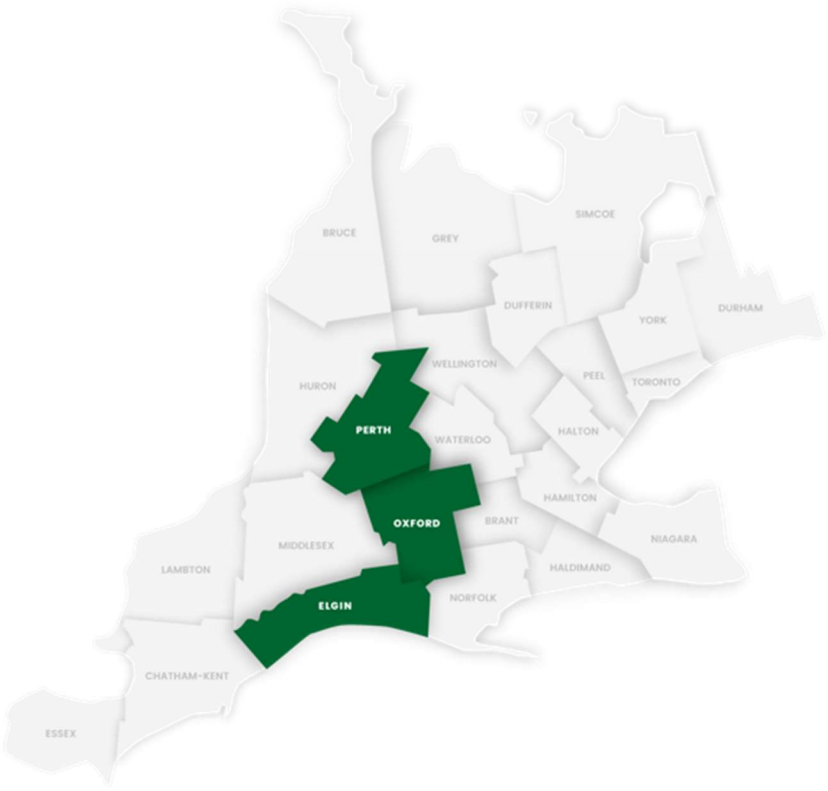
PERFORMANCE CONCEPTS CONSULTING

OXFORD, ELGIN & PERTH COUNTIES

Joint Municipal Paramedic Services Deployment Review (JMPSDR)



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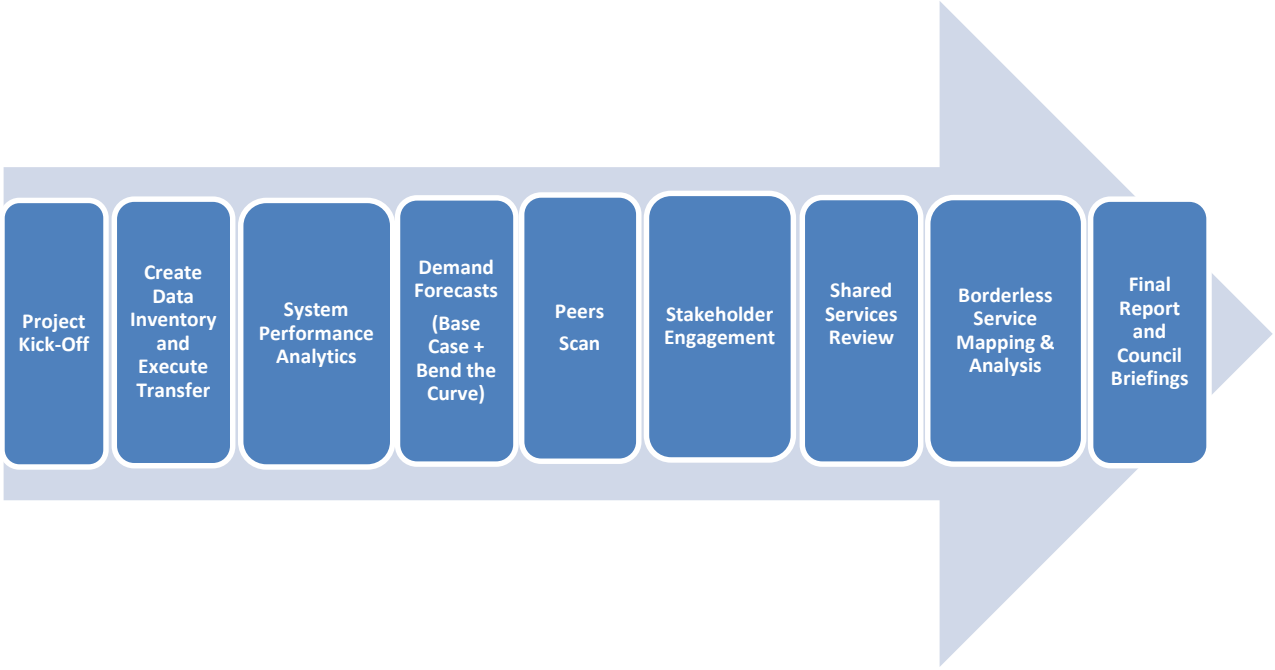
1.0 Introduction & Approach

Performance Concepts Consulting Inc. was retained by the Counties of Oxford/Elgin/Perth in September 2021 to execute a Joint Municipal Paramedic Services Deployment Review (JMPSDR) under the auspices of the provincial Municipal Modernization Fund. This independent 3rd party Final Report positions the County of Oxford (on behalf of the group) to fully comply with the terms of its Modernization Fund contract with the Province. The 2021-2022 JMPSDR has been delivered on time and on budget by the Performance Concepts team.

1.1 Methodology Overview

The JMPSDR project methodology is evidence based. Oxford, Elgin, and Perth ambulance services have each been evaluated on a standalone basis using an advanced package of performance analytics. Demand forecasts have been prepared for Oxford, Elgin, and Perth, providing insights into future resourcing requirements as well as the future utilization of existing vehicle hours of service. Internal and external stakeholders have been engaged, and peer municipality service levels and productivity metrics have been documented and evaluated. A shared services review has been conducted and priority sharing deals have been identified. Borderless coverage issues/opportunities have been mapped and analyzed for future action/implementation. This Final Report sets out a series of stress tested Recommendations and an Implementation Roadmap for consideration by the three ambulance services and their respective Councils.



1.2 Provincial Financial Realities – The Municipal Self-Reliance Imperative

The Province's Municipal Modernization Fund program pre-dates the COVID pandemic. The stated intent of the Modernization Fund is to support Ontario municipalities that are committed to identifying and implementing service delivery efficiencies.

Pre-COVID, public statements by the Premier indicated that Modernization Fund municipal efficiency dividends of 4% to 5% of targeted spending were achievable. In other words, the Province's original goal was to secure *incremental $ efficiencies* across the municipal sector. Pre-COVID, the Province's incremental improvement vision for the municipal sector seemed reasonably scaled. But now in 2022, the context and stakes around Modernization Fund reviews have changed dramatically.

The deficit figures in the table below are instructive in this regard. An already heavily indebted Provincial government (pre-COVID) will be more than $70B further in debt by the end of fiscal year 2021-22. A new provincial-municipal financial reality is now at hand.

The COVID-19 New Abnormal: Crushing Senior Government DEBT Loads

- **The Province forecast a 2020-21 deficit of $38.5 BILLION in March**
- **The Province is forecasting a 2021-22 deficit of $33.1 B**
- **Deficit forecasts for the following 2 fiscal years total $47.9 Billion**

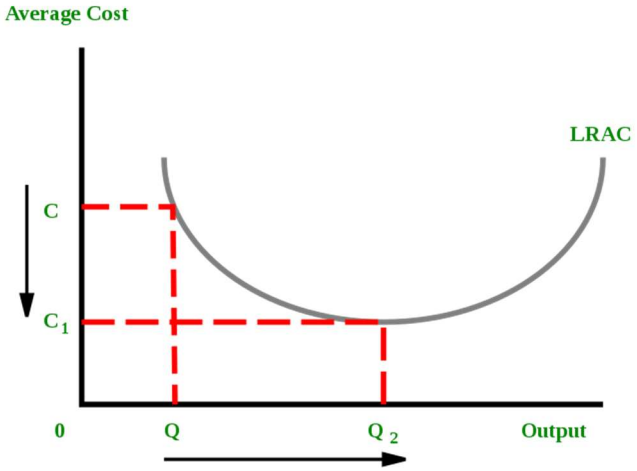
- **The Province is looking at the Municipal Modernization Program to source significant operational efficiencies and $ savings.**
- **Key Question: Are Oxford, Elgin and Perth ready to collectively embrace significant change to buffer upcoming fiscal turbulence?**

Land ambulance services will need to maximize their efficiency toolkit and secure improved scale economies as they grapple with these new fiscal realities. Cost avoidance and operational efficiency improvements can be secured via robust service sharing deals and well-designed borderless service arrangements. These innovations will help generate financial self-reliance for the Oxford, Elgin, and Perth partners in a challenging Federal/Provincial/Municipal financial environment.

1.3 Primer on Benefits of Municipal Service Sharing

1.3.1 Securing Economies of Scale

Economies of scale permit a municipality to secure lower average unit costs for a given service by increasing the total output of that service being delivered. Increases in total output allow for fixed costs (e.g., staff FTEs or materials) to be distributed over more units of service. The result is a drop in average cost over successive budget cycles. The figure below sets out the classic economic explanation of scale economies.



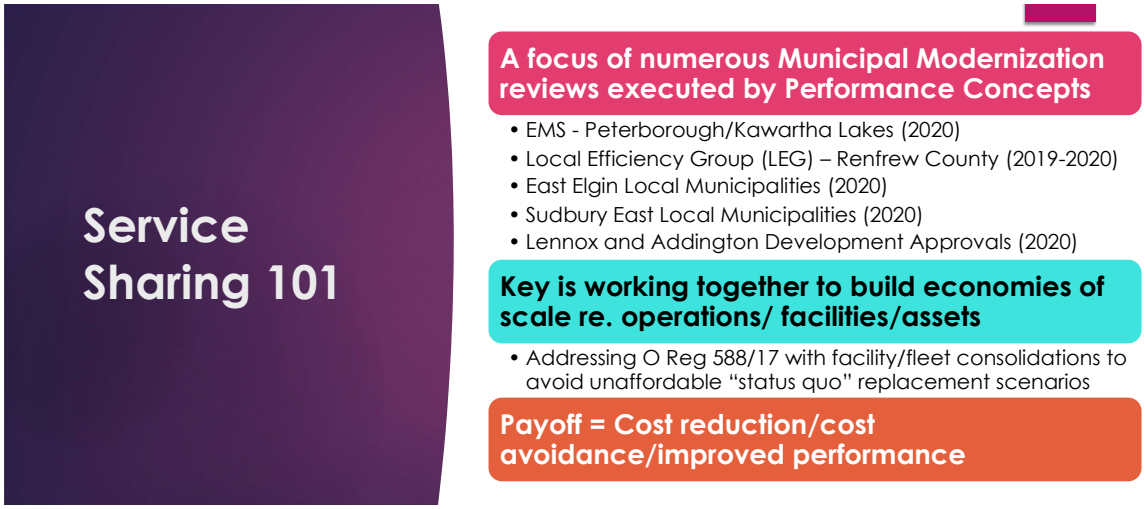
The Ontario municipal sector has attempted to secure "the holy grail of scale" using a number of different approaches over the decades. Regional governments were created to pool taxpayer resources beyond local municipal boundaries to create scale economies. Municipal amalgamations were undertaken to expand/consolidate service delivery catchment areas and reduce/control costs by sharing overheads.

Amalgamation within the Ontario municipal sector has proven to be ineffective at securing scale economies (based on the $ evidence). There are no municipal case studies documenting reduced unit costs or long-run cost management benefits from amalgamation. Municipal overhead costs (nested in corporate departments) can be consolidated and then distributed over a much larger pool of direct service delivery outputs. However, the upwards averaging of service levels/costs for direct service delivery swamps any overhead savings for amalgamation participants. The net result of municipal amalgamation efforts has been dis-economies of scale, cost spikes, and operational upheaval.

On the bright side, properly executed service sharing arrangements among municipal partners can bypass the risks of formal amalgamation (i.e., upward averaging) while securing scale economies by distributing shared fixed costs over more units of service. Bypassing the negative politics and economics of amalgamation has led to increased interest/utilization of service sharing across the Ontario municipal community. To the Province's credit, Municipal Modernization projects featuring service sharing

investigation have been moved to the front of the line when it comes to securing modernization grant funding approvals. The Province finally understands that municipal service delivery efficiencies generated by scale economies can be achieved without the political disruption associated with forced amalgamations.

Municipal service sharing arrangements are spreading across Ontario; encompassing a variety of services and diverse combinations of upper tier and/or lower tier municipalities (see figure below).



Municipalities like Kawartha Lakes and Peterborough County delivering EMS (land ambulance) services have been working together to share the costs of staff training, scheduling, specialized staff units, medical supplies, fleet, etc. These EMS services have also made strides in implementing coordinated borderless deployment where they cover sections of each other's territory/communities from a single station; avoiding the inefficiency of 2 stations with overlapping coverage zones at a border. Peterborough County and Kawartha Lakes have imbedded this win/win borderless deployment in their EMS master planning, avoiding millions of dollars in future capital/operating costs.

The Renfrew County Local Efficiencies Group (LEG) consists of seven local municipalities that have executed an exhaustive service sharing project across Corporate, Public Works, Fire and Recreation service bundles. The LEG group are working their way through an implementation roadmap that includes 30+ action items.

Groups of local municipalities in Elgin County and East Sudbury district have embarked on a series service sharing deals involving Building/Planning, Fire, and Arena/Recreation services.
Scale economies have been achieved around sharing specialized/qualified staff, facilities, and technologies.

In the County of Lennox and Addington, the County and the four local municipalities have designed a consolidated/standardized Development Approvals Process (DAP) service delivery model supported by a

single IT workflow/GIS solution. The consolidated/streamlined upper/lower tier DAP model is being positioned as a major economic development advantage attracting new development projects across L&A municipalities during the COVID 19 "flight from density" outflow of knowledge workers from Greater Toronto.

1.3.2 Service Sharing Approaches Across Ontario

The figure below sets out the Service Sharing approaches/categories being used across the Ontario municipal community.

A range of approaches/sharing categories are being investigated and implemented; including shared IT platforms/software solutions, consolidated contracted service providers, position sharing, specialized equipment sharing, borderless service arrangements, and cross-municipal special purpose bodies such as Planning Boards.

Traditional sharing arrangements around bulk purchasing continue to be refined/expanded in Public Works (e.g., salt/winter material) and EMS (e.g., medical supplies) settings.

Municipalities are making use of a variety of execution instruments to bring service sharing opportunities to fruition:

- *Memorandum of Understanding* - Municipalities can enter into a non-legally binding agreement to share services that describes mutually accepted expectations of all the parties involved.

- *Intergovernmental Service Contracts* - Intergovernmental contracts exist when one organization pays another for an extension of service. Agreements can specify an ongoing, defined level of service or services can be provided on an 'as needed' basis. Service providers may want to take advantage of economies of scale, while service recipients may want access to expertise. This option is used when smaller communities need to expand operations, which could involve new staff, goods, or internal functions or services. They are used to defray high costs of deploying a

new service or responding to increasing service demands. They are primarily used when there is a sporadic demand for service or a combination of a large area and a small rural population to service. Special attention to fair apportionment is addressed in the agreement, including processes to ensure workload is fairly apportioned.

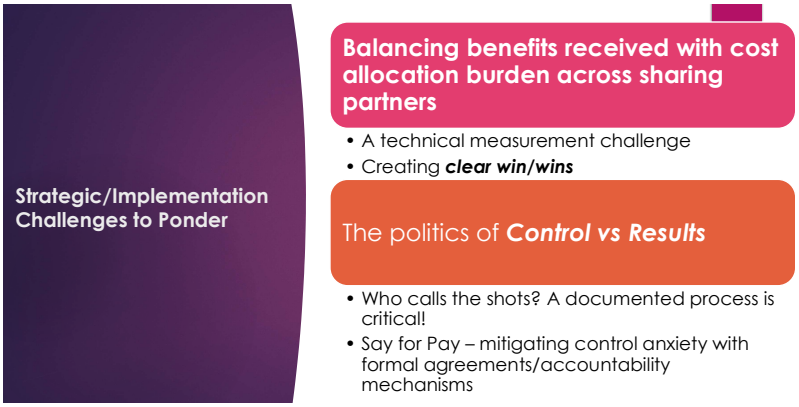
- *Automatic Aid Agreement* - A form of Intergovernmental Service Contract, Automatic Aid Agreements are typically used by fire departments to pre-arrange fire protection services by another fire department that has shorter response times to a given group of addresses in the first fire department's response area. Compensation is typically a flat-rate annual fee regardless of the number of calls attended.

- *Joint Services Committee* - Committees can be developed to facilitate cooperation and coordination among organizations. They are generally non-binding discussion forums and can be a precursor to more formal shared service arrangements.

- *Municipal Services Corporation* - Municipalities can create MSCs to delegate their powers or duties to a corporation with respect to oversight and service programming.

1.3.3 Service Sharing Insights for Municipalities to Ponder

The process of negotiating/implementing municipal service sharing frameworks is rife with political/strategic challenges (see figure below).



The politics of *Control versus Results* cannot be avoided by potential sharing partners. Balancing benefits received with fair cost burden allocation is key. Measurement tools to verify *planned* win/win arrangements are actually generating win/win results are critical. Trust among partners is important, but so is verification. *Trust but verify* is a fitting approach to success.

"Say for Pay" control anxiety among service buyers/receivers and their Councils can be mitigated by formal agreements and accountability mechanisms that ensure poorly performing sharing deals can be fixed or terminated.

1.4 Primer on the Benefits of Borderless Deployment

Borderless deployment is a scale economies efficiency tool that can be applied to a range of municipal services including the following:

- Curbside waste collection (green bag/blue bin)
- Roads winter control
- Fire suppression
- Land ambulance

The central premise is that municipal borders can sometimes create "efficiency disincentives" for route-based municipal services or emergency response services. Why should a snowplow discontinue an efficiently executed route just because of a boundary line drawn on a map? The same logic applies to a garbage truck collecting curbside waste. Why should municipality A and B create 2 distinct fire suppression services if their combined built form is ideal for one integrated coverage model?

A recent land ambulance borderless service example is instructive. In the Kawartha Lakes Master Plan mapping analyses demonstrated that certain Kawartha Lakes border communities could be efficiently covered by a new close-by Peterborough County station. In turn, Peterborough border communities were also being efficiently covered by a Kawartha Lakes station. These reciprocal cross-border coverage arrangements have now been formalized as a borderless coverage "barter" model. Both jurisdictions have been able to forgo expensive station/coverage expansions. Kawartha Lakes has been able to re-deploy ambulance vehicle hours out of the border coverage area and address coverage soft spots elsewhere in the municipality. The result has been a borderless coverage win/win.

The following excerpt from the 2021 Kawartha Lakes EMS Master Plan makes the case for borderless deployment.

Performance Concepts recommends the following bundle of Coverage/Resourcing actions:

- ***Kawartha Lakes staff be directed to negotiate with Peterborough County for a Cross-Border Service Agreement between the municipalities. In conjunction with the agreement, the City of Kawartha Lakes and Peterborough County should develop a Common Deployment Strategy to maximize both Bobcaygeon/Trent Lakes and Millbrook/Pontypool coverage and balance costs through cross-border billing.***

- ***Sequence the transition of the existing hours of Pontypool coverage (3x12 hours) and add additional hours of service (2x12 hours) to the Oakwood station once the Millbrook station is occupied. Conduct an analytics "deep dive" to determine the optimal deployment of the (5x12 hour) resource in terms of time-of-day/day-of-week.***

  Rationale: A Cross-Border Service Agreement/Common Deployment Strategy with Peterborough County will take advantage of similar cross border call volumes to ensure coverage in the Bobcaygeon/Trent Lakes and Millbrook/Pontypool areas in an efficient and cost-effective manner. As noted in the Pontypool Post mapping in Section 5.4.7, the current staffing pattern (12 hours/3 days a week) is ineffective at servicing the catchment area.

  Peterborough County has recently approved plans to build/staff a new paramedic station in Millbrook. This new base creates a potential series of "dominos" for improved coverage in Kawartha Lakes (attacking the red travel time calls). Our recommendation sets these dominos in motion. Oakwood availability has been confirmed. A deep dive analytics refresh in Q1 2022 will further inform the timing of Oakwood and Lindsay resourcing upgrades.

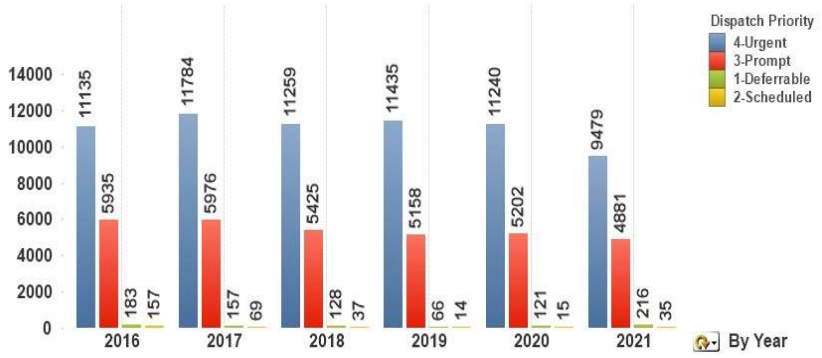
2.0 Oxford System Performance (Overview)

2.1 Service Delivery Performance Analytics

Technical Appendix A to this Report contains a comprehensive analytics package for the Oxford Paramedic Service. Highlights are presented below in this section of the Final Report to document workload, response time, and system busyness challenges moving forward.

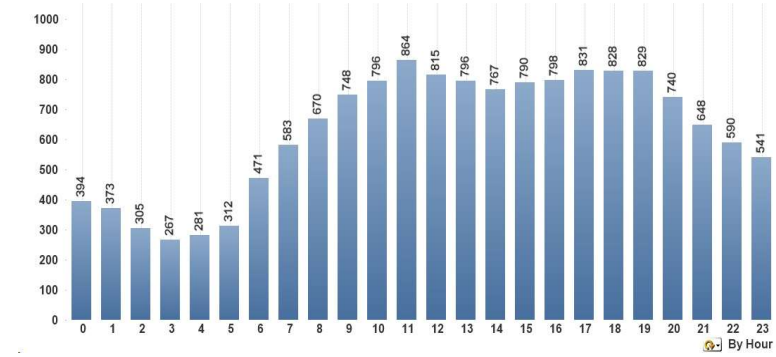
2.1.1 Dispatched Code 3-4 Call Volumes

The Covid pandemic has not significantly blunted Oxford's Code 3-4 call volume levels. By the end of 2021, forecast Code 3-4 call volumes will meet/exceed prior years.



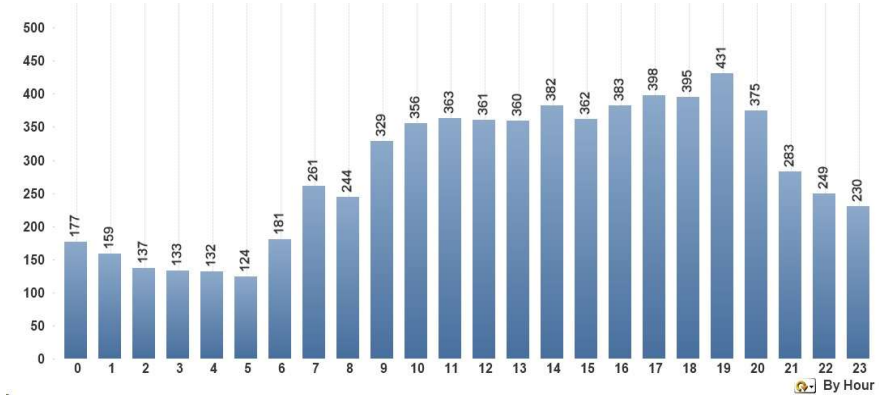
Oxford 2016-2021
Dispatched Code 1-4 calls

Hour of Day Code 3-4 call volumes for 2020 (most recent year of complete data) demonstrate the classic pattern found across Ontario ambulance services; call volumes peak in the late morning and then extend into the early evening. They begin to recede across the evening and then drop significantly overnight.



Oxford 2020
Dispatched Code 3-4 calls by Hour of Day

Urban call volumes in Woodstock are a significant driver of Oxford's total system-wide call volumes. The pattern of Woodstock calls across the hours of the day mirror the pattern of the entire Oxford system.

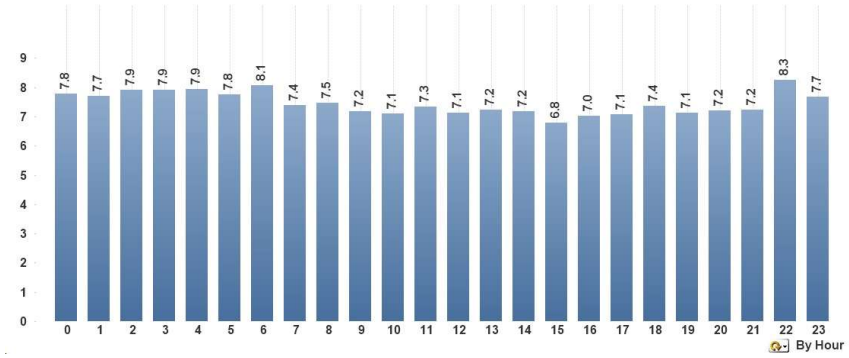


Woodstock Stations 2020
Dispatched Code 3-4 calls
by Hour of Day

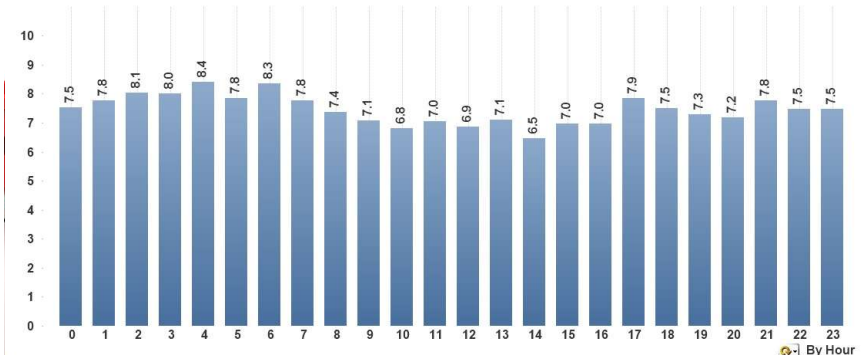
Detailed station-by-station Code 3-4 call volume data is available in the Technical Appendix.

2.1.2 Dispatched Code 4 Average Response Times

Oxford 2019-2020
Dispatched Code 4 Average Response Times by Hour of Day



2019



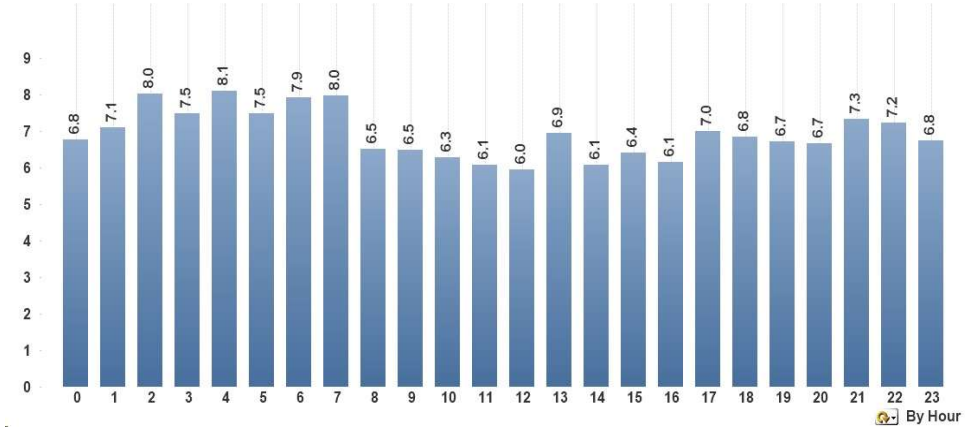
2020

Oxford's Dispatched Code 4 average response times have remained stable during the COVID pandemic. System-wide response times integrate the high call volume urban stations in Woodstock and Tillsonburg with the lower volume non-urban stations.

The most recent Code 4 response time data for 2021 (up to October) is consistent with these 2019-2020 full-year trends.

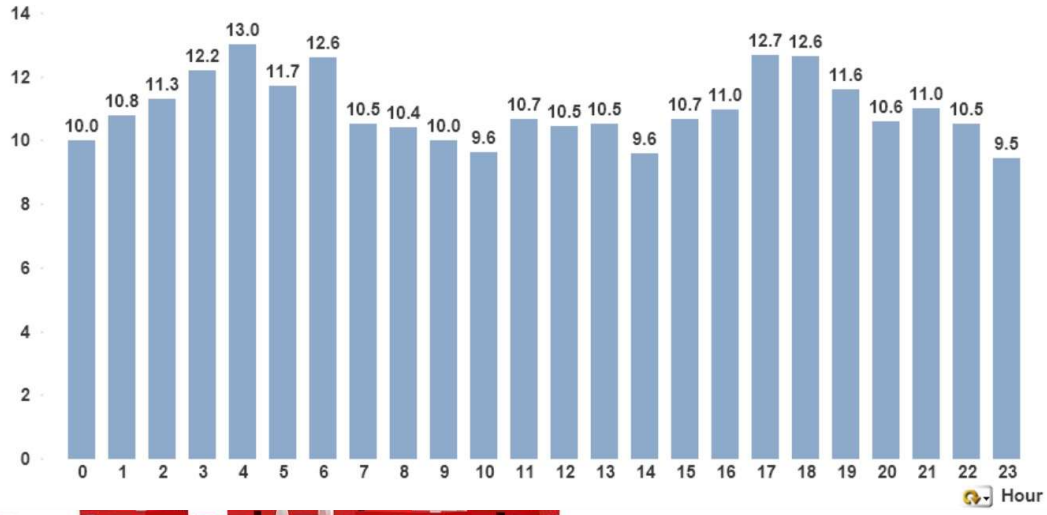
Urban Dispatched Code 4 average response

times in Woodstock are quicker than times for the entire Oxford system or the non-urban stations, due to the proximity of the Woodstock stations to a denser built form.



Woodstock Stations 2020 Dispatched Code 4 Average Response Times by Hour of Day

Non-urban Dispatched Code 4 average response times (outside Woodstock/Tillsonburg) are slower than times for the entire system, due to the dispersed built form and longer ambulance drive times.



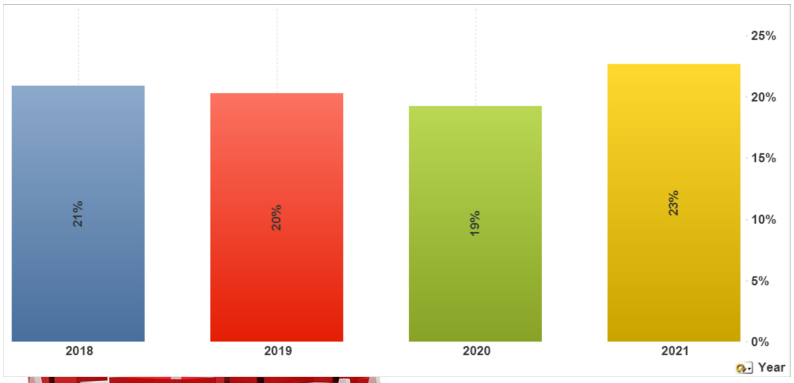
Non-Woodstock/Tillsonburg Stations 2020 Dispatched Code 4 Average Response Times by Hour of Day

2.1.3 System Busyness - Unit Hour Activity (UHA)

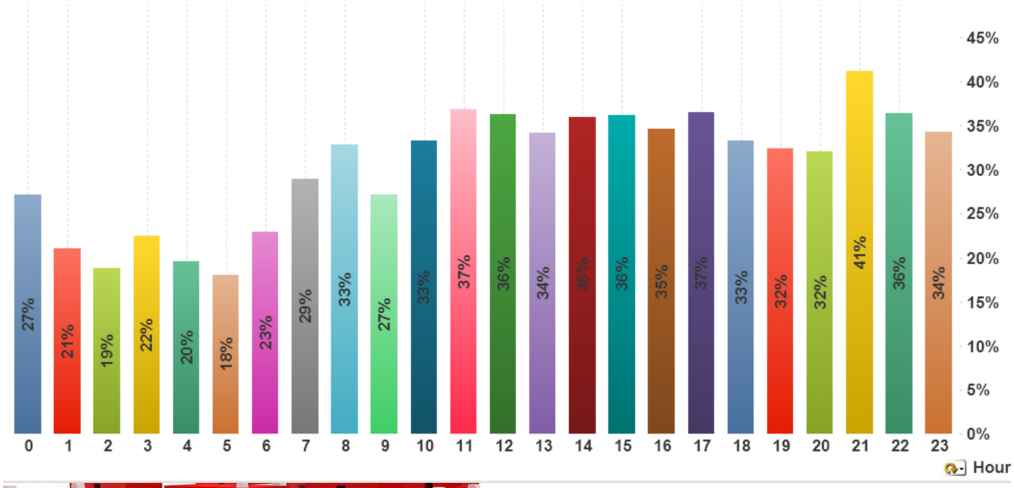
Unit Hour Activity (UHA) is a standard metric across Ontario for measuring patient-focused system busyness levels. UHA measures the share of a deployed hour ambulances are "in service" doing patient-centric work versus the share of an hour spent preparing to respond to a call.

System-wide UHA (busyness) has increased from pre-pandemic levels to a high of 23% in the first ten months of 2021. Call volume increases have been generated by population growth, aging tsunami demographics and a growing propensity to call 9-1-1. Call volume growth drives annual and hourly UHA.

2018-2021 Annual UHA (All Bases)

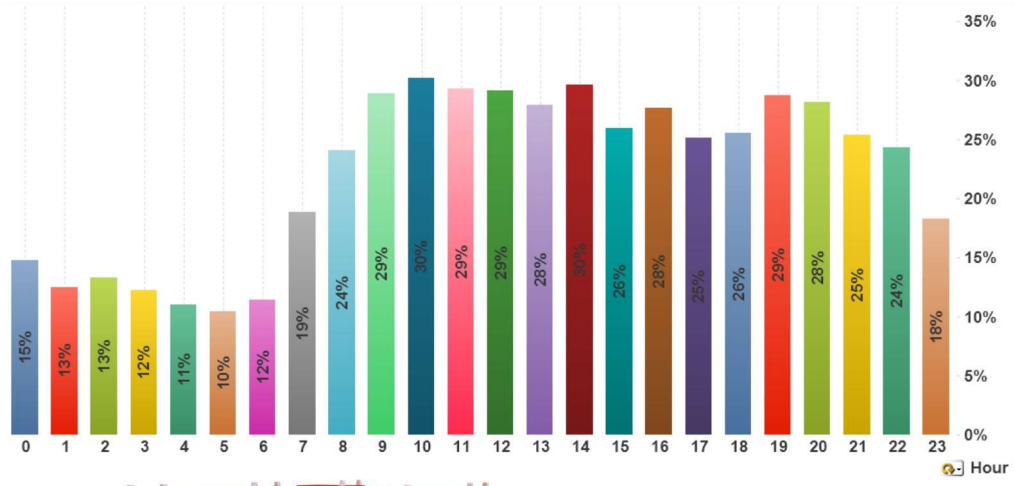


System busyness in urban Oxford (Woodstock during peak hours of the day) are trending towards a concerning 40% UHA threshold. Busyness beyond 40% UHA can burn out medics and negatively impact response times.



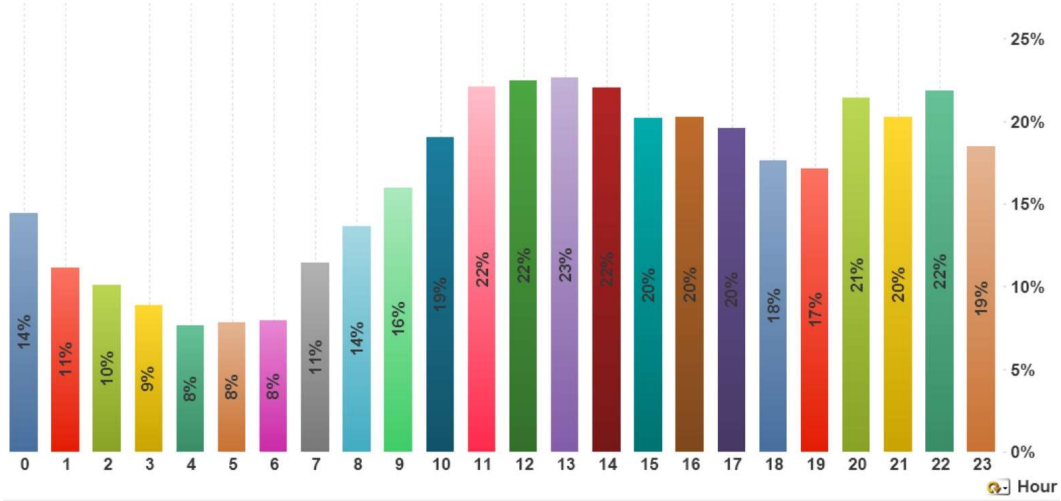
2021 UHA by Hour of Day (Woodstock Stations)

Tillsonburg peak hour UHA has also been trending upwards. Ongoing residential growth in Tillsonburg over the next few years will drive peak hours UHA further towards "Woodstock-ish" levels of urban busyness.



2021 UHA by Hour of Day (Tillsonburg Station)

UHA levels across the rest of the Oxford system are significantly lower than Woodstock or Tillsonburg. These Non-urban stations balance the realities of system busyness with the need for stable/predictable geographic coverage.



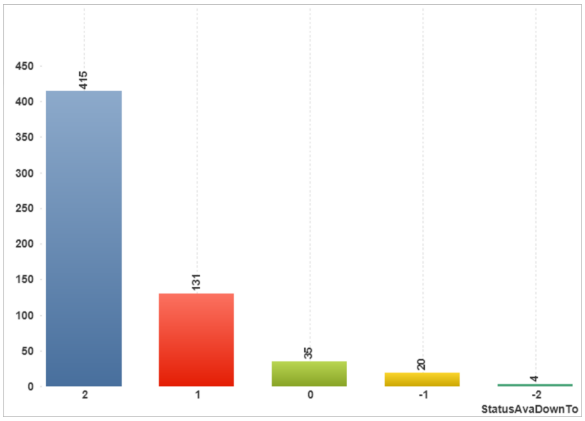
2021 UHA by Hour of Day (Non-Woodstock/ Tillsonburg Stations)

2.1.4 Daily Erosion of Available Units - Code Zero

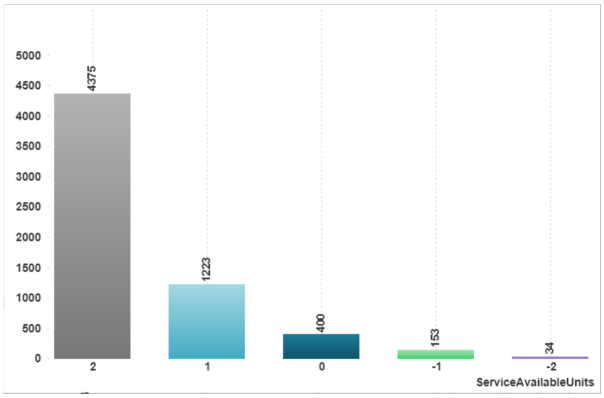
Over the course of any given day, Oxford's deployed ambulances become increasingly busy. During periods of peak busyness, Oxford experiences an erosion in the number of available ambulance units. When the number of available Oxford ambulances falls below a certain level, the response time for the next Code 4 call may not meet typical system-wide response times.

In 2021, Oxford experienced 131 incidents of having only one ambulance available for the next Code 4 call. Oxford also experienced 59 incidents of "Code Zero" ambulance shortages (35 green + 20 gold + 4 turquoise on the chart below).

 # Occurrences < 2 Available Units



 # Minutes at < 2 Available Units

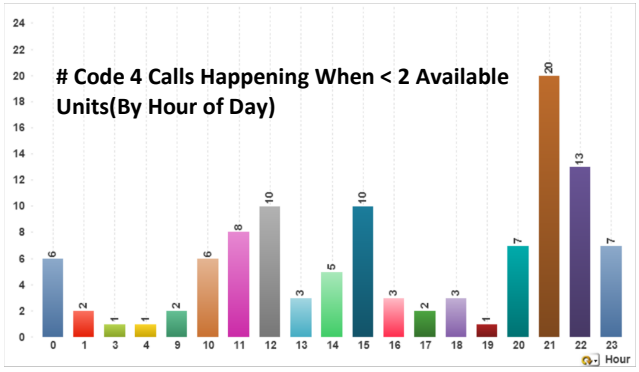


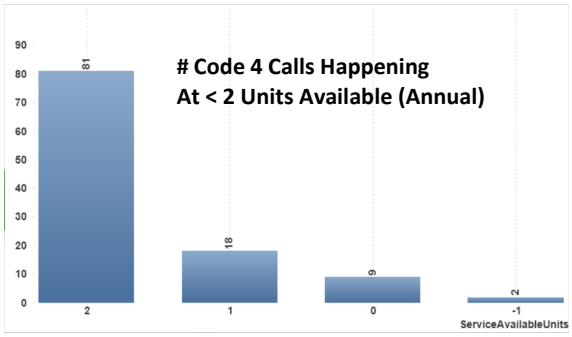
2021 Erosion of Available Units

In 2021, Oxford experienced 1,223 minutes (20.4 hours) at the critical resource level of 1 available ambulance. Oxford also experienced 587 minutes (9.8 hours) at Code Zero (or worse) levels of ambulance shortages.

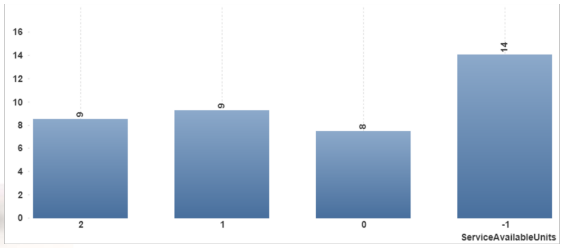
When Oxford experiences < 2 available ambulances, subsequent Code 4 calls represent a potential risk event. The table below documents the 2021 distribution of these potentially risky Code 4 calls across the hours of the day. Eighteen Code 4 calls occurred when only one ambulance was available across Oxford. Eleven Code 4 calls occurred once the Code Zero "no available ambulances" threshold was crossed. Fortunately, Code 4 response times in 2021 (when available ambulances < 2) were moderately impacted compared to the average system-wide response times for 2021.

2021 Erosion of Available Units





Average Response Time for Code 4 Calls Happening at < 2 Units Available



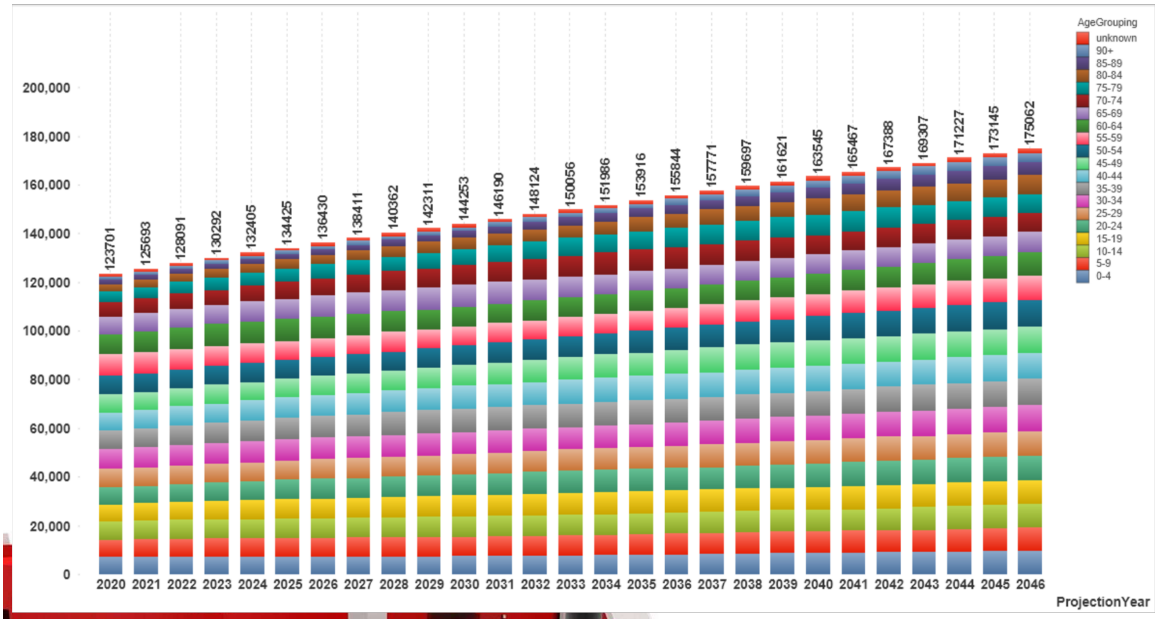
2.2 Base Case Demand Forecasts (Current to 2046)

2.2.1 Methodology & Population Forecast

Properly executed demand forecasts are a prerequisite for effective paramedic service delivery planning. Demand forecasts should generate informed estimates of future Code 3-4 call volumes and the required in-service vehicle hours of effort required to respond to these call projections.

Three factors drive land ambulance demand forecasts across Ontario. The first factor is population growth. More residents/seasonal visitors over time translate into more Code 3-4 calls over time - especially if population growth occurs in age cohorts > 65 years old. The second factor is the demographic aging tsunami impacting health care across Ontario. The back end of the Baby Boomer generation is now transitioning into the age cohort > 65 years old. Senior citizen age cohorts are a call volume growth engine for land ambulance services across Ontario. Aging tsunami call volume growth is driving annual land ambulance call volume increases of 4-5% in parts of Ontario experiencing no population growth. The third factor is the increasing propensity of the public to call 9-1-1. The changing public willingness to request emergency services (sometimes in non-emergency circumstances) is a major driver of demand for ambulance calls in some jurisdictions.

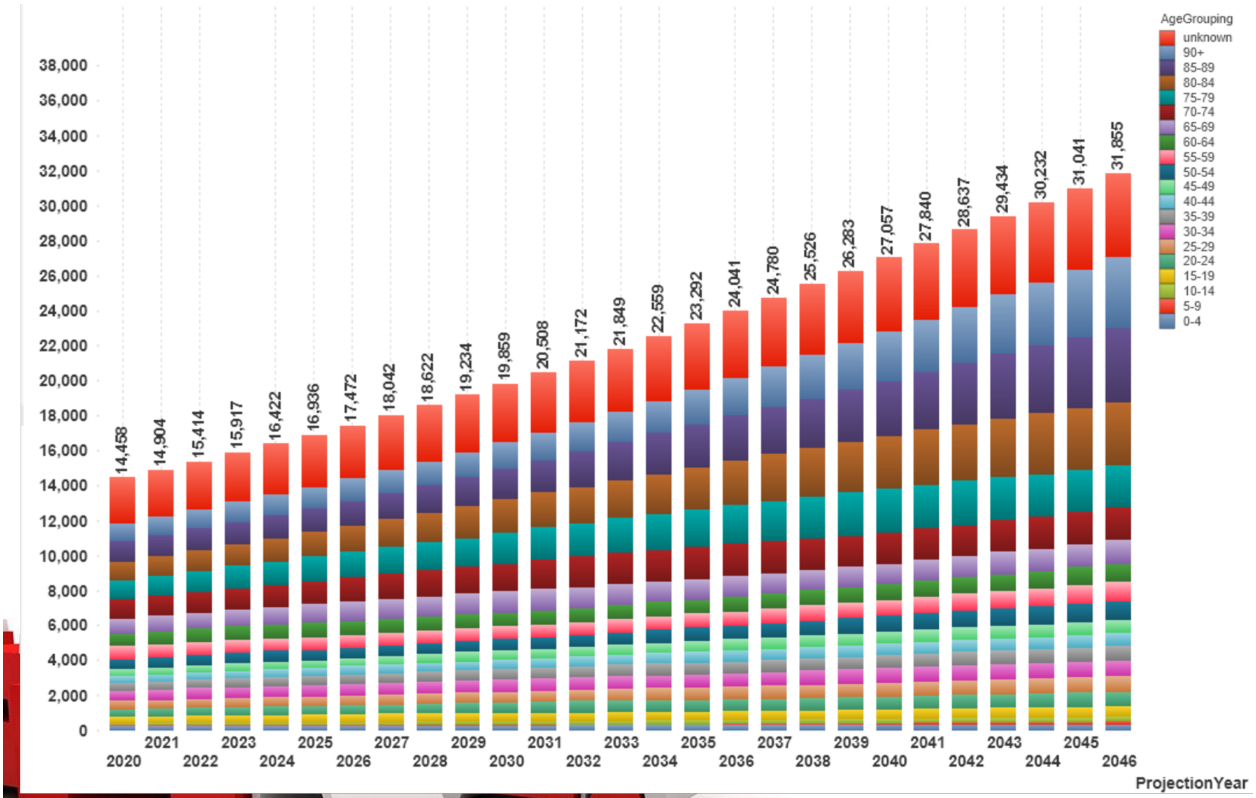
Oxford's demand forecast begins with the Ontario Ministry of Finance's population forecast to 2046. The Ministry of Finance population forecast for Oxford is broken down by age cohorts. By 2032 the Oxford population will grow by 20,000 people compared to 2022 - totalling 148,124 residents. Age cohorts > 65 will factor strongly in Oxford's overall population growth.



2046 Population Projection
By Age Cohort

2.2.2 *Base Case* Demand Forecast - Call Volumes + In Service Time

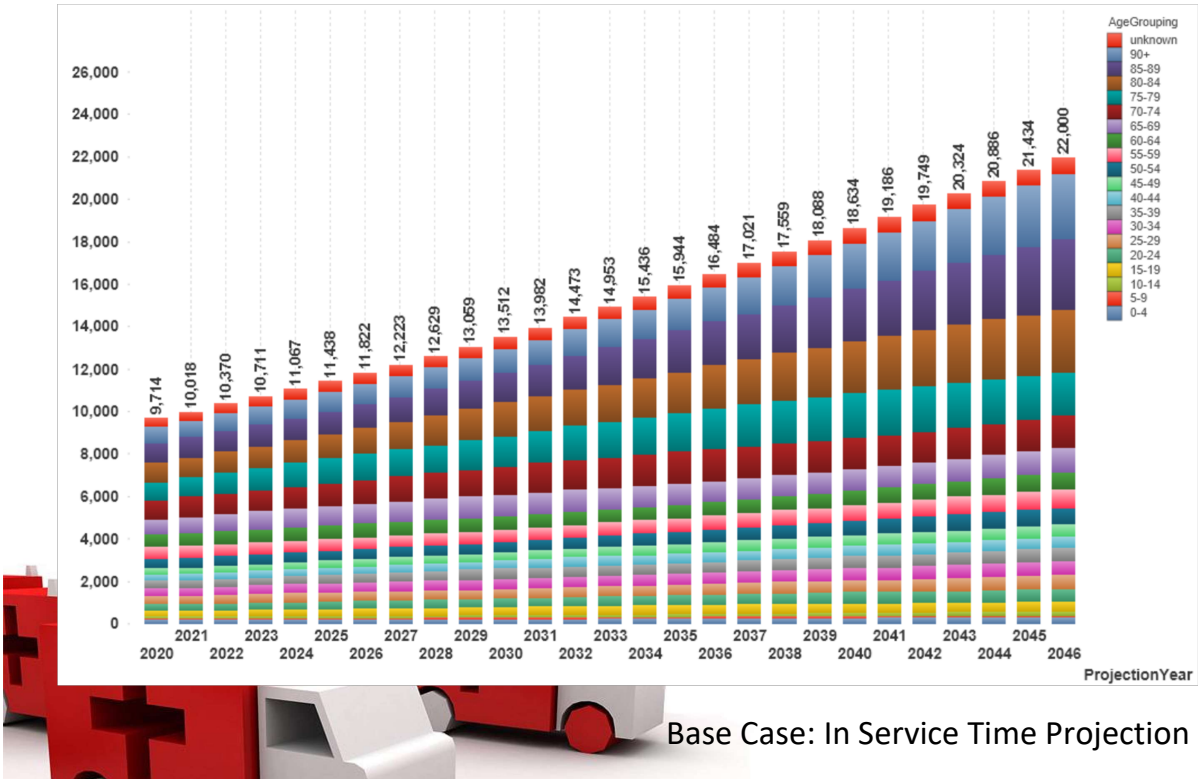
The base case demand forecast of Oxford Paramedic Service calls is set out in the chart below. This forecast accounts for the impacts of population growth + the aging tsunami + the impact of increasing public willingness to call 9-1-1 for emergency assistance. The 2022 to 2032 near-term forecast horizon is instructive/daunting from both a budget and operational perspective. Code 3-4 call volume totals in 2032 are forecast at 21,172 - an increase of 5,758 calls or 37% compared to 2022. The senior citizen age cohorts > 65 years will continue to drive call volume growth between 2022 and 2032. The Oxford property tax base/budget framework will be challenged/stressed by annual call volume increases in the 4% range across the base case demand forecast.



Base Case: Call Volume Projection

Oxford In-service time (hours) spent on Code 3-4 calls is also forecast to grow significantly between 2022 and 2032 (10-year near-term forecast). By 2032 a forecast 14,473 In-service hours will be required - a 39% increase over the 2022 total of 10,370 In-service hours (see graph on next page).

The average in-service time per Code 3-4 call is significantly less than an hour because a portion of total forecast calls are cancelled prior to arriving on-scene to care for a patient. More typical calls involving arrival on-scene and subsequent patient care typically hover around an hour of In-service time.



Base Case: In Service Time Projection

2.3 Community Paramedicine and Alternate Pathways

The following demand management tools/initiatives inform the revised "Bend the Curve" demand forecasts for Oxford, Elgin, and Perth. While this section of the Report precedes Oxford's subsequent "Bend the Curve" forecast it applies equally to the subsequent Elgin and Perth forecasts.

2.3.1 *Re-imagining Paramedicine*

The traditional municipal approach of adding ambulance vehicle hours to deal with increasing call volumes is not sustainable in the medium to long term. Population growth, the aging tsunami, and an increasing propensity to call 9-1-1 by all age cohorts will continue to impact both call volumes and In-Service "time on task" workload. With an almost 40% projected increase in call volume over the next decade, adding a $0.6 million 12-hour ambulance crew every 3 to 4 years can be expected. A key question for the Ontario paramedic sector: can we reimagine new ways of doing business?

2.3.2 *Dispatch Enhancements*

For many years, Ontario ambulance calls have been prioritized using a computerized Dispatch Priority Card Index (DPCI) developed by the Ministry of Health and Long-Term Care. DPCI uses extremely

cautious algorithms and as such, more than 70% of requests for ambulance service are dispatched with Code 4 "lights and siren". Emphasizing the cautious nature of DPCI, only 10% of these dispatched calls are typically identified by paramedics as life-threatening after seeing the patient, and subsequently return to hospital with "lights and siren". With 70+% of calls determined as emergencies when dispatched, paramedic resourcing/staffing must be maximized to ensure immediate availability of an ambulance. In short, the DPCI dispatch system's risk management biases create incentives for municipalities to over-invest in timely response to emergency calls that are not really "emergency" calls. No other jurisdiction in North America employs the DPCI algorithm to triage 9-1-1 calls.

The Ministry of Health and Long-Term Care is presently converting its communications centres from DPCI to the Advanced Medical Priority Dispatch System (AMPDS), long felt to be the worldwide gold standard in ambulance call triaging. AMPDS allows communicators to categorize the call more sensitively by chief complaint and set a determinant level (a.k.a. urgency) ranging from **Alpha** (minor) to **Echo** (immediately life-threatening) relating to the severity of the patient's condition. The AMPDS system also uses the determinant **Omega** which may be a referral to another service or other situation that may not actually require an ambulance response at all (an alternate pathway). In the Niagara Region communications centre, calls may be referred to a nurse located in the centre for further assessment, health advice, referral, etc., thus eliminating the need for an ambulance to be dispatched. Only a small number of calls are sent "hot" (with lights and siren), and lower priority **Charlie** calls can be queued until an ambulance is available. Fewer "lights and siren" responses result in safer roads and more availability for true emergency calls.

The transition to AMPDS first requires all dispatch centres to upgrade to CAD5 (Computer-aided dispatch software). This process has just begun in Ontario.

2.3.3 *Propensity to Call 9-1-1*

A unique factor driving call volume growth regardless of population growth and aging, is the propensity to call 9-1-1. Whether driven by better awareness through media of emergency services available, prevalence of higher risk activity such as non-prescription drug use, or an "I want it now" mentality (a mistaken belief that arriving by ambulance will bypass the emergency department queue), the number of 9-1-1 ambulance calls per capita has been steadily climbing, at a rate in some municipalities, often exceeding that of population growth and aging. In an effort to reverse this trend, ongoing "Make the Right Call" media campaigns are essential to re-educate the general public.

2.3.4 *Community Paramedicine*

A number of other patient care innovations are showing promise on a smaller scale, but need to be ramped up significantly to make a quantifiable difference in flattening the call volume demand curve:

"**Community paramedicine**" is an umbrella term that describes a more proactive and preventive approach to care provided by expanded scope paramedics. Most recently, COVID-19 highlighted the potential of community paramedics through critical roles at assessment clinics and assisting during

staffing shortages at long term care facilities in crisis. The Province has responded with interim funding for these programs, and more recently, with significant 4-year funding to support patients awaiting long term care beds.

The concept of community paramedicine is quite broad in scope, allowing individual paramedic services to develop programs that best meet the needs of their constituents. During more "normal" times, three potential benefits of community paramedicine are:

- Chronic disease management and injury prevention
- Reduced calls to 9-1-1 and transport to hospital for non-urgent patients
- Providing appropriate follow-up care for high-risk patients without hospital readmission

Community paramedics can aid in routine immunization, disease management and injury prevention by helping patients manage chronic diseases such as diabetes and hypertension. Simple home checks to verify compliance with prescription medications, assessing blood pressure, oxygen saturation and blood sugar, as well as confirming safety of the home environment can go a long way towards keeping patients out of hospital. Utilizing remote monitoring technology to assist with self-monitoring and alerting paramedics when values move out of normal range, ensures proactive action can be taken with the patient's family physician before symptoms escalate and there is a need to go to hospital. Point-of-care blood testing will soon compliment the community paramedic's skill set.

A number of studies have shown significant reduction in paramedic calls for those patients enrolled in community paramedicine programs. A group of Ontario medically complex "high users" reduced their 9-1-1 activation by 24%; remotely monitored Ontario patients reduced 9-1-1 activation by 26% and transportation to the emergency department by 31%; rural Nova Scotia users reduced annual trips to emergency departments by 40%; while residents in an Ontario high-risk social-housing setting showed a 19% reduction in EMS calls to their housing complex.

Two additional initiatives in the Niagara Region show significant potential as well. Activities of their Falls Intervention Team (paramedic and occupational therapist) have resulted in a 3.8% reduction in calls for falls among seniors this year, compared to two years of call volume growth of 9.4 and 14.2% respectively. Transports to hospital in these patients were reduced by 6.3%. Further, their Mental Health and Addictions Response Team (paramedic and mental health nurse) has generated a 6.9% reduction in transport of mental health patients to Emergency Departments, despite an 8.1% increase in the number of calls.

These studies show that injecting lower-cost community paramedicine interventions customized for local needs, have the potential to significantly reduce the ongoing growth of ambulance calls. It is not unreasonable to expect a 20-30% reduction in ambulance call volume once these community paramedicine programs are scaled up appropriately.

A business case can certainly be made for community paramedics reducing ED visits, improving service in the community, and ultimately reducing the future cost of ambulance service. A significant increase

and stable ongoing funding are essential to positively impact the 2027-2032 back-end of the 10-year forecast call volume demand curve.

2.3.5 Alternate Pathways

Traditionally, paramedics were required to transport all patients to a hospital emergency department, but recent legislative change now allows for alternative destinations instead. This allows paramedics to transport patients directly to a facility that is most appropriate for their complaint, e.g., an Urgent Care, a sobering centre or mental health facility, rather than funneling all patients through a crowded emergency department.

2.3.6 Assess, Treat-and-Release or Assess-and-Refer

Not every patient needs to be transported to a facility. Until recently, unless a patient refused care, provincial legislation required any patient who requested an ambulance, to be transported to an acute care hospital. Formalization of protocols are required to allow paramedics to assess patients at the scene, provide needed care and then release the patient or assess the patient and determine they are safe for referrals. These referrals to their GP, clinic (providing a transportation chit if necessary) or for follow-up by a Community Paramedic, would more quickly free up ambulance resources for emergency service.

2.3.7 AMPDS a Potential Game Changer for Resource Planning

The call volume projections in the 2022-2032 base case forecast reflect the Province's current approach to managing risk at the point of dispatch. Approximately 75% of calls are dispatched as Code 4 emergencies - the highest risk category for patients. Therefore, Oxford/Elgin/Perth and other ambulance services across Ontario must resource themselves to deliver timely on-scene responses for an excessively large share of total calls. But the majority of Code 4 dispatched 9-1-1 emergency calls end up not being emergencies at all. Once paramedics actually put eyes on these Code 4 emergency patients, only 10-15% are generally triaged as "lights and siren" transports to the hospital. Provincial over-triaging of patient risk drives response time driven resourcing/budget decisions by Councils across Ontario.

The AMPDS triage algorithm can transform demand forecasting, resourcing requirements and municipal budgeting on a go-forward basis. Once the current 75% of dispatched ambulance calls classified as Code 4 "emergencies" are re-classified by AMPDS into three risk-based sub-sets (Echo/Delta/Charlie), differing response time standards can be assigned. Resourcing decisions can be revisited since less serious Delta/Charlie triaged calls can conceivably be delayed beyond current Code 4 response time standards.

The combination of AMPDS + dispatch centres staffed with health care practitioners capable of diverting patients to alternate pathways may serve as a gamechanger when it comes to resource planning. The daunting call volume forecasts presented in this Report's forecasts (mostly Code 4 calls) can and should be replaced by smaller forecasts of time-critical Echo/Delta calls. Current resourcing levels will be able

to absorb forecast Echo/Delta call volumes because Charlie calls can be deferred during times of peak busyness.

Oxford/Elgin/Perth will need to better understand these new resource planning realities in the first half of the 10-year planning horizon in order to modify resource requirements in the second half of the planning horizon once AMPDS has been rolled out and implemented by the Province.

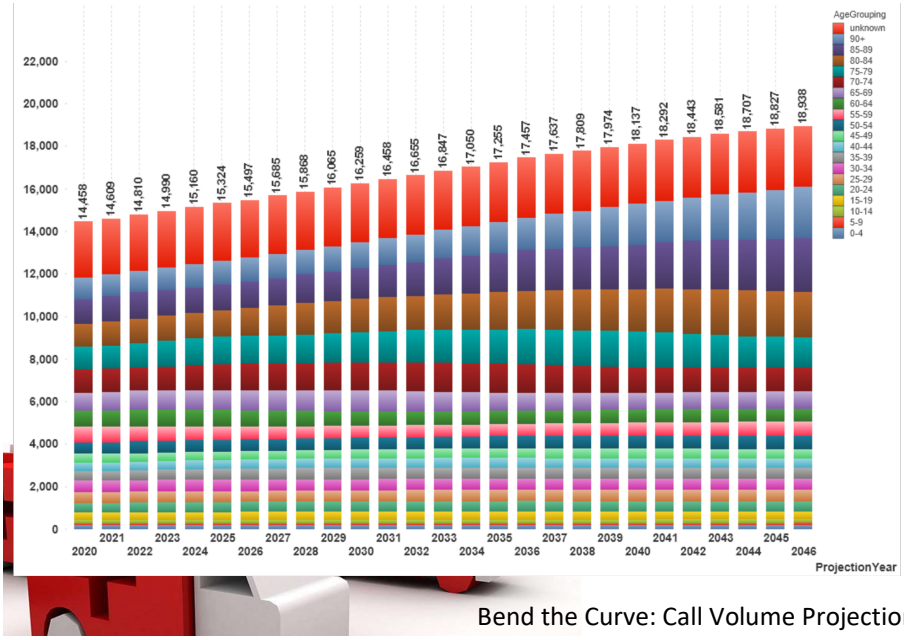
2.4 Revised Oxford Demand Forecasts

2.4.1 *Flattening the "Base Case" Demand Curve*

A modified demand forecast has been prepared to reflect the hoped-for mitigation/flattening impacts of AMPDS, community paramedicine, and alternate pathways. The "flatten the curve" forecast attempts to incorporate demand curve flattening initiatives across the 2022-2032 10-year planning horizon. However, it is unlikely that the structural reforms required to secure demand curve flattening can be achieved during the initial five years of the 2022-2032 period. Therefore, the expected net impact of revised demand curve modeling across the entire 2022-2032 period will be less than presented in the charts below - likely impacting only years 6-10 of the planning horizon.

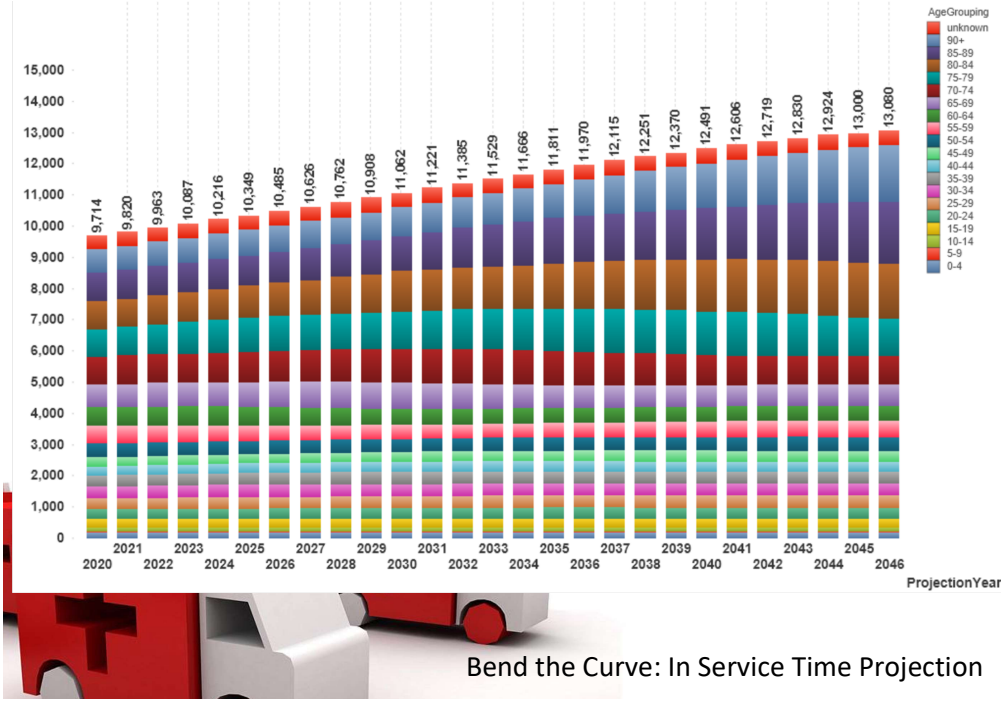
2.4.2 *Bend the Curve* Demand Forecast - Call Volumes + In Service Time

Oxford's "bend the curve" scenario forecasts 16,665 Code 3-4 calls in 2032, compared to 21,172 calls set out in the "base case" forecast for the same year.



Bend the Curve: Call Volume Projection

Oxford's "bend the curve" scenario forecasts 11,385 In-service hours in 2032, compared to 14,473 hours set out in the "base case" forecast for the same year.



Bend the Curve: In Service Time Projection

2.5 Oxford System Performance - Summary Observations & Performance Insights

Oxford's call volumes are increasing as Ontario transitions through the pandemic. Average Code 4 response times have remained stable across the overall system and in the busier urban Woodstock and Tillsonburg stations. System busyness metrics in urban Oxford (i.e., Woodstock during peak hours of the day) are trending towards a concerning 40% UHA threshold. Busyness beyond 40% UHA can burn out medics and negatively impact response times. Tillsonburg peak hour UHA has also been trending upwards. Ongoing residential growth in Tillsonburg over the next few years will drive peak hours UHA further towards "Woodstock-ish" levels of urban busyness. Code Zero available unit shortages are not overly problematic compared to many jurisdictions across Ontario, however eroded Code 4 response times at "zero availability" need to be monitored/identified moving forward.

The base case Oxford demand forecast is daunting. Annual base case 4% growth rates for call volumes/In-service time will probably trigger the need for added vehicle hours of service at various points across the 2022-2032 period. Recommendations in this Report may stretch the required timeframes for adding vehicle hours of service - a desirable outcome with financial and operational efficiency dividends.

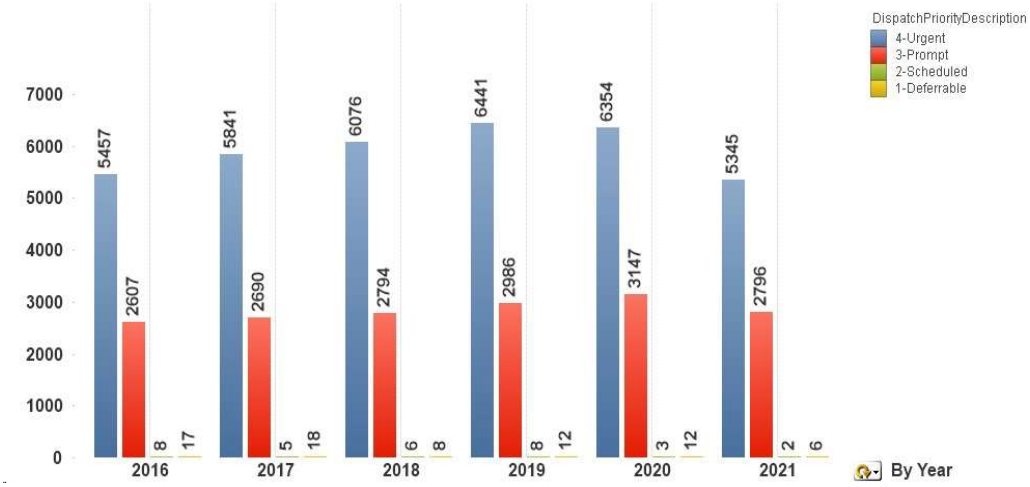
3.0 Elgin System Performance (Overview)

3.1 Service Delivery Performance Analytics

Technical Appendix B to this Report contains a comprehensive analytics package for the Elgin Paramedic Service. Highlights are presented below in order to document workload, response time, and system busyness challenges moving forward.

3.1.1 Dispatched Code 3-4 Call Volumes

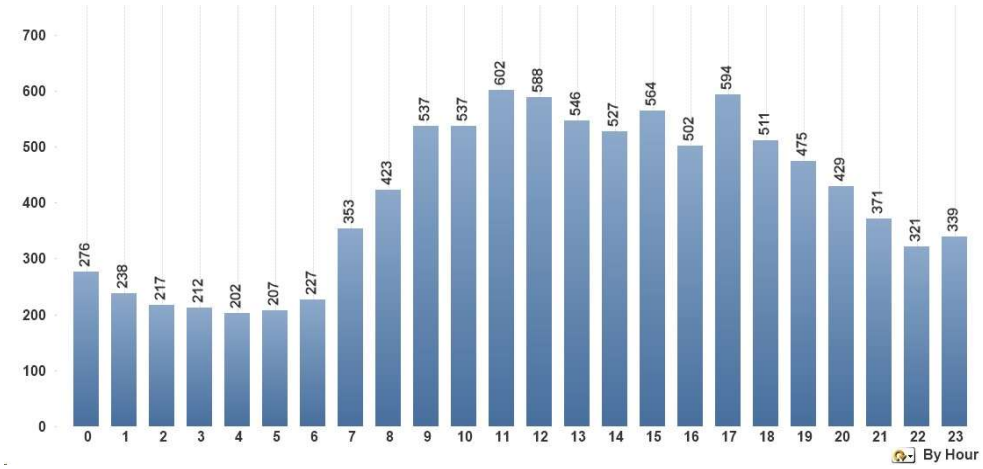
The Covid pandemic has not significantly blunted Elgin's Code 3-4 call volume levels. By the end of 2021, forecast Code 3-4 call volumes will meet/exceed prior years.



Elgin 2016-2021
Dispatched Code 1-4 calls

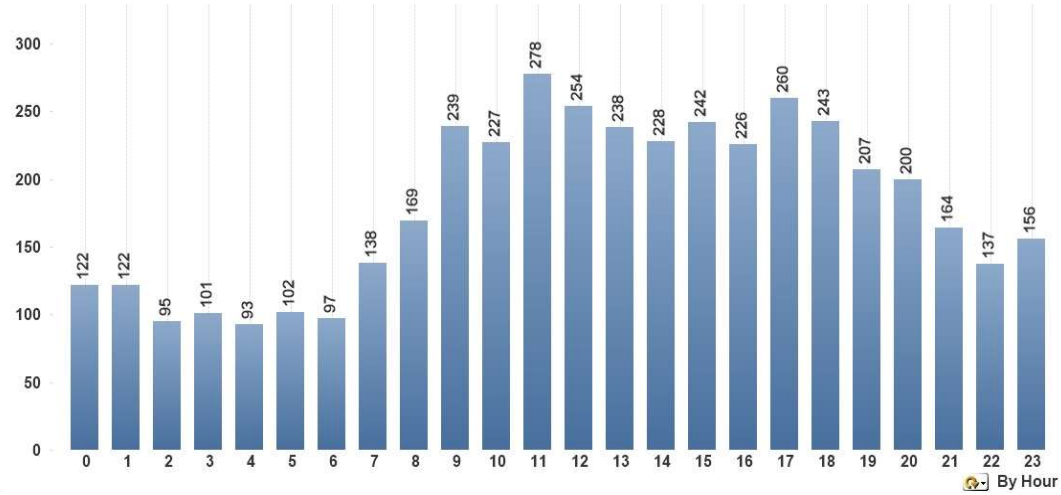
*** 2021 partial (mid-October)**

Hour of Day Code 3-4 call volumes for 2020 (most recent year of complete data) demonstrate the classic pattern found across Ontario ambulance services; call volumes peak in the late morning and then extend into the early evening. They begin to recede across the evening and then drop significantly overnight (see graph on next page).



Elgin 2020
Dispatched Code 3-4 calls by Hour of Day

Urban call volumes in St. Thomas are a significant driver of Elgin's total system-wide call volumes. The pattern of St. Thomas calls across the hours of the day mirror the pattern of the entire Elgin system.

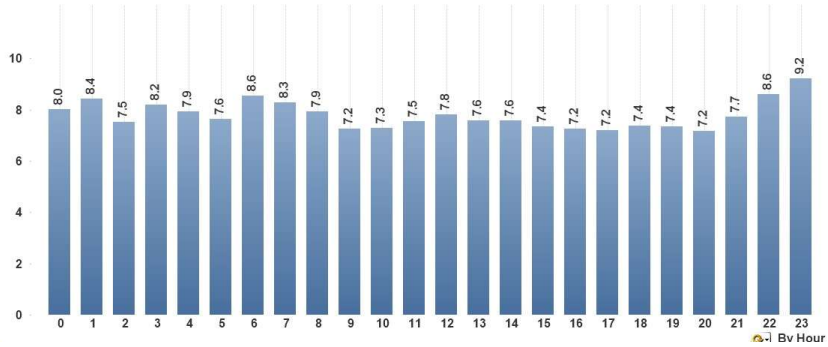


St. Thomas Stations 2020
Dispatched Code 3-4 calls by Hour of Day

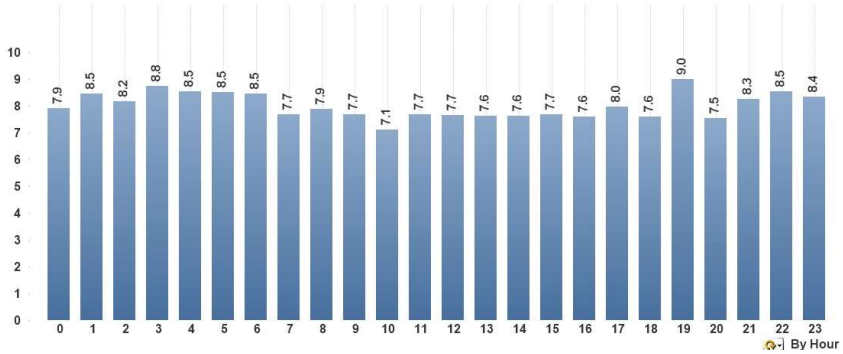
Detailed base-by-base Code 3-4 call volume data is available in the Technical Appendix.

3.1.2 Dispatched Code 4 Average Response Times

Elgin 2019-2020
Dispatched Code 4 Average Response Times by Hour of Day



2019

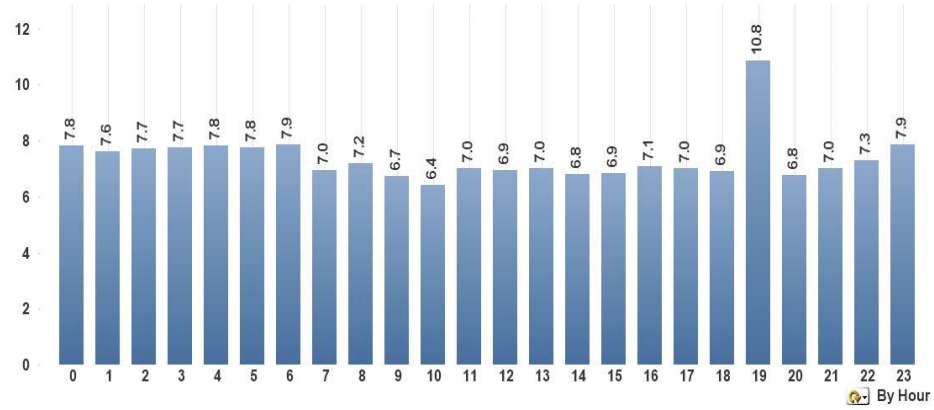


2020

Elgin's Dispatched Code 4 average response times have remained stable during the COVID pandemic. System-wide response times integrate the high call volume urban station in St. Thomas with the lower volume non-urban stations.

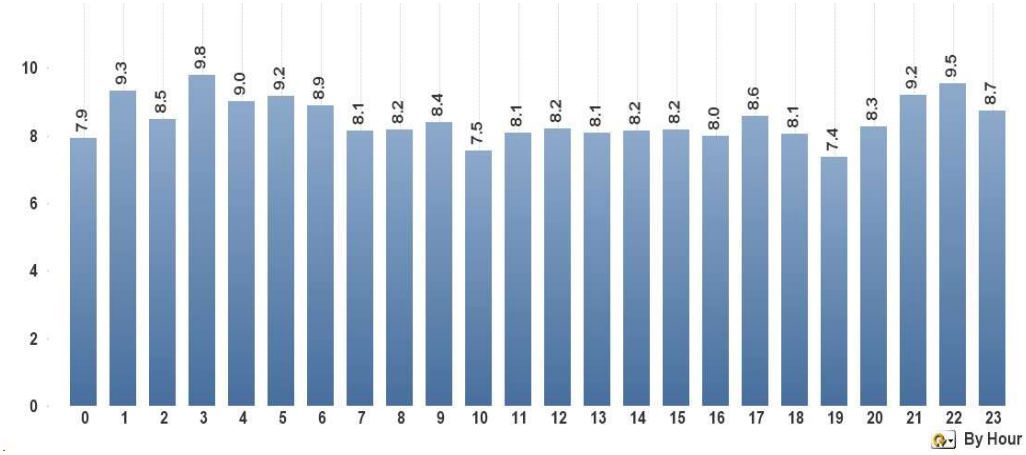
The most recent Code 4 response time data for 2021 (up to October) is consistent with these 2019-2020 full-year trends.

Urban Dispatched Code 4 average response times in St. Thomas are quicker than times for the entire Elgin system or the non-urban stations, due to the proximity of the St. Thomas station to a denser built form.



St. Thomas Stations 2020
Dispatched Code 4
Average Response Times
by Hour of Day

Non-urban Dispatched Code 4 average response times (outside St. Thomas) are slower than times for the entire system, due to the dispersed built form and longer ambulance drive times.



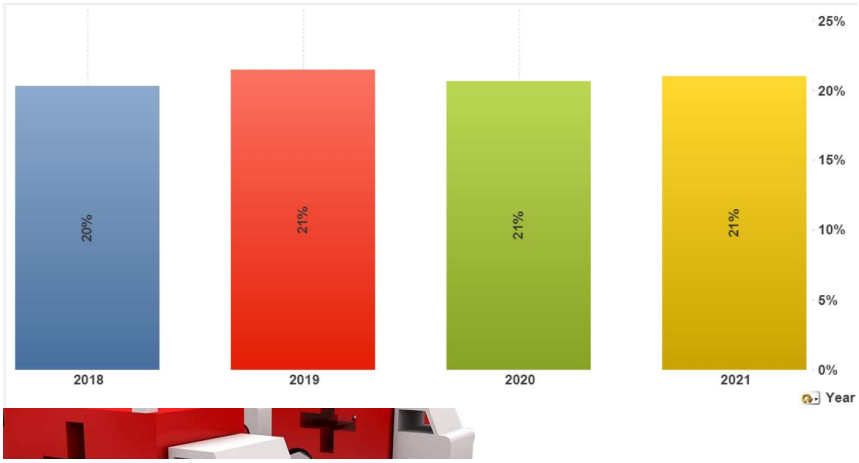
Non-St. Thomas Stations 2020 Dispatched Code 4 Average Response Times by Hour of day

3.1.3 System Busyness - Unit Hour Activity (UHA)

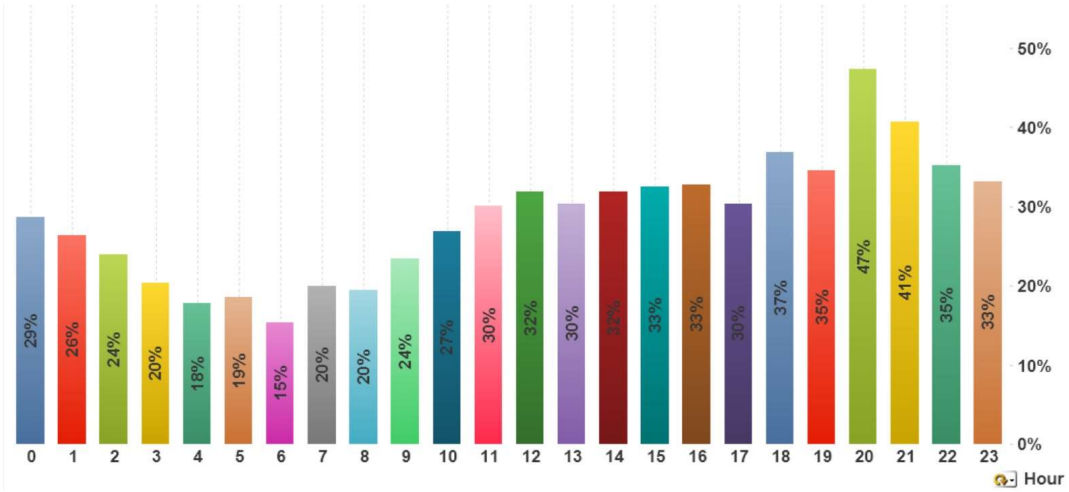
Unit Hour Activity (UHA) is a standard metric across Ontario for measuring patient-focused system busyness levels. UHA measures the share of a deployed hour ambulances are "in service" doing patient-centric work versus the share of an hour spent preparing to respond to a call.

System-wide UHA (busyness) has been maintained at pre-pandemic levels of 21% in the first ten months of 2021. Call volume increases have been generated by population growth, aging tsunami demographics and a growing propensity to call 9-1-1. Call volume growth drives annual and hourly UHA.

2018-2021 Annual UHA (All Bases)

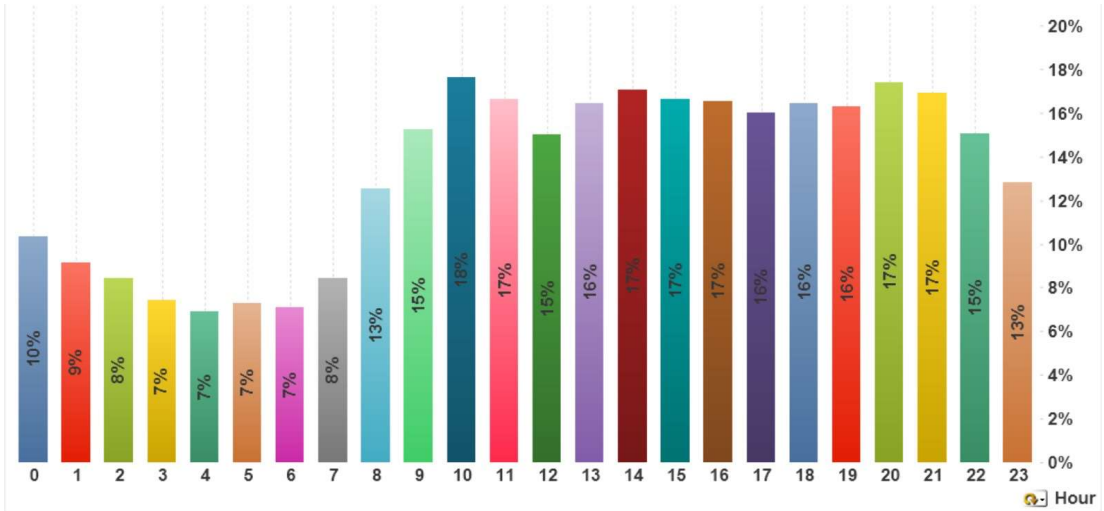


System busyness in urban Elgin (St. Thomas during peak hours of the day) are peaking in the low 30-33% range. Spiking UHA in hours 20-21 of the day are problematic. Busyness beyond 40% UHA can negatively impact response times.



2021 UHA by Hour of Day
(St. Thomas Stations)

UHA levels across the rest of the Elgin system are significantly lower than St. Thomas. These Non-urban stations balance the realities of system busyness with the need for stable/predictable geographic coverage.



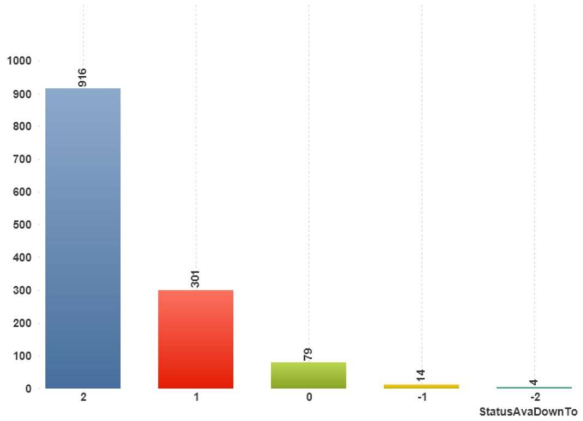
2021 UHA by Hour of Day
(Non-St. Thomas Stations)

3.1.4 Daily Erosion of Available Units - Code Zero

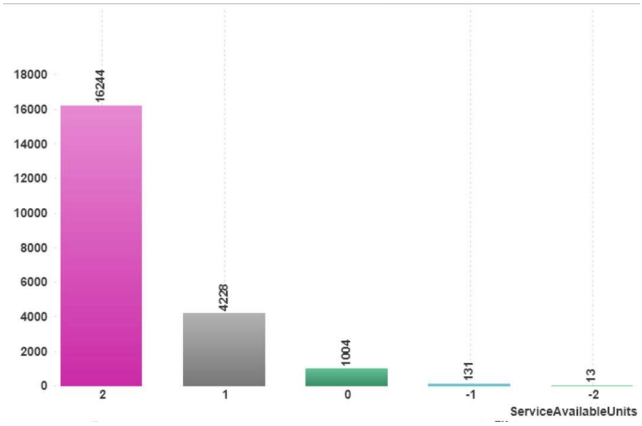
Over the course of any given day, Elgin's deployed ambulances become increasingly busy. During periods of peak busyness, Elgin experiences an erosion in the number of available ambulance units. When the number of available Elgin ambulances falls below a certain level, the response time for the next Code 4 call may not meet typical system-wide response times.

In 2021, Elgin experienced 301 incidents of having only one ambulance available for the next Code 4 call. Elgin also experienced almost 100 incidents of "Code Zero" ambulance shortages where no unit was immediately available for the next call.

 # Occurrences < 2 Available Units



 # Minutes at < 2 Available Units

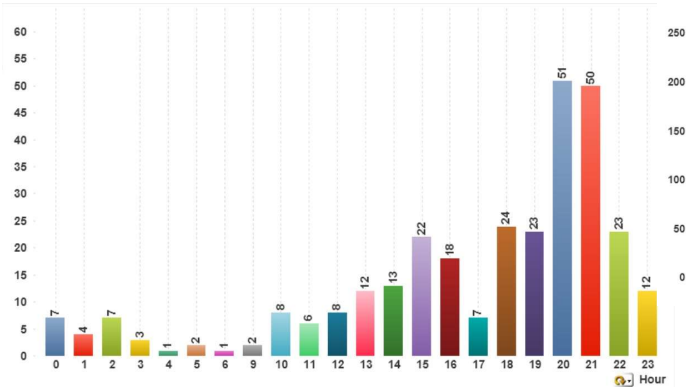


2021 Erosion of Available Units

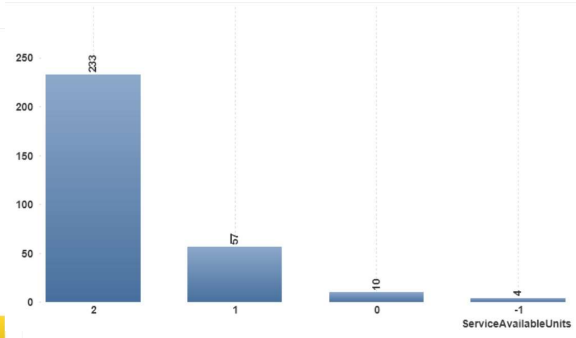
In 2021, Elgin experienced 4,228 minutes (70 hours) at the critical resource level of 1 available ambulance. Elgin also experienced 1,100+ minutes (18+ hours) at Code Zero (or worse) levels of ambulance shortages.

When Elgin experiences < 2 available ambulances, subsequent Code 4 calls represent a potential risk event. The table below (next page) documents the 2021 distribution of these potentially risky Code 4 calls across the hours of the day. Fifty-seven Code 4 calls occurred when only one ambulance was available across Elgin. Ten Code 4 calls occurred once the Code Zero "no available ambulances" threshold was crossed. Elgin Code 4 response times in 2021 (when available ambulances = 0) were 9 minutes on average.

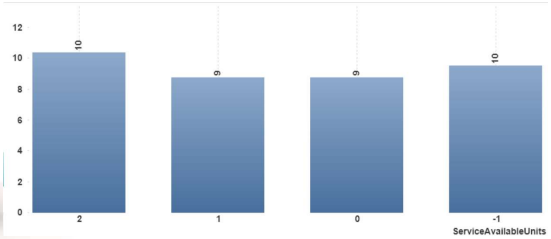
 # Code 4 Calls Happening When < 2 Available Units (By Hour of Day)



 # Code 4 Calls Happening At < 2 Units Available (Annual)



Average Response Time for Code 4 Calls Happening at < 2 Units Available



2021 Erosion of Available Units

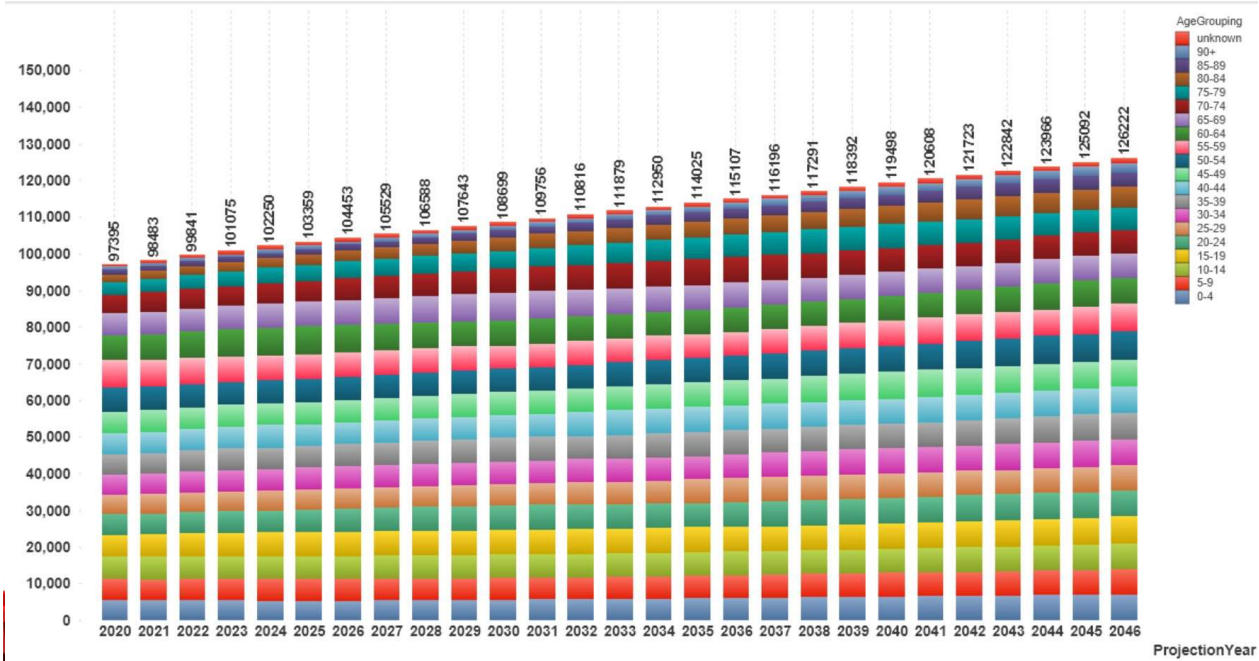
3.2 Demand Forecast (Current to 2046)

3.2.1 Methodology & Population Forecast

Properly executed demand forecasts are a prerequisite for effective paramedic service delivery planning. Demand forecasts should generate informed estimates of future Code 3-4 call volumes and the required in-service vehicle hours of effort required to respond to these call projections.

Three factors drive land ambulance demand forecasts across Ontario. The first factor is population growth. More residents/seasonal visitors over time translate into more Code 3-4 calls over time - especially if population growth occurs in age cohorts > 65 years old. The second factor is the demographic aging tsunami impacting health care across Ontario. The back end of the Baby Boomer generation is now transitioning into the age cohort > 65 years old. Senior citizen age cohorts are a call volume growth engine for land ambulance services across Ontario. Aging tsunami call volume growth is driving annual land ambulance call volume increases of 4-5% in parts of Ontario experiencing no population growth. The third factor is the increasing propensity of the public to call 9-1-1. The changing public willingness to request emergency services (sometimes in non-emergency circumstances) is a major driver of demand for ambulance calls in some jurisdictions.

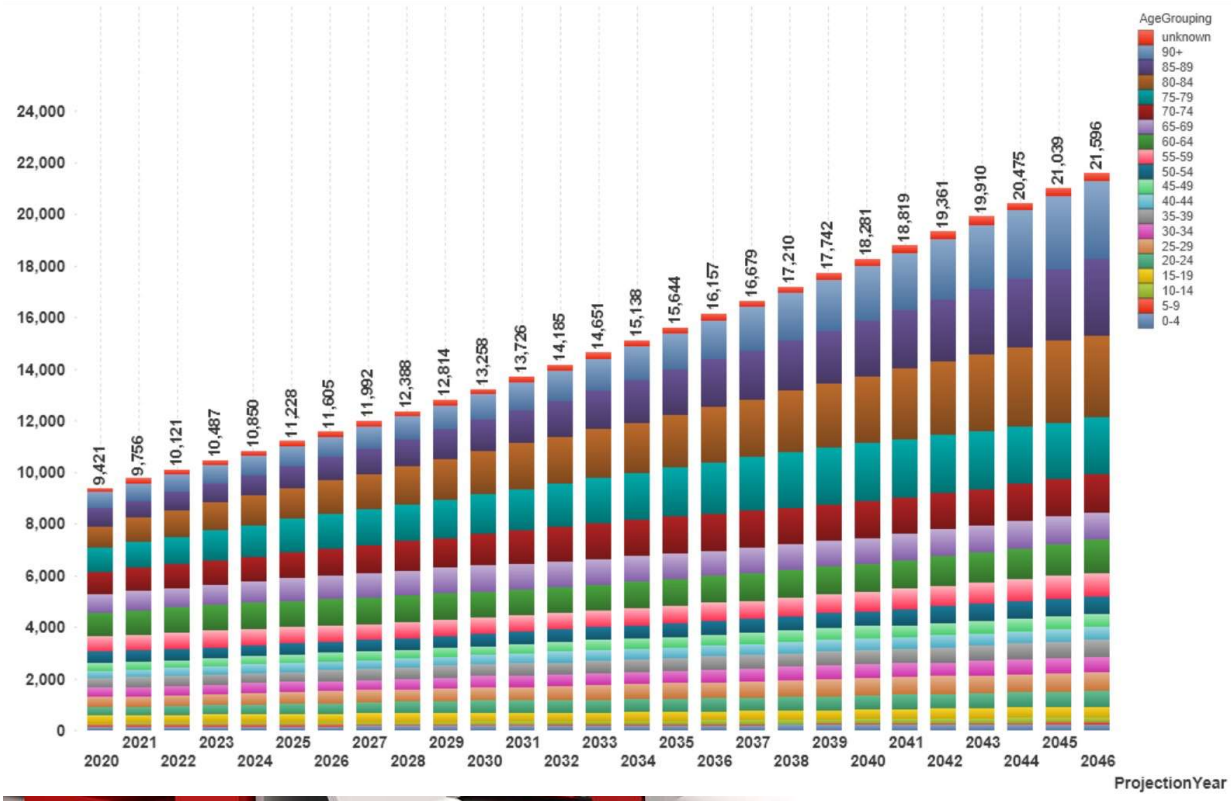
Elgin's demand forecast begins with the Ontario Ministry of Finance's population forecast to 2046. The Ministry of Finance population forecast for Elgin is broken down by age cohorts. By 2032 the Elgin population will grow by 10,975 people compared to 2022 - totalling 110,816 residents. Age cohorts > 65 will factor strongly in Elgin's overall population growth.



2046 Population Projection by Age Cohort

3.2.2 *Base Case* Demand Forecast - Call Volumes + In Service Time

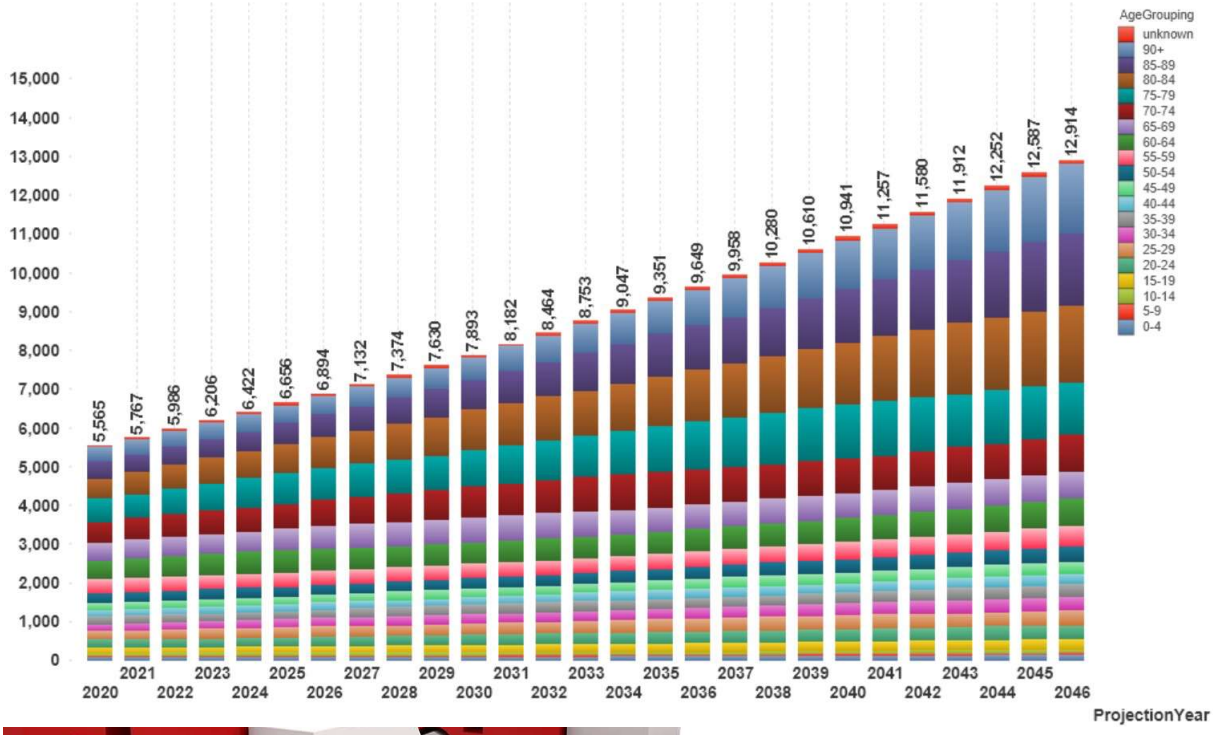
The base case demand forecast of Elgin Paramedic Service calls is set out in the chart below. This forecast accounts for the impacts of population growth + the aging tsunami + the impact of increasing public willingness to call 9-1-1 for emergency assistance. The 2022 to 2032 near-term forecast horizon is instructive/daunting from both a budget and operational perspective. Code 3-4 call volume totals in 2032 are forecast at 14,185 - an increase of 4,064 calls or 40% compared to 2022. The senior citizen age cohorts > 65 years will continue to drive call volume growth between 2022 and 2032. The Elgin property tax base/budget framework will be challenged/stressed by annual call volume increases in the 4% range across the base case demand forecast.



Base Case: Call Volume Projection

Elgin In-service time (hours) spent on Code 3-4 calls is also forecast to grow significantly between 2022 and 2032 (10-year near-term forecast). By 2032 a forecast 8,464 In-service hours will be required - a 41% increase over the 2022 total of 5,986 In-service hours (see graph on next page).

The average in-service time per Code 3-4 call is significantly less than an hour because a portion of total forecast calls are cancelled prior to arriving on-scene to care for a patient. More typical calls involving arrival on-scene and subsequent patient care typically hover around an hour of In-service time.



Base Case: In Service Time Projection

3.2.3 *Bend the Curve* Demand Forecast - Call Volumes + In Service Time

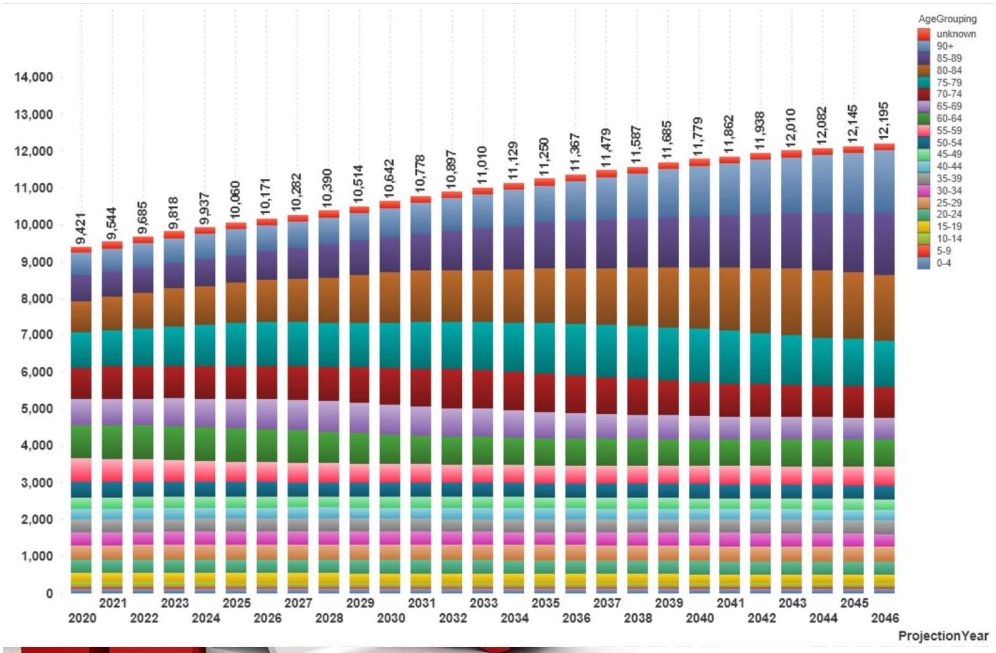
Refer to Section 2.3 of this Report as an introduction to the Elgin "bend the curve' demand forecast.

3.2.4 *Flattening the "Base Case" Demand Curve*

A modified demand forecast has been prepared to reflect the hoped-for mitigation/flattening impacts of AMPDS, community paramedicine, and alternate pathways. The "flatten the curve" forecast attempts to incorporate demand curve flattening initiatives across the 2022-2032 10-year planning horizon.

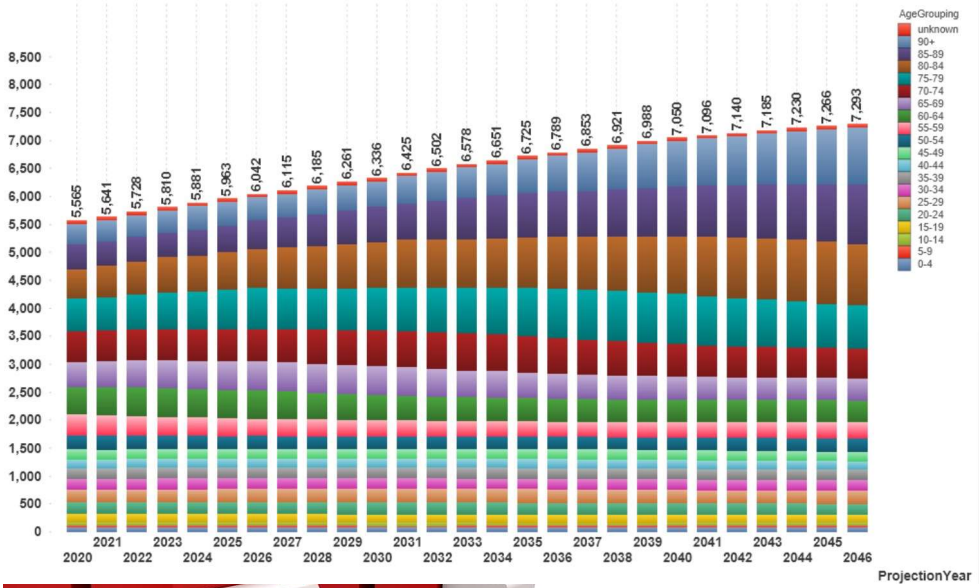
However, it is unlikely that the structural reforms required to secure demand curve flattening can be achieved during the initial five years of the 2022-2032 period. Therefore, the expected net impact of revised demand curve modeling across the entire 2022-2032 period will be less than presented in the charts below - likely impacting only years 6-10 of the planning horizon.

Elgin's "bend the curve" scenario forecasts 10,897 Code 3-4 calls in 2032, compared to 14,185 calls set out in the "base case" forecast for the same year.



Bend the Curve: Call Volume Projection

Elgin's "bend the curve" scenario forecasts 6,502 In-service hours in 2032, compared to 8,464 hours set out in the "base case" forecast for the same year.



Bend the Curve: In Service Time Projection

3.3 Elgin System Performance - Summary Observations & Performance Insights

Elgin's call volumes are increasing as Ontario transitions through the pandemic. Average Code 4 response times have remained stable across the overall system and in the busier urban St. Thomas station. System busyness metrics in urban Elgin (i.e., St. Thomas during peak hours of the day) are trending upwards with a disturbing evening peak. Code Zero resource shortages are not problematic compared to many jurisdictions across Ontario, however eroded Code 4 response times at "zero availability" can be problematic. Code Zero risk events need to be monitored closely moving forward.

The base case Elgin demand forecast is daunting. Annual 4% growth rates for Code 3-4 call volumes/In-service time could trigger the need for added vehicle hours of service at some point across the 2022-2032 period. Recommendations in this Report may stretch the required timeframes for adding vehicle hours of service - a desirable outcome with financial and operational efficiency dividends.

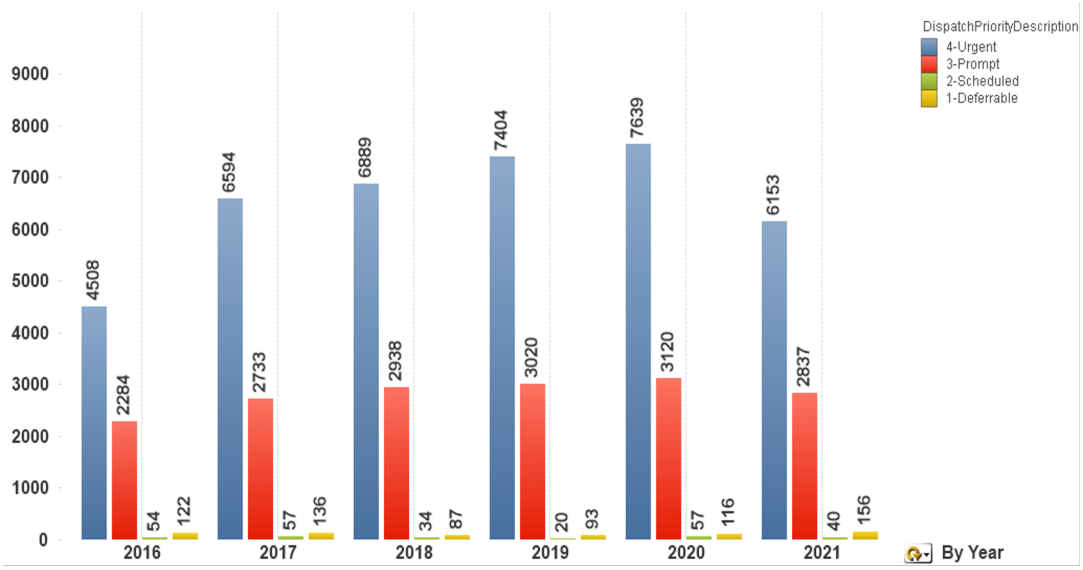
4.0 Perth System Performance (Overview)

4.1 Service Delivery Performance Analytics

Technical Appendix C to this Report contains a comprehensive analytics package for the Perth Paramedic Service. Highlights are presented below in order to document workload, response time, and system busyness challenges moving forward.

4.1.1 Dispatched Code 3-4 Call Volumes

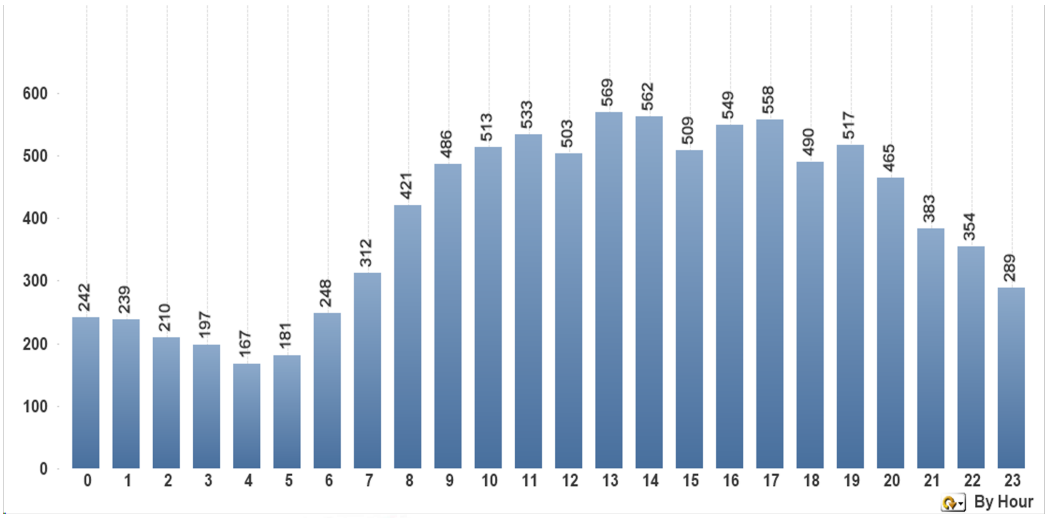
The Covid pandemic has not significantly blunted Perth's Code 3-4 call volume levels. By the end of 2021, forecast Code 3-4 call volumes will meet/exceed prior years.



Perth 2016-2021
Dispatched Code 1-4 calls

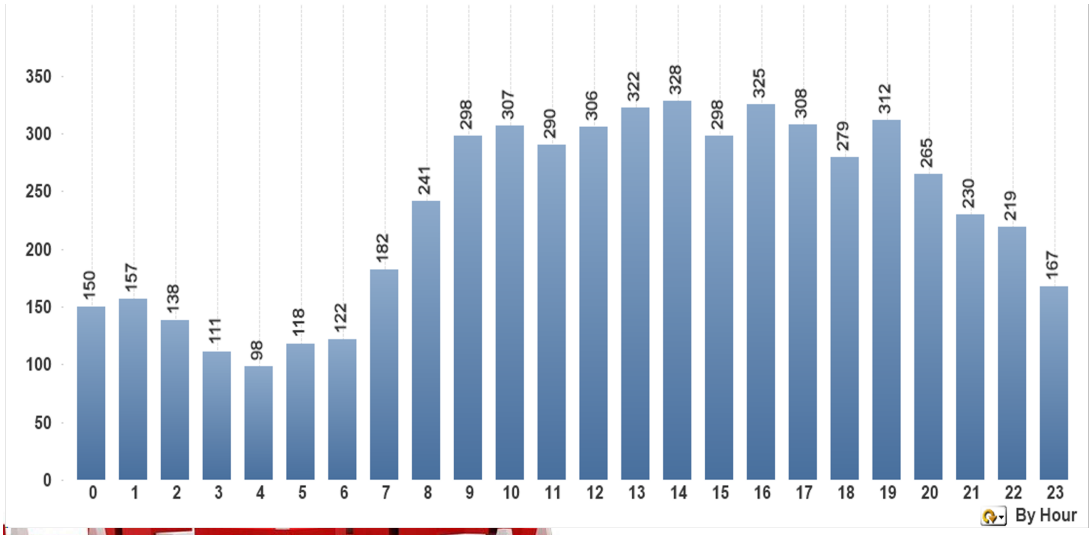
*** 2021 partial (mid-October)**

Perth's Hour of Day Code 3-4 call volumes for 2020 (most recent year of complete data) demonstrate the classic pattern found across Ontario ambulance services; call volumes peak in the late morning and then extend into the early evening. They begin to recede across the evening and then drop significantly overnight (see graph on next page).



Perth 2020
Dispatched Code 3-4
calls by Hour of Day

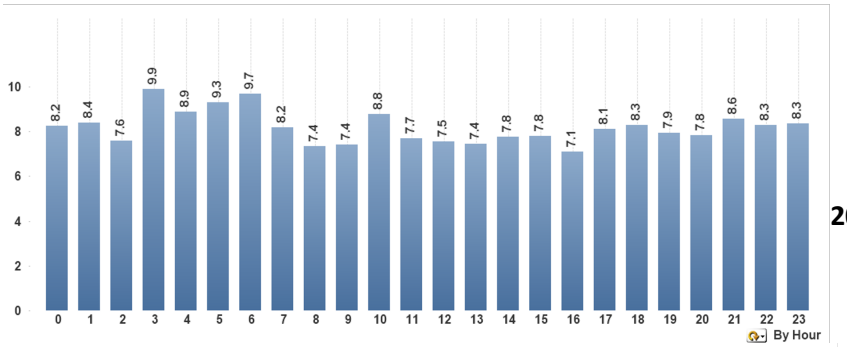
Urban call volumes in Stratford are a significant driver of Perth's total system-wide call volumes. The pattern of Stratford calls across the hours of the day mirror the pattern of the entire Perth system.



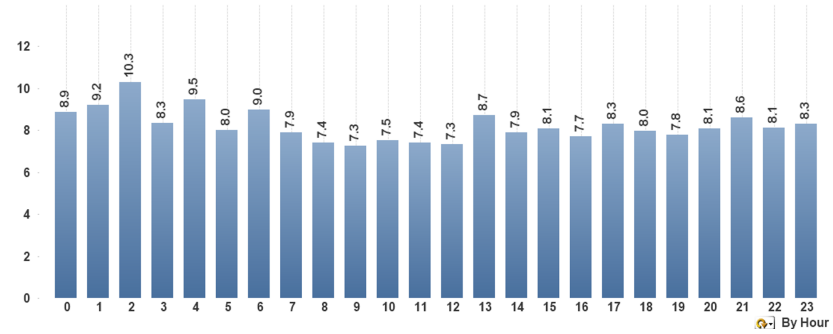
Stratford Station 2020
Dispatched Code 3-4
calls by Hour of Day

4.1.2 Dispatched Code 4 Average Response Times

Perth 2019-2020
Dispatched Code 4 Average Response Times by Hour of



2019

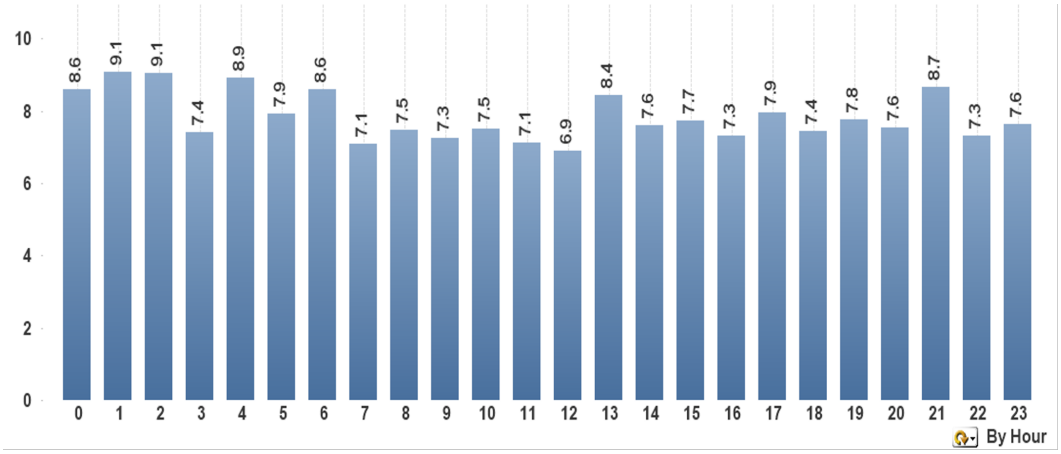


2020

Perth's Dispatched Code 4 average response times have remained stable during the COVID pandemic. System-wide response times integrate the high call volume urban station in Stratford with the lower volume non-urban stations.

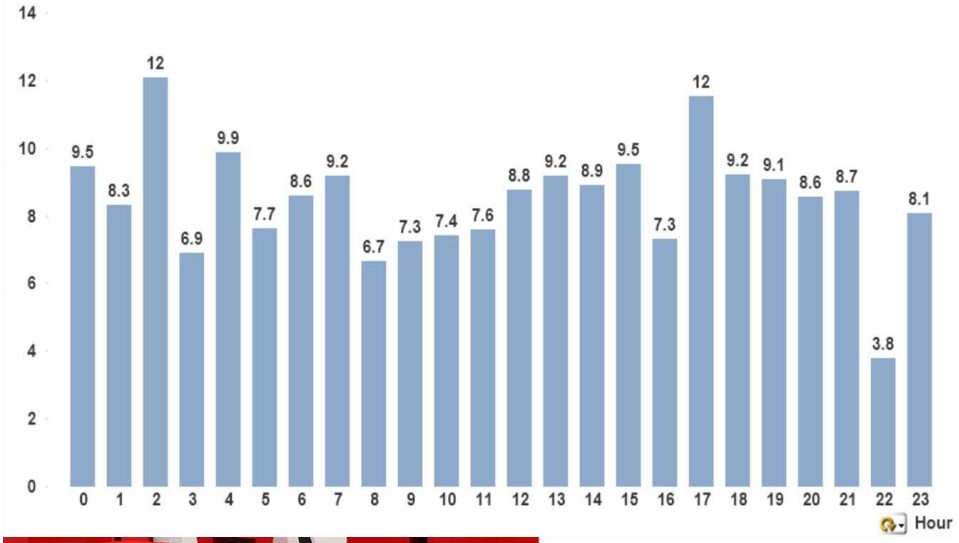
The most recent Code 4 response time data for 2021 (up to October) is consistent with these 2019-2020 full-year trends.

Urban Dispatched Code 4 average response times in Stratford are quicker than times for the non-urban Perth system, due to the proximity of the Stratford station to a denser built form.



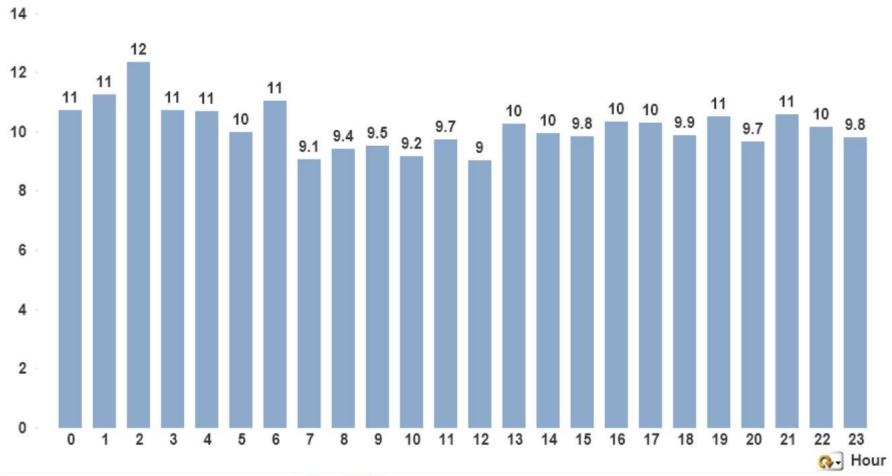
Stratford Station 2020 Dispatched Code 4 Average Response Times by Hour of Day

Average Code 4 response times for the Listowel station in 2020 are unusually "choppy" across the hours of the day compared to stable hourly response times across the entire Perth system. This choppy pattern in Listowel Code 4 response times is also present in the 2019 and 2021 data sets.



Listowel Station 2020 Dispatched Code 4 Average Response Times by Hour of Day

Non-urban Dispatched Code 4 average response times (outside Stratford/Listowel) are slower than times for the entire Perth system, due to the dispersed built form and longer ambulance drive times.



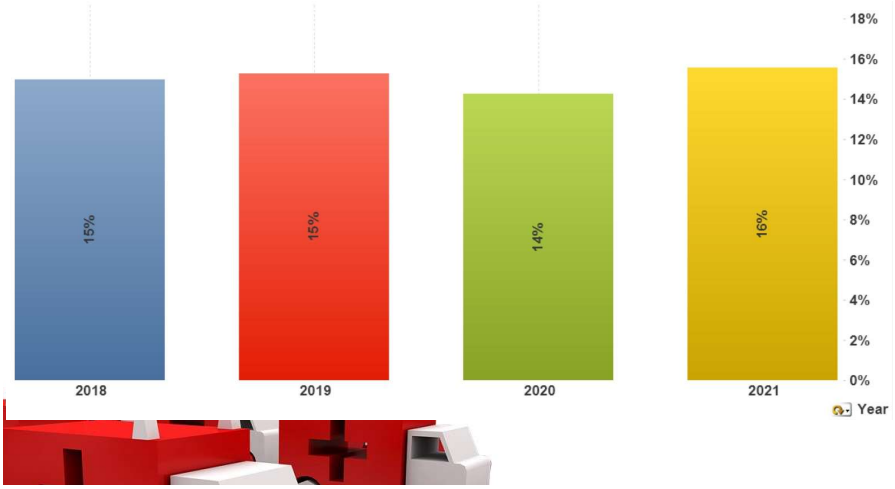
Non-Stratford/Listowel Stations 2020 Dispatched Code 4 Average Response Times by Hour of day

4.1.3 System Busyness - Unit Hour Activity (UHA)

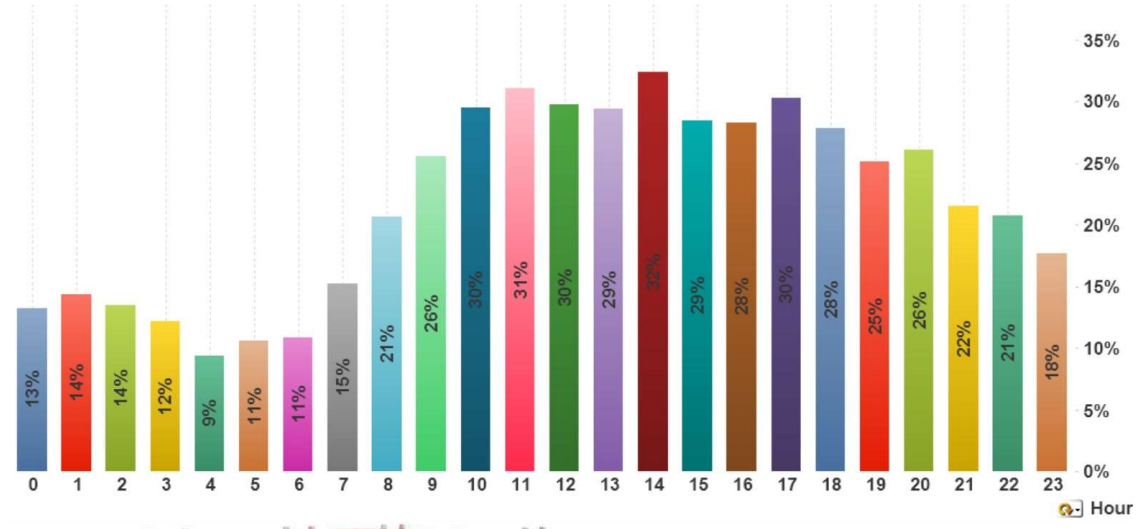
Unit Hour Activity (UHA) is a standard metric across Ontario for measuring patient-focused system busyness levels. UHA measures the share of a deployed hour ambulances are "in service" doing patient-centric work versus the share of an hour spent preparing to respond to a call.

System-wide UHA (busyness) has been maintained at pre-pandemic levels of 16% in the first ten months of 2021. Call volume increases have been generated by population growth, aging tsunami demographics and a growing propensity to call 9-1-1. Call volume growth drives annual and hourly UHA.

2018-2021 Annual UHA (All Bases)

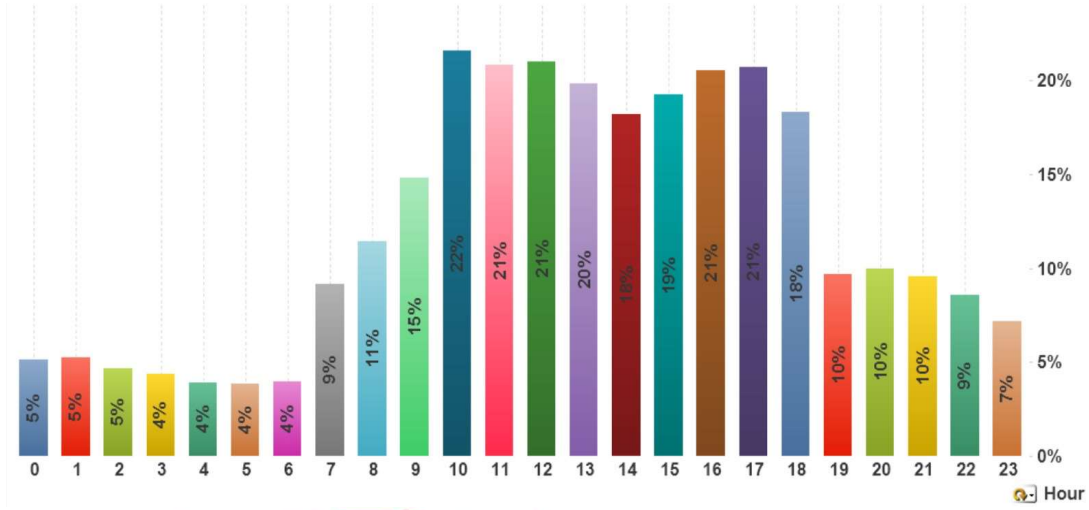


System busyness in urban Perth (Stratford during peak hours of the day) are trending towards a 30% UHA (see graph below). Busyness levels beyond 40% UHA can burn out medics and negatively impact response times. Stratford is not approaching the problematic peak 40% UHA threshold anytime soon.



2021 UHA by Hour of Day (Stratford Station)

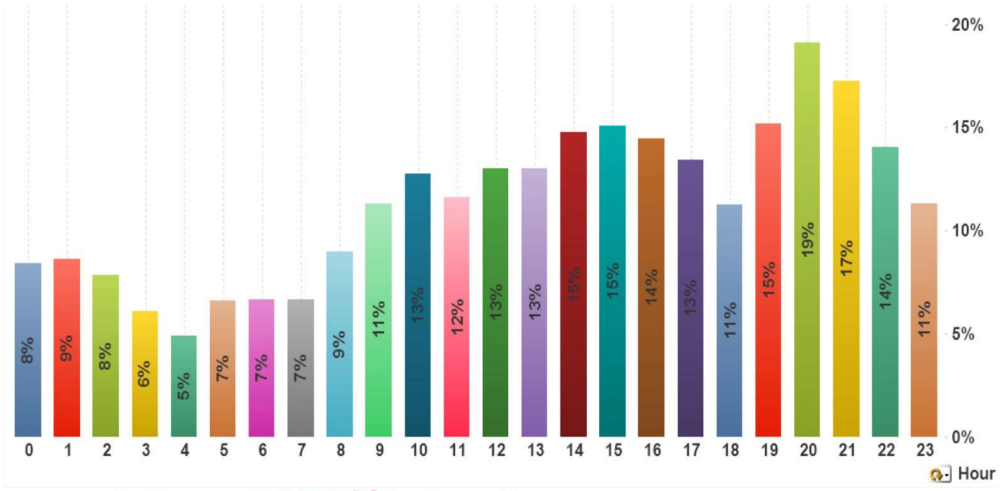
Listowel is a transitional station - not quite urban but different than the rest of the Perth system. Peak hour UHA hovers in the 20-22% range.



2021 UHA by Hour of Day (Listowel Station)

* Partial Oct 2021

UHA levels across the rest of the Perth system are significantly lower than Stratford or Listowel. These Non-urban stations balance the realities of system busyness with the need for stable/predictable geographic coverage.



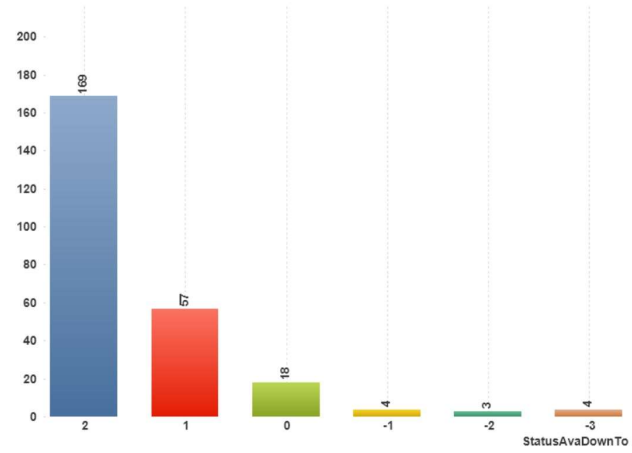
2021 UHA by Hour of Day (Non-Stratford/Listowel Stations)

4.1.4 Daily Erosion of Available Units - Code Zero

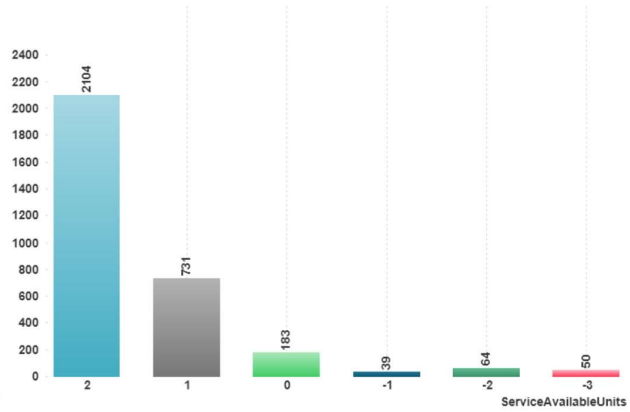
Over the course of any given day, Perth's deployed ambulances become increasingly busy. During periods of peak busyness, Perth experiences an erosion in the number of available ambulance units. When the number of available Perth ambulances falls below a certain level, the response time for the next Code 4 call may not meet typical system-wide response times.

In 2021, Perth experienced 57 incidents of having only one ambulance available for the next Code 4 call. Perth also experienced 29 incidents of "Code Zero" ambulance shortages where no unit was immediately available for the next call.

 # Occurrences < 2 Available Units



 # Minutes at < 2 Available Units

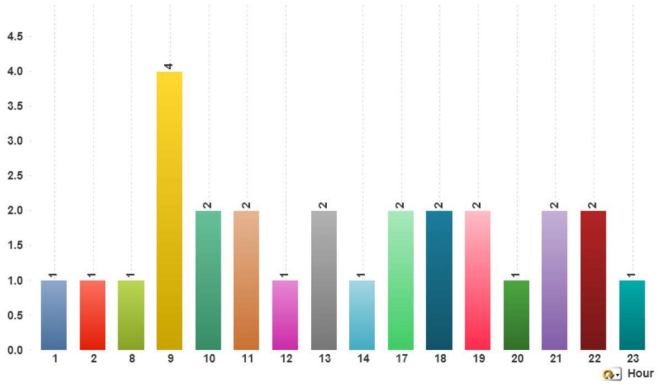


2021 Erosion of Available Units

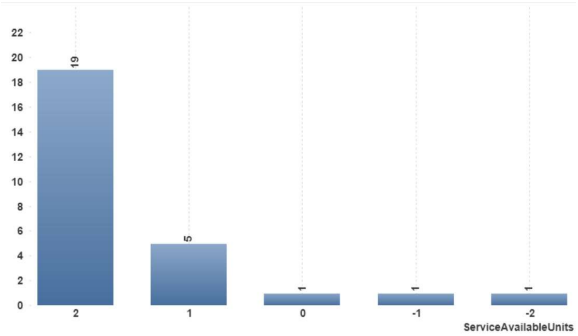
In 2021, Perth experienced 731 minutes (12 hours) at the critical resource level of 1 available ambulance. Perth also experienced 300+ minutes (5+ hours) at Code Zero (or worse) levels of ambulance shortages.

When Perth experiences < 2 available ambulances, subsequent Code 4 calls represent a potential risk event. The table below (next page) documents the 2021 distribution of these potentially risky Code 4 calls across the hours of the day. Five Code 4 calls occurred when only one ambulance was available across Perth. Three Code 4 calls occurred once the Code Zero "no available ambulances" threshold was crossed. Perth Code 4 response times in 2021 (when available ambulances = 0) were 9 minutes or less.

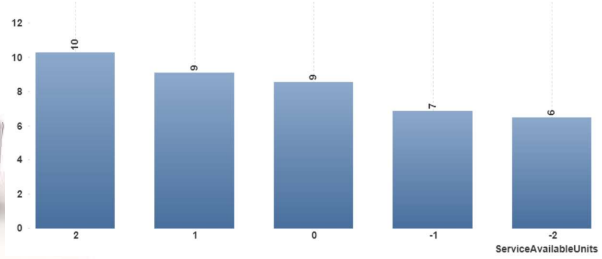
 # Code 4 Calls Happening When < 2 Available Units (By Hour of Day)



 # Code 4 Calls Happening At < 2 Units Available (Annual)



Average Response Time for Code 4 Calls Happening at < 2 Units Available



2021 Erosion of Available Units

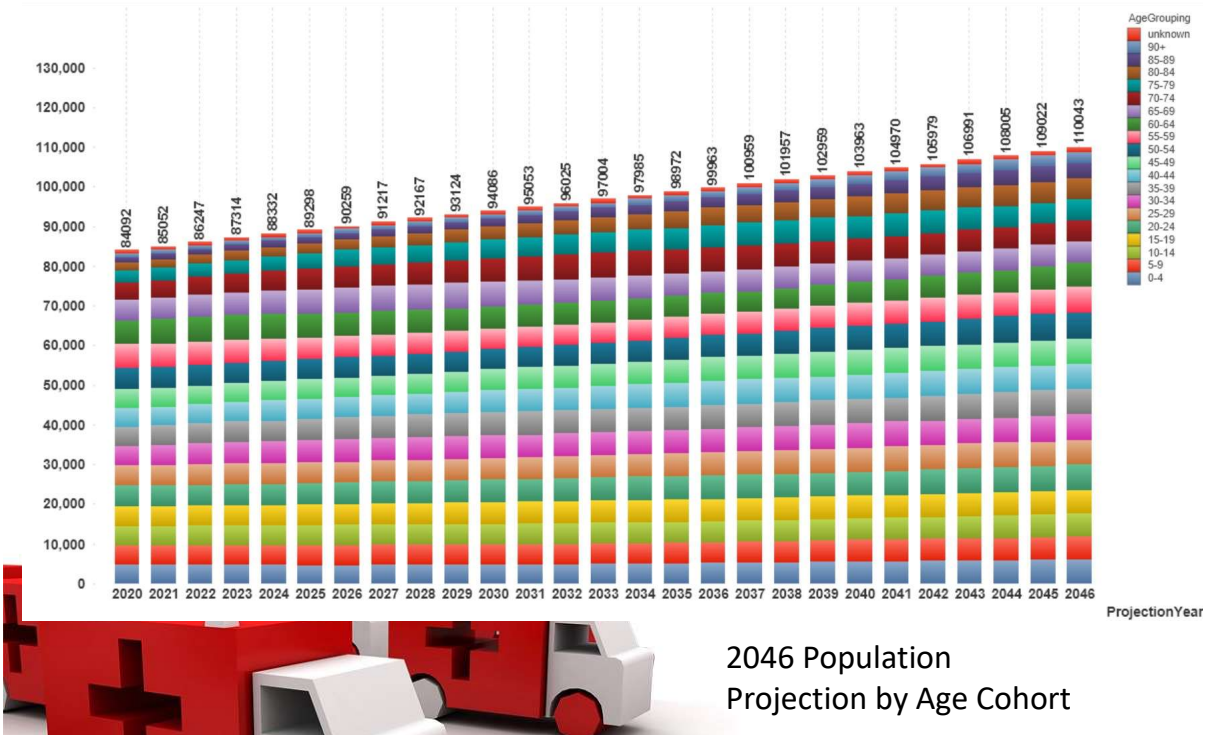
4.2 Demand Forecast (Current to 2046)

4.2.1 Methodology & Population Forecast

Properly executed demand forecasts are a prerequisite for effective paramedic service delivery planning. Demand forecasts should generate informed estimates of future Code 3-4 call volumes and the required in-service vehicle hours of effort required to respond to these call projections.

Three factors drive land ambulance demand forecasts across Ontario. The first factor is population growth. More residents/seasonal visitors over time translate into more Code 3-4 calls over time - especially if population growth occurs in age cohorts > 65 years old. The second factor is the demographic aging tsunami impacting health care across Ontario. The back end of the Baby Boomer generation is now transitioning into the age cohort > 65 years old. Senior citizen age cohorts are a call volume growth engine for land ambulance services across Ontario. Aging tsunami call volume growth is driving annual land ambulance call volume increases of 4-5% in parts of Ontario experiencing no population growth. The third factor is the increasing propensity of the public to call 9-1-1. The changing public willingness to request emergency services (sometimes in non-emergency circumstances) is a major driver of demand for ambulance calls in some jurisdictions.

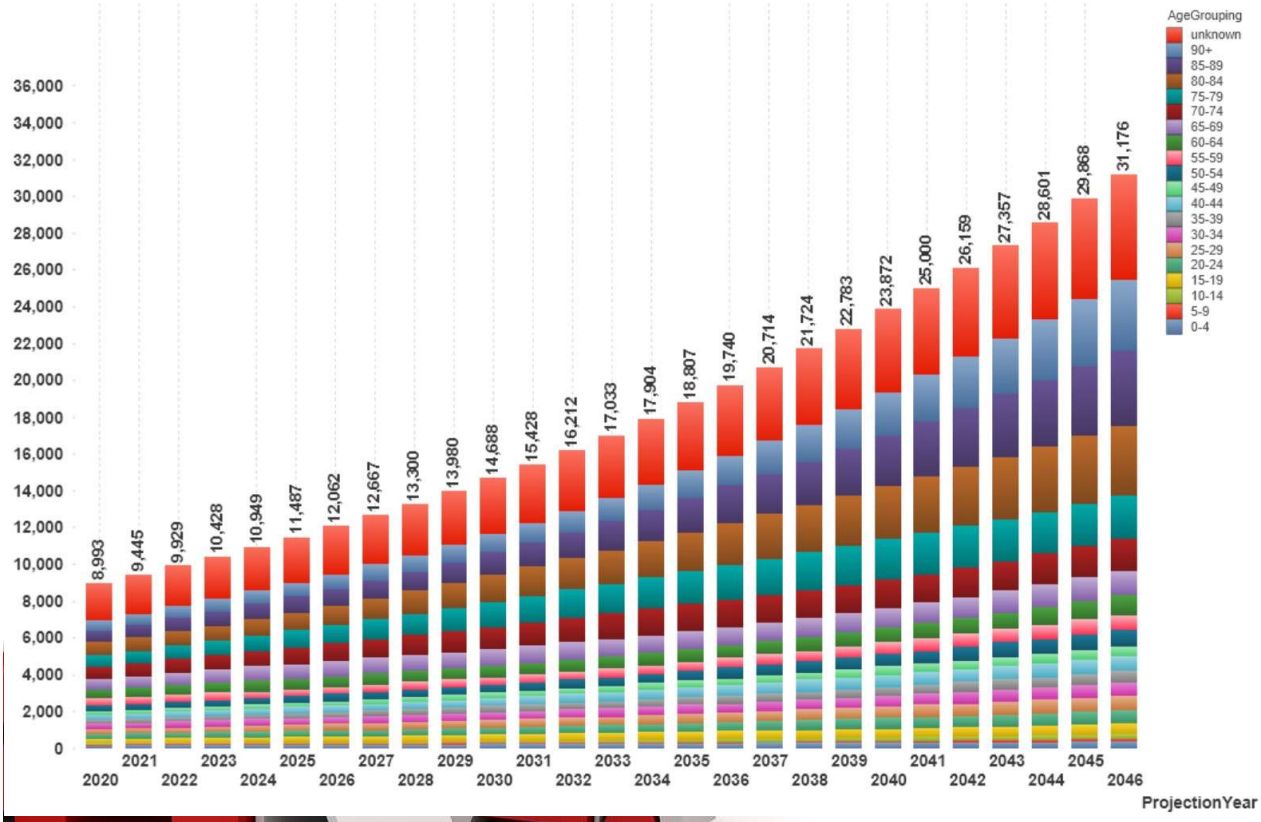
Perth's demand forecast begins with the Ontario Ministry of Finance's population forecast to 2046. The Ministry of Finance population forecast for Perth is broken down by age cohorts. By 2032 the Perth population will grow by 9,778 people compared to 2022 - totalling 96,025 residents. Age cohorts > 65 will factor strongly in Perth's overall population growth.



2046 Population Projection by Age Cohort

4.2.2 *Base Case* Demand Forecast - Call Volumes + In Service Time

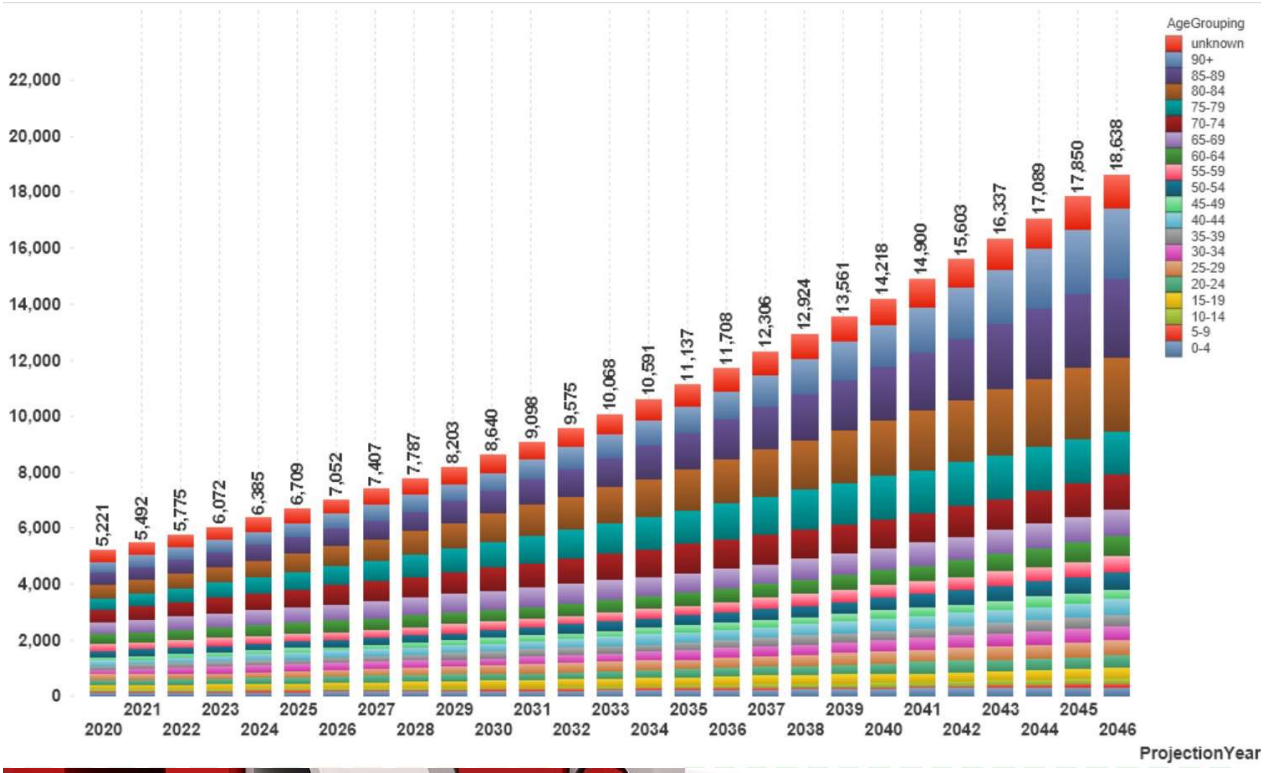
The base case demand forecast for Perth Paramedic Service calls is set out in the chart below. This forecast accounts for the impacts of population growth + the aging tsunami + the impact of increasing public willingness to call 9-1-1 for emergency assistance. The 2022 to 2032 near-term forecast horizon is instructive/daunting from both a budget and operational perspective. Code 3-4 call volume totals in 2032 are forecast at 16,212 - an increase of 6,283 calls or 63% compared to 2022. The senior citizen age cohorts > 65 years will continue to drive call volume growth between 2022 and 2032. The Perth property tax base/budget framework will eventually be challenged/stressed by annual call volume increases in the 6% range.



Base Case: Call Volume Projection

Perth In-service time (hours) spent on Code 3-4 calls is also forecast to grow significantly between 2022 and 2032 (10-year near-term forecast). By 2032 a forecast 9,575 In-service hours will be required - a 65% increase over the 2022 total of 5,775 In-service hours (see graph on next page).

The average in-service time per Code 3-4 call is significantly less than an hour because a portion of total forecast calls are cancelled prior to arriving on-scene to care for a patient. More typical calls involving arrival on-scene and subsequent patient care typically hover around an hour of In-service time.



Base Case: In Service Time Projection

4.2.3 *Bend the Curve* Demand Forecast - Call Volumes + In Service Time

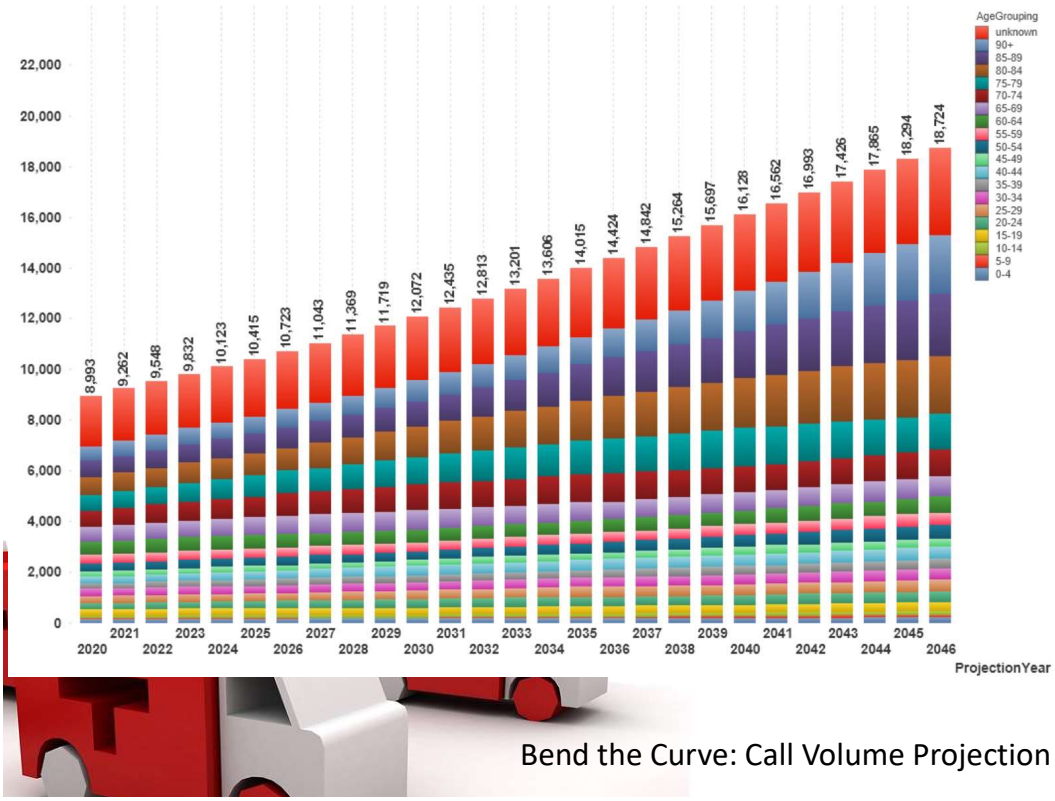
Refer to Section 2.3 of this Report as an introduction to the Perth "bend the curve" demand forecast.

4.2.4 *Flattening the "Base Case" Demand Curve*

A modified demand forecast has been prepared to reflect the hoped-for mitigation/flattening impacts of AMPDS, community paramedicine, and alternate pathways. The "flatten the curve" forecast attempts to incorporate demand curve flattening initiatives across the 2022-2032 10-year planning horizon.

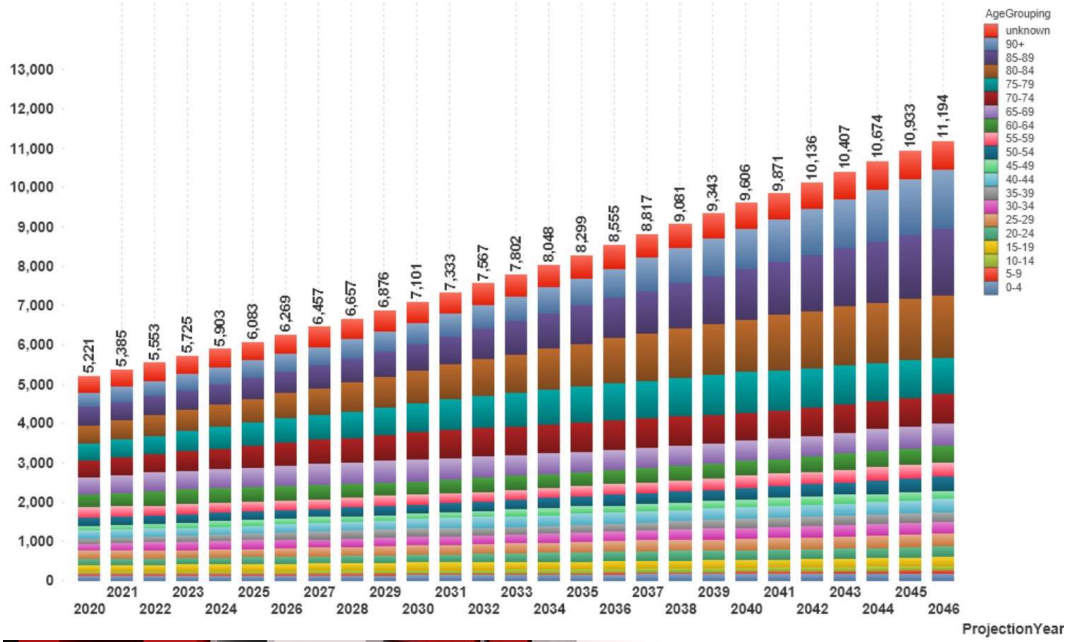
However, it is unlikely that the structural reforms required to secure demand curve flattening can be achieved during the initial five years of the 2022-2032 period. Therefore, the expected net impact of revised demand curve modeling across the entire 2022-2032 period will be less than presented in the charts below - likely impacting only years 6-10 of the planning horizon.

Perth's "bend the curve" scenario forecasts 12,813 Code 3-4 calls in 2032, compared to 16,212 calls set out in the "base case" forecast for the same year.



Bend the Curve: Call Volume Projection

Perth's "bend the curve" scenario forecasts 6,502 In-service hours in 2032, compared to 8,464 hours set out in the "base case" forecast for the same year.



Bend the Curve: In Service Time Projection

4.3 Perth System Performance - Summary Observations & Performance Insights

Perth's call volumes have not lagged as Ontario transitions through the pandemic. Average Code 4 response times have remained stable across the overall system and in the busier urban Stratford station. System busyness metrics in urban Perth (i.e., Stratford during peak hours of the day) are gradually trending upwards. UHA across the non-urban stations are low, especially during the overnight period. Code Zero available resource shortages are negligible compared to many jurisdictions across Ontario. Code Zero risk events can/should be monitored moving forward.

The base case Perth demand forecast is daunting. Annual 6% growth rates for Code 3-4 call volumes/In-service time could trigger the need for added (or re-positioned) vehicle hours of service during peak hours of the day at some point across the 2022-2032 period. Recommendations in this Report may stretch the required timeframes for adding vehicle hours of service - a desirable outcome with financial and operational efficiency dividends.

5.0 Planning/Justifying Future Resource Adds

Moving forward Oxford, Elgin and Perth have an opportunity to develop a common analytics-driven dashboard that will inform/justify future resourcing decisions. The three ambulance services have a number of "system design" factors in common:

- A core urban City featuring relatively high Code 4 call volumes and UHA during the peak hours of the day
- A Non-urban built form extending outwards from the core urban City where call volumes and UHA are lower, but timely geographic coverage is deemed a high priority
- A need to balance system-wide resources across the urban and non-urban built forms such that urban UHA is kept under control while Non-urban response times remain acceptable
- A relatively low risk profile when it comes to Code Zero resource shortages
- A robust 2022-2032 "base case" demand forecast that generates annual % increases in Code 3-4 calls and In-service workload hours (well beyond the expected growth rates in Current Value Assessment)

The dashboard set out in the figure below can act as the canary in the coal mine when it comes to the timing of future adds to deployed vehicle hours of service in Oxford, Elgin, and Perth. The dashboard employs urban and non-urban analytics together in a balancing act that may or may not require new vehicle hours of service over time.

Resourcing "Trigger" Decision-Support Dashboard

	Urban UHA: Peak Hours of Day	Non-Urban Average Code 4 Response Times: Peak Hours of Day	Code Zero KPIs:	Forecast Call Volume Growth
Analytics Trend Line	Above/At/Below 40% UHA Threshold	Trending Up/Stable/Down	Trending Up/Stable/Down	Trending Above/At/Below 4% Annual Growth
System Performance Risk Assessment	High/Medium/Low	High/Medium/Low	High/Medium/Low	High/Medium/Low

The following decision-making process around new resources should be considered:

Q1: Is the peak hour of day UHA in Woodstock/Tillsonburg/St. Thomas/Stratford trending towards the 40% UHA threshold where system performance starts to erode?

Q2: Are Non-urban average Code 4 response times starting to erode? If yes, the likely explanation is units being dispatched outside their coverage zones to respond to busier call clusters in the urban core. Urban core Cities are acting as workload magnets that erode coverage/response times in the "home" communities of these ambulances.

Q3: Is there any material change in the daily pattern of unit availability erosion towards levels < 2 units? If yes, urban resources are probably being overworked or soon will be.

Q4: Are call volume/in-service time actual growth rates meeting or exceeding the forecast level of growth on a quarter-by-quarter basis? If yes, urban resources are soon likely to be overworked from a UHA perspective.

These dashboard diagnostic questions can and should be used regularly to predict the timing of resourcing adds over the 10-year planning horizon of the demand forecast. Resource adds should be positioned in the urban core Cities to stabilize UHA and avoid the "magnet effect" of pulling non-urban resources out of their geographic coverage areas into the City.

Recommendations in Section 12 of this Final Report will utilize this resource "trigger" analytics dashboard to address timing issues around any future required vehicle hour adds in Oxford, Elgin, and Perth.

6.0 Stakeholder Consultations

In addition to very extensive discussions with the Paramedic Chiefs from Oxford, Elgin and Perth, the Performance Concepts team also held virtual consultation sessions with all three County CAOs, executive members of OPSEU Local 114 (Oxford), CUPE Local 4514 (Perth) and Unifor Local 302 (Elgin), the London Central Ambulance Communications Centre, and Health Materials Management Services (HMMS).

6.1 Implications of Stakeholder Feedback

The confidential feedback provided by the internal and external stakeholders has positively informed this Review by identifying performance issues in need of further investigation and/or supporting the issue identification/analysis already underway by the Performance Concepts team. The team sincerely appreciates the input provided by all the participants.

7.0 Peer Benchmarking Scan

In order to compare the Oxford/Elgin/Perth "cluster" with a similar size/type of comparator, it was not technically appropriate to use single municipalities as peers. Instead, three "best available fit" peer comparators were built out of "clustered neighbouring services". Three dual-service southern Ontario clusters were selected that best compared with the Oxford/Elgin/Perth population, area, population density, and number of households. At the peers' request, their public data has been de-identified to provide confidentiality.

Hybrid Peers Secure "Best Available Fit"

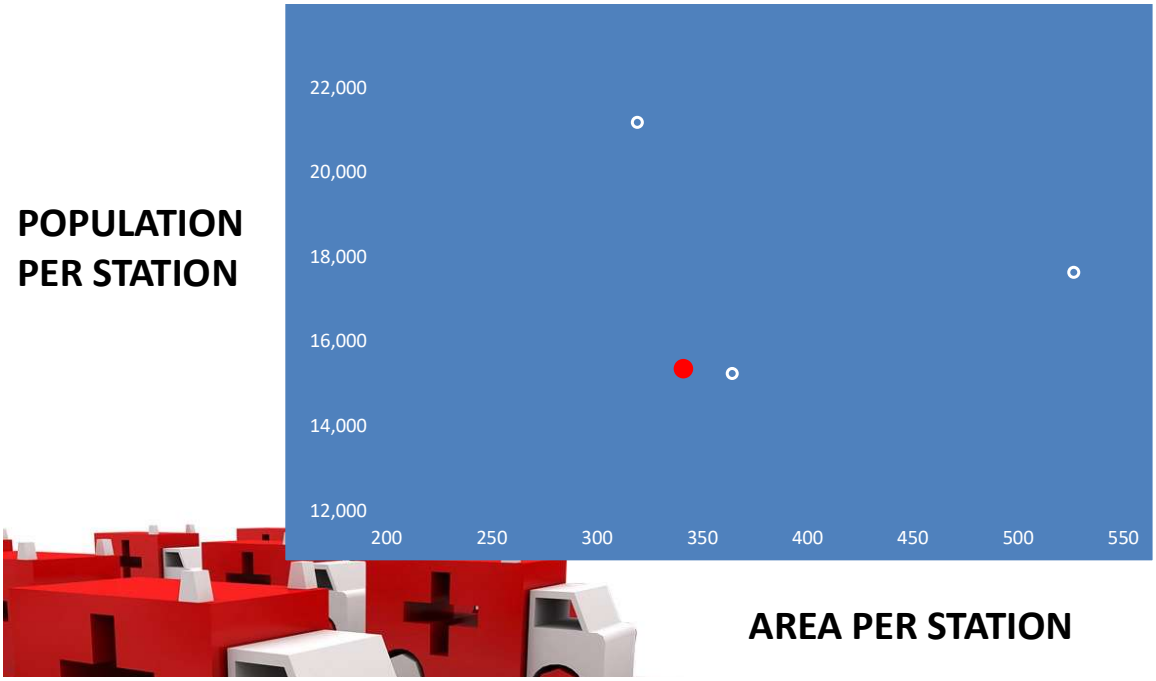
Peer Comparators	Population 2016 census	Area (/km2)	Population Density (/km2)	# Households
Peer Cluster A	284,461	4,147	68.6	117,460
Oxford/Elgin/Perth	276,636	6,139	45.1	114,468
Peer Cluster B	228,680	5,460	41.9	107,952
Peer Cluster C	211,659	6,306	33.6	110,581

The three comparator clusters feature populations, area, population density, and a households count that range over and under the Oxford/Elgin/Perth data set. The result is a "best available fit" among Ontario jurisdictions delivering land ambulance services.

Built Form "Drivers" of System Design/Performance

Peer Comparators	# Stations	Pop Served per Station	Area Served per Station
Peer Cluster A	13	21,882	319
Oxford/Elgin/Perth	18	15,369	341
Peer Cluster B	15	15,245	364
Peer Cluster C	12	17,638	526

Oxford/Elgin/Perth has a relatively low number of residents served per station compared to the three comparators. The cluster also covers a lower-than-average geographic area per station compared to the peers.



Provincial Cost Sharing % Share

Peer Comparators	Cost Sharing Revenue (Province)	Revenue (Other)	Total Revenue	Total Spending	Prov Cost Sharing %
Peer Cluster A	$14,136,422	$5,183,131	$19,319,553	$34,129,436	0.41
Oxford/Elgin/Perth	$20,647,605	$6,494,086	$27,141,691	$40,751,760	0.51
Peer Cluster B	$17,368,133	$410,676	$17,778,809	$31,698,021	0.55
Peer Cluster C	$16,371,549	$5,376,969	$21,748,518	$31,505,342	0.52

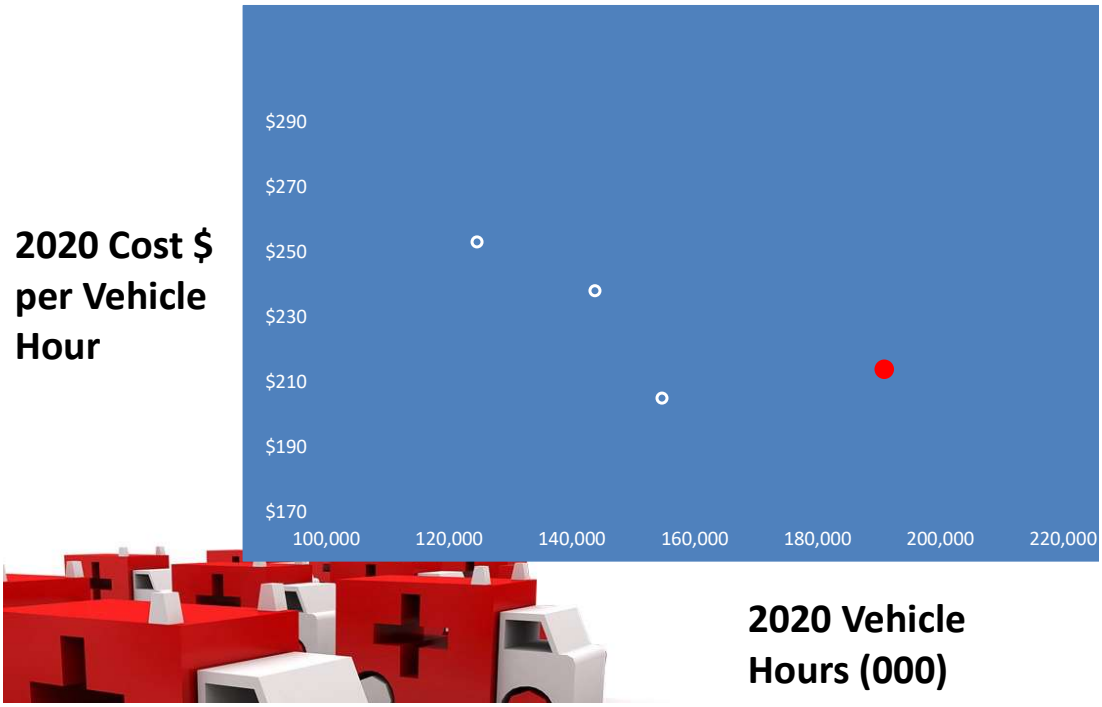
50% Provincial cost sharing is the peer group mean and the accepted level for fair provincial funding. Actual cost sharing differs with one-time funding such as Community Paramedicine or when a municipality chooses to accept an additional property tax funding burden. The Oxford/Elgin/Perth cluster receives slightly more than the accepted norm at 51%.

Cost of Service Ratios

Peer Comparators	Cost per Household	2020 Cost/Vehicle Hour	Cost per Capita
Peer Cluster A	$291	$238	$120
Oxford/Elgin/Perth	$356	$214	$147
Peer Cluster B	$294	$205	$139
Peer Cluster C	$285	$253	$149

Technically accepted cost per unit of service ratio for peer benchmarking across Paramedic "industry"

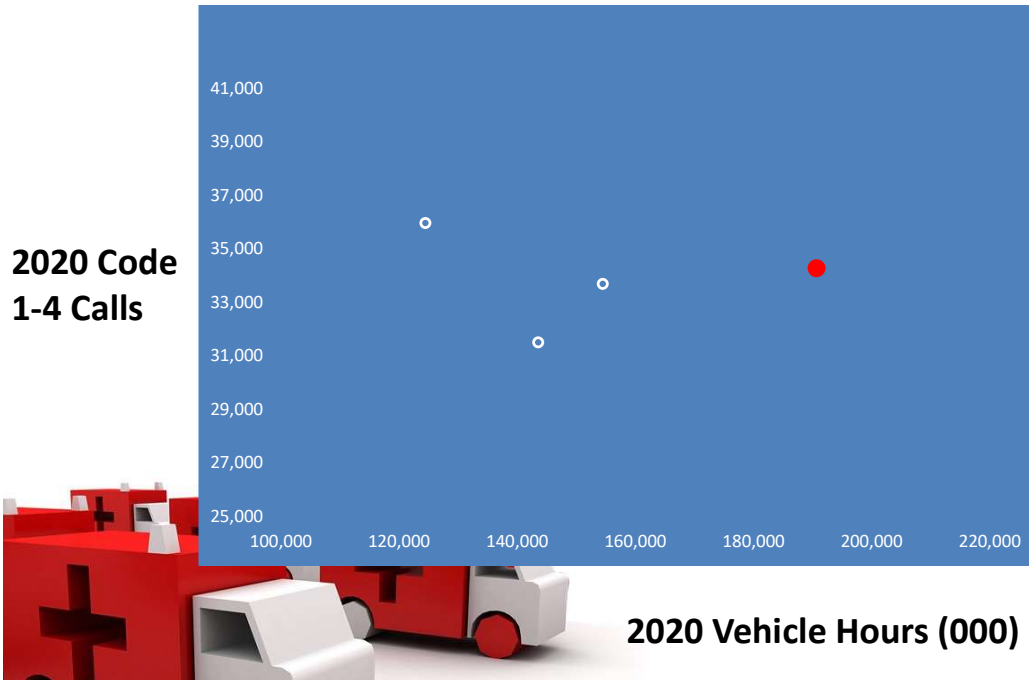
The Oxford/Elgin/Perth cluster has the highest Cost per Household ($356) and the 2nd highest cost per capita ($147). However, most importantly the Oxford/Elgin/Perth cluster has a lower-than-average Cost per Vehicle Hour ($214). Cost per Vehicle Hour is the most appropriate/widely used metric re. service delivery efficiency.



The Oxford/Elgin/Perth red dot in the chart above delivers a powerful value-for-money observation: more vehicle hours of ambulance service are supplied at a lower-than-average unit cost.

Deployed Resources versus Work Outputs

Peer Comparators	2019 Vehicle Hours	2020 Vehicle Hours	2019 C1-4 Calls	2020 C1-4 Calls
Peer Cluster A	139,880	143,634	33,139	31,517
Oxford/Elgin/Perth	172,254	190,764	33,389	34,306
Peer Cluster B	154,328	154,568	30,795	33,714
Peer Cluster C	124,176	124,516	36,365	35,989

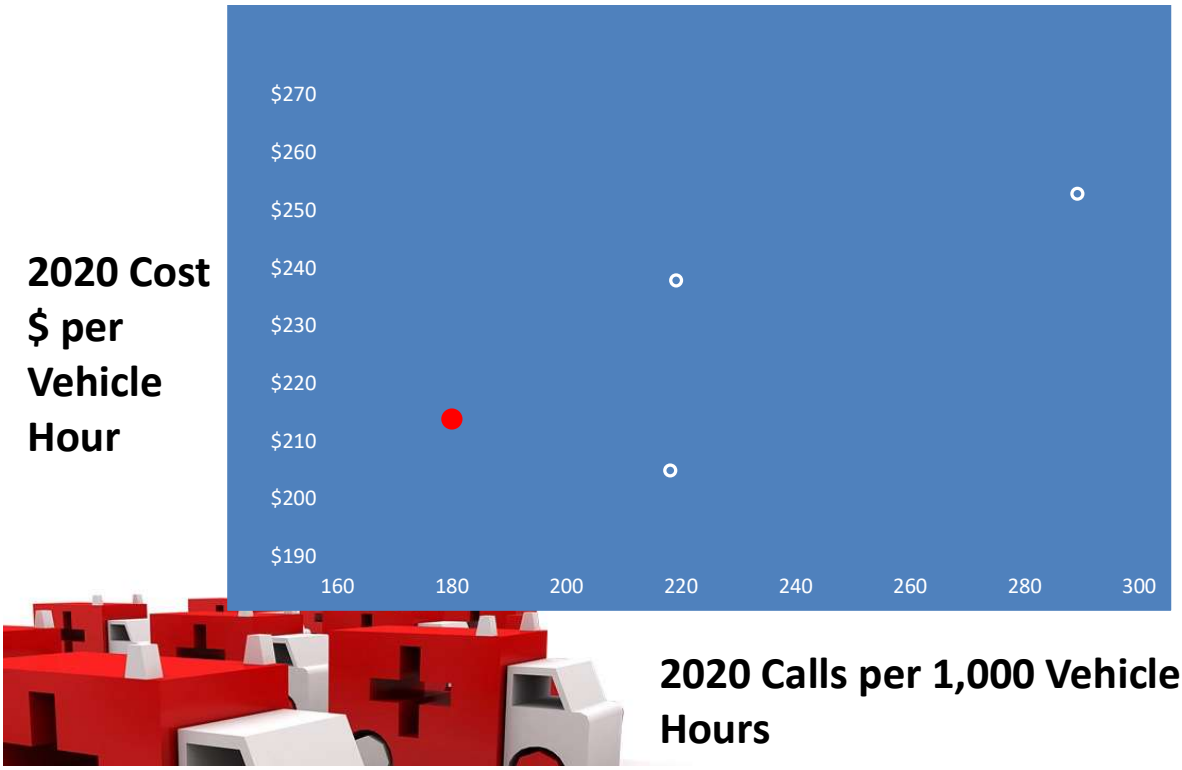


Oxford/Elgin/Perth deploys significantly more vehicle hours than the peers in order to handle a very comparable numbers of calls (see red dot above).

Proxy for UHA Calcs: System Busyness Ratios

Peer Comparators	# Households	2019 Vehicle Hours	2020 Vehicle Hours	2019 C1-4 Calls	2020 C1-4 Calls	2019 Calls/1,000 Vehicle Hours	2020 Calls/ 1,000 Vehicle Hours	2019 Calls/1000 Households	2020 Calls/1000 Households
Peer Cluster A	117,460	139,880	143,634	33,139	31,517	237	219	282	268
Oxford/Elgin/Perth	114,468	172,254	190,764	33,389	34,306	194	180	292	300
Peer Cluster B	107,952	154,328	154,568	30,795	33,714	200	218	285	312
Peer Cluster C	110,581	124,176	124,516	36,365	35,989	293	289	329	325

In lieu of more data-intensive Unit Hour Activity (UHA) calculations, simplified metrics like Calls per 1,000 Vehicle Hours and Calls per 1,000 Households are used as proxies for system busyness across the peers. The Oxford/Elgin/Perth cluster was less busy than all three peers in both 2019 and 2020.



The Oxford/Elgin/Perth red dot demonstrates lower-than-average unit costs (efficient pricing) as well as lower than average workload/busyness (lower productivity).

8.0 Service Delivery Call Mapping (Current State)

Comprehensive call mapping across Oxford, Elgin, and Perth can identify/inform operational improvement opportunities moving forward. To determine where ambulance calls are occurring and where Oxford/Elgin/Perth medics are actually doing their work, Performance Concepts, and our geospatial modelling partners at Transnomis, analyzed call data for 2019, 2020 and 2021 through mid-October. Urgent (Code 3) and Emergent (Code 4) calls were used to create heat maps of call intensity on a County, Local Municipality and Station basis. Heat maps create "hotspots" by grouping the number of calls within a specified distance of a given point on a map. If there are greater than 15 calls within 400-800 metres of a specific point, that map point will be bright red; 10-15 calls will be a lighter shade of red; 5-10 dark blue/purple; and 0-5 light blue. Heat mapping provides a useful visual approximation of the overall trend of call locations across the three counties for the 2019-2021 data set.

In addition to Code-3 and 4 calls, Code-8 ambulance movements were also heat mapped to identify the most frequently used standby locations in each County, and further broken down by local municipalities. Similarly, all patient calls (Codes 1-4) were categorized by local municipality for a better reflection of where each ambulance station does its work.

8.1 Oxford Mapping

Paramedic services are provided in Oxford through two stations in Woodstock, as well as stations in Drumbo, Ingersoll, Norwich, Tillsonburg, and Zorra (Embro). Only the Zorra station provides less than 24-hour coverage (12 hours daily). Deployment of vehicles by hour of day are shown below:

OXFORD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Drumbo																								
Ingersoll																								
Norwich																								
Tillsonburg																								
Tillsonburg																								
Woodstock Bysham Park																								
Woodstock Mill Street																								
Woodstock Mill Street																								
Woodstock Mill Street																								
Zorra																								
Hourly Vehicle Count	8	8	8	8	8	8	8	8	9	10	10	10	10	10	10	10	10	10	10	10	9	8	8	8

Oxford County heatmapping (see number map figures below) shows the expected "hot spots" encompassing Woodstock, Ingersoll and Tillsonburg, as well as "warm spots" in Norwich and Thamesford. A significant hot spot is found in the Tavistock area, and this will become the focus of a "deep dive" analysis in Section 9.3 of this Report. Typically, hot spots should be accompanied by ambulance stations due to their high propensity to produce calls. With regards to Woodstock proper, call volume is distributed across the community with expected hot spots in the downtown and along main travel roads, as well as hospital and long-term care sites.

8.1.1 Heatmapping By County/Urban/Non-Urban

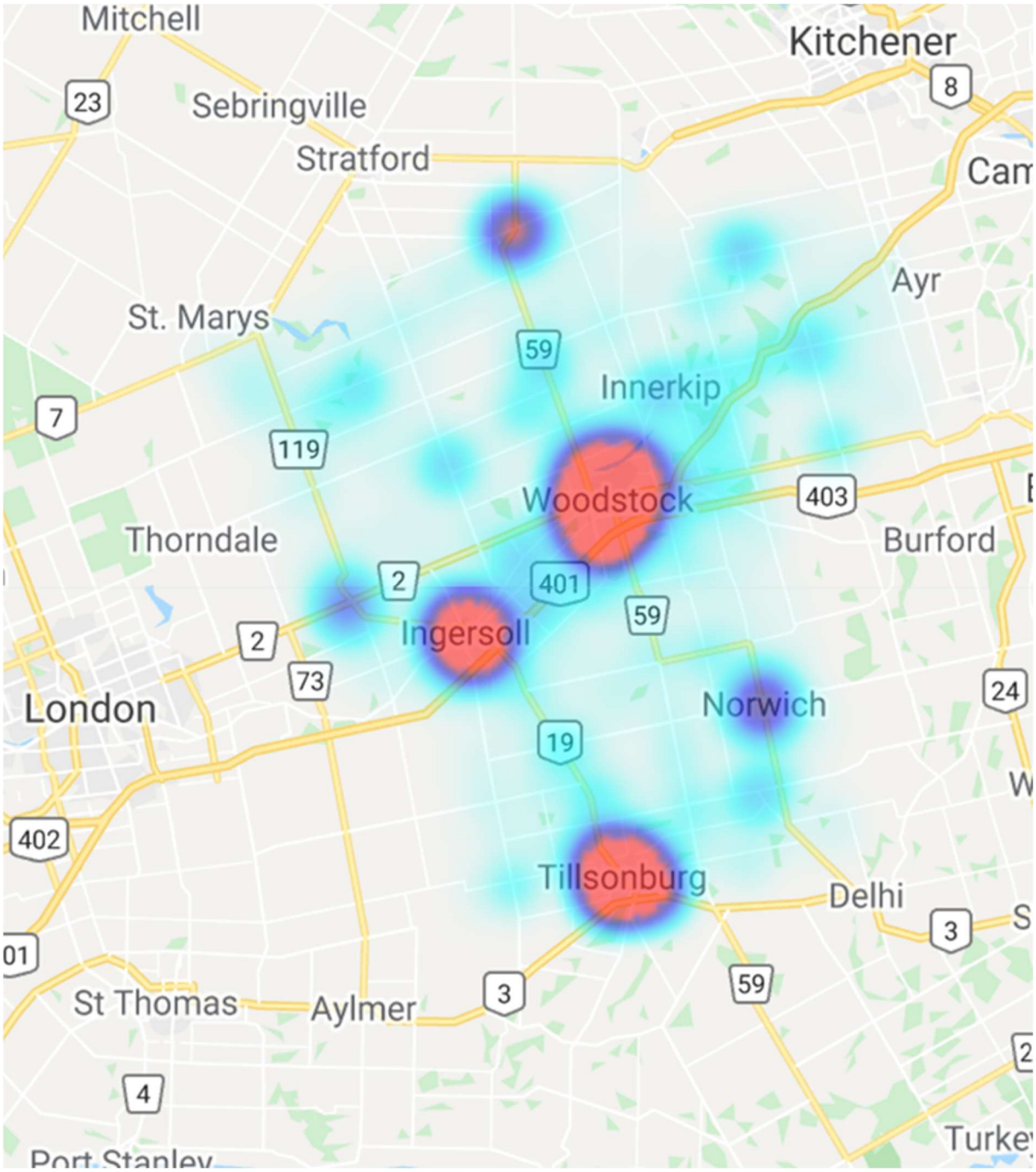


Figure 1 - C3-4 2019-21 Hotspots

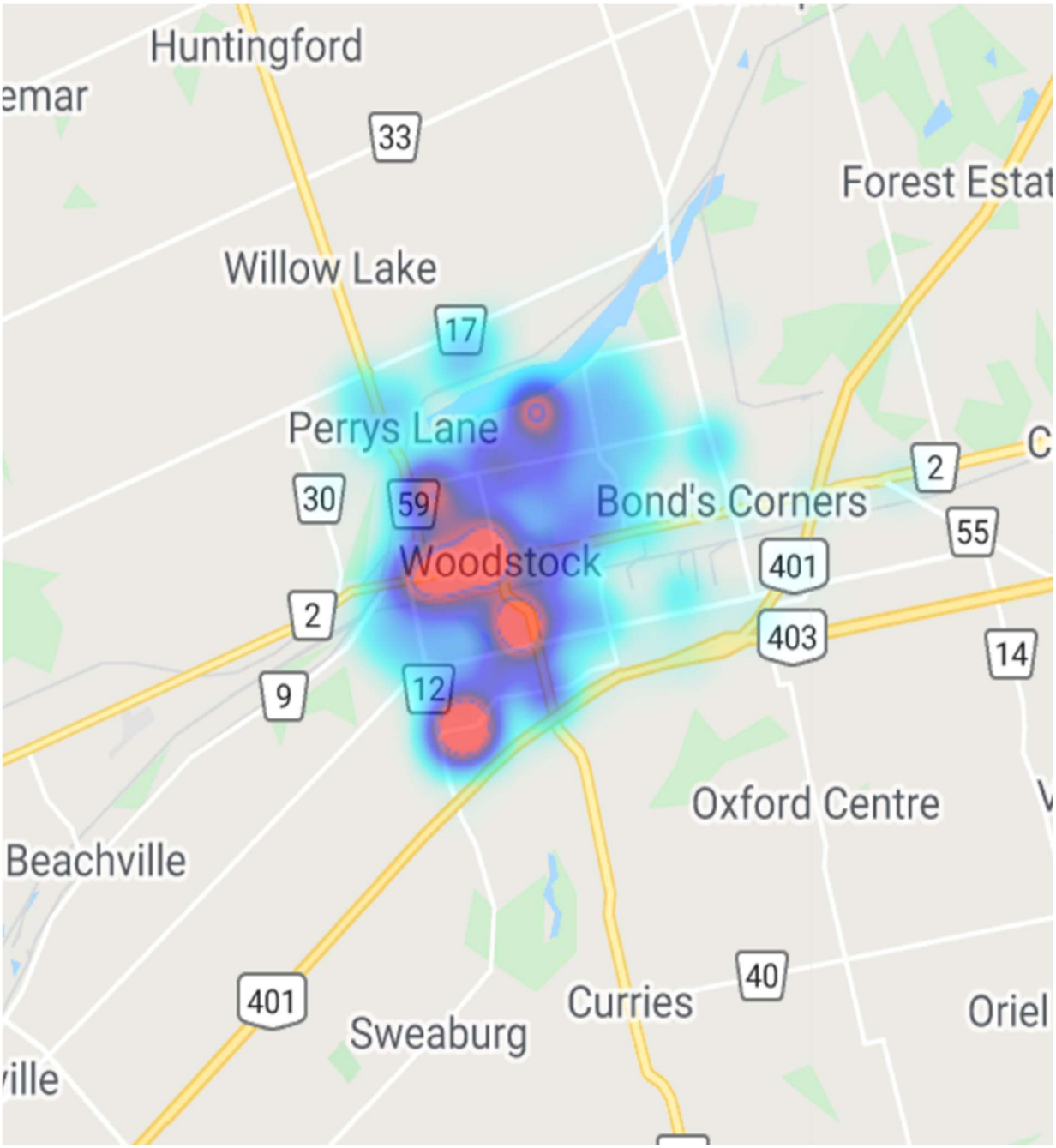


Figure 2 - Woodstock C3-4 2019-21 Hotspots

8.1.2 *Inside/Outside County*

Figure 3 shows areas outside of Oxford that receive significant service by Oxford paramedics. Hot spots can be expected in cities with tertiary health centres, where Oxford ambulances transfer patients and are then often tagged for local calls. This is evidenced in London. The most significant out-of-county hot spot is the corridor south of Tillsonburg into Elgin County. The close proximity of the Tillsonburg ambulance station to both the Elgin and Norfolk borders, enhances cross-border utilization of the Oxford resources. The Tillsonburg to Port Burwell corridor will also be the focus of a "deep dive" in section 9.4. Other less dramatic examples of Oxford supporting neighbouring communities are the hot spots in Ayr (Waterloo Region) and condo communities south of Highway 403 (Brant County).

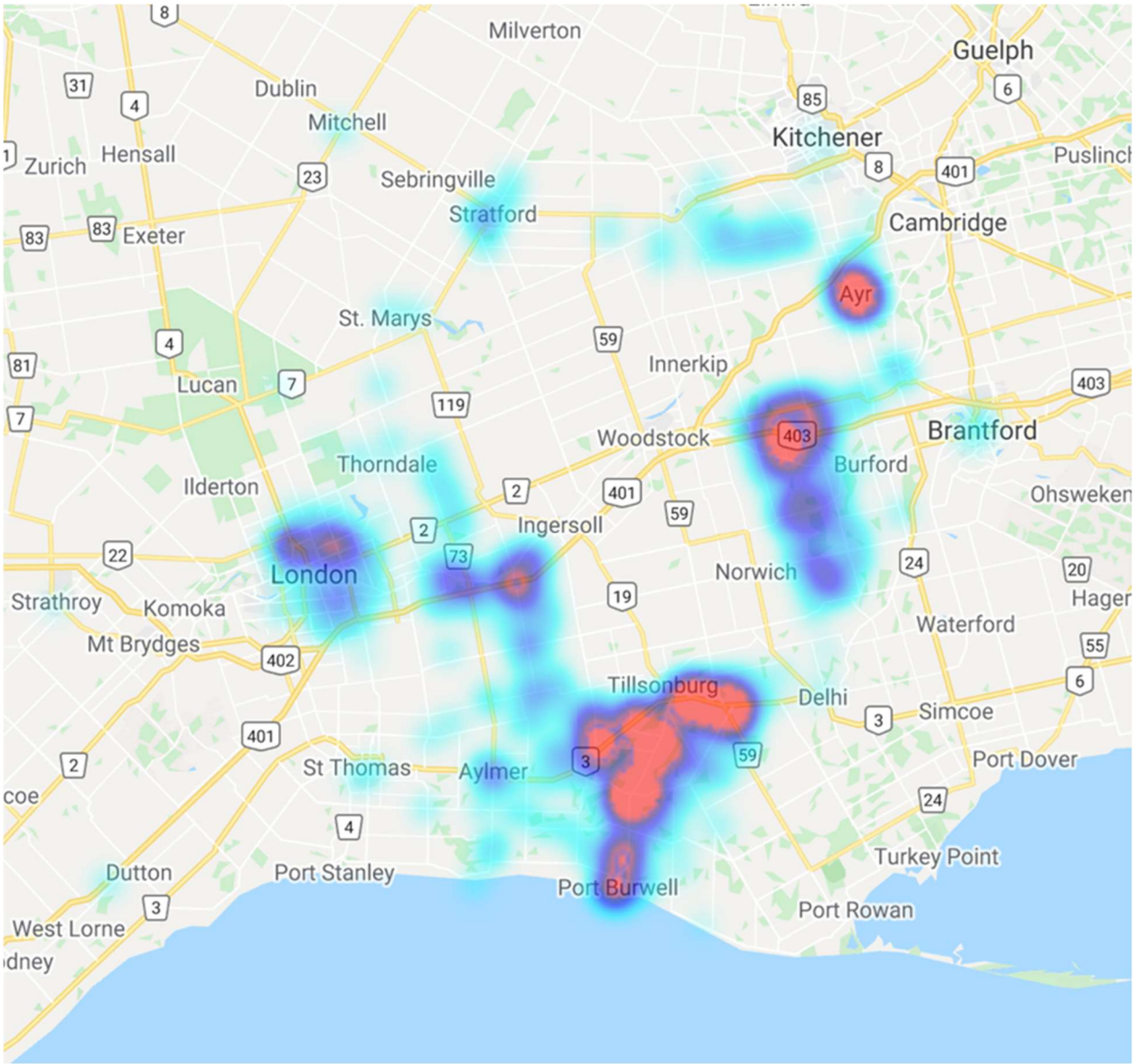


Figure 3 - Oxford C1-4 2019-21 Out of County

Figure 4 shows where help from outside Oxford is received from neighbouring paramedic services. The only significant hot spot is the previously mentioned Tavistock area, being supported by Perth County (see Section 9.3).

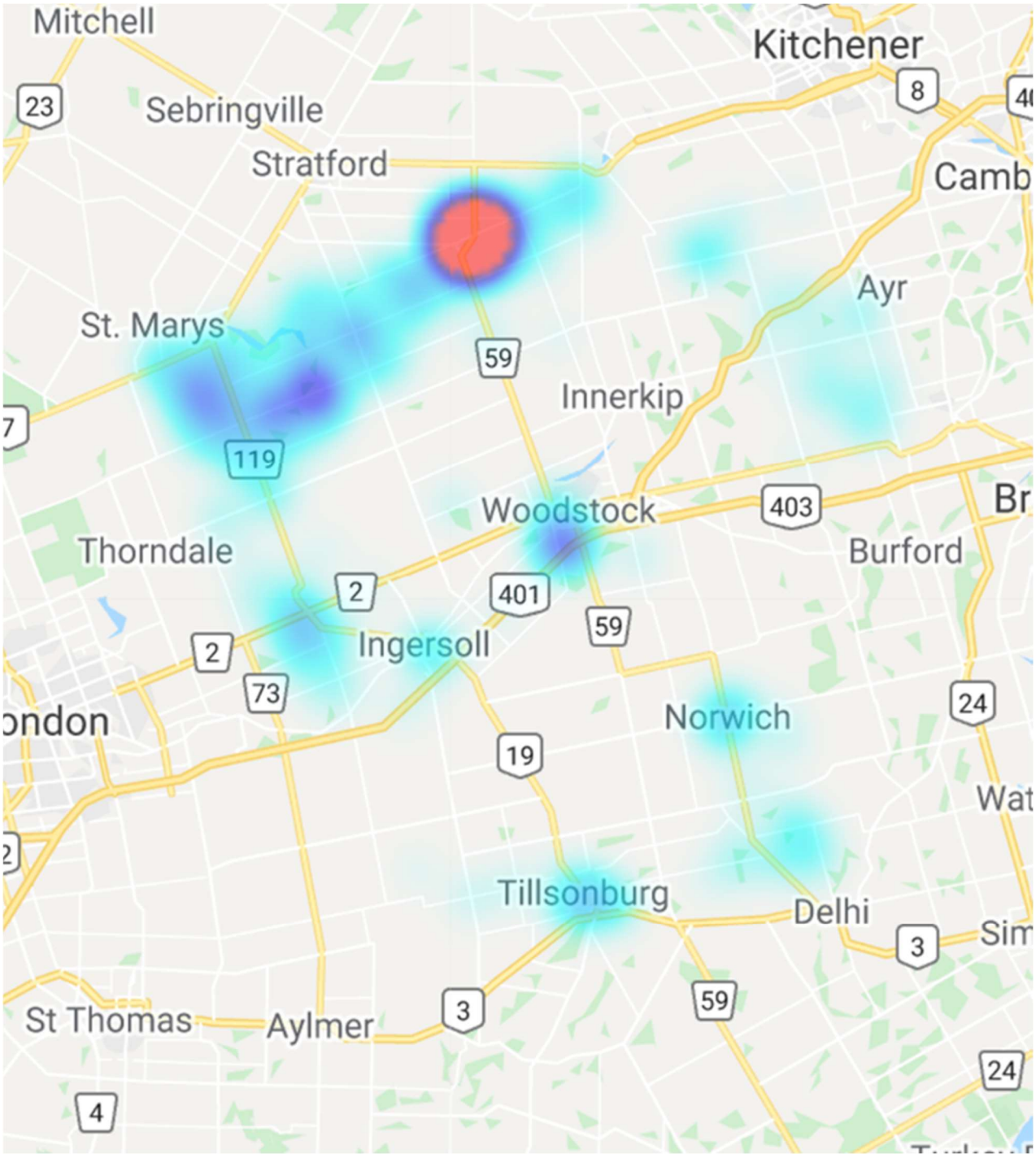


Figure 4- C3-4 2019-21 by others in Oxford

Figure 5 supplements the heat map in Figure 4 by showing travel times by supporting paramedic services to reach Oxford locations. The longest travel times can be found on the border with Waterloo/Brant and surrounding Tavistock. Note that the lowest travel times are found in Woodstock, Tillsonburg and Ingersoll, the three communities with hospitals, and the likelihood that out-of-town resources can be tagged for local calls in Oxford.

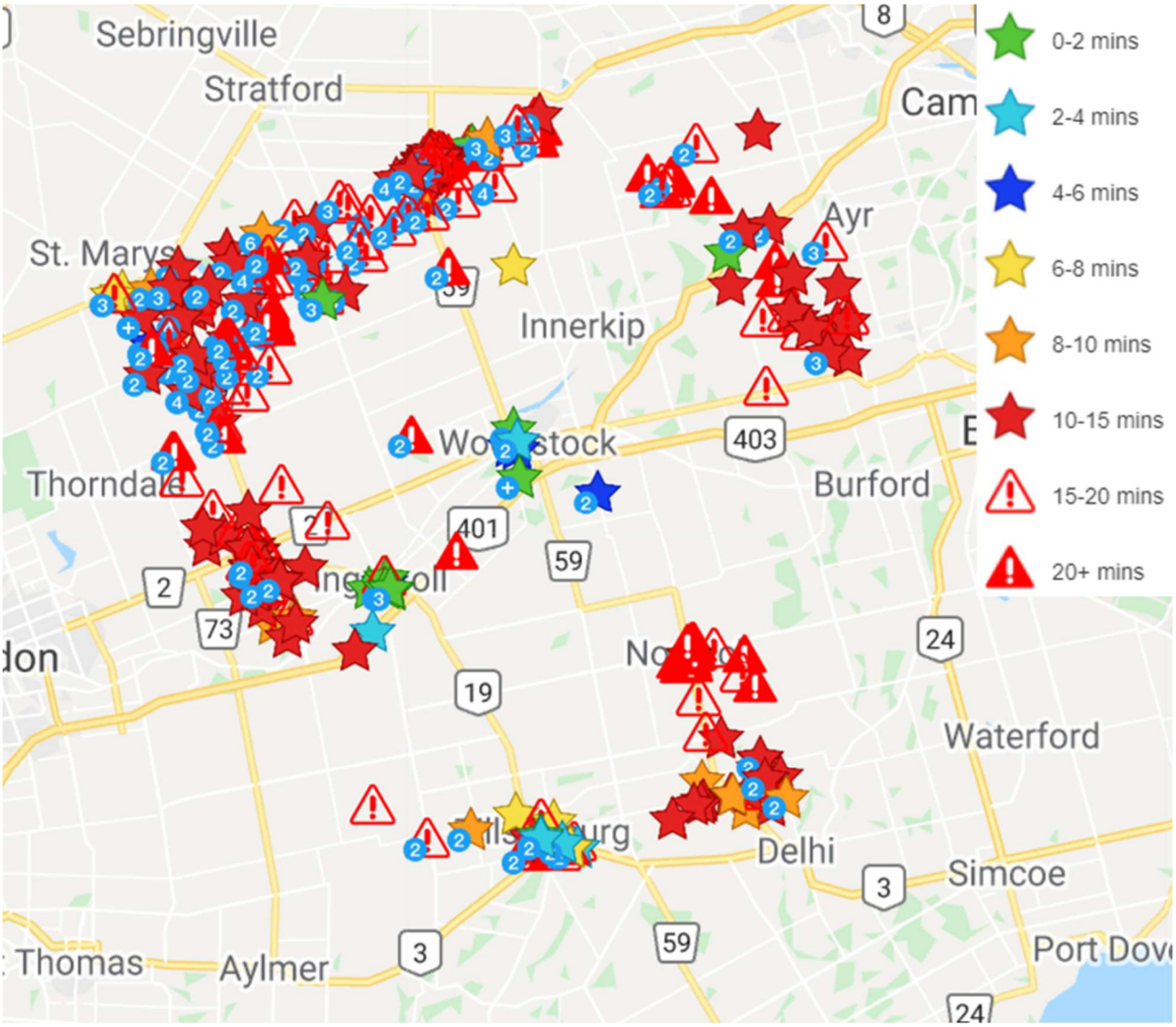


Figure 5 - C3-4 2019-21 by others in Oxford

8.1.3 County-wide Standby Locations

Paramedic deployment plans are designed to collapse towards the most highly populated centres as call volumes impact the ability to fully cover all stations. As expected, the highest likelihood of standbys is at the two Woodstock stations, in Ingersoll and Tillsonburg as shown in Figure 6.

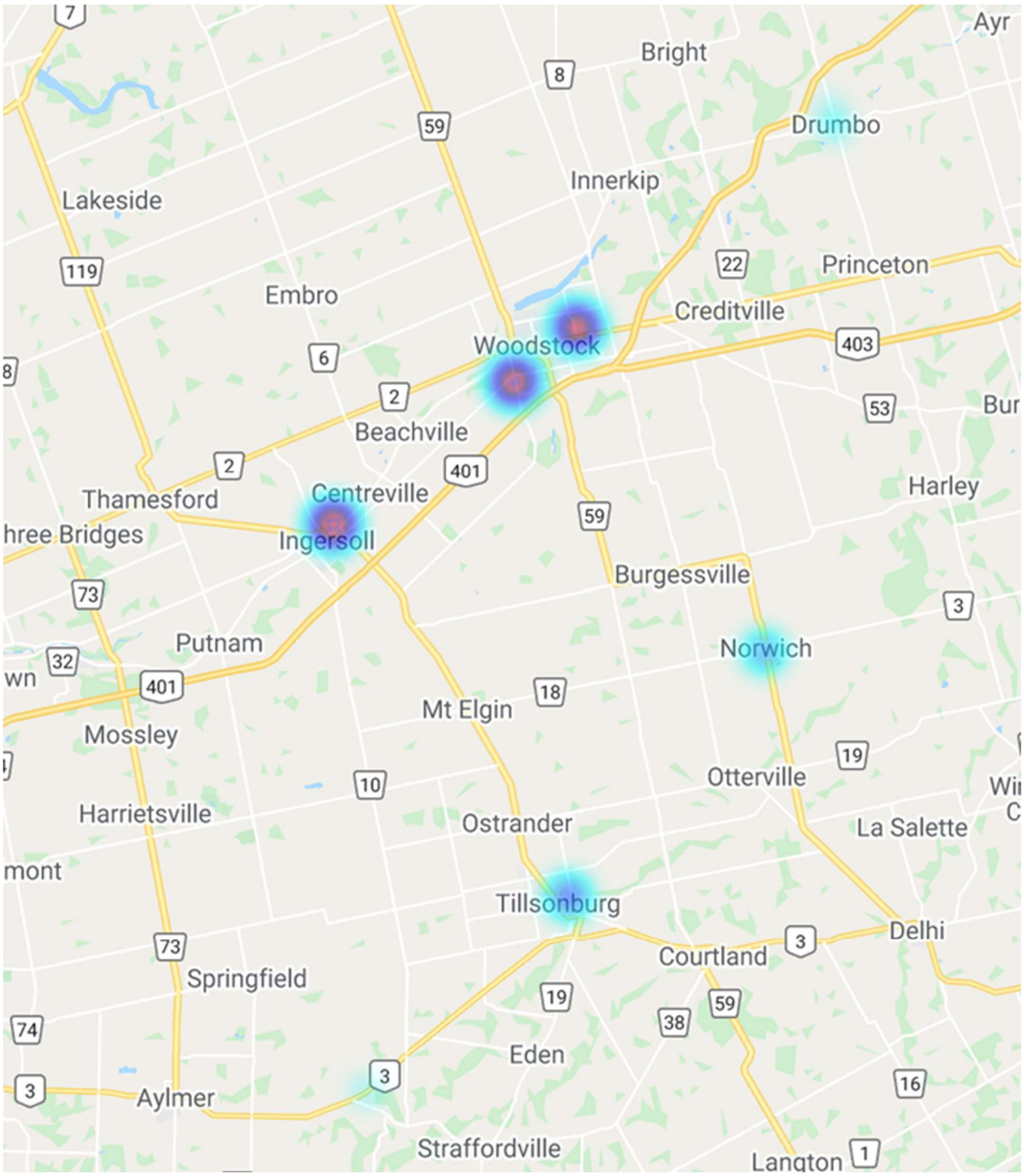


Figure 6 Oxford Stations C8 2019-21 Heatmap

8.1.4 Call Charting by Station of Origin

This section is broken down by each station, beginning with a heat map of Code 3-4 (urgent and emergent) calls originating from the station, followed by a tabular breakdown of calls by local municipality serviced, and a similar tabular breakdown of Code-8 coverage standbys by municipality.

DRUMBO

Typically, a large hotspot will encompass an ambulance station, validating the appropriateness of the station location by call demand. In any situation where a station's demand hot spot is greater in a different location, questions are prompted about whether the station is correctly located. That is indeed the situation with Drumbo as shown in Figure 7. Although there are small hot spots in Drumbo, Plattsville/Bright and Ayr in neighbouring Waterloo, the vast majority of this station's work is in the city of Woodstock. As shown in Figure 8, more than half of Drumbo's patient calls (Code 1-4) were in Woodstock (53%), vs. 27% in Blandford-Blemheim. Similarly, as shown in Figure 9, over 90% of the coverage standbys conducted by Drumbo were in Woodstock.

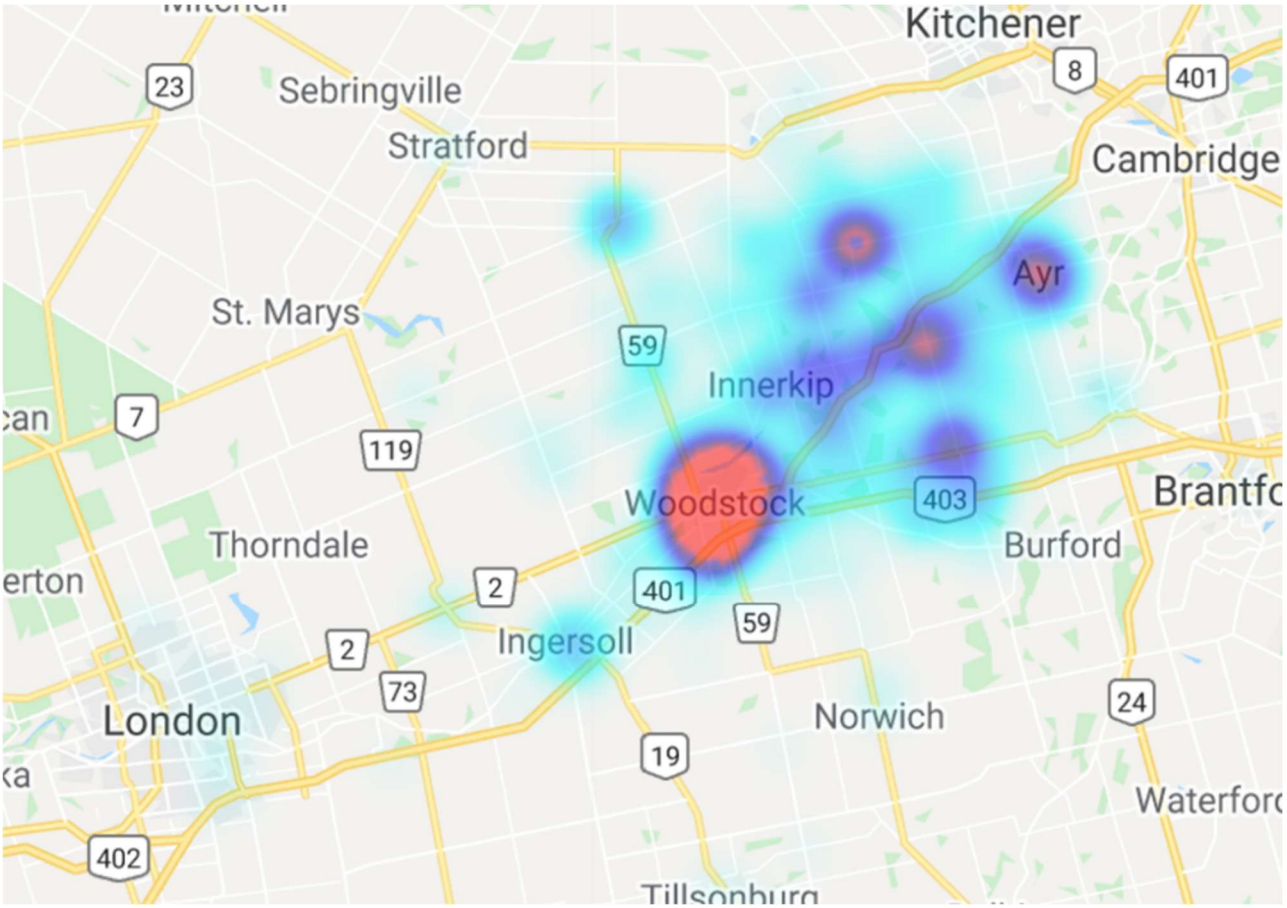


Figure 7- Drumbo C3-4 2019-21 Heatmap

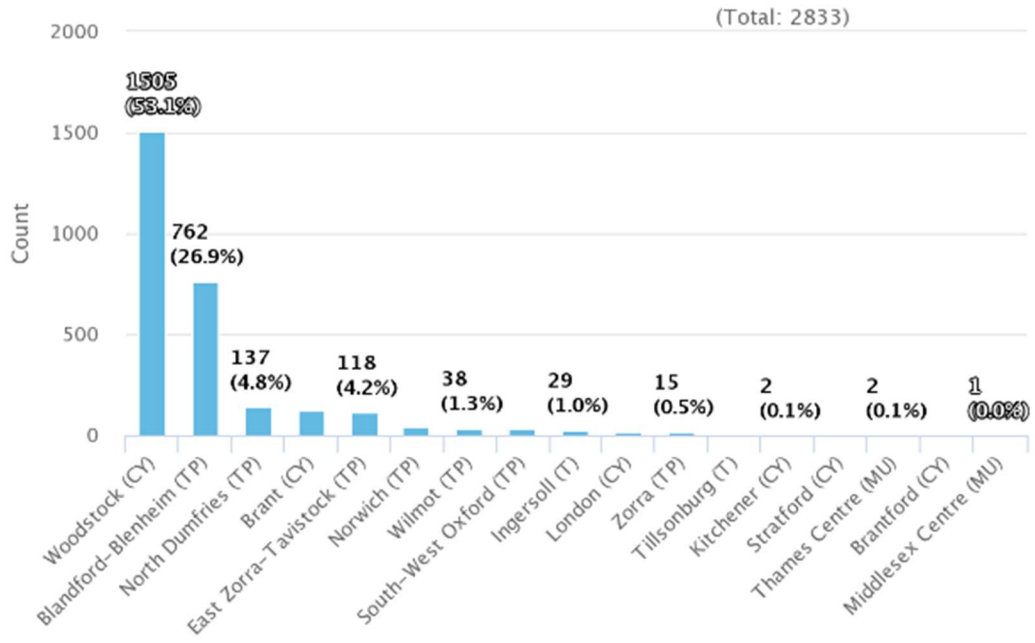


Figure 8 - Drumbo C1-4 2019-21 Calls

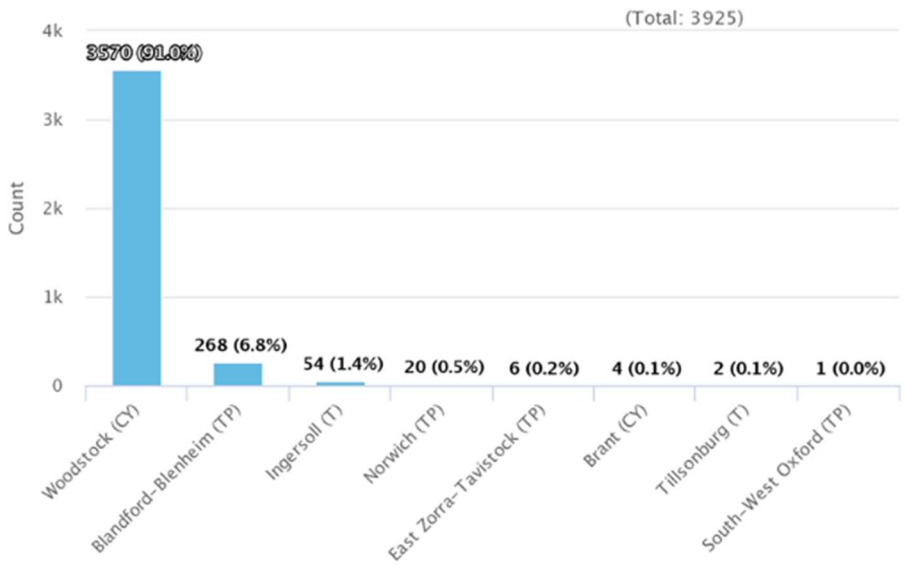


Figure 9 - Drumbo C8 2019-21 Calls

INGERSOLL

Contrary to the Drumbo example and as shown in Figure 10, the Ingersoll station has a large hotspot over the community with a secondary warm spot over Thamesford. Almost 2/3rds of Ingersoll's calls are local, with an additional 10% in its Thamesford response area. Coverage standbys as shown in Figure 12, are mainly in Woodstock (54%) and Tillsonburg (34%).

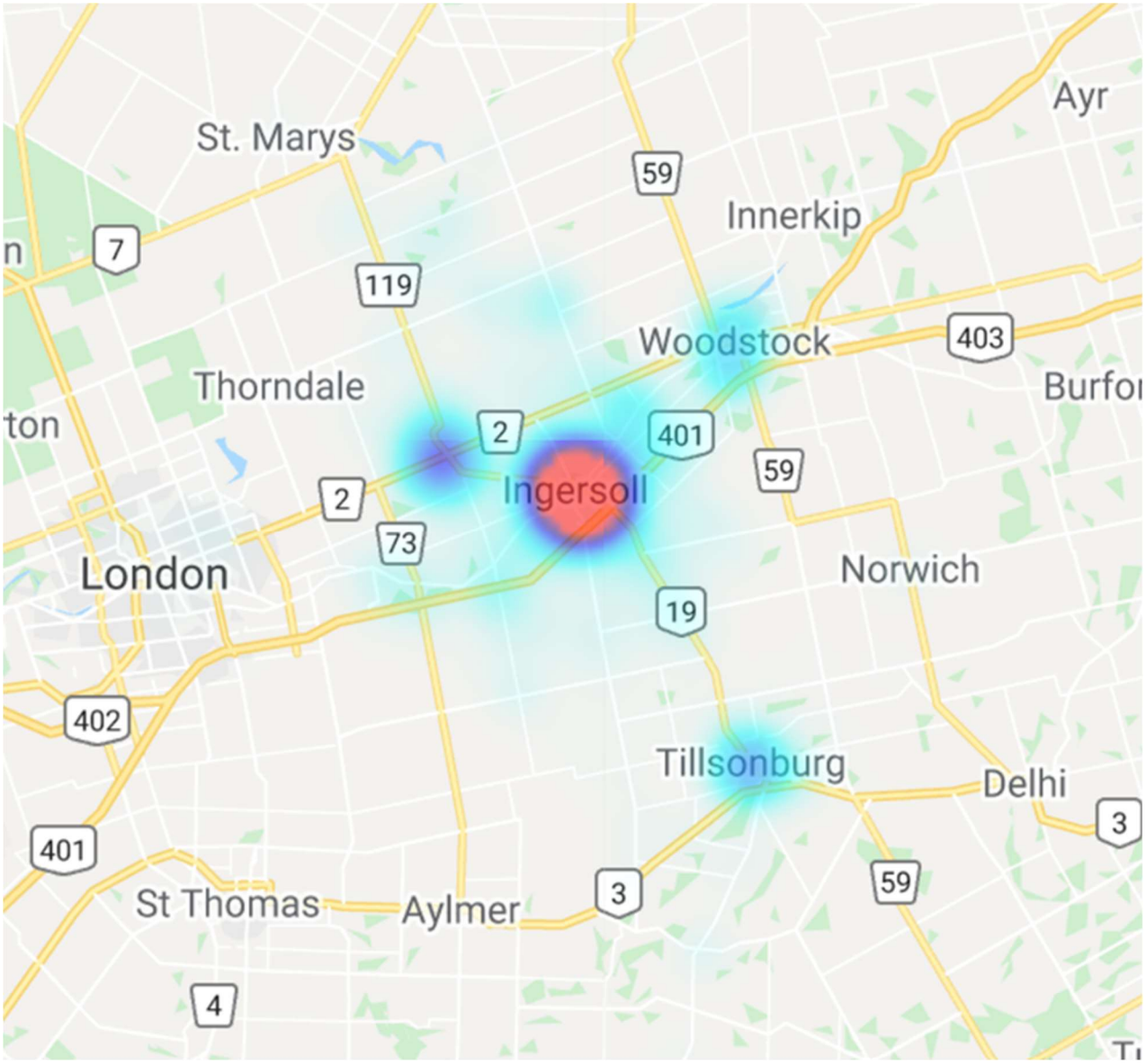


Figure 10 - Ingersoll C3-4 2019-21 Heatmap

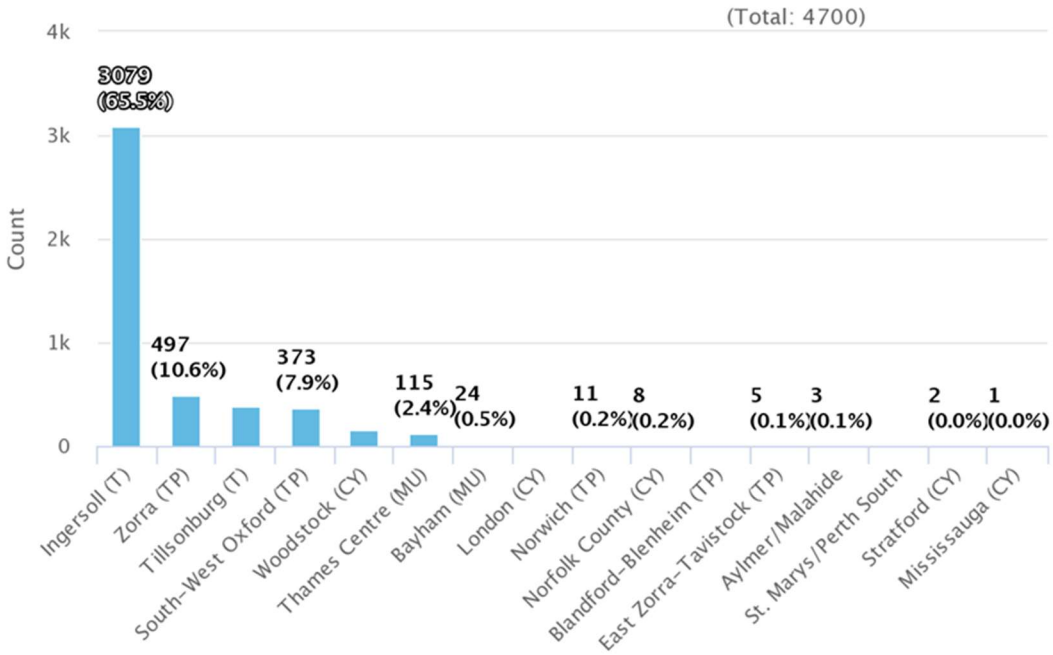


Figure 11- Ingersoll C1-4 2019-21 Calls

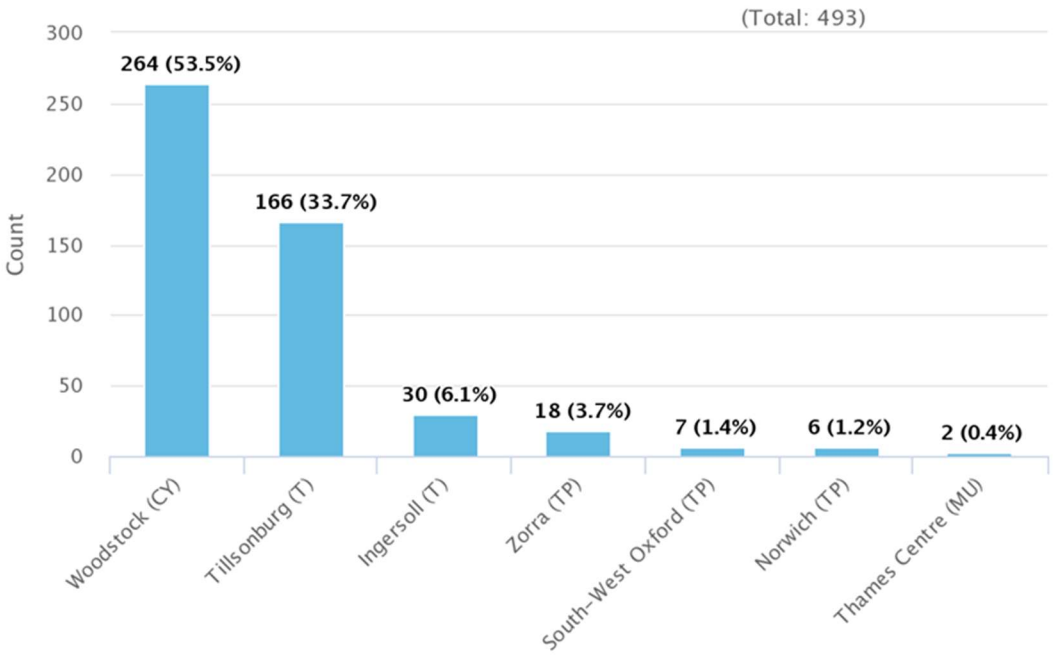


Figure 12- Ingersoll C8 2019-21 Calls

NORWICH

The Norwich station presents as a contradiction – It has its primary hot spots over Norwich and Otterville, but similar sized workload supporting Woodstock and Tillsonburg. As seen in Figure 13 and 14, there is more than enough workload (50+%) to justify Norwich's location, but this shows that the recent resource increases in Woodstock and Tillsonburg have yet to fully restore local coverage at this particular station. Approximately 40% of Norwich workload is almost evenly spread between Woodstock and Tillsonburg. Similarly, 48% of coverage standbys are in Woodstock, and 41% in Tillsonburg.

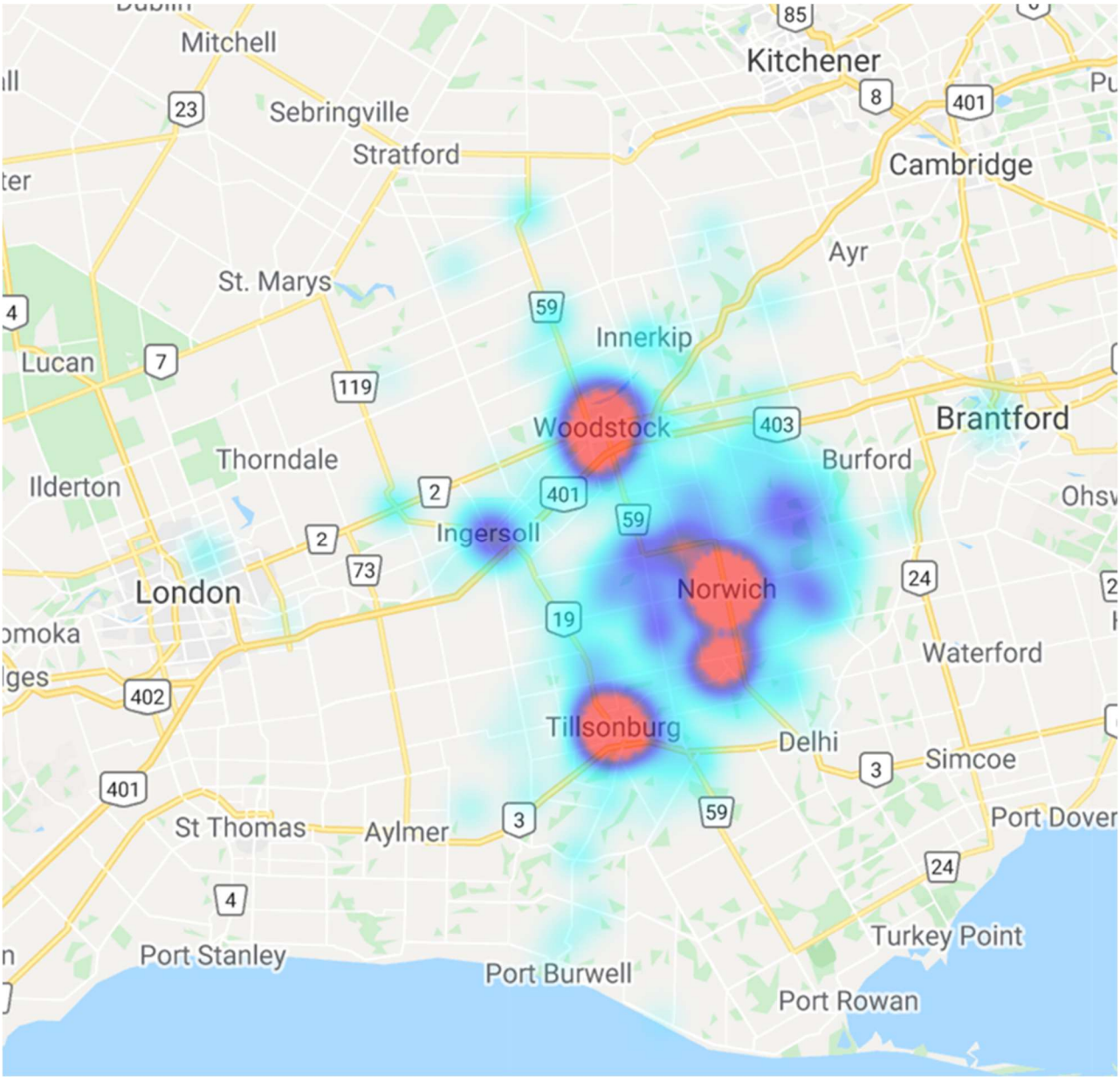


Figure 13 - Norwich C3-4 2019-21 Heatmap

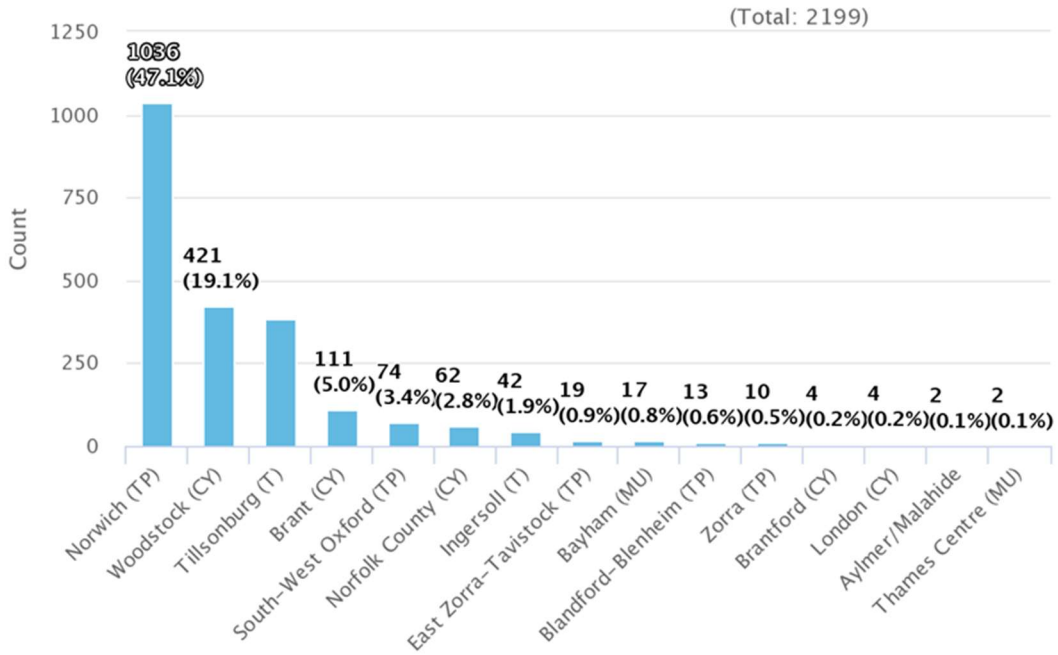


Figure 14 - Norwich C1-4 2019-21 Calls

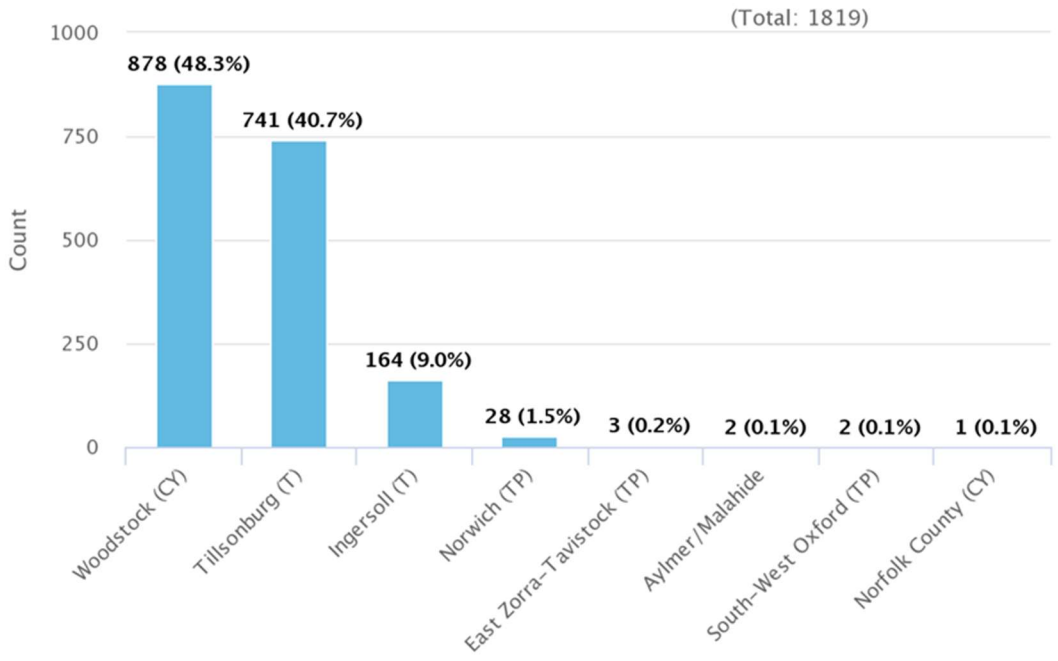


Figure 15 - Norwich C8 2019-21 Calls

TILLSONBURG

This growing community staffs two ambulances, 24 hours a day. The primary hot spot is the community itself with 73% of calls local. A supporting role in Ingersoll has 59% of Tillsonburg coverage standbys there, along with 24% supporting Norwich. Interestingly, some 7% of this busy station's calls are in Elgin's Bayham township (see deep dive at section 8.4).

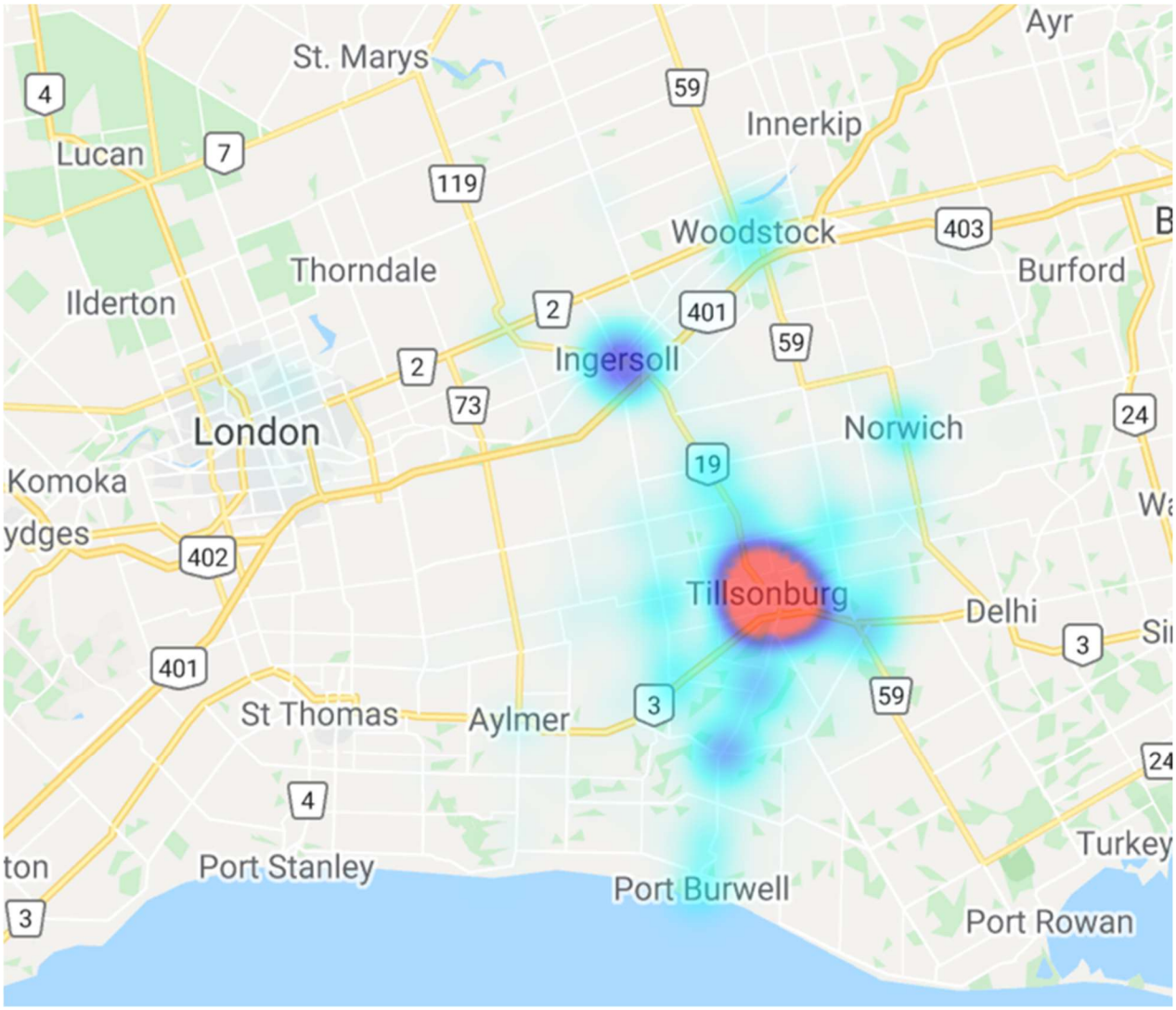


Figure 16 - Tillsonburg C3-4 2019-21 Heatmap

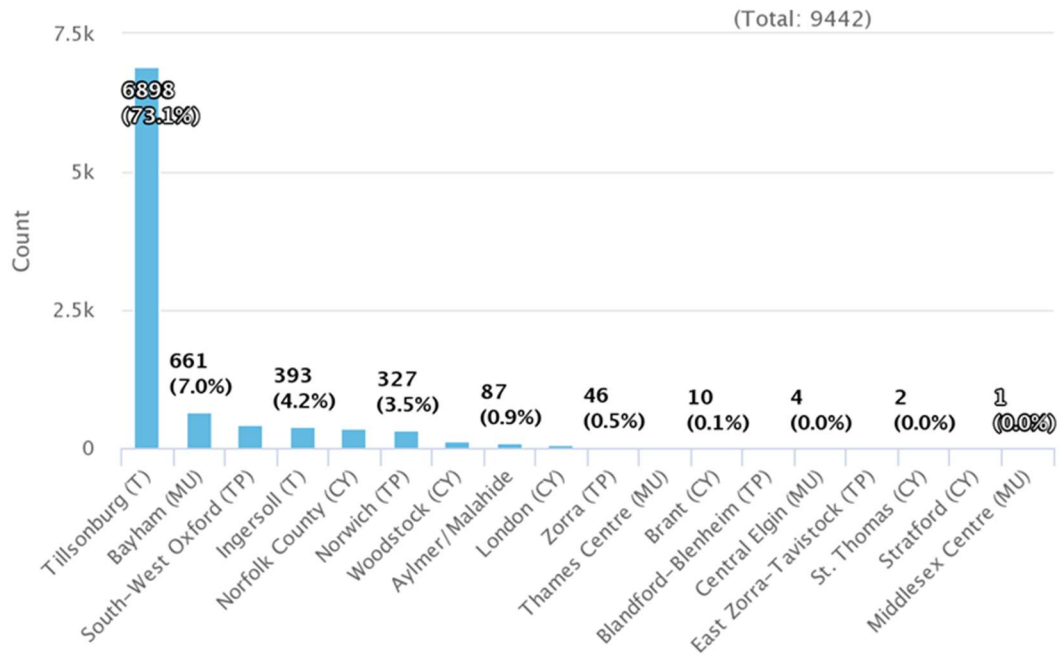


Figure 17- Tillsonburg C1-4 2019-21 Calls

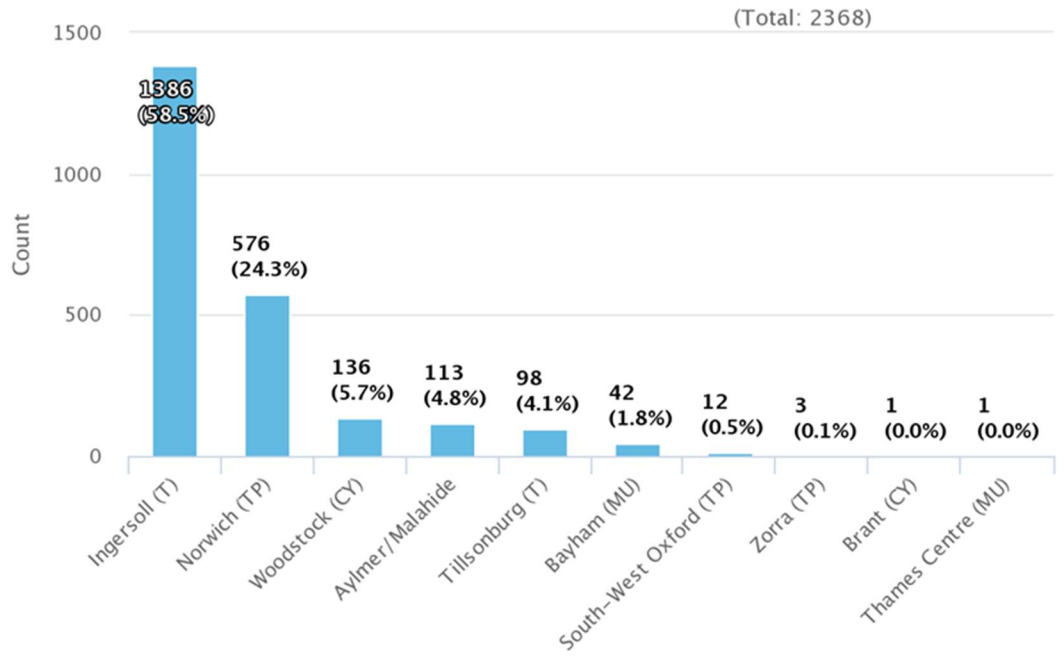


Figure 18 - Tillsonburg C8 2019-21 C8

WOODSTOCK BYSHAM PARK

The Bysham Park station services the entire city of Woodstock almost exclusively (86%), with its next largest demand zone in the Plattsville/Bright area. This station also plays a significant role in the Tavistock area which will be discussed further in section 9.3. Standbys are primarily within Woodstock (46%), although 30% of coverage movements are to Ingersoll.

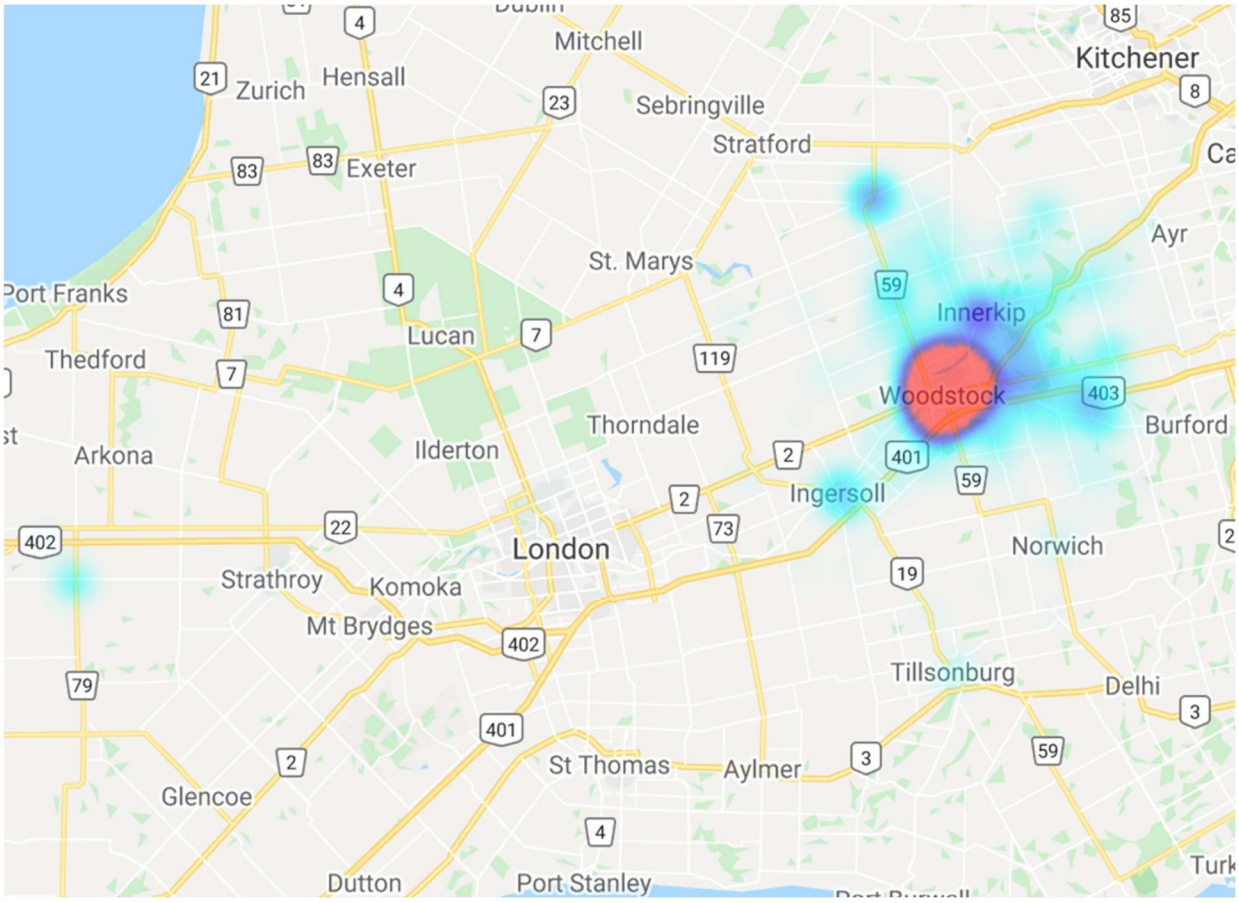


Figure 19 - Woodstock Bysham Park C3-4 2019-21 Heatmap

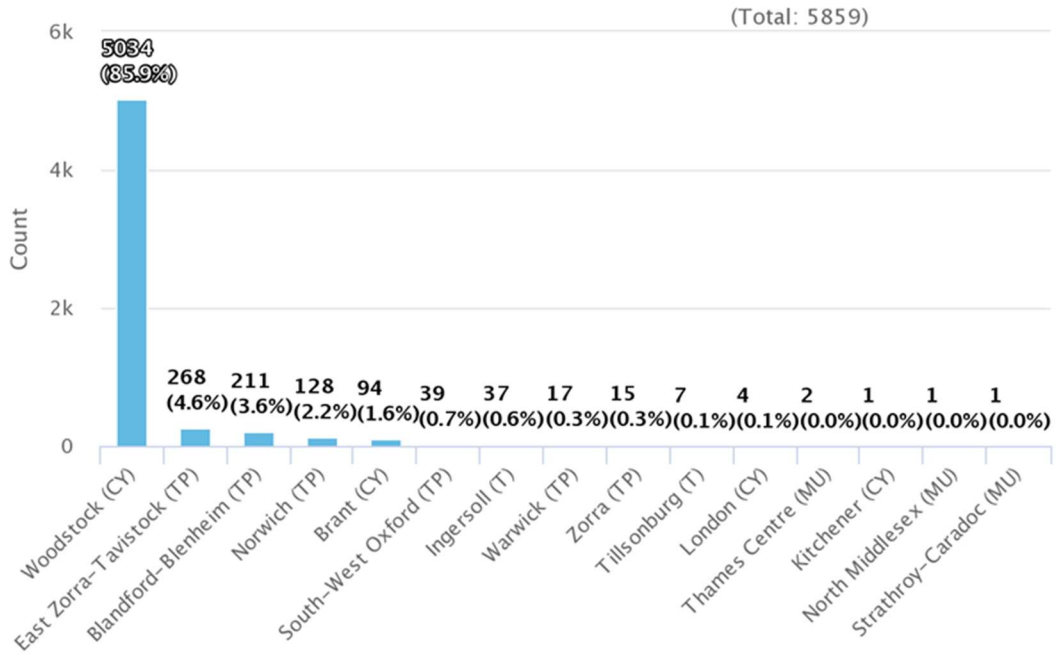


Figure 20 - Woodstock Bysham Park C1-4 2019-21 Calls

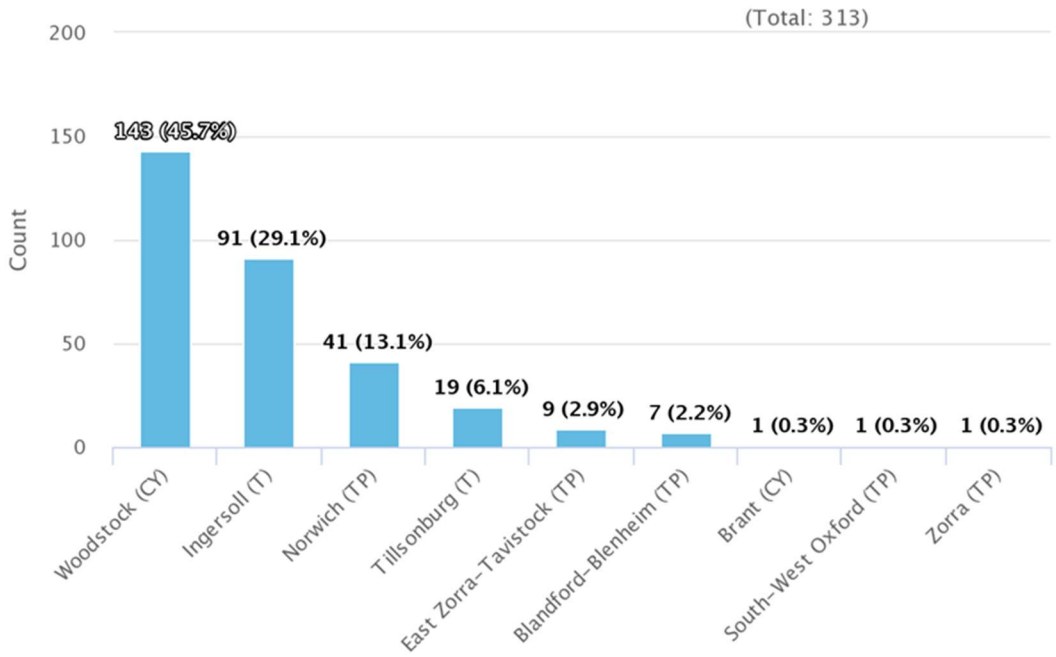


Figure 21- Woodstock Bysham Park C8 2019-21 Calls

WOODSTOCK MILL STREET

Similarly, the Mill Street station services the entire city of Woodstock indiscriminately and almost exclusively (83%), with its next largest demand zone in the South-West Oxford/Ingersoll area. The station plays less of a role in the Tavistock area, but still shows as a warm spot. Coverage standbys are almost evenly split between Ingersoll and Woodstock at between 40-45%.

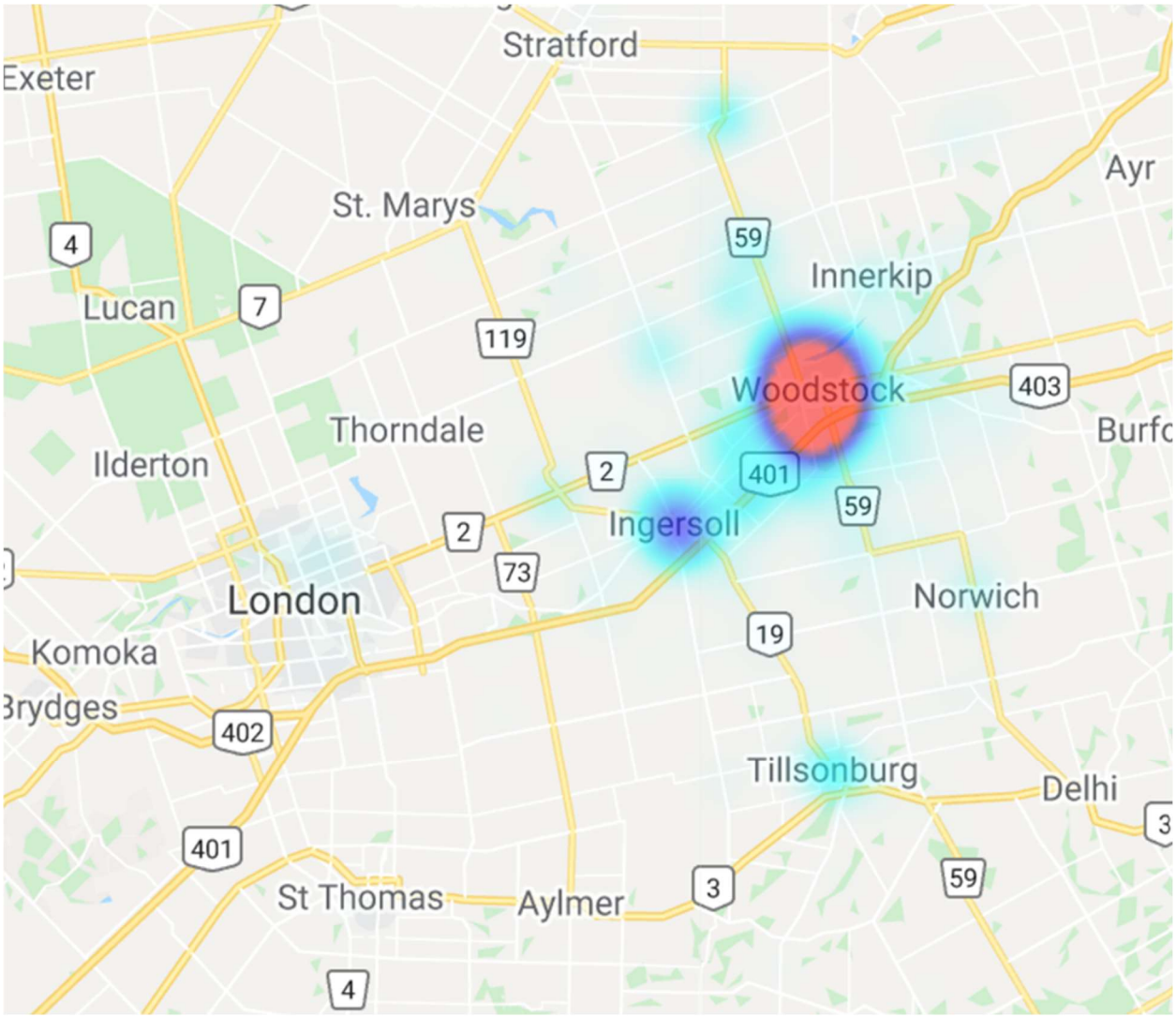


Figure 22 - Woodstock Mill St C3-4 2019-21 Heatmap

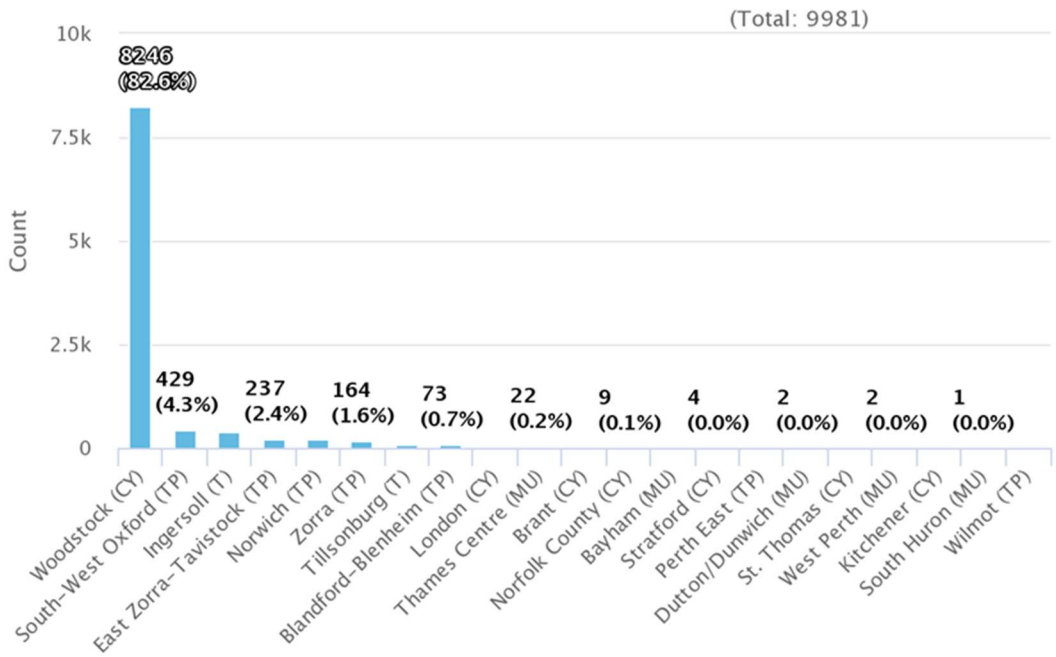


Figure 23- Woodstock Mill St C1-4 2019-21 Calls

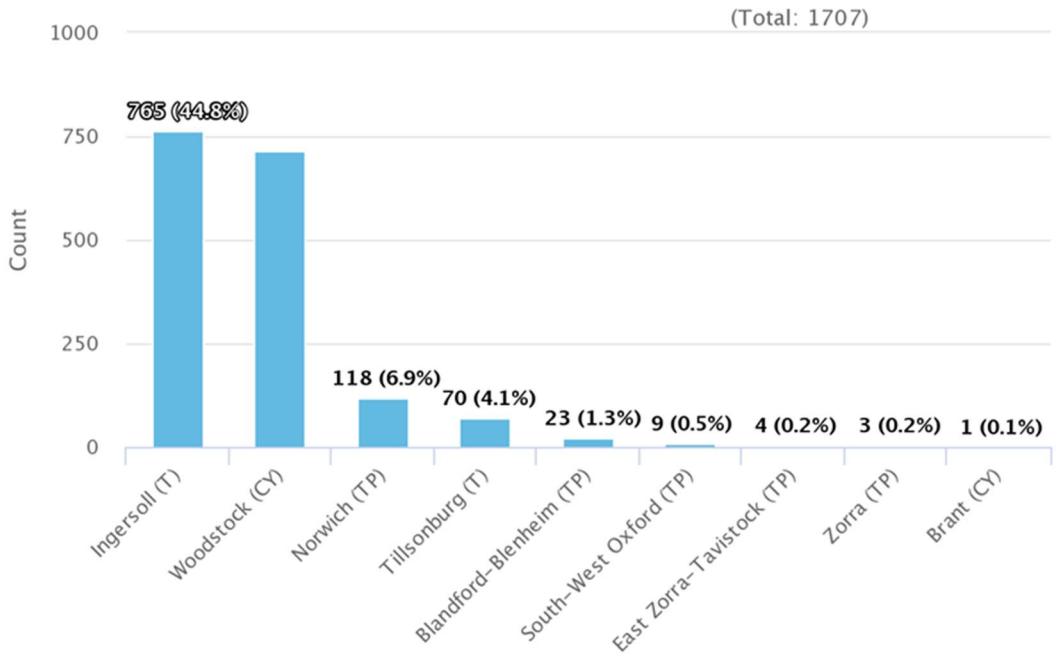


Figure 24 - Woodstock Mill St C8 2019-21 Calls

ZORRA

Located in close proximity to the town of Embro, this station presents with multiple hotspots north of Highway 401. Figures 25 and 26 show workload spread between Woodstock (31%), the East Zorra-Tavistock area and Ingersoll (at approximately 20% each), while its own primary coverage area is similarly just under 20%. This station is in desperate need of a defined purpose. Despite being staffed only 12 hours a day, it serves an important role in Tavistock, Woodstock and Ingersoll, but travels across essentially half of the county. While at the same time, its location serves an otherwise underserviced part of the County, this station location needs to be more fully evaluated to determine how these service hours can be better utilized.

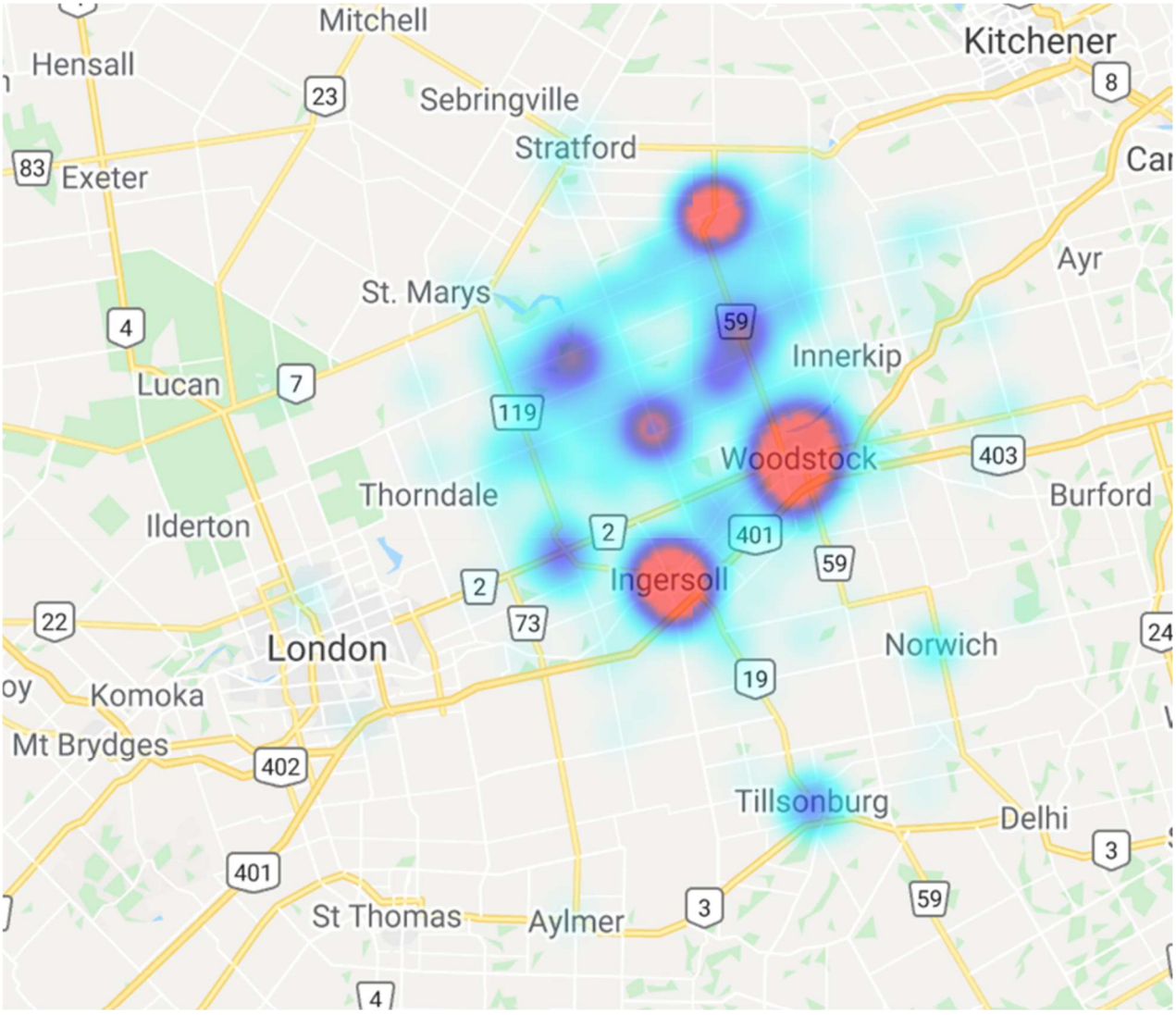


Figure 25 - Zorra C3-4 2019-21 Heatmap

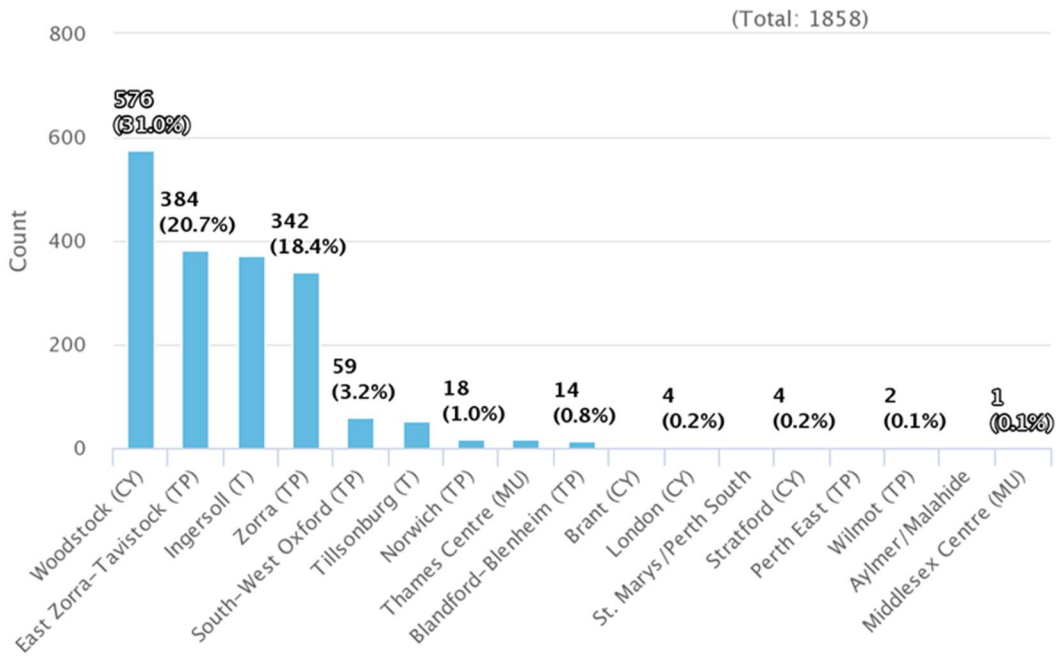


Figure 26 - Zorra C1-4 2019-21 Calls

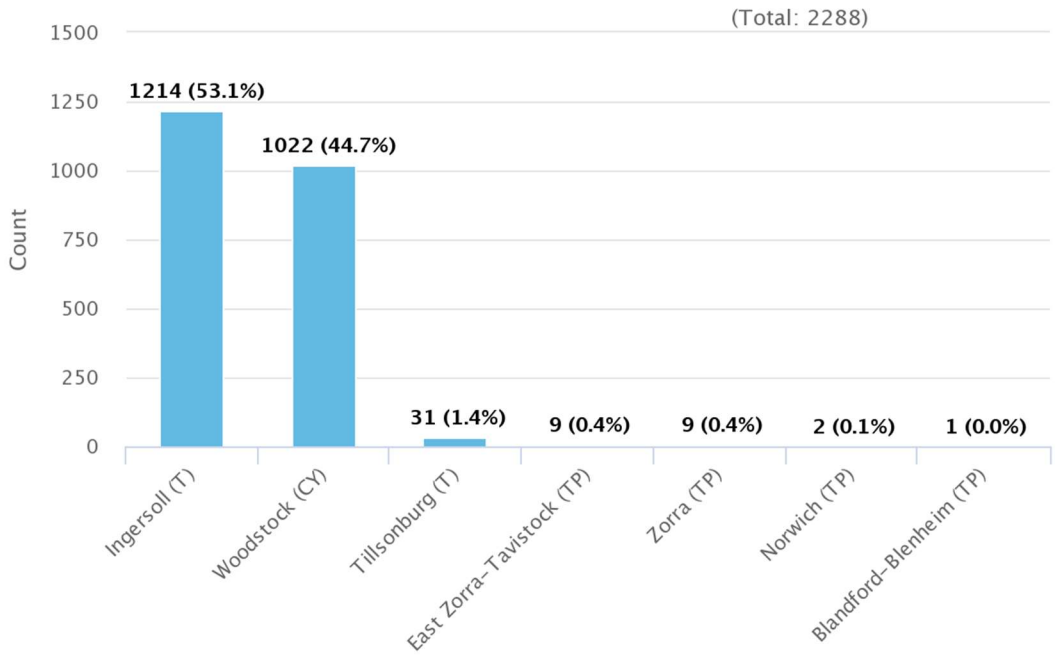


Figure 27 - Zorra C8 2019-21 Calls

8.2 Elgin Mapping

Paramedic services are provided in Elgin through two stations in St. Thomas, as well as stations in Aylmer, Dutton and Rodney. In addition, a 12 hour-a-day, single paramedic rapid response unit (RRU) is based in Port Burwell 7 days-a-week from Victoria Day to Labour Day, and Monday-Friday the remainder of the year. Deployment of vehicles by hour of day are shown below:

ELGIN	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Aylmer																								
Dutton																								
Port Burwell																								
Rodney																								
St. Thomas Edward Street																								
St. Thomas Edward Street																								
St. Thomas Shaw Valley																								
St. Thomas Shaw Valley																								
Hourly Vehicle Count	5	5	5	5	5	5	6	6.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6.5	6	5	5	5	5

* Port Burwell Rapid Response Unit

8.2.1 *Heatmapping By County/Urban/Non-Urban*

Elgin County heatmapping shows the expected "hot spots" encompassing St. Thomas and Aylmer, as well as a surprising secondary hot spot in Port Burwell, given its reduced coverage. "Warm spots" are visualized in both the Rodney and Dutton station communities, as well as in West Lorne and Port Stanley. The hot spot in Port Burwell and the accompanying Tillsonburg corridor area, will become the focus of a "deep dive" in section 9.4. Typically, hot spots should be accompanied by ambulance stations due to their high propensity to produce calls. With regards to St. Thomas proper, call volume is distributed across the community with expected hot spots in the downtown and along main travel roads, as well as hospital and long-term care sites.

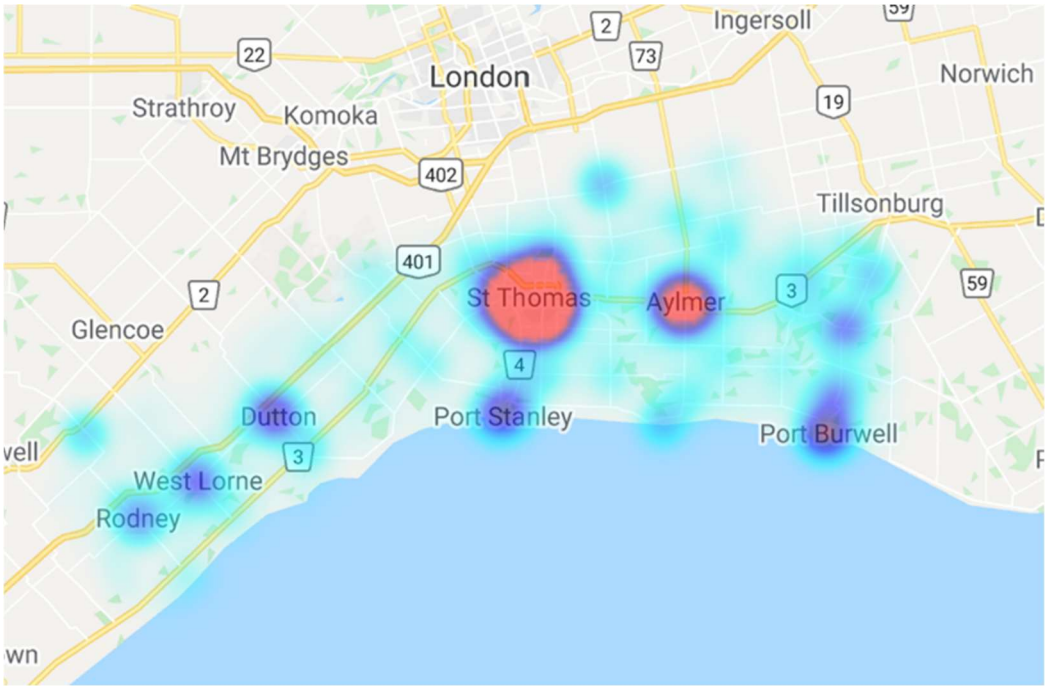


Figure 28 - C3-4 2019-21 Hotspots in Elgin County

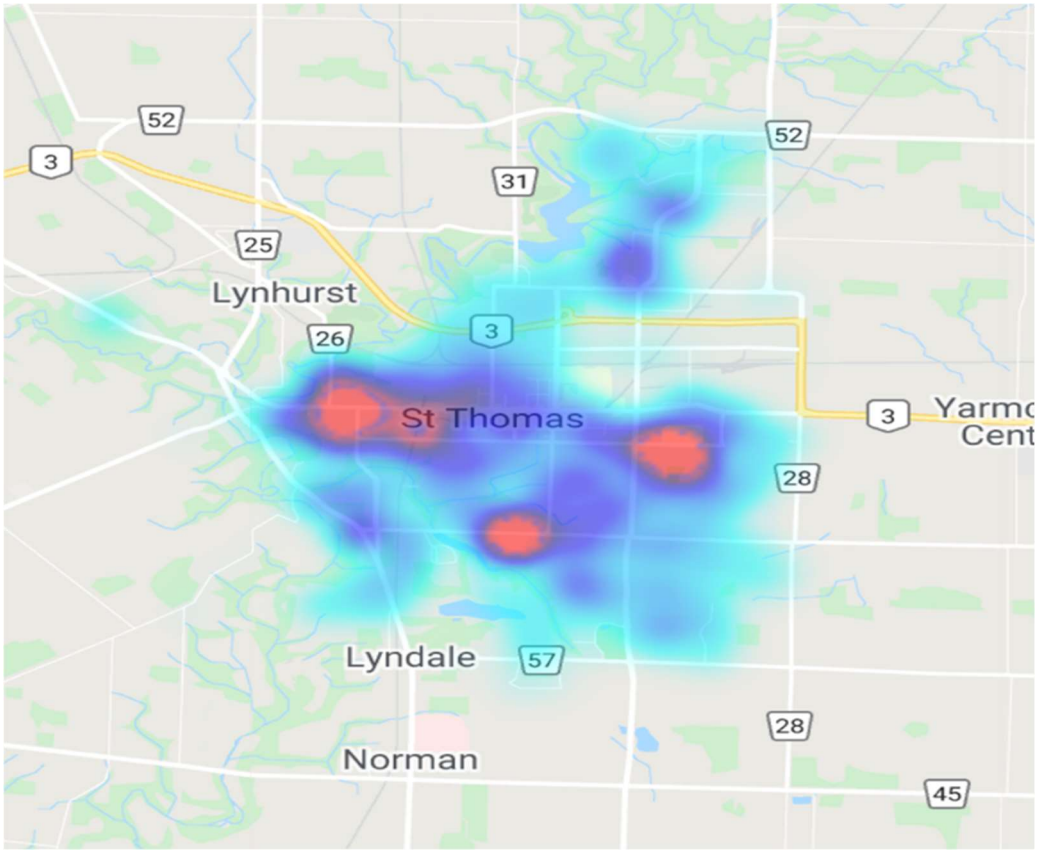


Figure 29 - St. Thomas C3-4 2019-21 Hotspots

8.2.2 Inside/Outside County

Figure 30 shows areas outside of Elgin that receive significant service by Elgin paramedics. Hot spots can be expected in cities with tertiary health centres and other hospitals, where Elgin ambulances transfer patients and are then often tagged for local calls. This is evidenced in London, and less so in Tillsonburg. The most significant out-of-county hot spots are the corridor north of Highway 401 into Middlesex County, and a portion of southeastern Chatham-Kent. Elgin also supports a small portion of Norfolk County east of Port Burwell.

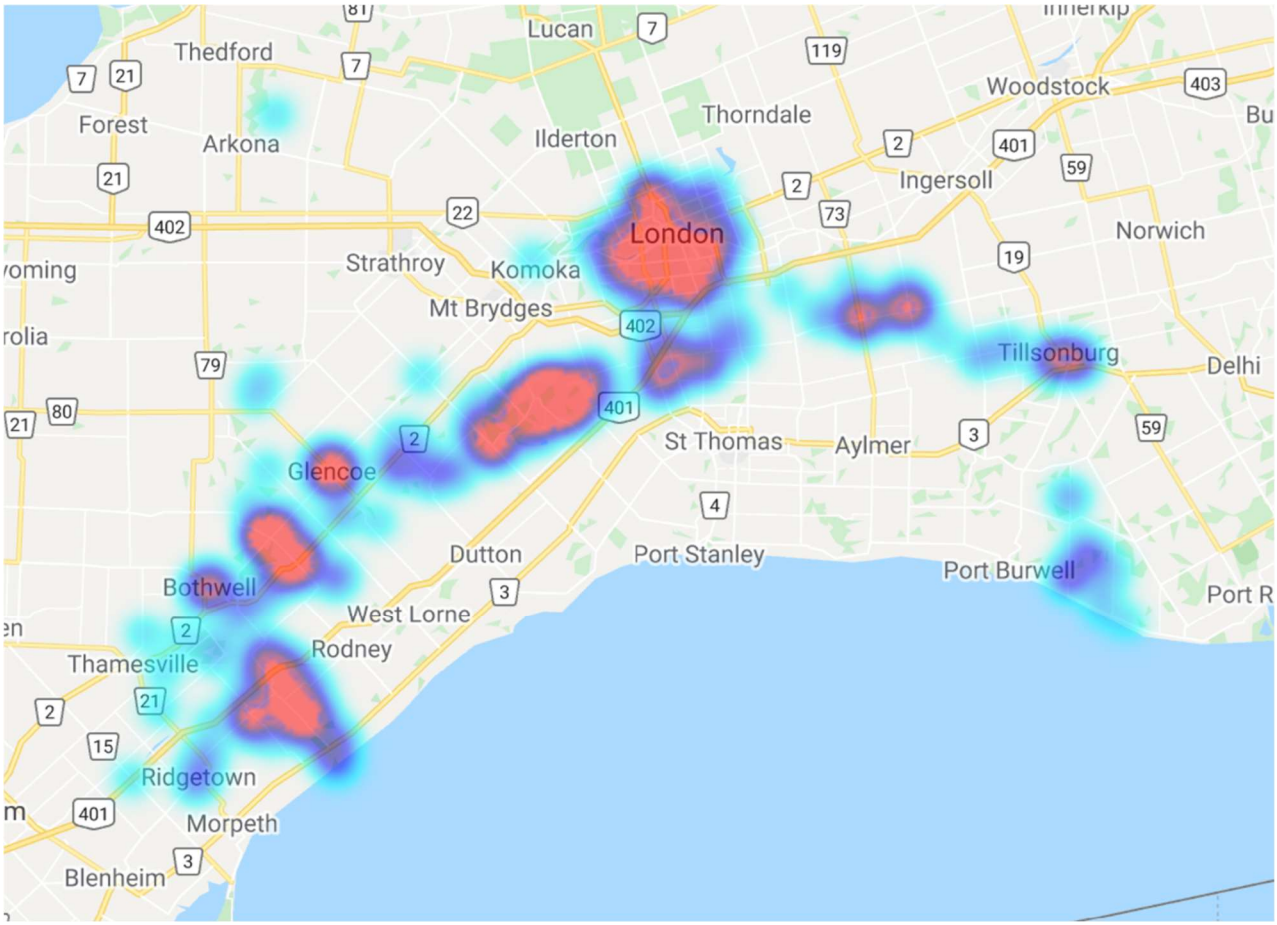


Figure 30 - Elgin C1-4 2019-21 Out of County

Figure 31 (see next page) shows where help from outside Oxford is received from neighbouring paramedic services. The most significant hot spot is the previously mentioned Tillsonburg-Port Burwell corridor, being supported by Oxford's Tillsonburg station (see section 9.4). In addition, St. Thomas itself counts on significant outside support as does the community of Belmont. In both cases, support is generally provided by Middlesex-London.

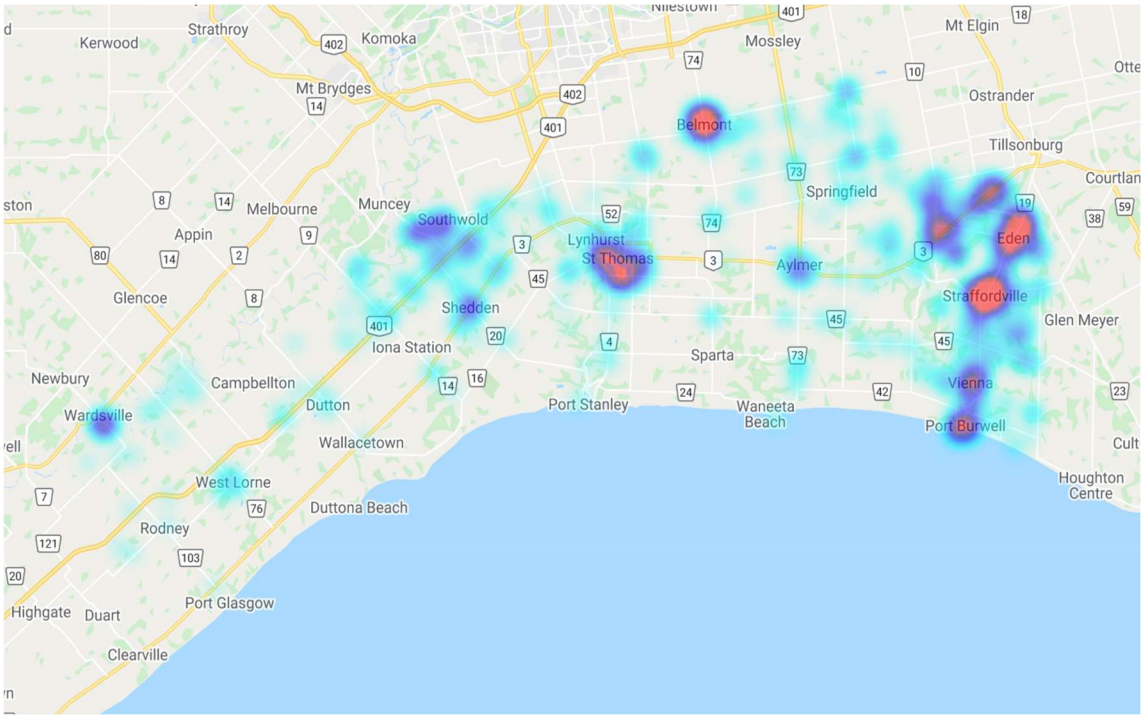


Figure 31 - C3-4 2019-21 by others in Elgin

Figure 32 supplements the heat map in Figure 31 by showing travel times by supporting paramedic services to reach Oxford locations. The longest travel times can be found along the Tillsonburg-Port Burwell corridor (due to partial coverage and no transport vehicle in Port Burwell) and in the Springfield/Avon area. Note that the lowest travel times are found in St. Thomas, whose hospital generates the likelihood that out-of-town resources can be tagged for local calls in Elgin.

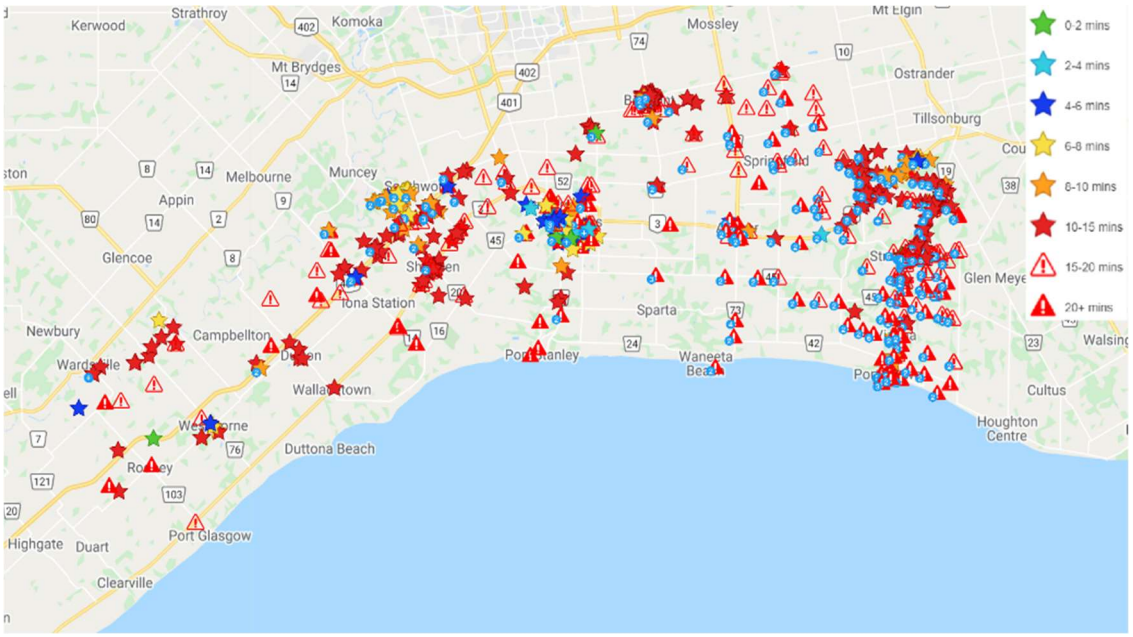


Figure 32 - C3-4 2019-21 by others in Elgin

8.2.3 County-wide Standby Locations

Paramedic deployment plans are designed to collapse towards the most highly populated centres as call volumes impact the ability to fully cover all stations. In the case of Elgin, St. Thomas maintains coverage until the last vehicle and standbys are most likely at Aylmer and West Lorne to balance coverage as shown in figure 33.

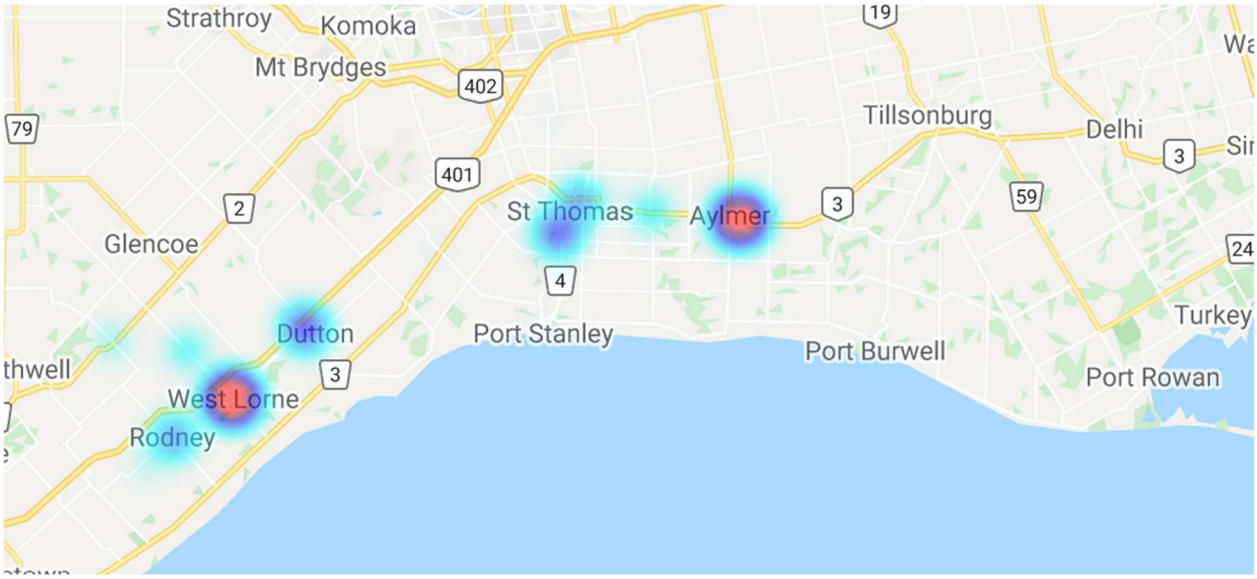


Figure 33 - Elgin Stations C8 2019-21 Heatmap

8.2.4 Call Charting by Station of Origin

This section is broken down by each station, beginning with a heat map of Code 3-4 (urgent and emergent) calls originating from the station, followed by a tabular breakdown of calls by local municipality serviced, and a similar tabular breakdown of Code-8 coverage standbys by municipality.

AYLMER

Located in the centre of East Elgin, Aylmer has an appropriate hot spot over its home community (and Port Bruce in its response area), as well as significant hot spots in St. Thomas and Port Burwell. Once again, the Tillsonburg-Port Burwell corridor is impacting other resources because of its partial coverage and lack of a transport vehicle. Even when the Port Burwell RRU is staffed, any call in their response area requires a second transport resource to be dispatched from primarily either Aylmer or Tillsonburg. In the hours when the Port Burwell RRV is not staffed, Aylmer becomes the primary responding resource for the community. Aylmer is also the primary backup for St. Thomas, Elgin's largest community. The Aylmer resource is pulled back and forth across the region, with 60% of calls in their Aylmer/Malahide home, 24% in Bayham, and 11% in St. Thomas. Similarly, Aylmer provides widespread standby coverage in Central Elgin (37%) and St. Thomas (25%).

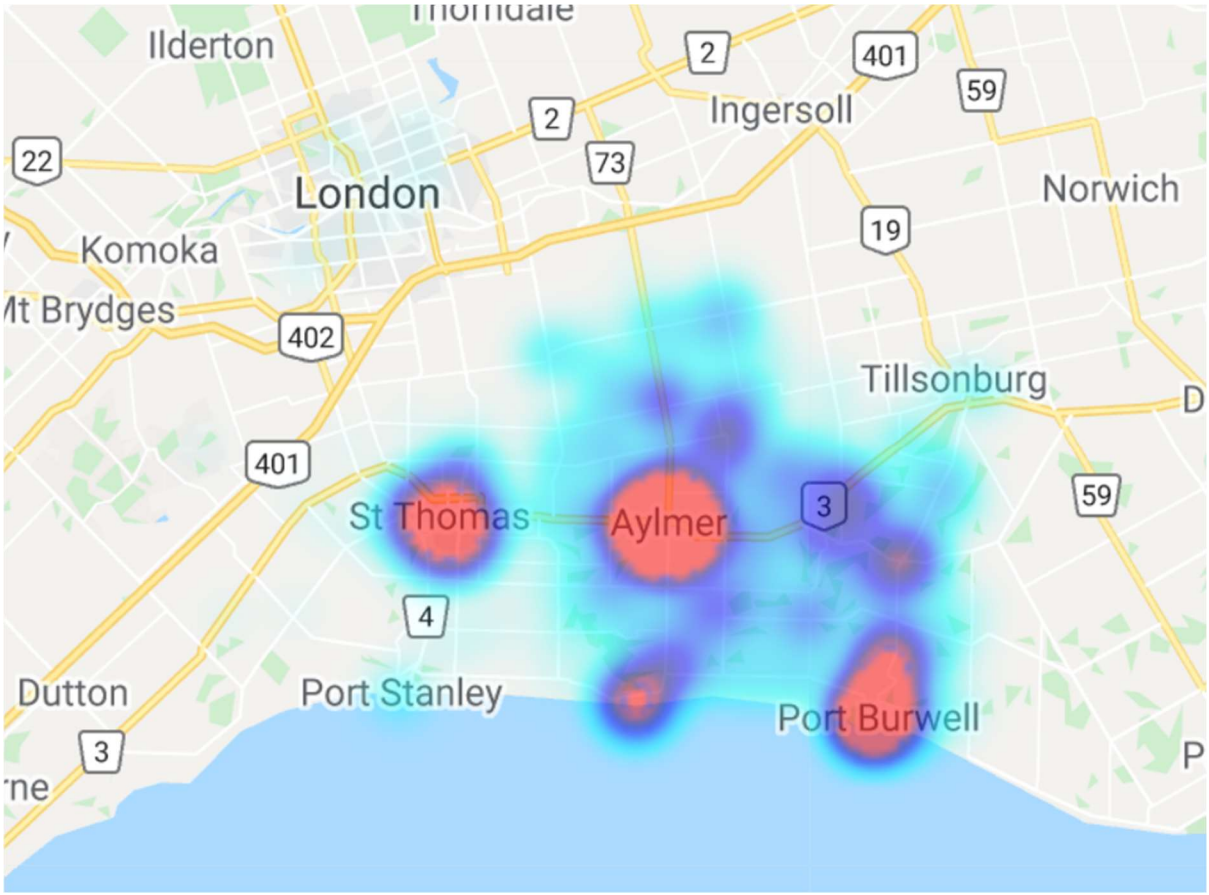


Figure 34 - Aylmer C3-4 2019-21 Heatmap

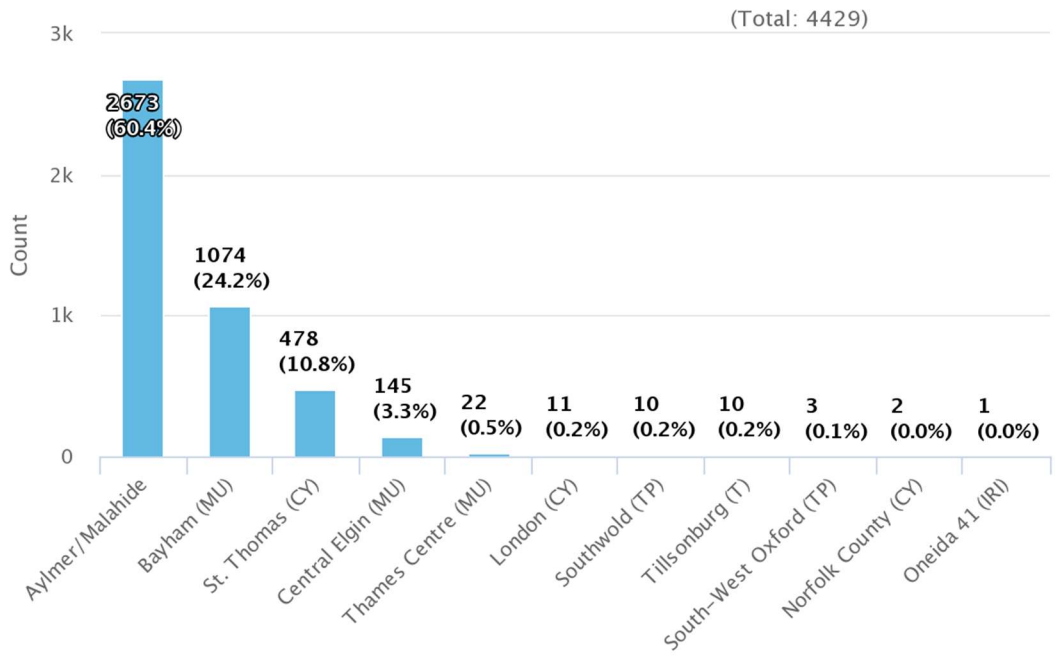


Figure 35 - Aylmer C1-4 2019-21 Calls

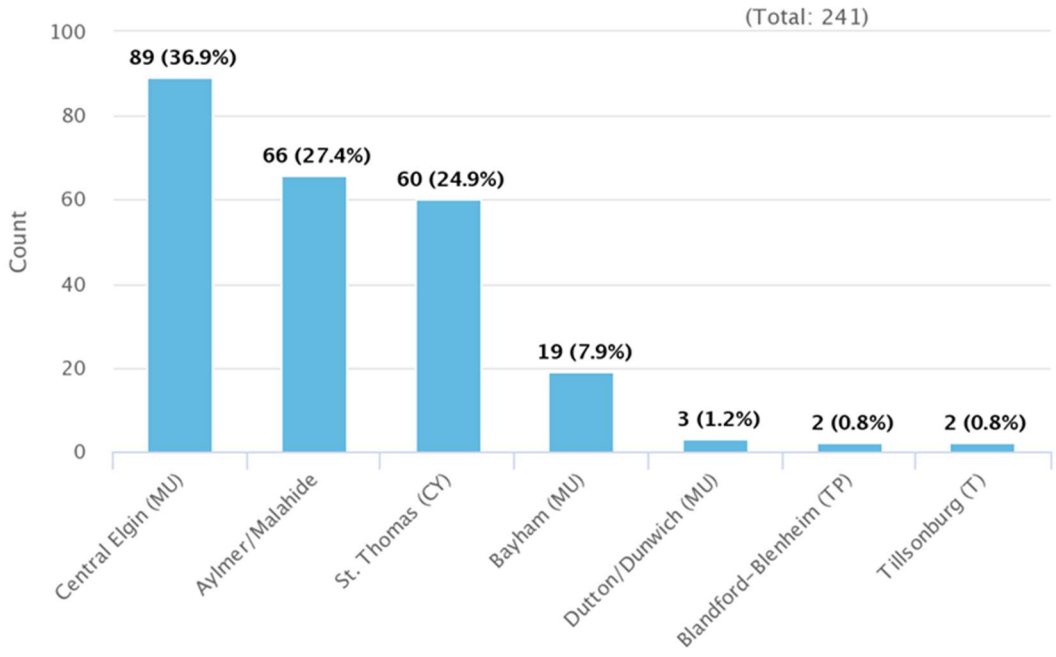


Figure 36 - Aylmer 2019-21 C8 Calls

DUTTON

Typically, a large hotspot will encompass an ambulance station, validating the appropriateness of the station location by call demand. In any situation where a station's demand hot spot is similar or greater in a different location, questions are prompted about whether the station is correctly located. That is indeed the situation with Dutton, where 38% of calls are in Dutton/Dunwich, but 35% are taking place in St. Thomas. With regards to coverage standbys, 58% are in West Elgin supporting the Rodney station, while 35% are in St. Thomas. Dutton is clearly a direct support for the higher call demand in St. Thomas.

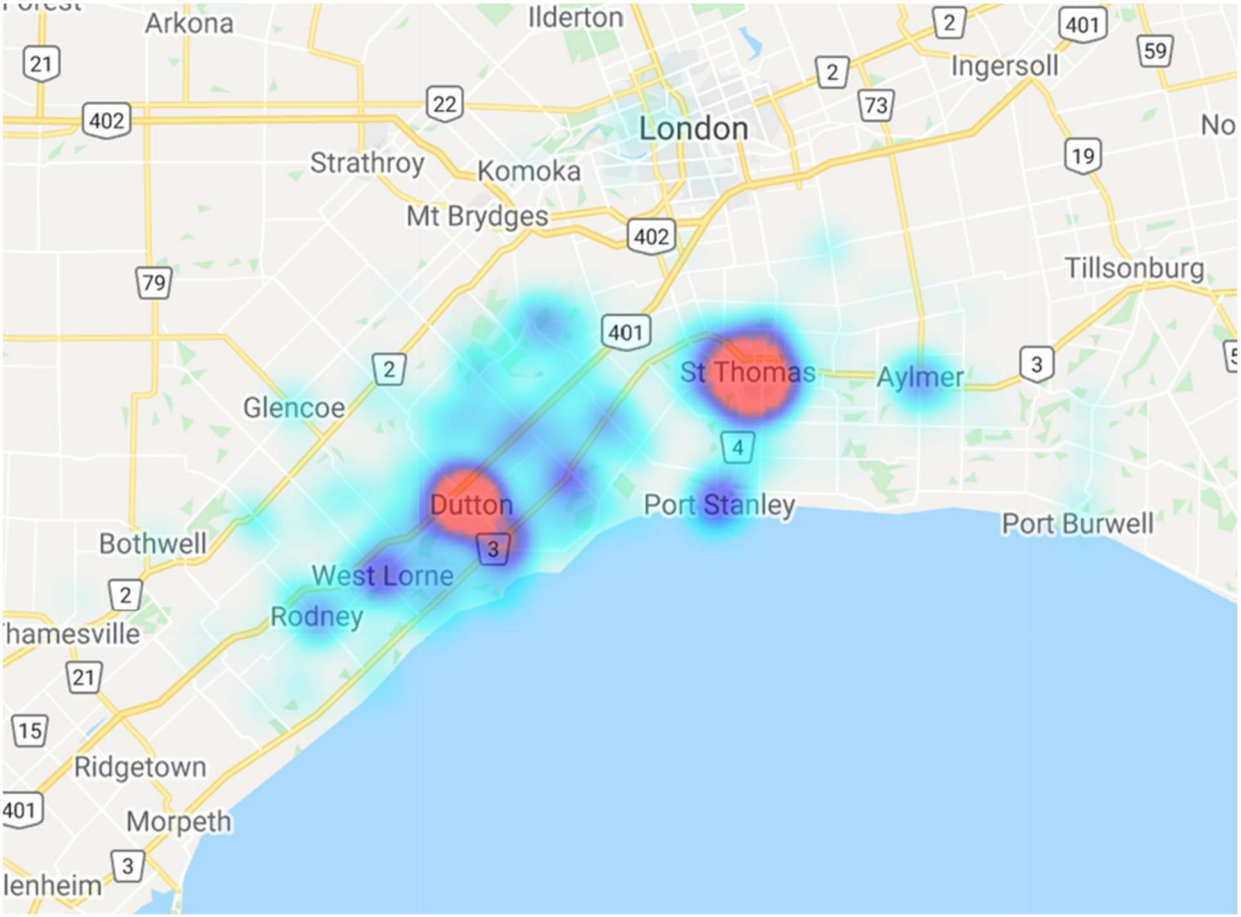


Figure 37 - Dutton C3-4 2019-21 Heatmap

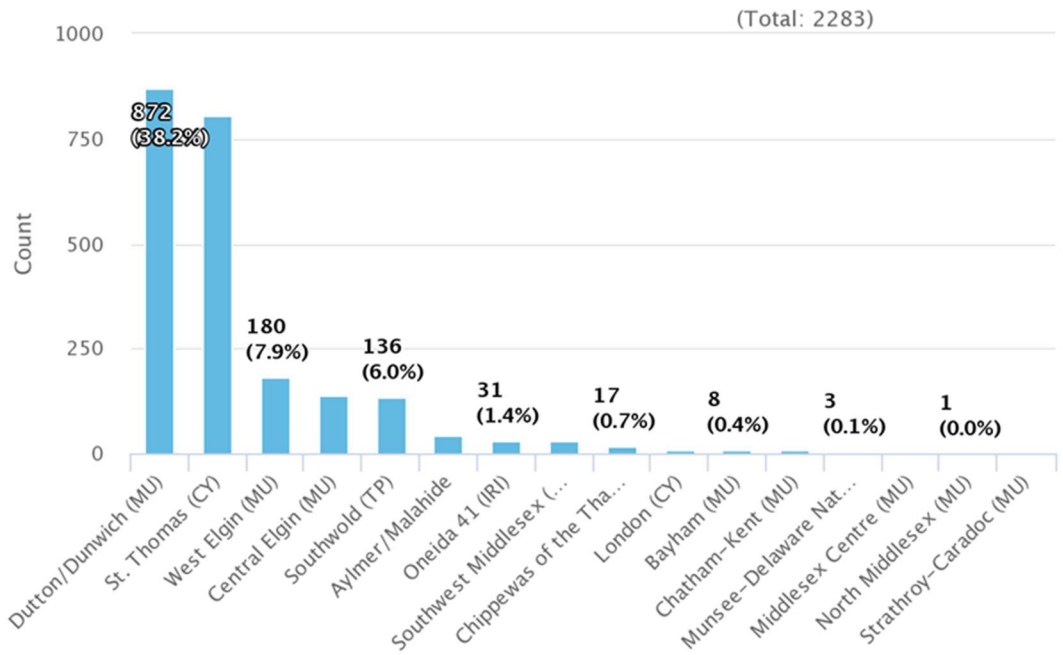


Figure 38 - Dutton C1-4 2019-21 Calls

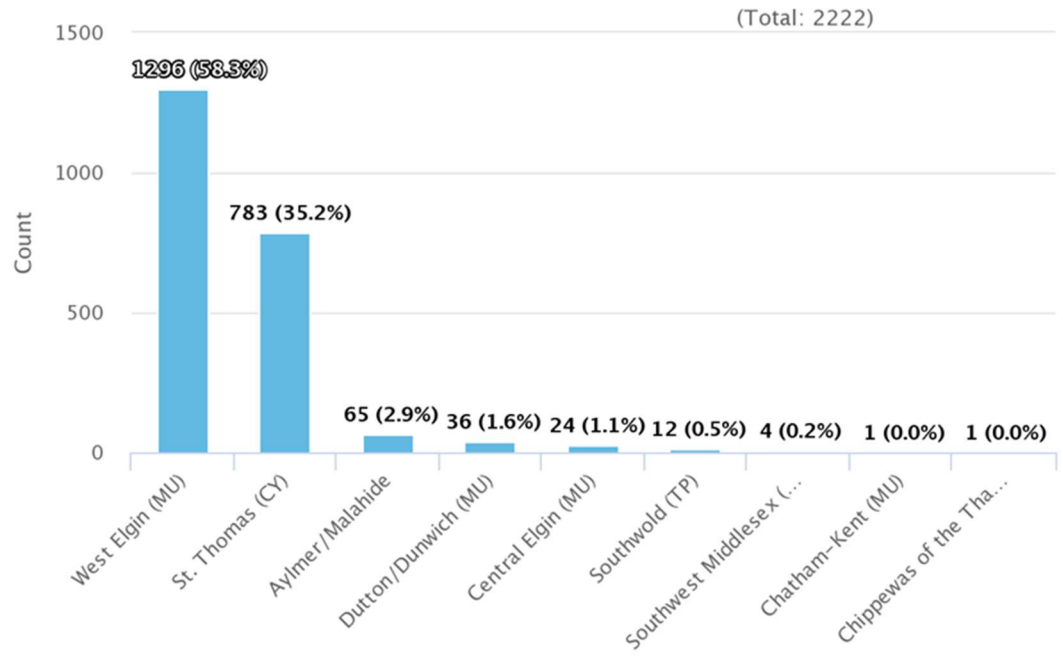


Figure 39 - Dutton C8 2019-21 Calls

PORT BURWELL

As noted previously, Port Burwell is staffed 12 hours-a-day by a non-patient-transporting rapid response unit. Any patient call during those 12 hours also requires the dispatching of a transporting ambulance, usually from either Tillsonburg or Aylmer. Hot spots in the Port Burwell response area include Vienna and Straffordville, as well as a secondary warm spot in Aylmer. It is obvious that despite being a non-transport resource, Port Burwell is used to respond in Aylmer when that busy resource is in use elsewhere. Figure 41 shows that while its workload is primarily in Bayham (82%), Aylmer/Malahide calls make up approximately 15%. Coverage standbys are almost exclusively in Aylmer/Malahide (90%). The Tillsonburg-Port Burwell corridor will be addressed in detail in the deep dive at section 9.4.

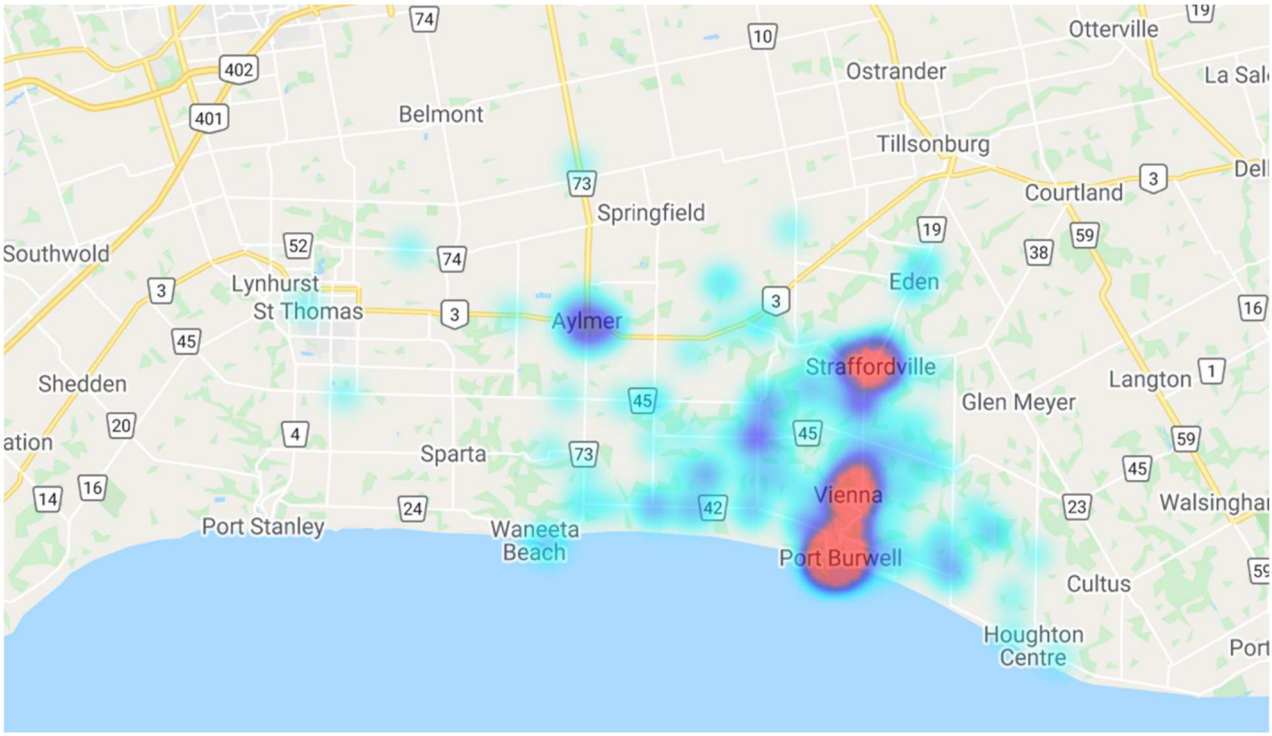


Figure 40 - Port Burwell C3-4 2019-21 Heatmap

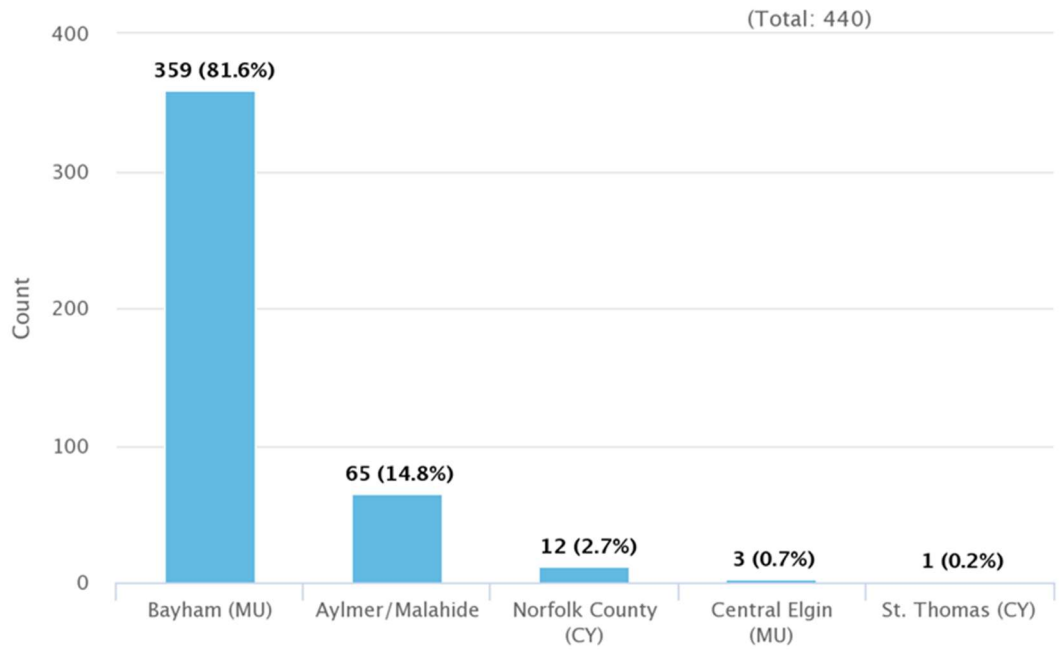


Figure 41 - Port Burwell C1-4 2019-21 Calls

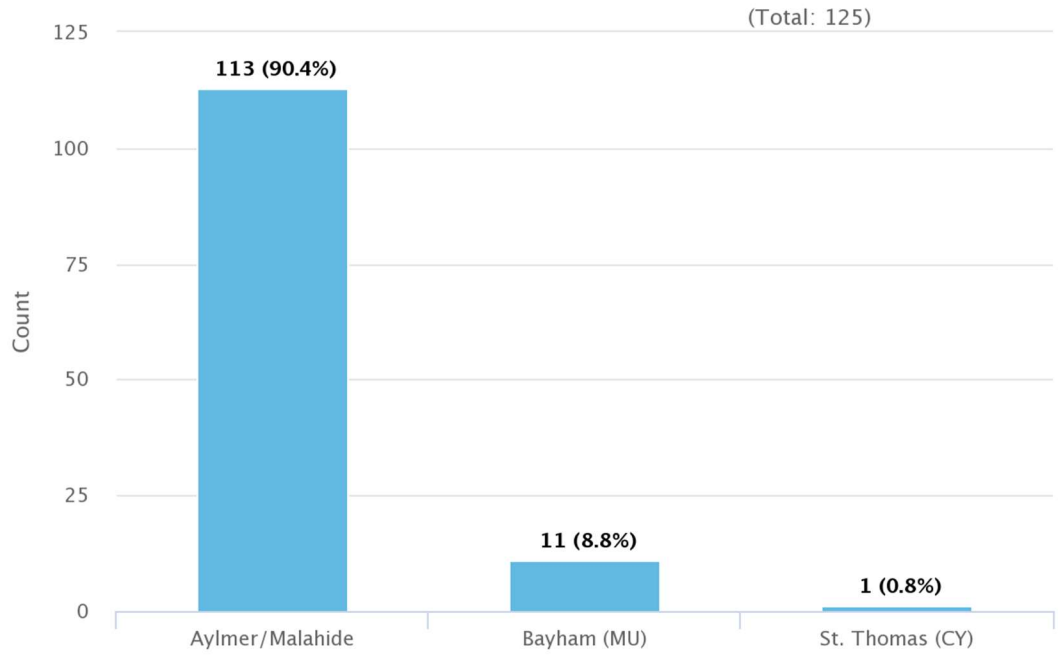


Figure 42 - Port Burwell C8 2019-21 Calls

RODNEY

Located at the west end of Elgin, the Rodney station is almost exclusively a West Elgin resource, with hot spots in Rodney, West Lorne, Dutton and Wardsville/Newbury in Middlesex County. Figures 44 and 45 show that 84% of their calls are in West Elgin and Dutton/Dunwich, and 95% of coverage standbys replacing the Dutton station while it is otherwise occupied (usually in St. Thomas).

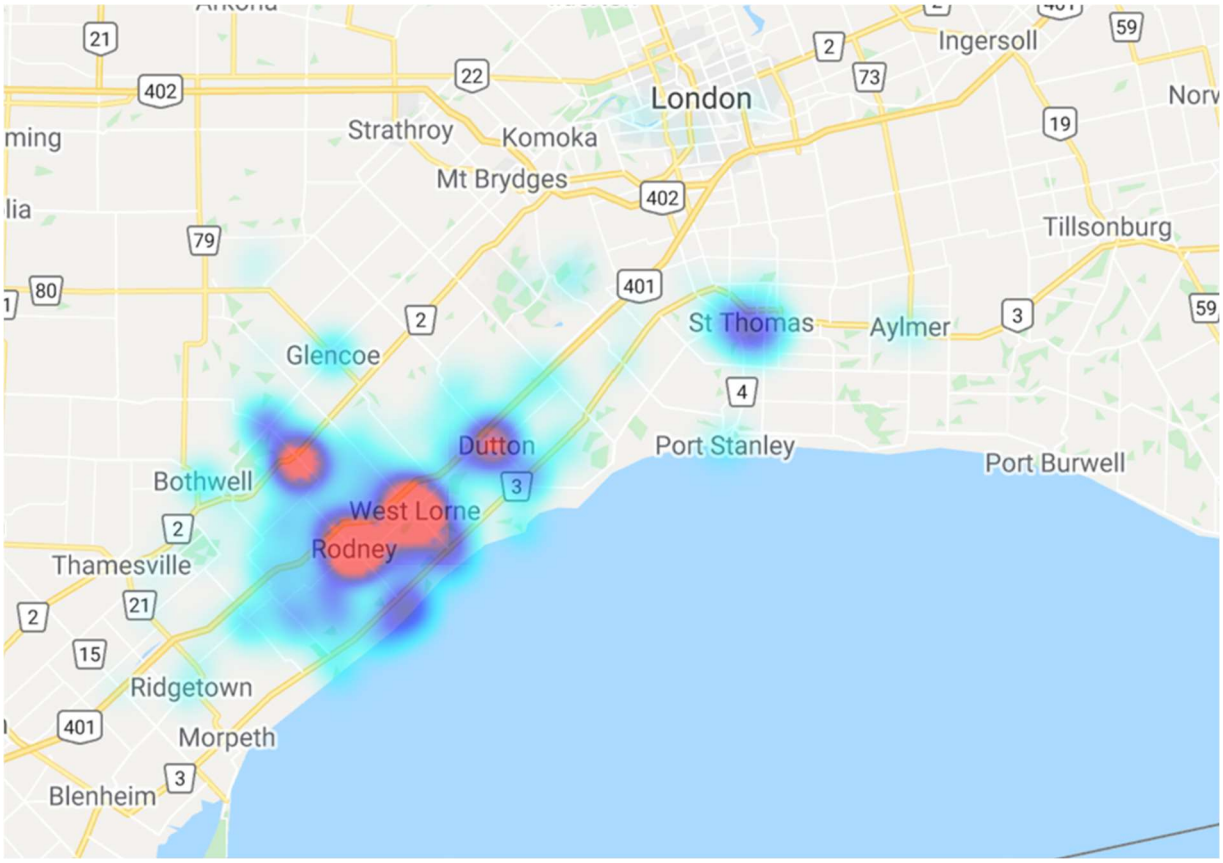


Figure 43 - Rodney C3-4 2019-21 Heatmap

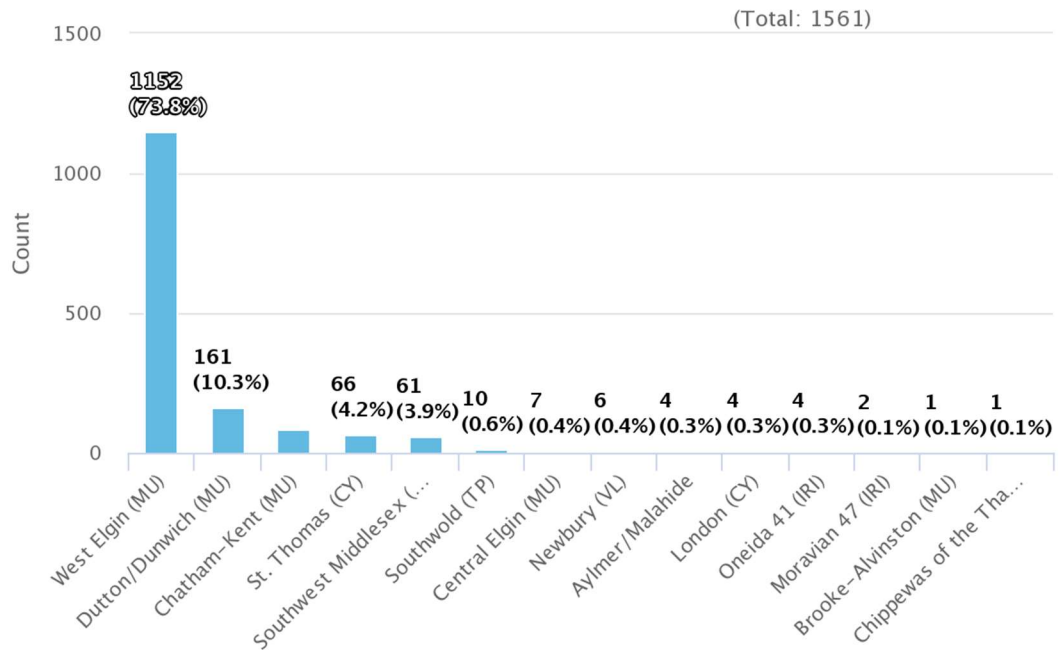


Figure 44 - Rodney C1-4 2019-21 Calls

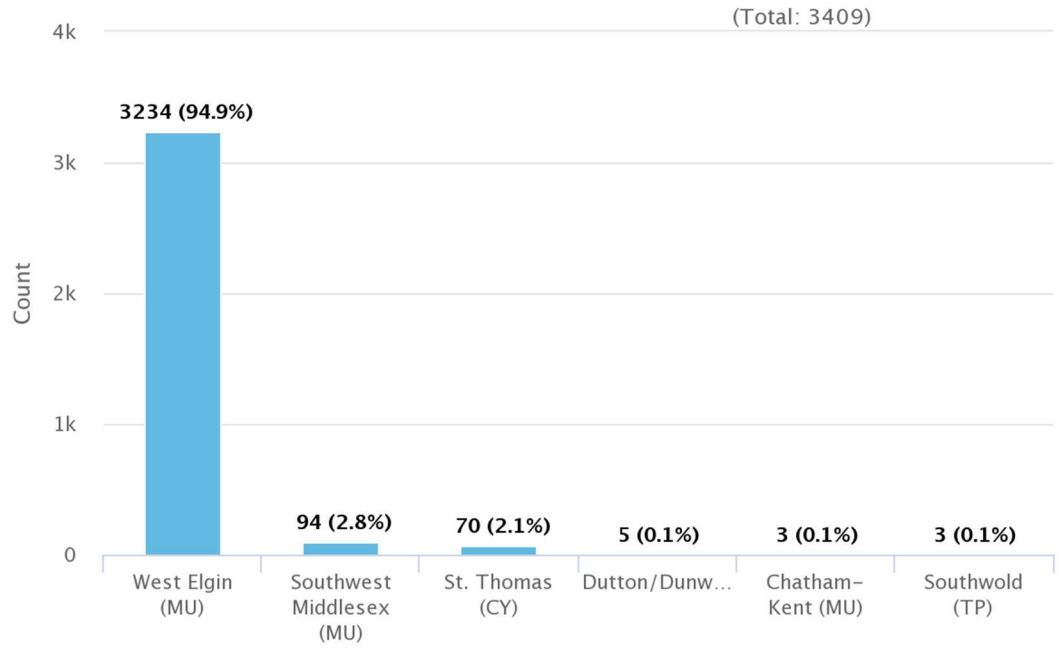


Figure 45 - Rodney C8 2019-21 Calls

ST. THOMAS EDWARD STREET

As expected, the Edward Street headquarters station services primarily St. Thomas with a secondary hotspot in Aylmer and an evolving warm spot in Port Stanley. 80% of patient calls are in St. Thomas, with 8.7% in Central Elgin and 6% in Aylmer/Malahide, while 71% of coverage standbys take place in Aylmer/Malahide. This is an undesirable situation in that coverage from the County's largest population centre is being drawn out to provide coverage in Aylmer. Fortunately, for half of the day, two ambulances staff this station.

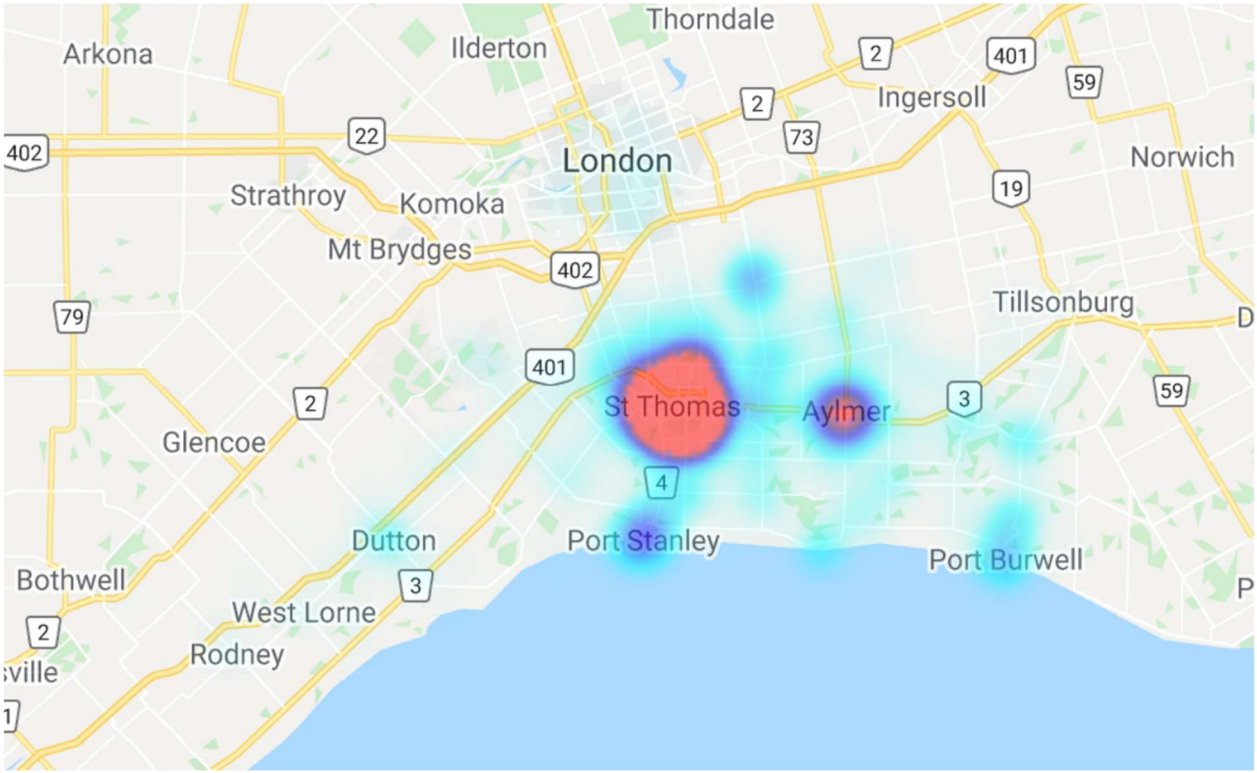


Figure 46 - St. Thomas Edward C3-4 2019-21 Heatmap

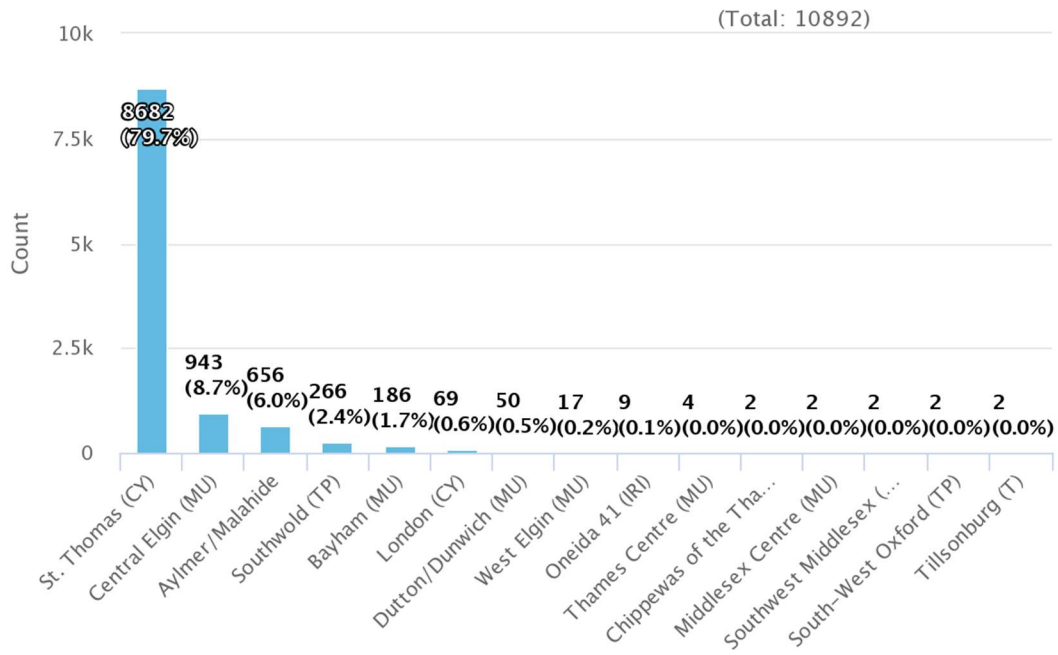


Figure 47 - St. Thomas Edward C1-4 2019-21 Calls

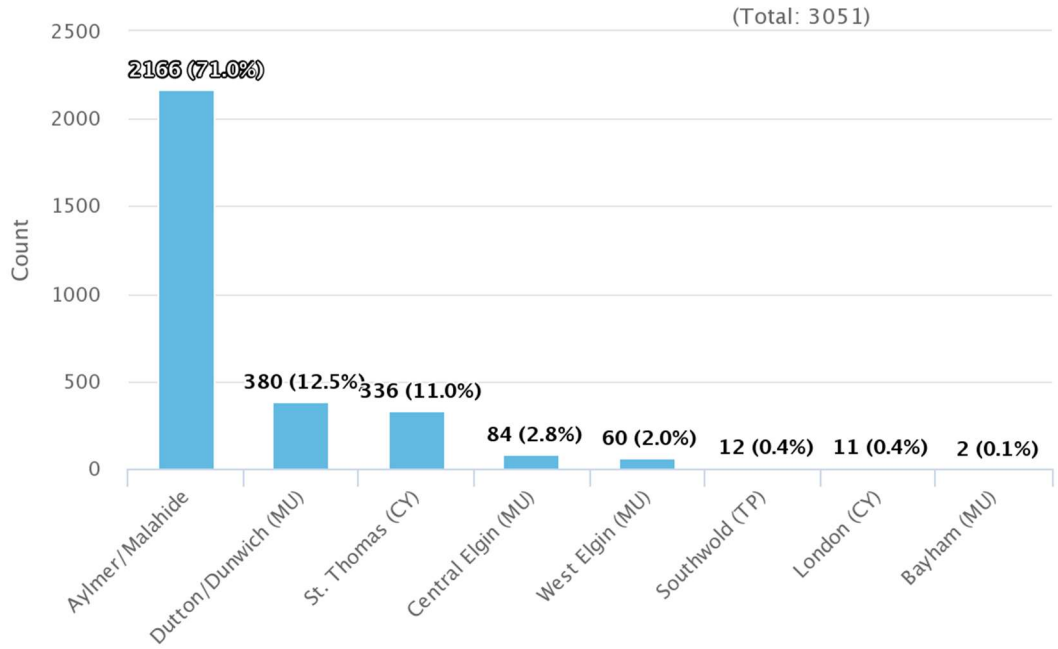


Figure 48 - St. Thomas Edward C8 2019-21 Calls

ST. THOMAS SHAW VALLEY

Shaw Valley has a similar heat map to Edward Street, but with greater intensity in Port Stanley, and lesser in Aylmer, due to more easterly location in the city. 75% of patient calls are in St. Thomas and 14% in Central Elgin, with 55% of coverage standbys in Aylmer/Malahide and 29% in Dutton/Dunwich. Again, this is rather undesirable in that coverage from the County's largest population centre is being drawn out to provide coverage in Aylmer and less so, Dutton. Similarly, growing call volume in Port Stanley is also drawing resources out of St. Thomas. Fortunately, for half of the day, two ambulances staff this station. Both city stations would benefit from an additional resource to lessen the ripple effect that calls outside the city have on St. Thomas coverage.

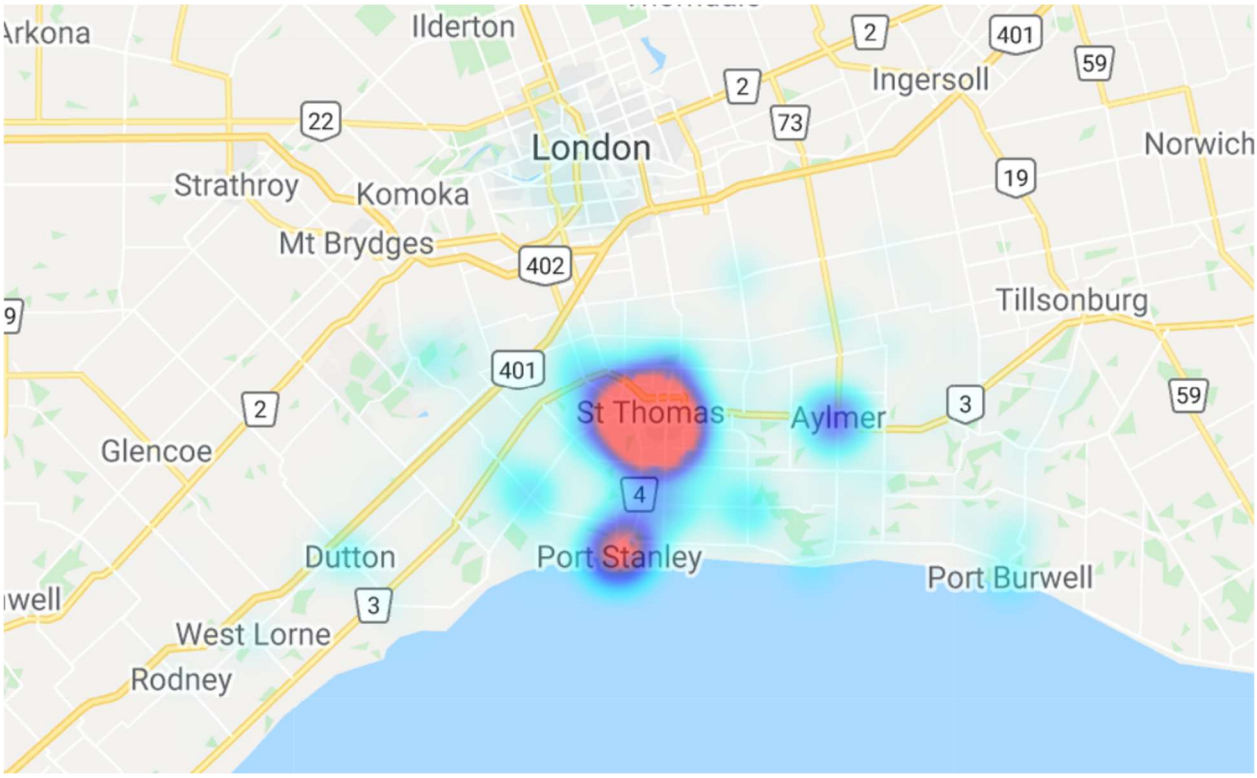


Figure 49 - St. Thomas Shaw Valley C3-4 2019-21 Heatmap

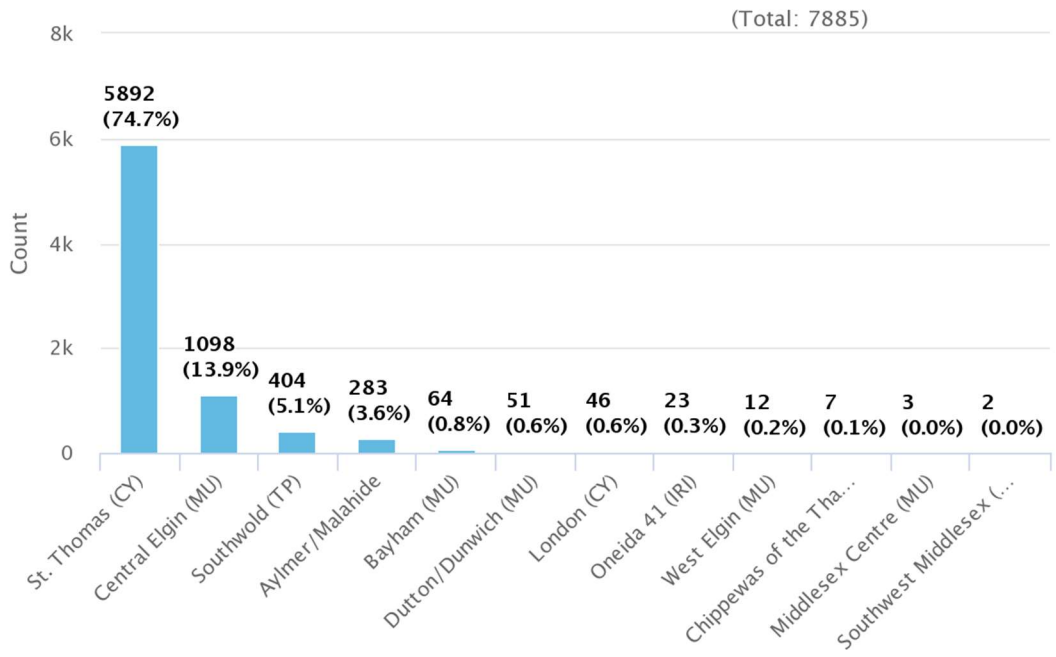


Figure 50 - St. Thomas Shaw Valley C1-4 2019-21 Calls

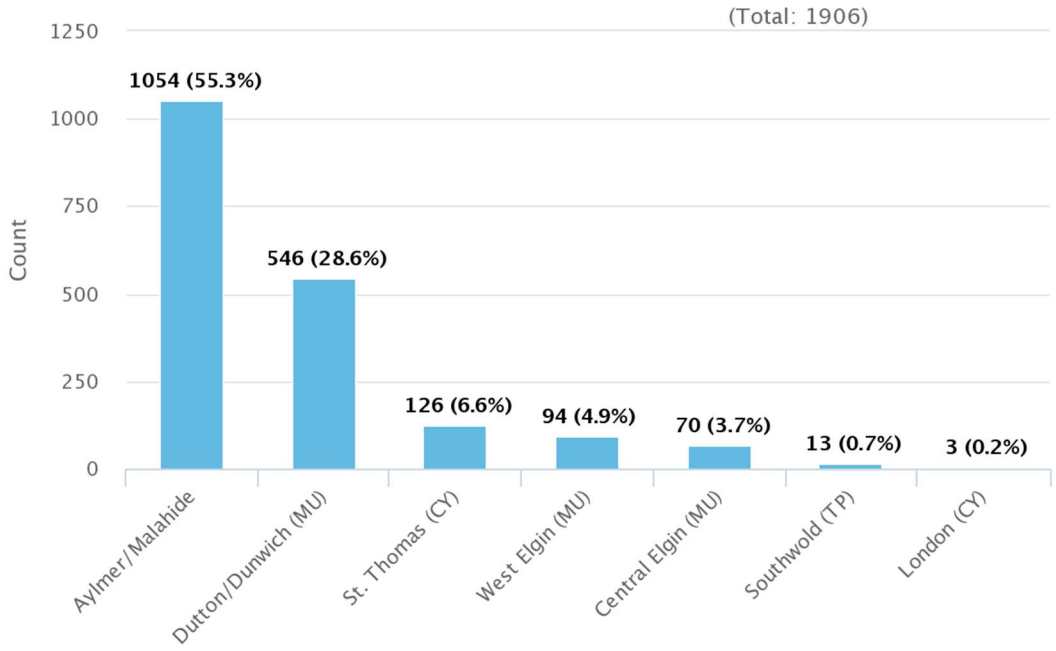


Figure 51 - St. Thomas Shaw Valley C8 2019-21 C8 Calls

8.3 Perth

Paramedic services are provided in Oxford through 24-hour stations in Listowel, Milverton, Mitchell, St. Marys and Stratford. Deployment of vehicles by hour of day are shown below:

PERTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Listowel																								
Milverton																								
Milverton																								
Mitchell																								
St. Marys																								
Stratford																								
Stratford																								
Stratford																								
Hourly Vehicle Count	7	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	7/8	7	7	7	7

* Milverton 1100-2000 Th-S

8.3.1 By County/Urban/Non-Urban

Perth County heatmapping shows the expected "hot spots" encompassing Stratford, St. Marys, Listowel and Mitchell and a "warm spot" over Milverton. Typically, hot spots should be accompanied by ambulance stations due to their high propensity to produce calls, unless a geographic need prevails. With regards to Stratford proper, call distribution is spread across the city with the expected hot spot at the hospital.

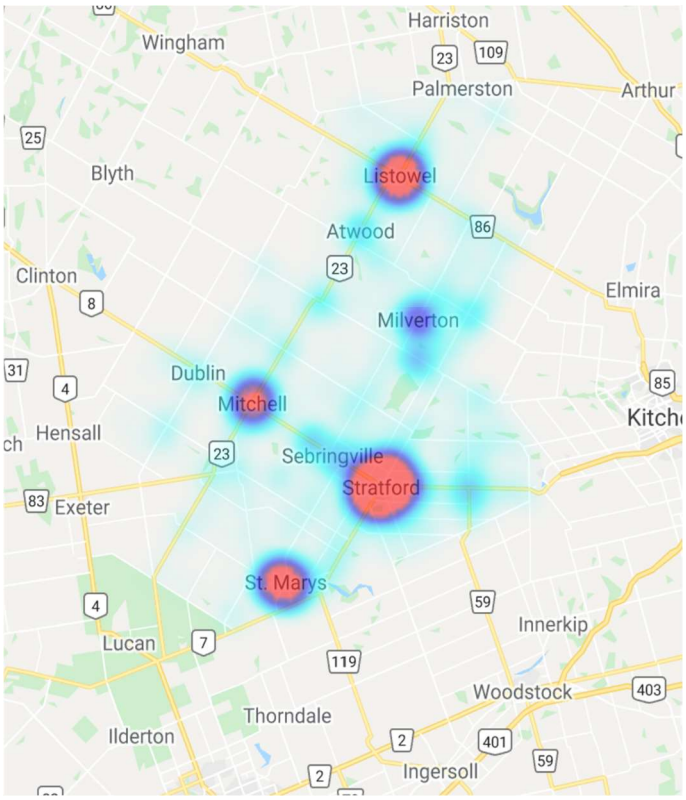


Figure 52 - Perth C3-4 2019-21 Hotspots

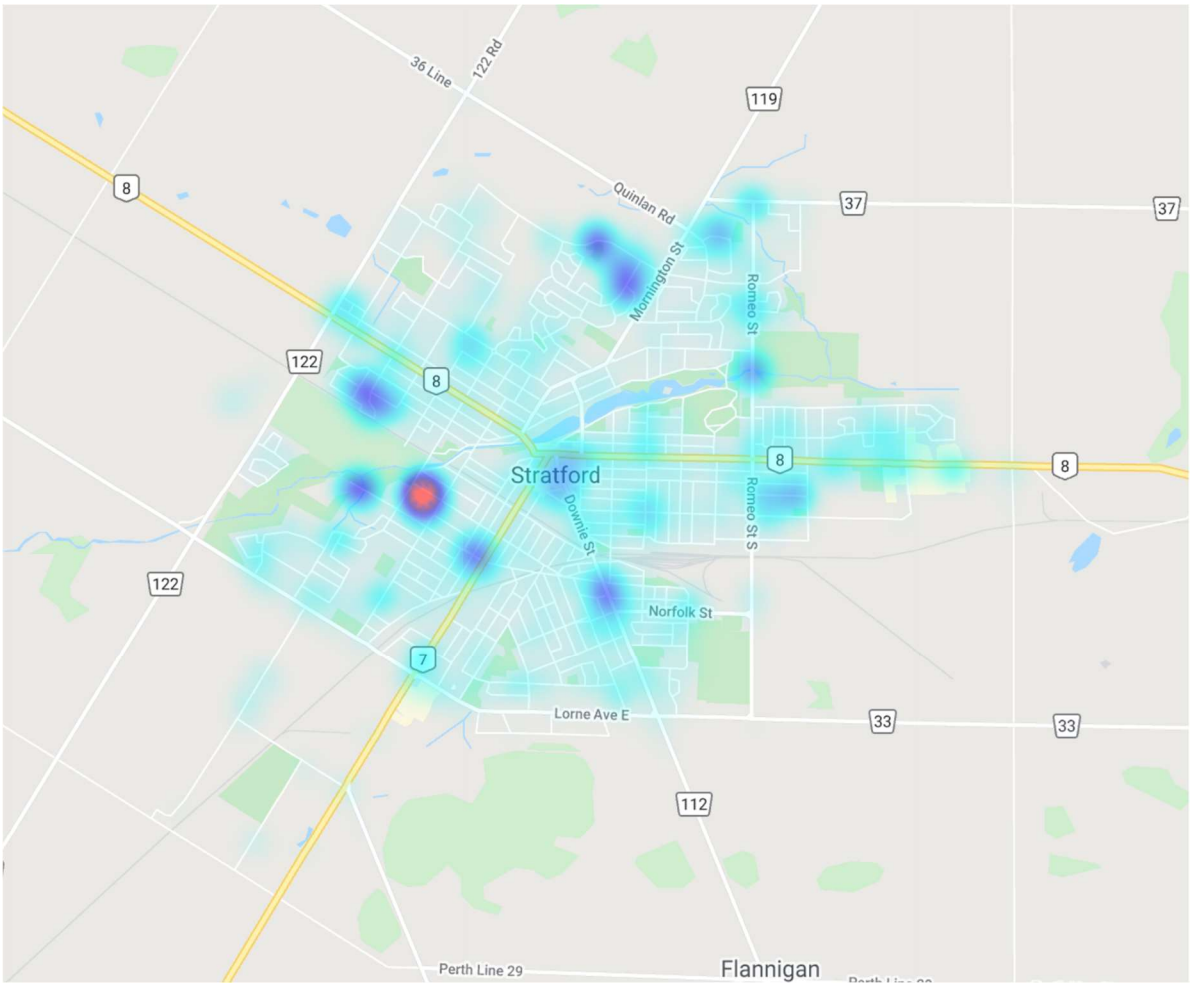


Figure 53 - Stratford C3-4 2019-21 Hotspots

8.3.2 Inside/Outside County

Figure 54 shows areas outside of Perth that receive significant service by Perth paramedics. Hot spots can be expected in cities with tertiary health centres, where Perth ambulances transfer patients and are then often tagged for local calls. Interestingly, this is only marginally evidenced in London, and Kitchener. The most significant out-of-county hot spot is the Tavistock area in Oxford County. This area will be the focus of a "deep dive" in section 9.3. Other less dramatic examples of Perth supporting neighbouring communities are along the northern boundary of Oxford, and the western boundary of Waterloo Region.

Figure 55 shows where help from outside Perth is received from neighbouring paramedic services. Interestingly, only Stratford and Listowel benefit from significant out-of-county resources. Figure 56 shows that low travel times are encountered on these calls, likely because these communities have hospitals and the resources being used are those that are already in town after dropping off patients. This is a very appropriate use of cross-border resources.

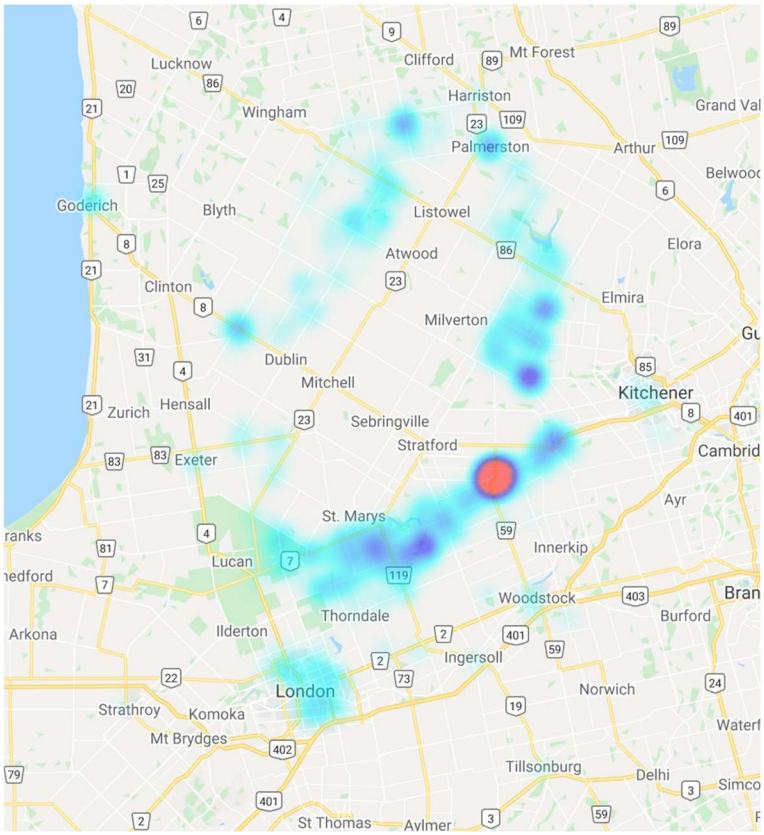


Figure 54 - Perth C1-4 2019-21 Out of County

Figure 55 - C3-4 2019-21 by others in Perth

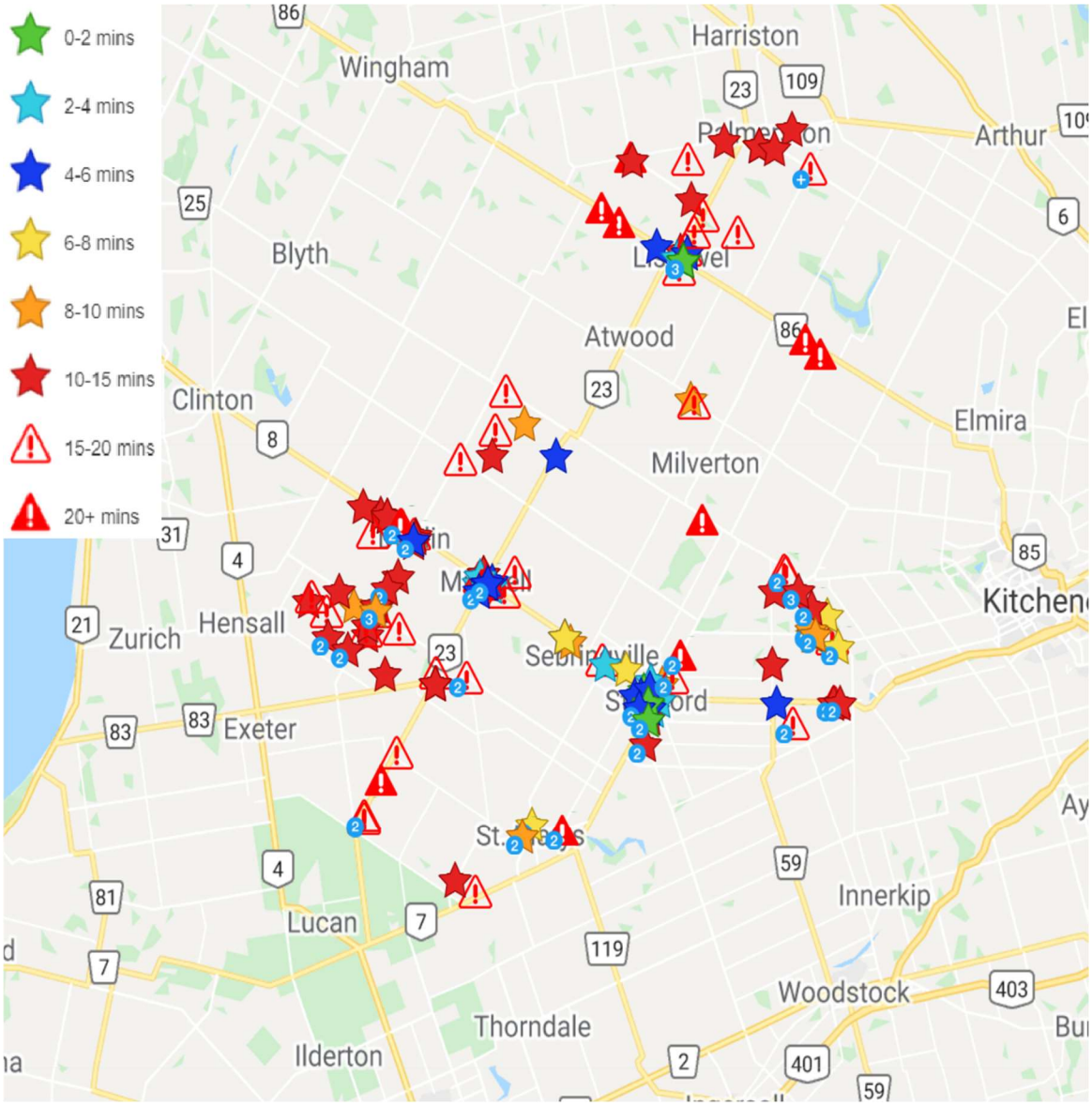


Figure 56 - C3-4 2019-21 by others in Perth

8.3.3 County-wide Standby Locations

Paramedic deployment plans are designed to collapse towards the most highly populated centres as call volumes impact the ability to fully cover all stations. In the case of Perth, the lack of a major hot spot in Stratford (Figure 57) would indicate that sufficient resources exist to cover each station (and the high priority standby location at Monkton) as needed without a significant ripple effect impacting overall coverage. No hot spot is shown at Sebringville, the preferred location for the last remaining vehicle during Critical Unit Availability. As such, and as documented by the Code Zero analytics, it would appear this posting is an infrequent occurrence.

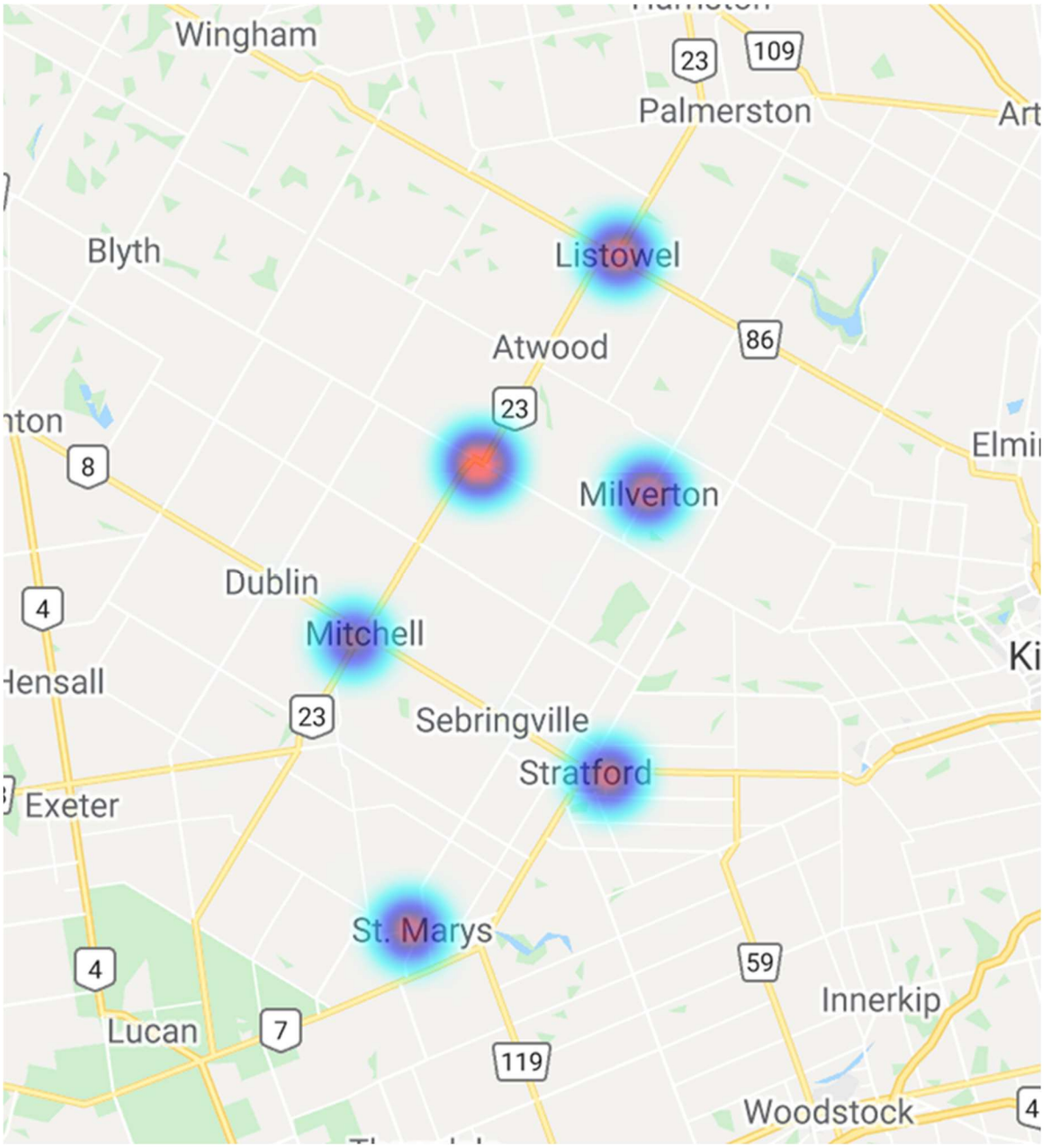


Figure 57 - Perth Stations C8 2019-21 Heatmap

8.3.4 Call Charting by Station of Origin

This section is broken down by each station, beginning with a heat map of Code 3-4 (urgent and emergent) calls originating from the station, followed by a tabular breakdown of calls by local municipality serviced, and a similar tabular breakdown of Code-8 coverage standbys by municipality.

LISTOWEL

The only hot spot encompasses Listowel, with 86% of patient calls occurring in North Perth. Similarly, coverage standbys are usually local incident standbys (52%), with additional use for standbys in Stratford (20%) and St. Marys/Perth South (11%). These standbys result in occasional patient calls as identified by the warm spots in Figure 58.

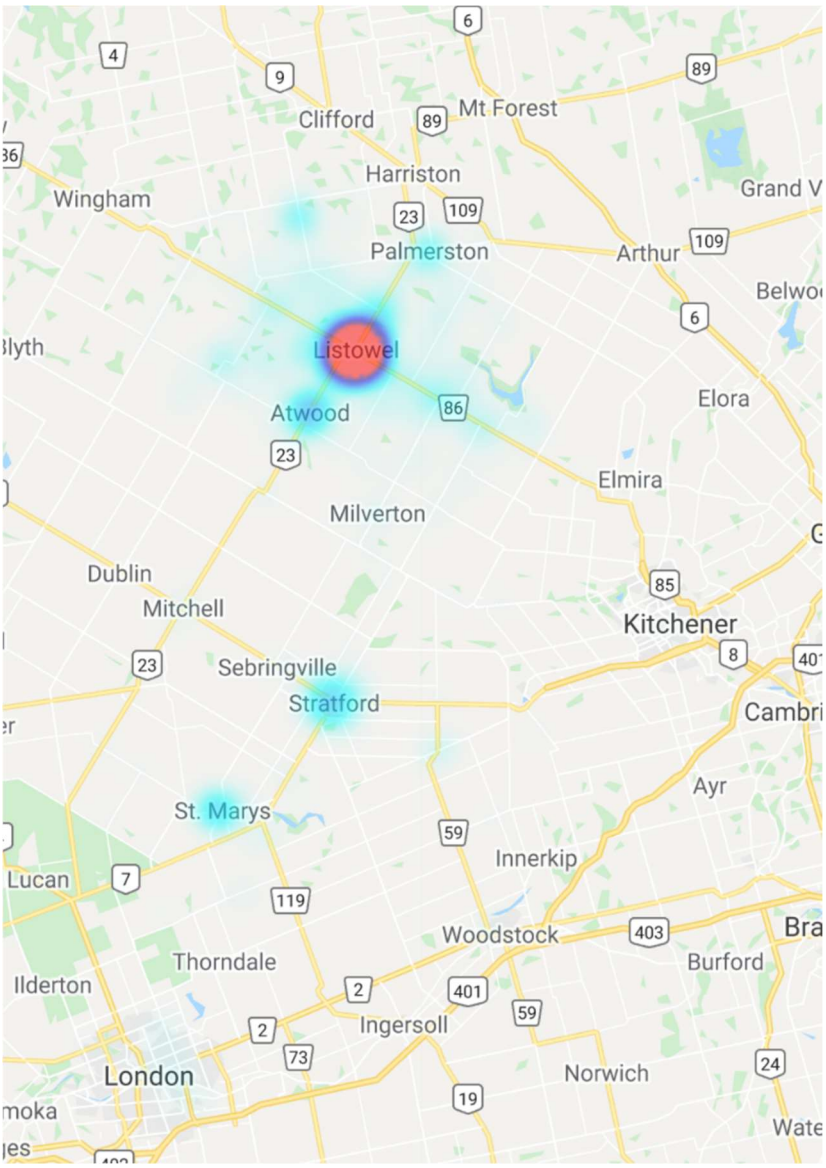


Figure 58 - Listowel C3-4 2019-21 Heatmap

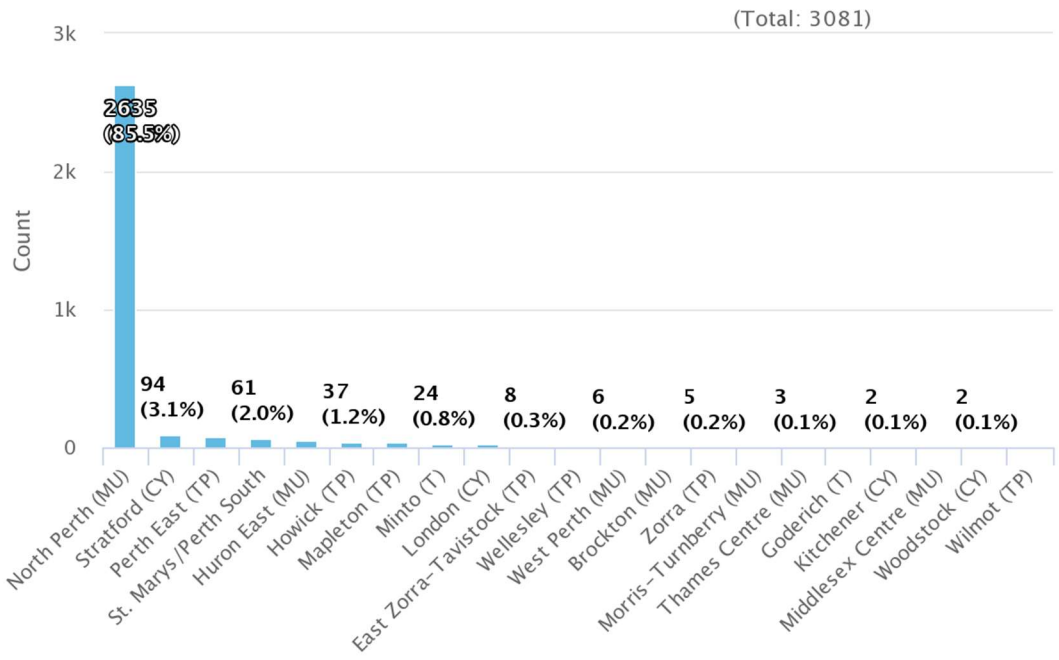


Figure 59 - Listowel C1-4 2019-21 Calls

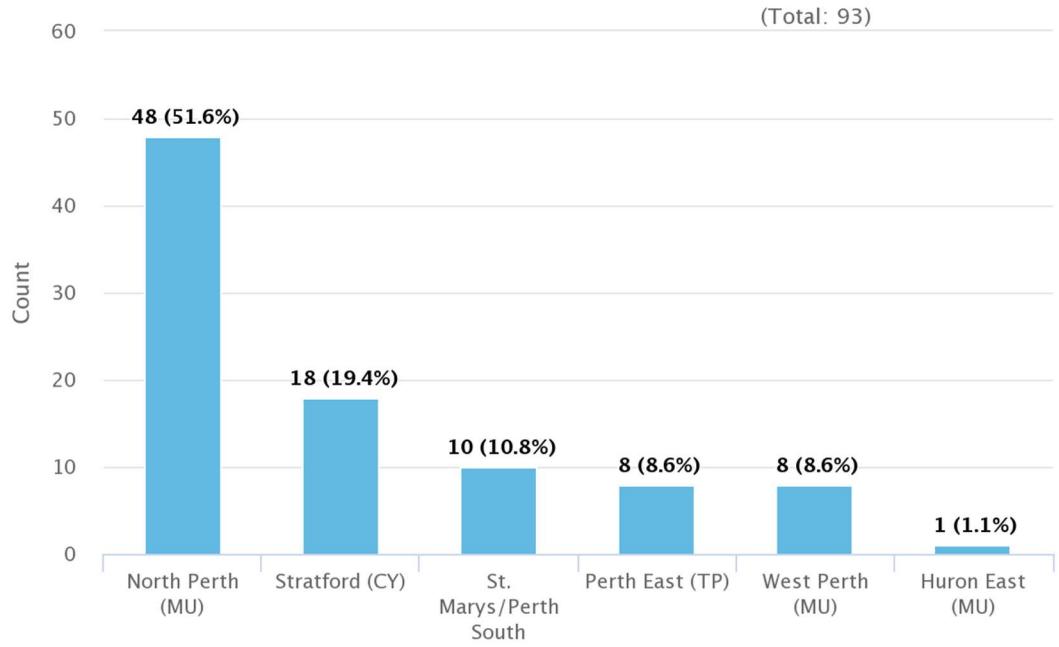


Figure 60 - Listowel C8 2019-21 Calls

MILVERTON

The Milverton station houses a second vehicle 8 (or 9) hours a day, not because of demand, but rather available space. This vehicle moves east to Monkton for coverage immediately after sign-on, but can be moved wherever needed in the County. As shown in Figure 61, in addition to its home hotspot, it has significant call demand in Listowel, Stratford and Mitchell. 40% of patient calls are in Perth East with 15% in North Perth and 8% in Stratford. These calls are often generated through the significant standbys undertaken by this station: North Perth (74%) and Stratford (14%), rather than calls dispatched directly from Milverton.

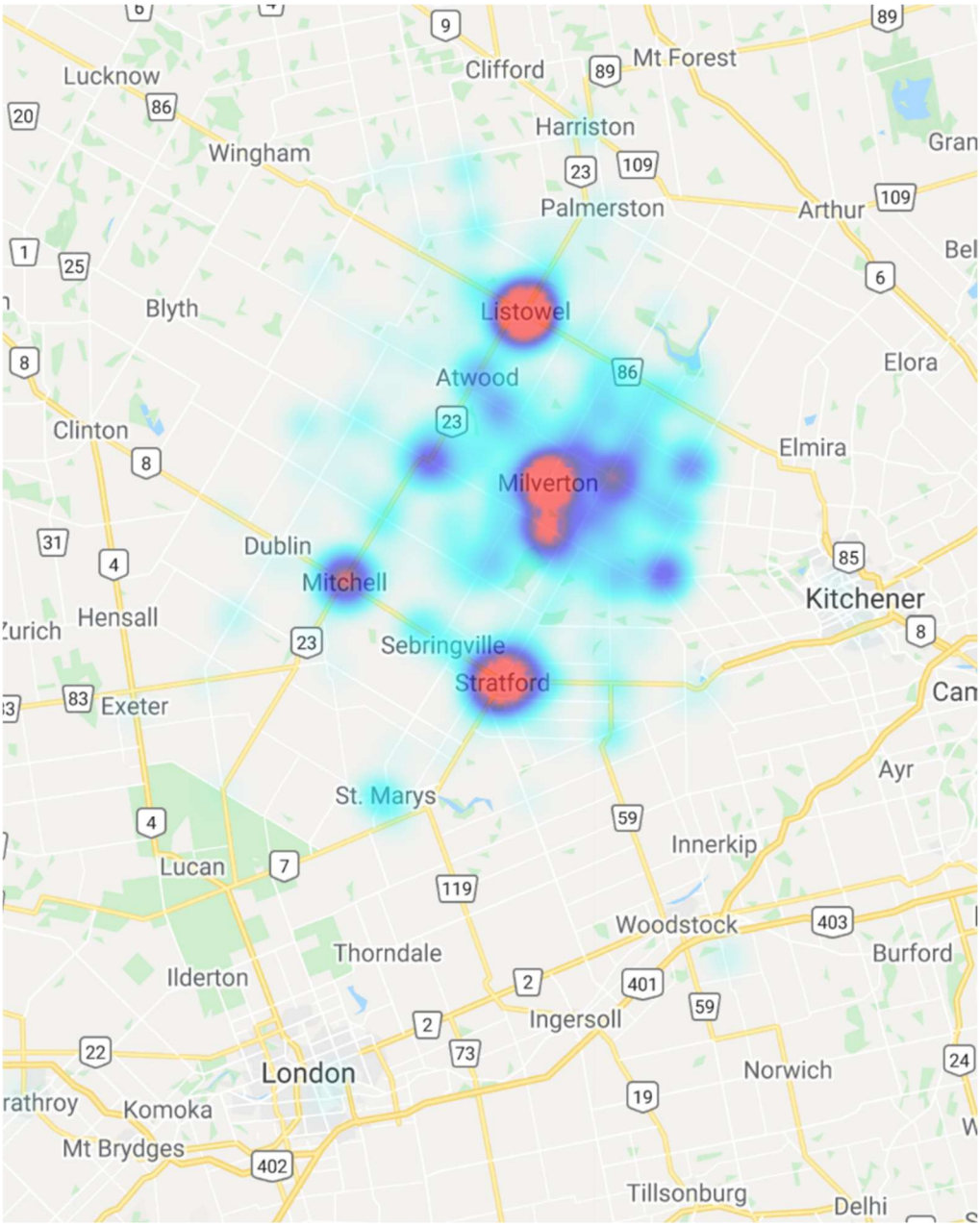


Figure 61 Milverton C3-4 2019-21 Heatmap

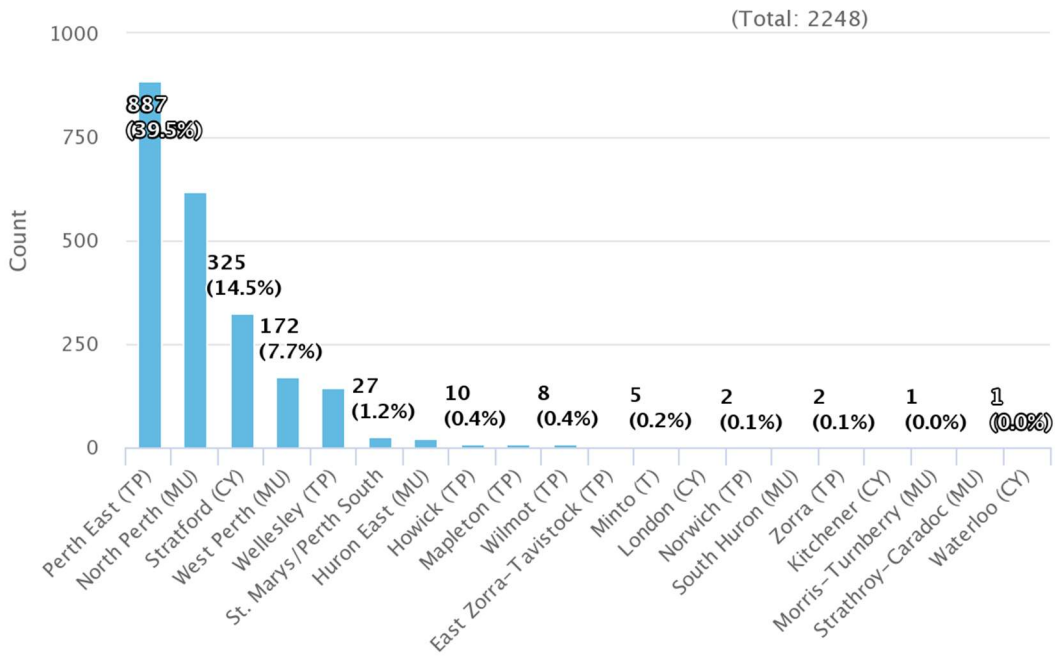


Figure 62- Milverton C1-4 2019-21 Calls

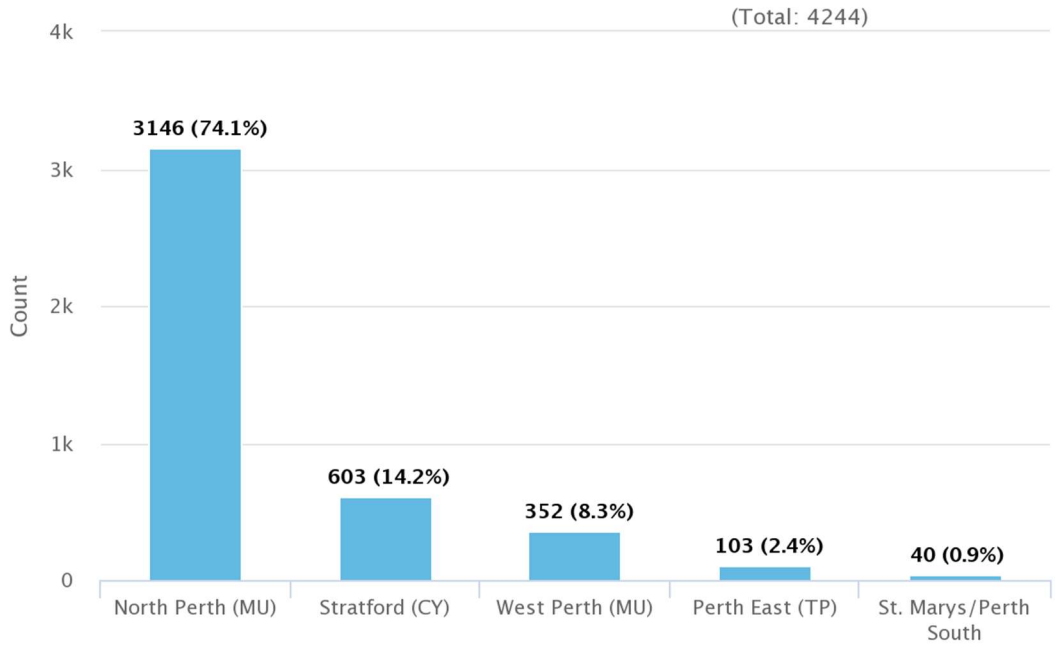


Figure 63 - Milverton C8 2019-21 Calls

MITCHELL

The Mitchell resource travels along Highway 8 between hot spots in Mitchell and Stratford with an evolving warm spot in Sebringville. As shown in Figures 65 and 66, patient calls in West Perth make up 73% of workload, and Stratford 14%. From a coverage standby point of view, the Mitchell location allows movements to multiple locations with standbys for North Perth (53%), Stratford (26%) and St. Marys/Perth South (17%)

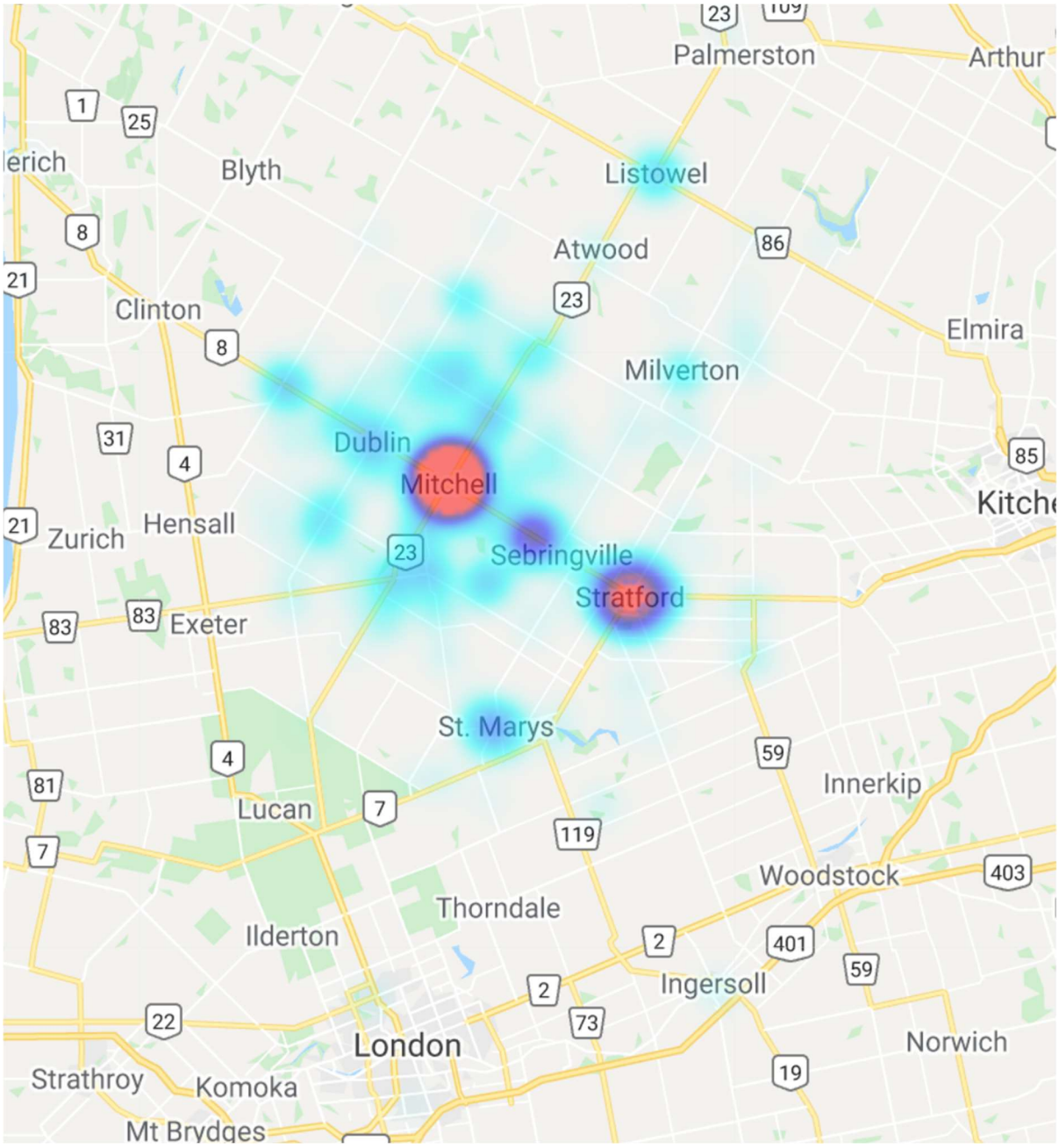


Figure 64 - Mitchell C3-4 2019-21 Heatmap

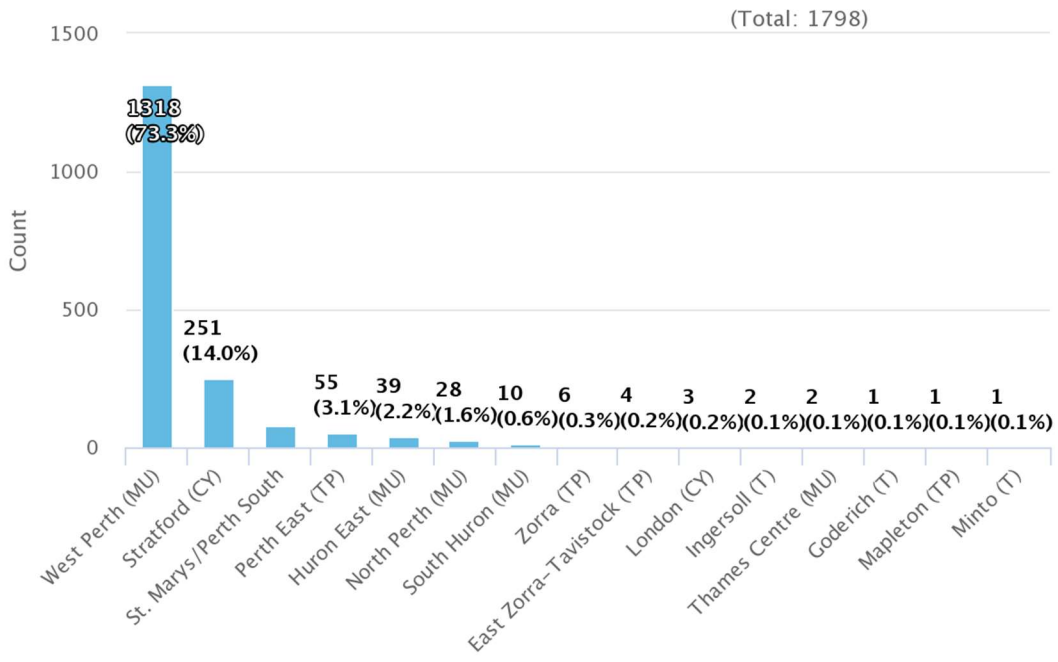


Figure 65 - Mitchell C1-4 2019-21 Calls

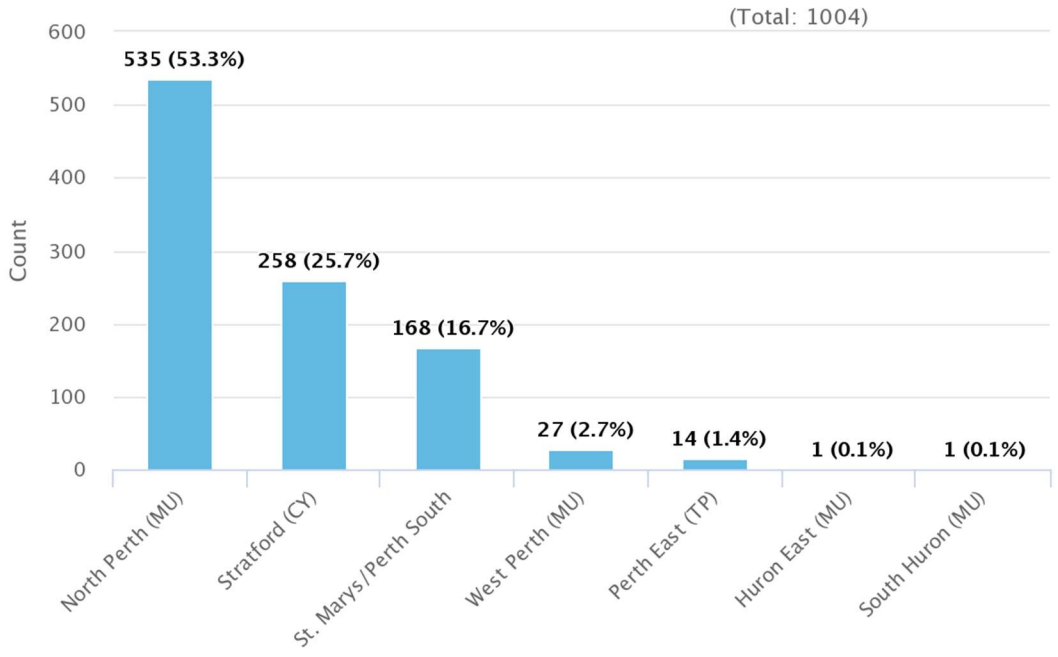


Figure 66 - Mitchell C8 2019-21 Calls

ST. MARYS

Essentially an exclusive St. Marys station, Figure 67 shows only a single hotspot encompassing its home community. 76% of patient calls are in St. Marys/Perth South and 11% in Stratford, with 59% of coverage standbys there as well.

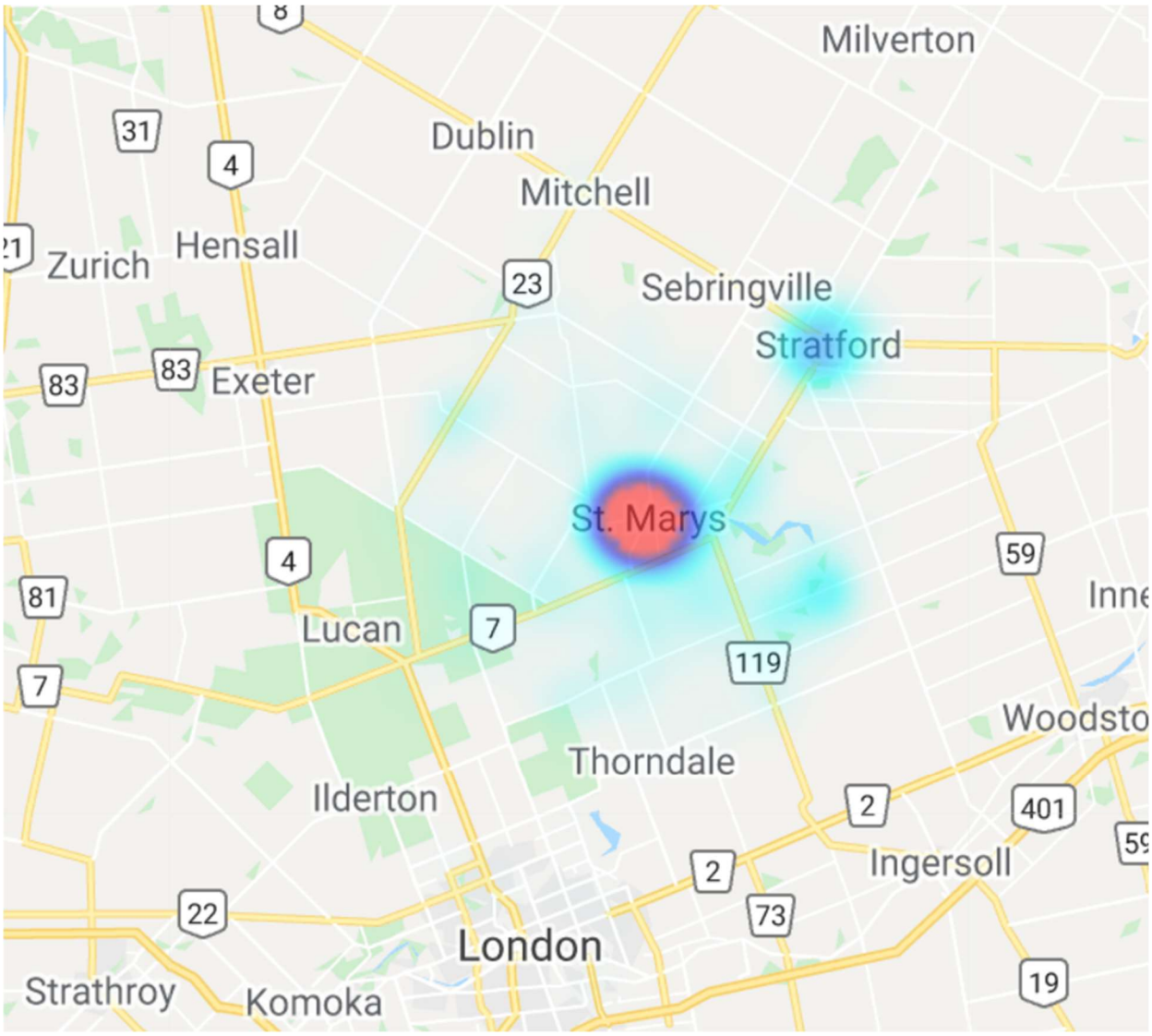


Figure 67 - St. Marys C3-4 2019-21 Heatmap

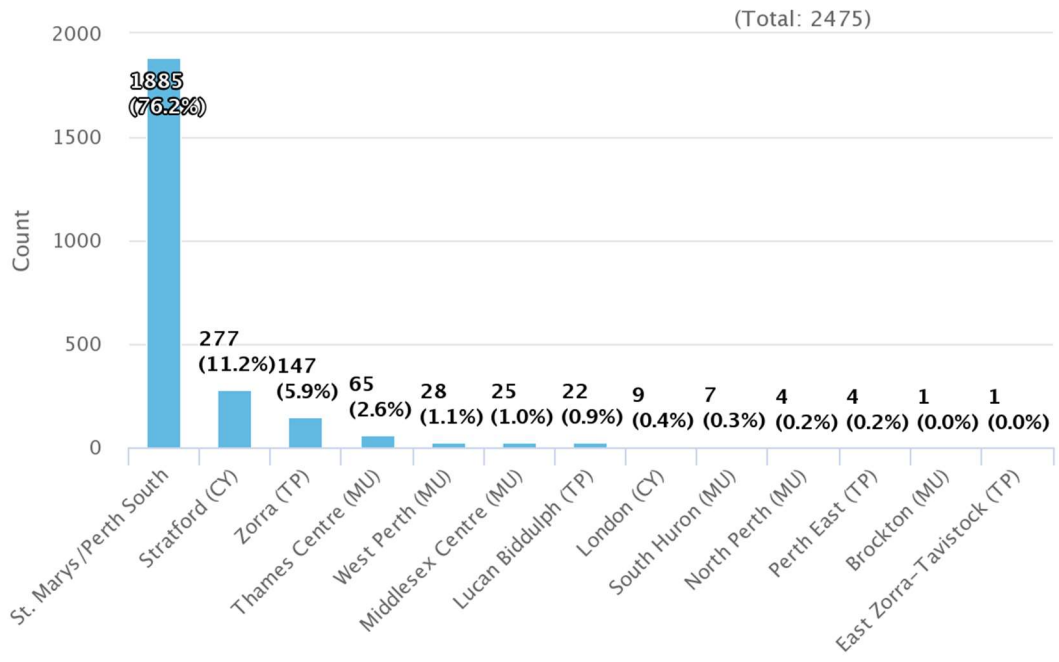


Figure 68 - St. Marys C1-4 2019-21 Calls

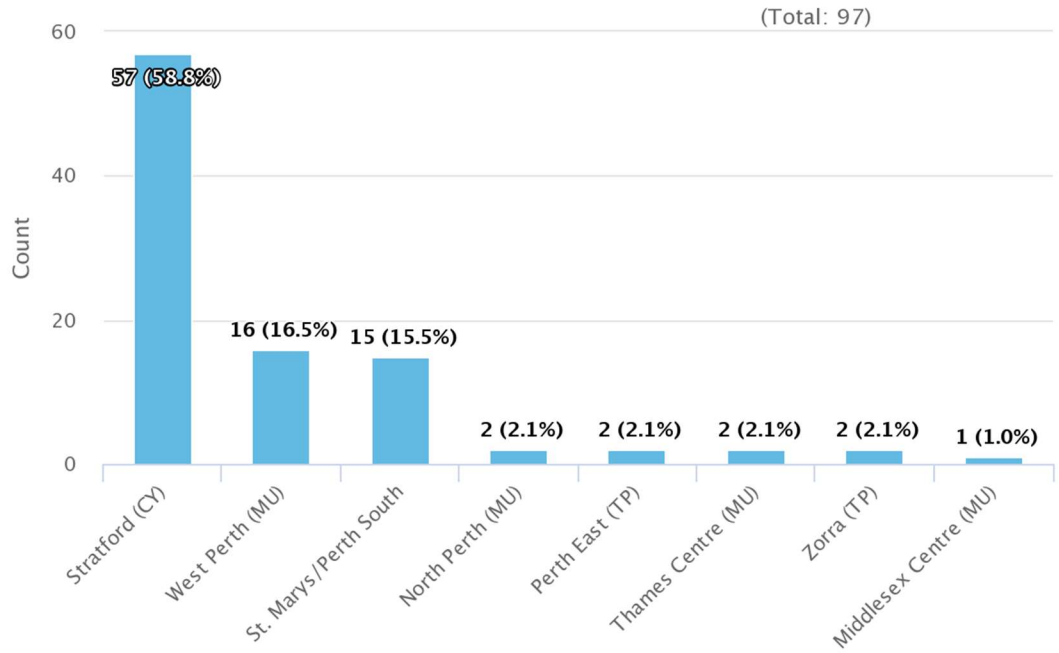


Figure 69 - St. Marys C8 2019-21 Calls

STRATFORD

Staffed by three vehicles around-the-clock, the Stratford station has a significant hot spot encompassing the city, as well as an evolving warm spot in St. Marys. 76% of the station's calls are in Stratford itself. The Tavistock area, which straddles the Perth/Oxford border, is another interesting hot spot with 5% of the Stratford station's patient calls. As noted earlier, this area will be fully addressed in the deep dive at section 9.3. With multiple resources around the clock, it is expected that the station will provide coverage standbys as needed across the County. Figure 72 shows 32% of standbys in Perth East, 28% in St. Marys/Perth South, 18% in West Perth and 10% in North Perth, with 13% as Stratford incident standbys as well.

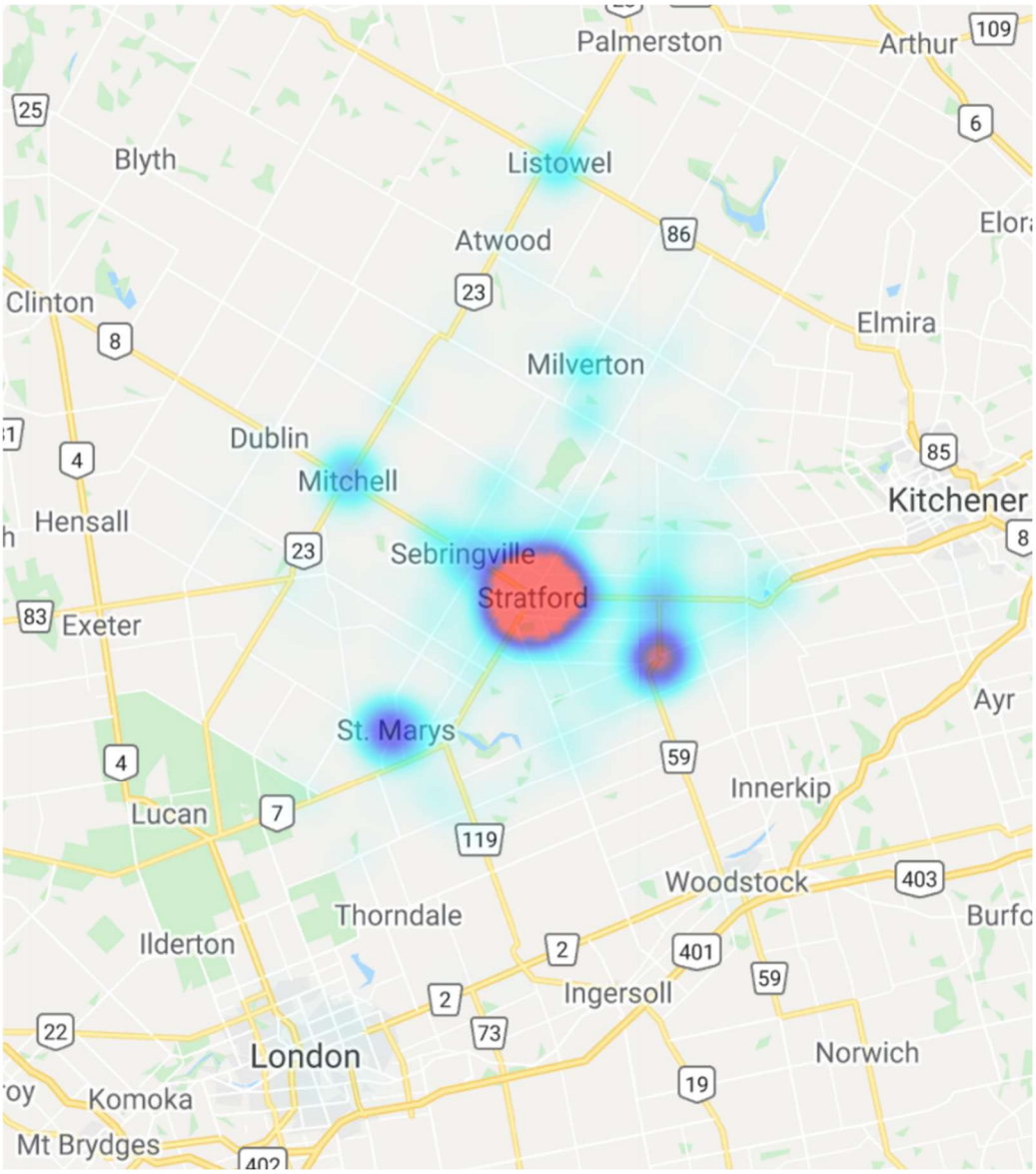


Figure 70 - Stratford C3-4 2019-21 Heatmap

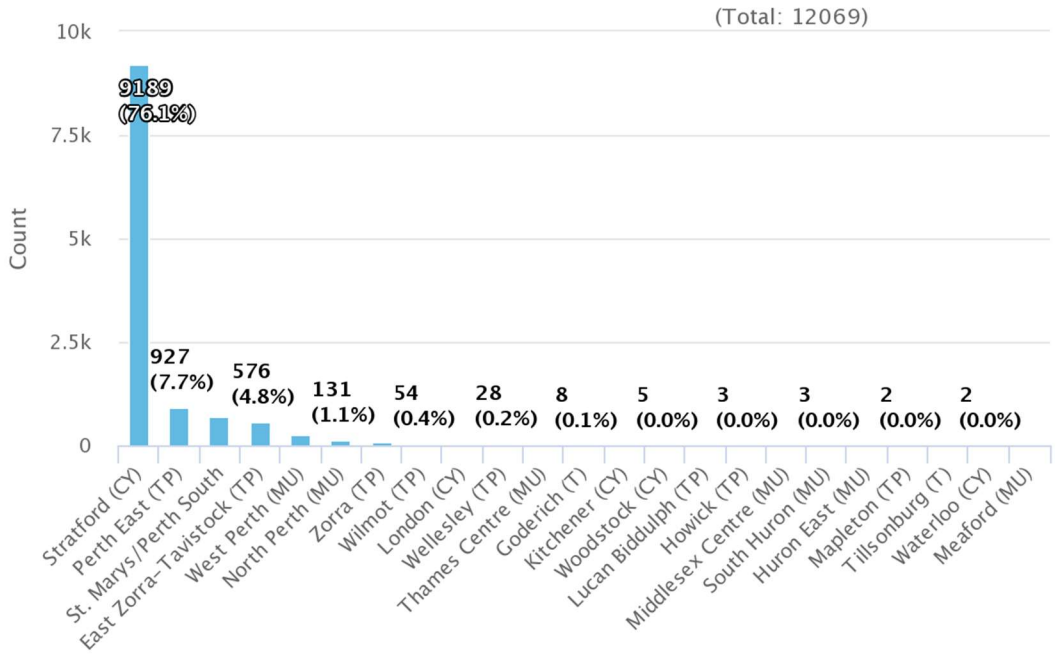


Figure 71 - Stratford C1-4 2019-21 Calls

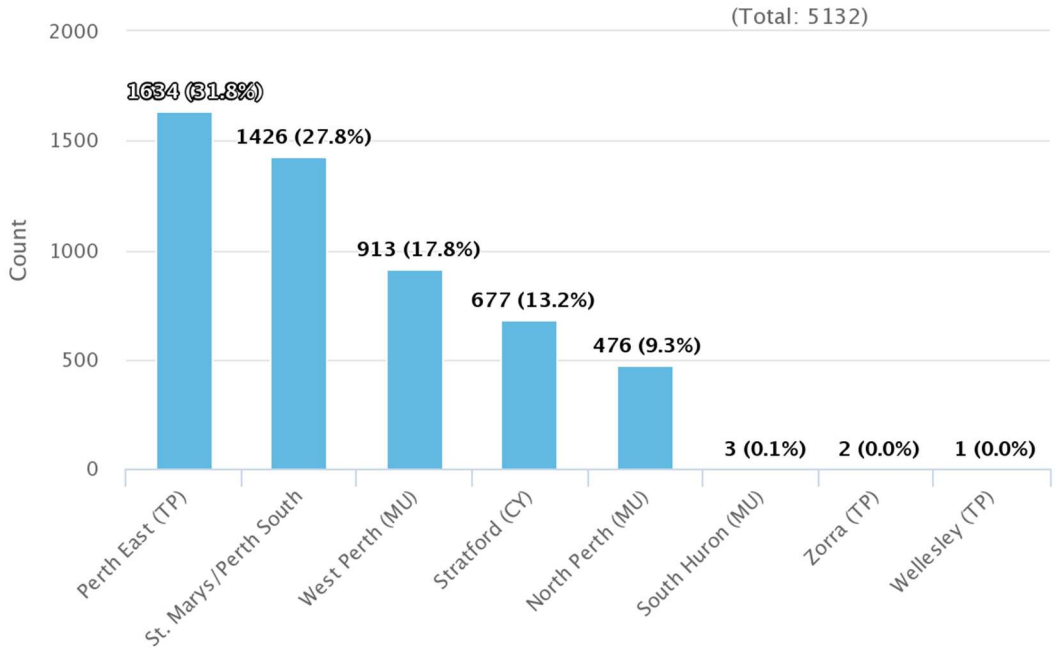


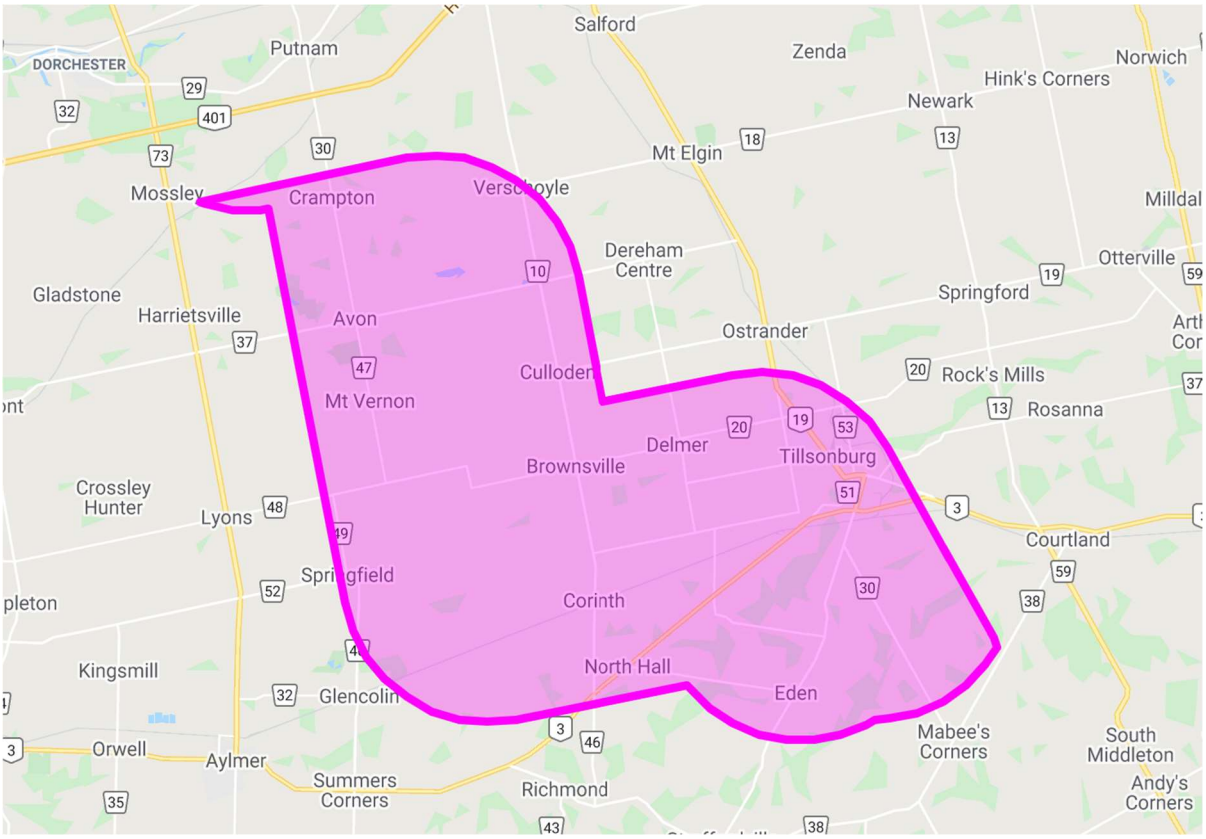
Figure 72 - Stratford C8 2019-21 Calls

9.0 Borderless Service Delivery Investigation

In an effort to investigate potential borderless service sharing opportunities, Performance Concepts and Transnomis, our spatial modelling partners, mapped calls along the borders between Oxford and both Elgin and Perth. In both cases, a 5-kilometer buffer was established on both sides of the border, and only calls within the buffer area were mapped and evaluated. The objective was to determine whether any benefit existed to formally sharing resources in these zones.

Two existing areas of interest were ultimately identified in Tavistock/Shakespeare and the Tillsonburg to Port Burwell corridor, and "deep dives" performed to identify options to optimize coverage in these areas.

9.1 Oxford-Elgin Border Area



Urgent and Emergent (Code 3-4) calls were examined throughout the buffer area which includes the entire community of Tillsonburg. As expected in such a case, a very significant proportion of the calls performed by Oxford were within Oxford (Figure 73). Due to proximity to the Tillsonburg station, regular support was provided to Elgin in northern Bayham, with travel times in the 10–15-minute range. Less frequent support was provided to the northeastern portion of Elgin (Springfield to Avon corridor),

with significantly longer travel times in the 15-20+ minute range. When calls performed by Elgin in the same buffer zone were examined (Figure 75), the same pattern existed: Calls were predominantly performed within Elgin, with similar 15-20+ minute response times in the northeast, and not surprisingly due to resource location, 20+ minute response times in northern Bayham. With the current distribution of resources between the two services, Tillsonburg can obviously service this area better, albeit not ideally from a response time point of view.

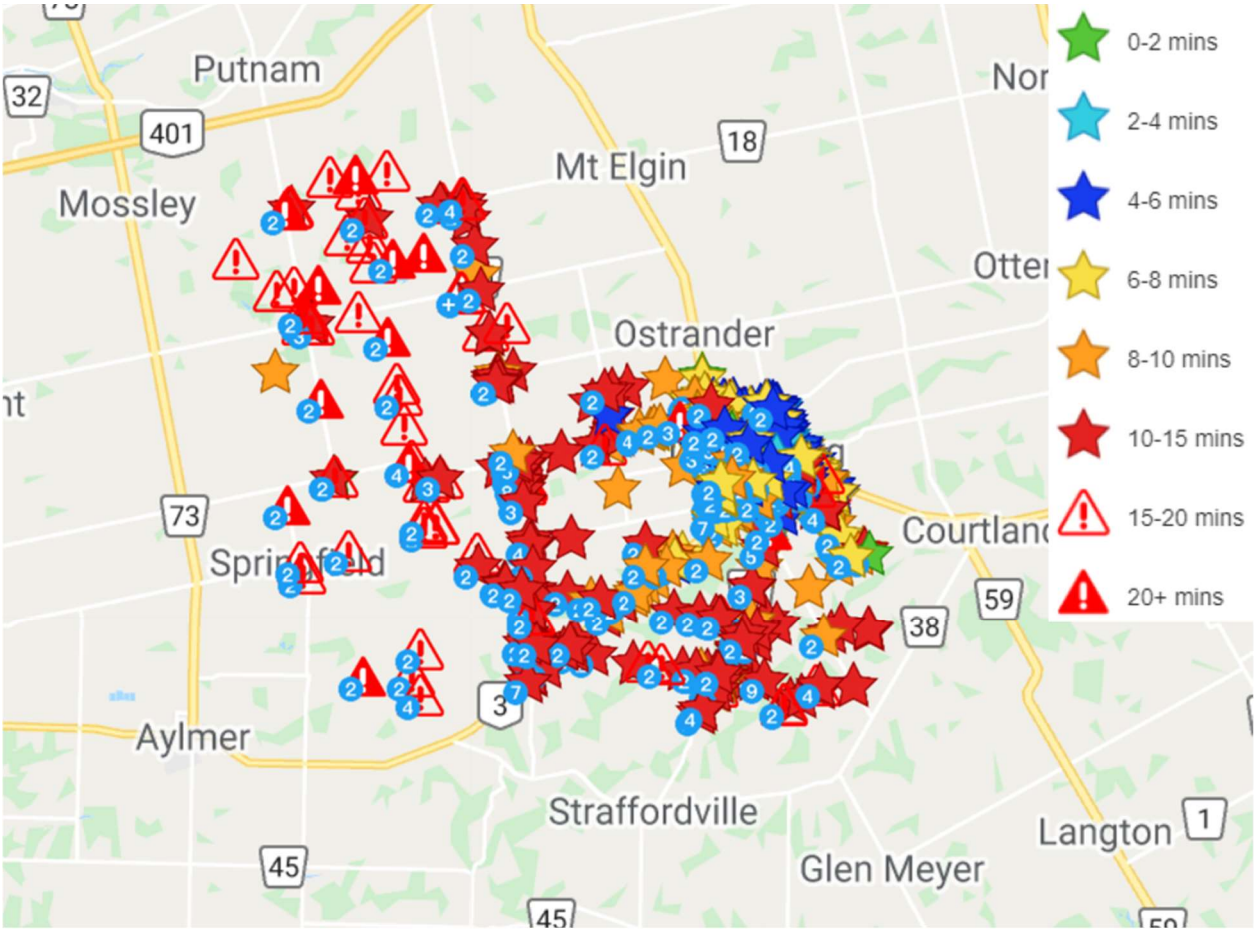


Figure 73- C3-4 Calls by Oxford in Oxford-Elgin Border Area

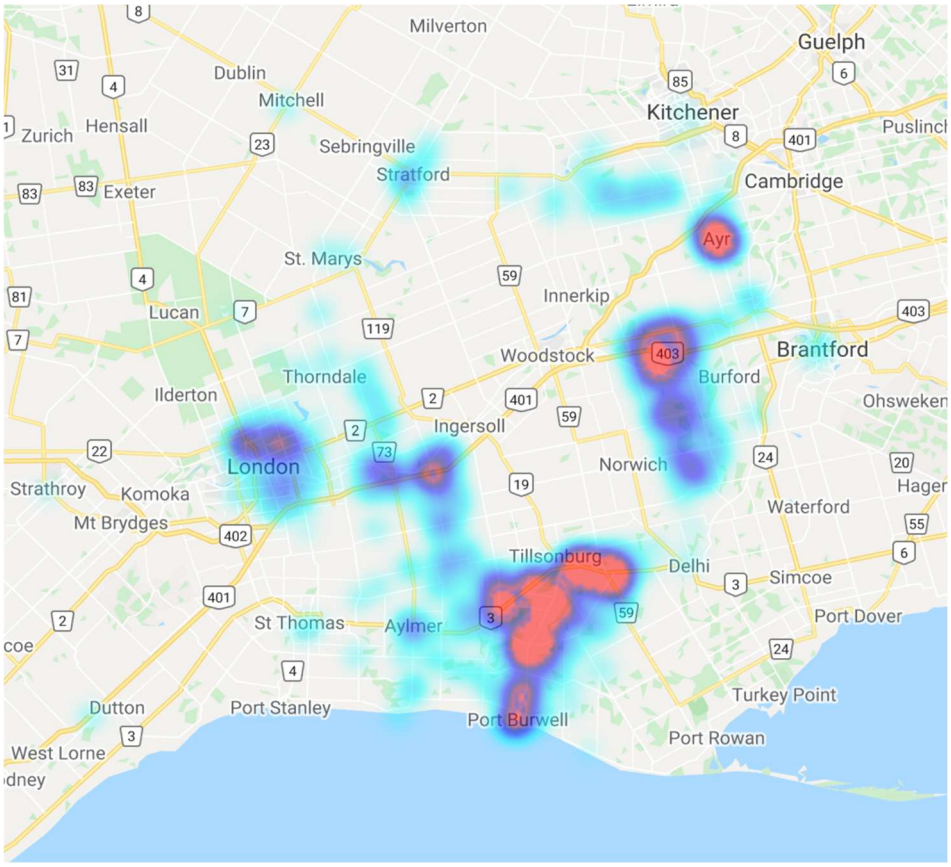


Figure 74 - C1-4 2019-21 Calls by Oxford out of Oxford County

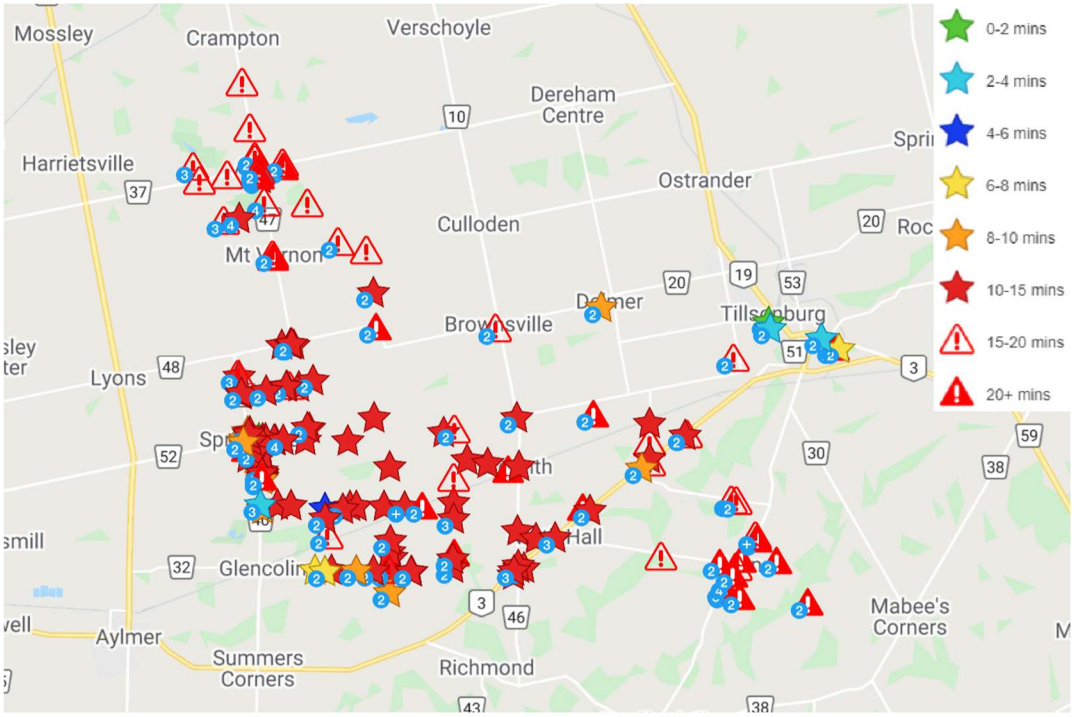


Figure 75 - Calls by Elgin in the Oxford-Elgin Border Area

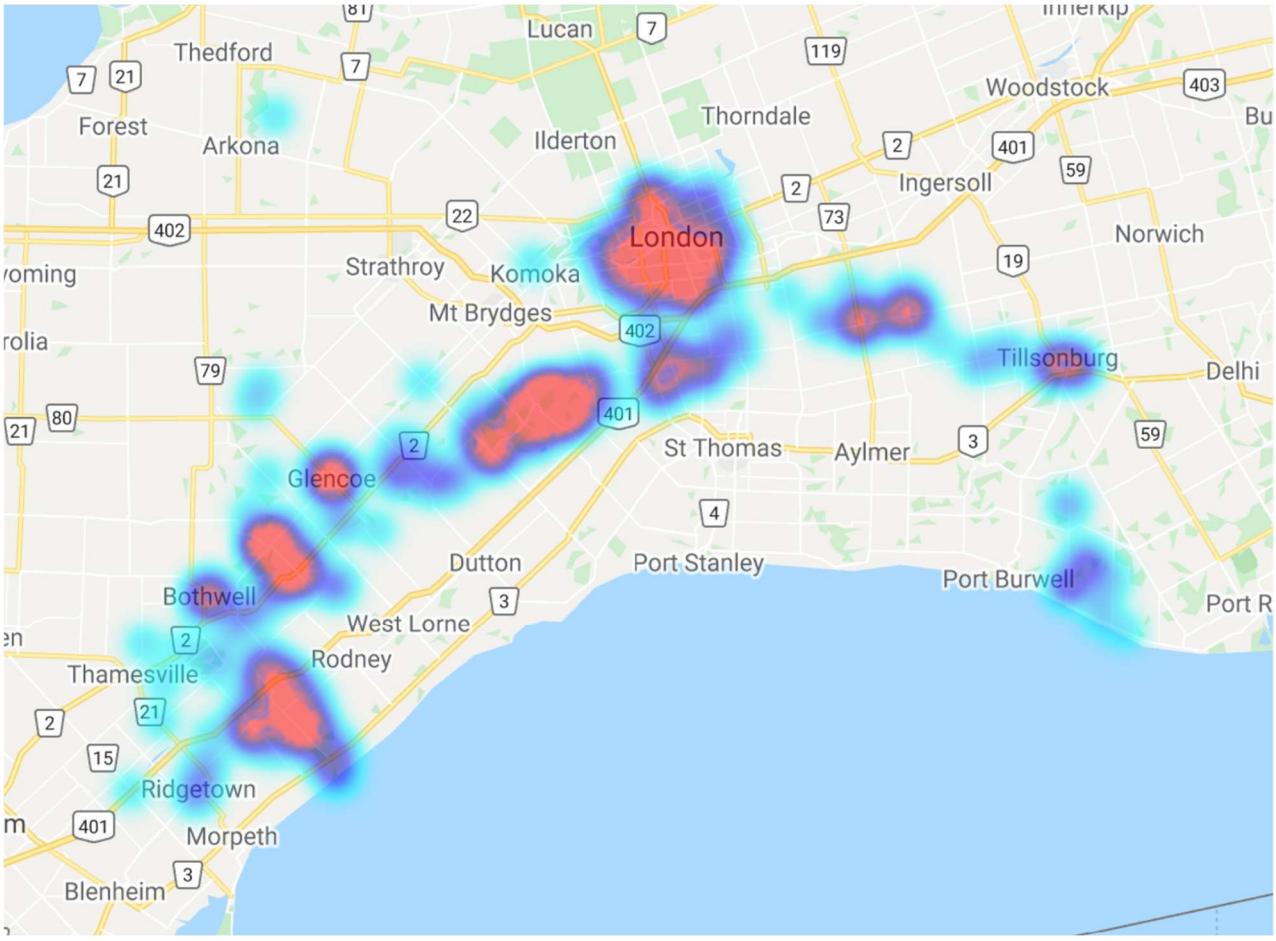


Figure 76 - C1-4 2019-21 Calls by Elgin out of Elgin County

9.2 Oxford-Perth Border Area

Code 3 and 4 calls were similarly examined along the northern border of Oxford/southern border of Perth, which includes the town of St. Marys. While Oxford performed calls in this buffer (Figure 77), the positioning of their stations significantly to the south, reduced their involvement. By far the busiest area for them was Tavistock with travel times in the 10–15-minute range. Concerning response times in the 15-20+ minute range were the norm in the northeast corner of Oxford, although call volume was limited. When calls performed by Perth in the same buffer zone were examined, there was a significant, expected cluster of Perth calls in St. Marys, with a second cluster in the Tavistock/Shakespeare area. Tavistock/Shakespeare is serviced with 10–15-minute travel times. A third call cluster to the east in Waterloo Region, surrounds the town of New Hamburg, with expected 20+ minute travel times due to distance. While Perth response times are reasonable along the length of the border corridor, they obviously deteriorate the further one travels from the St. Marys and Stratford stations. As call locations penetrate further south into Oxford, travel times increase to the 15–20-minute range.

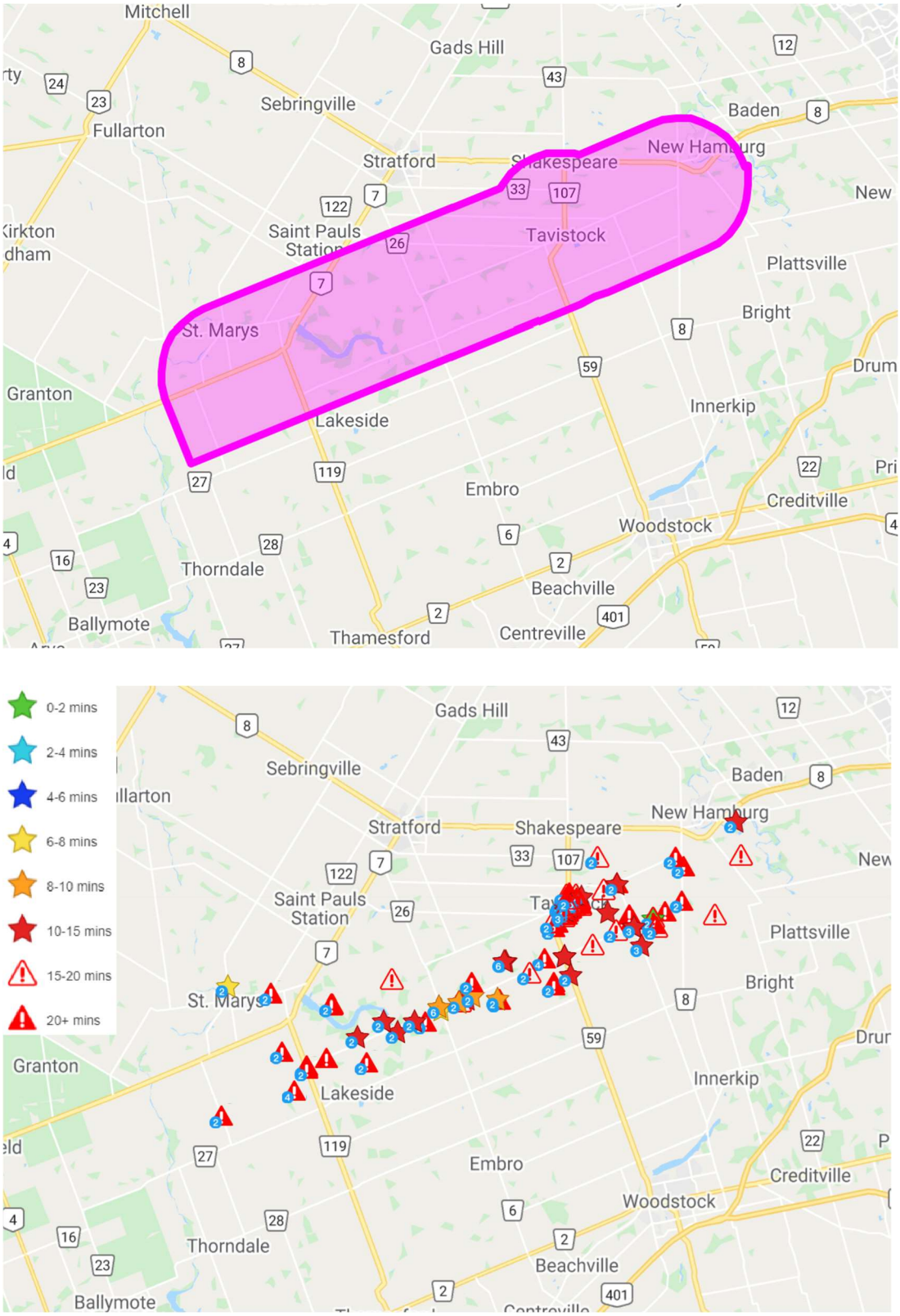


Figure 77 - C3-4 2019-21 Calls by Oxford in the Oxford-Perth Border Area

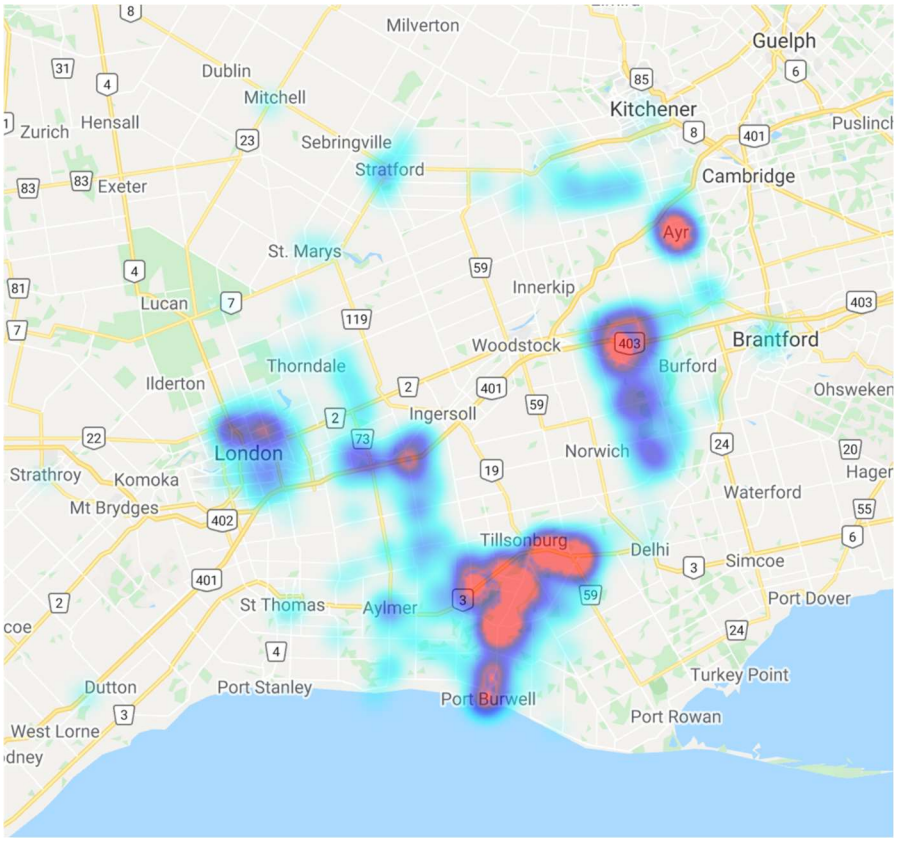


Figure 78 - C1-4 2019-21 Calls out of County by Oxford

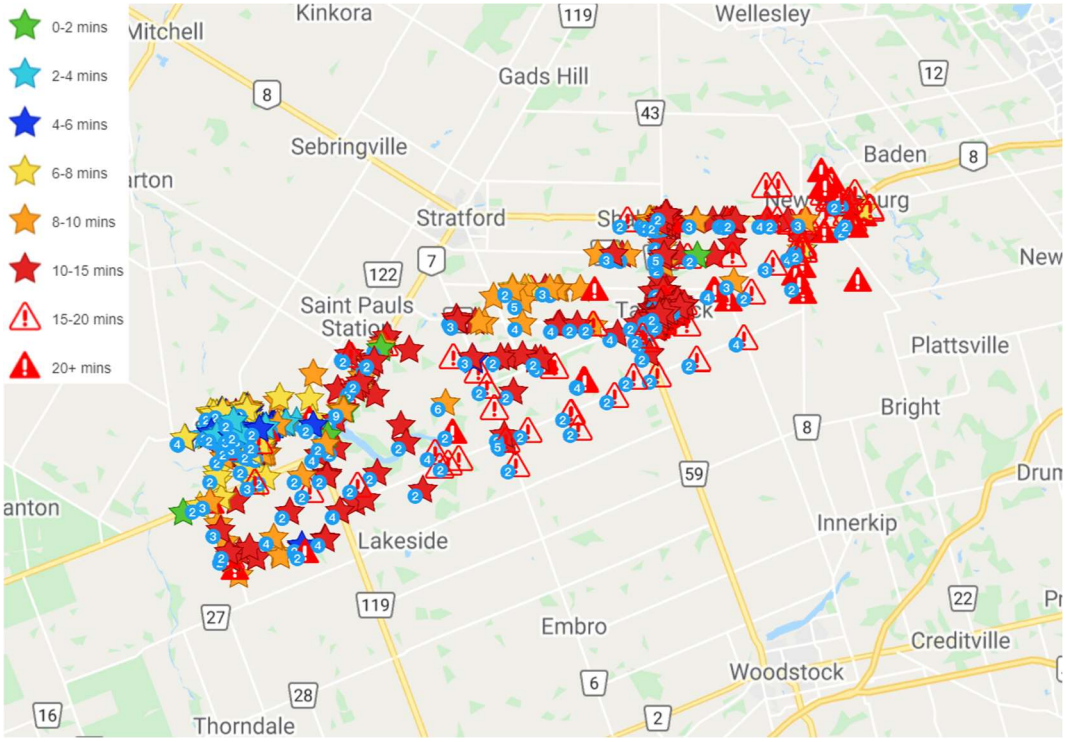


Figure 79 - C3-4 2019-21 Calls by Perth in the Perth-Oxford Border Area

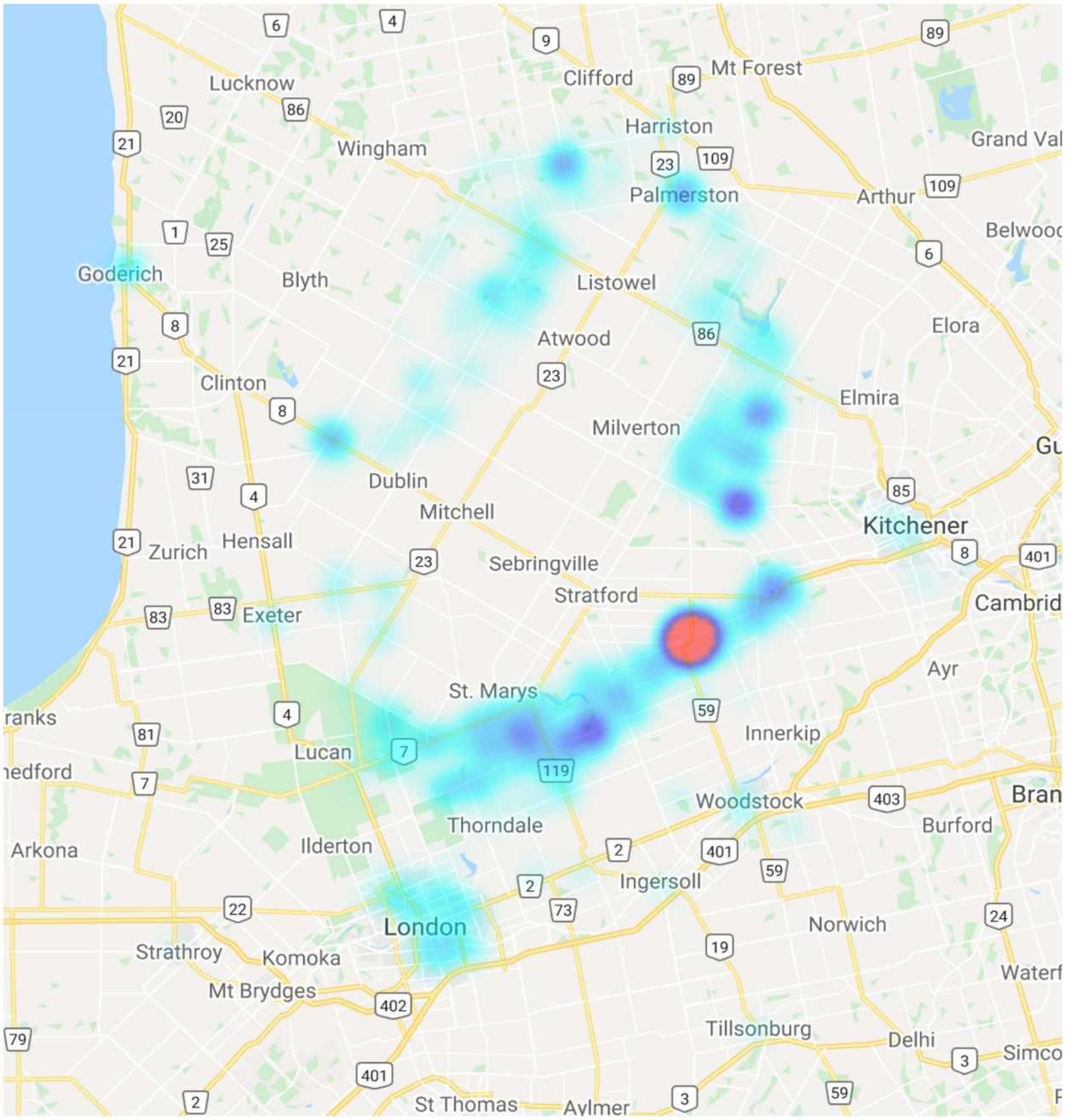


Figure 80 - C1-4 2019-21 Calls out of County by Perth

9.3 Hot Spot Deep Dive - Tavistock Overlapping Coverage Zone

The identified "hot spots" (call clusters) in Tavistock and Shakespeare presented as ideal opportunities for a deep dive investigation. The Tavistock and Shakespeare communities are separated by 5 kms of roadway. Tavistock is in Oxford but located immediately adjacent to the Perth/Oxford border, while Shakespeare is 5 kms to the north in Perth. Due to provincial dispatch policies that require the nearest ambulance to be sent to an emergency call regardless of municipal borders, Tavistock has become a de facto shared responsibility of the Oxford and Perth paramedic services. With a 16 km distance between Stratford-Tavistock, vs. upwards of 25 kms between Woodstock-Tavistock, Perth resources from their Stratford station are routinely dispatched to all Code-4 emergency calls in Tavistock. At the same time, Oxford resources are dispatched to lower priority calls, including Code-3 urgent calls, from their Zorra (daytime staffing) or Woodstock stations.

Both Tavistock and Shakespeare have travel times at the top end of acceptable for busy call communities. At the same time, service along the northern Oxford/southern Perth border struggles with 15-20+ minute travel times. Could service be improved for both these communities and bordering areas through a deployment or other operational change? Would locating a station in this high use area prompt additional poaching of resources to further assist in Waterloo Region? Both are questions to consider.

Both Oxford and Perth would equally benefit from a resource in the general area, and as such, shared costing would be appropriate. A station could be located in either Tavistock or Shakespeare and owned/leased by the county in which it resides. Service could be provided in a number of ways. Two examples are:

- The service that "owns" the station could "sell" half the cost of providing paramedic services to the other service, i.e., real costs rather than the artificial cross-border incremental cost per call.
- The service that "owns" the station could charge the other service half the facility cost of providing the station and allow the other service to use the station 50% of the time, e.g., one service would staff the station for two weeks of days and then two weeks of nights, while the other did the opposite.

Staffing could be funded by relocating existing hours, i.e., Oxford could move the 12-hour Zorra vehicle which already services this area, while Perth could similarly move 12 hours from one of its three 24-hour Stratford vehicles that also service Tavistock. This vehicle would still be available to support Stratford as necessary.

9.4 Hot Spot Deep Dive - Tillsonburg to Port Burwell Overlapping Coverage Zone

The corridor from Tillsonburg south through Eden, Straffordville, Vienna and into Port Burwell, is currently serviced by a combination of Elgin and Oxford resources. While the corridor is completely in Elgin, its proximity to Tillsonburg immediately north of the County border, and the lack of an Elgin transport resource nearby, has resulted in a heavy reliance on Oxford.

No ambulance is currently deployed in Bayham township, which encompasses the corridor. The nearest Elgin vehicle is located in Aylmer, and the nearest Oxford vehicle is at the Tillsonburg station. Between Victoria Day and Labour Day, a single paramedic Rapid Response Unit (RRU) is stationed at the southern end of the corridor in the vacation community of Port Burwell. This 12 hour-a-day coverage reverts to Monday-Friday, from Labour Day through Victoria Day. Although the RRU "stops the clock" for emergency responses when staffed, any RRU response requires a transport vehicle (ambulance) to respond as well. With Aylmer and Tillsonburg literally equidistant from Port Burwell, the shorter distance to locations further north on the corridor will often require dispatch to send Tillsonburg to Code-4 emergency calls. Even when the call is in Port Burwell, the busy nature of the Aylmer resource, will often have Tillsonburg as the nearest available vehicle regardless.

During the evening and overnight when no RRU is staffed (or weekends during two-thirds of the year), a required paramedic response will travel the 26-28 kms from either Aylmer or Tillsonburg. Any Aylmer response causes a significant ripple effect across the entire county. Aylmer is busy enough that it prompts a coverage standby, pulling an ambulance out of St. Thomas, and then the Dutton ambulance into St. Thomas for city coverage. Finally, the Rodney vehicle is moved to West Lorne to cover both Rodney and Dutton. In other words, four vehicles move whenever there is an overnight call in Port Burwell.

Elgin has been fortunate that Oxford has resourced Tillsonburg with two ambulances around-the-clock and that this resource has been available to them. However, this unplanned cross-border assistance is likely nearing its end. With Tillsonburg growth booming and the station UHA increasing, availability for anything other than local needs will soon be unreliable. Although this shared servicing was a good use of available resources at one time, Elgin should begin to plan for the transition to a 24 hour-a-day, transport-capable resource in the corridor. Ideally, this ambulance would be located at some point along the corridor rather than in Port Burwell, to maximize directions travelled in a timely manner without one direction being limited by Lake Erie.

10.0 Towards a Mutual Coverage Plan During Periods of Critical Unit Availability

Oxford, Elgin, and Perth all have Minimum Emergency Coverage plans to designate the best location for their resources during periods of Critical (reduced) Unit Availability. Minimum Emergency Coverage is required when call volume results in transport resources (ambulances) dropping to a pre-determined level (4 in Oxford; 3 in Perth; and 3 in Elgin aided by the RRU when scheduled). Each system's ambulances are then relocated to ensure the best available coverage with the available resources. In addition, neighbouring paramedic services are asked to provide additional emergency coverage, generally by relocating to the cross-municipal border.

# Vehicles	Minimum Emergency Coverage Priority Posts
OXFORD	
4	Woodstock 0; Woodstock 01; Ingersoll; Tillsonburg
3	Woodstock 0; Ingersoll; Tillsonburg
2	Woodstock 0; Tillsonburg
1	Woodstock 0
PERTH	
3	Stratford; St. Marys; Listowel
2	Stratford; Monkton
1	Sebringville
ELGIN	
3	St. Thomas; Aylmer; West Lorne; (Port Burwell RRU)
2	St. Thomas; Aylmer; (Port Burwell RRU)
1	St. Thomas; (Aylmer RRU)
0	(St. Thomas RRU)

Oxford, Elgin and Perth have an opportunity to secure better emergency coverage through a Mutual Coverage Plan during periods of Critical Unit Availability. The three Chiefs have expressed a willingness to formalize the extent/circumstances where cross-border emergency coverage would be provided. In essence, the three paramedic services would serve as a single system with three operational zones. Movement between the zones would help balance coverage when a zone has available resources to assist in another zone.

Following the principles outlined below, further discussions amongst the Chiefs should be held to generate agreements detailing operational requirements or obligations (i.e., should these parameters be integrated into deployment plans for automation implementation by the CACC, or should this be a Superintendent to Superintendent-driven request)?

Mutual Coverage Zone Principles

1. A zone's vehicles will not normally cross a second zone (municipality) to provide coverage in a third zone (i.e., Perth will not normally cover Elgin and vice versa).

2. When all three zones are at Minimum Emergency Coverage simultaneously, no coverage movements between zones takes place.

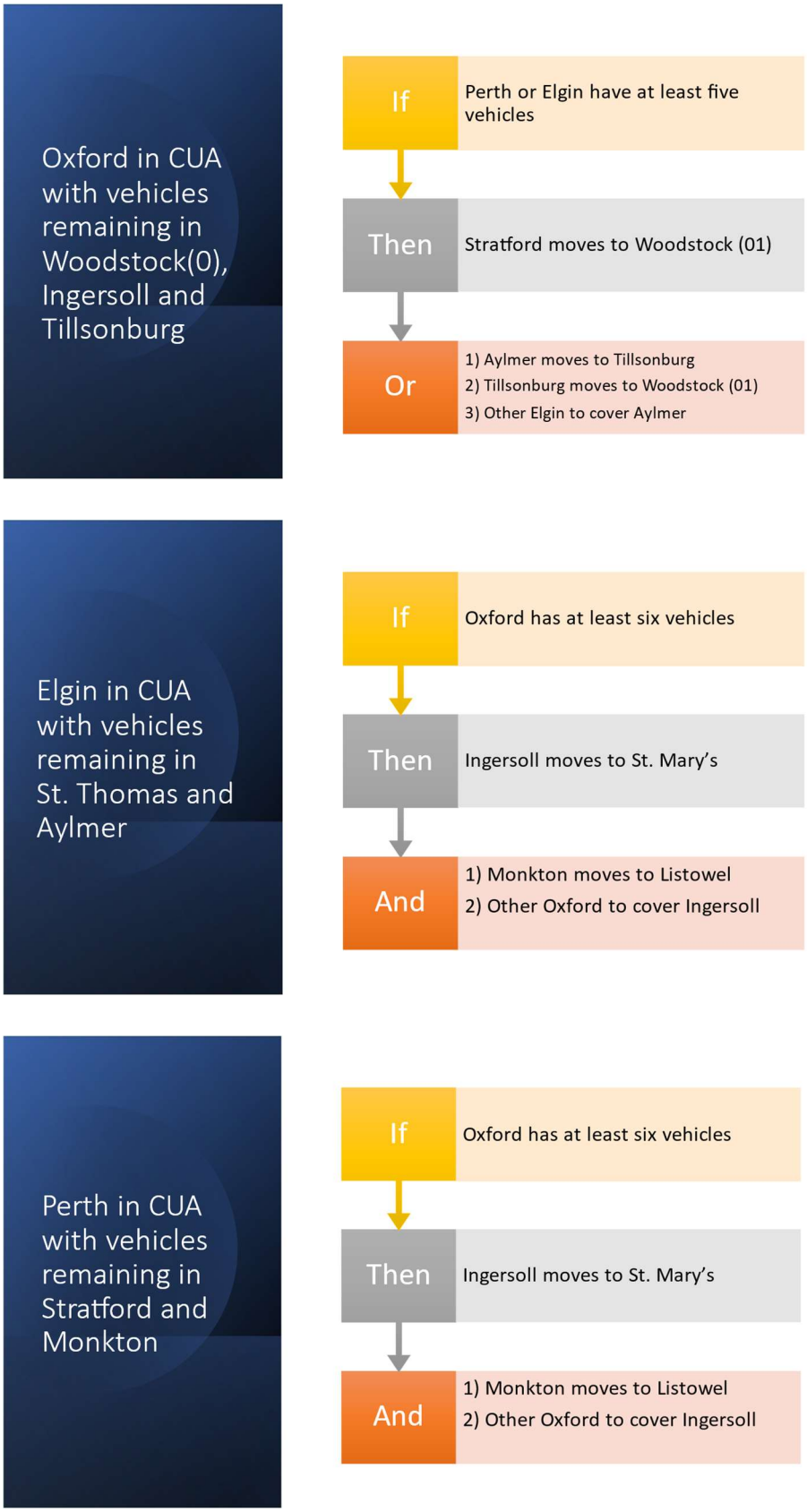
3. If one of the three zones drops below Minimum Emergency Coverage (i.e., Oxford to 3 available vehicles; Elgin or Perth to 2) and the neighbouring zone is at least 2 vehicles above their Minimum Emergency Coverage level, then a vehicle from the neighbouring zone can be dispatched to the nearest priority post in the requesting zone. If that nearest priority post is not the one requiring immediate coverage, it is the obligation of the requesting zone to move one of its resources to the priority post requiring coverage.

4. Urban coverage (Woodstock, Stratford, St. Thomas) coverage will not be compromised to provide coverage in any requesting zone.

5. If the zone providing coverage drops to Minimum Emergency Coverage, then any of its vehicle providing coverage in another zone returns to its home zone.

6. When all three zones are at Minimum Emergency Coverage, and/or zones do not have at least 2 vehicles above their Minimum Emergency Coverage level, conventional cross-border coverage from their municipal border, should be requested from neighbouring paramedic services.

The following three algorithms provide a useful illustration of how the Mutual Coverage Principles can be operationalized moving forward:


Oxford in CUA with vehicles remaining in Woodstock(0), Ingersoll and Tillsonburg
If
Perth or Elgin have at least five vehicles
Then
Stratford moves to Woodstock (01)
Or
1) Aylmer moves to Tillsonburg
2) Tillsonburg moves to Woodstock (01)
3) Other Elgin to cover Aylmer
Elgin in CUA with vehicles remaining in St. Thomas and Aylmer
If
Oxford has at least six vehicles
Then
Ingersoll moves to St. Mary's
And
1) Monkton moves to Listowel
2) Other Oxford to cover Ingersoll
Perth in CUA with vehicles remaining in Stratford and Monkton
If
Oxford has at least six vehicles
Then
Ingersoll moves to St. Mary's
And
1) Monkton moves to Listowel
2) Other Oxford to cover Ingersoll

11.0 Service Sharing Analysis/Opportunities

11.1 Group Purchasing in Ontario Paramedic Services

Prior to the current model of municipal delivery of land ambulance services, the Province provided bulk purchasing for all Ontario ambulance services. Through "Judson", the Ministry of Health and Long-Term Care maintained product consistency, purchased ambulances, response unit and other equipment and consumables, while pharmaceuticals were sourced by Base Hospitals or the Provincial Pharmacy. This bulk purchasing model was discontinued with the transfer of ambulance services to municipalities over 20 years ago, and the involvement of 50+ municipal purchasing/finance departments addressing their own needs. Given the continued increase in emergency service costs and the impact of COVID-19 on existing supply chains, revisiting procurement scale economies is a timely initiative.

More than a decade ago, Base Hospitals began to transition out of supplying pharmaceuticals to Ontario paramedic services. Some hospitals who were in possession of retail pharmacy licenses, remained willing participants, while across the Province other paramedic services utilized a variety of pharmaceutical sourcing supply chains including local retail pharmacies, direct purchases from pharmaceutical manufacturers, and pharmaceutical distributors like McKesson and MedicalMart.

A number of attempts have been made to consolidate these disjointed purchasing efforts, but to no avail. AMEMSO (Association of Municipal Emergency Medical Services of Ontario) investigated participation in hospital buying groups MedBuy and HealthPro a decade ago. Estimated 50-60% cost savings were identified at that time, and municipal purchasing departments were supportive as these buying groups used competitive processes to source product. Unfortunately, AMEMSO failed to garner significant support as some paramedic services opted to retain their flexibility to choose individual products they felt were better suited to their needs. Other paramedic services concluded that face-to-face customer service was more important to them than the significant cost savings.

The outcome was that a small group of four paramedic services; Niagara, Muskoka, ORNGE and Prescott-Russell formed a consortium and joined MedBuy. This consortium was able to document savings of 60% on pharmaceuticals and 40% on consumables. Unfortunately, MedBuy ultimately released them as their purchasing volume was insufficient to offset the effort involved in servicing their specialty products. One of the consortium members documented the price of a single medication rising from $27 per dose to $300 upon termination of the agreement. Three years ago, the Eastern Ontario Chiefs again investigated participation in hospital buying groups and opted not to proceed despite similar savings being identified.

Consumables have caused the most concern with participation in buying groups. Product quality varies dramatically between suppliers, and paramedic services often look for compatibility with products used by their local hospitals. For example, a particular IV solution and administration set provided by a buying group contract, may not be compatible with the ones used by their hospitals – resulting in the

wasteful need and delay in changing the set and solution upon arrival at hospital. Paramedic services want and need the flexibility to approve products as appropriate for their needs; something that is not always possible within larger buying groups where a product that is acceptable to the majority of users is often deemed appropriate.

11.2 Developing Service Sharing Initiatives

To initiate the required service sharing element of this review, Performance Concepts compiled a comprehensive list of potential service sharing opportunities for discussion. These opportunities are listed in the following table:

PURCHASING	SHARED HUMAN RESOURCES	MAINTENANCE (Contracts or Internal Personnel)
Capital	Professional Standards	Vehicle Maintenance
Vehicles	Investigations	Cardiac Monitors
Stretchers	Education Development	Public Access AEDs
Cardiac Monitors	Education Delivery	Auto-Pulse/Lucas CPR Devices
Simulation Aids	Hiring	Stretchers/Power Loads
Fit Test Equipment	Onboarding and Orientation	Conveyance Equipment
Disinfection Equipment	Scheduler	Fit Test Equipment
Non-Capital	Operations/Shift Supervision	Suction and Oxygen Equipment
Medical Disposables	Community Paramedic Program	
Drugs/Pharmaceuticals	Public Education/Special Events	
Oxygen	Logistical Staff Support	**LICENSING AND SOFTWARE**
Patient Care Equipment	Senior Leadership	Interdev Imedic ePCR
Pandemic Stockpile	(shared position(s) or on-call)	Interdev Analytics
Linen	CISM Team/Chaplain Services/	Interdev mDocs
Uniforms	Psychologist	Interdev Certification
Computer Tablets		Acetech AVL (Vehicle Locator)
Mobile Devices and Plans	**SHARED SPECIALTY ASSETS**	Operative IQ (Logistics)
Equipment Bags	Bariatric Transport Ambulance	PAD Tracking
Services	Command Post Trailer/Vehicle	JBS Scheduler
Laundry (Dry Cleaning)	Tactical Paramedics	Community Paramedic Software
Facility Maintenance	Spare Vehicles	(pre-hos/radius)
BioHazard Removal	Multi-Patient Unit	Real Time Data (RTD Dashboard)
Office Equipment Contracts	Mobile Simulation Lab	CAD Link (Future)
IT Services	Driving Simulator	
Legal Services		
Corporate Services	**SHARED FACILITIES**	
Human Resources	Stations	
EAP/Mental Health	Logistics Warehouse	
Occupational Health	Pandemic Storage Stockpile	
Telephone Answering		
Physical Demands Testing		
Employee Appreciation Program		

These options were welcomed with open minds by the three Chiefs and prompted a healthy group discussion about potential opportunities. One-on-one conversations followed with each Chief to identify specific priorities they might have. A catalogue of high-potential opportunities that appeared to have support from all three Chiefs was then created, as was a list of other opportunities that while beneficial, might only impact a single player, or would require significant time and effort to accomplish.

Four particular areas garnered the most interest:

- Joint purchasing opportunities across all areas (including two external group buying opportunities
- Shared Staffing/Human Resources (but with caution that while possible, contracting out certain paramedic support services would have significant impact on availability of that service for other County departments)
- Shared Specialty Assets including spare vehicles, bariatric ambulances, command post trailer/vehicle, and specialty work teams
- Shared Facilities especially a pandemic stockpile warehouse.

11.2.1 *Joint Purchasing*

Vehicles, defibrillator/monitors and stretchers make up the highest value capital items purchased by paramedic services, and as such, deserve special mention:

Vehicles:

There are currently only four Canadian ambulance manufacturers, with the two largest, Demers and Crestline, capturing most of the Ontario market. Recently, both companies became part of the same corporate entity. While multiple paramedic services buying ambulances from a single provider would be able to secure "bulk purchase" savings, several issues must be taken into account:

- The ambulances being purchased across the three municipalities are not the same. Different underlying vehicle manufacturer, chassis length, patient compartment size, electrical systems, emergency warning systems, and numerous options make each paramedic service's vehicles unique. Profit margins are different depending on the vehicle configuration and options.
- The two manufacturers (although commonly owned) operate separately via manufacturing plants located in two different provinces with different shipping costs.
- Economies of scale are only gained if a manufacturer is building the same vehicle on the same manufacturing line at the same time. This generates efficiencies through repetitive building processes.
- Response vehicle conversions are both smaller in number and cost and provided through several different conversion vendors located within Ontario. Despite the sourcing differences, the same general economic realities exist.

It is unlikely that Oxford, Elgin and Perth purchase enough new vehicles each year to net manufacturers the benefit of significantly quicker completion rates that would create "bulk buying" savings. If, however, the three municipalities are willing to standardize on a vehicle to be purchased and accept delivery of all vehicles at the same time, there is the possibility of a small saving in the future. However, given how seriously COVID-19 has impacted the profitability of ambulance manufacturing – even if only temporarily (i.e., second shifts and their associated costs being added to meet physical distancing requirements), it is more likely that manufacturers will attempt to recoup these added costs in future sales through higher pricing.

Defibrillator/Monitors:

Defibrillator/Monitor purchases offer a potential to reduce costs through bulk purchases. Two manufacturers: Zoll and Stryker, currently serve the bulk of the Ontario (and North American) paramedic market. The products produced are similar in terms of features provided, and therefore pricing is competitive. Historically, both manufacturers have accepted "me too" RFP clauses. With regards to hospital buying groups, these vendors are obliged to extend a price offered to one member of the buying group to any other member – regardless of whether the purchase is made through the buying group. Further, manufacturers are obliged to extend the same price to another buying group member if the original buying group requests this price extension. Even if paramedic services do not belong to a formal buying group, "me too" clauses allow any service to "piggyback" onto an order placed by a larger paramedic service, or group of services, and receive any price advantage volume rewards.

Stretchers:

Sole sourcing has seriously affected the stretcher market. Until recently, two stretcher manufacturers competed for the paramedic business, but now the market has shifted to almost all paramedic services using (or moving to) the Stryker Powerload product. Stryker has consistently offered the same pricing regardless of the number of stretchers purchased – classic monopolistic pricing tactic. This has resulted in Toronto receiving the same unit pricing as a small Northern Ontario paramedic service. There are presently no savings to be had by combining orders with a monopolistic service provider.

Other Purchasing Opportunities:

There are, however, significant savings to be had with purchasing non-capital product and services, and Oxford, Elgin and Perth should make every effort to go out to market with their joint requirements for best pricing. Two significant external "group buying" opportunities exist for the services:

- Health Materials Management Services (HMMS)
- Medavie Buying Group

HMMS is the sourcing and procurement arm of the London Health Sciences Centre and St. Joseph's Health Care group. They act for all intents and purposes as a hospital buying group like HealthPro or MedBuy, while at the same time, are a member of MedBuy. This gives them all the benefits of

belonging to a major buying group (e.g., “me too” clauses and best bulk pricing), while giving them flexibility to opt out if a better deal can be had elsewhere, or there is a local need for a different product. Rather than being profit driven, HMMS exists to create value in the health care system and directs its customers to the best deal, even if it is through another buying group (i.e., MedBuy, or HealthPro through MedBuy).

HMMS has had experience dealing with the three paramedic services in this review, most recently through Oxford’s role as the County’s pandemic warehouse and is quite interested in expanding their involvement. Having this important sourcing and procurement resource nearby, and its ability to provide a best value product that meets specific paramedic needs rather than just a lowest price commodity, is a benefit that cannot be ignored.

If there is one disadvantage to HMMS, it is their lack of items that are specific to paramedic services, rather than those used by both hospitals and paramedic services. Again, two members of the local group (Elgin and Perth) have an existing relationship with the Medavie buying group, established to benefit Medavie’s ambulance services across the country. This group is already purchasing paramedic-specific equipment in bulk. Elgin and Perth participate where these offers benefit them, and early discussions reveal no reason why Oxford could not as well. Regardless of Oxford not being a Medavie service, the goal of any buying group is purchasing power and value for all and added volume from an additional service the size of Oxford, benefits all members of the group.

Participating in both the HMMS and Medavie buying groups, would provide the benefits of a major hospital buying group without any membership fee, and with the advantage of best value products that meet the paramedic services’ needs at the best cost.

11.2.2 *Shared Staffing/Human Resources*

While a number of shared human resource initiatives were seen to be potentially beneficial, they were felt to have negative impacts on other County departments that would require further research or had collective agreement implications. These should not be discarded, but rather revisited as this service sharing initiative evolves. A number of shared staffing opportunities are, however, ready for consideration now, and highlighted below:

Data Analyst:
All three services require data collection and analysis expertise with regards to system performance monitoring and demand projections. While none of the three can justify a standalone FTE themselves, the opportunity exists for a cost-effective shared FTE to service Oxford, Elgin and Perth together.

Centralized Scheduling/Scheduler:
While all three services currently have staff performing scheduling as a part of their portfolios, this is generally a “9-5” weekday asset. After hours, the work reverts to the Duty Superintendents trying to

deal with sick calls and other short notice absences, when they are least available and equipped to. Centralizing at least after-hours scheduling across the three services, ensures a person is available to deal with absences in a timely fashion, without impacting operations negatively. This position has the opportunity to be a "game changer" in the mid-term by simplifying scheduling for employees that work across more than one service and maximizing their system-wide availability.

Investigations/Professional Standards Officers:

Again, investigations are another required specialty where none of the three services can justify a standalone FTE. As such, this becomes a management role performed "off the edge of the desk" with little expertise being developed in this important risk management role. A dedicated resource would ensure the needed expertise in an unbiased manner, as this individual would not be involved with field staff in as interactive a relationship
as the superintendent/paramedic.

Educators:

While each service currently conducts education in its own way, i.e., dedicated full-time staff, seconded field training officers, etc., each service is also teaching the same topics, but in their own way. Instead of developing materials three times and then delivering it three times, there are savings to be had by developing program materials once and then delivering it many times. Sharing program materials between services is a no cost initiative that can take place today. Similarly, all three services would benefit from additional staff resources during training. With careful scheduling, training assets from all three services could "blitz" the training required at each service in sequence, thus reducing the amount of time needed to complete the training. Given that training is the same at all three services, staff could further choose to attend training at whatever service is more convenient rather than being tied to a fewer number of choices at one service. The same benefits exist for pre-hire testing, onboarding and orientation, as well as return-to-work orientation.

Technical Specialists:

Paramedicine is becoming more and more specialized as evidenced by the growing involvement of Community Paramedicine. Other areas of expertise include Tactical Medics, Hazardous Materials, Public Order and Infectious Diseases, to name only a few. Again, the challenges of maintaining specialty teams in each service for every eventuality, are simply impractical. However, training specialists in each service who can provide awareness training for other staff but have the capability of gathering specialists from all three services to build a team as required, is achievable. While not an immediate priority, this technical specialist concept should be kept at hand as program needs evolve.

Equipment Testing/Maintenance:

Like Educators, each service has staff with logistics responsibilities, but could benefit from sharing their other service counterparts to "blitz" occasional service-wide tasks such as re-standardizing vehicle contents, cot and conveyance equipment inspections/maintenance, oxygen/suction testing, etc. Like

Technical Specialists, rather than having every logistics staff member trained as a specialist in all aspects of the work, specialist roles could be shared across the three services. These specialists could train other logistics staff to a working level but be available for questions and challenges as they arise.

Community Paramedicine:

While Community Paramedicine is currently well funded and evolving on a service-by-service basis, this is likely to change somewhat with the conclusion of the pandemic. While "ramp up" requires significant dedicated administrative staff in each municipality, it would be expected that this will settle to a "new normal" where a common management/oversight role might be shared across the three services. One role where a shared position would benefit all three Community Paramedicine programs is to support the Remote Monitoring programs being included in CP. Remote monitoring uses technology to monitor patient's vital signs at home and electronically warn paramedics if these deteriorate, to prompt a CP visit. Unfortunately, most programs only monitor these transmissions during the daytime hours when CP staff are on-duty. A single after-hours staffer could safely monitor patients across all three services and follow up/make necessary arrangements with patients as needed.

11.2.3 *Shared Specialty Assets*

Spare vehicles and specialty assets such as bariatric ambulances, command posts, etc., are expensive to purchase, and sit for inordinate periods of time before being needed. Even so, they are a necessary part of the service capabilities. Rarely used resources like the bariatric ambulance and command post, could be limited to a single vehicle for the three services to use as needed, while a generic spare ambulance pool could potentially be downsized from what each service currently has. Generic decaling would allow these vehicles to move between services as needed. More research is necessary to determine ownership and insurance issues, and to develop a fair cost-recovery scheme for use of these vehicles.

11.2.4 *Shared Facilities*

The shared facility discussion arose from each service needing a location to store pandemic supplies. In discussion, it became obvious that there was no specific need to have a warehouse in each municipality. If the warehouse was easily accessed by all three municipalities, the facility capital and operating costs should be the driving factors for a selected location. While there was no immediate need identified for a central logistics facility, there is no reason this too should not be considered if the need arises. A potential opportunity also exists for a shared response station as per the "deep dive" investigation into the Tavistock/Shakespeare catchment area. Options regarding ownership and operations have yet to be fully examined.

11.3 Implementing Service Sharing: A Permanent Framework

To implement service sharing deals among Oxford, Elgin, and Perth a permanent Planning & Implementation Framework is necessary. The figure below sets out a 5-step service sharing cycle. The service sharing cycle integrates with a broader *Plan-Do-Check* cycle already in place within each County.

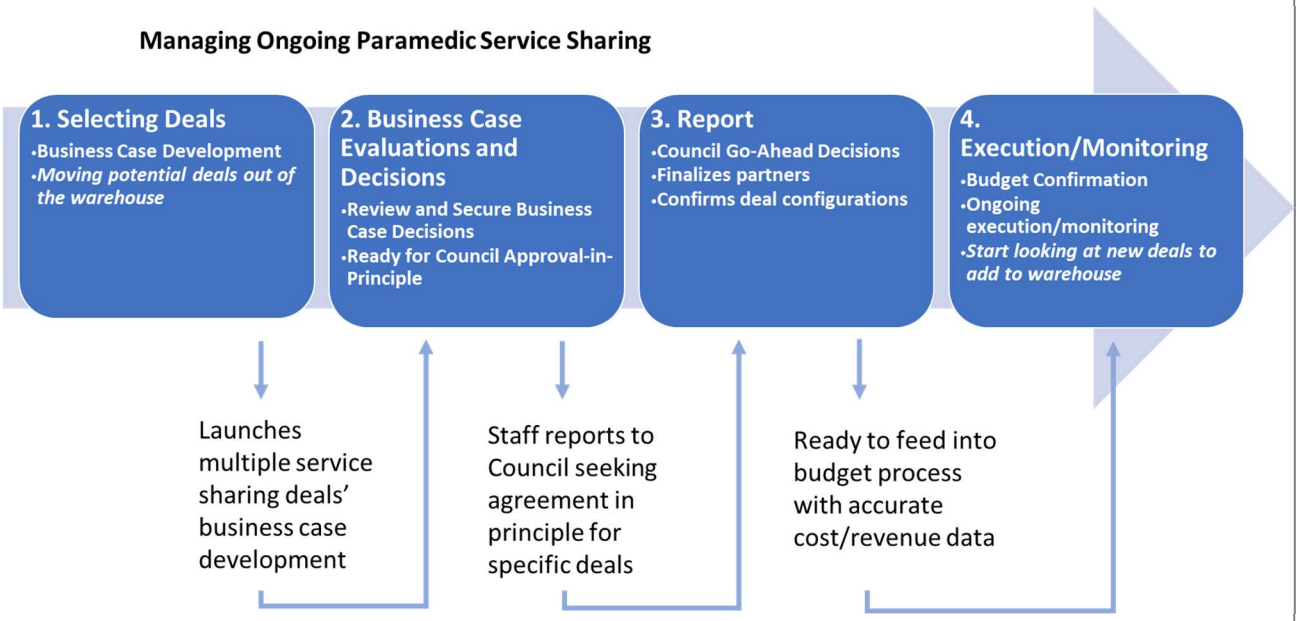
Paramedic Service Sharing Framework Aligns With Ongoing County Service Delivery Cycle(s)

Paramedic Shared Services Planning & Delivery Cycle

Ongoing Service Delivery Cycle(s) in Oxford, Elgin & Perth

The figure below sets out a more detailed process for managing ongoing paramedic service sharing deals. This process would be overseen by the CAOs and Chiefs across Oxford, Elgin, and Perth. Service sharing deals compiled in the "warehouse" will be prioritized for business case development and eventual approval/selection by CAOs and Chiefs. Where required, the three respective Councils will endorse sharing deals on the way to detailed budget implementation and ongoing monitoring.

Managing Ongoing Paramedic Service Sharing



The CAOs and Chiefs will work seamless together in a Paramedic Service Sharing Working Group (P-SSWG). The figure below provides a series of sharing deal scenarios likely to occur over time.

Managing Sharing Deals: Scenario Examples

Once Oxford, Elgin, and Perth commit to ongoing service sharing using the above referenced framework, it will be possible to expand the model to include additional neighbouring paramedic services.

12.0 Findings & Recommendations

Findings and Recommendations have been assembled for Oxford, Elgin, and Perth on a standalone basis. A common set of Findings and Recommendations dealing with a range of issues/improvement opportunities have also been delivered for the three Paramedic Services to consider together.

Recommendations have been categorized as *Strategic* or *Tactical*. Strategic recommendations are potential gamechangers that can deliver significant benefits; however, they may be more complex or challenging from an implementation perspective. Tactical recommendations are by nature more operational, and their benefits are more incremental. On the positive side they may be more straightforward to implement.

Recommendations have all been placed on a Do NOW, Do SOON, Do LATER implementation roadmap. The following timeframes apply:

- Do NOW (less than 6 months)
- Do SOON (less than 1 year)
- Do LATER (more than 1 year)

The Implementation Roadmap timeframes are compressed and will require focussed implementation effort from Oxford, Elgin, and Perth. The timeframe compression is deliberate. Research is clear that drawn-out change management initiatives are more prone to failure because the urgency of day-to-day operations (the Whirlwind) often smothers attempts seeking systemic change (the Important).

12.1 System Performance Recommendations for Oxford, Elgin & Perth

12.1.1 *Oxford System Performance*

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
1	The "base case" demand forecast for Oxford (2022-2032) generates a 37% increase in Code 3-4 calls and a 39% increase in In-service hours. Increases in deployed vehicle hours of service will be required across the 10-year forecast horizon - initially in the Woodstock urban core of the County. This Report contains an analytics driven dashboard tool to justify/support the timing of necessary resource adds - essentially acting as an objective "trigger" mechanism.	***Tactical Recommendation*** ***Oxford should adopt the analytics dashboard tool (set out in Section 5.0 of this Report) when considering necessary resourcing adds across the 10-year 2022-2032 planning horizon of the demand forecast.*** ***The 2022-2032 demand forecast should be updated annually, carefully monitored and used to support resource planning moving forward.*** ***"Flatten the Curve" service delivery tools should be deployed to reduce forecast increases in call volume/In-service hours in the second half of the 2022-2032 10-year demand forecast***	Proposed resourcing adds across the 2022-2032 demand forecast horizon will be subjected to analytics-based due diligence. Resourcing adds will arrive on-time based on the mix of urban and non-urban metrics that act as a system performance "canary in the coal mine".	✔	✔	✔

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
2	Drumbo, Norwich and Zorra resources all perform a significant portion of their work in the Woodstock urban area. Oxford identified this coverage trend in late 2019, and subsequently enhanced deployed vehicle hours in Woodstock and Tillsonburg as a means of maintaining rural coverage in the rest of the County. Since this review utilized data from 2019, 2020 and part of 2021, the full impacts of these enhancements may not yet be evident.	***Tactical Recommendation*** ***Oxford should continue to monitor the impact of Woodstock (and Tillsonburg) workload on surrounding rural stations throughout 2022. Oxford use the dashboard tool provided in Section 5.0 of this Report to determine when an additional resource will be beneficial to address call volume growth and stabilize non-urban response times.***	Forecast call volume growth will be most significant in the Woodstock and Tillsonburg urban areas. Ensuring resources are in place to address this growth will reduce the ripple effect of rural stations being drawn into the urban centres in support and help maintain coverage and response times across the County.	✔	✔	✔

12.1.2 Elgin System Performance

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
3	The "base case" demand forecast for Elgin (2022-2032) generates a 40% increase in Code 3-4 calls and a 41% increase in In-service hours. Increases in deployed vehicle hours of service will be required across the 10-year forecast horizon. This Report contains analytics driven dashboard tool to justify/support the timing of necessary resource adds - essentially acting as an objective "trigger" mechanism.	***Tactical Recommendation*** ***Elgin should adopt the analytics dashboard tool (set out in Section 5.0 of this Report) when considering necessary resourcing adds across the 10-year 2022-2032 planning horizon of the demand forecast.*** ***The 2022-2032 demand forecast should be updated annually, carefully monitored and used to support resource planning moving forward.*** ***"Flatten the Curve" service delivery tools should be deployed to reduce forecast increases in call volume/In-service hours in the second half of the 2022-2032 10-year demand forecast***	Proposed resourcing adds across the 2022-2032 demand forecast horizon will be subjected to analytics-based due diligence. Resourcing adds will arrive on-time based on the mix of urban and non-urban metrics that act as a system performance "canary in the coal mine".	✔	✔	✔

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
4	The 2021 UHA analysis by hour of day identifies a significant St. Thomas spike in busyness between 2000-2200 hours daily (41% to 47% UHA). This UHA spike was noticed during an Operational Review conducted by Performance Concepts in 2019, and has not improved since. It should be noted that the 0600-1800 Edward vehicle generates low UHAs for the first two hours of its shift. Unless there is another operational need for keeping them at 0600-1800 hrs, moving the Edward unit to an 0800-2000 schedule and the Shaw Valley unit to an 1100-2300 schedule would better balance peak daytime workload.	***Tactical Recommendation*** ***a) It is strongly recommended that at a minimum, the 0800-2000 Shaw Valley vehicle be changed to an 1100-2300 schedule.*** ***b) It is further recommended that the 0600-1800 Edward vehicle be moved to an 0800-2000 schedule to better address existing call demand.***	The recommended changes would better distribute existing ambulances to deal with call demand per hour, reduce stressful UHA workload burdens, and reduce "ripple effect" Code 8 movements across the system as resource levels fall to critical levels.	✔		

12.1.3 *Perth System Performance*

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
5	The "base case" demand forecast for Perth (2022-2032) generates a 63% increase in Code 3-4 calls and a 65% increase in In-service hours. Increases in deployed vehicle hours of service will be required across the 10-year forecast horizon. This Report contains an analytics driven dashboard tool to justify/support the timing of necessary resource adds - essentially acting as an objective "trigger" mechanism.	***Tactical Recommendation*** ***Perth should adopt the analytics dashboard tool (set out in Section 5.0 of this Report) when considering necessary resourcing adds across the 10-year 2022-2032 planning horizon of the demand forecast.*** ***The 2022-2032 demand forecast should be updated annually, carefully monitored and used to support resource planning moving forward.*** ***"Flatten the Curve" service delivery tools should be deployed to reduce forecast increases in call volume/In-service hours in the second half of the 2022-2032 10-year demand forecast***	Proposed resourcing adds across the 2022-2032 demand forecast horizon will be subjected to analytics-based due diligence. Resourcing adds will arrive on-time based on the mix of urban and non-urban metrics that act as a system performance "canary in the coal mine".	✔	✔	✔

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
6	The secondary Milverton resource (1100-1900 M-W and 1100-2000 Th-S) is rarely used within the Milverton response area, routinely moving to a standby location in Monkton upon daily sign-on. While the Listowel station is quiet during the evening hours and overnight, daytime UHAs between 1000-1900 hrs hover around 20%. While heat mapping shows that Listowel is primarily a North Perth resource with its local hospital helping maximize availability, a backup resource would be beneficial. 74% of the Milverton station standbys are already performed at the Listowel station.	***Tactical Recommendation*** ***Perth should consider the relocation of the secondary Milverton daytime resource to support the Listowel station during its busy daytime hours 1000-1800 hrs.*** ***As an alternate consideration, the addition of 24 weekly hours to this vehicle would create a conventional 12-hour shift which could serve as an emergency replacement for any downstaffed primary coverage shift across the service, while normally continuing to support Listowel.***	Relocating the Milverton resource to Listowel would provide a needed backup in the second busiest "urban" area in Perth. Relocation would not impact response times in the Atwood area from levels previously provided through the Monkton standbys.	✔	✔	

12.1.4 Code 8 Movement Workload

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
7	Code 8 ambulance movements (with no patient) generate a significant workload burden for frontline paramedics. While ambulance services across Ontario regularly employ Code 8 movements to stabilize Code 4 response times during periods of high system busyness, the actual impact of Code 8 movements on system performance is unclear – beyond engaging paramedics in a continuous cycle of movement.	***Tactical Recommendation*** ***Oxford, Elgin, and Perth should conduct a cost/benefit analysis of Code 8 movements as part of their deployment plans. The cost/benefit analysis should address the effectiveness of Code 8 movements in managing response times and improving emergency coverage across the three services.***	A cost/benefit analysis of Code 8 ambulance movements will either confirm the value of the existing practice, or prompt deployment plan changes and inform the rollout of recommended Mutual Coverage Plan during Periods of Critical Unit Availability. Frontline paramedic workload burdens around Code 8 movements will either be validated in the name of emergency response time stabilization, or workload burdens will be reduced and local coverage in "home" coverage zones improved.	✔	✔	

12.1.5 *Mutual Coverage Plan*

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
8	Oxford, Elgin, and Perth all have Minimum Emergency Coverage plans to designate the best location for their resources during period of Critical (reduced) Unit Availability. Minimum Emergency Coverage is required when ambulance availability drops to a pre-determined level (4 in Oxford; 3 in Perth; and 3 in Elgin). Each system's resources are then relocated to ensure the best available coverage with the available resources. In addition, neighbouring paramedic services are asked to provide cross-border emergency coverage, generally by relocating to the municipal border. Oxford, Elgin, and Perth have an opportunity to secure better emergency coverage across all three systems compared to conventional cross-border arrangements.	***Strategic Recommendation*** ***Oxford, Elgin, and Perth should develop a Mutual Coverage Plan for Periods of Critical Unit Availability. This plan would have the three paramedic services function as a single system with three operational zones and allow ambulance movement between the zones as needed to balance coverage, as long as a zone has available resources to assist.*** ***Oxford, Elgin, and Perth should adopt the Mutual Coverage Plan principles set out in Section 10 in this Report as they move forward with implementation.***	A Mutual Coverage Plan would automate the process of relocating ambulances whenever needed and move those resources directly into a partner municipality rather than to the cross-municipal border. Emergency coverage would be re-established/ stabilized more quickly, and emergency response times would be improved from the priority post locations.	✔	✔	

12.2 Borderless Service Deployment Recommendations

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
9	Heat mapping/analysis in this Report has identified an opportunity to rationalize service delivery/coverage in the Oxford/Perth border zone around Shakespeare/Tavistock. Currently Oxford deploys resources from Woodstock or Zorra (long travel times) to cover Code 3 calls in this Tavistock border zone, while Perth typically responds to Code 4 calls from the Stratford station. A significant opportunity has been identified to restructure Tavistock coverage and improve overall efficiency/resource utilization.	***Strategic Recommendation*** ***The following sequence of Oxford and Perth resourcing and coverage adjustments are recommended:*** • ***Oxford and Perth should collaborate to build a new shared station at either Tavistock or Shakespeare.*** • ***Oxford and Perth Implement a shared staffing model at the new station with a rotating two-week Days/Nights schedule. For a given two-week schedule Oxford would staff one of the 12-hour shifts (e.g., Days) and Perth would staff the other 12-hour shift (e.g., Nights).*** • ***Oxford could consider staffing the new station by re-deploying its 12-hour Zorra resource*** • ***Perth could consider staffing the new station by re-locating one of its three Stratford Station resources (12-hour car)***	Multiple service delivery benefits/efficiencies will be generated by this borderless service initiative: • Woodstock will avoid sending its much-needed urban vehicle hours on the long trip to Tavistock to service lower priority Code 3 calls. Response times for local servicing of all Tavistock Code 3-4 calls will improve. • Oxford will secure improved UHA and response times from its 12-hour unit currently deployed in Zorra when that resource is moved closer to a community that actually generates workload. • Perth will improve coverage and response times around Shakespeare by re-locating an existing resource out of Stratford. • One new station will meet the coverage priorities of both services - avoiding a duplicative $2M capital cost on two stations in a border area.		✔	✔

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
10	Oxford's Tillsonburg station provides unplanned borderless service delivery support for Elgin Code 4 calls in the "Tillsonburg to Port Burwell corridor" that has been mapped and analyzed in this Report. The "window of availability" for Oxford's Tillsonburg station to cover the Tillsonburg Port Burwell corridor in Elgin is now ending. Robust growth and an upwards trending peak UHA in Tillsonburg guarantee an increasingly unreliable ability to also cover the Tillsonburg to Port Burwell corridor. Tillsonburg Code 4 response times servicing the Tillsonburg to Port Burwell corridor are already unacceptably slow. Elgin's PRU service delivery model is problematic, stop gap in nature, and not sustainable. The absence of patient transport capability causes excessive Code 8 movements and coverage ripple effects across the rest of Elgin.	***Strategic Recommendation*** ***Elgin should commit to a phased approach to 24-hour coverage in the Tillsonburg to Port Burwell corridor. An initial 12-hour daytime transport unit should replace the PRU coverage model in 2023. A second 12-hour unit should be deployed in 2024 or 2025 to eliminate this conspicuous gap in the County's geographic coverage plan.***	A number of system performance benefits will be secured by investing in 24-hour coverage in the Tillsonburg to Port Burwell corridor: • The ripple effect of Code 8 vehicle movements across Elgin caused by the existing Tillsonburg to Port Burwell corridor coverage gap will be significantly reduced. • Response times will improve significantly for Code 4 calls in the Tillsonburg to Port Burwell corridor; eliminating the risk associated with slow/lagged response times from Tillsonburg. • Oxford will be able to repatriate Tillsonburg vehicle hours being consumed by Elgin calls - a "must have" outcome given the pressures of growth and upwards trending peak UHA already being experienced in Tillsonburg.	✔	✔	

12.3 Service Sharing Opportunities/Deals

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
11	Oxford, Elgin, and Perth are well positioned to engage in a range of service sharing deals. This Report has identified and prioritized service sharing deals that will create scale economies and cost savings. The Report also sets out an ongoing planning framework for initiating and managing service sharing deals moving forward. The permanent framework will be overseen by the CAOs and Chiefs from participating services. During this review, Performance Concepts identified four areas of potential service sharing with the most interest from the review participants. These included specific items in the following categories, as detailed in section 11.2 of this report: • Joint purchasing opportunities • Shared Staffing/Human Resources • Shared Specialty Assets • Shared Facilities	***Strategic Recommendation*** ***Oxford, Elgin, and Perth should create the ongoing Paramedic Service Sharing Working Group (P-SSWG) set out in this Report to oversee implementation of multiple service sharing deals.*** ***Tactical Recommendation*** ***The following priority service sharing deals should be considered by the P-SSWG when initiating an initial cycle of deals:*** - Synchronize purchases of all high-value items, or ensure "me too" clauses are included, or that all purchasing requirements reference the needs of all three services to ensure the maximum quantity discounts available. - Conduct due diligence in order to proceed with participation in the HMMS and Medavie buying groups. - Consider cost-shared positions that can be hired by one service and used by all three, i.e., Data Analyst (1); Schedulers (2) Investigator/Professional Standards Officer (1).	Service sharing will improve the value for money across a range of service delivery processes, staffing, and assets. Scale economies will generate significant cost avoidance opportunities and contribute to integrated planning and operations across Oxford, Elgin, and Perth. Expected cost and efficiency benefits approximate those that would be secured in any proposed amalgamation scenario (i.e., securing scale economies without the risks of formal amalgamations). Operational benefits include significantly reduced supply costs; the ability to acquire needed services that were unaffordable to each individual entity; more cost-effective and efficient use of existing resources.	✔	✔ ✔	 ✔

#	Findings	Recommendations	Expected Benefits	DO NOW	DO SOON	DO LATER
		- Consider cost-shared Remote Monitoring positions (2) which can be fully funded from Community Paramedicine monies. - Confirm ownership, insurance requirements and establish a cost-recovery formula to allow use of common spare vehicles and specialty assets such as Bariatric Vehicles, Command Posts, etc. - Confirm ownership, insurance requirements and establish a cost-recovery formula to allow shared use of facilities such as common pandemic stockpile warehouse. If approved in concert with the Tavistock/Shakespeare catchment area "deep dive", further detail operational/financial requirements for a shared station. - Co-ordinate activities of all three services' education staff to optimize resources, e.g., develop materials once and share across all three services. Utilize educators as necessary across all three services and maximize availability of programming opportunities for all paramedics. - Co-ordinate activities of all three services' logistics staff to allow for "blitzing" opportunities as necessary to complete mandatory service-wide tasks in a timelier fashion. - Consider a tri-service team approach any time that technical specialists, e.g., tactical paramedics, are being considered.				

13.0 Moving Forward

Oxford, Elgin, and Perth have committed to a new collaborative business model for delivering paramedic services in post-pandemic Ontario.

The new business model embraces borderless service delivery solutions, a new permanent shared services model, a new Mutual Coverage Plan, a new analytics-based decision-making dashboard, and a forward-looking continuous improvement mindset.

Improved value for money, cost avoidance, operational efficiencies and effective demand/growth management are potential outcomes for Oxford, Elgin, and Perth as they continue to collaborate. Scale economies will be achieved without the risk of unintended diseconomies of scale associated with a poorly conceived province-wide amalgamation.

Successful change management is all about focus. Moving ahead simultaneously with numerous bold and ambitious change initiatives rarely works. If an organization has 10 priorities it really has no priorities. Oxford, Elgin, and Perth can secure meaningful change by implementing the right blend of strategic and tactical Recommendations set out in this Report. By focusing on a small number of Wildly Important Goals (WIGs) at any given time, significant progress is possible. Any approach that is a mile wide and a foot deep is bound to fail.

Successful change management is also about dedicated resources. Oxford, Elgin, and Perth will need to deploy internal resources and/or secure external support to implement the desired change. Change management projects run off the corner of a leader's desk inevitably fail.

Oxford, Elgin, and Perth are well positioned moving forward in their attempt to secure improved value for money and timely delivery of paramedic services in the face of growth and an aging tsunami demographics profile.

TECHNICAL APPENDICES