16:06
Overall	61.7%	77.6%	93.0%	07:55	13:32

Difference to meeting targets scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
-0.1%	-0.1%	-0.1%	00:01	00:01
14.0%	34.3%	9.9%	-01:47	-01:04
0.0%	0.0%	0.0%	-00:00	-00:01
-0.2%	-0.3%	0.1%	-00:01	-00:01
0.5%	1.2%	0.3%	-00:04	-00:13

performance metrics are improved by between 1% and 2%. This is the same site that was identified in the previous ORH review.

- 7.12 The optimal replacement for 02 Fergus was placed on Wellington Road 18 (see Appendix **F1c**). This location allows for much quicker access into Elora while still providing adequate coverage in Fergus. Large improvements in Centre Wellington performance can be found for the shorter response time metrics (for example, P4 8-minute performance improves by 4.8%), however there is a slight detriment to the longer response time metrics.
- 7.13 The optimal location for 08 Rockwood is close to the existing facility (see Appendix **F1d**). Since the optimal site is relatively close, the response performance improvements are small, except for P4 8-minute response performance which improves by 2.4% in Guelph/Eramosa. This is the same site that was identified in the previous ORH review.
- 7.14 Both 05 Arthur and 07 Drayton were found to be located very close to their optimal sites, within at least 200 metres (see Appendices **F1e** and **F1g**). Therefore, relocating the current locations to the replacement sites would not offer any improvement to response performance.

Resource Requirements with Recommended Sites

- 7.15 By considering the performance benefits offered by more optimally located sites, as well as limitations with the current facilities, a future station configuration is proposed which allows for improved equity of service delivery.
- 7.16 Based on potential response performance impacts, it is recommended that 02 Fergus, 04 Mount Forest, 06 Harriston, 08 Rockwood and 10 Hillsburgh be relocated to their optimal locations as soon as reasonably possible to avoid deterioration to performance in the County. It is also recommended that the proposed Speedvale location be opened in Guelph as intended (replacing 00 Elmira Road North).
- 7.17 Even though the relocations of 05 Arthur and 07 Drayton lead to minimal improvements in response performance, these are still recommended in order to address capacity constraints and other issues outlined in the following subsection.
- 7.18 Due to the improved coverage through these relocations, the proposed P4 targets could now be met in 2034 with 840 additional ambulance hours (see Appendix **F2**). This is equivalent to a 37% increase in resourcing, compared with the 41% increase required with existing facilities only. It is noted that there would not be adequate capacity to do this with the current stations anyway.
- 7.19 The 18-minute 90th percentile target can be met for Puslinch (despite no resourcing nor facilities being added there) since it receives residual coverage from 03 Clair Road West. However, its P4 8-minute response performance remains lower than all other LTMs at 10.9%, while the next lowest is 34.6%. Since

Puslinch's 2034 demand is greater than the 2023 demand for Erin, Guelph/Eramosa, Mapleton and Minto, it is not equitable that Puslinch's performance should still be 'falling behind' in ten years time for the shorter response time measures.

- 7.20 To address this, ORH tested the addition of a post (with less footprint than a station facility) in Aberfoyle, the optimal location for a new site in Puslinch. In this scenario a vehicle from 03 Clair Road West would book on in the same way but forward deploy to Aberfoyle, with no further increase in resourcing. Crews, on finishing jobs, would still restock at 03 Clair Road West or at hospital.
- 7.21 The use of a post in Puslinch significantly improves performance there, with a 21% improvement to P4 8-minute performance (see Appendix **F3**), and no detriment to performance in any other area. It is assumed that whenever the City lacks available vehicles, the ambulance in Puslinch will be sent back to provide coverage. This means that Guelph performance does not deteriorate on adding this facility.
- 7.22 A summary of the performance and resource benefits of using the recommended sites is given in Figure **7-2**. As well as accommodating the peak ambulances, facilities also need additional capacity for support, community paramedicine and supervisor vehicles, as well as room for future growth.

Facility Issues and Risks

- 7.23 In addition to evaluating capacity requirements and performance benefits, ORH reviewed the findings from the 2022 facility needs assessment alongside facility information collected in the previous review. A summary of the findings in terms of capacity, condition, staff amenities, and access and egress issues, is compiled in Figure **7-3**.
- 7.24 The results of the 2022 needs assessment found that no County of Wellington station was "purpose-built to provide amenities required by paramedics" and describes that the facilities do not meet the needs of the service. No changes to facilities in the County have been made since before the previous ORH review and, without the relocation of all facilities, there are capacity issues at all County stations.
- 7.25 The current 02 Fergus facility is already at capacity and therefore no further vehicles can be deployed at this second most populous LTM, an area which has experienced an 8% deterioration in P4 8-minute performance between 2015 and 2023. Currently there is also not space for a supervisor, who would support paramedics and ensure quality patient care.
- 7.26 The performance benefits offered by relocating 08 Rockwood are not large, however a new facility is still recommended as the amenities are especially inadequate, and are shared with both the fire service and other community groups. There are large egress issues as some of the rooms used by crews are on a separate floor to the garage bays and, when responding to calls, "paramedics

Figure 7-2: Recommended 2034 Scenario

Performance

LTM	Proposed		Base Position Performance		Proposed 2034 Scenario Perf.		Difference from Base	
	P4 90th %ile	P4 90th %ile	P4 % in 8 mins	P4 90th %ile	P4 % in 8 mins	P4 90th %ile	P4 % in 8 mins	P4 90th %ile
Guelph	11:00	10:58	69.0%	10:58	73.4%	10:17	4.4%	-00:40
Centre Wellington	12:30	12:41	61.8%	12:41	69.4%	12:21	7.6%	-00:20
Guelph/Eramosa	16:00	17:57	28.3%	17:57	37.6%	16:14	9.3%	-01:43
Wellington North	16:00	17:33	57.9%	17:33	72.1%	15:13	14.1%	-02:20
Minto	16:00	17:00	29.9%	17:00	36.5%	14:46	6.6%	-02:13
Erin	18:00	19:34	18.3%	19:34	36.4%	16:28	18.2%	-03:06
Puslinch	18:00	17:30	10.6%	17:30	31.6%	16:18	21.0%	-01:11
Mapleton	18:00	19:17	30.8%	19:17	34.5%	17:24	3.7%	-01:53
Overall			57.7%	14:46	63.6%	13:24	5.9%	-01:22

Weekly Ambulance Hours

Station	2024 Base Position	Proposed 2034 Scenario	Difference to 2024 Base Position	Compared to proposed Target
00 Elmira Rd North / Speedvale	252	336	84	+60s below
02 Fergus	336	420	84	+60s below
03 Clair Rd West	252	336	84	+30s below
04 Mount Forest	168	252	84	+30s below
05 Arthur	168	252	84	below target
06 Harriston	168	252	84	below target
07 Drayton	168	168	84	below target
08 Rockwood	84	252	168	+60s above
10 Hillsburgh	168	252	84	+30s above
12 Gordon	504	588	84	above target
Overall	2,268	3,108	840	

A **37%** increase in ambulance hours

Figure 7-3: County of Wellington Facility Issues and Risks

Station	Capacity		Existing site conditions		
	Minimum requirement to meet proposed targets in 2034	Current Capacity	Condition	Amenities	Access/Egress
10 Hillsburgh	2 bays	1 bay	Average 	Lacks amenities 	Not all vehicles allowed
08 Rockwood	2 bays	1 bay	Poor 	Inadequate 	Garage space too far from crew area
06 Harriston	2 bays	2 bays	Good 	Lacks amenities 	Good
04 Mount Forest	2 bays	1 bay	Good 	Lacks amenities 	Good
02 Fergus	3 bays	2 bays	Good 	Lacks some amenities 	Good
05 Arthur	2 bays	2 bays	Average 	Lacks amenities 	Garage space too far from crew area
07 Drayton	1 bay*	1 bay	Average 	Lacks amenities 	Some issues

Sorted from highest to lowest priority.

*this assumes 02 Fergus, 04 Mount Forest, 06 Harriston, 08 Rockwood, and 10 Hillsburgh are relocated. (It would require two peak vehicles/bays if no relocations are made.)

Facility Condition/ Risk	
Larger risk	
Smaller risk	

leaving their designated room must traverse across a garage full of fire apparatus to reach their ambulance on the far side of the building”.

- 7.27 As discussed, relocating 10 Hillsburgh to its optimal site offers huge performance benefits. Additionally, the current facility has access issues, with vehicles requiring a specific exhaust type to be housed there.
- 7.28 Performance benefits cannot be found when relocating 05 Arthur and 07 Drayton as they are already optimally located. However, 05 Arthur’s facility has similar egress issues to that of 08 Rockwood, and 07 Drayton has an especially cramped crew space. Paramedics at Drayton are “dependent on the good will and schedule of events for the Mapleton Fire staff” for access to amenities.

8 Final Recommendations and Trajectory

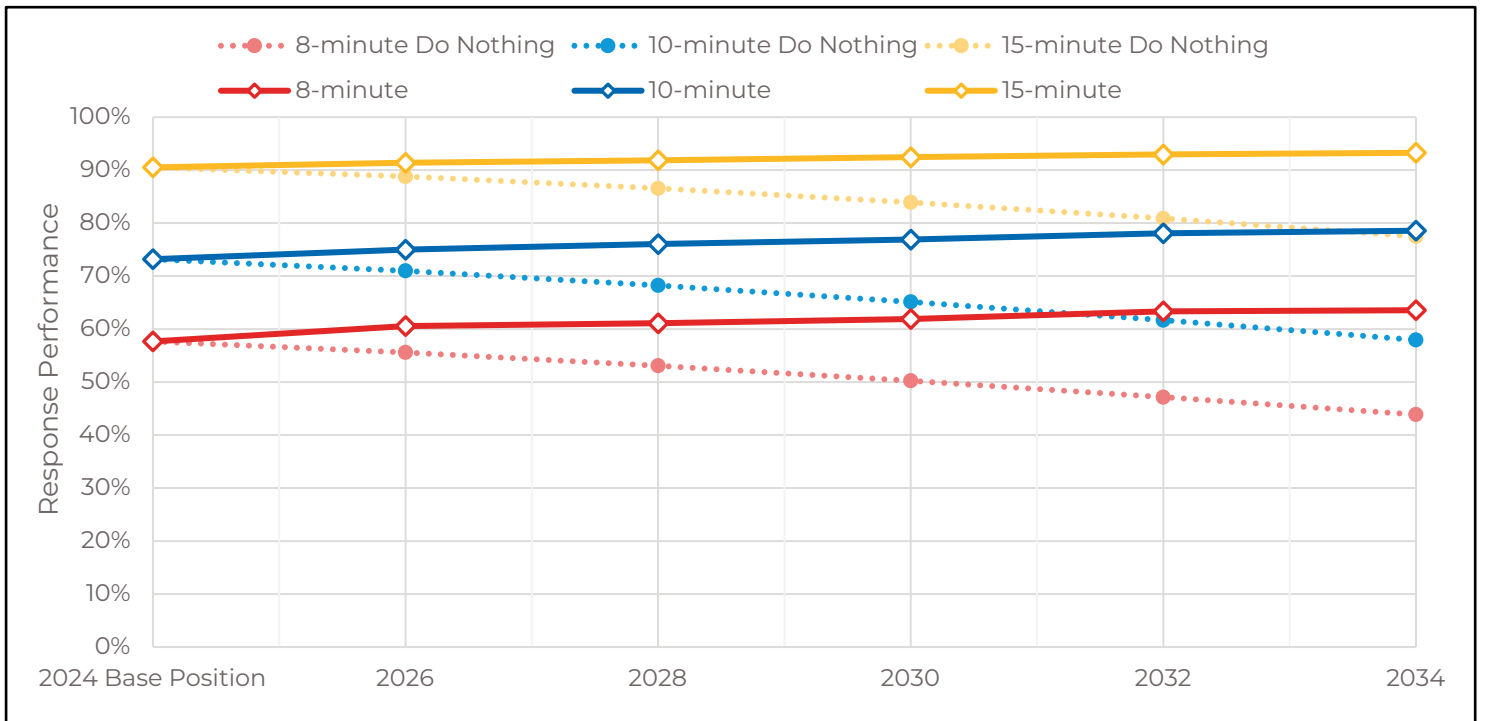
- 8.1 The proposed 2034 position requires an additional 840 ambulance hours per week, equivalent to a 37% increase, to improve performance and equity of service delivery in 2034 (as shown in Appendix **G1**). This is in conjunction with the following facility recommendations:
- Speedvale should replace 00 Elmira Road as planned. This should have space for at least four ambulances, but ideally be able to also accommodate spares and support service vehicles. Note that this review accounts for service changes required up to 2034, but inevitably further capacity will be needed to deal with growth beyond this.
 - 12 Gordon to be replaced by another nearby facility in 2034. This should have space for at least four ambulances, but ideally be able to also accommodate spares and support service vehicles.
 - 10 Hillsburgh (minimum 2 bays) should be closed and relocated to its optimal site for performance benefits alone, but also for capacity reasons.
 - 02 Fergus (minimum 3 bays), 04 Mount Forest (minimum 2 bays), 06 Harriston (minimum 2 bays), and 08 Rockwood (minimum 2 bays) should be closed and relocated to their optimal locations; this will offer some performance benefits, but also will alleviate issues with capacity, condition, egress, and/or amenities.
 - Although 05 Arthur (minimum 2 bays) and 07 Drayton (minimum 1 bay) are optimally located, they should be rebuilt or relocated close to their current locations due to issues with capacity, egress, and/or amenities.
 - The addition of a post at Aberfoyle, which would bring P4 8-minute response performance in line with other LTMs.
- 8.2 Assuming a 42-hour working week and 2 staff per ambulance, an additional 40 full-time frontline staff positions will be required. This will need to be supported by an increase in PT positions to account for approved absences.
- 8.3 The number of physical frontline ambulances will need to increase to a total of 8 peak ambulances (excluding spares) to accommodate the resource requirements. This will need to be supported by an increase in spare vehicles to account for vehicle maintenance requirements.
- 8.4 It was agreed that the introduction of both staffing and facilities should occur gradually, as this is more realistic in terms of the funding GWPS will be granted and allows for the service to acclimatize to the changes. Most importantly, it still means that performance can gradually improve each year, while ensuring that no LTM performs significantly worse than it is currently (see Appendix **G2**).

- 8.5 For the City, Speedvale will replace 00 Elmira Road North in 2026 as planned and 12 Gordon will be relocated in 2034.
- 8.6 Since 2028 is realistically the earliest a newly submitted facility will be built by, it is proposed that, from 2028, two new County of Wellington facilities should be built every two years.
- 8.7 The prioritization of the County facilities is based on response performance improvements when using the optimal sites, the issues at the current facilities, and how soon additional capacity is required to maintain performance in each LTM. The year proposed for each relocation is:
- 2028 – 10 Hillsburgh and 08 Rockwood
Recommended previously that these were completed by 2020 and 2023 respectively.
 - 2030 – 06 Harriston and 04 Mount Forest
Recommended previously that these were completed by 2026.
 - 2032 – 02 Fergus and the addition of a post at Aberfoyle
 - 2034 – 05 Arthur and 07 Drayton
- 8.8 Deployment and facility recommendations have been set out according to the trajectory outlined in Figure **8-1**.
- 8.9 The additional 840 weekly hours is to be achieved by adding 168 hours (equivalent to two 12-hour shifts) every two years. In each of these two years, one of the shifts added targets improving performance in the City while the other targets this in the County, noting that adding resources in Rockwood helps Guelph as they are in the same dynamic cover group.
- 8.10 The order in which the County of Wellington shifts are added is determined by where there is capacity, as well as balancing improving performance against where deterioration in performance would arise without an additional shift.

Figure 8-1: Recommended Trajectory

Year	Additional Vehicles	Sites closed	Sites Built	Shifts redeployed	Shifts added *
2026	2	00 Elmira Road North	Speedvale	1 x 24Hr, 1 x 12Hr and peak ERU now deployed at Speedvale instead of 00 Elmira Road North	Peak shift at Speedvale
					Peak shift at 06 Harriston
2028	1	10 Hillsburgh	Hillsburgh optimal location	1 x 24Hr at 10 Hillsburgh to optimal location	Peak shift at Hillsburgh optimal location
		08 Rockwood	Rockwood optimal location	1 x 12Hr at 08 Rockwood to optimal location	Night shift at Rockwood optimal location
2030	2	06 Harriston	Harriston optimal location	1 x 24Hr and 1 x 12Hr at 06 Harriston to optimal location	Peak shift added books on at 03 Clair Road and forward deploys to 12 Gordon
		04 Mount Forest	Mount Forest optimal location	1 x 24Hr at 04 Mount Forest to optimal location	Peak shift added at Mount Forest optimal location
2032	1	02 Fergus	Fergus optimal location	2 x 24Hr at 02 Fergus to optimal location	Peak shift added at Fergus optimal location
			Aberfoyle post	Peak shift at 03 Clair Road books on as normal but forward deploys to Aberfoyle	Night shift at 03 Clair Road West
2034	2	05 Arthur	Arthur optimal location (nearby)	1 x 24Hr at 05 Arthur to optimal location	Peak shift at Arthur optimal location
		07 Drayton	Drayton optimal location (nearby)	1 x 24Hr at 07 Drayton to optimal location	Peak shift at Rockwood optimal location
		12 Gordon	Gordon replacement (nearby)	3 x 24Hr at 12 Gordon to replacement location 03 Clair Road peak shift now books on at Gordon (due to additional capacity)	

*168 weekly vehicle hours added in every two-year period



9 Sensitivity Modelling

- 9.1 Sensitivity modelling was undertaken to test changes to assumptions that have been built into the proposed 2034 scenario, and the impact that these changes would have on future resource requirements.
- 9.2 GWPS should continue to monitor the level of demand increase and changes to offload delays as this impacts the resourcing needed.

Adding a Post in Elora

- 9.3 An optimal location was identified in Elora in Section 7. This scenario tests whether instead of relocating O2 Fergus to the optimal location, Fergus station were fixed and an additional post added at this optimal site in Elora.
- 9.4 Implementing this would mean an additional 2.7% improvement in P4 Centre Wellington 8-minute performance compared to the proposed 2034 scenario (see Appendix **H1**). The 90th percentile performance also improves in this area by 32s.
- 9.5 The same resourcing is still required to meet the proposed targets (set in Section 6), however performance is improved slightly overall when using the same resourcing.
- 9.6 GWPS should monitor land availability near the optimal location in Elora as well as growth in this area, since the benefit from an additional location may increase further.

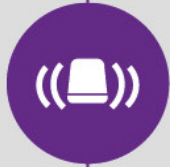
Alternative Demand Projections

- 9.7 The core demand projection increase was assumed at 4.3% per year.
- 9.8 When applying the low growth projection (4.1% per year) the same additional resourcing is needed to meet proposed targets (see Appendix **H2**), although performance is slightly better with this same staffing.
- 9.9 The high growth scenario (5.3% per year) means that 1,008 additional weekly vehicle hours are required to meet the proposed targets in 2034, rather than 840. Performance is still not as improved as with the proposed 2034 scenario, except for Centre Wellington and Guelph/Eramosa due to where resources are added.

Alternative Time at Hospital

- 9.10 Offload delays have fluctuated over the last five years. The future modelling scenarios use a time at hospital analyzed between 2022 and 2023 of 55 minutes (see Appendix **H3a**). However, the average from May 2022 to April 2023 was 64 minutes, while it was 43 minutes from May to December 2023.

- 9.11 If the proposed 2034 scenario was run with the 55-minute time at hospital (known as the high assumption) then an additional 84 weekly vehicle hours would be required to meet targets (see Appendix **H3a**), on top of the 840.
- 9.12 Assuming a 43-minute time at hospital means that 168 less vehicles hours are required per week to meet the proposed targets, compared to the proposed 2034 scenario.



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Appendices

- A Data Analysis and Benchmarking
- B Demand Projections
- C Model Setup and Base Position
- D 'Do Nothing' Scenario
- E Performance Targets for Improved Equity of Service Delivery
- F Identifying Facility Requirements
- G Final Recommendations and Trajectory
- H Sensitivity Modelling

Guelph Wellington Paramedic Services

Master Plan Update

Final Report

November 04, 2024
ORH/GWPS/1

A Data Analysis and Benchmarking

A1 Demand

- A1a Daily incidents by year
- A1b Demand by day and hour

A2 Patients Transported

A3 Time at Hospital

- A3a Time at Hospital by month
- A3b Time at Hospital by facility

A4 Priority 4 Response Times

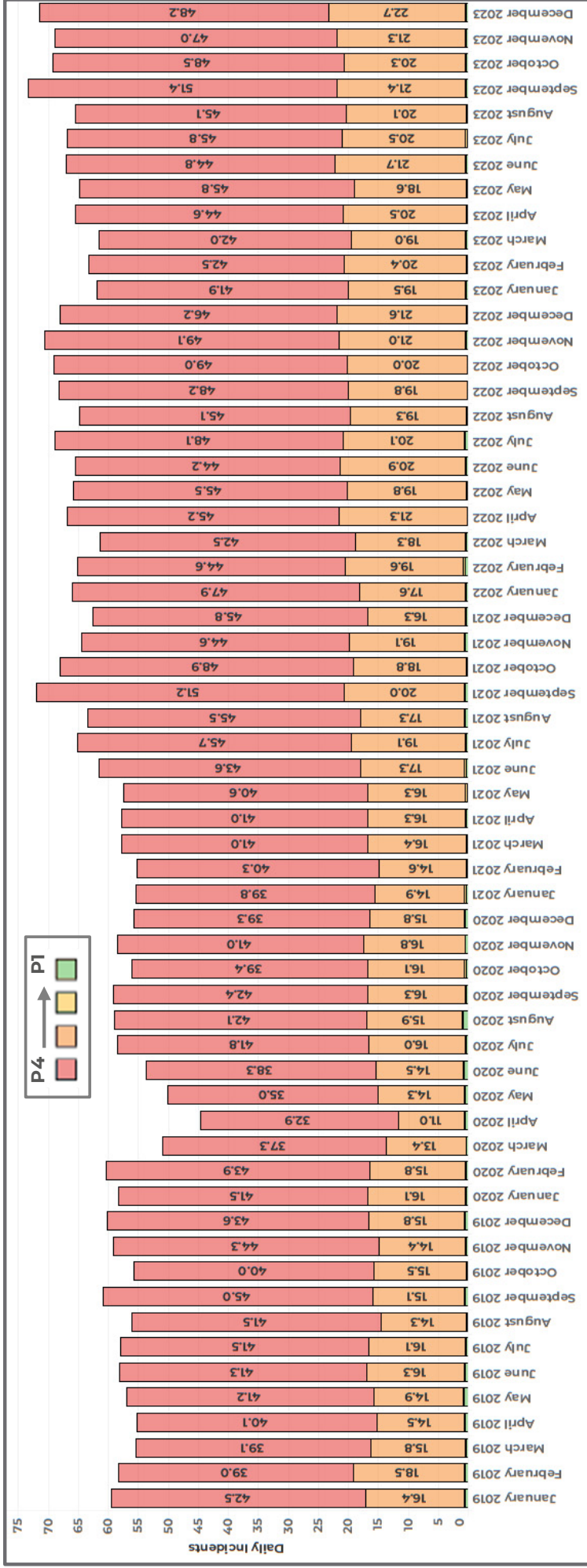
A5 Resource use

- A5a Utilization by hour
- A5b Demand and Resource Matching
- A5c Standby move summary

A6 Internal Benchmarking

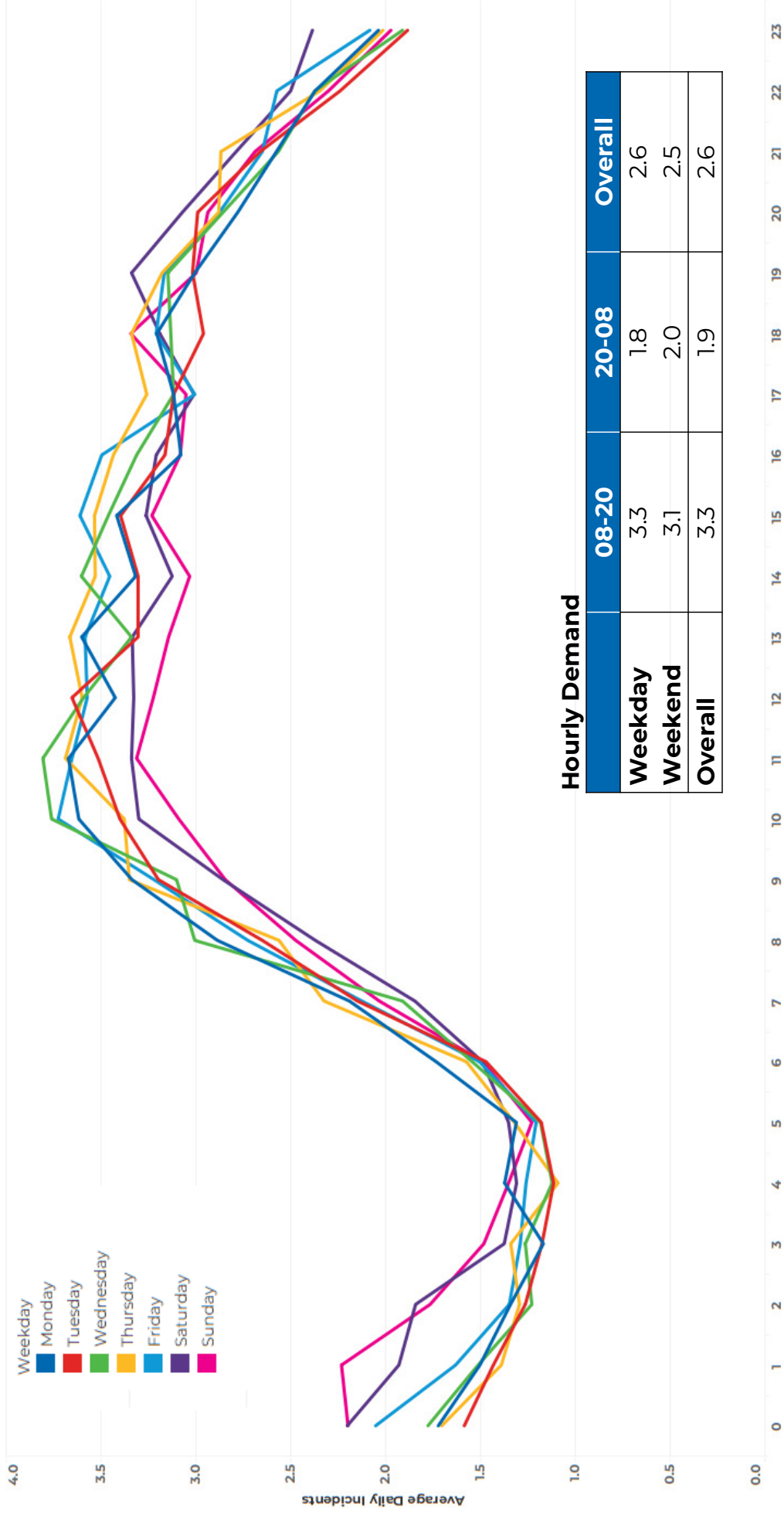
- A6a Priority 4 Performance
- A6b Travel to Scene and Occupied times
- A6c Utilization

Daily Demand by Month and Year



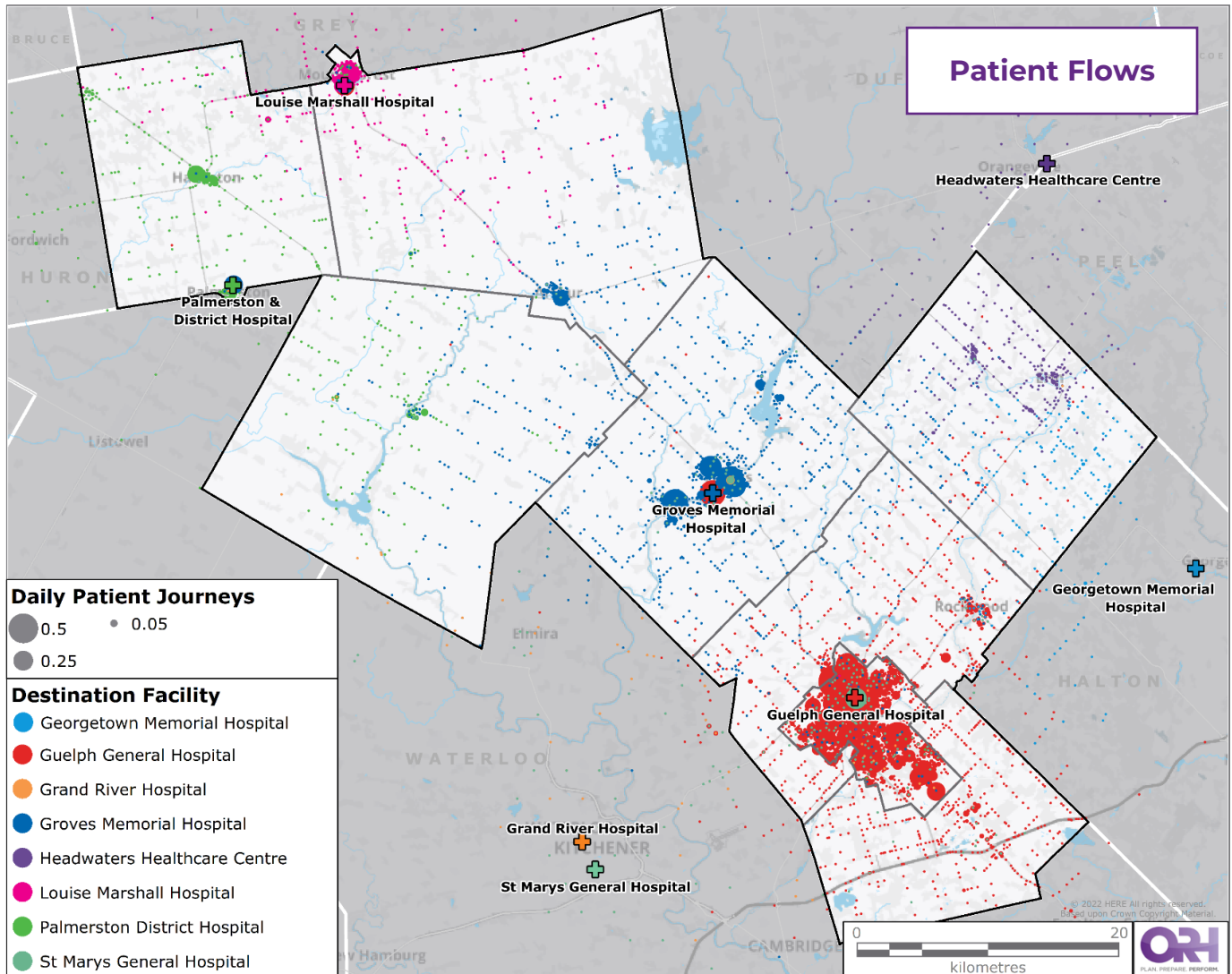
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall
2019	59.5	58.2	55.4	55.3	56.9	58.2	58.0	56.1	60.8	55.8	59.2	60.2	57.8
2020	58.2	60.3	50.9	44.6	50.1	53.7	58.4	59.0	59.2	56.1	58.4	55.7	55.4
2021	55.3	55.2	57.7	57.9	57.4	61.5	65.2	63.5	71.9	68.1	64.4	62.6	61.8
2022	66.1	65.1	61.3	66.8	65.7	65.5	68.9	64.8	68.2	69.1	70.6	68.1	66.7
2023	61.9	63.3	61.5	65.4	64.7	67.0	66.8	65.5	73.3	69.3	68.8	71.4	66.6
Overall	60.2	60.4	57.4	58.0	59.0	61.2	63.5	61.8	66.7	63.7	64.3	63.6	61.6

Demand by Day and Hour

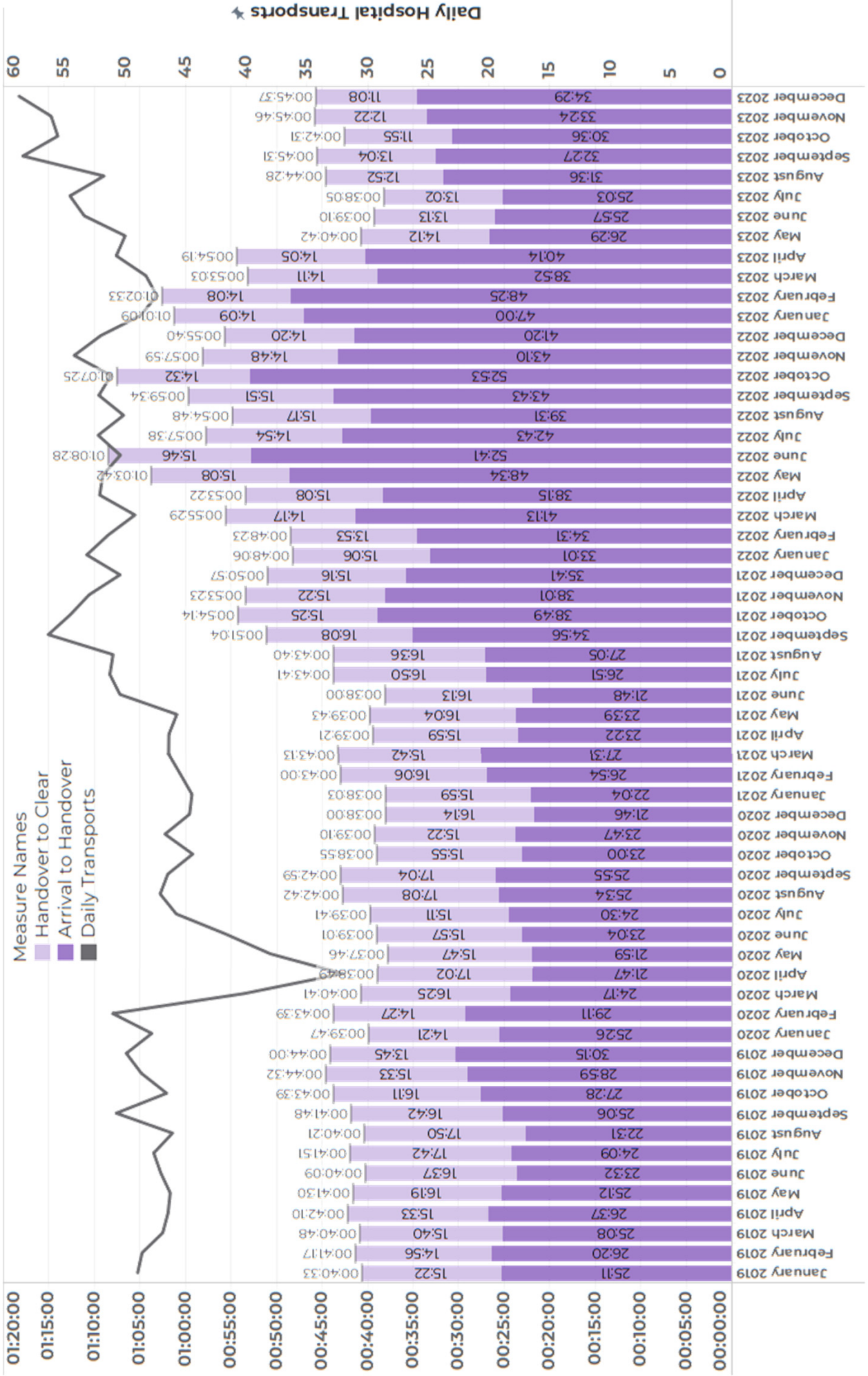


Daily Patient Transports

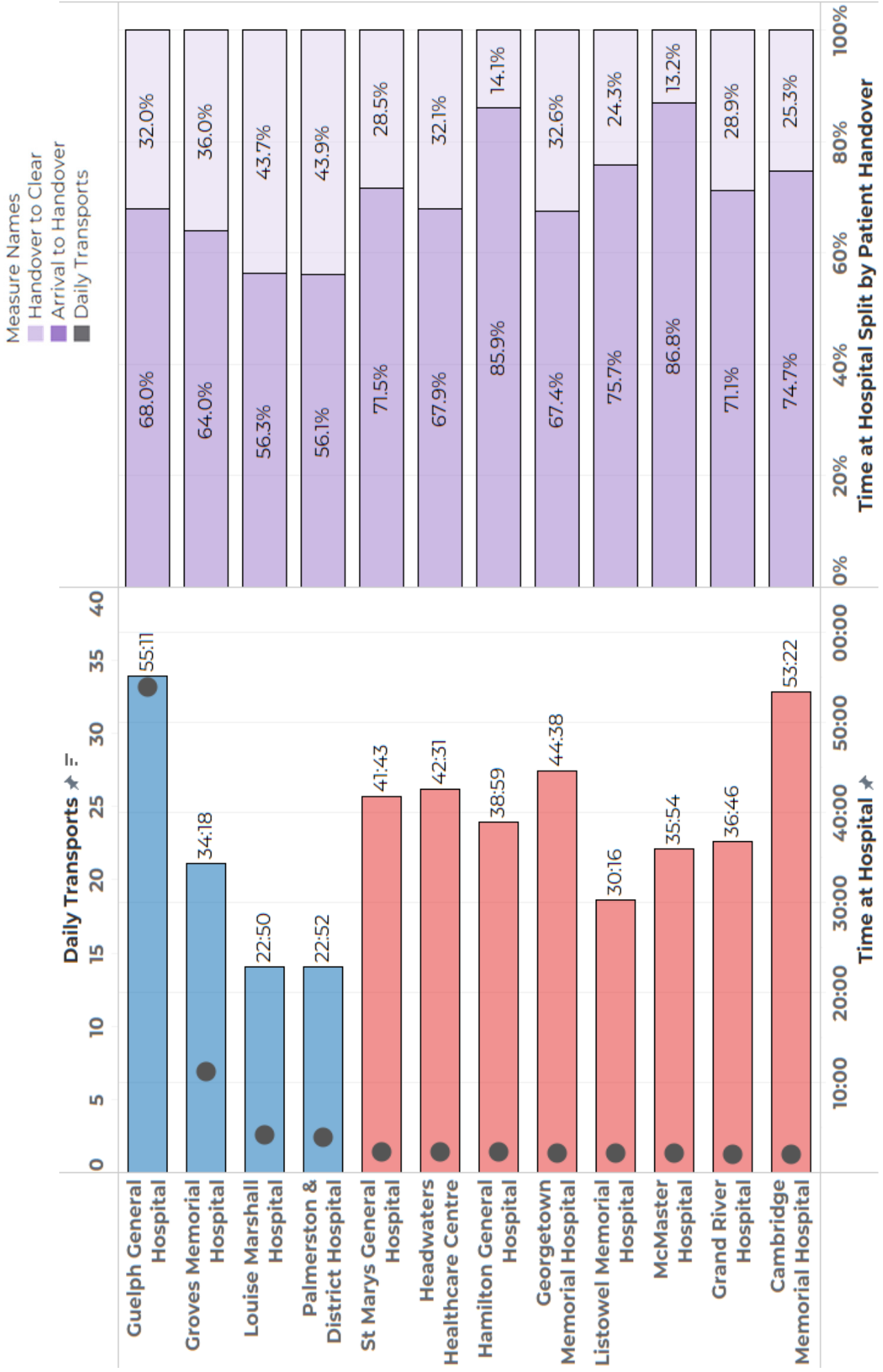
Facility	Category						Overall
	P1	P2	P3 Non-IFT	P3 IFT	P4 Non-IFT	P4 IFT	
Guelph General Hospital	0.1	0.0	8.0	0.8	24.0	0.4	33.2
Groves Memorial Hospital	0.0	0.0	1.7	0.3	4.8	0.1	6.9
Louise Marshall Hospital	0.0	0.0	0.6	0.1	1.6	0.0	2.4
Palmerston & District Hospital	0.1		0.5	0.1	1.4	0.0	2.1
St Mary's General Hospital		0.0	0.0	0.1	0.2	0.4	0.7
Headwaters Healthcare Centre			0.2		0.6		0.7
Grand River Hospital	0.0		0.0	0.2	0.1	0.1	0.5
Georgetown Memorial Hospital			0.1		0.3		0.5
Hamilton General Hospital			0.0	0.1	0.1	0.2	0.4
McMaster Hospital			0.0	0.2	0.0	0.1	0.4
<i>Other/Unknown</i>	<i>0.1</i>	<i>0.0</i>	<i>0.1</i>	<i>0.3</i>	<i>0.5</i>	<i>0.2</i>	<i>1.3</i>
Overall	0.3	0.1	11.2	2.3	33.6	1.5	49.1



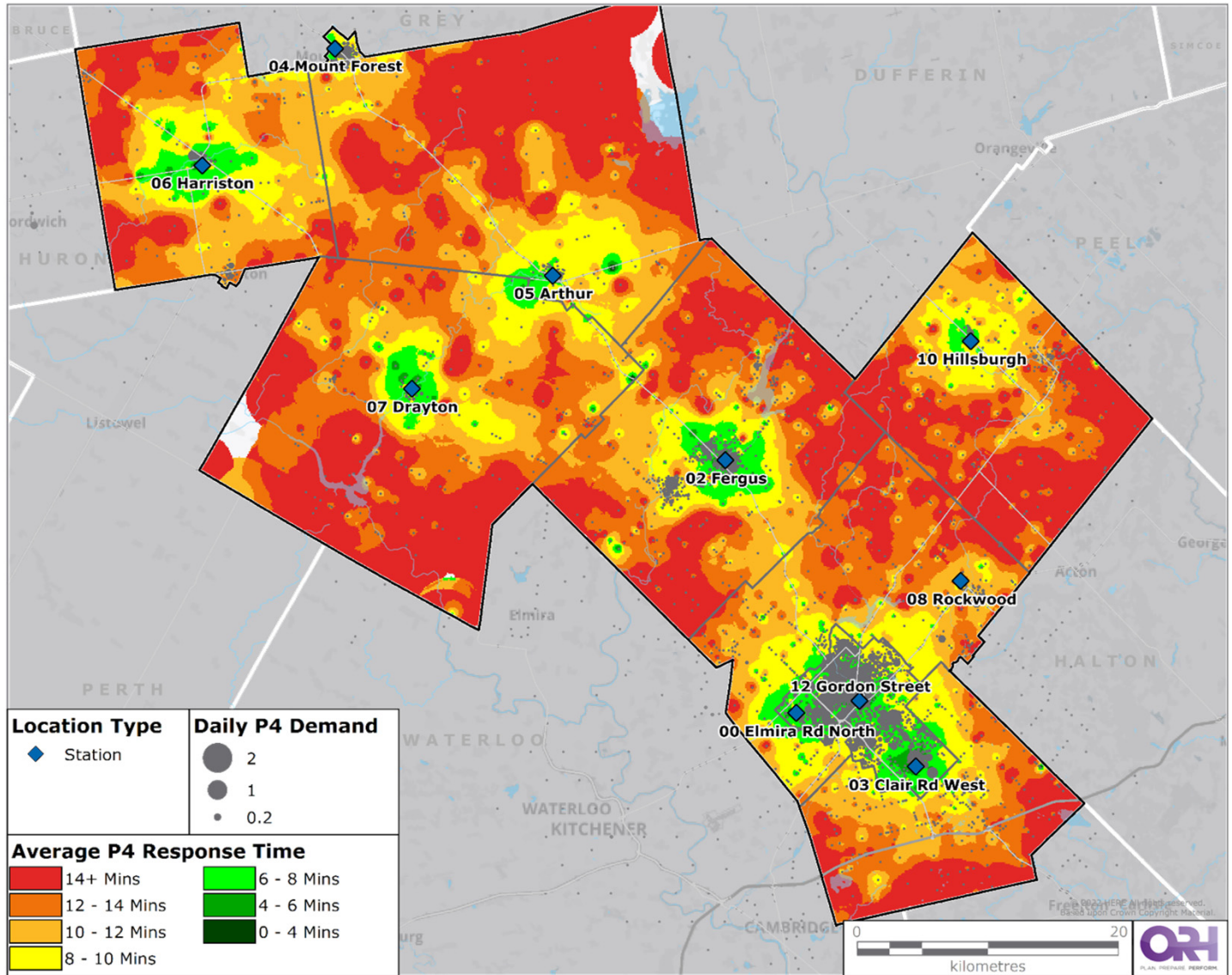
Time at Hospital by Month



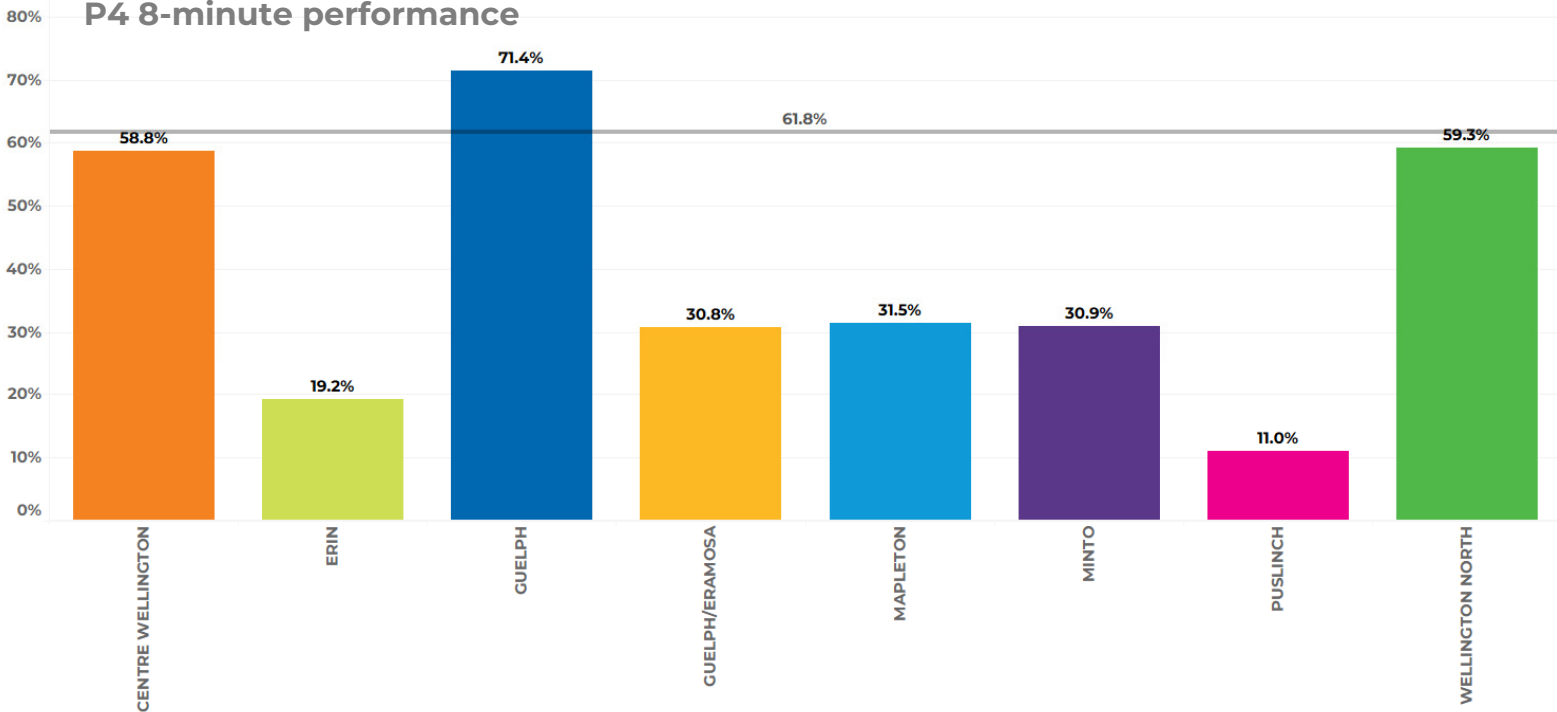
Time at Hospital by Facility



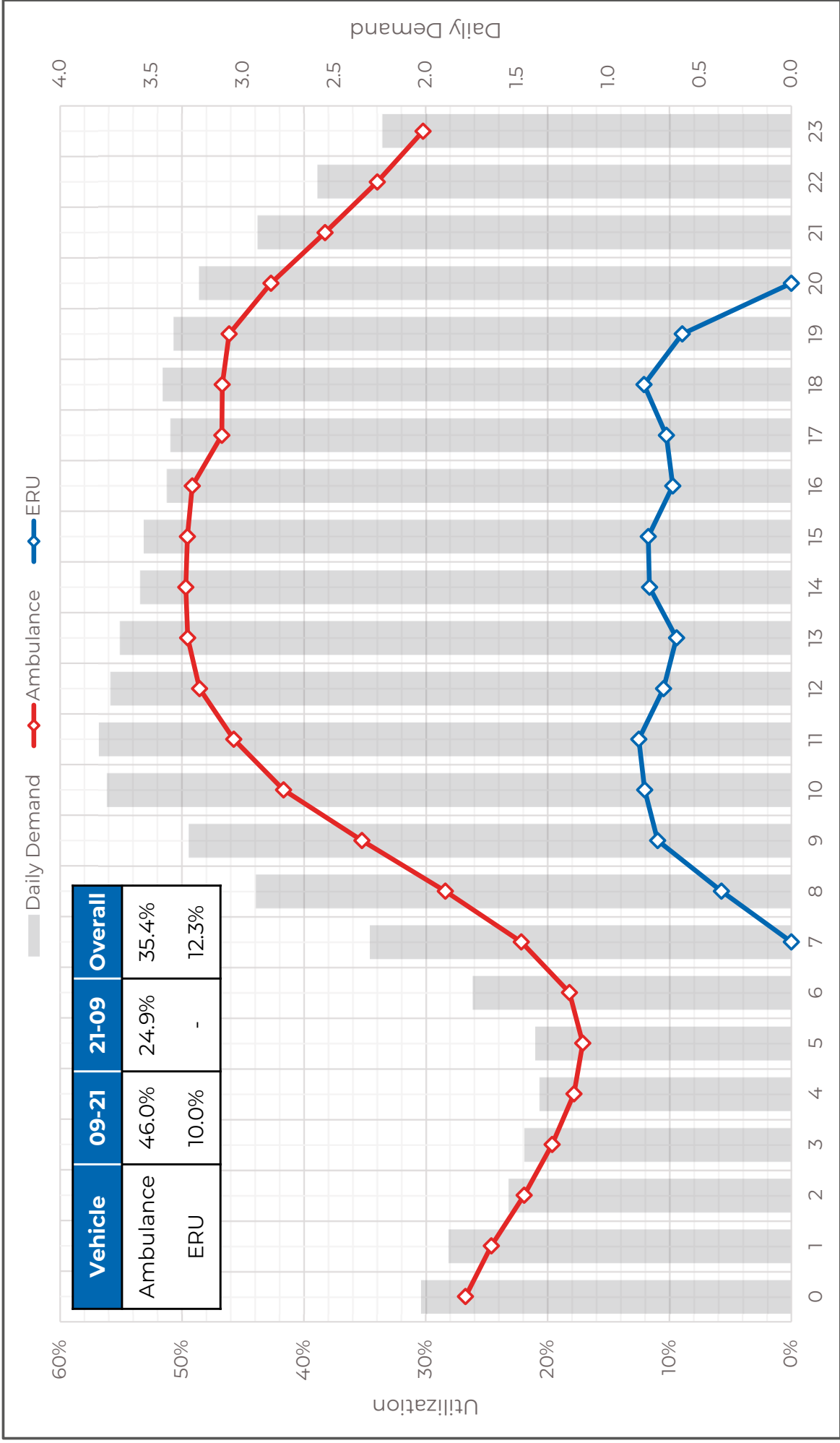
Priority 4 Response Times



P4 8-minute performance

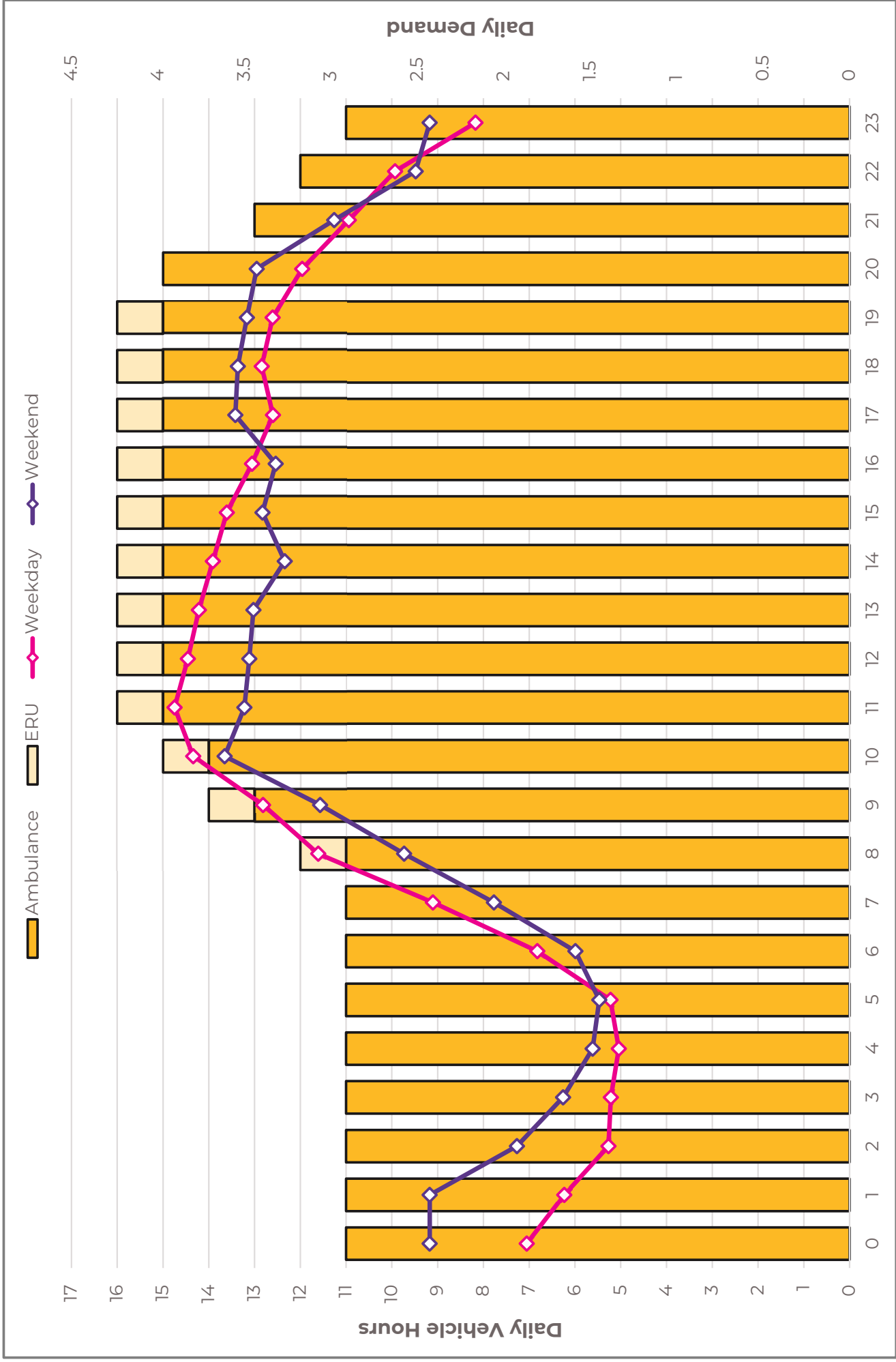


Utilization by Hour (2022-23)



Utilization is defined as the sum of occupied time (from vehicle mobilization to clear) divided by planned vehicle time; time spent on meal breaks, returning to base and standby moves are thus excluded from the calculation.

Demand and Resource Matching (2022-23)



Standby Move Summary (2022-23)

Rostered Station	Average Daily Standby Moves	Average time on move	Proportion interrupted by incident/ move*	Proportion of interrupted belonging to each Priority				
				P8 (Standby move)	P4	P3	P2	P1
00 Elmira Rd North	7.4	24:25	37%	31.3%	47.4%	21.2%	0.1%	0.1%
02 Fergus	5.7	19:07	35%	38.2%	38.4%	23.1%	0.1%	0.1%
03 Clair Rd West	3.0	16:53	31%	21.3%	56.2%	22.5%	0.0%	0.0%
04 Mount Forest	2.1	26:00	45%	76.0%	14.4%	9.3%	0.0%	0.3%
05 Arthur	6.0	28:21	38%	59.9%	25.0%	14.9%	0.2%	0.1%
06 Harriston	3.1	30:25	41%	77.3%	13.8%	8.9%	0.0%	0.0%
07 Drayton	4.0	27:29	38%	63.2%	22.6%	14.3%	0.0%	0.0%
08 Rockwood	2.1	16:27	41%	42.0%	38.6%	19.4%	0.0%	0.0%
10 Hillsburgh	5.8	25:14	40%	63.5%	24.4%	12.1%	0.1%	0.0%
12 Gordon	3.6	26:57	26%	17.1%	54.2%	28.4%	0.1%	0.1%
Overall	42.8	24:28	36.9%	49.9%	33.0%	17.2%	0.1%	0.1%

* Interrupted moves also includes those which were assigned to incident less than two minutes after arriving

Benchmarking: Priority 4 Response Performance

P4 8-minute performance

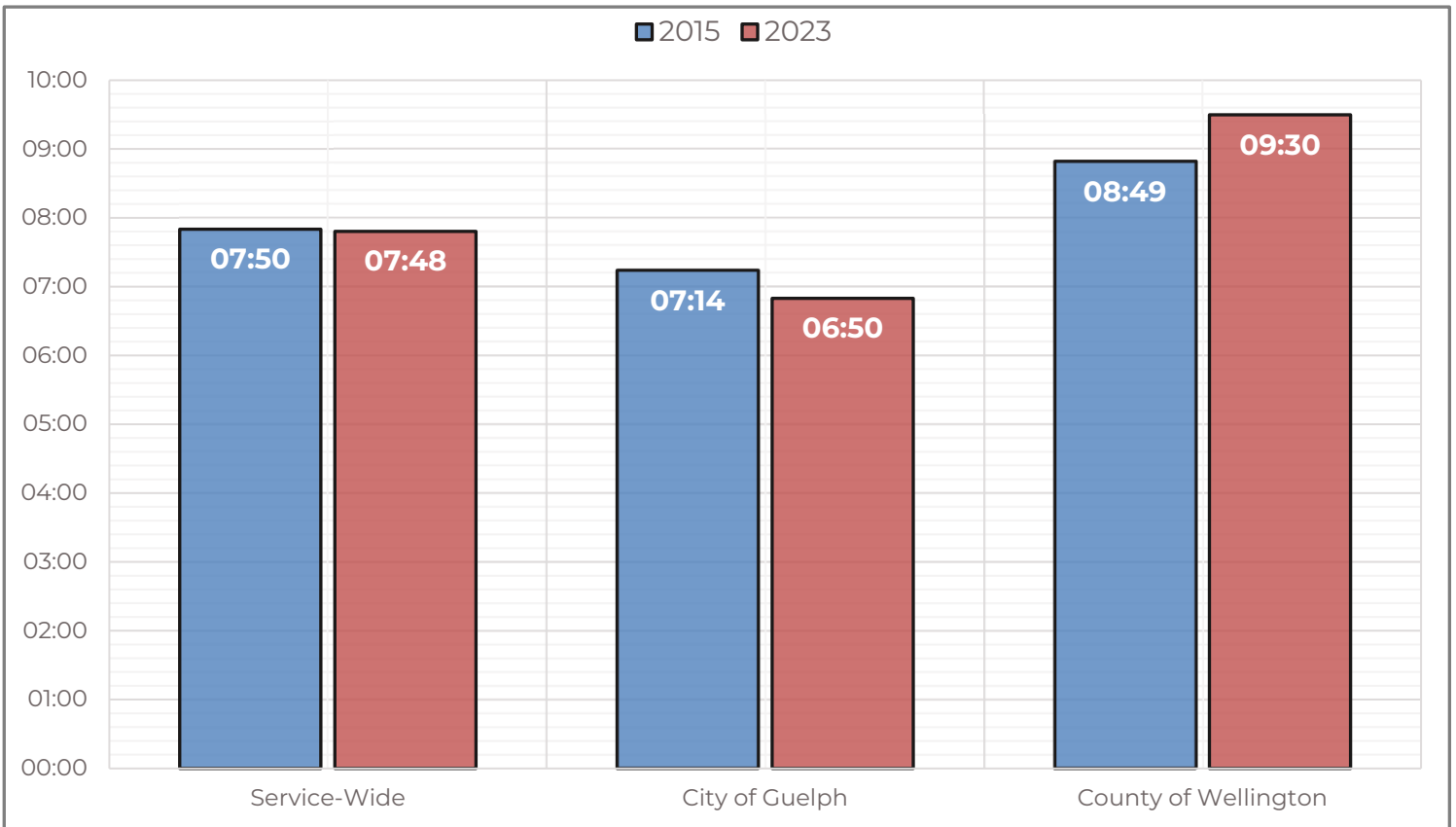
Area	Year		Difference
	2015	2023	
Centre Wellington	67.3%	59.6%	-7.7%
Erin	22.4%	17.9%	-4.5%
Guelph	62.5%	73.5%	11.0%
Guelph/Eramosa	39.6%	32.6%	-7.0%
Mapleton	12.1%	34.8%	22.7%
Minto	41.5%	34.4%	-7.1%
Puslinch	14.6%	11.6%	-3.0%
Wellington North	65.3%	60.5%	-4.8%
Overall	58.3%	60.8%	2.5%

P4 15-minute performance

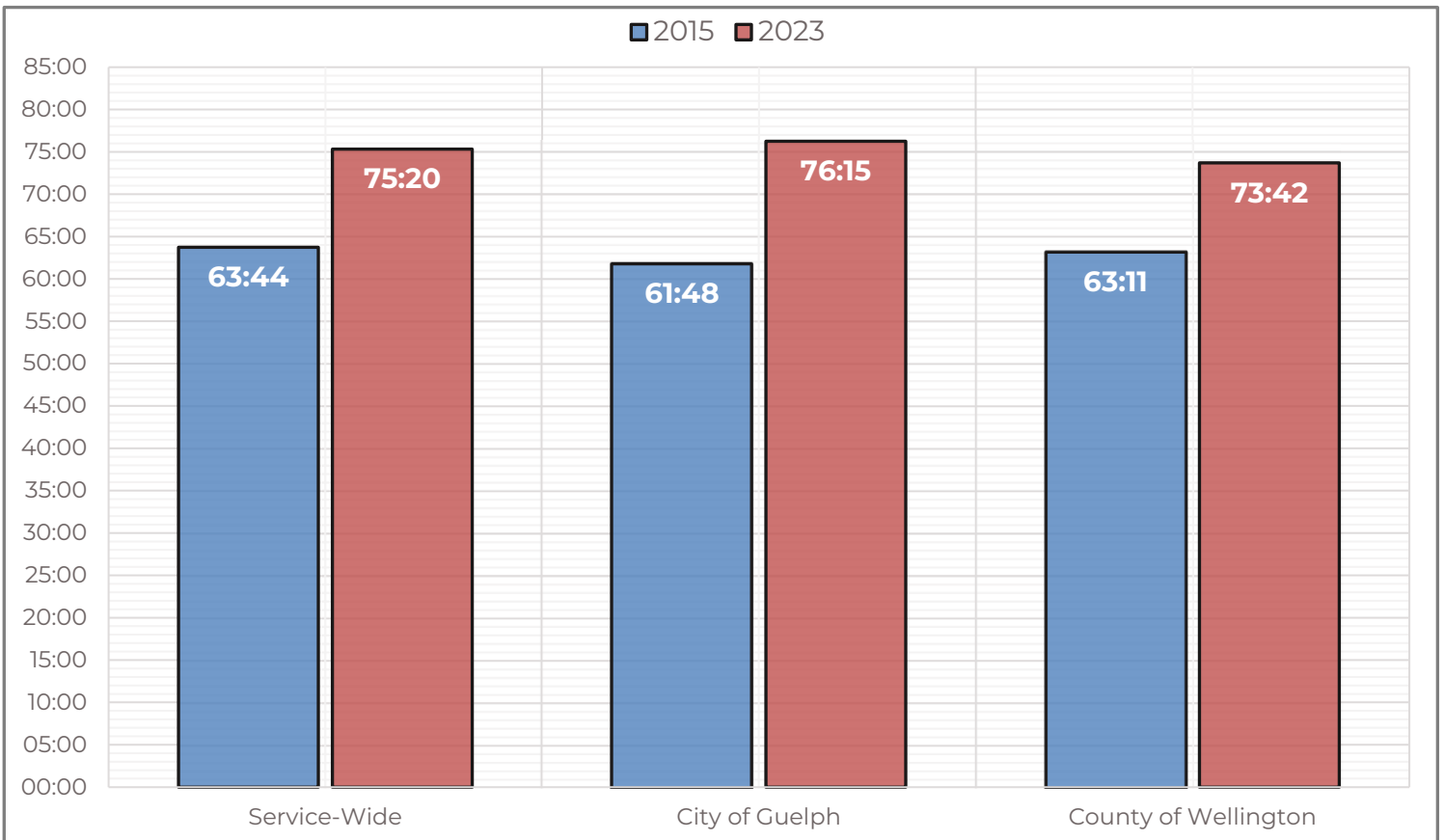
Area	Year		Difference
	2015	2023	
Centre Wellington	95.1%	92.2%	-2.9%
Erin	80.1%	76.0%	-4.1%
Guelph	98.7%	98.4%	-0.3%
Guelph/Eramosa	87.3%	81.7%	-5.6%
Mapleton	55.8%	80.9%	25.1%
Minto	92.8%	87.8%	-5.0%
Puslinch	81.8%	85.5%	3.7%
Wellington North	89.4%	82.5%	-6.9%
Overall	95.5%	92.2%	-3.3%

Improvement
0 to 5% deterioration
+5% deterioration

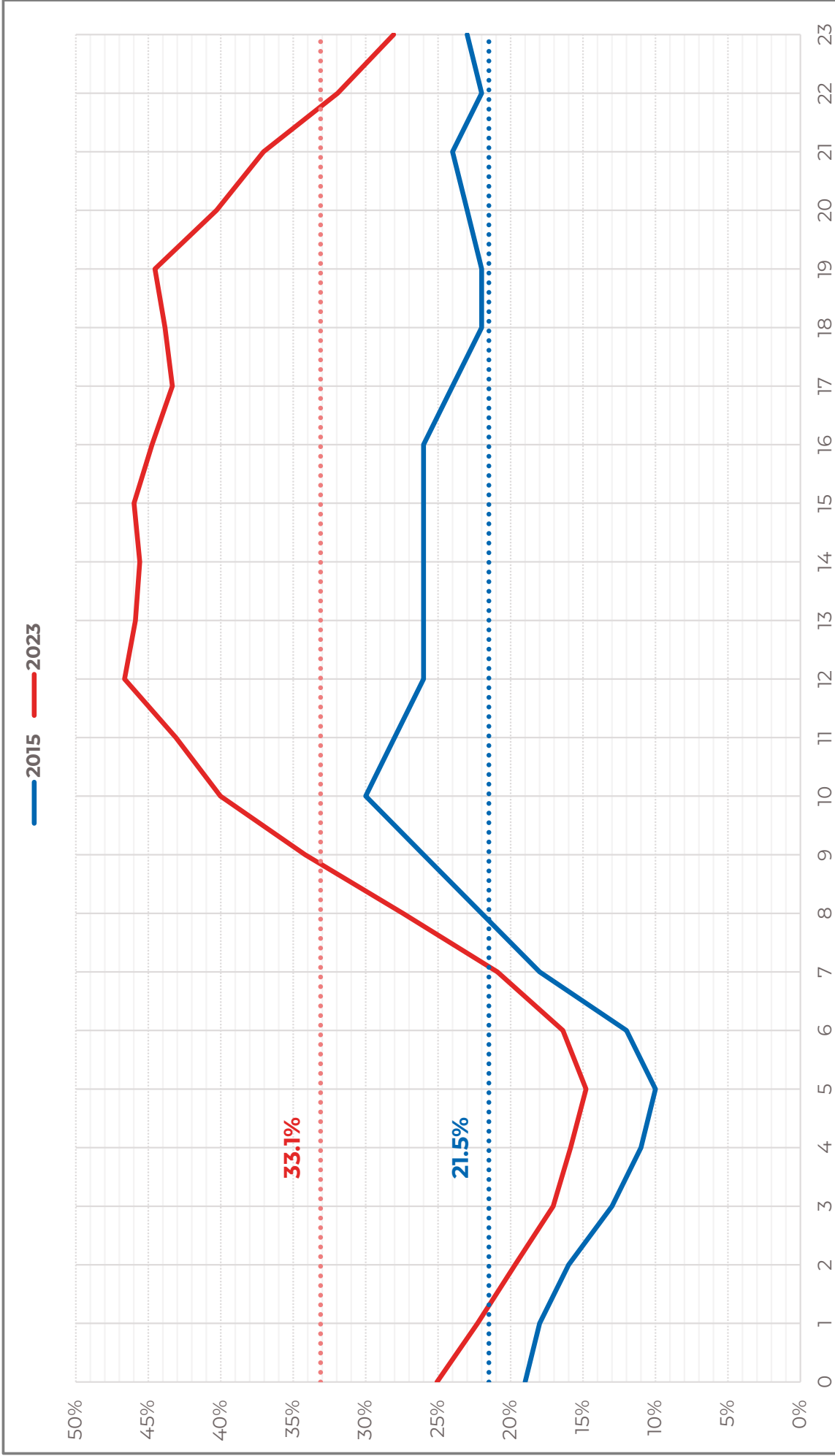
Travel Time to Scene



Occupied Time



Benchmarking: Utilization by Hour



Utilization is defined as the sum of occupied time (from vehicle mobilization to clear) divided by planned vehicle time; time spent on meal breaks, returning to base and standby moves are thus excluded from the calculation.

B Demand Projections

B1 Population Data Sources

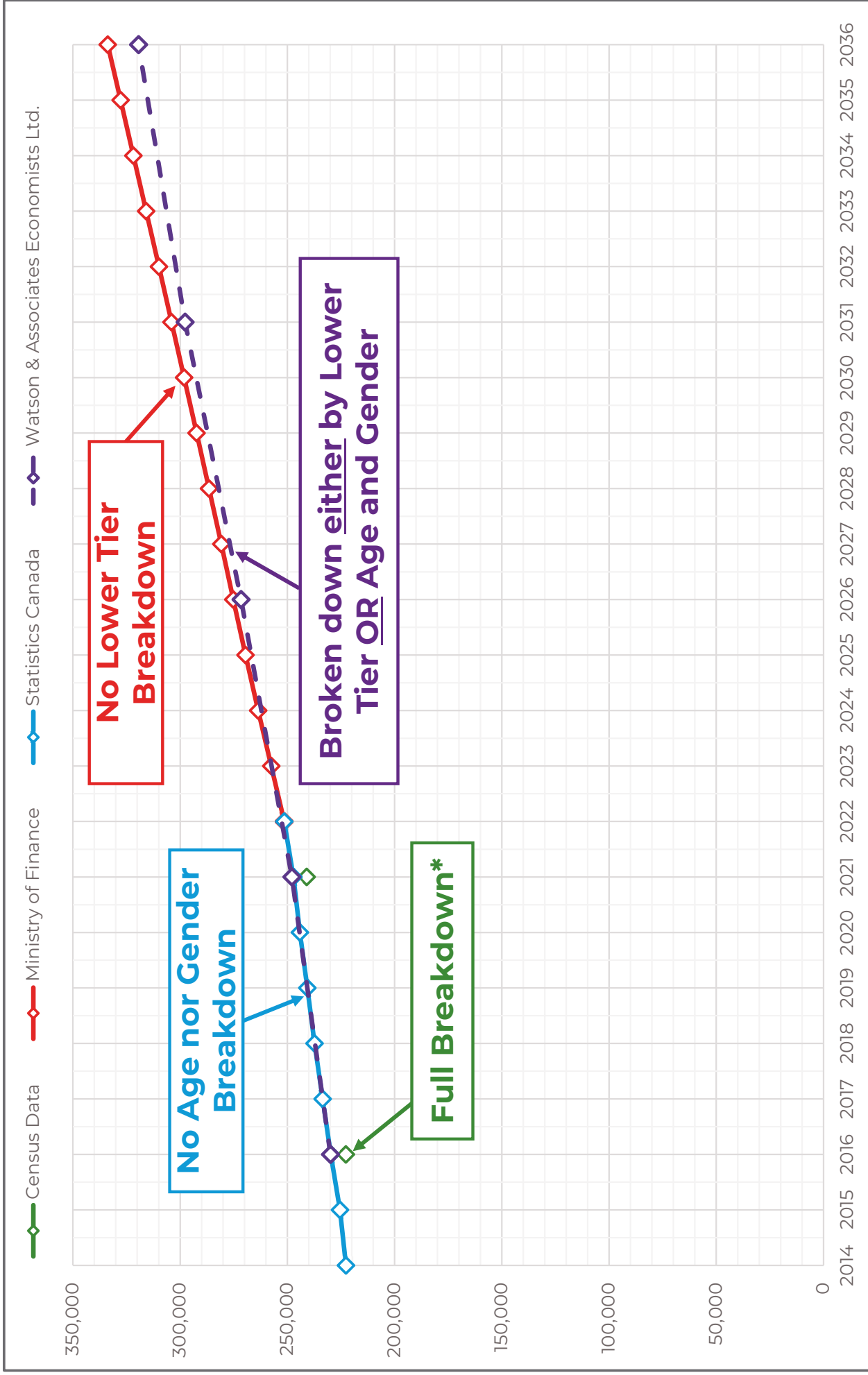
B2 Proportion of each age band per LTM

B3 Demand Rates

B4 Proposed Developments

B5 Alternative Demand Projections

Population Data Sources



*Census data is lower since it does not apply an adjustment for the undercount

Census Data – Percentage of each age band within each Lower Tier Municipality

2016

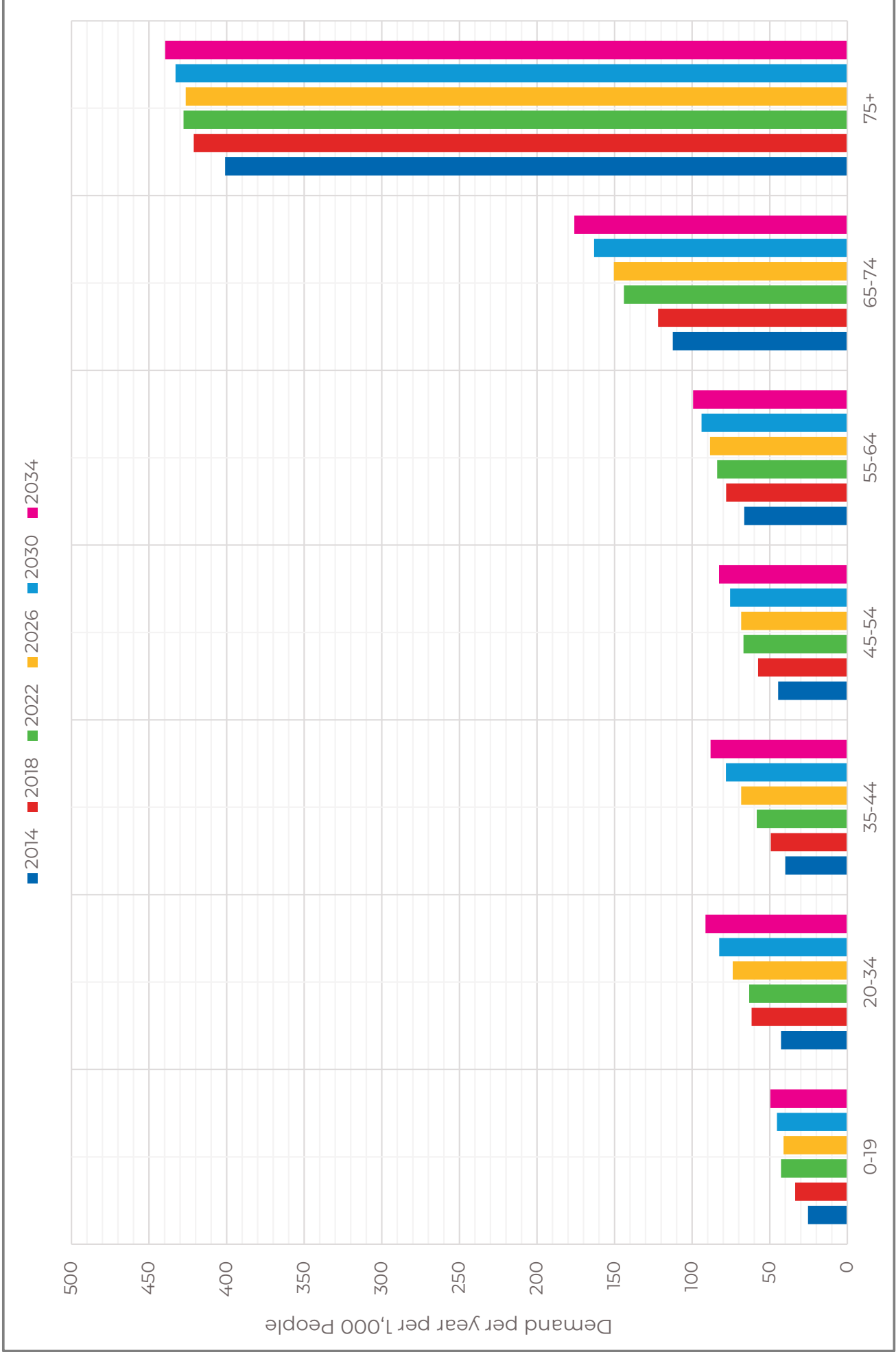
Age Group	LTM										Overall
	Centre Wellington	Erin	Guelph	Guelph/ Eramosa	Mapleton	Minto	Puslinch	Wellington North			
0-9	12.1%	3.9%	59.0%	4.7%	7.8%	4.3%	2.3%	5.9%			100%
10-19	12.2%	5.4%	57.1%	6.5%	6.7%	3.8%	3.1%	5.1%			100%
20-29	9.8%	3.9%	67.7%	4.1%	4.6%	3.1%	2.2%	4.6%			100%
30-39	11.1%	3.7%	66.4%	4.6%	4.7%	3.2%	2.0%	4.3%			100%
40-49	11.7%	5.9%	61.4%	6.1%	3.8%	3.4%	3.4%	4.3%			100%
50-59	13.1%	6.8%	55.5%	7.2%	3.9%	3.8%	4.2%	5.5%			100%
60-69	15.4%	5.6%	54.3%	6.4%	3.4%	4.5%	4.7%	5.7%			100%
70-79	15.9%	4.6%	54.8%	6.1%	2.8%	4.5%	4.3%	7.1%			100%
80 Plus	14.6%	2.8%	59.7%	4.6%	2.2%	5.6%	2.7%	7.8%			100%
Overall	12.6%	4.9%	59.8%	5.7%	4.6%	3.9%	3.2%	5.3%			100%

2021

Age Group	LTM										Overall
	Centre Wellington	Erin	Guelph	Guelph/ Eramosa	Mapleton	Minto	Puslinch	Wellington North			
0-9	12.4%	3.8%	57.6%	5.5%	7.3%	4.8%	2.3%	6.3%			100%
10-19	12.9%	4.7%	58.0%	6.1%	6.5%	4.0%	3.2%	4.7%			100%
20-29	9.7%	3.8%	68.0%	4.2%	4.4%	3.1%	2.3%	4.5%			100%
30-39	12.0%	4.0%	65.2%	4.7%	4.2%	3.5%	2.0%	4.4%			100%
40-49	12.0%	5.1%	62.8%	6.1%	3.7%	3.0%	3.4%	4.0%			100%
50-59	13.3%	6.7%	56.8%	6.8%	3.8%	3.4%	4.0%	5.2%			100%
60-69	15.7%	5.8%	54.1%	6.6%	3.6%	4.2%	4.2%	5.7%			100%
70-79	16.6%	4.8%	55.3%	6.0%	2.8%	4.0%	4.5%	6.1%			100%
80 Plus	14.3%	2.5%	61.0%	4.2%	2.0%	4.9%	3.0%	8.1%			100%
Overall	13.0%	4.7%	60.1%	5.6%	4.4%	3.8%	3.2%	5.2%			100%

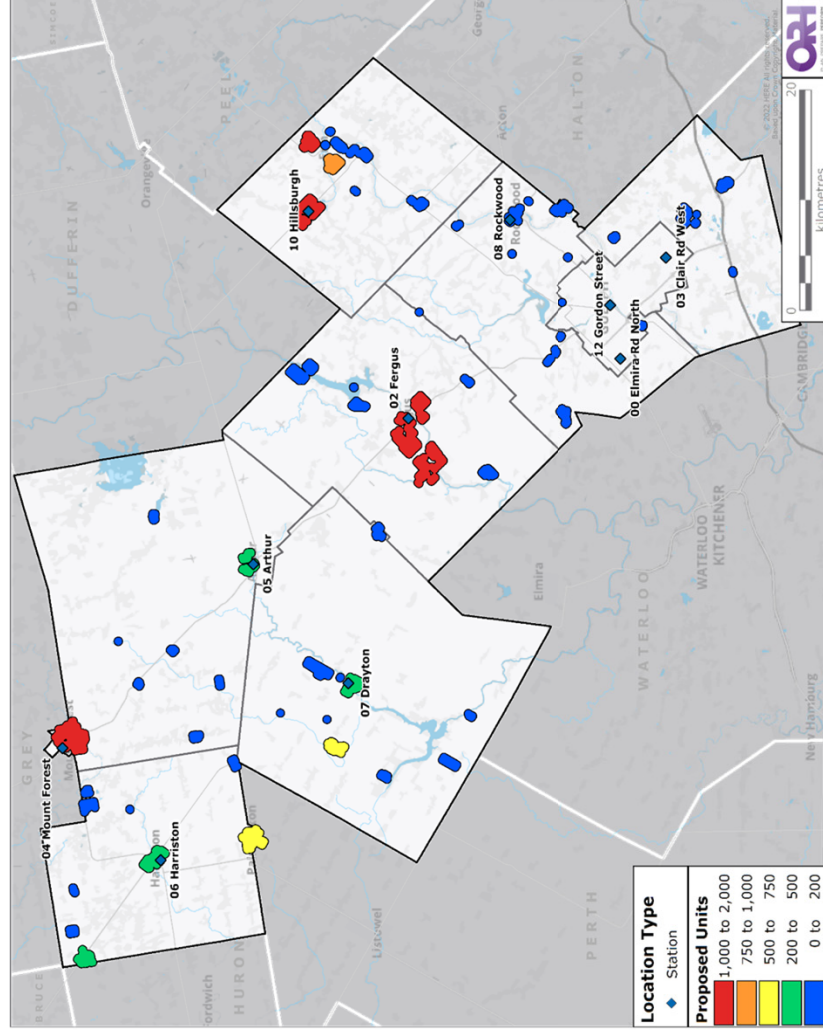
The proportion of each age band which falls into each area is assumed to remain constant.

Final Demand Rates by Year

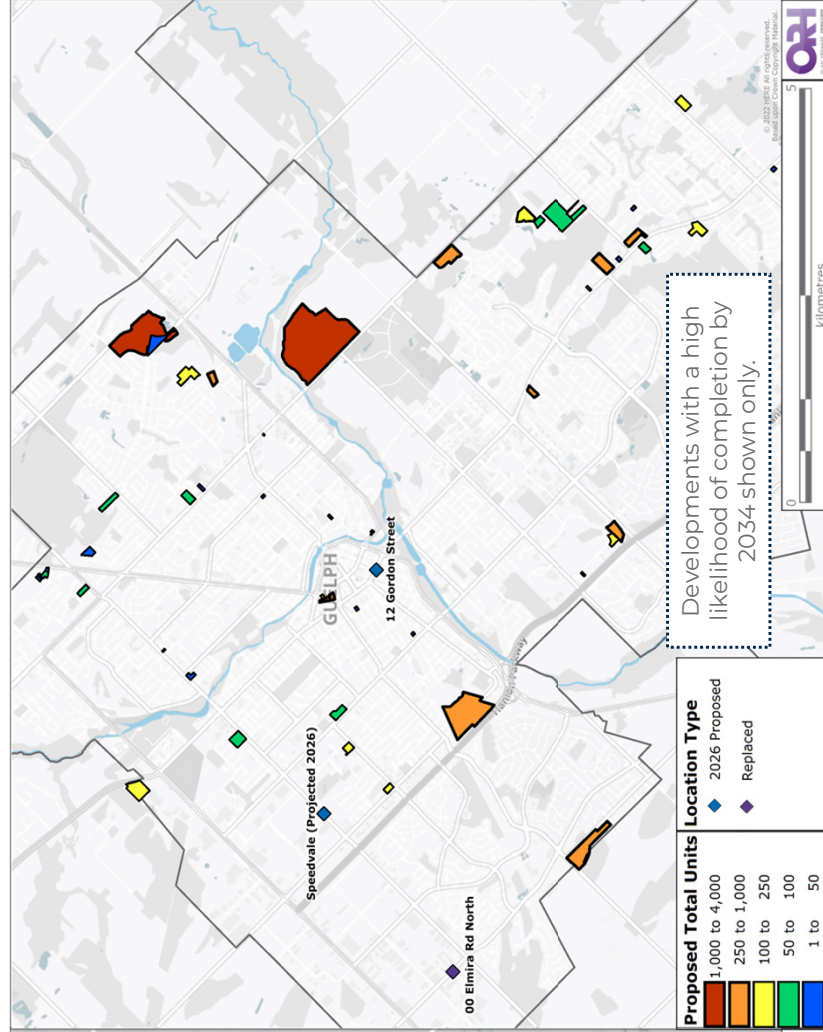


Proposed Developments

County of Wellington by 2039



City of Guelph by 2034



Alternative Demand Projections

Area	Average Annual Increase 2024 to 2034			Daily Demand				
	2014-23	Low	Core	High	2023	Low	Core	High
Centre Wellington, TP	5.7%	4.4%	4.7%	5.7%	9.4	15.9	16.7	18.3
Erin, T	9.8%	6.9%	7.0%	8.0%	1.7	4.1	4.2	4.7
Guelph/Eramosa, TP	4.6%	4.1%	4.3%	5.3%	3.1	5.6	5.7	6.3
Mapleton, TP	5.0%	4.3%	4.5%	5.5%	1.3	1.8	1.8	2.0
Minto, T	3.7%	2.5%	2.8%	3.8%	3.0	4.3	4.5	4.9
Puslinch, TP	3.6%	4.2%	4.4%	5.4%	2.0	3.5	3.6	4.0
Wellington North, TP	4.3%	3.9%	4.2%	5.2%	4.3	6.9	7.2	7.9
Guelph, CY	4.8%	3.9%	4.2%	5.2%	41.2	65.3	67.5	74.3
Overall	4.9%	4.1%	4.3%	5.3%	66.0	107.2	111.2	122.4

% Increase over ten years	48.9%	52.2%	67.4%
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C Model Setup and Base Position

C1 AmbSim

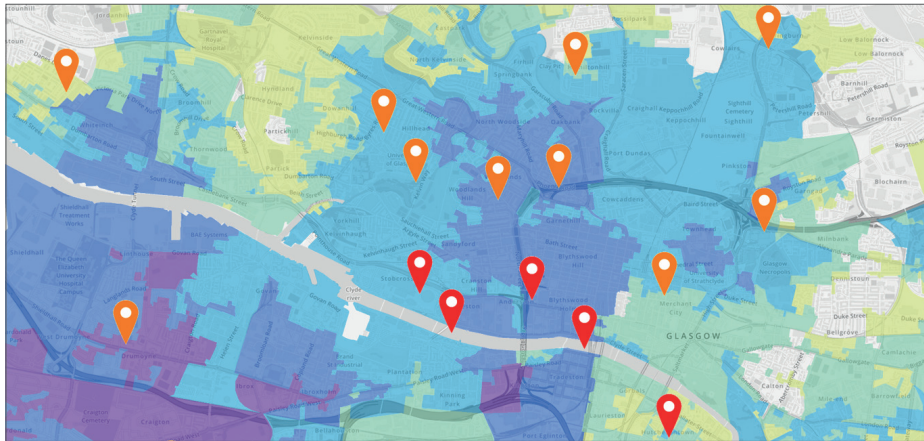
C2 Model validation examples

C2a Priority 4 Performance

C2b Hospital and Vehicle Workload

AmbSim

ORH Ambulance Simulation Model



KEY BENEFITS

- Quickly identifies the impact of future changes on response performance and utilization
- Quantifies seasonal vehicle and staffing requirements to meet national standards in future scenarios
- Examines impacts of changes in individual or multiple interrelated operational factors

Simulating potential changes and understanding their impacts

KEY FACTS

- Used in numerous studies worldwide
- Built on historical analysis
- Validated against known operations
- Risk-free environment for testing
- Evidence base for change

ABOUT AMBSIM

AmbSim is a simulation model that replicates the key characteristics of an ambulance service to predict future behaviour and performance under a variety of different scenarios. AmbSim is used by ORH consultants for ambulance service reviews, and in-house by services worldwide.

AMBSIM'S APPROACH

Demand is generated in AmbSim in accordance with historical data. Vehicles within the model respond to this demand according to their proximity and the desired dispatch protocols; dispatch rules can be based on any combination of categorization systems, resource types and staff skills.

ORH analyzes Automatic Vehicle Location data to understand variation in road speeds by time, location, road classification and vehicle type. These are fed into the model to ensure that travel times accurately replicate reality.

Resources within AmbSim can reflect both actual and planned rosters. This allows the user to identify required changes in resource levels/balance in specific detail.

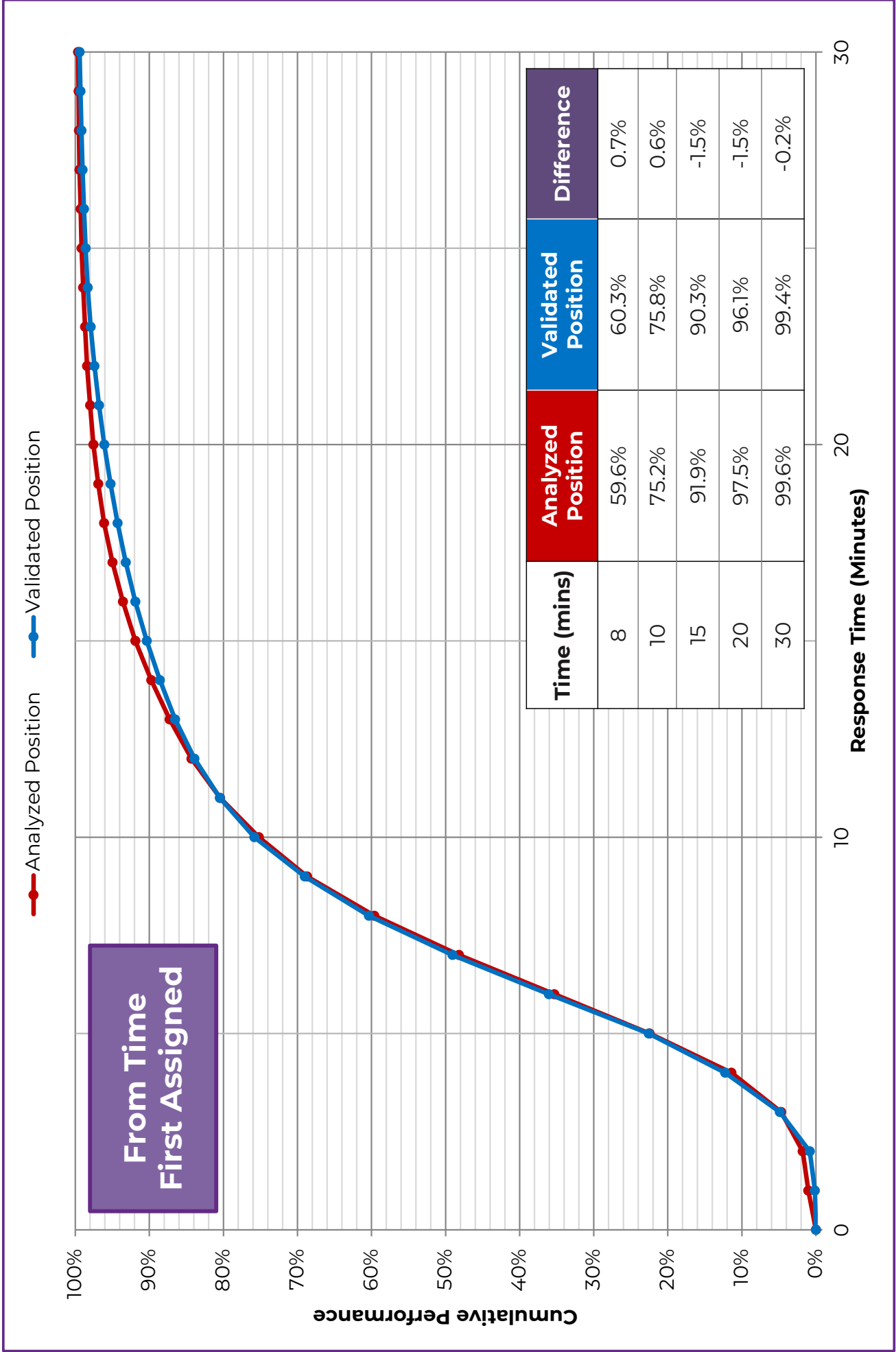
Time components of the job cycle are based on historical analysis and differ by location, day, hour, category, and vehicle type. Along with demand and resourcing, the user can vary these parameters to assess different scenarios.

APPLICATION

AmbSim can be used to devise optimal operational models and resourcing by location, time, vehicle type and staff skill. Different demand levels and combinations of operational parameters can be incorporated to provide an evidence base for informed decision making. Inputs and parameters are flexible and can be updated to reflect changes that are within the control of the service and those that are external, such as hospital configuration.

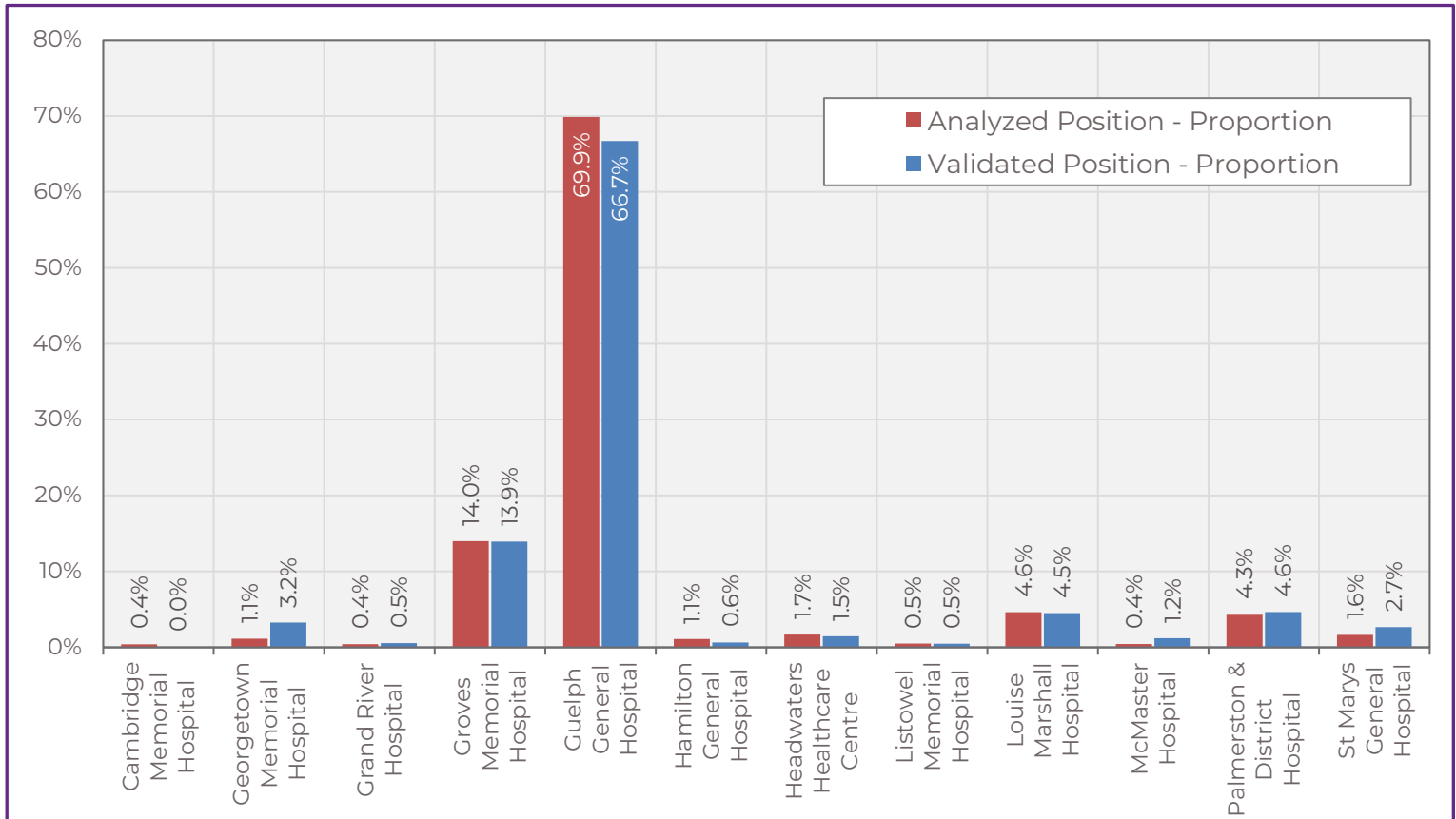


Model Validation – Priority 4 Performance Distribution



Model Validation – Hospital and Vehicle Workload

% of P4 Non-IFT Patient Journeys



Daily Vehicle Responses

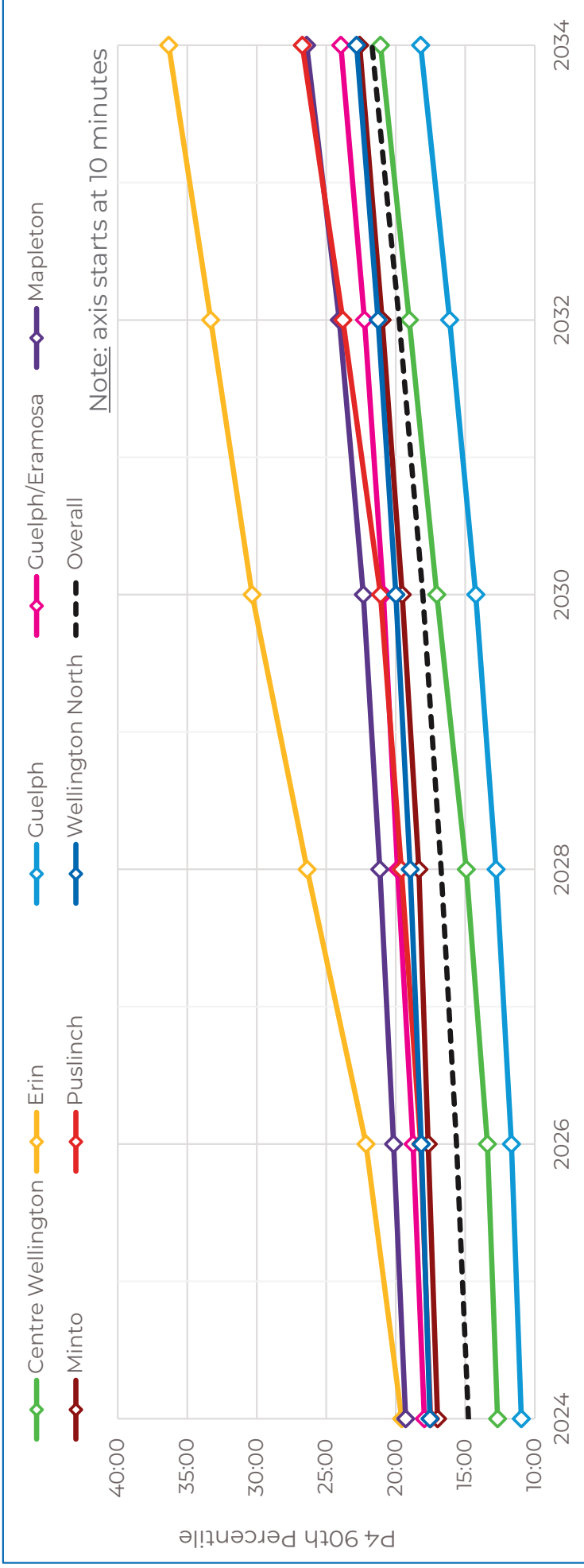
Category	Analyzed		Validated		Difference		% Difference	
	ERU	Ambulance	ERU	Ambulance	ERU	Ambulance	ERU	Ambulance
P1		0.3		0.3		0.0		-2.9%
P2		0.1		0.1		0.0		-1.2%
P3 Non-IFT	0.2	17.4		17.3	-0.2	-0.1		-0.5%
P3 IFT		3.0		2.9		-0.1		-2.0%
P4 Non-IFT	2.5	45.6	3.7	46.0	1.3	0.5	51.7%	1.0%
P4 IFT		1.8		1.7		0.0		-1.3%
Overall	2.6	68.1	3.7	68.4	1.1	0.3	41.5%	0.4%

D 'Do Nothing' Scenario

D1 'Do Nothing' Priority 4 Performance by year

D2 'Do Nothing' Performance Summary : All Priorities

'Do Nothing' Priority 4 Performance by year

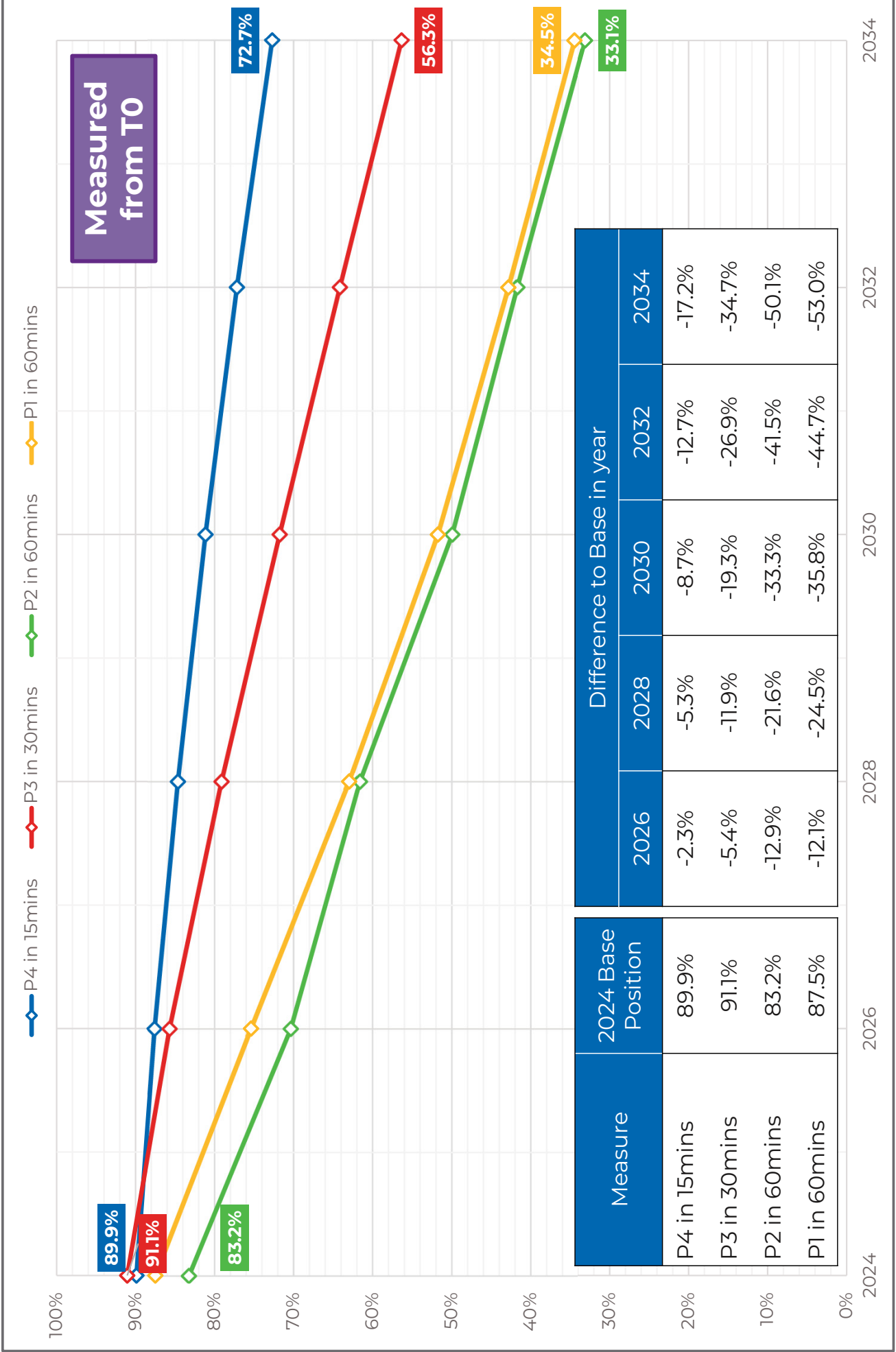


P4 90th Percentile

Lower Tier Municipality	2024 Base Position
Centre Wellington	12:41
Erin	19:34
Guelph	10:58
Guelph/Eramosa	17:57
Mapleton	19:17
Minto	17:00
Puslinch	17:30
Wellington North	17:33
Overall	14:46

		Year				
		2026	2028	2030	2032	2034
Centre Wellington	00:44	02:15	04:22	06:21	08:26	
Erin	02:34	06:48	10:46	13:45	16:46	
Guelph	00:43	01:49	03:17	05:09	07:15	
Guelph/Eramosa	00:48	01:55	02:56	04:18	06:00	
Mapleton	00:52	01:51	03:03	04:47	07:08	
Minto	00:40	01:21	02:32	03:59	05:36	
Puslinch	00:43	02:06	03:36	06:19	09:14	
Wellington North	00:37	01:25	02:27	03:44	05:17	
Overall	00:51	01:58	03:17	04:59	06:57	

'Do Nothing' Performance Summary : All Priorities



E Performance Targets for Improved Equity of Service Delivery

E1 Achieving Proposed Targets with Existing Stations

Achieving Proposed Targets with Existing Stations in 2034

Performance

LTM	Proposed		Base Position Performance		2034 Scenario Perf.		Difference from Base	
	P4 90th %ile	P4 90th %ile	P4 % in 8 mins	P4 90th %ile	P4 % in 8 mins	P4 90th %ile	P4 % in 8 mins	P4 90th %ile
Guelph	11:00	10:58	69.0%	10:58	72.8%	10:25	3.8%	-00:33
Centre Wellington	12:30	12:41	61.8%	12:41	64.5%	11:57	2.7%	-00:44
Guelph/Eramosa	16:00	17:57	28.3%	17:57	35.8%	16:07	7.5%	-01:50
Wellington North	16:00	17:33	57.9%	17:33	65.6%	15:33	7.6%	-02:00
Minto	16:00	17:00	29.9%	17:00	35.7%	14:57	5.8%	-02:02
Erin	18:00	19:34	18.3%	19:34	22.7%	17:07	4.5%	-02:27
Puslinch	18:00	17:30	10.6%	17:30	10.8%	17:19	0.2%	-00:11
Mapleton	18:00	19:17	30.8%	19:17	38.7%	16:06	7.9%	-03:11
Overall			57.7%	14:46	61.2%	13:45	3.6%	-01:01

Weekly Ambulance Hours

Station	2024 Base Position	Achieving Proposed Targets in 2034	Difference to 2024 Base Position
00 Elmira Rd North / Speedvale	252	336	84
02 Fergus	336	420	84
03 Clair Rd West	252	336	84
04 Mount Forest	168	252	84
05 Arthur	168	252	84
06 Harriston	168	252	84
07 Drayton	168	252	84
08 Rockwood	84	252	168
10 Hillsburgh	168	252	84
12 Gordon	504	588	84
Overall	2,268	3,192	924

Compared to proposed Target
+60s below
+30s below
below target
above target
+60s above
+30s above

A **41%** increase in ambulance hours

F Identifying Facility Requirements

F1 Location Optimization Results

F1a 04 Mount Forest

F1b 06 Harriston

F1c 02 Fergus

F1d 08 Rockwood

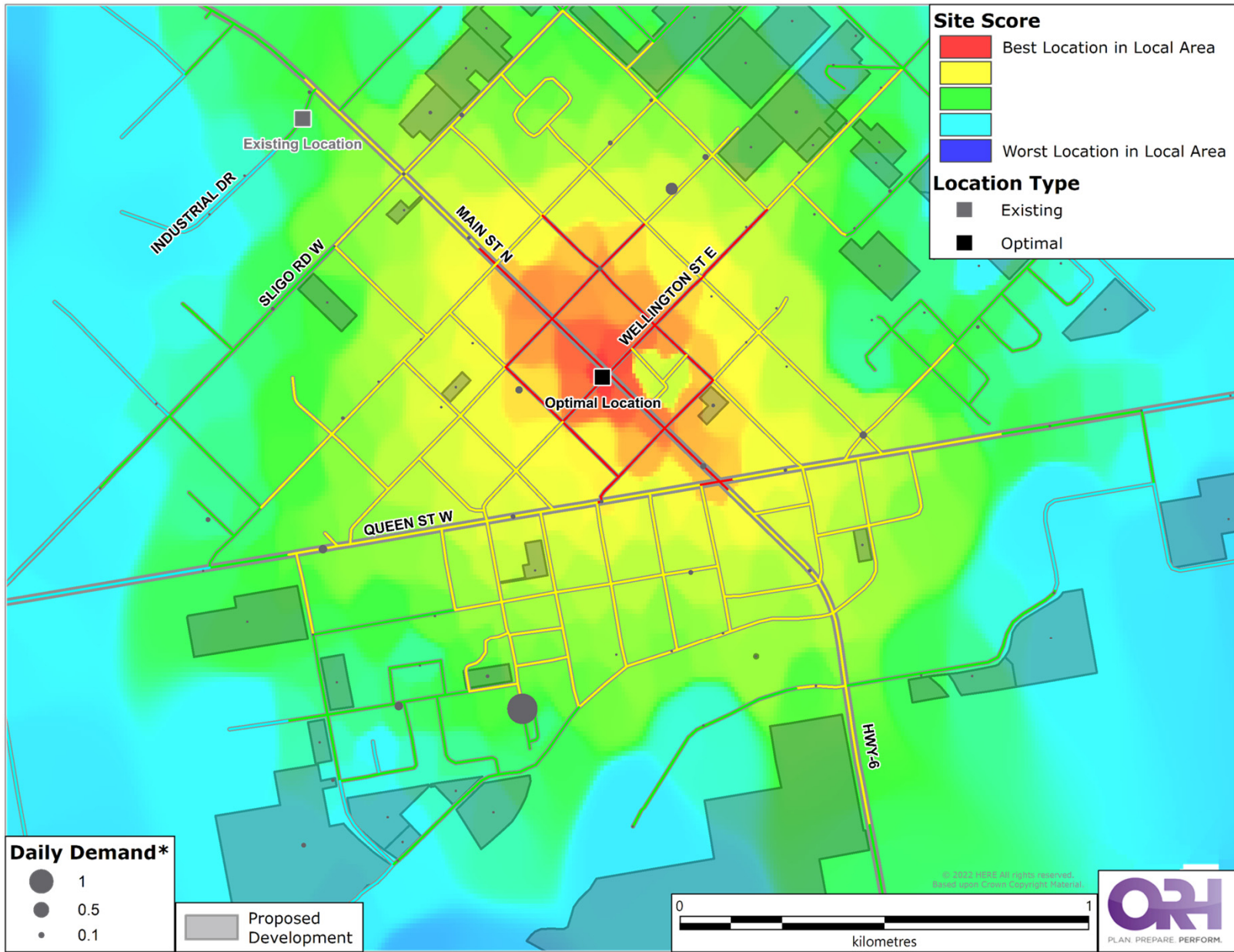
F1e 05 Arthur

F1f 07 Drayton

F2 Achieving Proposed Targets with Existing and Optimal Sites

F3 Performance Improvements in Puslinch using Aberfoyle Post

Optimal Location : 04 Mount Forest



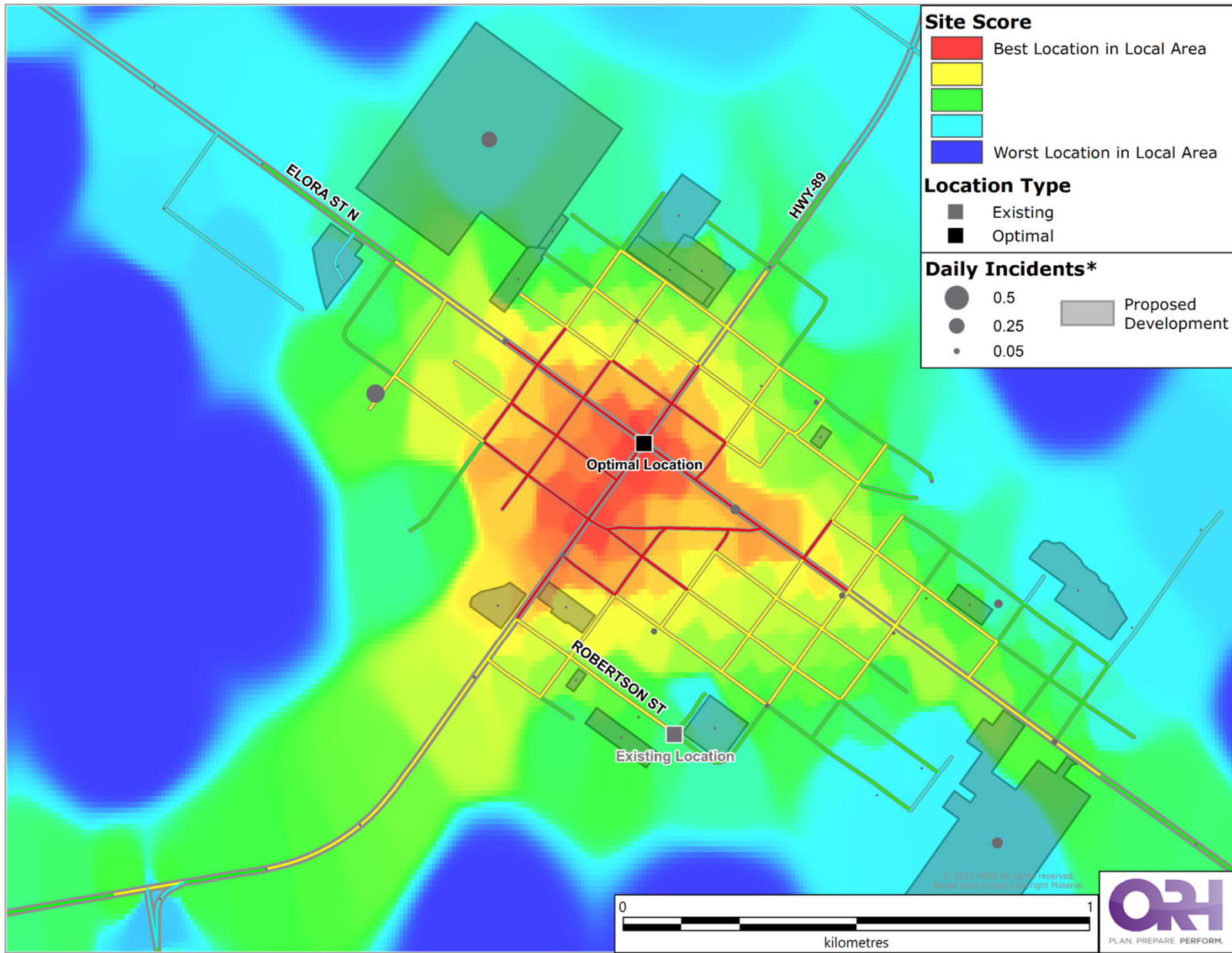
Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	64.5%	81.5%	95.5%	07:31	11:57
Guelph	72.8%	88.5%	97.6%	06:46	10:25
Minto	35.6%	48.8%	90.2%	09:51	14:58
Wellington North	72.1%	75.8%	88.9%	07:18	15:21
Overall	61.4%	76.3%	92.8%	07:56	13:45

Difference to meeting targets scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
0.0%	0.0%	0.0%	00:00	-00:00
0.0%	0.0%	0.0%	-00:00	-00:00
-0.1%	-0.3%	0.0%	00:01	00:00
6.6%	0.5%	0.7%	-00:54	-00:12
0.2%	-0.1%	0.0%	-00:02	-00:01

Optimal Location : 06 Harriston



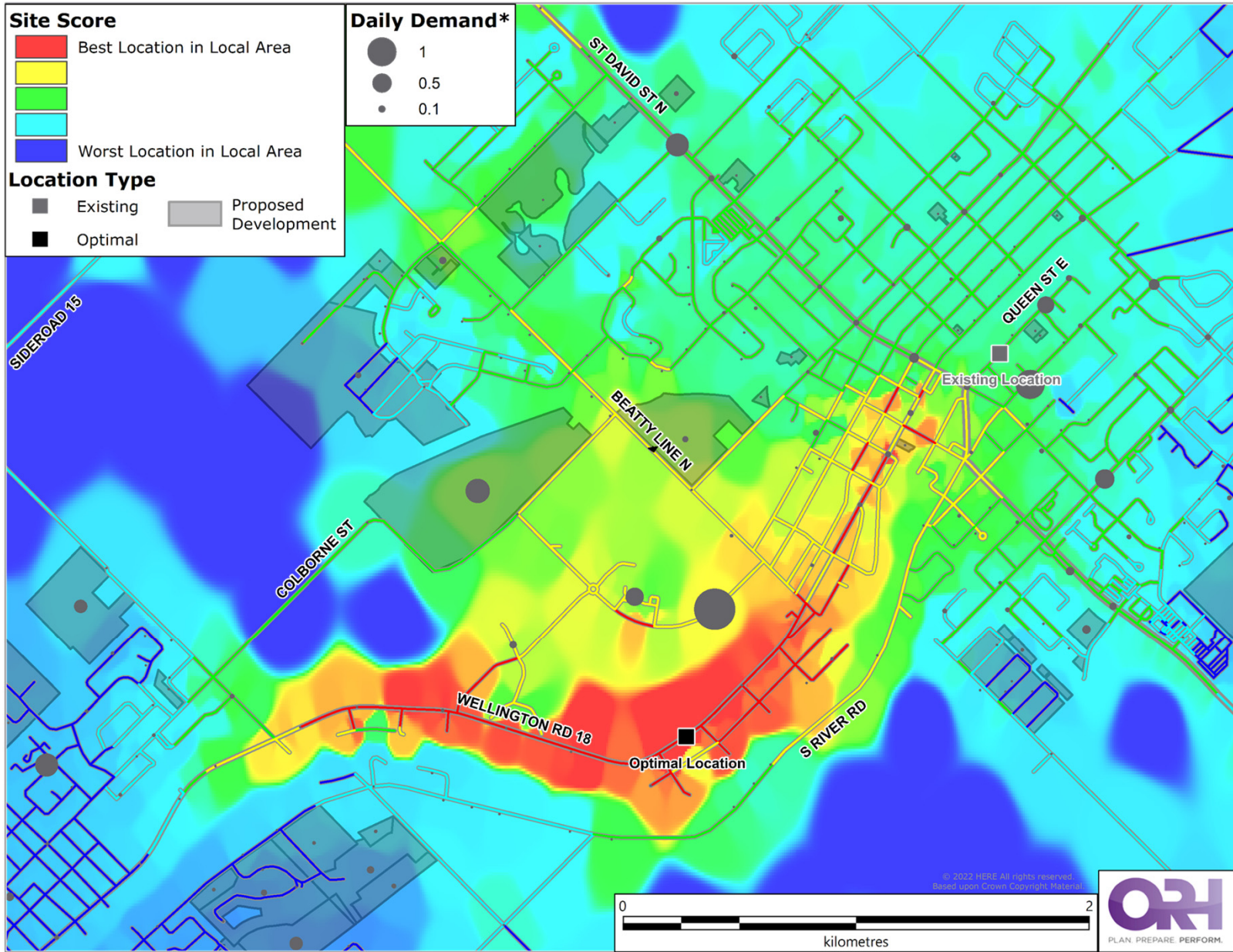
Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	64.5%	81.5%	95.5%	07:30	11:56
Guelph	72.8%	88.5%	97.6%	06:46	10:25
Mapleton	38.8%	54.5%	85.5%	09:55	16:04
Minto	36.7%	51.1%	91.8%	09:24	14:41
Wellington North	65.6%	75.2%	88.7%	08:11	15:24
Overall	61.3%	76.5%	92.9%	07:57	13:43

Difference to meeting targets scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
0.0%	0.0%	0.0%	-00:00	-00:01
0.0%	0.0%	0.0%	-00:00	-00:00
0.1%	0.1%	0.1%	-00:01	-00:02
1.0%	2.0%	1.5%	-00:26	-00:16
0.0%	0.0%	0.5%	-00:02	-00:08
0.0%	0.1%	0.1%	-00:01	-00:03

Optimal Location : 02 Fergus



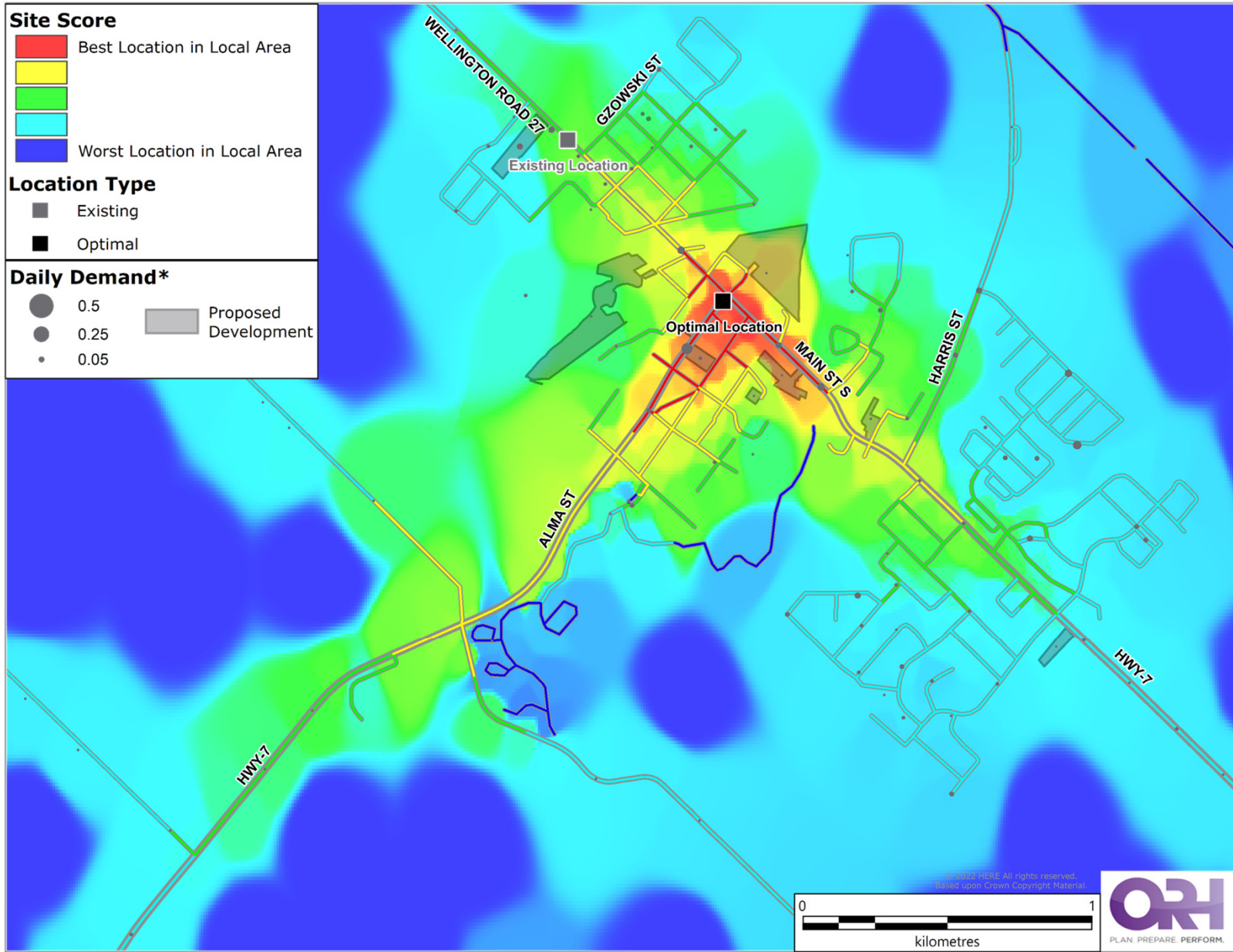
Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	69.3%	82.6%	95.0%	07:48	12:20
Guelph	72.7%	88.3%	97.5%	06:48	10:28
Guelph/Eramosa	35.4%	53.2%	85.2%	10:22	16:16
Mapleton	38.8%	54.6%	87.0%	09:48	15:41
Wellington North	65.7%	75.3%	88.2%	08:13	15:32
Overall	61.7%	76.4%	92.6%	08:02	13:51

Difference to meeting targets scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
4.8%	1.1%	-0.5%	00:17	00:24
-0.2%	-0.2%	-0.1%	00:02	00:03
-0.4%	-0.6%	-0.6%	00:06	00:09
0.1%	0.2%	1.7%	-00:08	-00:25
0.1%	0.0%	0.0%	-00:00	-00:01
0.5%	0.0%	-0.2%	00:04	00:06

Optimal Location : 08 Rockwood



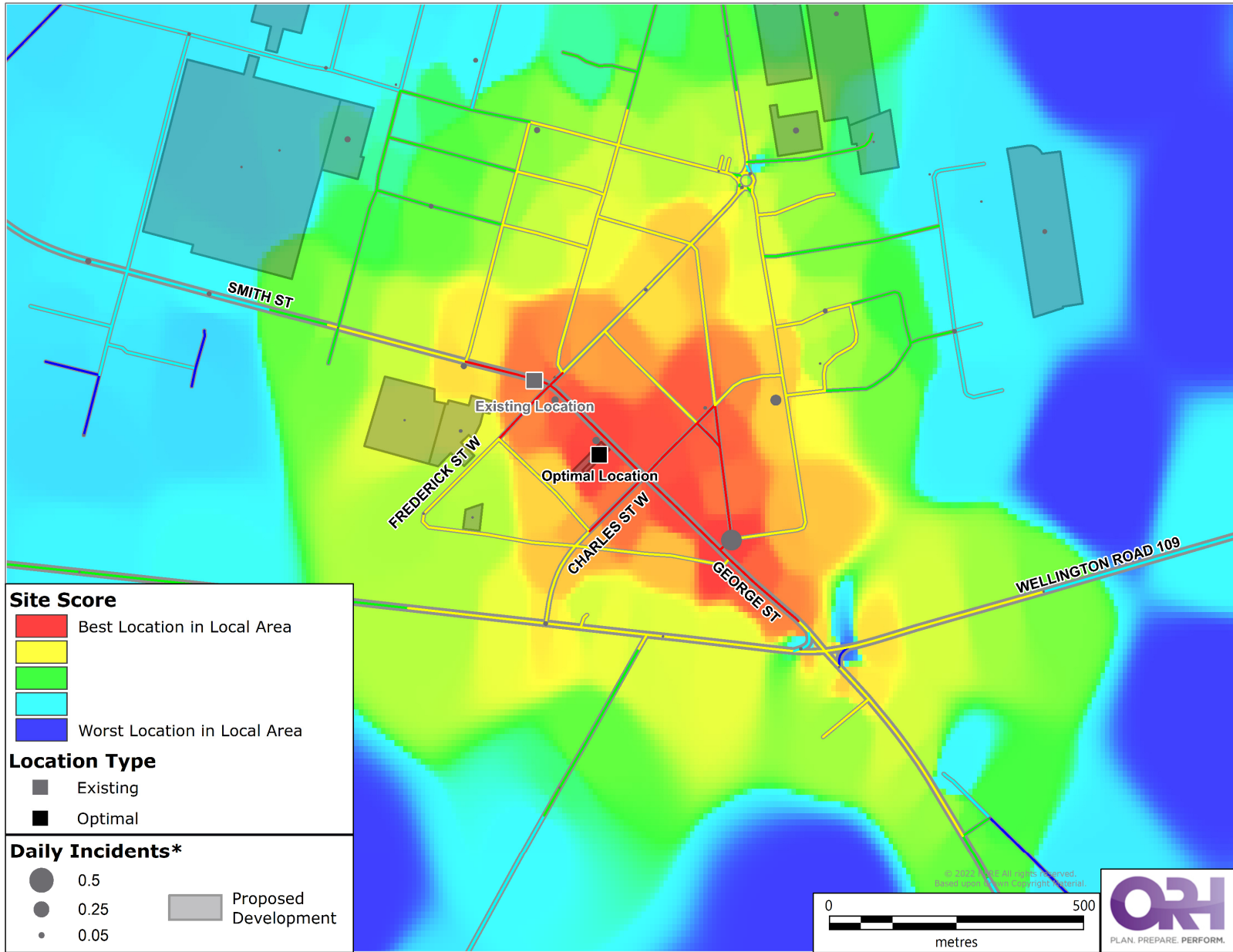
Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	64.4%	81.4%	95.5%	07:31	11:58
Erin	22.6%	34.0%	78.3%	11:41	17:14
Guelph	73.1%	88.7%	97.7%	06:44	10:21
Guelph/Eramosa	38.2%	53.9%	85.6%	10:12	16:10
Overall	61.6%	76.6%	92.8%	07:57	13:44

Difference to meeting targets scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
-0.1%	-0.1%	0.0%	00:00	00:01
-0.1%	-0.4%	-0.3%	00:04	00:06
0.3%	0.3%	0.1%	-00:02	-00:05
2.4%	0.1%	-0.2%	-00:04	00:03
0.3%	0.2%	0.0%	-00:01	-00:02

Optimal Location : 05 Arthur



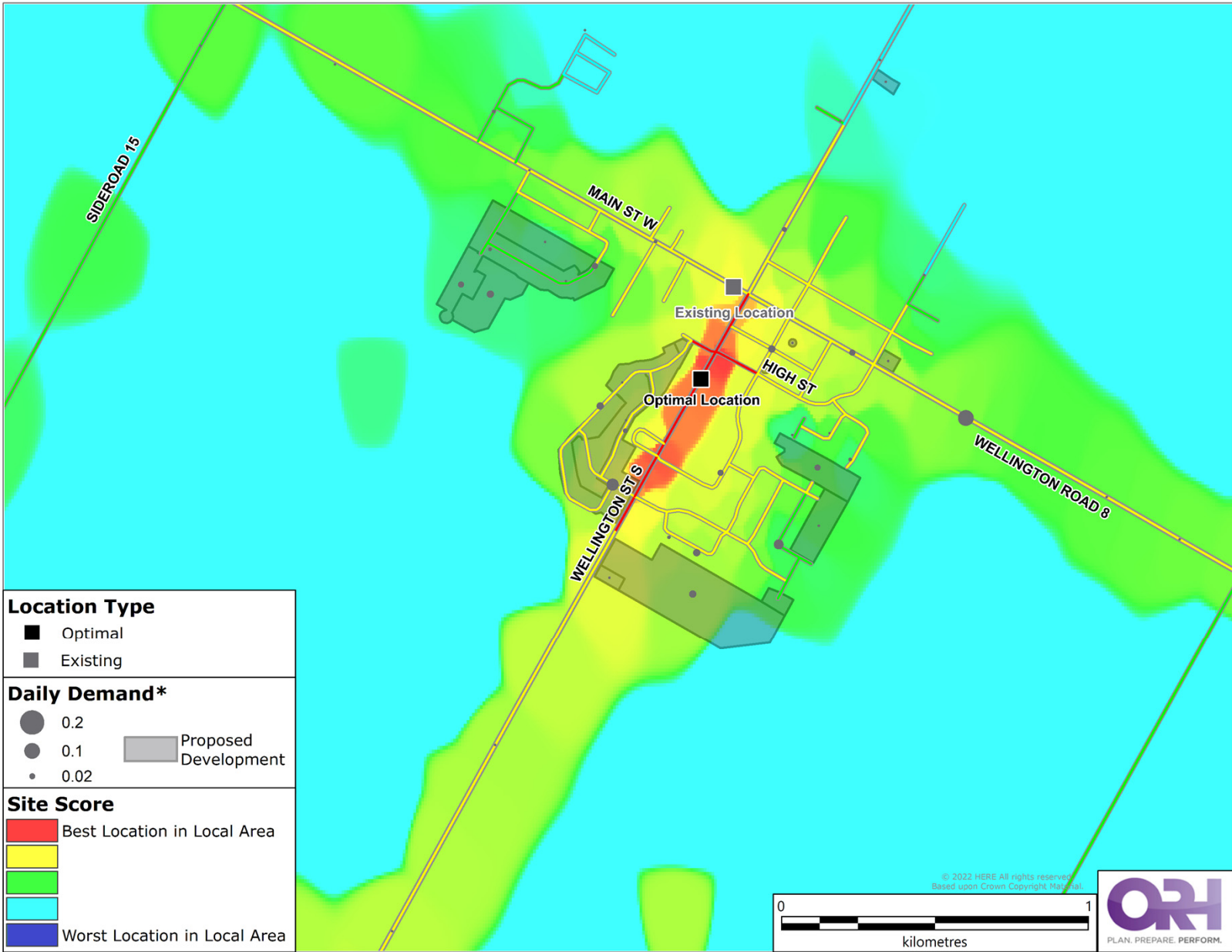
Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	64.5%	81.5%	95.6%	07:31	11:57
Guelph	72.8%	88.4%	97.6%	06:46	10:25
Minto	35.7%	49.1%	90.3%	09:50	14:57
Wellington North	65.5%	75.2%	88.1%	08:13	15:33
Overall	61.2%	76.4%	92.8%	07:59	13:45

Difference to meeting targets scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
-0.1%	0.0%	0.0%	00:00	-00:00
0.0%	0.0%	0.0%	00:00	00:00
0.0%	0.0%	0.0%	-00:00	-00:00
0.0%	0.0%	-0.1%	-00:00	00:01
0.0%	0.0%	0.0%	-00:00	-00:00

Optimal Location : 07 Drayton



Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	64.5%	81.5%	95.5%	07:31	11:57
Mapleton	38.2%	54.5%	85.9%	09:53	15:58
Minto	35.7%	49.1%	90.2%	09:50	14:58
Wellington North	65.6%	75.2%	88.1%	08:14	15:34
Overall	61.2%	76.4%	92.8%	07:59	13:45

Difference to meeting targets scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
0.0%	0.0%	0.0%	00:00	00:00
-0.5%	0.1%	0.6%	-00:03	-00:08
0.0%	0.0%	-0.1%	00:01	00:01
0.0%	-0.1%	-0.1%	00:01	00:01
0.0%	0.0%	0.0%	00:00	-00:00

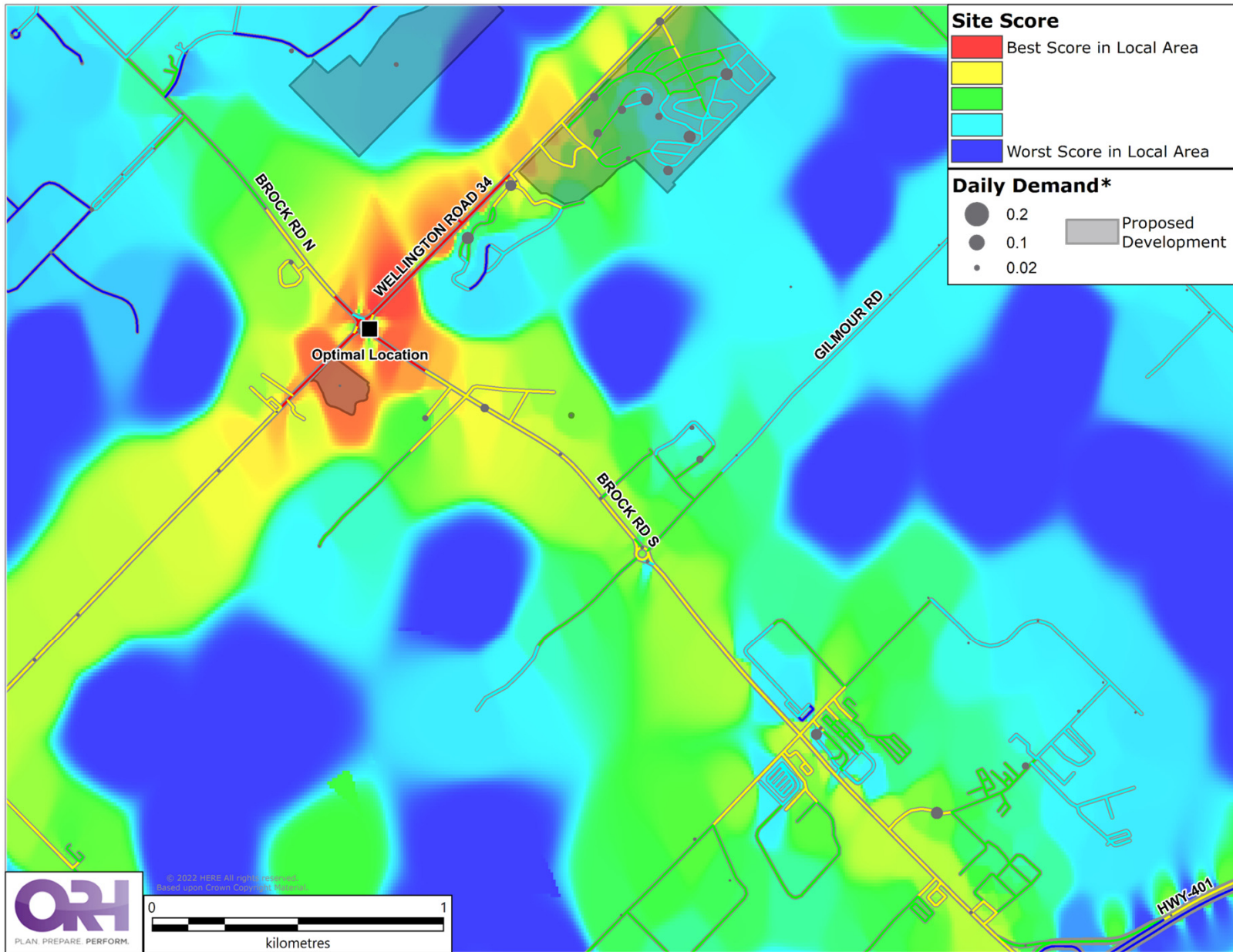
Achieving Proposed Targets with Existing and Optimal Stations – Performance Summary

LTM	Proposed 90 th %ile target	2034 with Existing Locations		2034 with Optimal* Locations		Difference	
		P4 % in 8 mins	P4 90th %ile	P4 % in 8 mins	P4 90th %ile	P4 % in 8 mins	P4 90th %ile
Guelph	11:00	72.8%	10:25	73.0%	10:23	0.2%	-00:02
Centre Wellington	12:30	64.5%	11:57	69.3%	12:23	4.8%	00:27
Guelph/Eramosa	16:00	35.8%	16:07	37.7%	16:16	1.9%	00:09
Wellington North	16:00	65.6%	15:33	72.0%	15:13	6.4%	-00:19
Minto	16:00	35.7%	14:57	36.5%	14:46	0.8%	-00:11
Erin	18:00	22.7%	17:07	36.5%	16:33	13.7%	-00:34
Puslinch	18:00	10.8%	17:19	10.9%	17:17	0.1%	-00:02
Mapleton	18:00	38.7%	16:06	34.6%	17:25	-4.1%	01:19
Overall		61.2%	13:45	62.7%	13:37	1.5%	-00:09
Weekly Ambulance Hours		924 (41% increase from base)		840 (37% increase from base)			-84

Compared to proposed Target	
+60s below	below target
+60s above	above target

* 02 Fergus, 04 Mount Forest, 06 Harriston, 08 Rockwood and 10 Hillsburgh closed and relocated to their optimal (00 Elmira Road North also relocated to Speedvale)

Impacts upon adding a post at Aberfoyle to other Optimals used



Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	69.4%	82.6%	95.0%	07:48	12:21
Erin	36.4%	68.3%	88.0%	09:56	16:28
Guelph	73.4%	88.9%	97.8%	06:43	10:17
Guelph/Eramosa	37.6%	53.4%	85.2%	10:14	16:14
Mapleton	34.5%	49.6%	80.6%	10:43	17:24
Minto	36.5%	50.8%	91.3%	09:28	14:46
Puslinch	31.6%	49.4%	85.4%	10:30	16:18
Wellington North	72.1%	75.7%	89.3%	07:16	15:13
Overall	63.6%	78.6%	93.3%	07:49	13:24

Difference

% responded within X minutes			Mean	90th %ile
8	10	15		
0.1%	0.1%	0.1%	-00:01	-00:03
0.0%	0.0%	0.1%	-00:01	-00:05
0.4%	0.4%	0.2%	-00:03	-00:06
-0.1%	0.0%	0.1%	-00:00	-00:03
0.0%	0.0%	0.0%	00:00	-00:00
0.0%	0.0%	0.0%	-00:00	-00:00
20.7%	17.5%	4.0%	-01:36	-00:59
0.1%	0.1%	0.0%	-00:00	-00:01
0.8%	0.8%	0.3%	-00:05	-00:13

G Final Recommendations and Trajectory

G1 Response Performance under Recommendations

G2 Response Performance by LTM under Recommendations

Response Performance under Recommendations

Modelled Scenario

Lower Tier Municipality	% P4 responded within X minutes			Mean	90th Percentile
	8	10	15		
Centre Wellington	69.4%	82.6%	95.0%	07:48	12:21
Erin	36.4%	68.3%	88.0%	09:56	16:28
Guelph	73.4%	88.9%	97.8%	06:43	10:17
Guelph/Eramosa	37.6%	53.4%	85.2%	10:14	16:14
Mapleton	34.5%	49.6%	80.6%	10:43	17:24
Minto	36.5%	50.8%	91.3%	09:28	14:46
Puslinch	31.6%	49.4%	85.4%	10:30	16:18
Wellington North	72.1%	75.7%	89.3%	07:16	15:13
Overall	63.6%	78.6%	93.3%	07:49	13:24

Difference to 2024 Base Position

Lower Tier Municipality	% P4 responded within X minutes			Mean	90th Percentile
	8	10	15		
Centre Wellington	7.6%	4.2%	0.9%	00:05	-00:20
Erin	18.2%	36.5%	14.0%	-02:50	-03:06
Guelph	4.4%	3.1%	1.1%	-00:30	-00:40
Guelph/Eramosa	9.3%	10.0%	7.7%	-01:19	-01:43
Mapleton	3.7%	5.4%	4.8%	-00:47	-01:53
Minto	6.6%	7.9%	7.9%	-01:27	-02:13
Puslinch	21.0%	17.6%	4.2%	-01:47	-01:11
Wellington North	14.1%	12.0%	9.3%	-02:14	-02:20
Overall	5.9%	5.4%	2.8%	-00:42	-01:22

Response Performance by LTM under Recommendations

P4 90th percentile performance

Lower Tier Municipality	2024 Base Position	Difference compared to Base in year				
		2026	2028	2030	2032	2034
Centre Wellington	12:41	00:06	00:26	00:43	<u>-00:22</u>	-00:20
Erin	19:34	00:25	<u>-04:20</u>	-03:46	-03:26	-03:06
Guelph	10:58	<u>-00:35</u>	-00:37	-00:43	-00:38	<u>-00:40</u>
Guelph/Eramosa	17:57	-00:42	<u>-01:11</u>	-01:21	-01:22	-01:43
Mapleton	19:17	-00:51	00:02	00:07	-00:41	<u>-01:53</u>
Minto	17:00	-02:13	-02:07	<u>-02:27</u>	-02:20	-02:13
Puslinch	17:30	-00:15	-00:12	-00:12	<u>-01:01</u>	-01:11
Wellington North	17:33	-00:21	00:06	<u>-01:42</u>	-01:45	<u>-02:20</u>
Overall	14:46	-00:23	-00:38	-00:56	-01:11	-01:22

P4 8-minute performance

Lower Tier Municipality	2024 Base Position	Difference compared to Base in year				
		2026	2028	2030	2032	2034
Centre Wellington	61.8%	-0.2%	-1.1%	-1.6%	<u>8.2%</u>	7.6%
Erin	18.3%	0.1%	<u>19.2%</u>	18.7%	18.4%	18.2%
Guelph	69.0%	<u>4.7%</u>	4.6%	5.0%	4.4%	<u>4.4%</u>
Guelph/Eramosa	28.3%	0.2%	<u>4.2%</u>	5.7%	6.6%	9.3%
Mapleton	30.8%	1.9%	2.0%	2.4%	2.7%	<u>3.7%</u>
Minto	29.9%	4.9%	5.2%	<u>6.6%</u>	6.4%	6.6%
Puslinch	10.6%	0.1%	0.0%	0.0%	<u>19.2%</u>	21.0%
Wellington North	57.9%	-0.3%	-1.8%	<u>10.4%</u>	10.8%	<u>14.1%</u>
Overall	57.7%	2.9%	3.4%	4.2%	5.7%	5.9%

improvement compared to base

deterioration compared to base

station added in LTM

H Sensitivity Modelling

H1 Adding a post at Elora

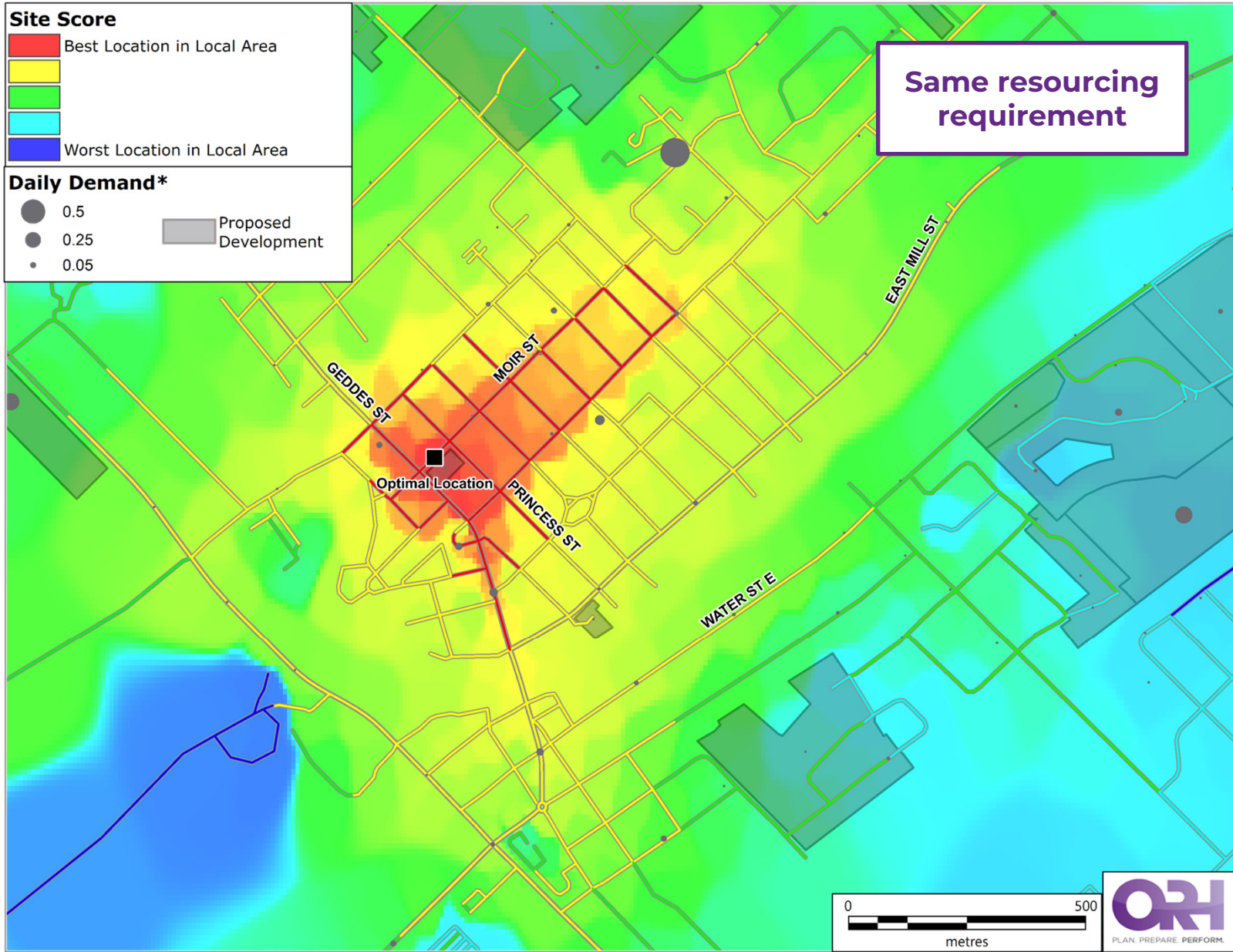
H2 Alternative Demand Projections

H3 Alternative Time at Hospital

H3a Alternate sample periods

H3b Performance and resourcing impacts

Sensitivity Modelling Scenario: Adding a post at Elora



Modelled Scenario

Lower Tier Municipality	% responded within X minutes			Mean	90th %ile
	8	10	15		
Centre Wellington	72.1%	83.5%	95.5%	07:05	11:49
Erin	36.6%	68.6%	88.3%	09:53	16:15
Guelph	73.6%	89.1%	97.9%	06:41	10:14
Guelph/Eramosa	37.9%	53.7%	85.8%	10:09	16:06
Mapleton	34.6%	50.3%	81.5%	10:39	17:28
Minto	36.5%	50.8%	91.3%	09:29	14:46
Puslinch	31.9%	49.9%	85.6%	10:26	16:11
Wellington North	72.0%	75.7%	89.3%	07:17	15:14
Overall	64.1%	78.9%	93.5%	07:42	13:14

Difference to proposed 2034 scenario

% responded within X minutes			Mean	90th %ile
8	10	15		
2.7%	0.8%	0.5%	-00:44	-00:32
0.1%	0.3%	0.3%	-00:03	-00:13
0.3%	0.2%	0.2%	-00:02	-00:03
0.3%	0.3%	0.6%	-00:05	-00:08
0.1%	0.7%	0.9%	-00:05	00:03
0.0%	0.0%	0.0%	00:00	00:00
0.3%	0.5%	0.2%	-00:04	-00:07
-0.1%	-0.1%	-0.1%	00:01	00:01
0.5%	0.3%	0.3%	-00:08	-00:10

Sensitivity Modelling Scenario: Alternative Demand Projections

Weekly Ambulance Hours

Station	2024 Base Position	Improve Perf. in 2034			Difference
		Low Growth	Core Projection	High Growth	
00 Elmira Rd North / Speedvale	252	336	336	336	84
02 Fergus	336	420	420	504	84
03 Clair Rd West	252	336	336	420	84
04 Mount Forest	168	252	252	252	84
05 Arthur	168	252	252	252	84
06 Harriston	168	252	252	252	84
07 Drayton	168	168	168	168	84
08 Rockwood	84	252	252	252	168
10 Hillsburgh	168	252	252	252	84
12 Gordon	504	588	588	588	84
Overall	2,268	3,108	3,108	3,276	840

P4 90th Percentile

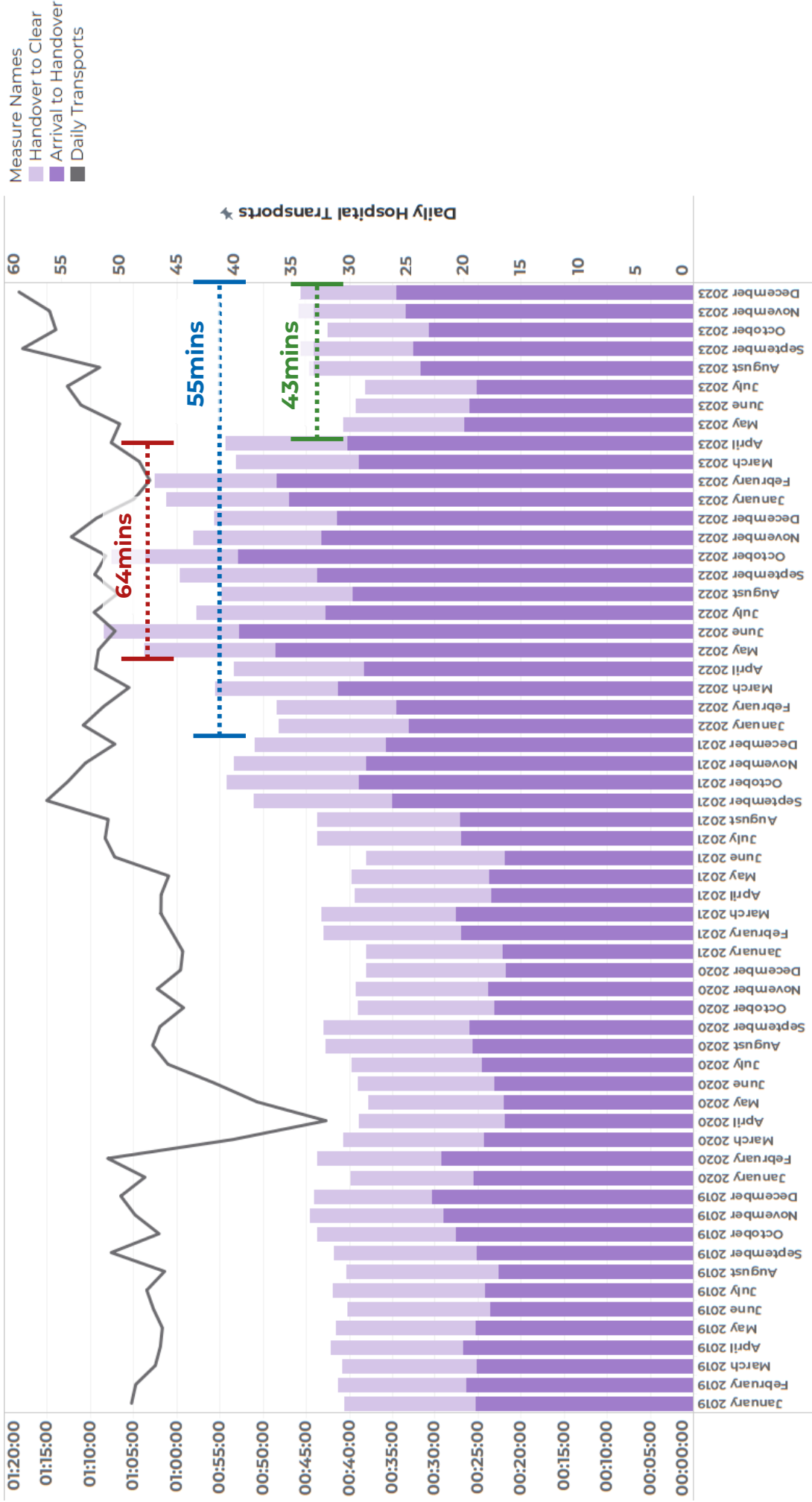
Lower Tier Municipality	2024 Base Position	Improve Perf. in 2034			Difference
		Low Growth	Core Projection	High Growth	
Guelph	10:58	10:05	10:17	10:25	-00:53
Centre Wellington	12:41	12:07	12:21	11:35	-00:34
Guelph/Eramosa	17:57	16:00	16:14	16:18	-01:57
Wellington North	17:33	15:06	15:13	15:22	-02:27
Minto	17:00	14:40	14:46	14:54	-02:20
Erin	19:34	15:59	16:28	17:07	-03:36
Puslinch	17:30	15:58	16:18	16:18	-01:32
Mapleton	19:17	17:17	17:24	17:42	-02:00
Overall	14:46	13:08	13:24	13:25	-01:38

Low Growth = 4.1% Increase per Yr.	Core Growth = 4.3% Increase per Yr.	High Growth = 5.3% Increase per Yr.
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Compared to proposed Target	
+60s below	below target
+60s above	above target

A **37%** & **44%** increase in ambulance hours

Sensitivity Modelling: Observing Changes to Time at Hospital



May to December 2023
43 minutes

2022 - 2023
55 minutes

May 2022 to April 2023
64 minutes

Sensitivity Modelling Scenario: Alternative Time at Hospital

Weekly Ambulance Hours

Station	2024 Base Position	Improve Perf. in 2034			Difference
		Low Assumption	Core Assumption	High Assumption	
00 Elmira Rd North / Speedvale	252	336	336	336	84
02 Fergus	336	420	420	420	84
03 Clair Rd West	252	252	336	420	84
04 Mount Forest	168	252	252	252	84
05 Arthur	168	168	252	252	84
06 Harriston	168	252	252	252	84
07 Drayton	168	168	168	168	84
08 Rockwood	84	252	252	252	168
10 Hillsburgh	168	252	252	252	84
12 Gordon	504	588	588	588	84
Overall	2,268	2,940	3,108	3,192	672

P4 90th Percentile

Lower Tier Municipality	2024 Base Position	Improve perf. in 2034			Difference
		Low Assumption	Core Assumption	High Assumption	
Guelph	10:58	10:06	10:17	10:15	-00:52
Centre Wellington	12:41	11:50	12:21	12:39	-00:50
Guelph/Eramosa	17:57	16:03	16:14	16:10	-01:54
Wellington North	17:33	15:38	15:13	15:28	-01:55
Minto	17:00	14:36	14:46	14:55	-02:24
Erin	19:34	15:34	16:28	16:58	-04:00
Puslinch	17:30	16:03	16:18	16:01	-01:27
Mapleton	19:17	17:32	17:24	17:49	-01:45
Overall	14:46	13:09	13:24	13:28	-01:57

Low Assumption = 43 minutes	Core Assumption = 55 minutes	High Assumption = 64 minutes
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Compared to proposed Target	
+60s below	below target
+60s above	above target

A **30%**, **37%** & **41%** increase in ambulance hours