



Comprehensive Deployment and Base Review of Paramedic Services

Final Report

July 2, 2020

Agenda

- Introduction
- Current Service Profile
- Demand Projections
- Model Validation and Base Position
- Station Location Optimization
- Future Demand Modelling
- Phasing

Introduction

Objective

Perform a **Comprehensive Deployment and Base Review** to develop a plan for the delivery of Paramedic Services, encompassing a ten-year time period of **2019 to 2029.**

Deliverables

Ambulance call
forecasts

Response time
targets

Resource
requirements

Facilities model



ORH helps emergency services around the world to optimize resource use and respond in the most effective and efficient way.



Current Service Profile

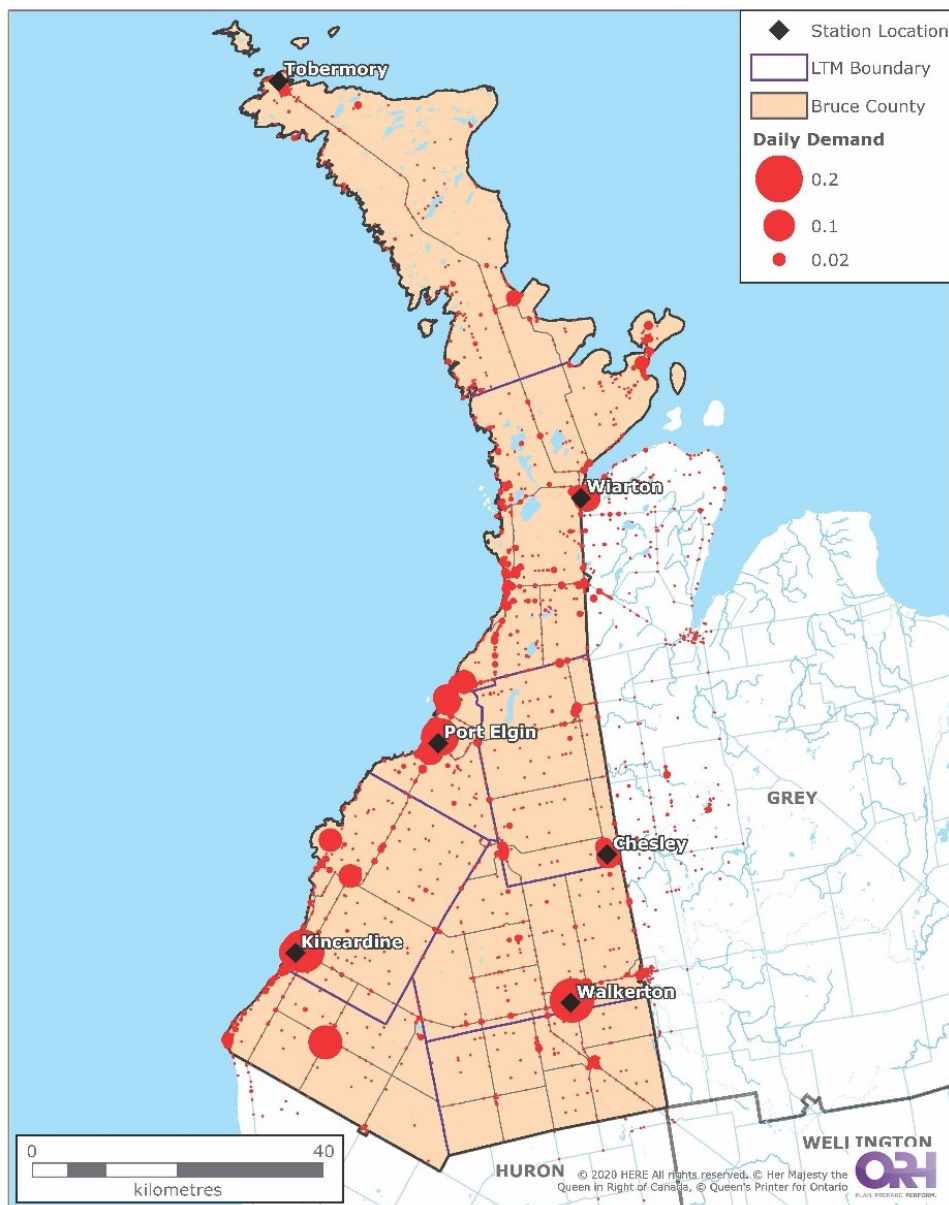
Demand

Average Daily Incidents

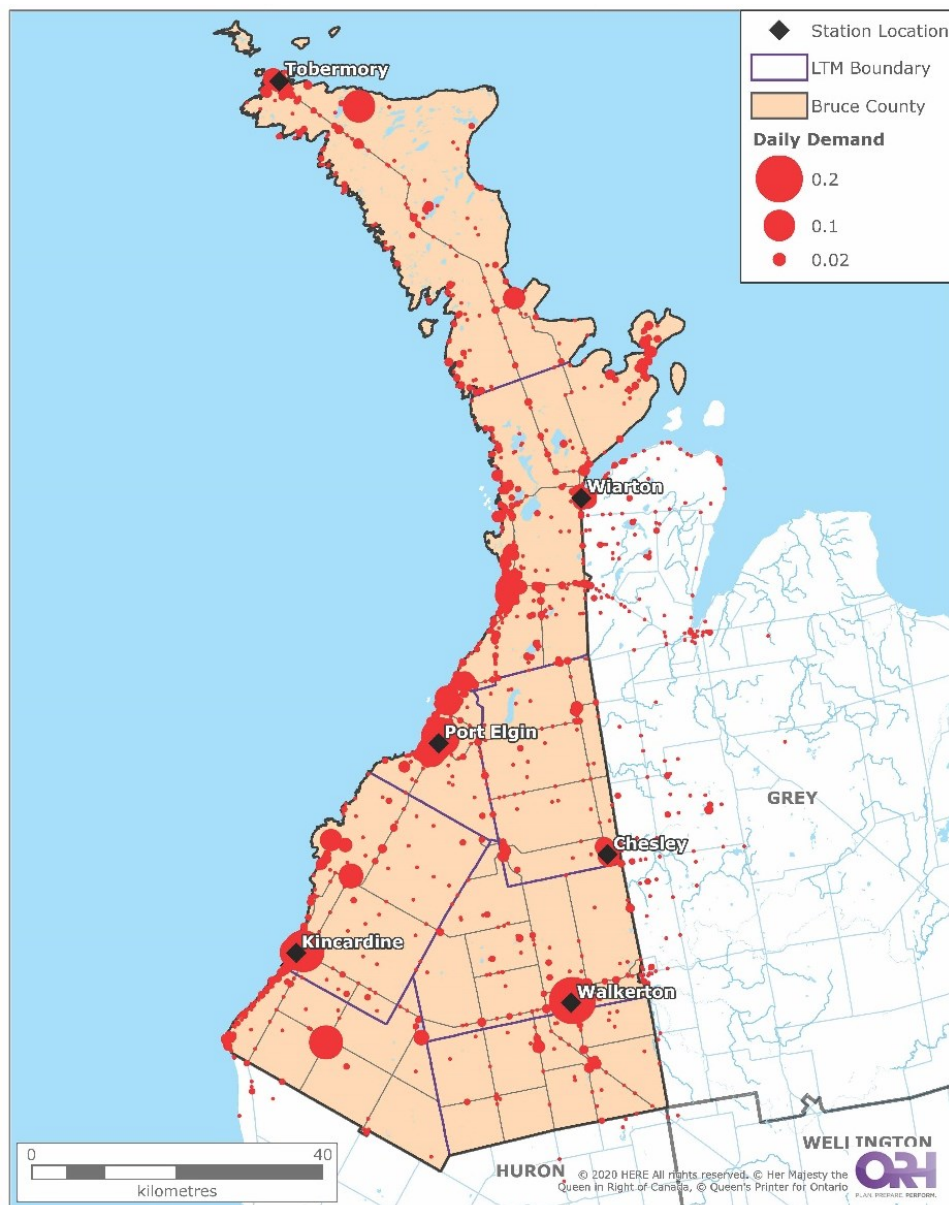
LTM	BCPS Responded	% by LTM	Non-BCPS Responded
Arran-Elderslie	1.2	7.1%	0.2
Brockton	2.4	13.9%	1.0
Huron-Kinloss	0.8	4.5%	0.6
Kincardine	3.1	17.5%	
Northern Bruce Peninsula	1.2	6.9%	
Saugeen Shores	3.7	21.0%	
South Bruce	0.3	1.9%	0.2
South Bruce Peninsula	3.5	19.9%	0.04
Out of Area	1.3	7.4%	
Overall	17.5	100.0%	2.0

P4	P3	P2	P1
55.7%	38.7%	0.7%	4.9%

Off-Peak (mid-Sep to mid-Jun)

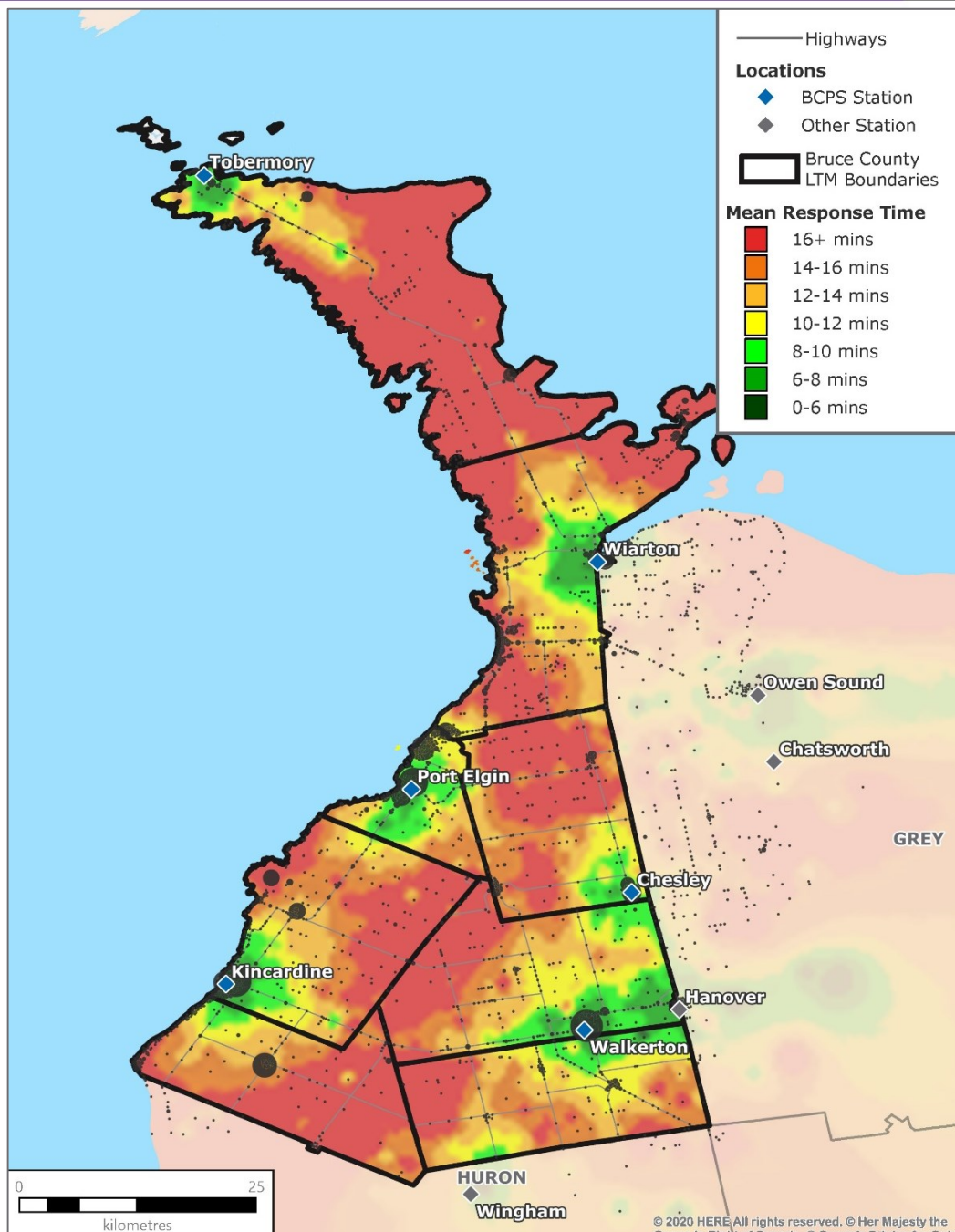


Peak (mid-Jun to mid-Sep)



Mean Response Time (P4 Non-Transfer)

BCPS met or exceeded almost all CTAS targets at County-wide level.



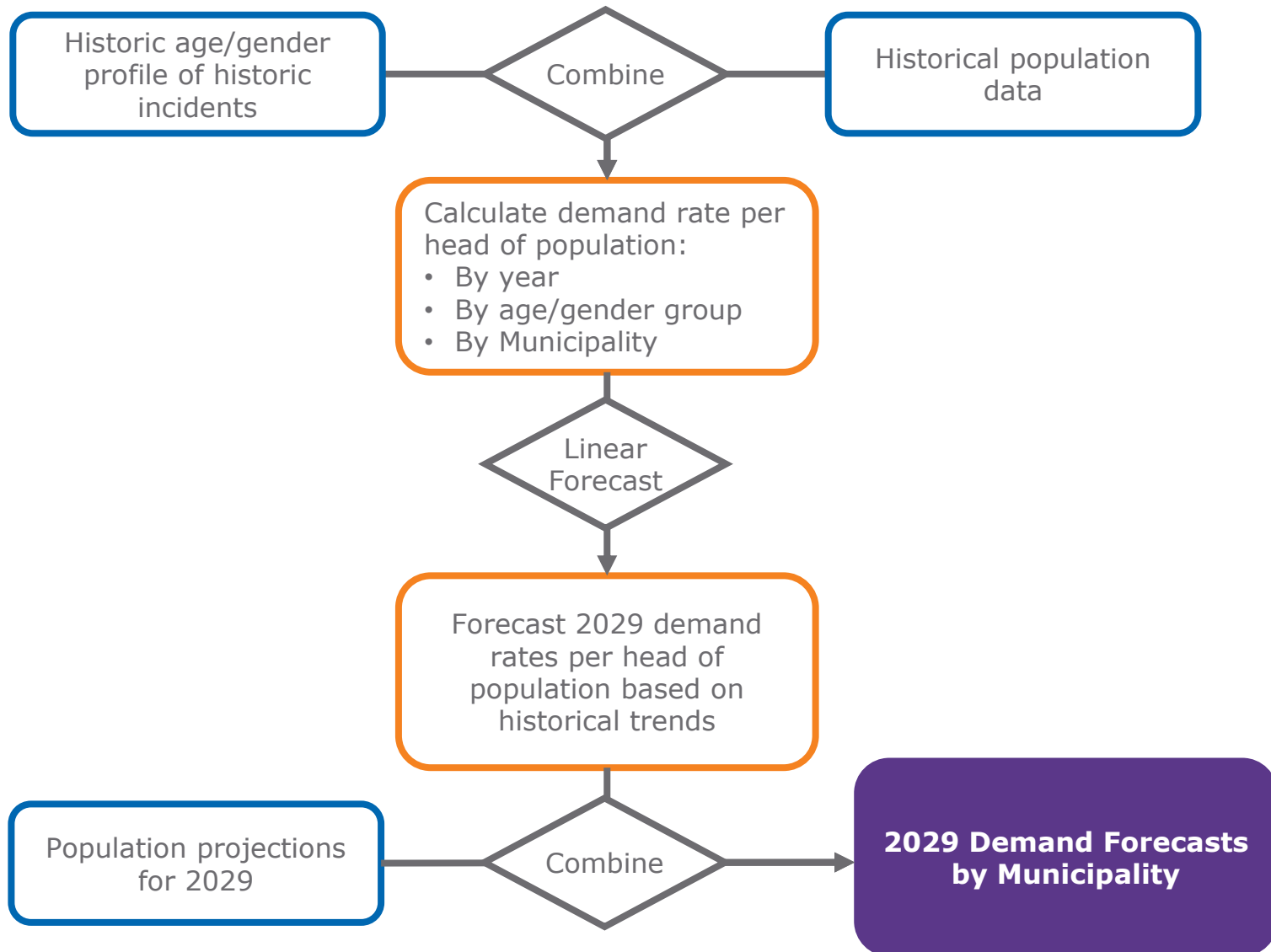
Resource Levels

Station	Weekly Vehicle Hours	Utilization	
		P1 to P4	P1 to P4 + P8
Chesley	168	9.3%	23.4%
Kincardine	168	13.7%	15.6%
Port Elgin	168	13.7%	20.4%
Tobermory	168	3.1%	5.8%
Walkerton	210	9.5%	20.2%
Warton	210	13.2%	17.3%
Overall	1,092	10.7%	17.0%

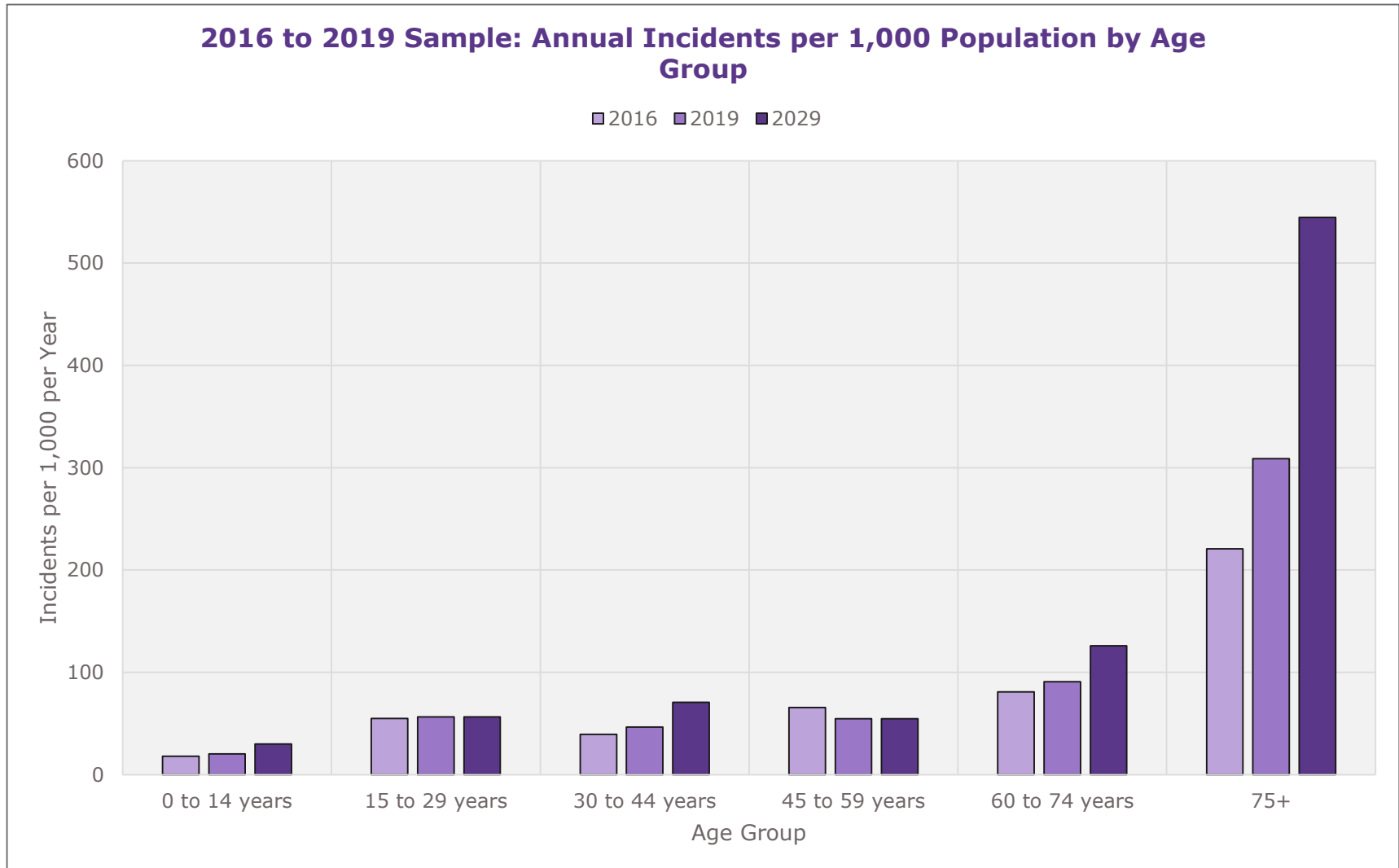
168 hours per week = 24/7 vehicle

Demand Projections

Population-based Projection Method



Demand Rates



Demand Projection

Average Annual Demand Increase by Projection Option

Area	Average Annual Demand Increase		
	Lower Bound	Upper Bound	Core Projection
Arran-Elderslie	3.5%	8.5%	6.0%
Brockton	4.9%	8.0%	6.4%
Huron-Kinloss	4.8%	8.3%	6.6%
Kincardine	4.8%	2.9%	3.8%
Northern Bruce Peninsula	2.9%	4.7%	3.8%
Saugeen Shores	4.0%	7.9%	5.9%
South Bruce	4.5%	9.3%	6.9%
South Bruce Peninsula	3.1%	5.6%	4.4%
Bruce County	4.0%	6.5%	5.3%

Core Projection: Incidents per Day

Area	Incidents per Day		
	2020	2029	Difference
Arran-Elderslie	1.4	2.4	0.9
Brockton	2.6	4.3	1.8
Huron-Kinloss	0.9	1.6	0.7
Kincardine	3.0	4.2	1.2
Northern Bruce Peninsula	1.4	1.9	0.5
Saugeen Shores	4.3	7.2	2.9
South Bruce	0.4	0.7	0.3
South Bruce Peninsula	3.8	5.6	1.8
Bruce County	17.7	27.8	10.1

Model Validation and Base Position

AmbSim

- AmbSim is a discrete event **simulation model** which simulates the entire life-cycle of emergency incidents.
- The model is set up based on **analyzed** demand, resources, performance, and other operational parameters.
- Once validated AmbSim is a **virtual replica** of BCPS operations and can be used to test 'what if' scenarios.

2020 Base Position

Utilization: 11.8%

LTM	P4 Performance				
	8-minute	10-minute	15-minute	Average	90th Percentile
Arran-Elderslie	40.2%	44.6%	61.6%	11:39	19:47
Brockton	75.4%	82.5%	93.6%	06:42	12:57
Huron-Kinloss	5.8%	14.3%	47.8%	15:19	20:35
Kincardine	61.8%	67.5%	83.9%	08:55	17:54
Northern Bruce Peninsula	25.4%	30.3%	38.0%	17:50	28:35
Saugeen Shores	55.6%	72.3%	90.4%	08:33	14:47
South Bruce	11.3%	43.1%	82.1%	11:31	16:44
South Bruce Peninsula	33.5%	38.9%	58.8%	12:51	22:51
Out of Area	22.0%	32.4%	62.1%	13:20	21:43
Bruce County	45.2%	54.5%	73.0%	10:54	21:07

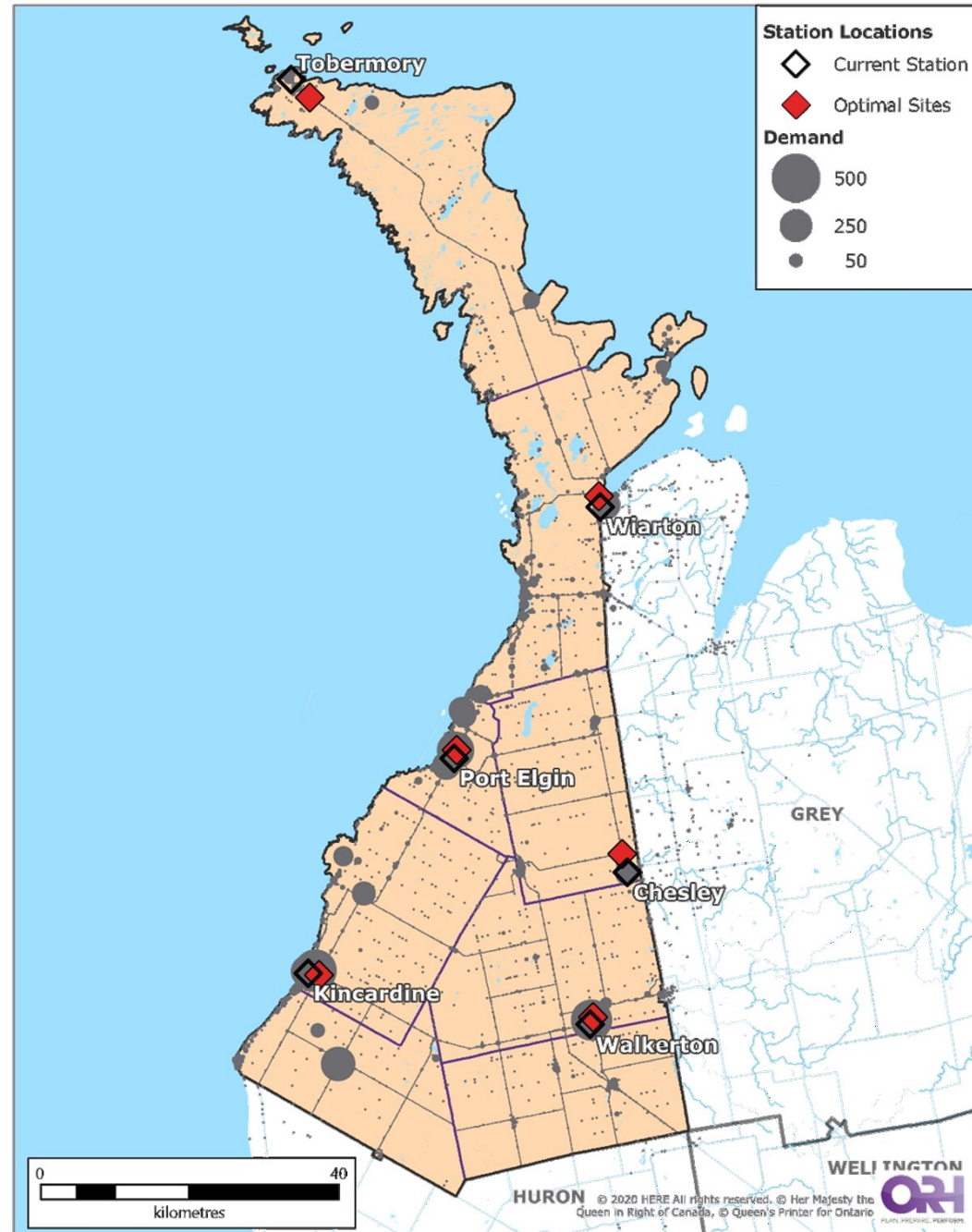
Station Location Optimization

Location Optimization

- ORH's location optimization model used to assess station configuration using 2019 demand levels.
- 'Blank canvas' modelling indicated County stations are close to optimally located.
- The following additional or relocated sites were identified:
 - Port Elgin station relocating north to MacKenzie Road (for capacity and condition reasons).
 - Response posts at Holyrood, Sauble Beach and Ferndale.

Blank Canvas Optimization BCPS Demand

Existing stations are well located.



Additional Site Optimization

BCPS Demand

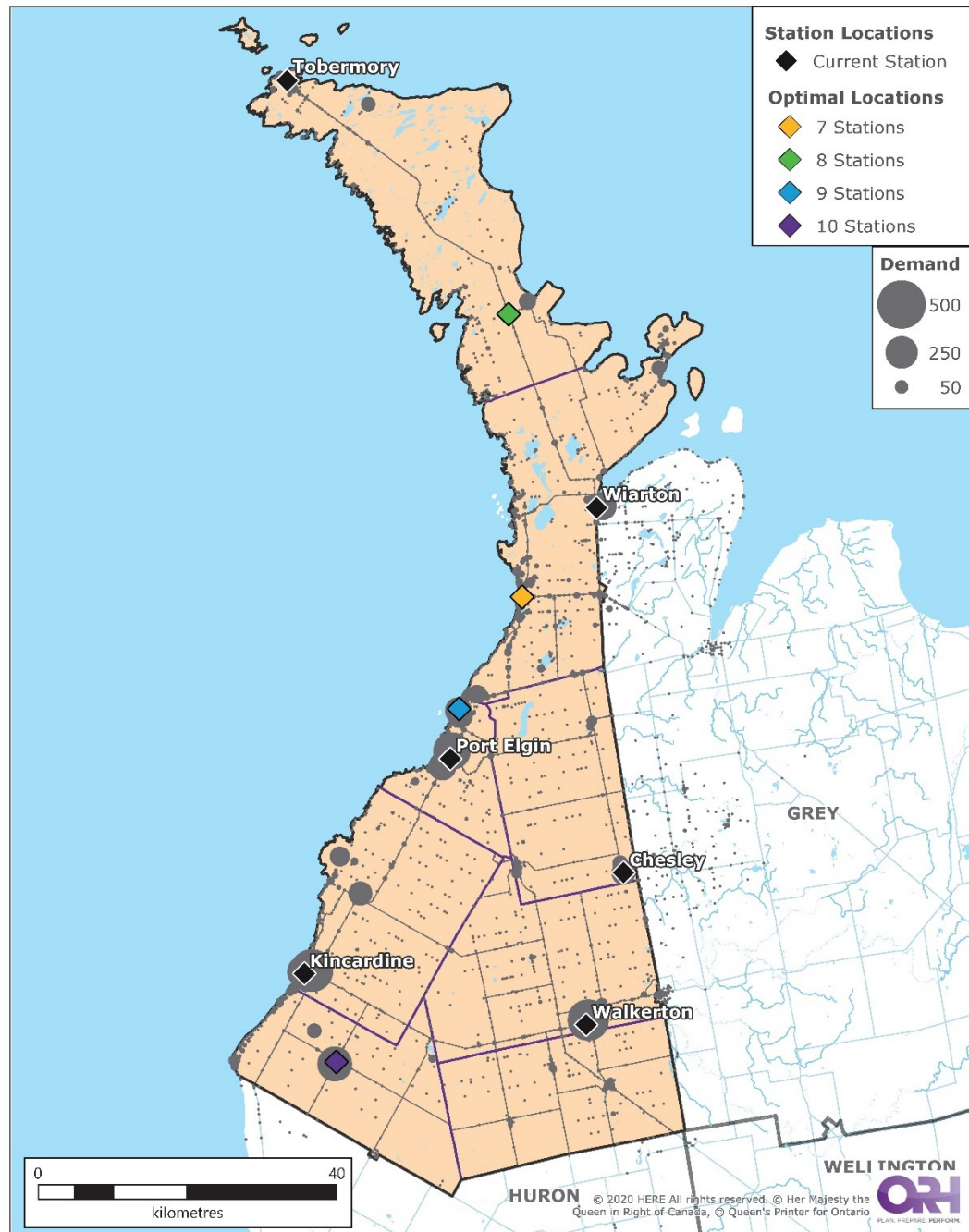
Additional sites found at:

Sauble Beach

Ferndale

Southampton

Ripley



Additional Site Optimization

Bruce Demand

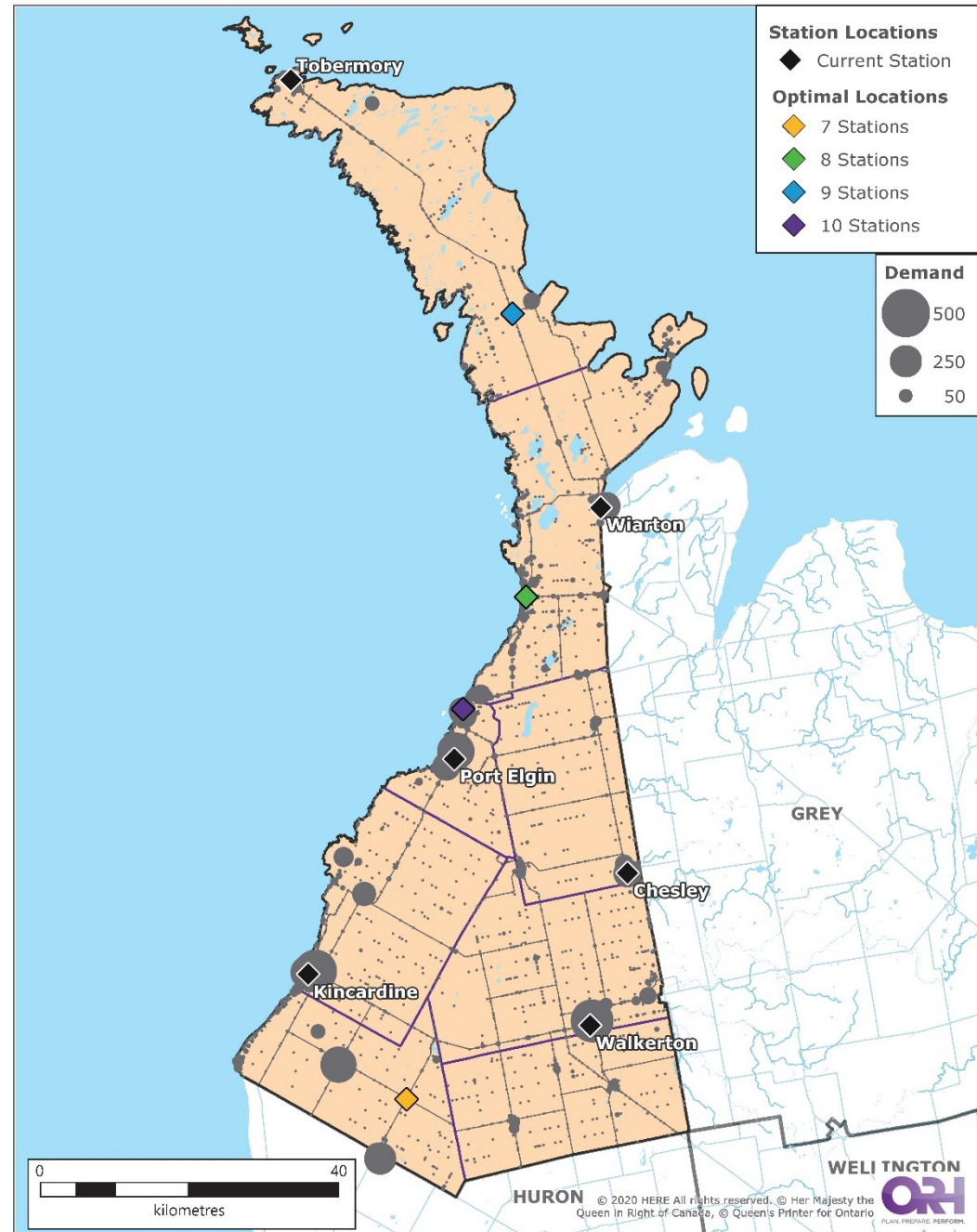
Additional sites found at:

Holyrood

Sauble Beach

Ferndale

Southampton



Future Demand Modelling

Future Demand Assumptions

- P3 and P4 demand uplifted by LTMs according to lower and upper bounds, core projection taken as mid-point (5.3% average annual increase).
- P1 and P2 demand assumed to remain at current levels.
- Out of Area demand assumed to increase at the overall rate.
- All other parameters, including vehicle deployments and hospitals, remain unchanged.

'Do Nothing' Core Projection

LTM	P4 Performance				
	8-minute	10-minute	15-minute	Average	90th Percentile
Arran-Elderslie	47.6%	52.8%	74.5%	10:13	18:30
Brockton	76.8%	84.3%	95.1%	06:18	12:18
Huron-Kinloss	7.2%	31.3%	60.6%	14:49	25:31
Kincardine	62.2%	68.3%	85.0%	08:38	17:07
Northern Bruce Peninsula	26.2%	31.5%	40.4%	17:15	28:11
Saugeen Shores	68.8%	77.9%	90.5%	08:21	14:44
South Bruce	12.6%	45.7%	85.7%	10:53	16:05
South Bruce Peninsula	43.2%	53.3%	68.7%	11:06	21:33
Out of Area	22.5%	33.3%	64.8%	12:42	20:55
Bruce County	50.0%	60.4%	77.0%	10:16	20:22

Utilization: 15.3%

Difference to 2020 Base Position

LTM	P4 Performance				
	8-minute	10-minute	15-minute	Average	90th Percentile
Arran-Elderslie	7.4%	8.2%	12.8%	-01:25	-01:17
Brockton	1.4%	1.8%	1.5%	-00:24	-00:39
Huron-Kinloss	1.4%	16.9%	12.8%	-00:30	04:56
Kincardine	0.4%	0.8%	1.1%	-00:17	-00:47
Northern Bruce Peninsula	0.7%	1.3%	2.4%	-00:35	-00:24
Saugeen Shores	13.2%	5.6%	0.1%	-00:12	-00:03
South Bruce	1.3%	2.6%	3.7%	-00:38	-00:39
South Bruce Peninsula	9.7%	14.4%	9.9%	-01:44	-01:17
Out of Area	0.5%	0.9%	2.6%	-00:38	-00:48
Bruce County	4.9%	5.9%	4.0%	-00:38	-00:45

Maintaining Performance: All LTMs

- Target: to maintain 2020 Base Position P4 performance (minute targets, average and 90th percentile) **by LTM**
- To achieve this, the following changes were made:
 - Sauble Beach response post introduced with 10:00-22:00 shift off-peak and 14:00-02:00 shift peak only (mid-June to mid-September).
 - Holyrood response post introduced with 07:00-19:00 shift (move hours from Walkerton/Wiarton split shift).
 - Port Elgin moves to MacKenzie Road.
 - Additional 09:30-21:30 at Kincardine, 10:00-22:00 at Port Elgin and 09:00-21:00 at Ferndale post (peak only).

Additional 336 vehicle hours per week in peak (+31%), 252 hours in off-peak (+23%)

Deployment Summary

Weekly Vehicle Hours

Station	Base Position	Maintaining Performance	
		Peak	Off-Peak
Chesley	168	168	168
Kincardine	168	252	252
Port Elgin	168	252	252
Port Elgin (Sauble Beach)	-	84	84
Tobermory	168	168	168
Walkerton	210	168	168
Walkerton (Holyrood)	-	84	84
Warton	210	168	168
Warton (Ferndale)	-	84	-
Total	1,092	1,428	1,344

Performance Summary

LTM	P4 Performance				
	8-minute	10-minute	15-minute	Average	90th Percentile
Arran-Elderslie	47.6%	52.8%	74.5%	10:13	18:30
Brockton	76.8%	84.3%	95.1%	06:18	12:18
Huron-Kinloss	7.2%	31.3%	60.6%	14:49	25:31
Kincardine	62.2%	68.3%	85.0%	08:38	17:07
Northern Bruce Peninsula	26.2%	31.5%	40.4%	17:15	28:11
Saugeen Shores	68.8%	77.9%	90.5%	08:21	14:44
South Bruce	12.6%	45.7%	85.7%	10:53	16:05
South Bruce Peninsula	43.2%	53.3%	68.7%	11:06	21:33
Out of Area	22.5%	33.3%	64.8%	12:42	20:55
Bruce County	50.0%	60.4%	77.0%	10:16	20:22

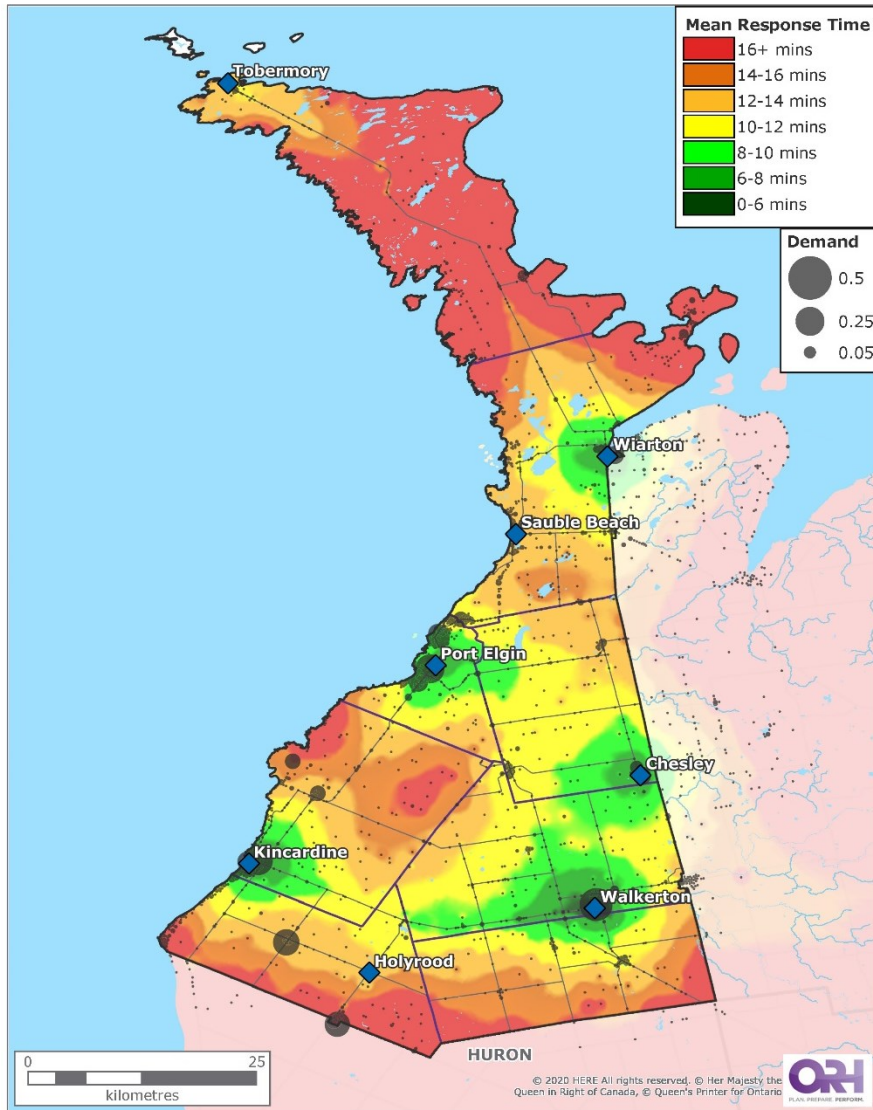
Utilization: 14.8%

Difference to 2020 Base Position

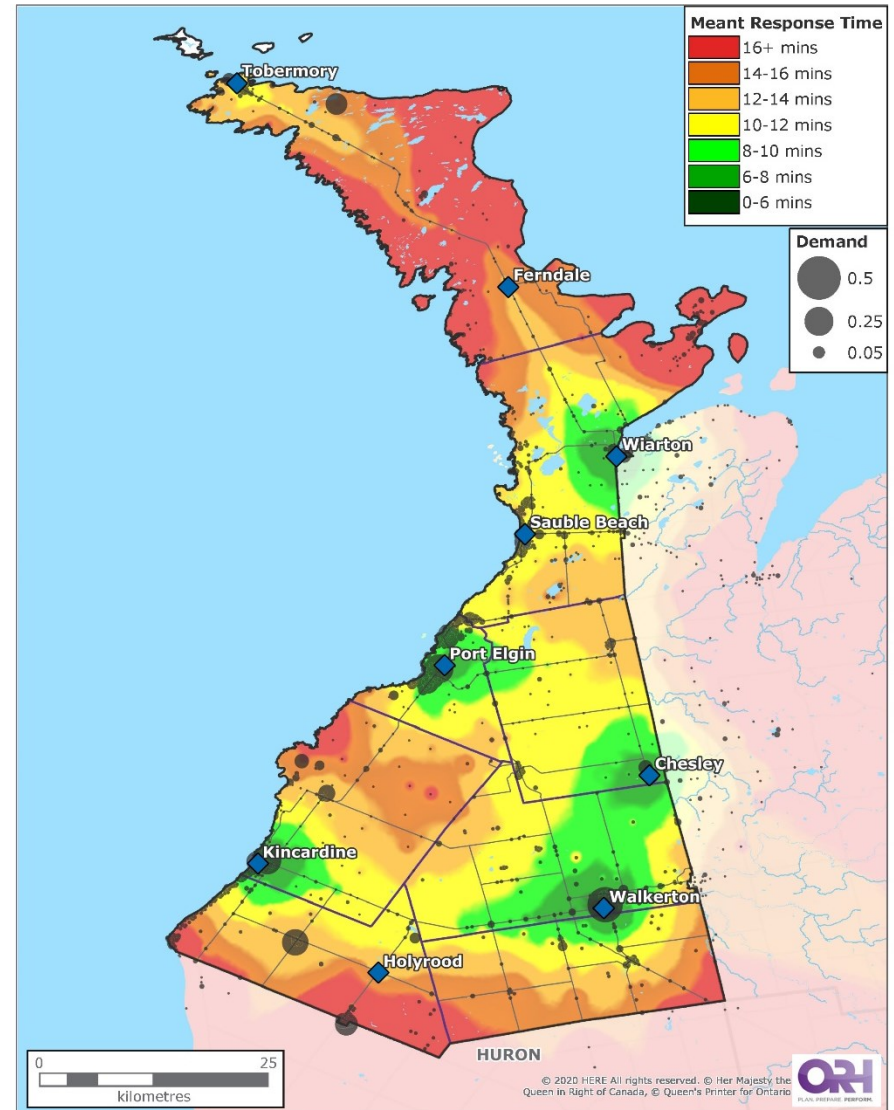
LTM	P4 Performance				
	8-minute	10-minute	15-minute	Average	90th Percentile
Arran-Elderslie	7.4%	8.2%	12.8%	-01:25	-01:17
Brockton	1.4%	1.8%	1.5%	-00:24	-00:39
Huron-Kinloss	1.4%	16.9%	12.8%	-00:30	04:56
Kincardine	0.4%	0.8%	1.1%	-00:17	-00:47
Northern Bruce Peninsula	0.7%	1.3%	2.4%	-00:35	-00:24
Saugeen Shores	13.2%	5.6%	0.1%	-00:12	-00:03
South Bruce	1.3%	2.6%	3.7%	-00:38	-00:39
South Bruce Peninsula	9.7%	14.4%	9.9%	-01:44	-01:17
Out of Area	0.5%	0.9%	2.6%	-00:38	-00:48
Bruce County	4.9%	5.9%	4.0%	-00:38	-00:45

Mean Response Time (P4 Non-Transfer)

Off-Peak



Peak



Potential Station Capacity Issues

- Space will be required for crews to take breaks at each of the post locations: Sauble Beach, Holyrood and Ferndale.
- New Port Elgin site would need at least four vehicle bays to accommodate current 24/7 ambulance, additional shifts at Port Elgin and Sauble Beach, and spare vehicle.
- Kincardine spare vehicle would be displaced by additional shift (potentially to Walkerton).
- Potential for Ferndale additional vehicle to be based at Wiarton or outside Tobermory station during summer months.
- Walkerton would need to accommodate existing 24/7 ambulance and Holyrood shift, plus existing spare vehicle and another from Kincardine.

Sensitivity Modelling

Sensitivity modelling was undertaken to test parameters included in the core modelling scenarios, including:

- Assuming the upper and lower bound demand projections.
- Modelling 2028 demand (assuming no growth for 2020).
- Increased 'treat and release'.
- Improving performance above 2020 levels.
- Inclusion of future developments.
- Alternative Huron-Kinloss and Neyaashiinigmiing 27 (Cape Croker) options.

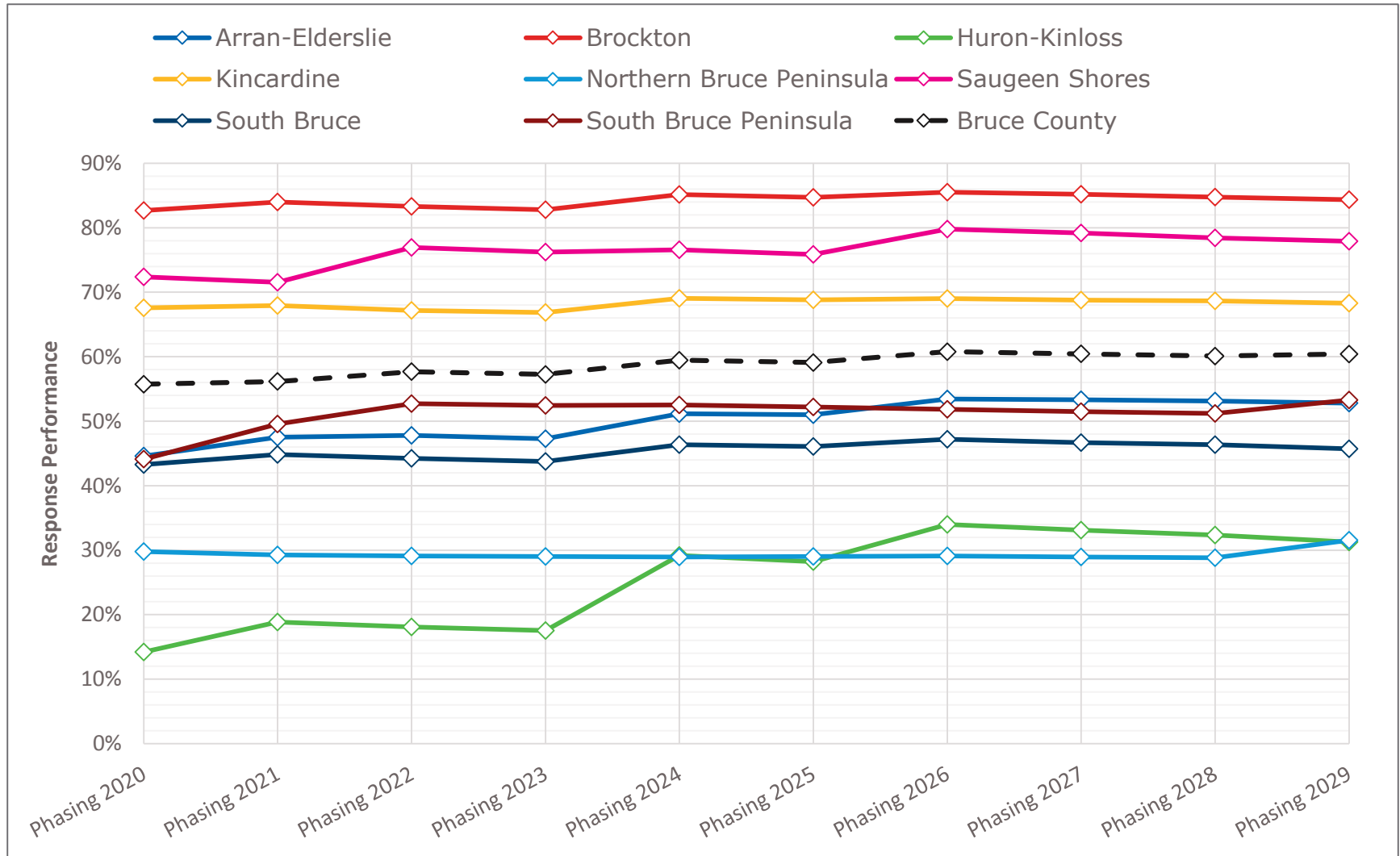
Phasing



Recommended Phasing

Year	Peak	Off-Peak
2020	Add 12-hour Sauble Beach shift (14:00 to 02:00)	No change
2021	<i>No change</i>	Add 12-hour Sauble Beach shift (10:00 to 22:00)
	Move Wiarton/Walkerton split shift to Holyrood (07:00 to 19:00)	
2022	Move Port Elgin station to Mackenzie Road site.	
2023	<i>No change</i>	
2024	Add 12-hour Kincardine shift (09:30 to 21:30).	
2025	<i>No change</i>	
2026	Add 12-hour Port Elgin shift (10:00 to 22:00).	
2027	<i>No change</i>	
2028	<i>No change</i>	
2029	Add 12-hour Ferndale shift (09:00 to 21:00).	<i>No change</i>

10-minute Performance by LTM



Questions?



Find Out More

- You can find out more about our range of services at:

www.orhltd.com

- If you would like to talk to one of our consultants please call:

+44(0)118 959 6623

- Or click:

orh@orhltd.com

- Alternatively write to us at:

ORH, 3 Queens Road,

Reading, Berkshire RG1 4AR, UK

