

Strathroy-Caradoc Fire Department



Station 2 Fire Location Study

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Acronyms

| | |
|-------|---|
| CFAI | Commission on Fire Accreditation International |
| FD | Strathroy-Caradoc Fire Department |
| EM&T | Emergency Management & Training Inc. |
| FUS | Fire Underwriter's Survey |
| HVAC | Heating, ventilation, and air conditioning |
| MFP | Master Fire Plan |
| NFPA | National Fire Protection Association |
| NIOSH | National Institute for Occupational Safety and Health |
| NIST | National Institute of Standards and Technology |
| OFC | Ontario Fire College |
| OFMEM | Office of the Fire Marshal and Emergency Management |
| OHSA | Occupational Health and Safety Act |
| SCPS | Strathroy-Caradoc Police Service |
| SOG | Standard Operating Guidelines |

Executive Summary

This Fire Station Location Study assesses the fire station location and the options for the municipality of Strathroy-Caradoc. The plan assesses present and future population statistics and anticipated growth.

The overall goal of this document is to provide the fire service and the municipality with a comprehensive look at how the current station is meeting the needs of the community and the options that are available. Once the plan is adopted, the next phase is implementation. Implementation will depend on the municipality's resources and ability to move forward with the associated recommendations contained within the document.

Ultimately, all decisions pertaining to the services provided, the staffing, and equipping of the fire service are those of Council.

Objectives

To ensure that the fire service are meeting the needs of the community and their staff, the SCFD recognizes the importance of conducting a review of the Mt. Brydges fire station location as the community grows.

Introduction

Performance Measures and Standards

This study has been based upon (but not limited to) key performance indicators that have been identified in national standards and safety regulations such as:

- Office of the Fire Marshal and Emergency Management's (OFMEM) Public Fire Safety Guidelines.
- *The Fire Prevention and Protection Act* and its subordinate regulations, including the Ontario Fire Code O. Reg. 378/18 Community Risk Assessment.
- Office of the Fire Marshal and Emergency Management's (OFMEM) Integrated Risk Management program.
- The *Ontario Health and Safety Act*, with reference to the National Institute for Occupational Safety and Health (NIOSH).
- Ontario Fire Service – Section 21 Guidelines:
 - The Section 21 Committee is based on Section 21 of the *Ontario Occupational Health and Safety Act* (OHSA). This committee is charged with reviewing industry safety concerns and developing recommended guidelines to reduce injuries for the worker.
- The National Fire Protection Association (NFPA) standards:
 - NFPA 921 – Guide for Fire and Explosion Investigations
 - NFPA 1001 – Standard for Fire Fighter Professional Qualifications
 - NFPA 1002 – Standard for Fire Apparatus Driver/ Operator Professional Qualifications
 - NFPA 1021 – Standard for Fire Officer Professional Qualifications
 - NFPA 1031 – Standard for Professional Qualifications for Fire Inspector and Plan Examiner
 - NFPA 1033 – Standard for Professional Qualifications for Fire Investigator
 - NFPA 1035 – Standard on Fire and Life Safety Educator, Public Information Officer, Youth Fire Setter Intervention Specialist and Youth Fire Setter Program Manager Professional Qualifications
 - NFPA 1041 – Standard for Fire Service Instructor Professional Qualifications
 - NFPA 1061 – Professional Qualifications for Public Safety Telecommunications Personnel

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- NFPA 1072 – Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications
- NFPA 1201 – Standard for Providing Fire and Emergency Services to the Public
- NFPA 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems
- NFPA 1500 – Standard on Fire Department Occupational Safety, Health, and Wellness Program
- NFPA 1521 – Standard for Fire Department Safety Officer Professional Qualifications
- NFPA 1582 – Standard on Comprehensive Occupational Medical Program for Fire Departments
- NFPA 1583 – Standard on Health-Related Fitness Programs for Fire Department Members
- NFPA 1720 – Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments
- NFPA 1730 – Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations
- NFPA 1851 Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting
- NFPA 1901 – Standard for Automotive Fire Apparatus
- NFPA 1911 – Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles
- The Commission on Fire Accreditation International (CFAI), which is a program that promotes fire service excellence by evaluating a fire department based on related National Fire Protection Association standards, local legislation and industry best practices (the parent organization for Commission on Fire Accreditation International is the Centre for Public Safety Excellence).
 - This program has been adopted by many fire departments in Canada as a measure of best practices. Within Ontario, Guelph, Kitchener, Toronto, and Ottawa are just a few fire departments that have obtained accreditation from the Commission on Fire Accreditation International.
- Fire Underwriters Survey (FUS) technical documents

SECTION 1: COMMUNITY AND FIRE DEPARTMENT OVERVIEW

- 1.1 COMMUNITY OVERVIEW
- 1.2 FIRE DEPARTMENT COMPOSITION
- 1.3 FIRE STATION LOCATIONS
- 1.4 CALL VOLUME EXPECTATIONS

Section 1: Community and Fire Department Overview

This Station Location Study for the Strathroy-Caradoc Fire Department (SCFD) analyzes and identifies current and probable community fire risks and needs over the next 10 years and beyond. This will greatly assist SCFD with future planning relating to staffing and response, fire and life safety programming, and asset management.

1.1 Community Overview

The Municipality of Strathroy-Caradoc is one of eight lower tier municipalities of Middlesex County. The municipality is bordered by Middlesex Centre on the east, Adelaide Metcalfe on the north, Southwest Middlesex on the west, and three First Nations to the south; Chippewas of the Thames First Nation, Muncey Delaware First Nation, and Onyota’Aka First Nation.

Important thoroughfares in Highway 402 and County Road 81 also serve the municipality. Three rail lines transverse the municipality. While most of Strathroy-Caradoc is agricultural, the transportation links create opportunities for industrial development.

With its history dating back to 1832, the Town of Strathroy and Township of Caradoc were amalgamated as the Municipality of Strathroy-Caradoc in 2001. Strathroy is the largest community in the Municipality, in 2021, based on Statistics Canada Census indicates Strathroy-Caradoc population was 23, 871 a change of 14.4 % growth, since 2016. Strathroy-Caradoc with a Land base of 270.86 square km. Based on 2024 Blackline consulting, Strathroy-Caradoc population is estimated at 25,877, indicating an annual growth of 2.73%

Other settlements in the Municipality include Mount Brydges, Melbourne, Campbellvale, and Delaware West, all considerably smaller than Strathroy. These settlements are primarily bedroom communities, with Mount Brydges being the largest of these with approximately 2,384 residents. In addition to the settlement area, it includes limited commercial and industrial space. Just east of Mount Brydges, there are three rural residential neighbourhoods. Melbourne has a population of approximately 300, of which roughly half live within the Strathroy-Caradoc boundary.

The Municipality has a large focus on agriculture including cash crops, tobacco, and livestock. Agriculture will continue to be a significant component of the Municipality’s economic base and the predominant use of land in the rural area.

Figure 1a: Middlesex/ Strathroy-Caradoc Map

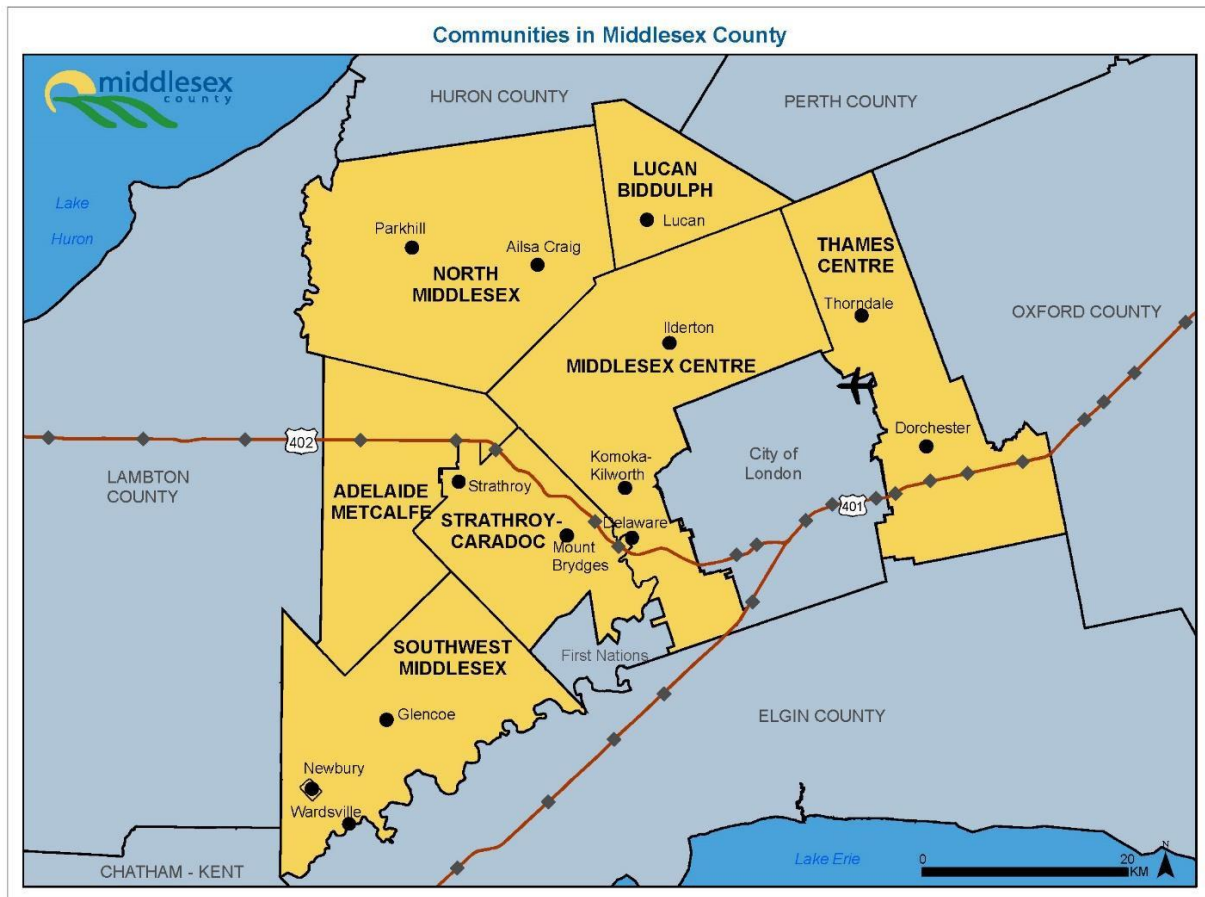
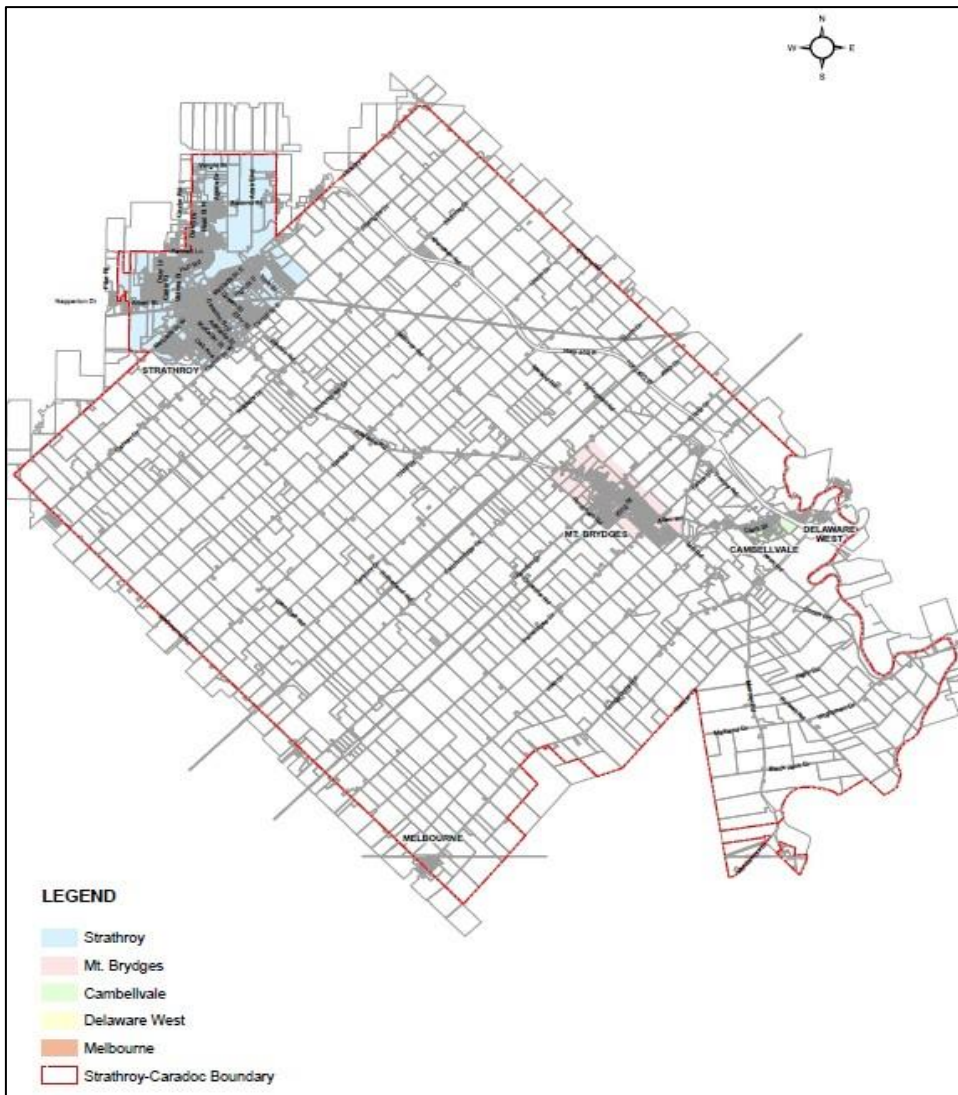


Figure 1b: Strathroy-Caradoc Overview Map



With a population estimate of 25, 877 with an annual growth of 2.73 % per year steady over the years, Strathroy-Caradoc has shown limited growth in the census years of 2001 to 2016. Since 2001, the population has grown 9.1%, albeit with some rise and fall. The 2016 Census data also shows that the median age is 43.7 years, with the provincial median age being 41.3 years.

Strathroy-Caradoc has 270.8 km² with a population density of 77.1 persons/ km².

Figure 1c: Mt. Brydges Urban Boundaries Map



1.2 Fire Department Composition

SCFD is comprised of 1 full-time Fire Chief, 1 full-time Fire service Coordinator, 1 full time Deputy Chief, 1 full-time Fire Prevention Officer, 1 Volunteer Deputy Chief, 2 Volunteer District Chiefs, 3 Deputy District Fire Chiefs 12 Volunteer Captains, and 60 Volunteer firefighters.

The Fire Department's operations are divided into four sections: Prevention and Public Education, Operations and Suppression, Training, and Administration.

Between 2022 and 2024, SCFD the Mt. Brydges station responded to an average of 125 emergency incidents per year.

1.3 Fire Station Locations

Figure 1d identifies the location of Station #2, which is located at 688 Bowen Street in the Village of Mount Brydges.

Figure 1d: SCFD Station Locations with 8-minute Travel Times

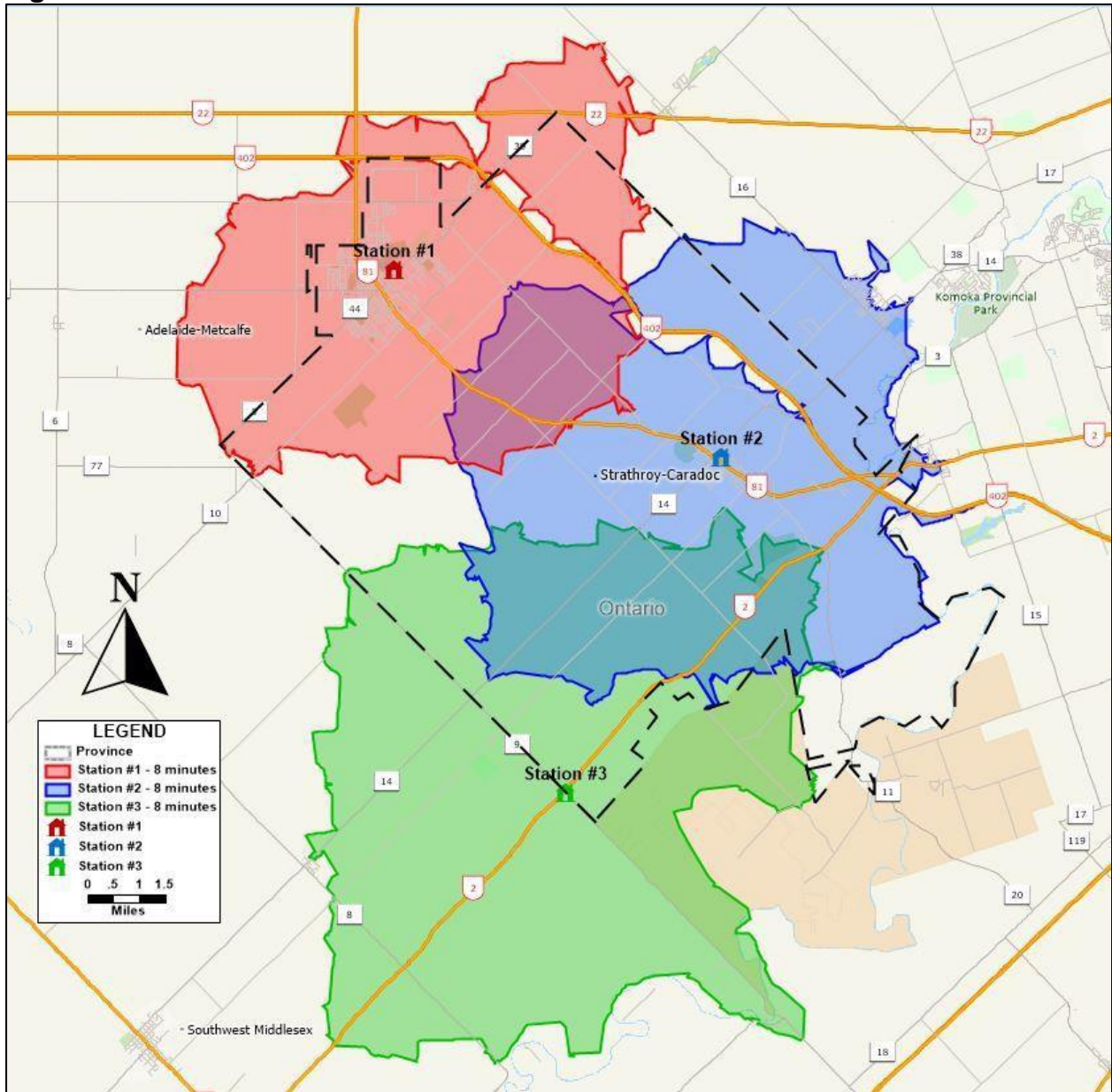
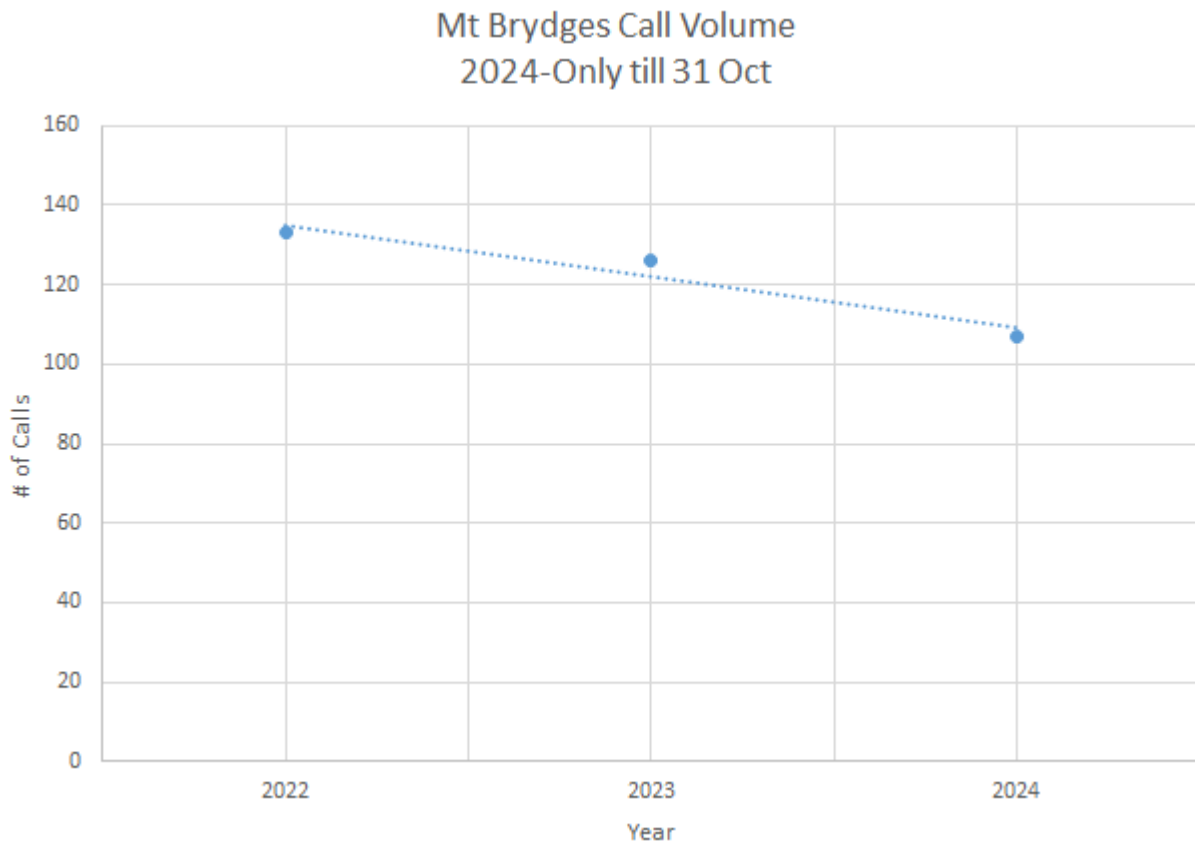


Figure 1d depicts the response coverage offered by the Mt. Brydges fire station in relation to the National Fire Protection Association (NFPA) response recommendations of 14 minutes. The map's legend notes an 8-minute travel time. This is the drive time coverage by each station, considering that it takes approximately 6 minutes for the volunteer firefighters to respond to the fire station, be geared up and depart from the station.

The recommended response time standard for rural areas (Mt. Brydges) under NFPA 1720 is 14 minutes.

The following chart identifies a 3-year comparison of responded Incidents for the Mt. Brydges Station. Mount Brydges covers a large portion of Hwy 402, and also backs up Strathroy and Melbourne stations for Incidents

Figure 1e: 2021 Total Station 2 Calls 3 year Comparison



Another important consideration in reviewing call data is location. The distribution of calls is essential for SCFD to fully understand the scope of their response expectations. Identifying call clusters, whether by location or type, is a useful tool. Implementing the first two lines of defence (public education and code enforcement) can aid in reducing the amount and frequency of calls that occur in clusters. Call location is also useful in ensuring that station location is meeting the needs of Strathroy-Caradoc. If calls are consistently occurring beyond the range of efficient and reliable response times as identified in NFPA 1720, corrections and improvements must be addressed. Figure 1e Highlights the calls for service for SCFD in 2023. It also has colour shading to display the 8-minute travel time areas for each station. Figure 1f identifies the SCFD station 2 Incident calls and the assistance calls to Station1 & 3. Figure 1g identifies Mt.Bydges calls only.

Figure 1f: SCFD Station 2 Incident Calls & Assistance to Stations 1 & 3

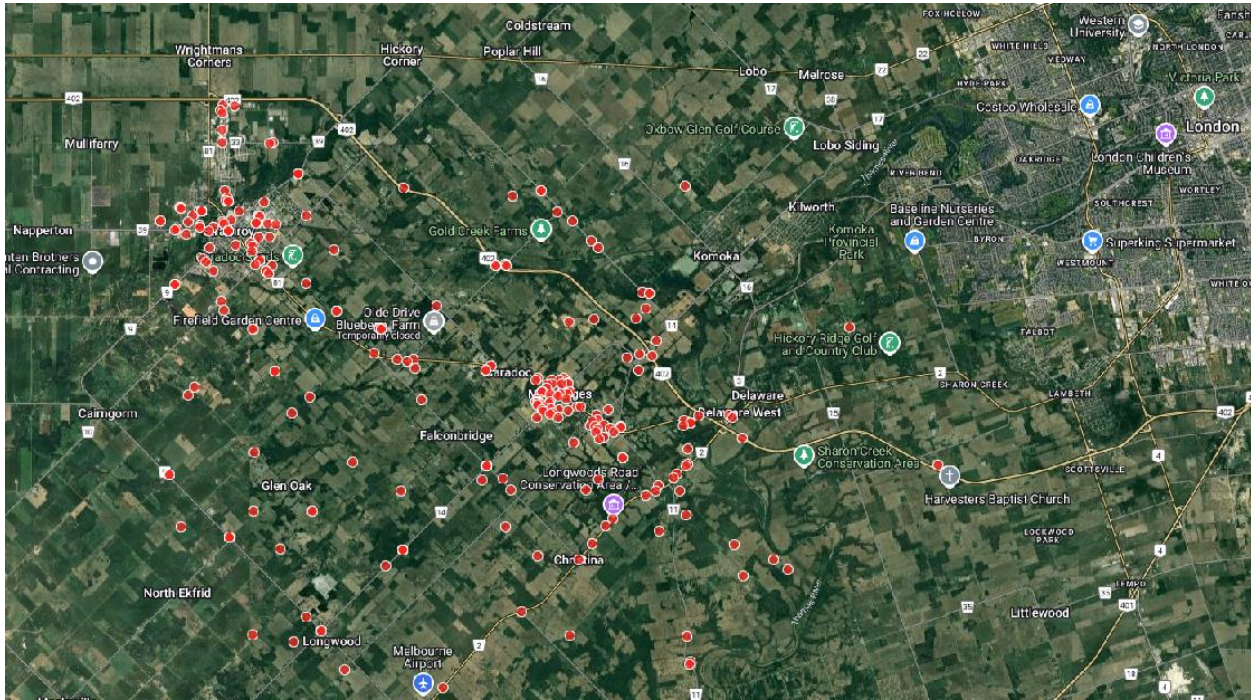
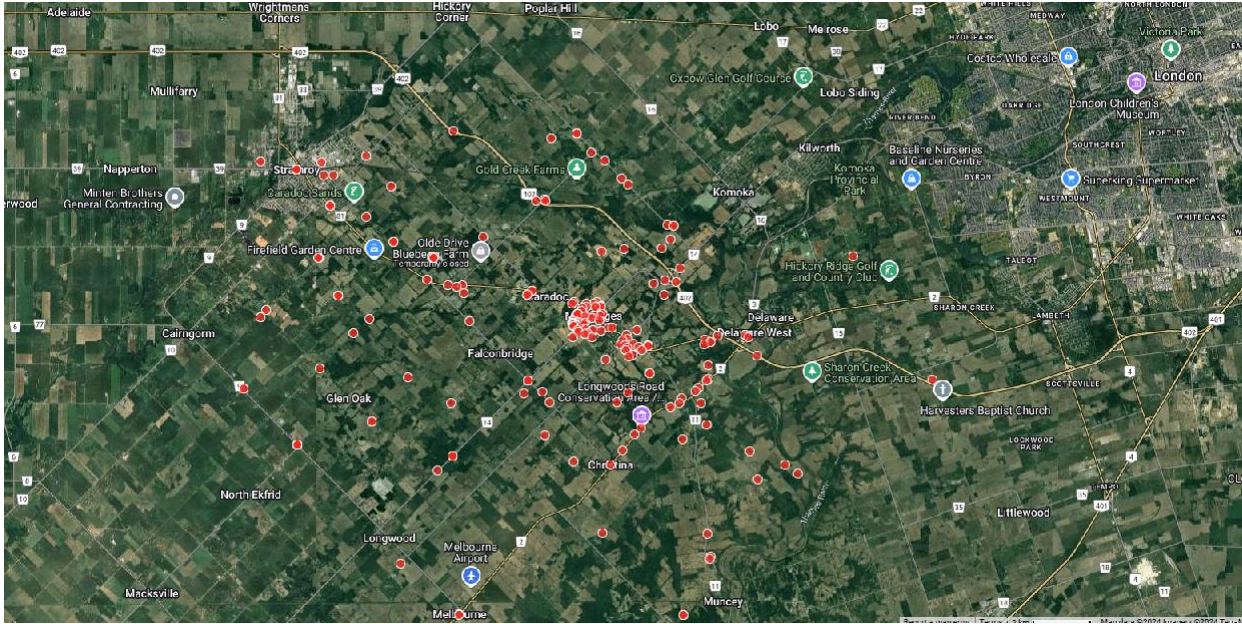


Figure 1g: SCFD Station 2 Incident Calls



1.4 Future Call Volume Expectations

There are factors that can affect the call volume from year to year such as weather patterns, including severe storms, or major road construction projects that detour traffic. Longer-lasting changes are directly related to these factors:

- Operating procedures
- Changes in technology
- Public education
- Community growth

Modifications to operating procedures can change call volume dramatically. For example, in those communities that participate in tiered medical response, calls will often increase the overall call volume of the department by 40-100 calls resulting in as many as 20% of the fire department calls being medical related.

Changes in technology can add or reduce the number of calls that the fire department responds too. For example, the addition of CO alarms, while having the potential to save lives, adds to the number of fire department responses. In 2018, CO calls made up 20% of the department responses. As more homes tie their smoke detectors and fire alarms into monitoring stations, it is anticipated that the number of alarm calls will increase. Police services have seen a significant growth in alarm calls, with some communities getting so many that they no longer respond to alarm calls unless a secondary system or person on scene has confirmed them.

Public education can influence call volumes. For example, education programs, including the enforcement of penalties for multiple alarms, can reduce the number of false alarms the fire department responds to. Education and enforcement on public burning can reduce the number of grass fires and nuisance smoke complaints.

Community growth will also have an impact on calls; greater populations along with increases in commercial/ industrial properties and traffic will affect call volume growth.

On January 19, 2021, the Director of Planning for Middlesex County provided a report to the County Committee of the Whole forecasting the growth of housing and populations for the county and each municipality in the county.

In the report, a low growth scenario, reference scenario, and high growth scenario were provided for each municipality. The report predicts that the annual growth rate of Strathroy-Caradoc will range from 1.4% (low scenario) to 2.9% (high scenario). The reference scenario is 1.8%. Strathroy-Caradoc has adopted the 2.1% annual growth as their forecasted growth rate. This planned growth is limited to the suburban areas of Strathroy and Mount Brydges.

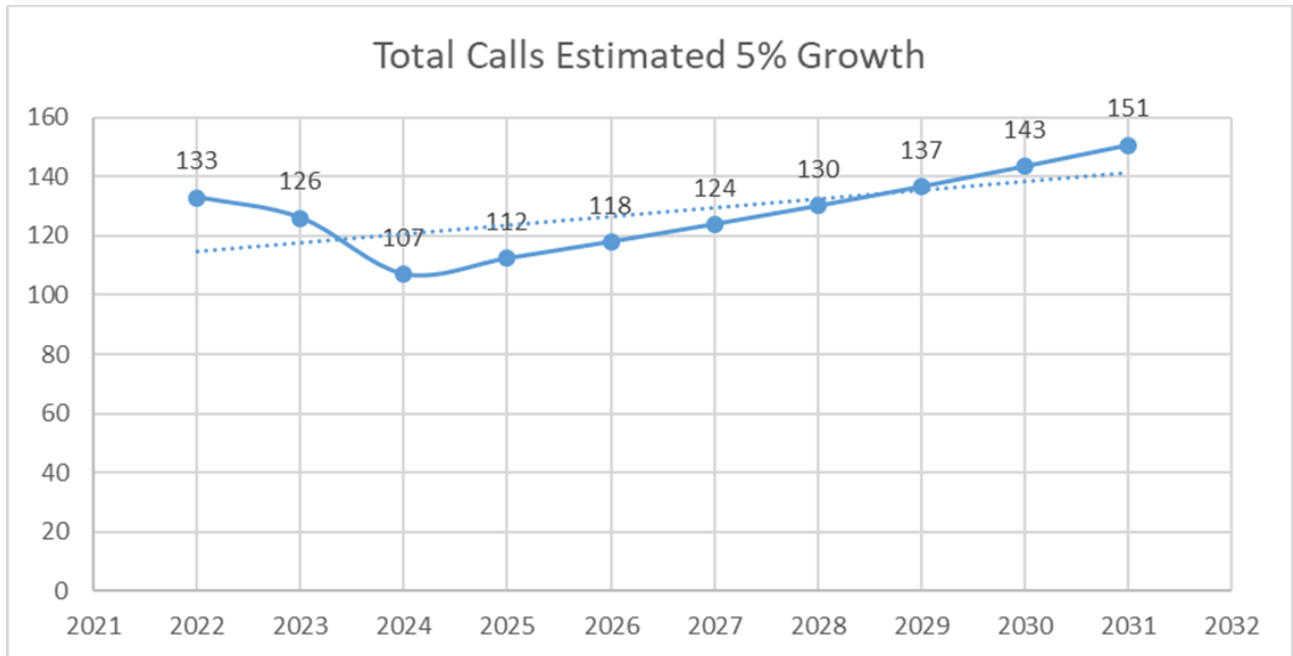
Figure 1h: Housing Forecast by Local Municipality

Middlesex County
Housing Forecast by Local Municipality – Low Scenario, 2016 to 2046

| Year | Village of Newbury | Municipality of Southwest Middlesex | Municipality of Strathroy-Caradoc | Municipality of Thames Centre | Municipality of Middlesex Centre | Municipality of North Middlesex | Township of Adelaide-Metcalfe | Township of Lucan Biddulph | Middlesex County |
|---|--------------------|-------------------------------------|-----------------------------------|-------------------------------|----------------------------------|---------------------------------|-------------------------------|----------------------------|------------------|
| 2016 | 180 | 2,350 | 8,300 | 4,920 | 5,990 | 2,330 | 990 | 1,790 | 26,820 |
| 2021 | 180 | 2,390 | 9,050 | 5,240 | 6,550 | 2,370 | 1,020 | 1,970 | 28,770 |
| 2026 | 200 | 2,550 | 9,800 | 5,620 | 7,110 | 2,560 | 1,110 | 2,080 | 31,030 |
| 2031 | 210 | 2,620 | 10,530 | 5,910 | 7,690 | 2,630 | 1,150 | 2,210 | 32,950 |
| 2036 | 220 | 2,680 | 11,230 | 6,220 | 8,430 | 2,700 | 1,190 | 2,380 | 35,060 |
| 2041 | 240 | 2,740 | 11,980 | 6,550 | 9,310 | 2,770 | 1,230 | 2,560 | 37,380 |
| 2046 | 250 | 2,790 | 12,660 | 6,840 | 10,180 | 2,810 | 1,260 | 2,780 | 39,560 |
| Share of 2016 County Housing | 1% | 9% | 31% | 18% | 22% | 9% | 4% | 7% | 100% |
| Share of 2046 County Housing | 1% | 7% | 32% | 17% | 26% | 7% | 3% | 7% | 100% |
| Housing Growth | | | | | | | | | |
| 2016-2046 | 70 | 440 | 4,360 | 1,920 | 4,190 | 480 | 270 | 990 | 12,740 |
| Annual Growth Rate, 2016-2046 | 1.1% | 0.6% | 1.4% | 1.1% | 1.8% | 0.6% | 0.8% | 1.5% | 1.3% |
| Share of County Housing Growth, 2016-2046 | 1% | 3% | 34% | 15% | 33% | 4% | 2% | 8% | 100% |

This forecasted growth in households appears, over the long-term, to be steady, but not overwhelming. Using the report figures to project the call volume, we can project that the call volumes of the fire department will range from 133 (low scenario) to 151 calls (high scenario) per year.

Figure 1i: 3 Year comparison Call Volume Projections Mount Brydges Station



While call volume will increase with the population growth, it will be primarily in the two developed communities of Strathroy and Mount Brydges.

SECTION 2: FIRE STATION REVIEW

2.1 STATION #2 - OVERVIEW

2.1 Fire Station Review

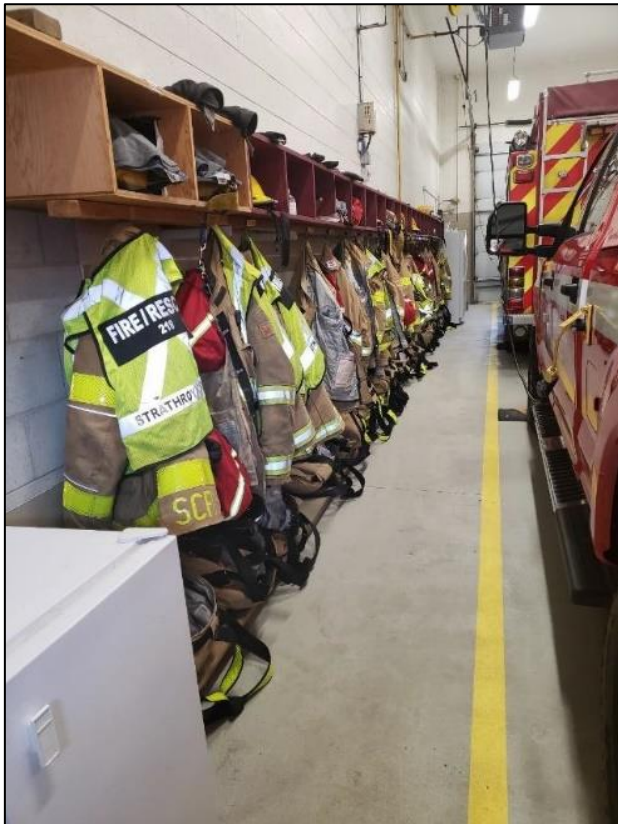
Station #2 is located at 688 Bowen Street, in the Village of Mount Brydges

2.2 Station #2 - Overview

Station #2 is a two-bay, single length garage structure, built in approximately 1994.

This station is home to an Engine, Tanker, and Service pick-up truck, which is designed to carry crew and equipment. Although the length of the bays comfortably hold an apparatus and a pick-up truck, they would not be adequate to hold a third larger apparatus.





The station does not have shower facilities for the firefighters. Reducing the risk to firefighters and their families, proper showers are recommended for use following calls to decontaminate from pollutants such as blood, smoke, and chemicals.

The station has a training room but lacks a fitness room.

Firefighter bunker gear is stored on the apparatus floor exposing it to diesel fume contamination. It is recommended that bunker gear be stored in a separate ventilated room.

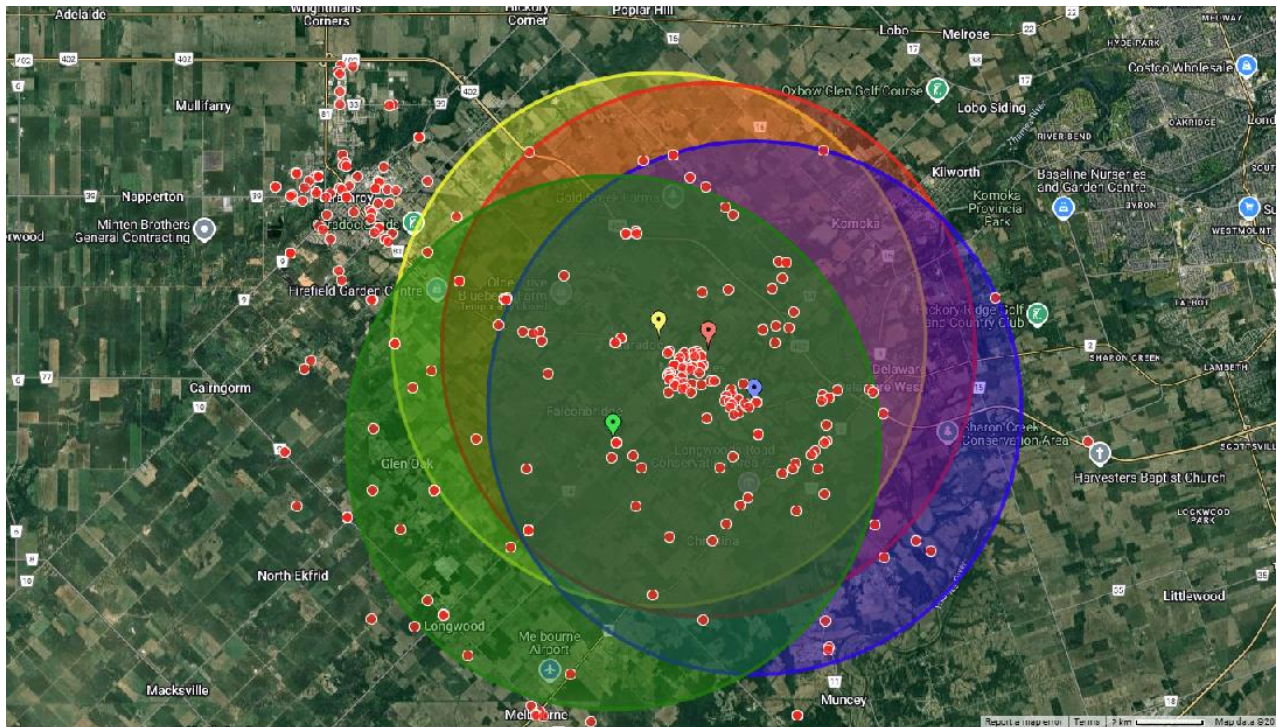
For the apparatus to enter the drive-through bays from the rear, they must travel over private property owned by the Royal Canadian Legion. The

Municipality should confirm a right of way is in place to guarantee fire department access.

It is recommended that an addition be added to the station to include a proper office, training room, and bunker gear storage.

Using the NFPA Standard 1720 10-minute response time for a suburban response using volunteers within the core of the Mt Brydges boundaries, the following charts show the travel capabilities using a 8-minute travel time (based on a 4-minute turn out time) station options. The various colors demonstrates the area that can be covered within 8 minutes travel.

Figure 2a: SCFD Station 2 Incident Calls



Note: travel time is based on the speed limits within the community, stop signs, traffic lights, one-way streets, etc. We acknowledge that fire apparatuses are legally allowed to exceed the speed limit while using lights and sirens when safe to do so, therefore under light traffic conditions and good weather, the fire trucks can reach a further distance than noted.

Station #2 - Solutions

Station #2 in Mount Brydges is landlocked and has no room for expansion. As the community grows and there is a transition to a composite staffing model at the station, there is the ability to adjust the location of the station.

Taking into consideration that Station #3 there would be the opportunity to build one station that could serve Mount Brydges and cover the response requirements over to the hamlet of Melbourne.

A station along County Road 14 (Glendon Dr.) between Christina Road and Rougham Road would ensure a 2–3-minute travel time into the core of Mount Brydges, while providing good north / south access and west access to the western boundary of the municipality.

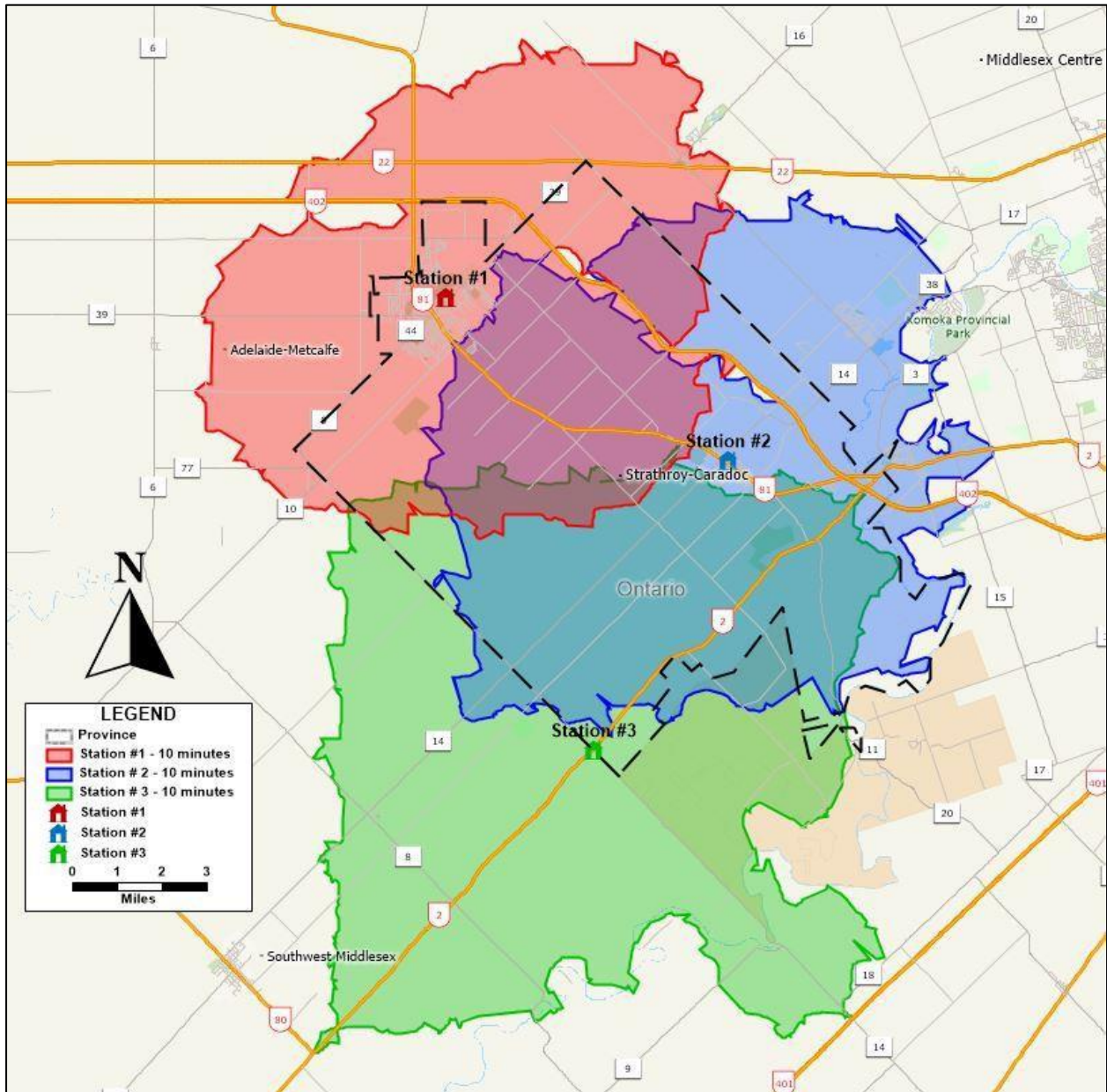
While there would be a 9-minute travel time to Melbourne, the current Melbourne Station had a 9 minute, 50 second 80th percentile turnout time (time for the first truck to leave the station). In other words, a career truck based just west of Mount Brydges would have a similar response time as a volunteer truck based right in Melbourne.

The Melbourne Station averages 48% of its calls within the municipality of Strathroy-Caradoc. From 2020 – 2023, the station averaged 40 responses per year (34 in 2020) with an average of 19 calls within the municipality. This number of calls could be easily incorporated into the response capabilities of Station #2.

Using the NFPA Standard 1720 14-minute response time for a rural response using volunteers within the core of the Strathroy-Caradoc boundaries, the following charts show the travel capabilities using a 10-minute travel time (based on a 4-minute turnout time) for the two station options in the south. The beige area illustrates the area that can be covered within 8 minutes travel.

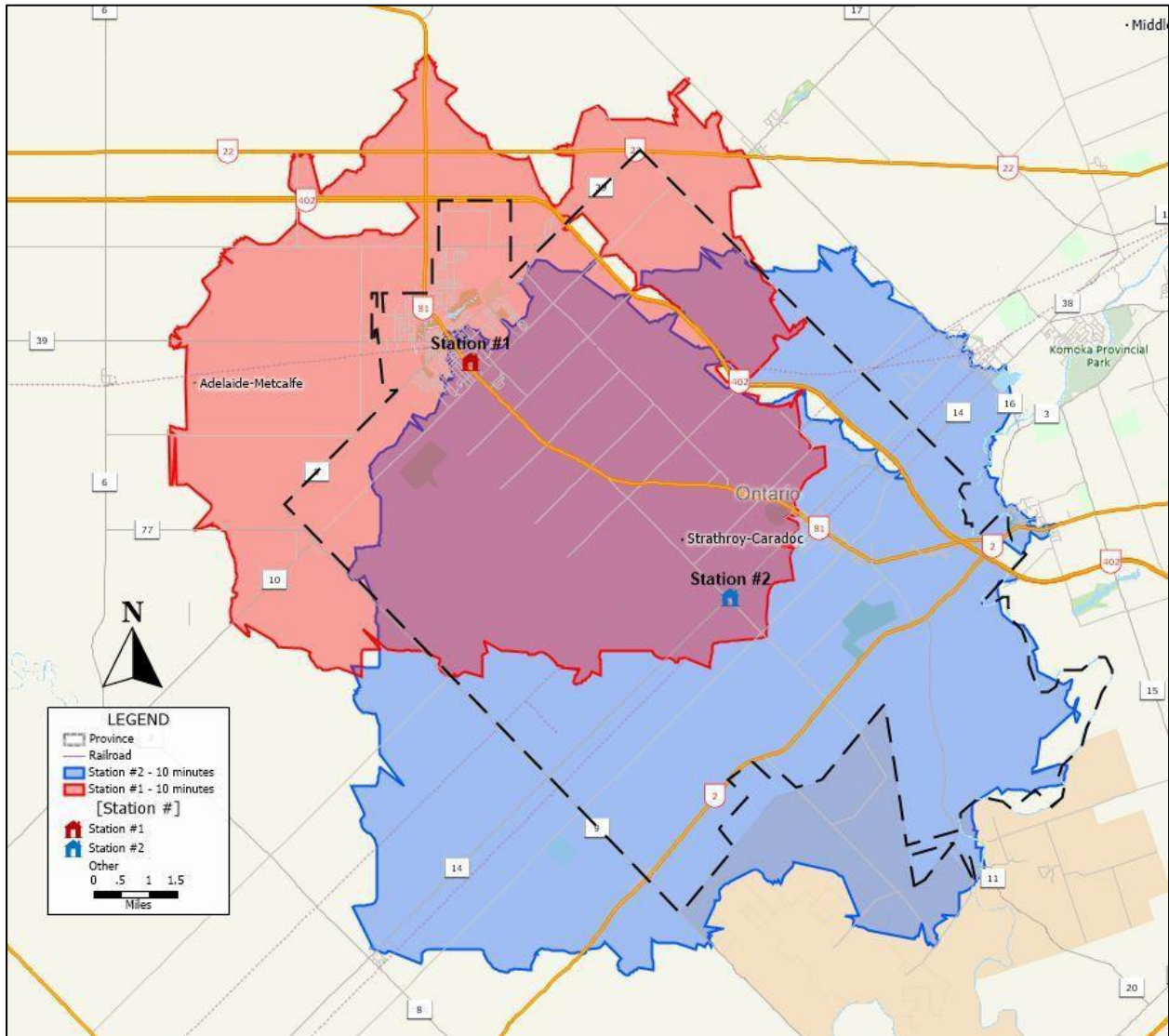
The first map shows the current station locations with a 10-minute travel time. As can be seen, the municipality, with only a small area to the southern border, is covered within a 10-minute travel time. A challenge, however, is that the Melbourne Station (Station #3) has more than a 9-minute (80th percentile) turnout time. Therefore, the area covered by the green Station #3 area does not reflect a realistic response time.

Figure 2c: 10-Minute Travel Grid from Current Stations



The following map provides a 10-minute travel time from a station located at Glendon Drive and Christina Road. The map clearly demonstrates that the municipality can be covered effectively from a two-station model.

Figure 2d: 10-Minute Travel Grid from Two New Stations



When we further examine where the firefighters live in relation to their assigned fire stations, we note very few firefighters live in proximity to Station #3, which contributes to the extended turnout times. Using a 6-minute travel time to the station, the map shows that approximately half of the Station #3 volunteers live more than 6 minutes from the station

SECTION 3: CONCLUSION

3.1 Conclusion

3.2 Phase 2

3.1 Conclusion

We have provided 4 options for the location of the Mt. Brydges station. The municipality has two fire stations that have capacity and structural challenges that are limiting their long-term life span.

3.2 Phase 2

Phase 2 of the fire service station plan would be to procure land on **Glendon Drive between Christina Road and Rougham Road** for a new Station #2. This station would adequately serve both Mount Brydges and Melbourne.

The new station could be built to accommodate a volunteer deployment initially but be designed to expand to accommodate career firefighters in the more distant future.

With this model, the municipality of Southwest Middlesex would be required to cover a larger portion of their own municipality as the Melbourne Station currently covers a large portion west of County Road 9.

Option Falconbridge offers easy access to Strathroy where many calls require Mt Brydges - Station 2 as back up or second station in. This land is currently the SCFD training ground and the municipality already owns the land. This location would allow a quick response to all areas of Mt Brydges urban growth boundaries.

Option Glendon Drive in close proximity of Mt Brydges Ford would be the most central location with easy access out covering the entirety of the urban growth boundary, and is a quick response into Strathroy as a second station. It also provides the best access to the 402 for MVC's.

Option Parkhouse/Allen Rd area this area would be at the outer limits of the urban growth area and the longest response time to Strathroy. This area is on the opposite side of the tracks, which could create a time delay however; this line has significantly fewer trains than the line dividing Strathroy. This location is next to new development and quickest to Delaware West. However is not the best location when considering the 3-year call history locations.

This project should take place in the long-term (3-5 years).