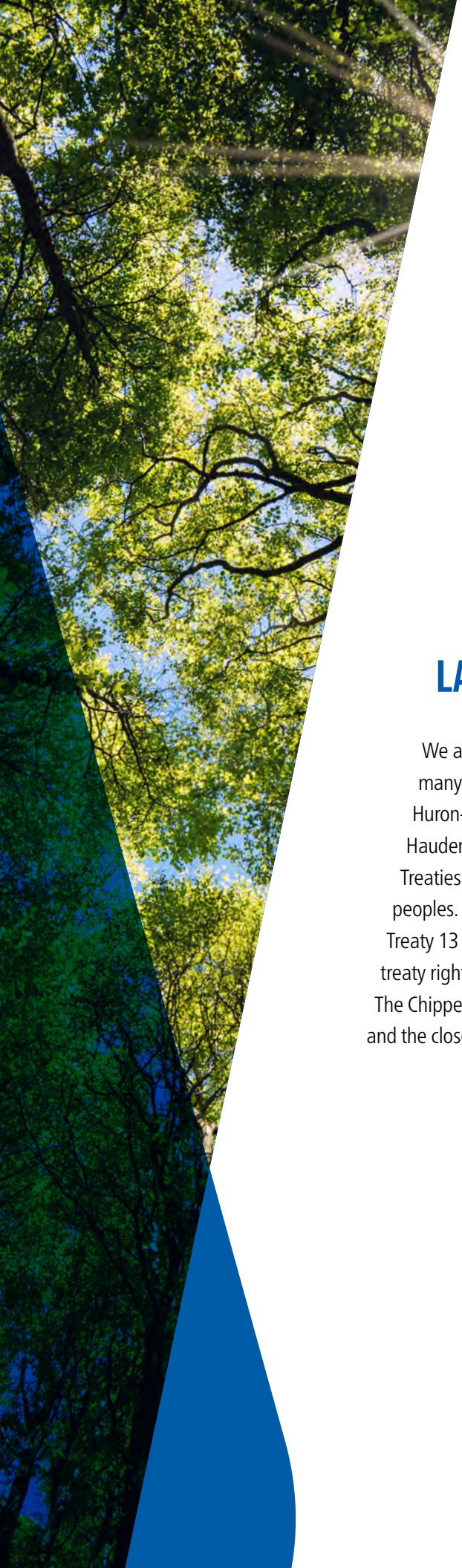
YORK REGION PARAMEDIC SERVICES MASTER PLAN 2021 TO 2031

York Region PARAMEDIC SERVICES



LAND ACKNOWLEDGMENT

We acknowledge York Region is located on the traditional territory of many Indigenous peoples such as the Anishinaabe, Haudenosaunee, Huron-Wendat and Métis peoples and the treaty territories of the Haudenosaunee, Mississaugas of the Credit First Nation and Williams Treaties First Nations. This land is now home to many diverse Indigenous peoples. York Region is located within the boundaries of the Nanfan Treaty, Treaty 13 and the Williams Treaties. There are also other land claims and treaty rights involving portions of York Region that have not been resolved. The Chippewas of Georgina Island First Nation is a Williams Treaty First Nation and the closest First Nation community to York Region.

Mayor
Frank Scarpitti
City of Markham

Regional Councillor
Don Hamilton
City of Markham

Regional Councillor
Jack Heath
City of Markham

Regional Councillor
Joe Li
City of Markham

Regional Councillor
Jim Jones
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Mayor
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City of Vaughan

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A Message from York Region Chairman and CEO and Members of Regional Council

Paramedics are an integral part of the health care system and a key partner in achieving York Region's commitment to strong, caring and safe communities.

As York Region's population continues to grow and age, the demand for paramedic services is also projected to increase by approximately 7% each year from now through to 2031.

The *York Region Paramedic Services Master Plan, 2021-2031* is the long-term plan providing data and insight to what is required to ensure we can continue providing excellent paramedicine care to residents across our nine cities and towns.

The plan also highlights the importance of innovation and partnerships needed for continued financial sustainability of this critical service.

This long-term plan is a proactive approach to future planning and was developed with experts in emergency services. It will help enable Paramedic Services to adequately plan future demand of emergency services while maintaining balanced and efficient 9-1-1 response times.

Mayor
Margaret Quirk
Town of Georgina

Regional Councillor
Robert Grossi
Town of Georgina

Mayor
Tom Mrakas
Town of Aurora

Mayor
Virginia Hackson
Town of East Gwillimbury

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Town of Whitchurch-Stouffville

YORK REGION
PARAMEDIC SERVICES
MASTER PLAN, 2021 TO 2031

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Chief's Message

On behalf of York Region Paramedic Services, I am pleased to present our Paramedic Services Master Plan 2021 – 2031. The Master Plan highlights the evolving demands in emergency services and provides a foundation for Paramedic Services to build capacity and respond effectively over the next 10 years.

As Paramedic Services has become an integral part of the health care system, improving access to care by collaborating with and linking patients to primary and community care to ensure their needs are met, it is important to build and sustain our capacity to meet the future needs of patients.

The commitment and perseverance of our Service members, the support of Regional Council, and the collaboration with our community partners have enabled us to continue providing the high level of service for which we are known.

Despite the challenges faced during the COVID-19 Pandemic, our Service members continue to serve the community with dedication and compassion. We continue to meet Provincially legislated and Council approved response times despite increased demand. I am very proud of every member of our organization – it is through their outstanding commitment and skill that York Region Paramedic Services continues to provide world class Paramedic service every day. This Master Plan will provide the direction to continue to provide this level of service in the future.

Sincerely,

Chris Spearen,
Chief
York Region Paramedic Services

INTRODUCTION

The Changing Landscape of Emergency Services

The role of paramedics, which has historically been viewed as emergency response and transportation, has expanded to include a range of community-based health and social services that are improving access to care services by linking patients to primary and community care.

As delivery of emergency services continues to evolve, and York Region's population grows and diversifies, York Region paramedics are responding to more incidents and complex calls than ever before. Planning for the future requires emphasis on coordinated and connected care that puts patients first, while being efficient to mitigate costs.

Purpose of the Paramedic Services Master Plan 2021 to 2031

York Region Paramedic Services uses multi-year plans and evidence to guide decision making on the allocation of staff, vehicles, and station locations for York Region, to maintain a high level of service and meet response time standards.

The Paramedic Services Master Plan 2021-2031 was developed to ensure Paramedic Services can meet York Region's growing demand and sustain current service levels up to 2031. The 2020 Demand and Capacity Study forecasted population growth, demographic trends and the evolution of demand in the Region. Against this backdrop, development of the Master Plan included detailed analysis of potential response time performance, considering factors such as roadway networks, urban development, travel time, and community resources.

The purpose of the Master Plan is to identify the future staffing, fleet and station resources required to respond to 911 demand and the needs of the Region's growing and aging population, equitably and consistently across all local municipalities. Realization of these resources depends on the Region's budget process, availability of Provincial funding and actual population growth and forecasts in the Regional Official Plan. The Master Plan also identifies opportunities and potential opportunities to mitigate costs.

Assessing the resources needed requires setting a standard for performance. After detailed analysis including modelling scenarios, this Master Plan uses a performance standard of responding to Priority 4 (life threatening) incidents in eight minutes or less, 70% of the time, regardless of the local municipality where the 911 call originated from. This standard is in line with Provincially legislated and Council approved response time targets (see Table 1 page 10 for details on the Canadian Triage Acuity Scale).

While considerable infrastructure is required to operate a world class service, such as stations, ambulances and specialized equipment, at its core, effective paramedicine requires highly qualified and compassionate staff. The Master Plan will also be used to help guide workforce development, staff retention and the well-being needs of paramedics.

Resource Needs

This Master Plan identifies the need for an additional $62.3 million in gross, and an estimated $31.15 million net investment (based on a 50% land ambulance grant funding assumption) over the period from 2023 to 2031 (approximately $3.46 million in annual net operating budget) to fund 305 additional frontline paramedics, 39 program support positions (total 344 full-time equivalent staff) and other program operating costs. Further, capital expenditures in the amount of $27.2 million have been identified to fund the additional stations, ambulances, special response units and logistics vehicle. Resource needs for 2021 and 2022 are already accounted for in the current budget cycle. Paramedic Services completed the 2020 Demand and Capacity Study to cover the period of 2021 to 2031 to understand increases in demand and resource needs. Instead of adding staff to cover resource gaps, the Rapid Response Unit program was converted to ambulances and one 24-hour ambulance was added to cover the demand increase in 2022.

Since 2011, York Region Paramedic Services has been working with experts in emergency services to plan for the future demands of emergency services in the Region while supporting response time performance. Previous Master Plan updates using the consultant's modeling have proven to accurately reflect demand and place the Region's stations in the right locations to meet the needs of residents, as well as plan for growth trends.

CURRENT LEVEL OF SERVICE

York Region has a population of 1.2 million residents and covers 1,778 square kilometres, stretching from Toronto to Lake Simcoe. It comprises nine local municipalities with a range of cities, towns, villages, and rural areas. It includes the Chippewas of Georgina Island First Nation which is located on the east shore of Lake Simcoe comprised of three islands: Snake, Fox, and Georgina.

Currently there are 26 Paramedic Services Response Stations located across York Region. Five additional stations are to be built between 2022 to 2026, and two existing stations will be replaced with new, larger stations to address and expand service capacity. By 2026, there will be a total of 32 paramedic stations, including the headquarters building located at 80 Bales Drive East in Sharon, Town of East Gwillimbury.

York Region Paramedic Services staffing levels in 2021 were 556 permanent full-time equivalents, including front-line staff (478) and those vital to operations such as professional practice, scheduling and administration (78).

York Region Paramedic Services currently operates 34 ambulances 24 hours a day and an additional 10 ambulances 12 hours a day. At peak hours, 12 p.m. to 12 a.m., there are 44 ambulances staffed. In addition, the service has four Special Response Unit vehicles, five Paramedic Superintendent response vehicles and one Multi-Patient Unit that are operational 24-hours a day.

Response Times

Paramedic resources and facilities are planned and located to enable York Region Paramedic Services to respond to 911 demand within Provincially legislated and Council approved response times.

The Canadian Triage Acuity Scale (CTAS) is a five-level tool used to assess the severity of a patient's condition and the need for timely care. CTAS level 1 is the most severe (resuscitation) and CTAS level 5 is the least severe (non-urgent). Table 1 provides response time targets for sudden cardiac arrests and each CTAS level for York Region.

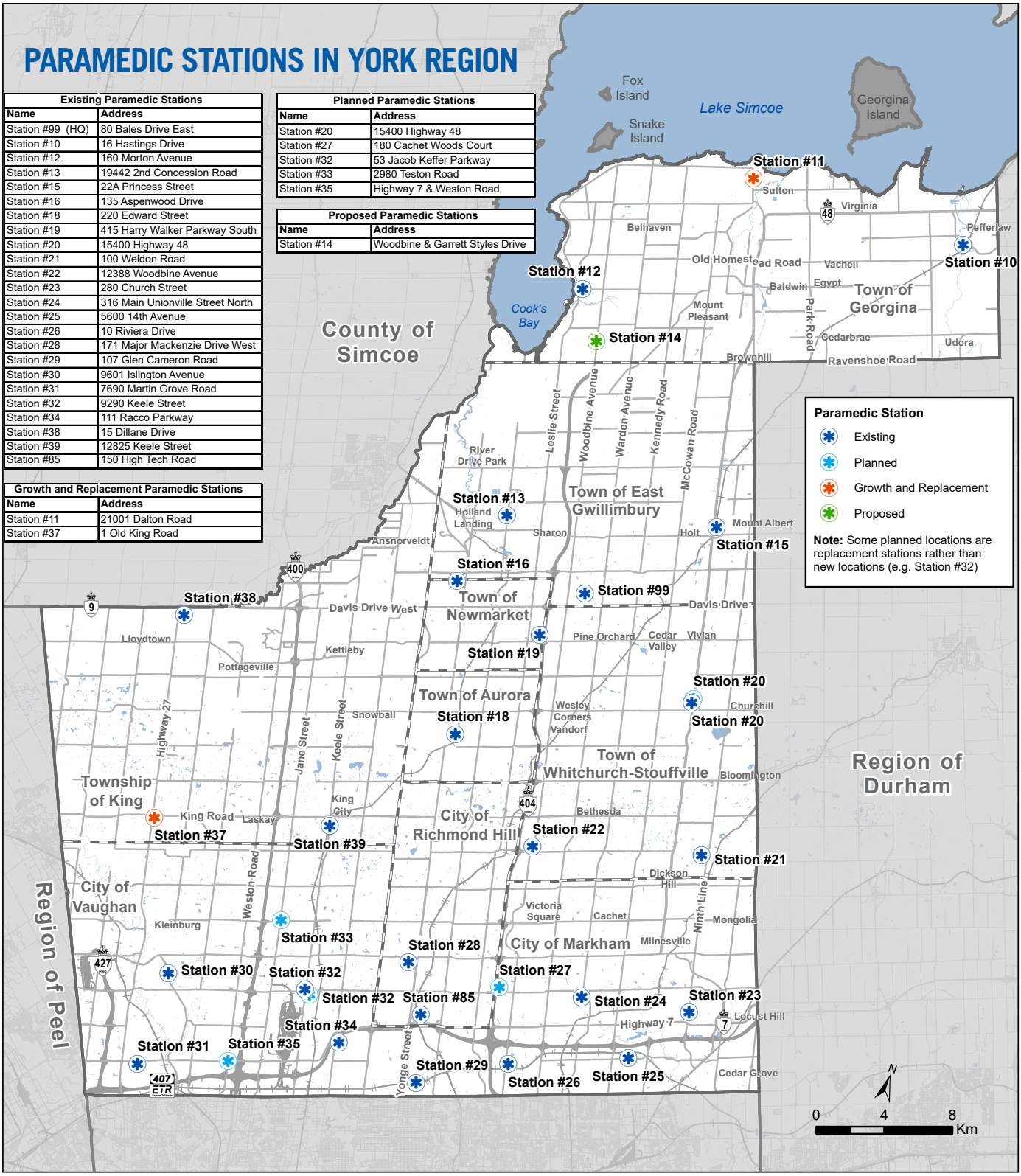
PARAMEDIC STATIONS IN YORK REGION

Existing Paramedic Stations	
Name	**Address**
Station #99 (HQ)	80 Bales Drive East
Station #10	16 Hastings Drive
Station #12	160 Morton Avenue
Station #13	19442 2nd Concession Road
Station #15	22A Princess Street
Station #16	135 Aspenwood Drive
Station #18	220 Edward Street
Station #19	415 Harry Walker Parkway South
Station #20	15400 Highway 48
Station #21	100 Weldon Road
Station #22	12388 Woodbine Avenue
Station #23	280 Church Street
Station #24	316 Main Unionville Street North
Station #25	5600 14th Avenue
Station #26	10 Riviera Drive
Station #28	171 Major Mackenzie Drive West
Station #29	107 Glen Cameron Road
Station #30	9601 Islington Avenue
Station #31	7690 Martin Grove Road
Station #32	9290 Keele Street
Station #34	111 Racco Parkway
Station #38	15 Dillane Drive
Station #39	12825 Keele Street
Station #85	150 High Tech Road

Growth and Replacement Paramedic Stations	
Name	**Address**
Station #11	21001 Dalton Road
Station #37	1 Old King Road

Planned Paramedic Stations	
Name	**Address**
Station #20	15400 Highway 48
Station #27	180 Cachet Woods Court
Station #32	53 Jacob Keffer Parkway
Station #33	2980 Teston Road
Station #35	Highway 7 & Weston Road

Proposed Paramedic Stations	
Name	**Address**
Station #14	Woodbine & Garrett Styles Drive



Source: York Region Corporate Services, Data, Analytics and Visualization Services

Table 1: Response Time Targets for York Region Paramedic Services

Category and examples	Target response time from dispatch to arrival on scene	Targeted percentage to meet response times (%)
Sudden Cardiac Arrest Absence of breathing, pulse	Community Target: Arrival of any person equipped with an AED within 6 minutes Set by the Ministry	60
CTAS 1 - Includes sudden cardiac arrest or other major trauma	8 minutes Set by the Ministry	75
CTAS 2 - Chest pain, stroke, overdose	10 minutes Set by York Region	80
CTAS 3 - Moderate pain or trauma	15 minutes Set by York Region	90
CTAS 4 – Minor trauma, general pain	20 minutes Set by York Region	90
CTAS 5 – Minor ailments, repeat visits	25 minutes Set by York Region	90

While response time performance is based on CTAS scores applied to patients by paramedic assessment on scene, calls to the 911 dispatch system are categorized by a 4-level Call Priority Code. The most commonly dispatched codes are Priority 4 (life threatening – "lights and sirens") responses for the most severe incidents such as cardiac arrest, chest pain, stroke and trauma and Priority 3 (urgent – non "lights and sirens").

Data collected for the Demand and Capacity Study over a sample period from January 1, 2018, to September 30, 2019 (pre COVID-19), found a significant variance in response times across the Region due to geographic conditions (lower vs higher volume areas, station locations, road locations, traffic conditions) and resources (staffing levels and ambulance availability due to call volumes and hospital offload times).

The current deployment plan for ambulances and their crews is designed to ensure coverage across the Region. Typically this means resources are shifted from less densely populated areas to more densely populated areas during times of high 911 response demand to optimize resources and to help meet a Region-wide standard. As population density and 911 demand continues to increase, additional resources will be required to achieve 70% Priority 4 performance across the Region and to achieve equity in responses to all local municipalities.

The Demand and Capacity Study

is the foundational Master Plan work that identified future demand and resource requirements for York Region Paramedic Services up to 2031. The Study was reported to Council in November 2020.

CHANGING DEMAND

York Region's population is growing and is set to grow even faster over the next decade. Between 2014 and 2019 the population increased by 7.3%, or about 1.4% per year; forecasts predict that by 2031 the population will rise by a further 30.1%, or 360,000 people, an increase of about 2.2% per year. The speed and amount of growth contributes to the need for additional paramedic resources.

Most of the increase will take place in urban areas such as the City of Markham and the City of Vaughan. Rural areas such as the Town of East Gwillimbury will see greater proportional increases, in some cases doubling in size. Planning for this growth will allow the service to balance resources appropriately to maintain equitable access to paramedic services across all nine local municipalities into the future. Figure 1 below provides an overview of population forecasts in each municipality up to 2031.

Figure 1 : Population Forecast by Local Municipality

Local Municipality	Year				Increase from 2019	Average Yearly Increase
	2019	2021	2026	2031		
Aurora	62,786	64,512	69,514	74,852	19.2%	1.5%
East Gwillimbury	32,877	39,617	53,275	77,758	136.5%	7.4%
Georgina	48,415	51,734	56,640	62,242	28.6%	2.1%
King	27,760	28,990	32,048	34,771	25.3%	1.9%
Markham	347,771	386,698	425,334	458,786	31.9%	2.3%
Newmarket	89,957	92,549	97,054	100,843	12.1%	1.0%
Richmond Hill	208,146	224,827	214,745	258,503	24.2%	1.8%
Vaughan	330,855	351,747	383,379	427,932	29.3%	2.2%
Whitchurch-Stouffville	49,088	52,944	59,040	62,012	26.3%	2.0%
York Region	**1,197,655**	**1,293,618**	**1,418,029**	**1,557,699**	**30.1%**	**2.2%**

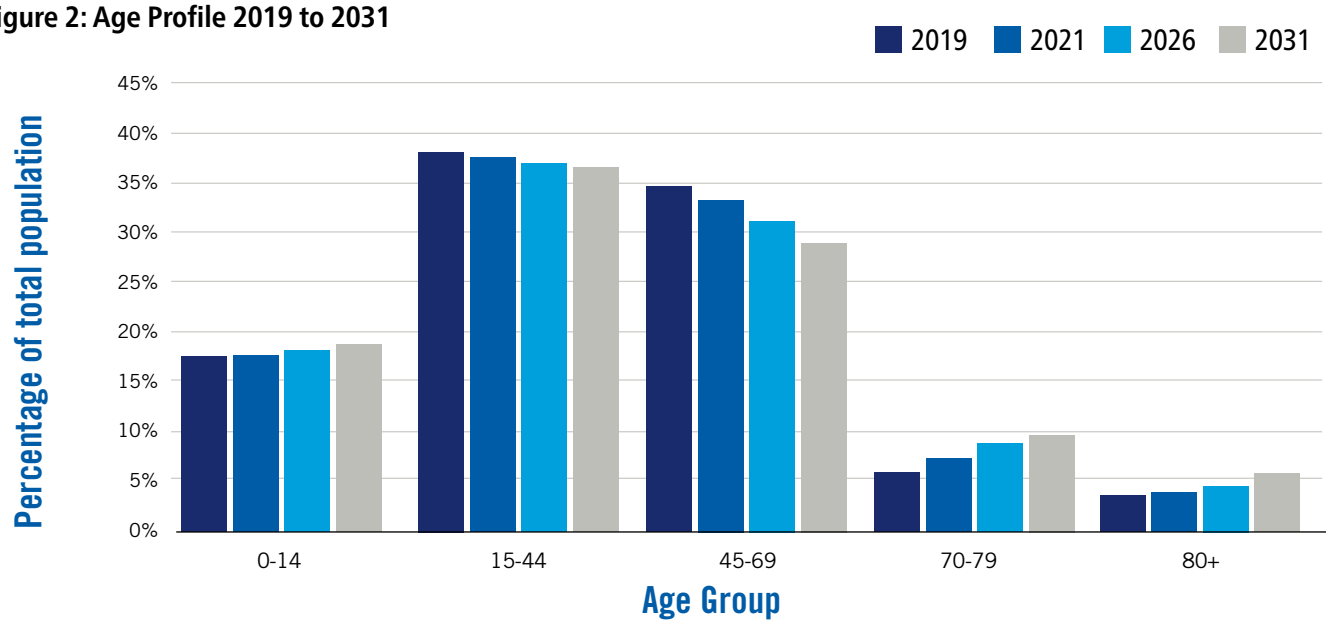
Source: York Region Long Range Planning and Data Analytics and Visualization Services

In addition to a growing population, the age structure of that population is changing. York Region's seniors' population is growing faster than any other age group. By 2051, close to one in four (23%) York Region residents will be over age 65. The most significant growth is expected amongst older seniors, those aged 75 and older. In 2021, older seniors accounted for 42% of the total seniors' population and this is expected to increase to 62% by 2051. Many older seniors require higher levels of care, putting pressure on paramedic services. For example, in 2021, seniors over 75 years old were approximately twice as likely to be hospitalized and/or use paramedic services than adults aged 55 to 74 years old[1].

Figure 2 shows that the population of York Region is both increasing and aging. The proportion of people aged between 15 and 69 is projected to decrease over the forecast period, while the proportion aged over 70 is expected to increase.

1 York Region Paramedic and Seniors Services Survey conducted with seniors, December 2021 – January 2022

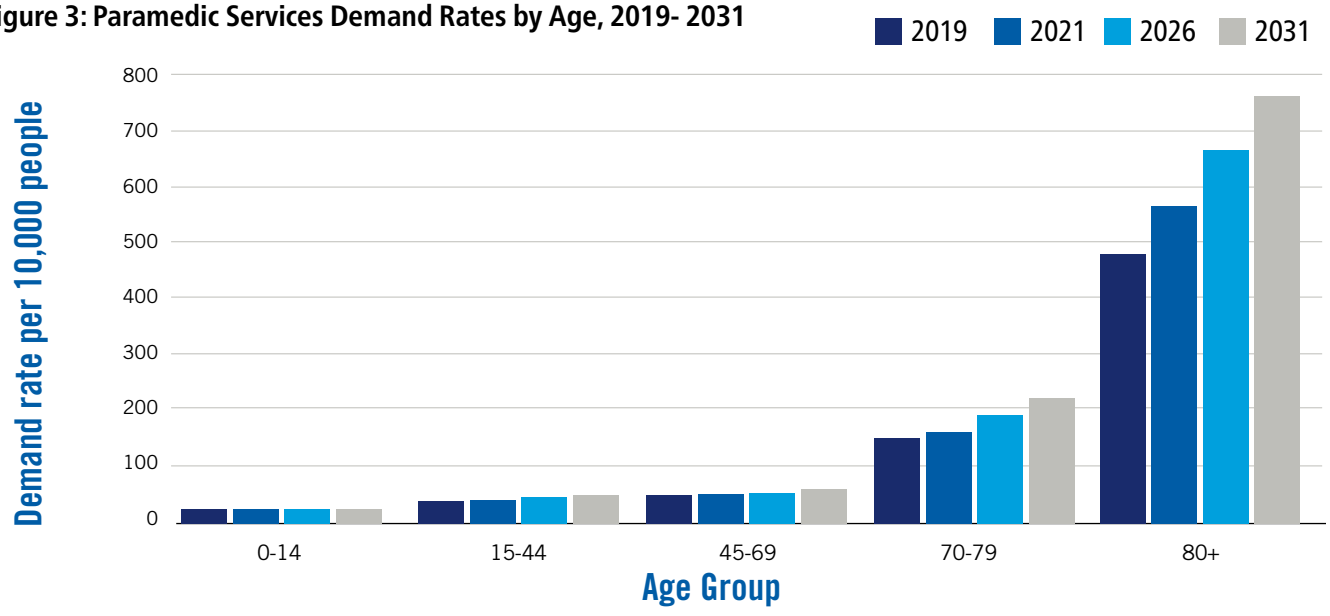
Figure 2: Age Profile 2019 to 2031



Source: Operational Research in Health Limited, Demand and Capacity Study, 2020

Moreover, Figure 3 shows that over the forecast period, the demand rate for paramedic services for those aged over 70 is expected to rise faster than other age groups, with a substantial increase for those aged over 80.

Figure 3: Paramedic Services Demand Rates by Age, 2019- 2031



Source: Operational Research in Health Limited, Demand and Capacity Study, 2020

Older seniors, however, are not the only age group where demand has been increasing. The demand rate (the number of incidents requiring a paramedic service response per 1000 people) for all age groups increased 17.3% between 2014 to 2019 compared to a 7.3% increase in population over the same period.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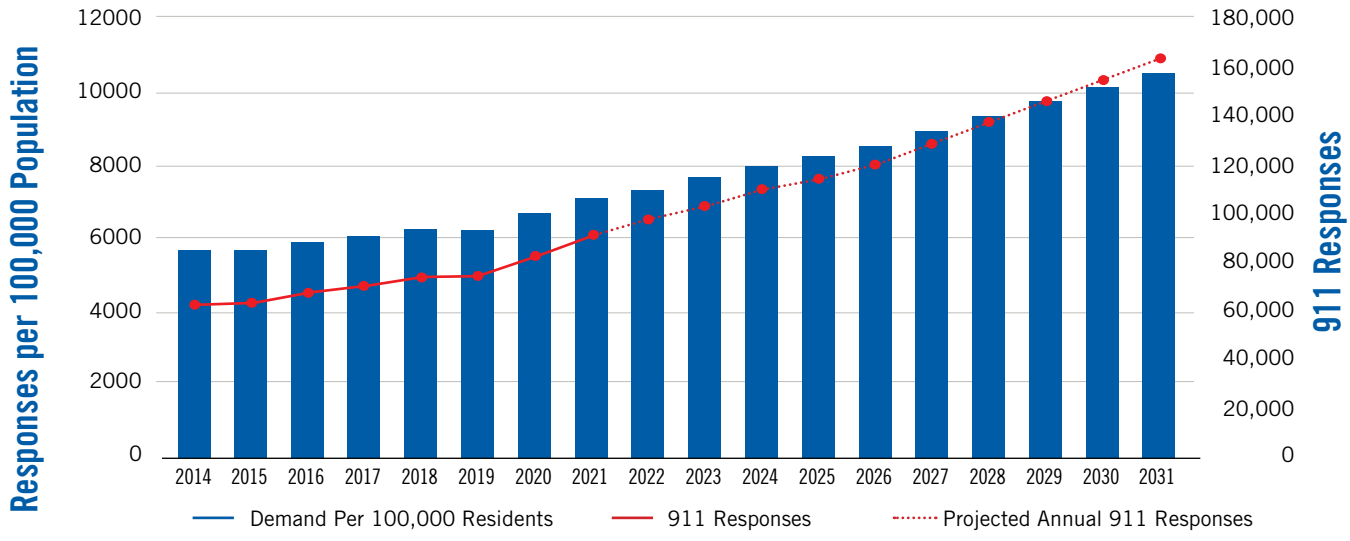
DEMAND PROJECTIONS

The demand projections to 2031 used for this Master Plan are based on historical demand rates, assessed by age, gender group and municipality, combined with population projections. Based on this data, demand is projected to increase by 6.8% per year to 2031 compared to a general population increase of 2.2% per year. In other words, while York Region's population is forecasted to increase by 30.1% between 2019 to 2031, the number of incidents requiring a paramedic response is expected to increase by 119.2%.

Demand is expected to rise most sharply for residents over 75 years old. As shown in Figure 4, in 2021 paramedics responded to 91,625 incidents and in 2031 paramedics are forecasted to respond to 163,606 incidents, an average annual increase of 6.8%. Further, in terms of average daily incidents, in 2015, paramedics responded to 174 incidents per day compared to 211 incidents per day in 2019, with a projection of 450 incidents per day by 2031.

Because all local municipalities in York Region will see population growth (Figure 1), the demand rate for paramedic services will also increase across the Region, intensifying in existing areas and expanding into new development areas. Note, population projections will also be reviewed against actual population growth and forecasts in the Regional Official Plan to assess appropriate resource needs.

Figure 4: 911 Response Demand 2014 – 2031, York Region Paramedic Services



Source: York Region Long Range Planning and Data Analytics and Visualization Services

ALTERNATIVE SCENARIOS – IMPACT MODELLING

The Demand and Capacity Study identified future demand and resource requirements to 2031. To ensure the correct balance between response time performance and resources required, many response time scenarios were modelled to determine a response time that produced optimal response time performance, while ensuring the most efficient use of resources.

Balancing Response Times Region-wide

Balancing response times Region-wide means the performance standard can be achieved regardless of where the 911 call originates from. Equitable access to care continues to become more challenging as the Region's population continues to grow and diversify, and 911 calls become more complex. Increasing urbanization is also contributing to response time challenges in terms of traffic congestion, responding in taller buildings, and building design.

The performance standard was determined through testing multiple response time scenarios as shown in Figure 5. Modeling considered the legislative framework for response times, demand factors, and optimizing the use of staff. It also considered what resources would be required to provide equitable and consistent response time performance in all local municipalities (balancing response times).

The methodology for assessing resource needs is based on a performance standard of a response time of eight minutes or less to Priority 4 incidents 70% of the time Region-wide and also in each of the local municipalities. The performance standard used in the previous plan, an 11 minute 29 second response 90% of the time, would not allow for adequate resources to meet current and projected demand rates, or to achieve balanced response times.

While scenarios analysed with lower response time targets would require less resource investment, they may also present risk to patient safety. The model presented in this report was chosen to reduce the risk of delayed responses to critical incidents and reputational harm.

Figure 5: Modelling of Response Time Scenarios

Criteria	Option 1 Region-wide 8 minutes or less 70% of the time and 70% in each local municipality (Recommended)	Option 2 Region-wide 70% of the time and a minimum of 65% in each Municipality	Option 3 Region-wide 75% of the time and a minimum of 70% in each Municipality	Option 4 Region-wide 75% of the time and a minimum of 65% in each Municipality	Option 5 Legislative maximum standard of 11:39 minutes and 39 seconds at the 90th percentile
Meets legislative framework for response times by maintaining current service levels (CTAS)	✓	✓	✓	✓	
Provides balanced response times Region-wide	✓		✓	✓	
Optimizes use of full-time equivalent staff	✓	✓			✓
Adequately address 911 volume growth and provides system capacity	✓	✓	✓	✓	
Minimize reputational risk	✓	✓	✓	✓	
Aligned with industry best practices	✓	✓	✓	✓	

Source: Operational Research in Health Limited, Final Report, 2022

PROJECTED ADDITIONAL RESOURCE REQUIREMENTS UP TO 2031

Based on projected demand estimates and analysis, and in line with our performance target and planning criteria, the Master Plan identifies the following requirements in addition to the current level of resources (see page 8):

Paramedic Response Stations

Paramedic response stations must be located to ensure efficient response times, both under current conditions and with a view to future planned growth. All 31 current and planned stations were assessed and found to be well-located and are needed to maintain ambulance system capacity. Existing, planned and proposed stations are shown in Map 1 (see page 9).

One additional station will be required by 2025, to be located in South Keswick in the Town of Georgina to meet population growth in the area. This station was identified because the anticipated growth and demand in this area would significantly surpass the current ambulance garage capacity in the area.

Analysis shows the current planned and proposed stations are also well located with respect to service planning beyond 2031. Information about post 2031 initial planning and analysis is provided in Planning Beyond 2031 (see page 33).

Ambulance Resources

Between 2021 and 2031, an additional 50 ambulances will be required.

Forty of these ambulances are required to address the projected increase in service demand. Table 2 identifies the number of weekly hours of ambulance coverage that will be added to the associated local municipalities to improve ambulance coverage and meet 911 call demand. Table 2 also identifies the net new number of ambulances added to the system yearly to provide these additional weekly ambulance hours. The remaining ambulances are required as spares. Having spare capacity ensures that crews can remain in service at the same levels even when ambulances are in for maintenance or otherwise out of service. Two special response units and one logistics vehicle will also be required to meet future demand.

Table 1: Yearly Additional Ambulance Resources Required by Municipality

Year	Weekly Ambulance Hours	Municipality Receiving Ambulance Resources	Net New Ambulance(s)
2022	336	• Town of Whitchurch-Stouffville • City of Markham • Township of King	3
2023	420	• Town of Georgina • City of Markham • City of Vaughan	3
2024	420	• Town of Whitchurch-Stouffville • City of Vaughan	3
2025	420	• Town of Whitchurch-Stouffville • Town of Georgina • City of Richmond Hill • City of Vaughan	4
2026	420	• Town of East Gwillimbury • Town of Georgina • City of Markham	4
2027	336	• Town of Georgina • City of Vaughan	2
2028	504	• Town of Aurora • City of Markham • Township of King	6
2029	336	• Town of East Gwillimbury • Town of Newmarket • Town of Whitchurch-Stouffville	2
2030	312	• Town of Georgina • Township of King	6
2031	444	• Town of Newmarket • City of Markham • City of Vaughan • City of Richmond Hill	7
		Total	40

Source: Operational Research in Health Limited, Final Report, 2022
Note: Of the total 50 additional ambulances identified, 10 are spare ambulances

Paramedic Services Staffing Resources

To operate one ambulance for 24-hours, seven days a week, 12 paramedics are required. Similarly, to operate one ambulance for 12-hours, seven days a week, six paramedics are required to ensure adequate relief ratio.

An average staffing increase of 4.3% will be needed annually until 2031. This represents a total of 305 additional full-time equivalents in front-line paramedic staff and 39 full-time support positions by 2031, as noted in Figure 6.

The support positions provide important functions such as professional practice, scheduling and administration, as well as technology and human resources support positions that the previous Master Plan did not include, but are also key to maintaining a safe and effective Paramedic Service.

Figure 6: Paramedic Staffing Resources Identified to Meet Demand, 2023 to 2031

Full-time Front-Line Paramedics*	36	36	35	35	37	34	29	28	35
Support Staff	7	2	2	7	7	3	1	7	3
Total FTE	**43**	**38**	**37**	**42**	**44**	**37**	**30**	**35**	**38**
Estimated Net Operating Impact**	$3.31 M	$2.92 M	$3.14 M	$3.49 M	$3.95 M	$3.42 M	$3.10 M	$3.68 M	$4.13 M
Weekly Ambulance Hour Coverage Increase	345	420	420	420	336	504	336	312	444

Note: Resources required in 2021 and 2022 have already been accounted for in those approved budgets.
Source: York Region Community and Health Services, Financial Services and Business Planning 2022

* Front-Line Paramedic Staff Includes logistics, Paramedic Superintendents, fleet and scheduling

** Assumes 50% funding through Land Ambulance Service grant for all incremental costs. Measure only of resources indentified in the Master Plan. Does not account for base service (e.g., COLA on existing staff and inflation on existing materials/supplies)

Operating Budget Implications

Additional resources have been identified to support the projected increased call volume and ambulance hours, such as increased vehicle costs (fuel, maintenance), medical supplies and equipment. An additional $62.3 million gross in operating funding will be required over the period 2023 to 2031, primarily for staffing as shown in Figure 6. Assuming the Province will continue to provide 50% land ambulance grant funding over that period, the next Regional property tax contribution would be approximately $31.15 million (approximately $3.46 million annually). To fund capital expenditures such as the new ambulances, special response units, logistics vehicles, equipment and stations, an additional $27.2 million will be required over the period 2023 to 2031. As the province does not provide capital funding, capital costs will be funded through Regional property taxes. These additional capital and operating funding requests will be included in annual budget submissions to Regional Council.

Ambulance Hours refers to one hour of ambulance service with two paramedics providing services in the community. For example, 168 hours of ambulance capacity equals one week of an ambulance in the community for 24 hours a day.

Relief Ratio refers to the number of paramedics required to backfill when another paramedic is unavailable to work their scheduled shift due to a leave of absence (such as illness, injury, statutory leave, or vacation). The relief ratio used for the 2020 Demand and Capacity Study was 1.47 staff. This means that for every one paramedic required to meet demand, an additional 0.47 is included to maintain service levels and potential employee leaves of absence. Other frontline positions, such as scheduling, fleet and logistics are typically backfilled with casual staff trained in those areas.

RESOURCE OPTIMIZATION

Current Actions

Against a backdrop of steadily increasing demand, York Region has worked continuously since introduction of the last Master Plan in 2012 to streamline services and maximize efficiencies wherever possible. These initiatives were considered in the analysis for determining resource needs, and include:

- Alternate Patient Transport Services: Routine, non-emergency patient transfers from hospital were reduced by encouraging use of alternative patient transport services. Working in partnership with Regional hospital partners, since 2018 Paramedic Services has reduced non-emergency transfers within the system by an average of 22% per year. The result is improved availability of paramedic resources for emergencies.
- Redeployment of Multi-Patient Unit: The Multi-Patient Unit is a large capacity response unit with the capacity to treat and transport eight stretcher patients and 12 ambulatory patients. It was stationed at Headquarters in East Gwillimbury. Analysis showed it should be relocated to southern York Region where there is better access to the highway network and 911 calls. In 2021, the Multi-Patient Unit was redeployed to Station 26 in the City of Markham. Additionally, more paramedics were trained to use these vehicles. Placing this resource in a more optimal location and increasing the number of paramedics trained to drive it has led to improved availability of the Multi-Patient Unit and more frequent deployment.
- Reallocation of Rapid Response Unit Resources: Paramedic Services has nine Rapid Response Units. The Rapid Response Units are vehicles staffed with paramedics, but without all of the equipment of a regular ambulance. Their purpose is to augment ambulance responses in areas with higher call volumes by stabilizing patients until an ambulance can arrive. Each Rapid Response Unit requires two front line paramedics to maintain 12-hour, seven days a week of coverage. Upon review, it was determined that allocating these resources instead to regular ambulances would be more efficient with minimal impact to response times. As a result, in 2021 the Rapid Response Unit program was reduced from nine Rapid Response vehicles to one, permitting reallocation of 16 front line paramedics to two new 24-hour ambulances stationed in high demand areas. Transport capacity within the system has increased without needing to increase operating costs.

- Transfer of Care: Time spent at hospital by York Region Paramedic Services while transferring patients to York Region hospitals has reduced 32% since 2010 and has been consistently below the Province's 30-minute average target since 2014. York Region Paramedic Services and York Region hospitals outperform the Canadian average[2]. This has in part been made possible through funding received through the Council-approved Memorandum of Understanding with the hospitals, which helped bring poor transfer of care times under control, the Provincial Dedicated Offload Nurse Program, which funds dedicated nurses in emergency departments to receive low-acuity patients brought by ambulance, and the ongoing collegial relationship between Paramedic Services and the hospitals to identify emergency issues and find solutions. In 2019, Provincial funding of $1.2M for dedicated offload nurses saved an estimated 15,300 hours in ambulance time, improving service efficiency and a cost avoidance of approximately $3.9 million.
- Maximizing co-location opportunities: Currently ten paramedic stations are co-located with fire stations, and one is co-located with York Region Police. This is important as the use of existing Regionally owned land, cooperatively purchased land or co-location with allied agencies creates efficiencies in land and building costs (such as the proposed station in Keswick South). To optimize resources, any future station builds will consider co-location opportunities with allied agency partners and/or Regionally owned lands.
- Computer Aided Dispatch/Mobile Data Application: York Region Paramedic Services partnered with the Ministry of Health in 2018 to develop and test a Computer-Aided Dispatch/Mobile Data Application. The system provides automatic information updates and real time data about 911 call information to paramedics. This has contributed to paramedics potentially reaching incident scenes sooner, reduced time on scene, and paramedics needing less time to document care reports.

System Innovations that Could Support Demand Mitigation but Require Provincial Support

Demand projections used in the analysis assume all incidents will require a York Region Paramedic Services ambulance to respond to the call and, in almost all cases, to transport the patient to a hospital.

However, there are opportunities that could allow us to make even better use of our resources by addressing and mitigating demand at the source. Many of these innovations require decisions and support at the Provincial level before they can be implemented at the Regional level and should be the focus of targeted advocacy efforts. Some significant opportunities are described below.

2 Based on percent of ambulance time lost to hospital turnaround, 2020 MBNCanada Performance Measurement Report

New Models of Care

New Models of Care are innovative, Provincially legislated initiatives that enable paramedics to treat patients on scene ("Treat and Release"), transport patients to other destinations, and/or refer patients to another health care provider ("Treat and Refer") thereby deferring the ambulance transport to hospital.

Provincial legislation requires that paramedics transport patients to hospital unless they expressly refuse, even if the paramedic's clinical opinion is that the patient's condition is stable and does not require a visit to the hospital emergency department.

Treat and Release refers to a model of care where patients are assessed and/or treated by paramedics on-site and choose not to be transported to hospital. In addition to avoiding unnecessary transport to the hospital, this model also provides the added benefit for patients to receive care in their home. Increasing Treat and Release rates reduces the amount of time ambulances are travelling to hospitals, and the amount of time crews must spend at hospitals. Time spent at the incident scene, however, increases.

Some examples of this model of care put in place by Paramedic Services include:

- The COVID-19 Medical Directive which began in April 2022, provided paramedics with guidance on how to identify low acuity COVID-19 symptom patients who could be assessed and released from paramedic care rather than be transported to hospital
- The Palliative Care Patients Receiving Care at Home Program which began in January 2022, enables paramedics to provide on-scene treatment within the home and refer patients to other health care providers (see page 27 for additional details)

In 21% of incidents, York Region paramedics respond to patients that have only minor injuries/illnesses and choose to seek further assistance on their own, rather than Paramedic transport to hospital. For Treat and Release to be even more effective, Provincial legislation is required that would permit paramedics to discharge patients on-scene after assessment and/or treatment.

To assess the potential savings impact of expanded Treat and Release and make a case to the Province for legislative changes, two scenarios were modeled. In scenario 1, paramedics were permitted to treat and release 29% of 911 call incidents, and in scenario 2, they were permitted to treat and release 36% of incidents. In both scenarios, even with increased time at the incident scene, the total time paramedics spent responding to incidents would decrease, allowing vehicles to become available more quickly. If paramedic services were permitted to treat and release patients, the resource needs detailed in this Master Plan could be reduced by 39.5 or 51.2 full-time equivalents respectively.

Time Spent at Hospital

Transfer of care times could increase as demand increases. If crews need to spend more time in hospital emergency departments waiting to transfer care of patients to the hospital, paramedic response times will decline. The more time paramedics spend waiting at hospitals, the more they are unavailable to respond to 911 service calls in the community. Inefficient use of ambulance and staffing resources increases costs.

Although transfer of care times has remained below the Province's 30-minute average target in the Region, the risk of increases is high due to factors outside the Region's control, such as hospital capacity and staffing. Ministry of Health funding for the Dedicated Offload Nurse Program has not kept pace with increasing demand and hospital staffing challenges. In February 2022, Regional Council asked the Minister of Health to increase funding for the Dedicated Offload Nurse Program at York Region's hospitals.

The transfer of care time used in the analysis was 49 minutes and 49 seconds, for 90% of the transports to hospitals. Three scenarios were modeled to assess the impact that increased time spent at the hospital could have on response times. Table 3 provides an overview of scenarios modelled demonstrating the potential impact of increased time at hospital at the 90th percentile on response times. For example, if paramedics spend 60% more time at hospital (80 minutes), response times across the system would increase by two minutes and six seconds at the 90th Percentile.

Table 3: Impacts of Increased Time at Hospital on Response times

Percentage of Time Paramedics Spend at Hospital	Time at Hospital in Minutes	Increase to Response Times Based on Time Spent at Hospital
20%	60 minutes	30 seconds
40%	70 minutes	1 minute, 12 seconds
60%	80 minutes	2 minutes, 6 seconds

Source: Operational Research in Health Limited, Final Report, 2022

Dispatch Modernization

911 calls for paramedic service in York Region go to the Provincially-run Georgian Central Ambulance Communications Centre. The dispatcher determines how quickly a response is needed based on how the 911 caller answers the dispatcher's questions.

As the information gathered by dispatch staff is limited, calls have tended to be over prioritized to limit risk to the patient. Currently over 76% of 911 responses are dispatched as lights and siren responses, where less than 10% require lights and sirens transport to hospital, and less than 1% are truly critically ill patients. When calls are over prioritized, it causes overuse of paramedic resources who are then unavailable to respond to true emergencies, leading to risks to public safety and contributing to inefficient use of resources.

The Province is working to implement the Medical Priority Dispatch System, a modern medical triage algorithm system, to enable better differentiation and triage of emergencies and ensure patients in need of the most urgent care receive it in the appropriate time frame with the resources available. Ontario's Medical Priority Dispatch System, once in place, will help paramedics respond more efficiently by triaging calls to determine the appropriate level and speed of response required.

For York Region Paramedic Services, dispatch modernization could reduce the number of lights and sirens responses to approximately 40% based on the experiences of other jurisdictions.

Implementation of the Medical Priority Dispatch System at Georgian Central Ambulance Communication Centre was planned for spring 2019. It has been delayed due to the COVID-19 pandemic, however implementation is expected in second quarter of 2023.

Call Diversion

Additionally, a more precise dispatch system, when staffed by clinicians, can divert calls where appropriate to another health resource ('hear and treat') instead of requiring an ambulance to respond. Call Diversion aligns with dispatch modernization because it is meant to reduce or divert non-emergency responses.

Call Diversion can also support frequent caller initiatives, identifying individuals or locations that call 911 frequently to understand the underlying cause of the issue and potentially employ preventative alternatives. There are jurisdictions such as Niagara Region where Call Diversion is used. This model is currently under evaluation by Niagara Region and results are expected later in 2022.

However, Call Diversion requires investment and legislative changes by the Ministry of Health. To support a case for advocacy to the Province, three levels of Call Diversion were modelled, with a projected 3%, 6% or 8% of calls being diverted away from using paramedic services. Under these scenarios, if Call Diversion was implemented by the Province, the resources detailed in this Master Plan could be reduced by 23.5 to 39.5 full-time equivalent staff (or -3% to -5.1%).

Palliative Care

Due to limited access to home and primary care in the community, a growing number of residents rely on the 911 system for conditions that could be treated more effectively through primary or community care. Improved access to care is needed, particularly for palliative and end of life care.

In 2020, York Region Paramedic Services was approved by the Ministry of Health to deliver a new palliative care service. Eligible patients receiving palliative care who call 911 have the option to be treated on-scene for pain and symptom management by trained paramedics. All paramedics are trained in the principles of palliative care and community resources.

This program, fully funded through a research grant, was implemented in January 2022 and is already helping to reduce paramedic transports to Emergency Departments when appropriate. To date paramedics have responded to approximately 10 calls; outcome data is being collected and will be analyzed for impacts.

Using scenarios evaluated in the Master Plan, these new models of care, once permitted and funded by the Province, may enhance resource savings opportunities and efficiencies in the future.

New Fleet Technologies

Paramedic Services is working with Public Works to advance long-term energy and green-house gas emission reductions in its fleet, including investigating opportunities to pilot electric ambulances, in support of the Region's Energy Conservation Demand Management Plan.

Currently the Service operates 16 hybrid ambulances which have reduced greenhouse gas emissions by 140 tonnes, reduced fuel consumption by 58,577 litres of gasoline and saved $15,000 on brake replacement since 2017. Further, every ambulance is equipped with anti-idle technologies that have reduced engine hour idle time by 92,824 hours, reduced fuel consumption by 338,692 litres of gasoline and reduced greenhouse gas emissions by 858 tonnes.

In addition to reductions in green-house gas emissions, use of electric ambulances could result in significant savings of approximately $124,724 per electric ambulance over its 10-year lifecycle. With 74 ambulances currently, and 50 more to be added by 2031, ultimately average annual cost avoidance could be in the range of $1.5 million annually.

Capital costs could be managed by accessing the various government funding opportunities and incentives currently available. Further analysis will be conducted to assess the full cost implications related to electric ambulances and the related infrastructure to maintain them (such as charging stations and batteries).

Primary Care
General practice physicians, nurse practitioners and/or Family Health Teams.

Community Paramedicine

Community Paramedicine has an important role in supporting more efficient emergency operations by providing clinical support to patients in their homes. Proactive, non-emergency services help keep residents living well and improve their quality of life, while reducing pressure on the health care system and providing service levels appropriate to need.

In addition, through proactive approaches the number of individuals making frequent calls to the 911 system is reduced, reducing overuse of the emergency paramedic system and improving its efficiency. A recent McMaster study found an overall decrease in 911 calls by 19% in multiple communities in Ontario where community paramedicine programs were implemented.[3] From 2020 to 2021, the York Region Paramedic Services' CP@Clinic reduced 911 calls at one of the participating seniors housing locations by 17 calls (15%). For every 911 call prevented, an ambulance is available to respond to another emergency in the community. Further savings are realized by the Ministry of Health funded acute and primary care systems.

3 Prehospital Emergency Care, Reducing 911 Emergency Medical Service Calls By Implementing A Community Paramedicine Program for Vulnerable Older Adults in Public Housing In Canada: A Multi-Site Cluster Randomized Controlled Trial, Agarwal et al., February 2019

York Region Paramedic services currently provides the following Community Paramedic programs:

Name	Description	Results (Estimate of 911 Calls Diverted)
CP@Clinic/ CP@Home	This is an evidence-based collaborative program conducted in partnership with McMaster University where Community Paramedics provide programs in seniors' housing buildings and in clients' homes	• Between January 3, 2021 and January 3, 2022, 798 frequent callers to 911 (465 or 58% of these were seniors) were supported through these programs • While this program is designed for health promotion and prevention, connection to service providers and system navigation, this model has shown decreased reliance on emergency system supports for participating clients
Emergency and Transitional Housing Program	In response to the COVID-19 Pandemic, this program provides regular clinic hours at emergency housing (homeless shelter) locations and/or homeless drop-in centers across York Region where paramedics provide clients with primary health assessments, health coaching and education, health care system navigation, influenza vaccination and human service referrals where appropriate	• In 2021, 280 clients were provided physician based, primary care and/or substance use support. Due to the lack of accessible healthcare for this population, it can be assumed that each client interaction within this program may have resulted in a 911 call • Approximately 280 calls were diverted, a value of approximately $78,680 saved to Paramedic Services and $163,800[4] to the healthcare system in terms of reduced costs for ambulance resources and a visit to the emergency department
Community Paramedicine for Long-Term Care	Supports people who are currently on the long-term care waitlist, as well as individuals who are eligible or soon to be eligible for placement on the long-term care waitlist, to remain safe and stable in their own homes as part of the Province's plan to address systemic barriers in long-term care bed development and the growing demand for long-term care	• Since October 2021, Community Paramedics provided in-home or virtual supports for 246 individuals

Many of York Region's Community Paramedicine programs are pilot projects aimed at filling gaps in primary care and in home and community care, without a long-term Provincial policy or funding framework. The success of community paramedicine programs requires legal clarity and sustainable, long-term funding commitments by the Province.

Council's advocacy to the Province for sustainable funding of Community Paramedicine programs is important to establishing a community paramedicine model that is sustainable for the future.

4 2020 MBNCanada Performance Measurement Report

Strengthening the Role of Paramedics in the Health Care System

Although emergency paramedics operate as an extension of hospital emergency departments and community paramedics extend the primary care system into people's homes, paramedic services have traditionally not been treated as part of the health care system in Ontario. For example, since paramedics are not a regulated health care profession, once they complete care, they cannot receive information from the hospital regarding a patient's condition or outcome data useful to improving the quality of care.

Sector leaders across Canada continue to advocate for paramedics to become a permanent component of the health care system in Ontario, including primary care. The following three policy frameworks have been recently developed to advocate for a better integration of paramedics in the health care system:

- Principles to Guide the Future of Paramedicine in Canada, commissioned by the Paramedic Chiefs of Canada and supported by York Region Paramedic Services, this study establishes guiding principles to shape paramedicine in Canada. It recommends that governments prioritize patients and their communities, provide health care along a health and social continuum, practice within an integrated health care framework, and enact legislation that provides professional autonomy.
- Community Paramedic Policy Framework, jointly developed by the Ontario Association of Paramedic Chiefs and the Association of Municipalities of Ontario and submitted to the Minister of Health and Minister of Long-Term Care, recommends to the Provincial Government that paramedic skills be maximized to be able to provide both emergency and primary care.
- Policy Framework on the Future of Paramedicine in Ontario: Charting a New Course for Paramedic Services to do More for Healthcare, developed by the Ontario Association of Paramedic Chiefs, recommends that the Provincial Government include paramedics in the ***Regulated Health Professions Act, 1991*** and create a regulatory college, strengthen dispatch, and expand community paramedicine.

As outlined in the Council approved York Region Response to the Emergency Health Services Modernization Discussion Paper, York Region is aligned with these sector leaders and their recommendations to effectively advance the role of paramedics as set out in their respective frameworks described above.

Partnerships

Partnerships with health and social service providers also contribute towards service efficiencies by permitting Paramedic Services to influence program development and delivery of local health care needs in the community. For example, Paramedic Services has established strong partnerships with York Region's local hospitals, community planning tables, and Ontario Health Teams. Collaborations with hospitals have contributed to reduced transfer of care times, and partnerships with local health service providers have resulted in local services that specifically target unmet community health needs, helping to reduce transfers to emergency departments.

Through collaboration, paramedics will continue to help improve coordination and service alignment for processes such as referrals and care delivery to enhance the patient care experience. Referrals directly connect residents and caregivers to health and social services and reduce reliance on emergency departments for assistance. Paramedic assessment and referral programs have been found to increase local home care and community service use up to 60%.[5] In 2021, York Region Paramedic Services' Paramedics Referral Program served 1,465 patients and resulted in 2,173 referrals to community partners.

Further, partnerships with York Region Public Health are helping to support harm reduction and address opioid addiction related incidents in the community. Since February 2021, paramedics have distributed 177 Take-Home Naloxone Kits to patients and their family or friends. This program is helping to reduce accidental opioid related deaths (80% of which occurred in private residences in York Region in 2020) by providing naloxone kits and education on overdose prevention and response to individuals in need.

5 Report on the Status of Community Paramedicine in Ontario, Leyenaar et al., 2019

RISKS OF NOT INCREASING RESOURCES

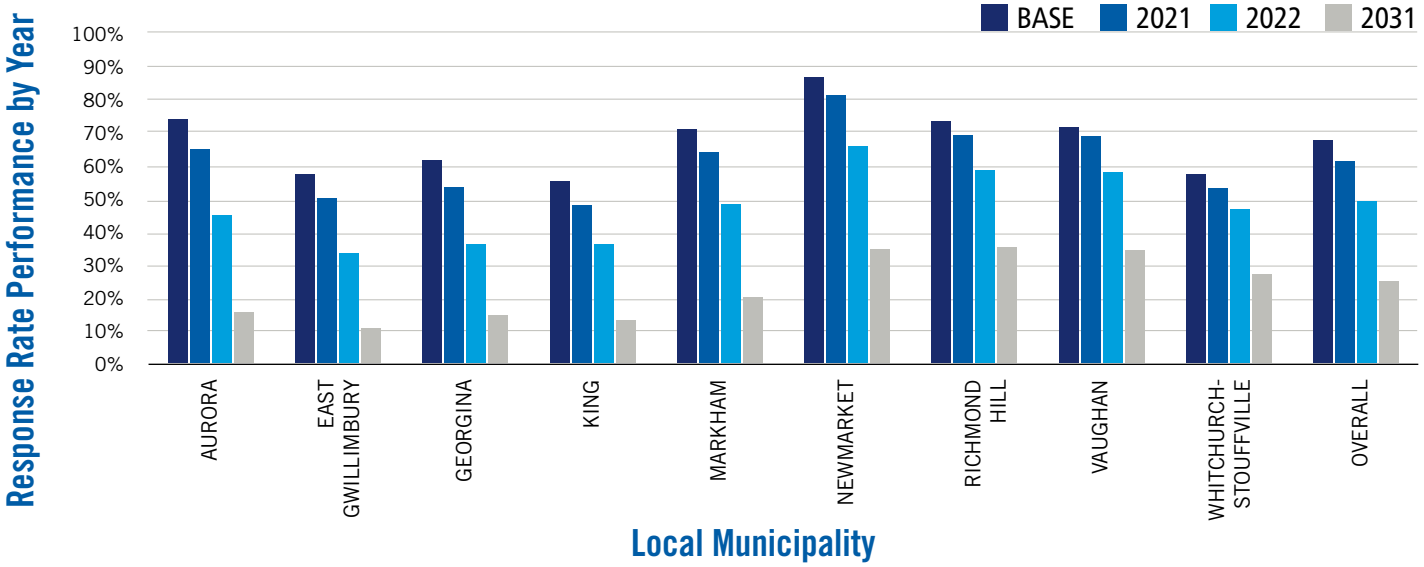
York Region Paramedic Services provides an essential service to all residents of the region, wherever they may reside, at times of great need and stress. Over 80% of residents across the region rate themselves as satisfied with the services York Region Paramedic Services provides.[6] Maintaining this level of trust and confidence requires consistently meeting the standards set by the Region and the Province. This in turn requires having the right numbers of well-trained people, backed up by reliable equipment, located in the right places to serve communities across the region most efficiently.

Equitable response is key to the trust residents place in York Region Paramedic Services. A growing and aging population brings challenges. Over the next decade, York Region Paramedic Services will have to serve new developments and operate in more densely populated areas. The time to respond to incidents in mid- to high-rise housing will increase (due to greater vertical distance, multiple floors, overall building design, and traffic congestion). Certain kinds of incidents, especially those correlated with aging, will become more frequent.

As part of the modelling analysis, a 'Do Nothing' scenario was included which clearly details the impact of demand if there are no corresponding changes in resources to match. If no resources are added by 2031, only 25% of 911 calls for Priority 4 life threatening conditions would receive a response in eight-minutes or less, meaning patients experiencing cardiac arrest or life-threatening emergencies would have to wait longer. In addition to impacts on the patient, such a response rate would fail to meet current legislated and Council approved response time targets.

As shown in Figure 7, the modelling analysis indicated that while all local municipalities would see a decline in response rate performance in a "Do Nothing" scenario, the impact would be greater on rural communities, as their population increase is expected to be proportionately greater over the same period. In other words, in addition to falling unacceptably below mandated standards across the board, inequality in response times among local municipalities would worsen.

Figure 7: "Do Nothing Scenario", Response Time Performance to Life Threatening Calls in 8-minutes or less



Source: Operational Research in Health Limited, Demand and Capacity Study, 2020

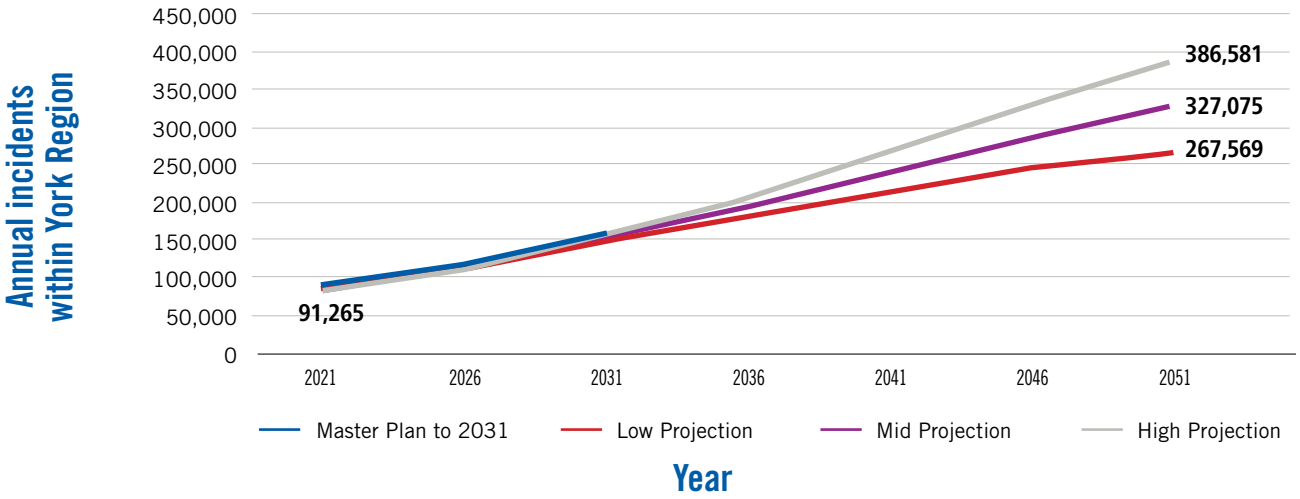
6 York Region 2021 Annual Community Opinion Report

PLANNING BEYOND 2031

Demand Projections Beyond 2031

Looking beyond the period covered by this Master Plan, Figure 8 below provides modelling projections of 911 call demand up to 2051. With steadily increasing 911 demand over the next 20 years, the resources identified in this new Master Plan will also be necessary to set the Service up for the future and will need to be evaluated later in this decade to ensure we have sufficient resources beyond 2031. This future expansion in the Region signals the need for continued planning for capital and staffing resources to prepare for the expected growth beyond this Plan.

Figure 8: 911 Demand Projections 2019-2051, York Region Paramedic Services



Source: Operational Research in Health Limited, Demand Projections, 2022

The hub-station model is where paramedics report to a larger central station and are then deployed to a network of existing satellite stations. Hub stations in the community have been used by some services to build station capacity .

Paramedic Stations Beyond 2031

Additionally, beyond 2031 and to maintain the appropriate number of ambulances available within the community, Paramedic Services is evaluating the benefits of a dynamic hub station model to support future growth. Appendix 1, Paramedic Station Heat Maps, shows that the intensification of demand in 2021 continues through to 2051. The Heat Maps are a modeling approach that demonstrate that this future hub station strategy may align well with the Service's existing stations as the existing stations are appropriately placed to meet 911 response demand and shows how demand projections correspond with future station plans. Maps 2021, 2031 and 2051 in Appendix 1 provide an overview of current, planned and proposed stations in relation to incident demand projections. For example, both Map 2031 and Map 2051 show how demand projections in high-density areas correspond with future station plans. As station capacity in the high-density areas is reached, a hub station location could be used to store, equip and deploy ambulances to the high demand areas. Therefore, the hub station model could allow for improved efficiency and deployment into the system for a growing workforce as demand continues to increase.

CONCLUSION

York Region Paramedic Services provides life-saving care to more than 1.2 million residents living across the Region, from dense urban areas to rural communities. Residents place great trust in York Region Paramedic Services to deliver the services they need, often in stressful and uncertain situations.

While Paramedic Services currently meets the response time targets set by the Region and the Province, much of this success relies on having the right people and equipment in the right locations. It is important that the Service continues to evolve to meet the requirements of a rapidly growing population that is also getting older and needs greater support. Moreover, the role of the York Region Paramedic Services will also evolve, as paramedics become more integrated into the health care system, offering improved health care access in the community to address unmet needs or gaps in primary care.

In building this updated Master Plan, alternative scenarios were considered to optimize response performance and to ensure Paramedic Services can efficiently maintain quality service in the community and public confidence in emergency services. This Master Plan identified additional resource requirements of approximately $3.46 million net in incremental operating expenses annually (total $31.15 million). Further, capital expenditures in the amount of $27.2 million have been identified to fund the additional stations, ambulances, special response units and a logistics vehicle. This level of resources would provide a solid foundation for proactive and effective resourcing to respond to the unique and evolving needs and build on the strengths of York Region's diverse and thriving communities to 2031.

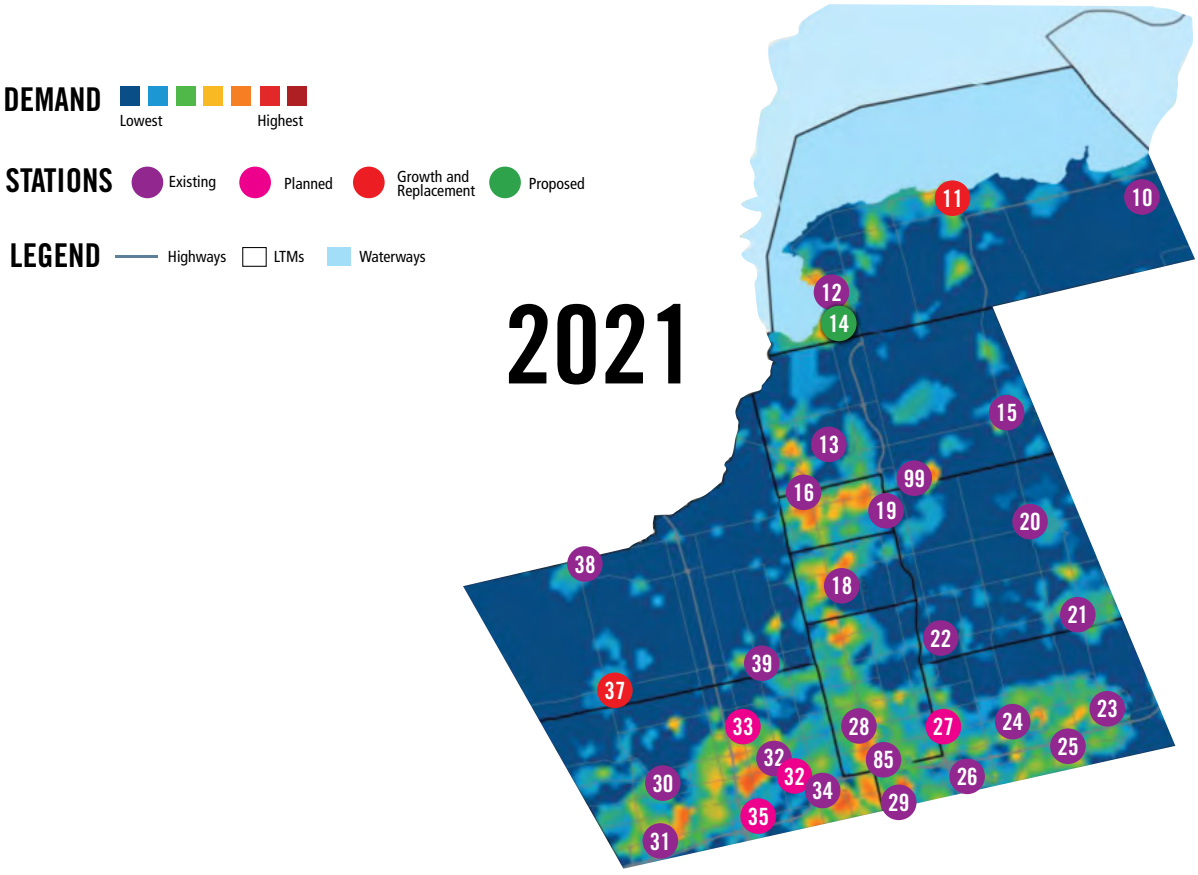
Actions that would optimize resources and could mitigate costs were modeled. Significant cost savings are possible, however, implementation of these actions requires leadership and investment by the Province.

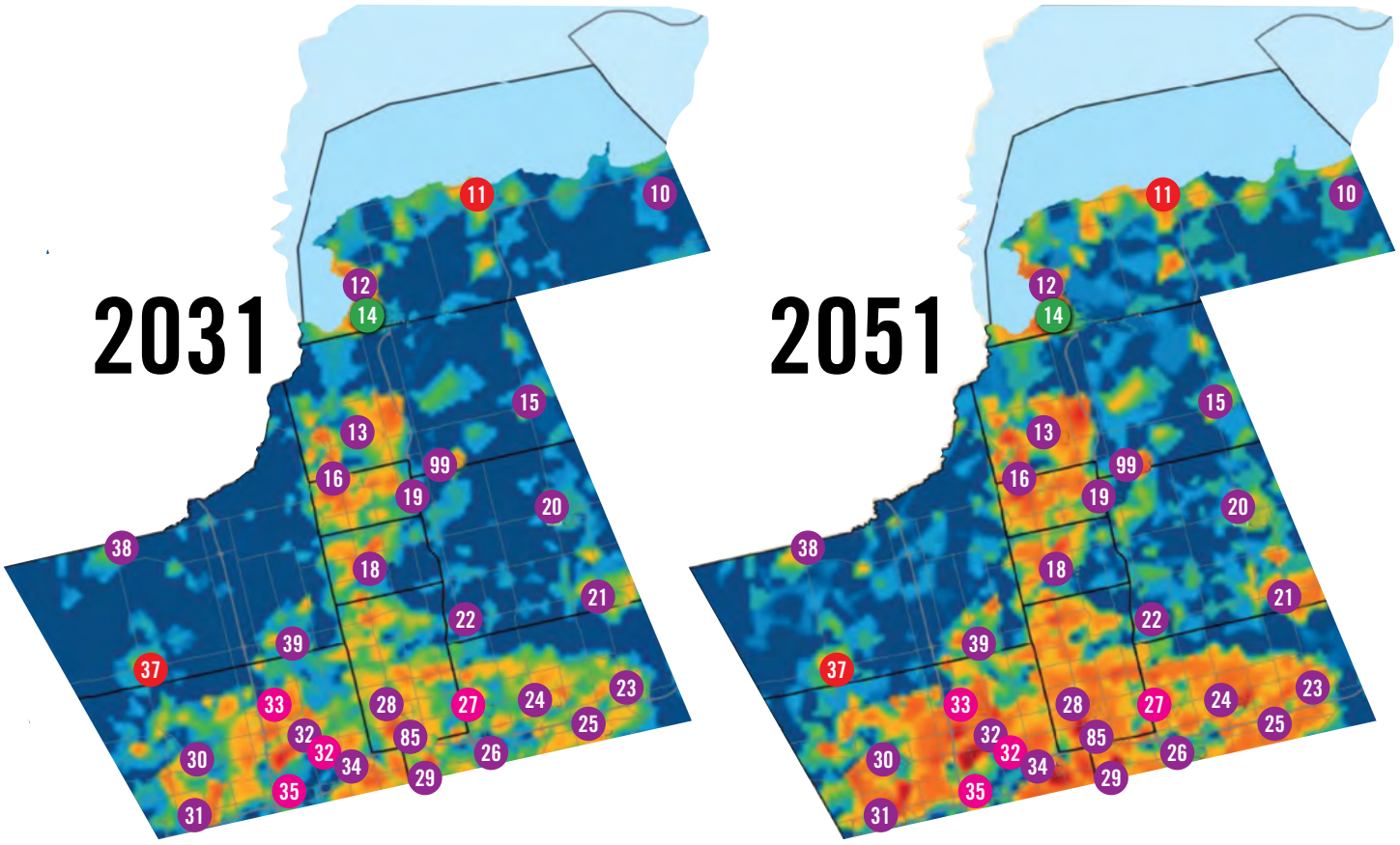
Looking ahead, the updated Master Plan provides an implementation pathway that leverages proven data to understand resource requirements to service population demand to 2051 in all nine local municipalities.

Since the inception of York Region Paramedic Services in 2000, Regional Council support has been instrumental in building a Service that has been able to grow, adapt and stay viable to the changing needs and demands of the Region's residents.

APPENDICES

Appendix 1: Paramedic Station Heat Maps

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