Winnipeg Fire Paramedic Service

Manitoba

MASTER PLAN

2018

Emergency Services Consulting International

Providing Expertise and Guidance that Enhances Community Safety

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EXECUTIVE SUMMARY

Emergency Services Consulting International (ESCI) was engaged by the City of Winnipeg Fire Paramedic Service to conduct an emergency service master plan for the agency.

Purpose and Approach

The purpose of a master plan for the fire paramedic service is to evaluate the agency in relation to the community's current risks, anticipate community growth (and therefore associated risk), and recommend steps to position the agency to address that growth in advance with appropriate resources and infrastructure. In short, a master plan keeps the agency from lagging behind community growth and development, maintaining or enhancing service as the community grows. It is an effective policy-making and budgeting tool as well. Knowing where and how the community will grow into the future and what the fire paramedic service will need in terms of policy and budget support to address it—well in advance—is a critical element of City Council deliberation.

The first phase of this master plan was to conduct a baseline assessment of the current conditions and current service performance of the fire paramedic service. The purpose of this phase was to assess the agency's infrastructure, operations, and service delivery in comparison to industry standards and best practices, as well as to create a benchmark against which the options for future service delivery can be measured.

The second phase was to assess the potential future community conditions, service demand, and risks that the organization may be expected to serve. The purpose of this phase was to determine community growth projections and interpret the impact on emergency service planning and delivery. The third phase was to identify future service delivery system models, identifying the appropriate staffing levels to increase the effectiveness of emergency incident actions.

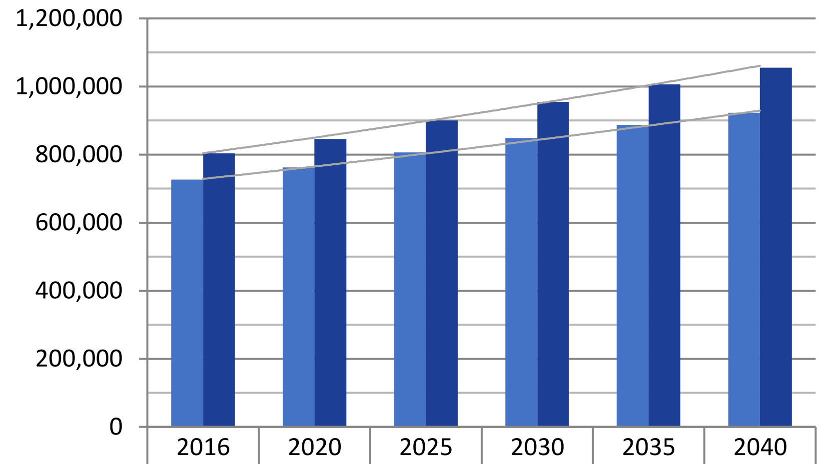
Finally, the fourth phase was to recommend program, staffing, equipment, and capital facilities strategies—including future development—to meet the needs of the community now and into the foreseeable future, keeping pace with growth and address gaps in the existing system where possible.

Evaluation of Current Conditions

The Winnipeg Fire Paramedic Service (WFPS) is a modern agency with appropriate equipment, many facilities that need upgrade or relocation, and personnel who are busier than most comparable agencies according to the Municipal Benchmarking Network Canada (MBNC). Of the ten other peer cities listed in the MBNC 2015 five-year report, WFPS is at the top for commercial/industrial (C&I) structural fires with losses per 1,000 C&I properties (11.27 per 1,000, or over 52% higher than the next highest city—Ottawa); and the number of medical calls handled by WFPS per 1,000 population (60.47 per 1,000, or nearly 49% higher than the next highest city—Montreal).

These are important factors to consider, given the growth ESCI projects for the community. If WFPS is already experiencing higher commercial and industrial fires and more medical emergencies than that of their contemporaries, growth will only exacerbate the problem. The City of Winnipeg 2016 Population, Housing, and Economic Forecast reflected a population of 726,700[1] and grew by over 8.5 percent to an estimated 780,000[2] in 2018, a rate of 20,533 people per year, or 2.86 percent per year. This exceeds the 2020 projected growth in the city.

City of Winnipeg and Winnipeg CMA Population Forecast, 2016–2040



	2016	2020	2025	2030	2035	2040
City of Winnipeg	726,700	761,900	806,200	848,700	887,400	922,600
Winnipeg CMA	803,500	846,000	900,500	954,500	1,006,000	1,055,500

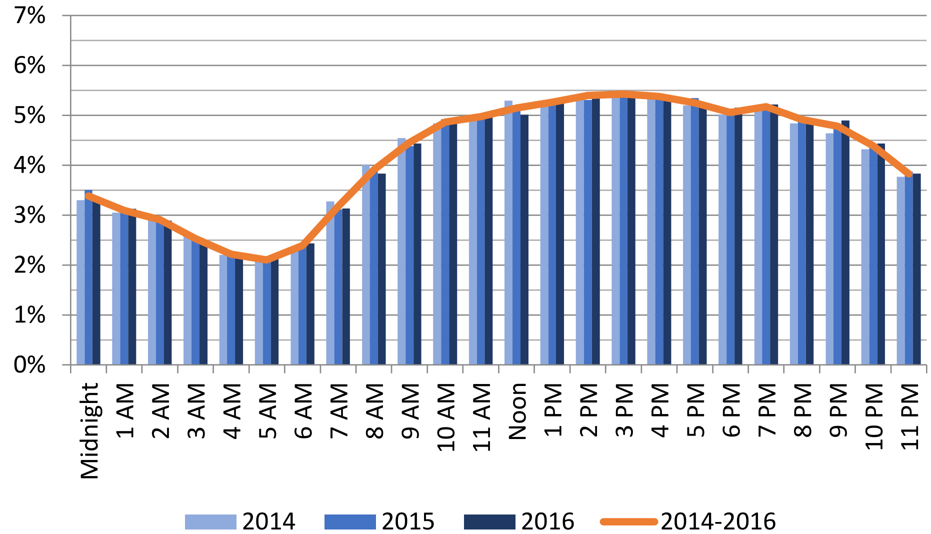
Using the more conservative growth estimates the City uses, the population will grow by over 28 percent (from 2015–2040).

Service Delivery and Response Performance

There is no significant shift in emergency response demand by day of week or month of year in Winnipeg. Analysis of temporal variation by hour of day, however, does result in a typical pattern of emergency response demand. Emergency demand follows a pattern of human activity. As people sleep, emergency demand for service declines. As people awaken to prepare for the day, call volume increases. As people are active during the day, emergency demand peaks in the mid-afternoon. As the day comes to a close, people return home, settle down, and prepare for sleep. Emergency demand begins to decline again until people are asleep, where demand is lowest. The pattern in Winnipeg is illustrated in the following figure.

[1] City of Winnipeg 2016 Population, Housing, and Economic Forecast.
[2] *2017 World Population Review*, http://worldpopulationreview.com/world-cities/winnipeg-population, accessed 3-26-2018.

Service Demand by Hour of the Day, 2014–2016



Exceptions to this diurnal pattern exist in communities where heavy industry dominates its workforce with day-, swing-, and graveyard shifts, which disrupts the normal pattern. This is not the case in Winnipeg. This is an important factor, since it allows the use of "Peak Activity Units" to supplement the 24-hour shift that represents the standing army. Peak Activity Units (PAUs) can take pressure off of the busiest emergency response crews and are used successfully by WFPS.

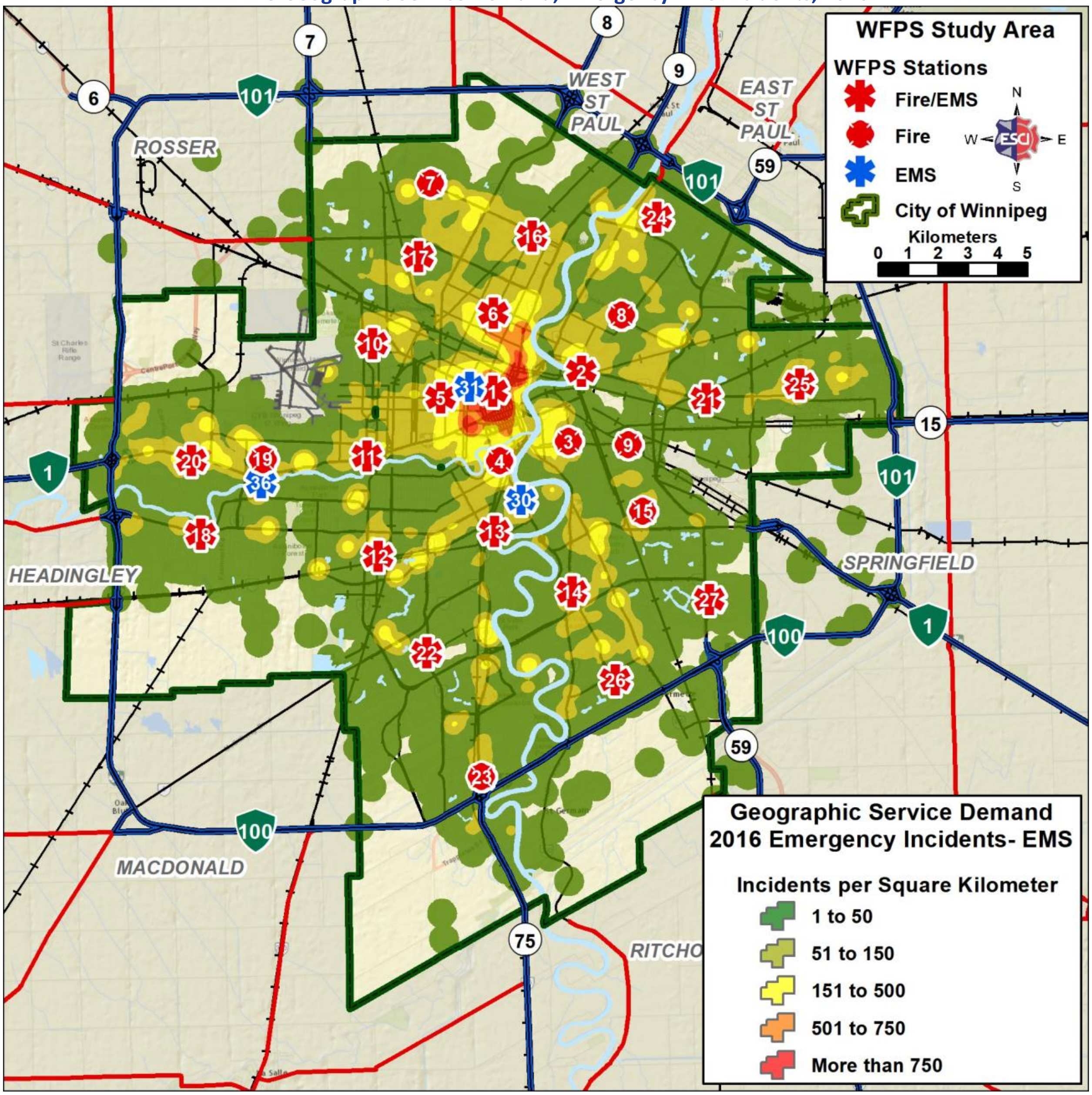
WFPS has a typical frequency for EMS incidents at just over 81 percent (81.3%) of all calls for service (demand). Fires represent 1.3 percent of the total call volume, or over four fires per day in the city. The percentage is a typical make-up of a modern fire paramedic service agency.

WFPS Responses by Type, 2016

CALL TYPE	OBSERVATIONS	PERCENT
Fires	1,496	1.3%
Rupture or explosion	3	0.0%
EMS/Rescue	90,779	81.3%
Hazardous condition	865	0.8%
Service call	5,798	5.1%
Good intent call	1,298	1.1%
False call	7,742	6.9%
Severe weather	0	0.0%
Other	3,827	3.4%
Total	**112,053**	**100%**

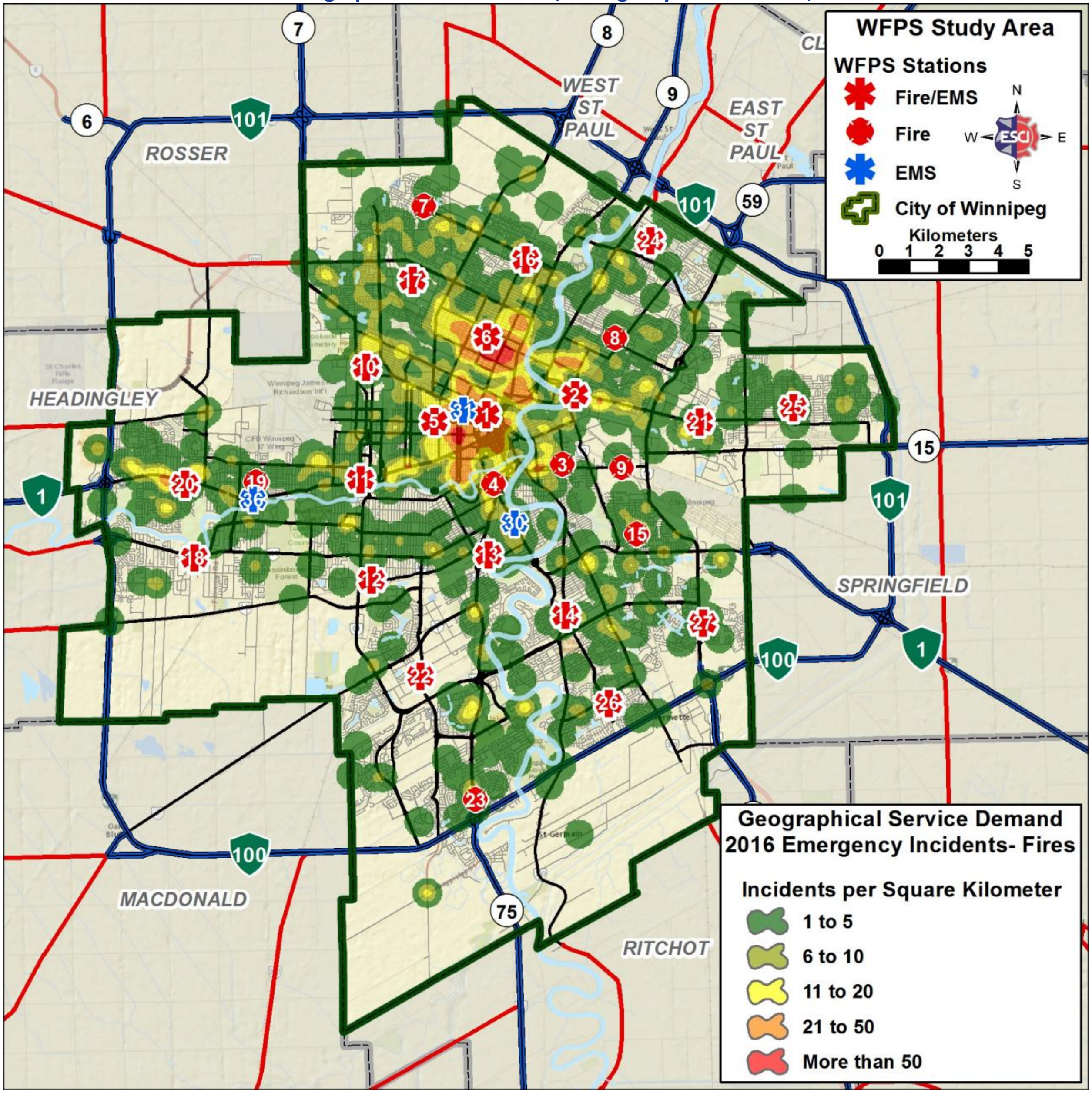
WFPS service demand (both fire and EMS incidents) is highest and concentrated in the central core area of the city, between Stations 1, 4, 5 and 6. The incident density by call type is depicted in the following two heat maps.

WFPS Geographic Service Demand, Emergency EMS Incidents, 2016



Concentration of population has a direct correlation to density of emergency response activity. For both medical response (above) and fire response (on the following page), the centre of the city represents a hub of emergency response activity.

WFPS Geographic Service Demand, Emergency Fire Incidents, 2016

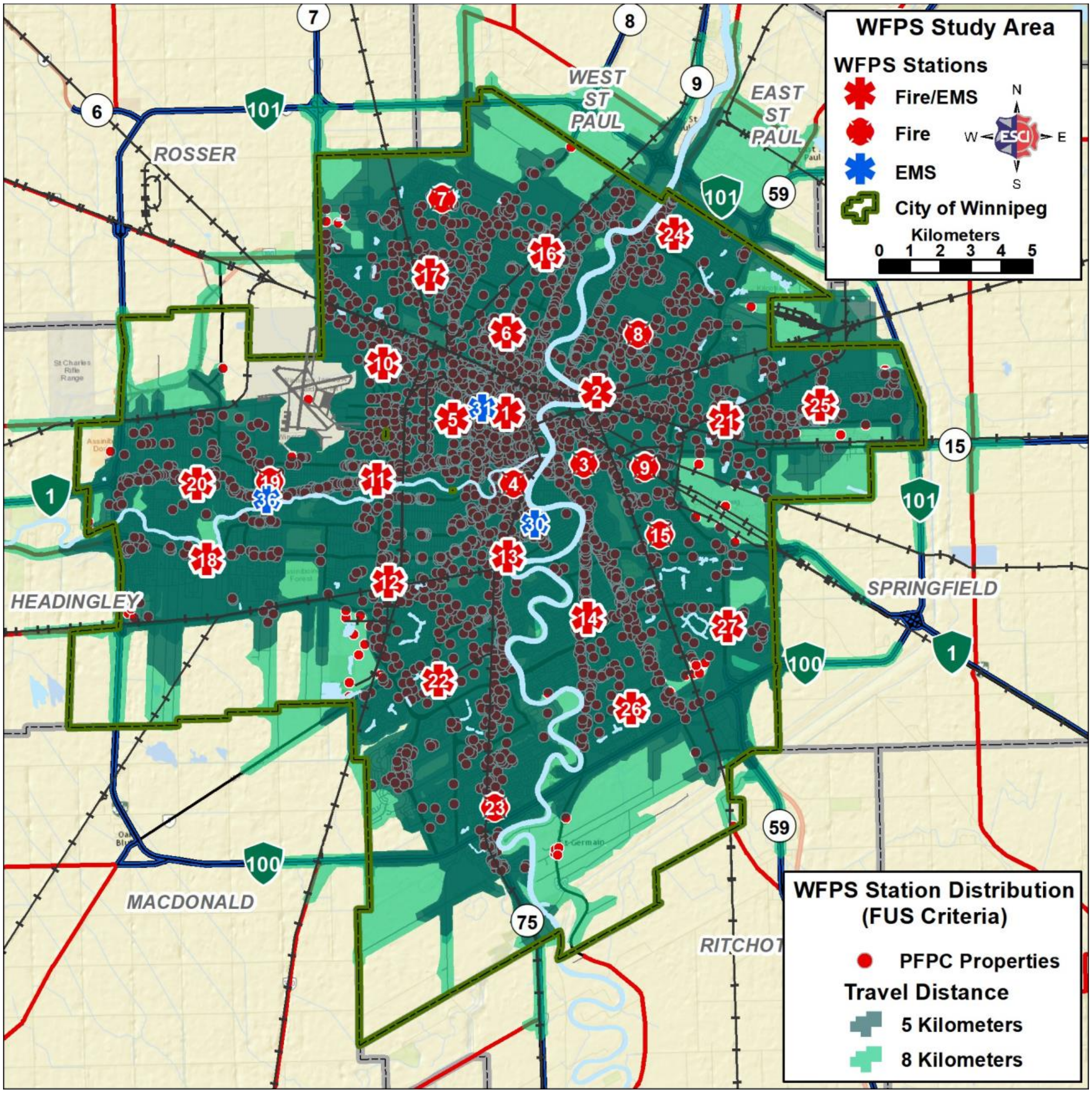


While the number of incidents per square kilometer differ between medical and fire incidents, the same geographic areas host the highest concentrations of emergency responses.

The Fire Underwriters Survey (FUS) is a national organization of private sector property and casualty insurance providers. FUS provides data from surveys of fire protection programs throughout Canada. The results of these surveys are utilized by insurance providers to establish the Public Fire Protection Classification (PFPC) and Dwelling Protection Grade (DPG) within a community.

The PFPC is a numerical grading system with Class 1 representing exemplary fire protection and Class 10 indicating little or no fire protection; which pertains to fire protection of multifamily residential, commercial, industrial, and institutional properties. The PFPC does not apply to properties beyond five kilometers travel over the existing road network from a recognized fire station.

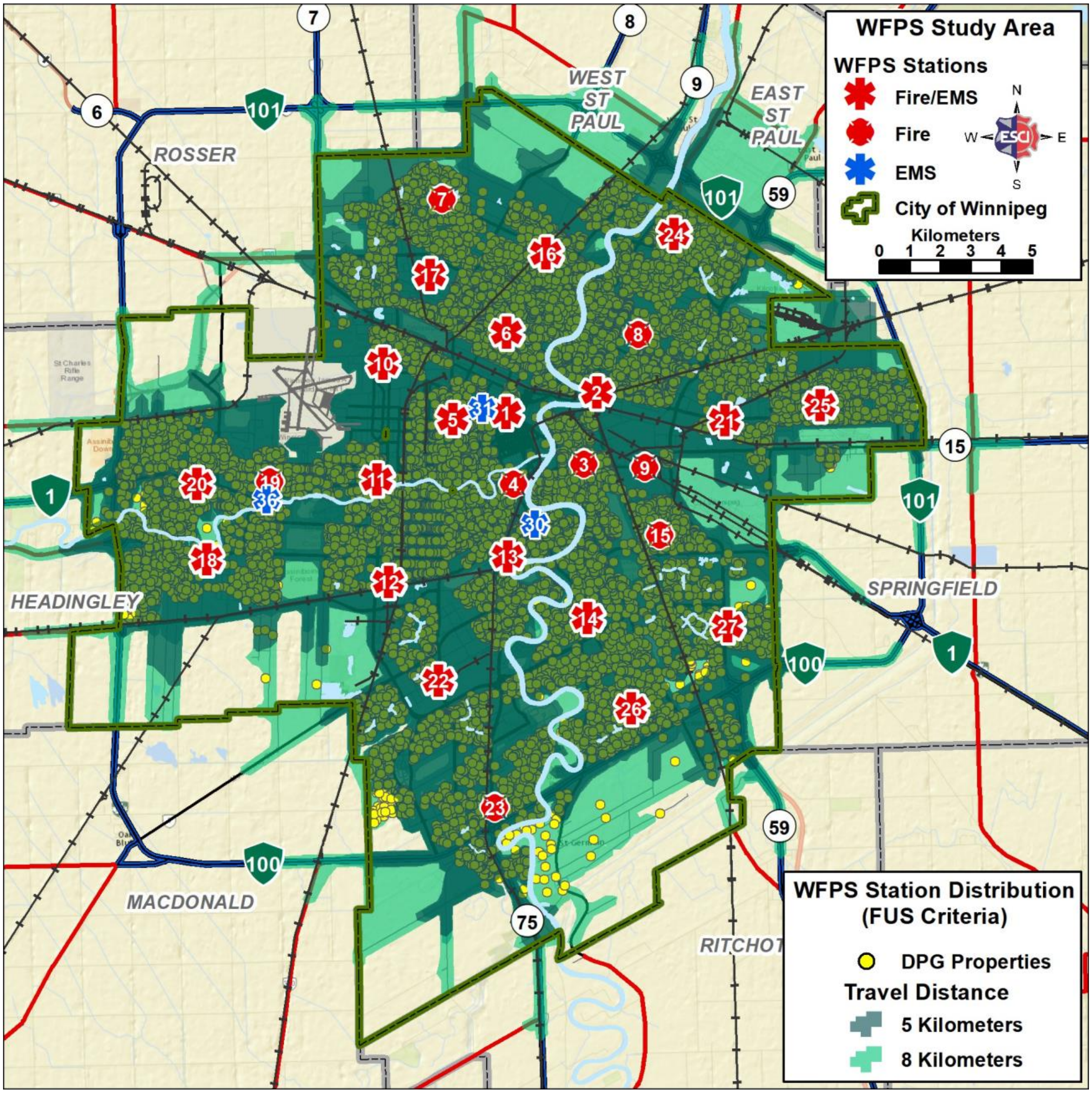
WFPS Station Distribution, FUS PFPC Criteria



Ninety-eight percent of properties zoned as multifamily residential, commercial, industrial, or institutional (PFPC properties) are within 5 kilometers travel of a WFPS fire station.

The DPG is a numerical grading scale of 1 to 5 (1 the highest grade and 5 is little or no fire protection); and assesses the protection of structures such as single-family residential properties. Properties must be within 8 kilometers of a recognized fire paramedic station to receive a Dwelling Protection Grade (DPG).

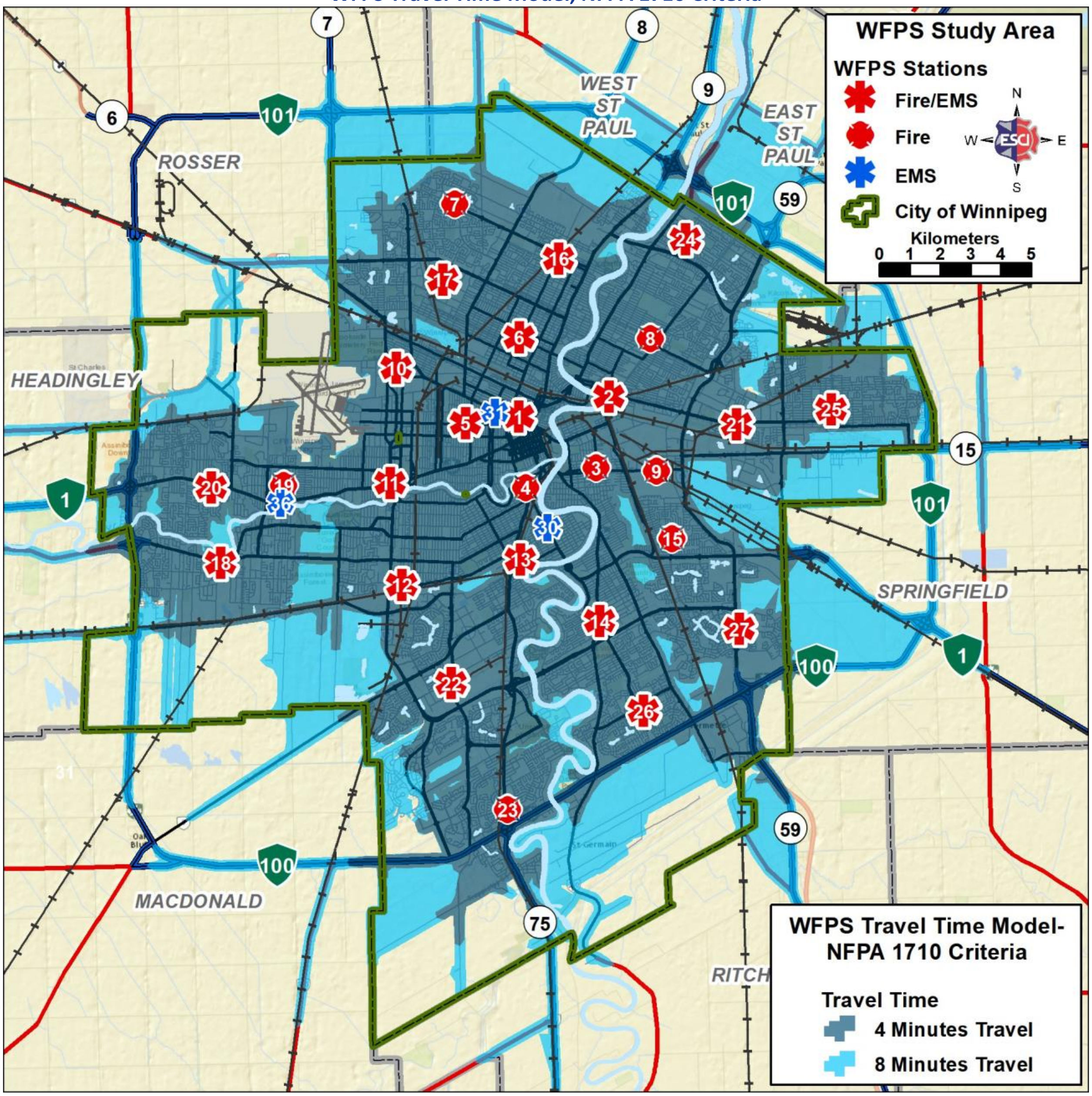
WFPS Station Distribution, FUS DPG Criteria



The above map reveals that nearly all (99 percent) of the properties zoned as single- or two-family residential dwellings (DPG properties) are within 8 kilometers travel of a fire station. These two maps reflect that station coverage of these two criteria is exceptional. Note that travel time from the three EMS stations (30, 31, and 36) is not modeled in these figures.

Fire service industry best practices documents such as the National Fire Protection Association (NFPA) 1710 Standard for Career Fire Departments, specify that career staffed, urban fire departments should deploy resources such that 90 percent of emergency service demand can be reached in four minutes travel time or less.[3] Additionally, NFPA 1710 recommends that a full first alarm assignment should arrive in eight minutes travel time or less at a fire suppression incident (measured at the 90th percentile).

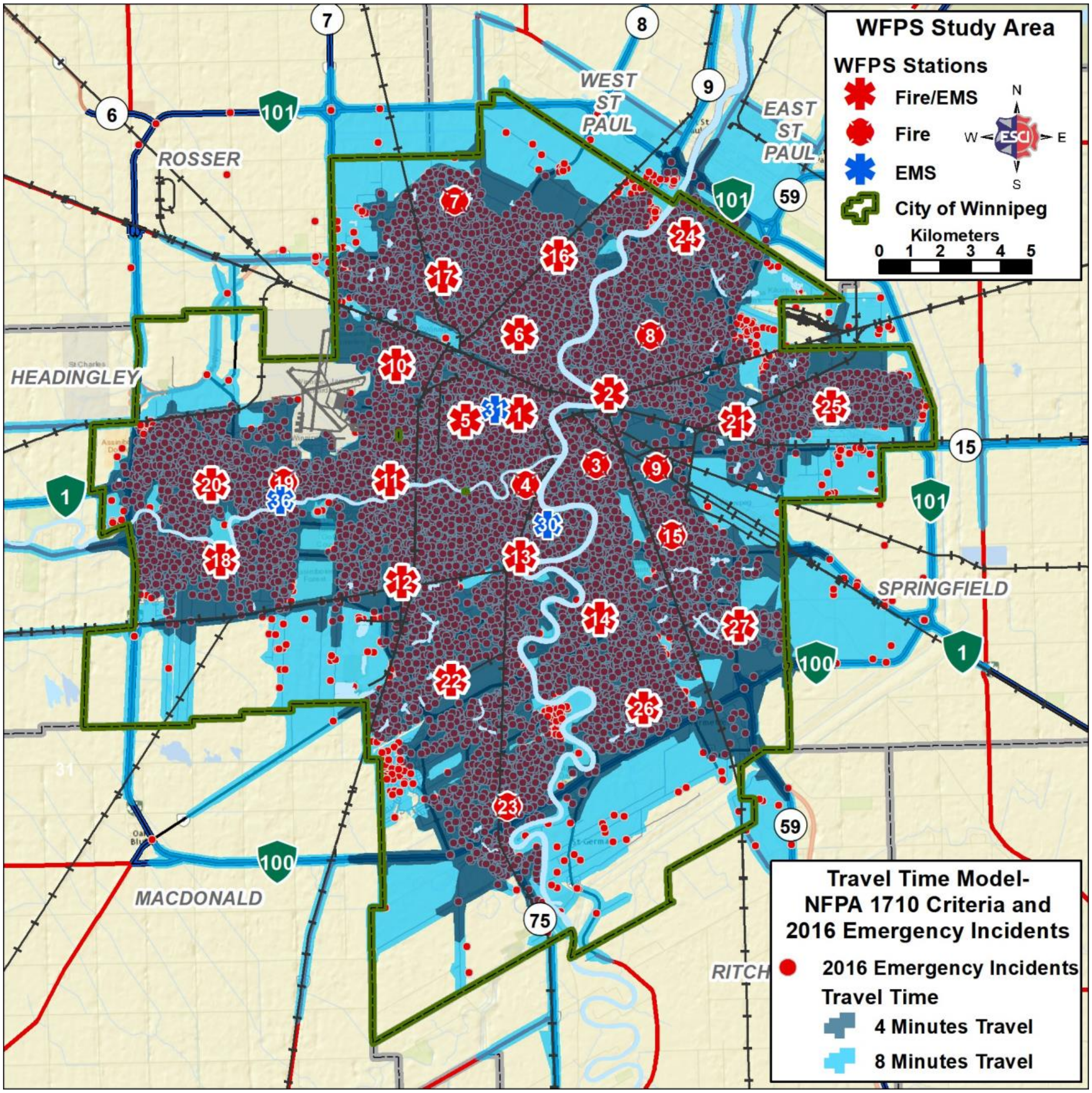
WFPS Travel Time Model, NFPA 1710 Criteria



[3] NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (National Fire Protection Association, 2016).

The preceding map demonstrates that the current deployment of WFPS resources provides good coverage to the most heavily populated and developed portions of Winnipeg. The following map displays 2016 emergency service demand overlaid on the four- and eight-minute travel time model.

WFPS 2016 Emergency Service Demand and Travel Time Model

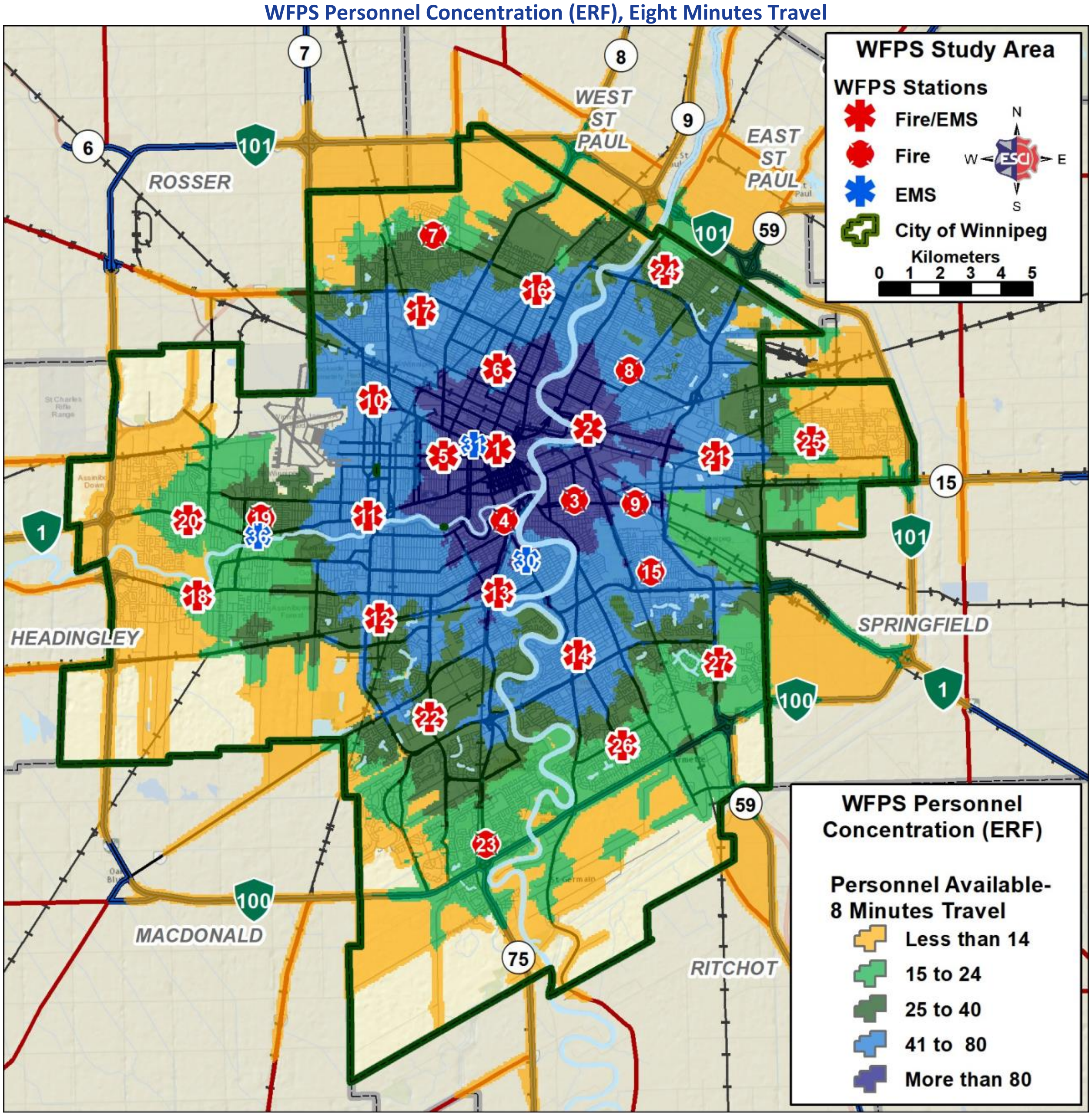


The above map illustrates that based on the four-minute travel time model; WFPS apparatus can theoretically reach approximately 97 percent of current service demand in four minutes or less travel time. This assumes the units are in quarters and available for response. It further reflects the 2016 demand pattern. If this pattern shifts dramatically, coverage may also be altered.

In addition to the *distribution* of resources to provide an effective response time, *concentration* of resources is critical to the more significant responses, such as fire, motor vehicle collisions, and other multi-unit response call types. It is critical that sufficient resources (personnel and equipment) arrive to a significant incident quickly enough to have a positive effect on the incident (mitigation).

The NFPA 1710 standard specifies that the effective response force (ERF) assignment for each of the response types handled in a jurisdiction (as an initial first alarm response) should arrive within eight minutes travel time, 90 percent of the time (90th percentile).

WFPS Personnel Concentration (ERF), Eight Minutes Travel



The previous map demonstrates that WFPS personnel are distributed in the service area in a manner that provides adequate personnel throughout the majority of Winnipeg. In addition, as the concentration of stations increases in the middle of the city; more personnel are available in eight minutes. This insures that adequate personnel and apparatus are available to mitigate higher risk incidents, which are more likely in the downtown area. Also, adequate personnel are available to handle simultaneous incidents. Response performance is handled more specifically in the companion *Community Risk Assessment: Standards of Cover* document, but is also discussed in this document.

The following figure reflects NFPA 1710's response time elements for emergencies.

NFPA 1710 Emergency Response Performance Elements

Response Element	NFPA Recommendation
Total Call Processing	64 Seconds @ 90th Percentile (some exceptions)
Turnout Time	60 Seconds @ 90th Percentile for EMS/Other 80 Seconds @ 90th Percentile for Fire/Special Ops
Travel Time – First unit on scene, all emergencies	4 Minutes @ 90th Percentile
Travel Time – First arriving ALS unit	8 Minutes @ 90th Percentile
Travel Time – Full Effective Response Force (Fire Incident)	8 Minutes @ 90th Percentile
Travel Time – Full Effective Response Force (High Rise fire)	10 minutes, 10 seconds, 90th Percentile

While NFPA 1710 does not assign a total response time within the standard, the individual chain of events that make up a total response are time stamped. The following figure compiles each of the components which make up a total response time for NFPA 1710 and compares that against WFPS's actual performance at 90 percent for 2015 and 2016.

WFPS Emergencies – Actual Performance versus NFPA 1710 Performance Standard, 2015–2016

Agency/Standard	Call Processing	Turnout Time	Travel Time 1st Unit
NFPA 1710	1:04 @ 90%	1:20 @ 90%	4:00 @ 90%
WFPS Performance	2:22 @ 90%	2:12 @ 90%	5:02 @ 90%

Recommended Future Strategies

Within each main heading of this report there contain key recommendations summarized in gray boxes. They range from minor considerations regarding operational changes to major recommendations that likely require significant investment. All of the recommendations are grouped into the following categories: program strategies; staffing strategies; equipment strategies; capital facility strategies; and future development strategies. These strategies are detailed in the *Strategic Implementation* section of this report. The major recommendations are summarized here.

Significant Program Strategies

- Create a Strategic Plan for WFPS, incorporating separate elements from this report and its companion report, *Community Risk Assessment: Standards of Cover*, into a single work plan for ease of implementation.
- Address workload excesses in EMS Operations.
- Partner with hospital administrators to develop strategies that reduce patient offload times for low and medium acuity patients.

Significant Staffing Strategies

- Maintain a minimum of 6–8 permanent, full-time fire training instructors.
- Achieve Fire Prevention Officer staffing of 32 by 2022, based on availability of funding.
- Achieve Fire Plans Reviewer staffing of three by 2022, based on availability of funding.
- Achieve Public Educator staffing of seven by 2022, based on availability of funding.
- Achieve Fire Investigator staffing of eight by 2022, based on availability of funding.

Significant Financial Strategies

- The department should develop a comprehensive five-year financial model to include status quo projections of revenue and expense as well as various service level improvement scenarios. Model should integrate projected capital equipment and facility costs to provide uniform cash flow requirements over life of model (better prediction of expense to prevent spiking expenditure budget analogous to FMA leasing costs).
- Annual apparatus lease payments should be monitored versus actual apparatus purchases and cost of each apparatus type should be reviewed against industry inflationary trends.
- Develop and adopt a long-range equipment replacement program based upon expected life cycle and technology changes for SCBA, extrication, major medical and other equipment systems.
- Develop a comprehensive ten-year facility capital improvement and maintenance plan to include new stations, major renovations, key building system replacements or upgrades, and an adequately funded routine (recurring) maintenance program.
- Closely monitor province ambulance fee reduction actions versus additional grant funding to determine impacts on CoW tax support of ambulance service.
- Monitor rising operating services costs and explore opportunities for cost reduction.

Significant Equipment Strategies

- Adopt a formulaic approach to apparatus replacement, factoring age, engine hours, mileage (kilometers), condition, maintenance intervals, and service type. A formula is provided within this report to determine status of each unit.

Significant Capital Facility Strategies

Training Centre

WFPS should either substantially remodel or construct a new training and maintenance facility. Since staffing increases are recommended, the facility must first be able to house the increased staff. The training centre should refer to NFPA 1402: *Guide to Building Fire Service Training Centers*. A new training centre should include facilities and resources sufficient to provide live fire training; multiple classrooms (with moveable wall systems to enable multiple classroom configurations) and other facilities; space for apparatus driver training; sufficient washrooms and showers (both genders); and enough indoor space to allow for “outdoor” drills but sheltered from inclement weather.

Response Facilities

ESCI believes WFPS can reduce the number of agency facilities from the current 27 stations and three additional EMS facilities to 23 combined facilities, while maintaining or improving the level of service provided. This recommendation was tested three times using Geographic Information System (GIS) software, plotting 2016 actual response data to test the results. In each case, the response capability of the 23 combined facilities slightly improved (+.5%) performance over the current 30 facility configuration.

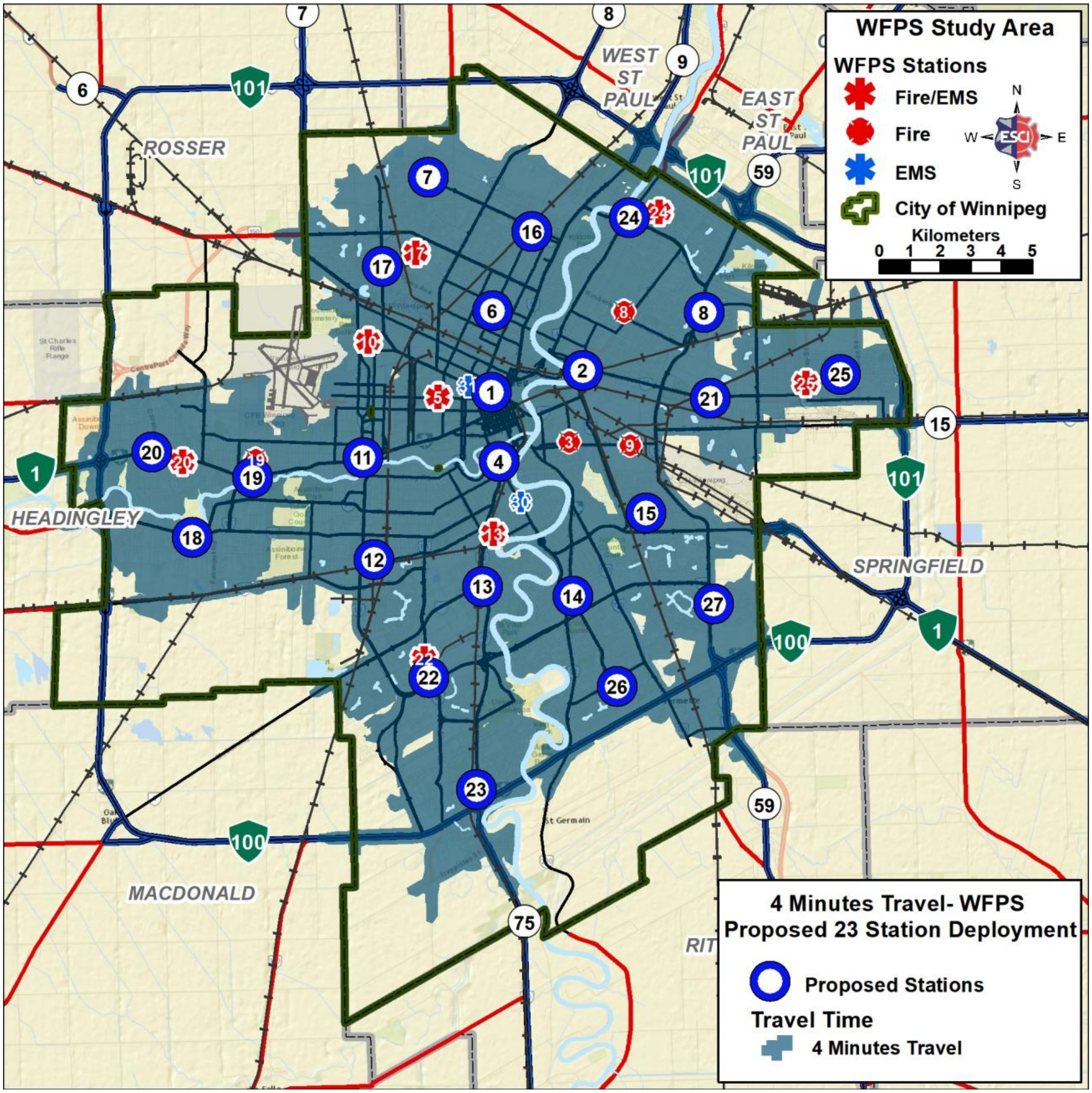
This is significant for the following reasons:

- Many of the WFPS facilities need significant remodeling or total replacement as determined by ESCI’s site assessment, thus any reconfiguration consideration is timely;
- Modern fire paramedic Station design can be factored into these facilities, reducing turnout time for responding crews just by improving work flow within the station;
- While facility reconstruction is an expensive and complicated logistical endeavor, it is a one-time cost. Reducing the number of facilities that require maintenance is an ongoing cost avoidance strategy;
- Existing fire paramedic station sites are utilized as much as practical to capture as much efficiency as possible and reduce expense;
- Existing inventory of facilities that become surplus to the needs of the City as a result of this strategy are able to be liquidated, with the proceeds of the sale of these properties reinvested in this strategy to offset the capital costs.

ESCI is ***not*** recommending a reduction of apparatus or staff assigned to those stations being eliminated. Instead, existing apparatus and crew deployment would be moved to the consolidating stations, adding to the resource concentration within the City.

The following figure demonstrates a deployment model which distributes WFPS operational resources in 23 combined fire and EMS facilities throughout the WFPS service area.

WFPS Proposed 23-Station Deployment

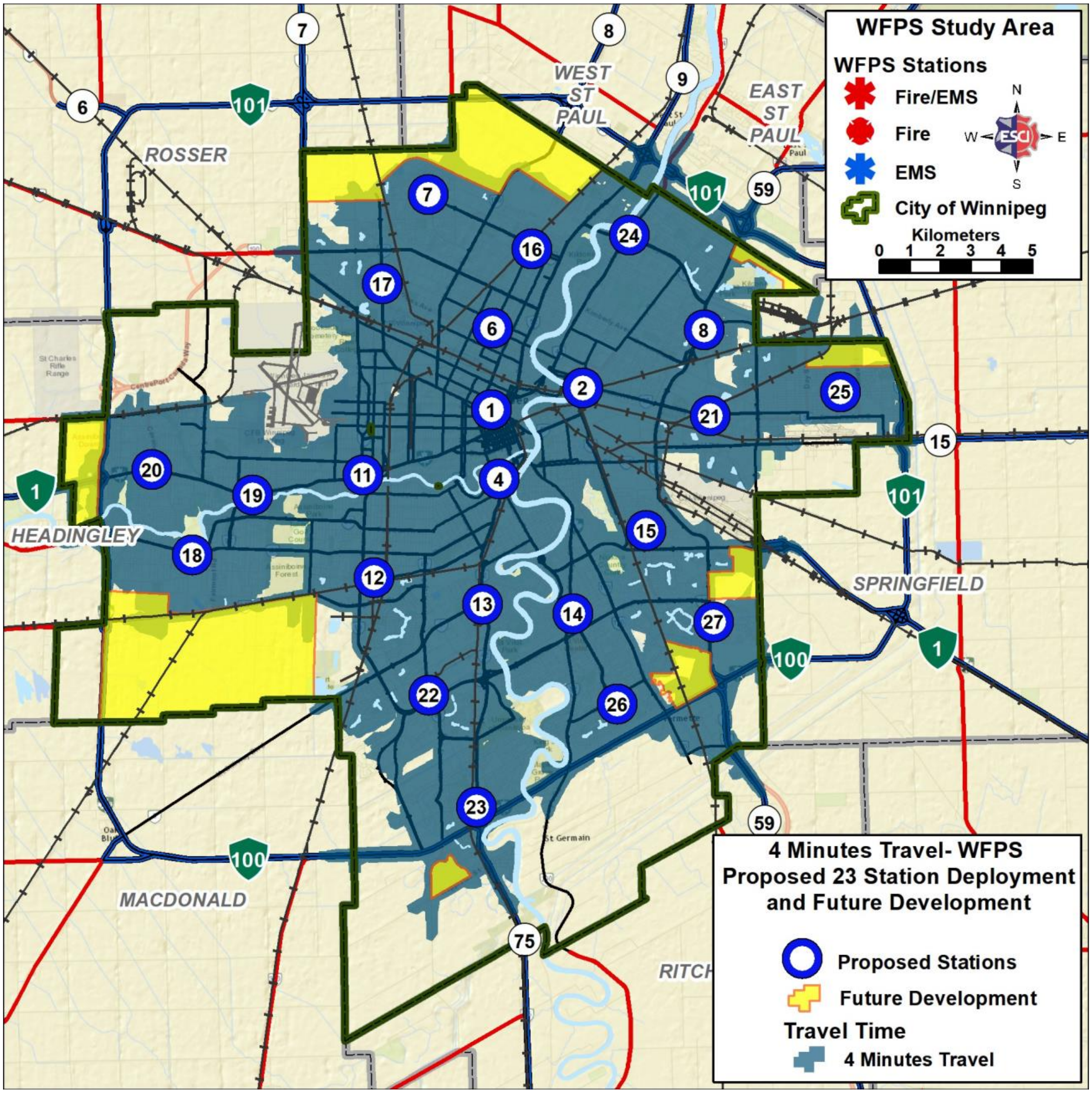


Multiple locations were assessed to arrive at the station locations modeled in the above map. This model represents a mix of existing and new locations to increase efficiency and reduce cost. The report contains a matrix wherein each station location is identified, and which units from surplus stations are relocated and matched to new or remodeled stations. The proposed 23 station model was also compared to the Fire Underwriters Survey criteria, which also slightly improved coverage. Ninety-nine percent (99%) of both the PFPC (commercial, industrial, and multifamily residential) and DPG (one- and two-family detached residential) properties are within five kilometers driving distance of a proposed fire paramedic station location.

Significant Future Development Strategies

Increased density and infill will accommodate the majority of new residents in Winnipeg. However, some new residential developments are planned in what is now primarily rural or agricultural land. The following figure displays areas identified for future development in City of Winnipeg planning documents.

Proposed 23-Station Deployment and Future Development



The areas identified for future development in this figure may or may not require additional WFPS facilities and resources in the distant future. It is difficult to assess until development occurs and a street network is in place to measure travel time performance from the nearest fire station. WFPS should work with City planners and developers to ensure that adequate planning for emergency services occurs prior to increased development in these areas.

To mitigate the effect of development and population growth on service demand and risk throughout the City, ESCI suggests that WFPS work cooperatively with City planners and developers to consider the following measures:

- Attention to future road networking and transportation planning to maximize fire department travel access;
- Use of traffic pre-emption technology to enhance response times;
- Implementation of proactive fire prevention and building design standards, such as fire sprinkler ordinances and other available initiatives, that will mitigate fire risk in newly developed areas.

EVALUATION OF CURRENT CONDITIONS

Using organizational, operational, staffing, and geographic information system (GIS) models; this phase of the study provides recommendations for improvement in current services delivered to the community. The evaluation and analysis of data and other information is based significantly on the Municipal Benchmarking Network Canada (MBNC) *2015 Performance Measurement Report* for comparison purposes, as well as industry standards, Canadian standards, National Fire Protection Association (NFPA) standards, Commission on Fire Accreditation International (CFAI) self-assessment criteria, health and safety requirements, national and provincial mandates relative to emergency services, and generally accepted best practices within the emergency services community.[4]

Each section in the following report provides the reader with general information about that element, as well as observations and analysis of any significant issues or conditions. Observations are supported by data provided by the Winnipeg Fire Paramedic Service (WFPS or department) and collected as part of the review and interview process. Finally, specific recommendations are included to address identified issues or to take advantage of opportunities that may exist.

Organizational Overview

The City of Winnipeg is named after the nearby Lake Winnipeg. The origin of the name comes from the Western Cree word for muddy water. Settlement dates to 1738, but the area was incorporated as the City of Winnipeg in 1873. It is the capital city and largest municipality in the Province of Manitoba. The City is governed by fifteen council members elected via ward system, and the council meetings are presided over by an at-large elected Mayor. The elected officials receive their authority through the City of Winnipeg Charter. The Mayor and Council appoint a Chief Administrative Officer (CAO) to manage the day-to-day activities of the City on behalf of the Council. Each department head, in turn, reports to the Chief Corporate Services Officer (CCSO) who in turn reports to the CAO. The Fire Paramedic Chief of Winnipeg Fire Paramedic Service is one such department head.

Executive & Administrative Structure

The WFPS Chief is hired under a five-year contract and is provided a performance review annually. The Chief's authority is addressed in Winnipeg Fire Paramedic Service By-Law #6311, written in 1994 and amended in 1998, 2000, 2001, 2002, 2004, 2007, 2013, and twice in 2015. The by-law draws a clear distinction between the technical authority of the fire paramedic service and the administrative activities of managing an agency, such as personnel decisions and the promulgation of rules and regulations. The Fire Paramedic Chief is clearly the technical director of the fire department and manages the day-to-day and emergency operations of the department, whereas the CCSO is responsible for supervising the Chief, making significant personnel decisions, and the promulgation of rules and regulations.

[4] The CFAI organization is now a subsection of the Center for Public Safety Excellence (CPSE) but maintains its prime function of accrediting fire agencies.

Personnel decisions are primarily limited to promotions, terminations, or reductions in rank. It is presumed that these decisions are made in consultation with the Chief.

The following figure provides an overview of the executive and administrative elements of the Winnipeg Fire Paramedic Service.

Figure 1: Executive & Administrative Structure

SURVEY COMPONENT	OBSERVATIONS
RESPONSIBILITIES & AUTHORITY	
Type of governing body?	Municipality
Head of governing body	Mayor Brian Bowman
Top appointed official	CAO Doug McNeil
Is elected official authority defined?	Yes; City of Winnipeg Charter
Fire Paramedic Chief position	John Lane
Hired by contract?	Yes; Contracted employee
Term of contract	5 years
Performance evaluations given?	Annually
Fire Paramedic Chief's authority defined?	Yes; Winnipeg Fire Paramedic Service Bylaw
Policy & administration roles defined?	Yes; Winnipeg Fire Paramedic Service Bylaw, Winnipeg Fire Prevention Bylaw

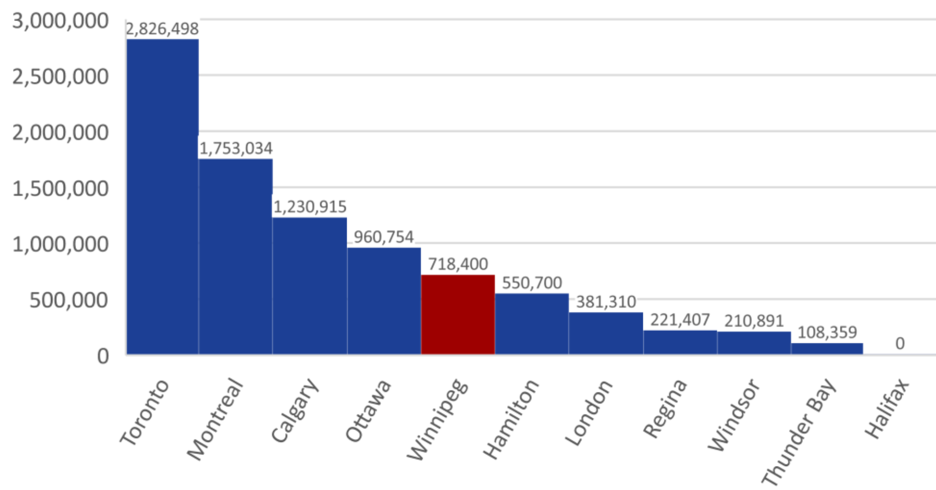
Demographics

The City of Winnipeg is the fifth largest city by population of the eleven cities reporting to the Municipal Benchmarking Network Canada (MBNC) *2015 Performance Measurement Report.*[5] Winnipeg is located in the south-centre of the province of Manitoba, and geographically near the centre of North America (267 km southwest of Winnipeg). With a population of 718,400,[6] Winnipeg represents just over 56 percent of Manitoba's 1,278,365 population.[7] Manitoba's population increased 5.8 percent from 2011 to 2016, posting a higher growth rate than the national average. Most of the gain was due to stronger international migration.[8] It can be reasonably extrapolated that international migration is at least proportionately stronger in Winnipeg than other of its contemporary cities in Canada.

Within the 475.5 square kilometers that make up the WFPS service area, there are 792,127 residential units and 10,030 businesses protected. At a population density of 1,510.83 persons per square kilometer, the city is quite obviously 100 percent urban in character. The city and service demographic sources are from the Municipal Benchmarking Network Canada, 2015 Performance Measurement Report, its five-year report derivative, or from internal WFPS sources.

[5] *Municipal Benchmarking Network Canada*, 2015 Performance Measurement Report. Municipal Benchmarking Network Canada (MBNCanada), c/o City of Hamilton, 71 Main Street West, Hamilton, ON L8P 4Y5.
[6] *Ibid*.
[7] http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/Page.cfm?
[8] http://www.statcan.gc.ca/daily-quotidien/170208/dq170208a-eng.htm

Figure 2: WFPS Population Compared to MBNC Peers, 2015[9]

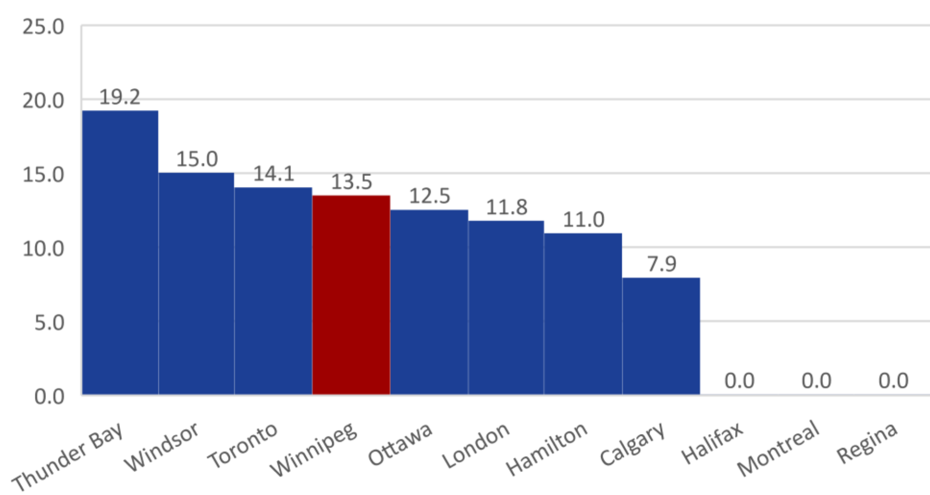


Response Overview

As a densely-populated agency, WFPS manages a significant emergency service demand. A short analysis of the broader implications of the response workload that WFPS experiences follows. Demand for service; distribution, concentration, and reliability of deployed assets; and performance are all addressed in significant detail in the *Service Delivery & Performance* section of this report.

The following figure illustrates the number of property fires, explosions, and related alarms handled by WFPS per 1,000 population served as compared to the other ten municipalities reporting to the Municipal Benchmarking Network Canada, 2015.

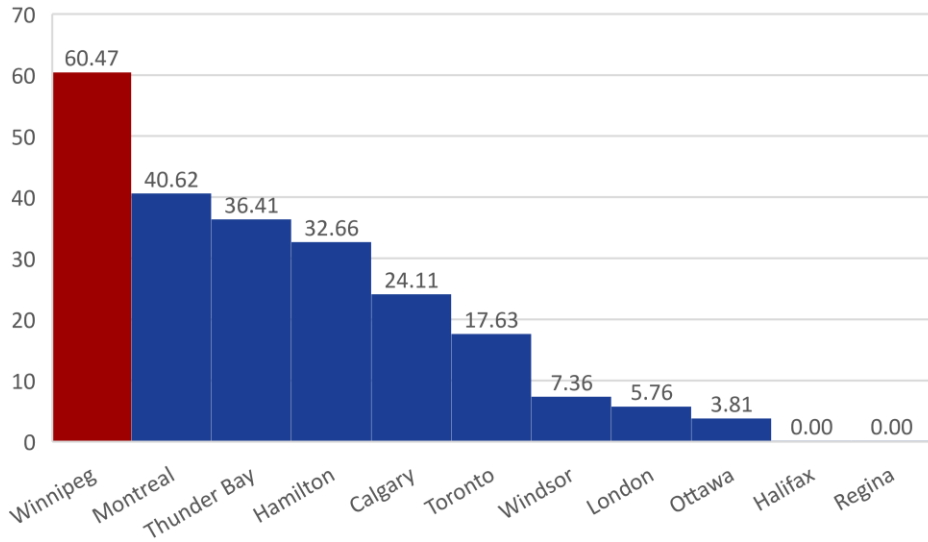
Figure 3: Property Fires, Explosions, & Alarms per 1,000 Population, 2015[10]



[9] *Ibid*.
[10] MBN Canada 5-Year Results Report – Fire.

As with virtually all fire paramedic departments in North America, EMS represents the largest percentage of emergency responses. The following figure illustrates the number of medical calls handled by WFPS per 1,000 population served as compared to the other ten municipalities reporting to the Municipal Benchmarking Network Canada.

Figure 4: Number of Medical Calls Handled by WFPS per 1,000 Population, 2015[11]

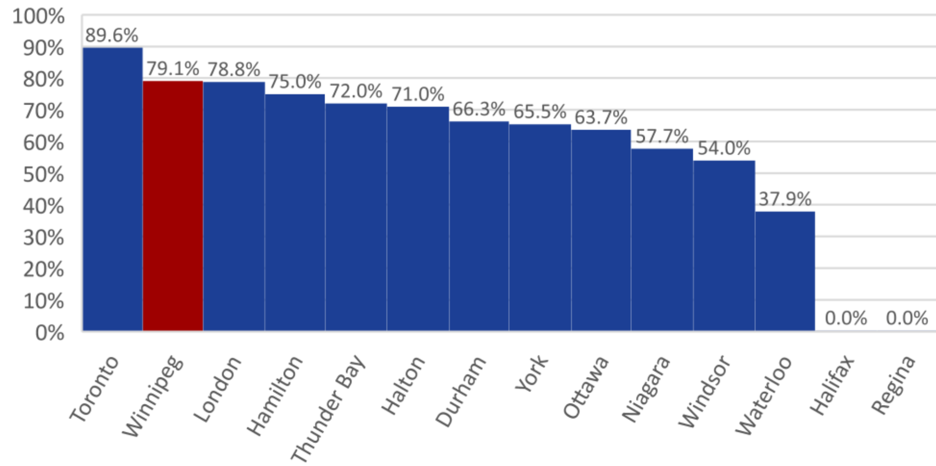


One of the most time-critical, immediate life risk types of emergency medical response is for sudden cardiac arrest (SCA). It is critical that these victims quickly receive cardiopulmonary resuscitation (CPR) and automatic external defibrillation (AED), followed by advanced care from field paramedics. For every minute without CPR and defibrillation, the (cardiac arrest) victim's chance of survival decreases by 7–10 percent. Unfortunately, only approximately one-third (32%) of SCA victims receive bystander CPR and only two percent (2%) are treated with AEDs by bystanders.[12] Since time to definitive care is the remaining variant, emergency services must respond and arrive quickly to maximize the possibility of resuscitation for these victims.

[11] *Ibid*.

[12] http://www.sca-aware.org, *Sudden Cardiac Arrest: A Healthcare Crisis*, Sudden Cardiac Arrest Foundation, acquired June 6, 2017.

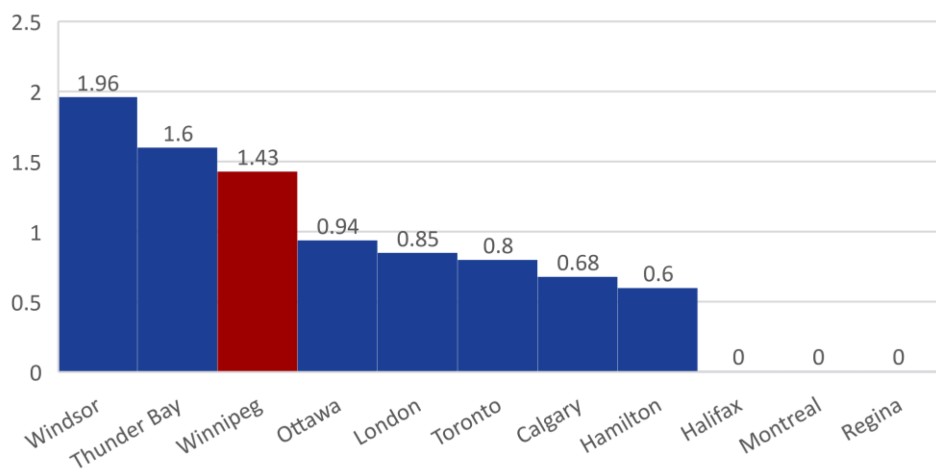
Figure 5: Sudden Cardiac Arrest Response Time Performance within six (6) minutes, 2015[13]



WFPS provides the second fastest response time performances for these types of events of their fourteen peers reporting to MBNC.

Property losses in Winnipeg due to fire are high relative to peer reports, for both residential fire and commercial/industrial fire. The following two figures illustrate the rate of fire losses per 1,000 residential structural fires and the rate of losses per 1,000 commercial and industrial properties as compared to the other ten municipalities reporting to the Municipal Benchmarking Network Canada. In Figure 6, Winnipeg's risk of property loss is third highest among peer agencies reporting to MBNC. However, life loss or civilian injury is statistically higher in residential properties than in commercial and industrial properties.

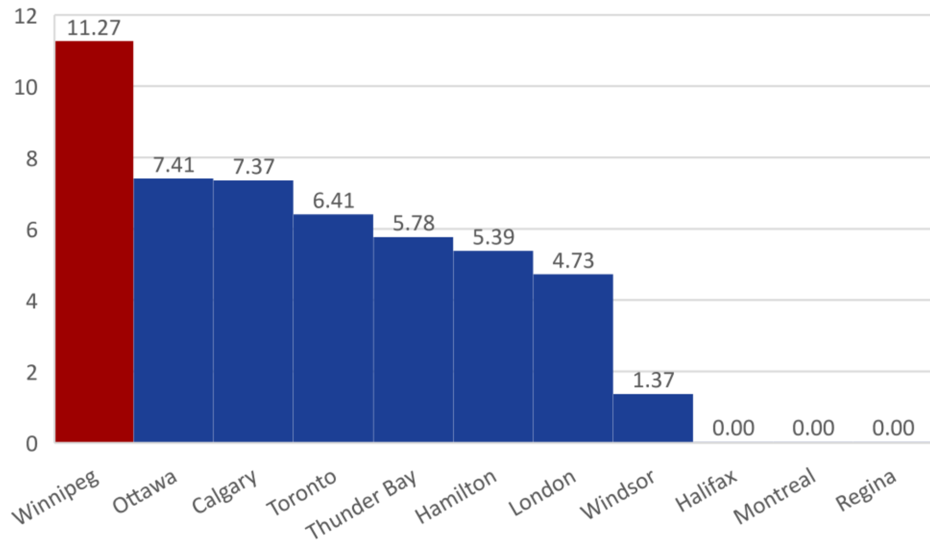
Figure 6: Rate of Residential Structural Fires with Losses per 1,000 Households, 2015[14]



[13] MBN Canada 5-Year Results Report – EMS.
[14] *Ibid*.

In Figure 7, Winnipeg's risk of property loss is highest among peer agencies reporting to MBNC. Winnipeg's risk of community economic loss due to these fires is also statistically high. Businesses that suffer a fire loss that require the business to close for three months or longer for repair statistically have a higher likelihood of closing permanently or not sustainably recovering from the loss of business after reopening. These failures result in economic loss to the community and to the households that rely upon the salaries of the jobs lost in that event. This also negatively impacts tax revenue to the City.

Figure 7: Rate of Commercial/Industrial (C&I) Structural Fires with Losses per 1,000 C&I Properties, 2015[15]



The following figure provides a breakdown of incident types that WFPS responded to in 2016, as well as the percentage of the total responses each major type represents.

[15] *Ibid*.

Figure 8: WFPS Responses by Type, 2016

SURVEY COMPONENT	OBSERVATIONS
ALARMS	
Fires	1,496 (1.3% of total)
Property value exposed to fire	$2,906,234,627 (estimate)
Property value lost to fire	$32,760,189 (estimate)
Rupture or explosion	3
EMS	90,779 (81% of total)
Rescues	245 (.02% of total)
Number of EMS transports	53,419 (58.8% of total EMS responses)
Hazardous conditions	865 (.07% of total)
Service calls	5,798 (5.1% of total)
Good intent calls	1,298 (1.1% of total)
False calls	7,742 (6.9% of total)
Severe weather	0
Other	3,827 (Cancelled fire calls – 3.4% of total)
Total	**112,053**

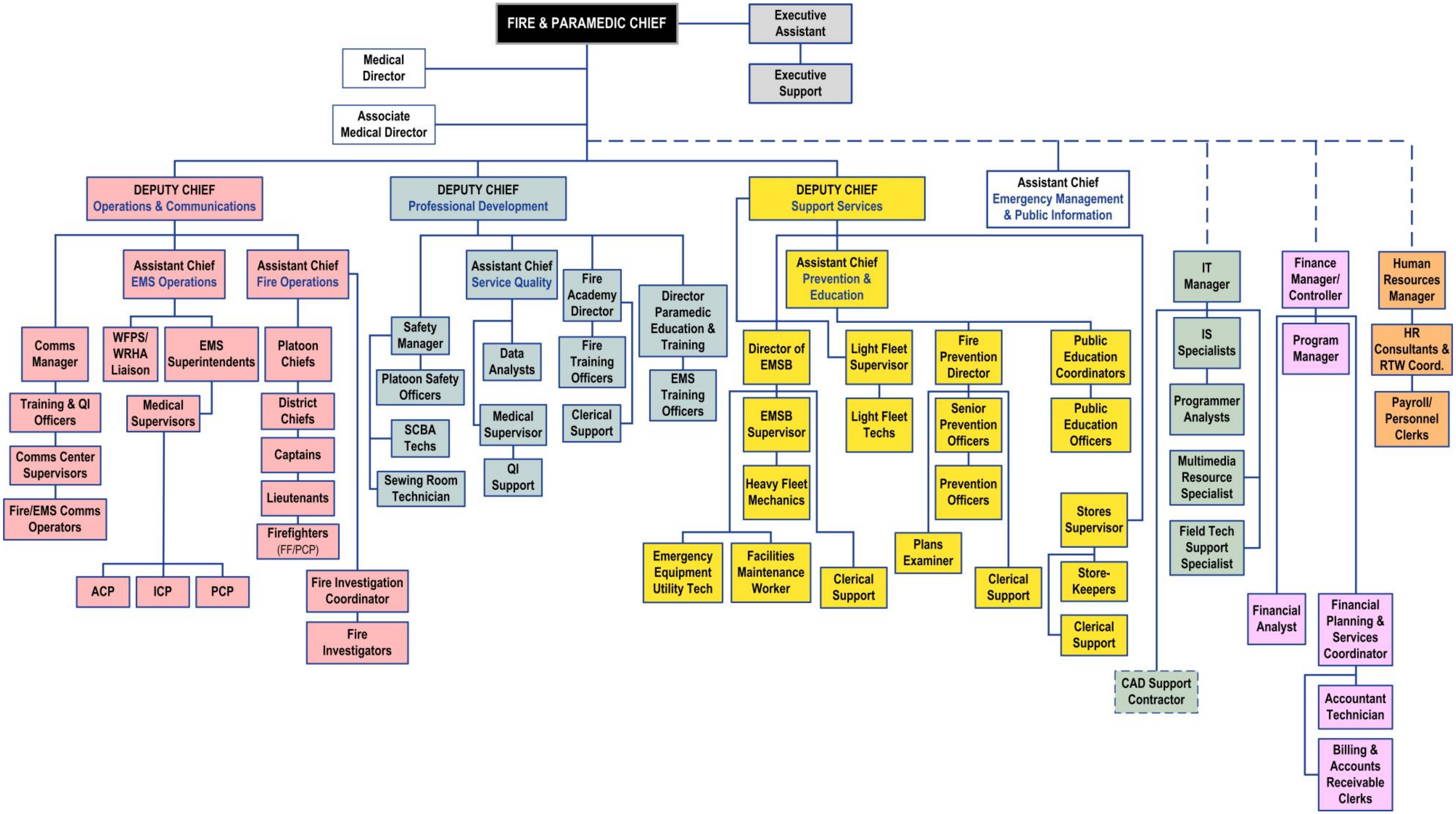
Organizational Design

The WFPS is a complex agency with many moving parts. The construction of divisions and branches divides the organization into natural affinity groupings. The personnel levels within these divisions and branches are analyzed and discussed in greater detail in the *Staffing* section of this report. The complexity of the organization is further complicated by the maintenance of two separate branches; the Winnipeg Fire Department and Winnipeg Emergency Medical Services.[16] These services are complementary and reside under the common WFPS umbrella. However, steps could be taken to more fully integrate the two branches.

The following figure represents the organization chart for the Winnipeg Fire Paramedic Service.

[16] *Winnipeg Fire Paramedic By-law No. 6311/94*, Establishment of Department, Section 2 (1), amended 7702/2000; 7897/2001; 8162/2002; 116/2007.

Figure 9: WFPS Organization Chart



Accreditation

There are several agencies that evaluate fire departments, such as Fire Underwriters Survey. Their purpose is to evaluate the relative risk for properties insured for loss by insurance carriers within a given community. However, this should not be confused with organizational accreditation. Accreditation by a respected independent third-party provides numerous advantages to an organization. ESCI is aware of only one accrediting agency for fire and emergency services departments in North America, and that is the Center for Public Safety Excellence (CPSE). The CPSE itself is the product of a partnership between the International Association of Fire Chiefs (IAFC) and the International City/County Management Association (ICMA), which came together to develop a framework for continuous improvement of the fire and emergency services.

The result is a mechanism to objectively evaluate fire and emergency service agencies in North America. Working towards, achieving, and maintaining accreditation will:

- Raise the profile of the agency with its community.
- Emphasize the agency's dedication to excellence to its stakeholders.
- Establish an agency-wide culture of continuous improvement.
- Assist with communicating the leadership's philosophies.
- Build positive relationships with internal labor groups.
- Offer independent verification and validation of the agency's operations.
- Provide tangible data and information for elected officials.

The Center for Public Safety Excellence is a not-for-profit corporation and an international technical organization that works with the most progressive fire and emergency service agencies and most active fire professionals. Their mission is to lead the fire and emergency service to excellence through the continuous quality improvement process of accreditation, credentialing, and education.

Agency accreditation is a voluntary process. Some agencies seek a dollar-for-dollar return on investment before pursuing accreditation, but the true investment is agency staff time and the actual return is a better-run, higher-performing agency.

Accreditation is an international recognition of achievement. It shows to the community that the accredited agency is performing to industry best practices and is holding itself accountable through an external peer review. Document review and onsite assessment by peer assessors is very thorough. Accreditation reports often include peer recommendations for improvement beyond those the agency being evaluated may have considered.

Key Recommendation

- Seek accreditation as a logical next step to the creation of a *Community Risk Assessment: Standards of Cover*.

Management Components

Effective department management is a complicated and expanding challenge for service leaders. With increasing complexity comes increased cost. Today's department must address management complexities that include an effective organizational structure, setting and measuring levels of service, staying abreast of new technologies and methods, evaluation and maintenance of a qualified workforce, staff development for effective succession, and financial sustainability for the future.

Foundational Management Elements

To be effective, the management of a department needs to be based on a number of components. These include a clearly stated mission (the fundamental purpose of an agency); a vision for the future (where the organization is going); and the values or guiding principles (how the organization will treat its members—culture—as it navigates from its current state to its desired future state). From these foundational elements, the organization evaluates the environment it operates within, and establishes a series of strategic initiatives, goals, and objectives. These elements combine to form a strategic plan.

While some of these elements exist as separate components within WFPS, it is an industry best practice to combine them into a single strategic plan, which creates a workplan and guides the efforts of the organization, ensuring that organizational energy is invested in the most important initiatives.

A strategic plan should span a period of three-to-five years, depending upon the scope of the work involved, and should be approved or adopted by the elected body, which then sanctions the work to be performed in implementing the plan. Current organizational goals and objectives should be folded into a new strategic plan, along with new goals and objectives.

Key Recommendation

- Create a strategic plan for WFPS, incorporating the separate elements into a single work plan and integrating new core elements. The plan should be approved and adopted by the Council.

Regulatory, Policy, and Guidance Documents

Consistent with other fire and EMS services nationally and even globally, WFPS functions in a paramilitary manner. This is to ensure that when personnel are engaged in rapidly changing circumstances in an emergency situation, clear and concise direction from a central authority (Incident Commander) is followed without delay. Cultural norms tend to relax the formality of this structure during routine operations, but it is nonetheless followed. WFPS is no exception. The paramilitary structure must be supported by standardized sets of rules, regulations, and policies that guide appropriate behaviour and accountability. These guiding documents are vital for success in all phases of fire department operations and at all levels.

WFPS has a complete set of regulatory documents, both guiding and directive in nature. Training is conducted on WFPS and broader Winnipeg policies. The regulatory documents are currently being reviewed and updated as appropriate. The review is expected to take three years to complete, which is within normal range for organizations of similar size and complexity. The documents are reviewed for consistency and for legal mandates. Guidance documents are used in training evolutions. As a department within the broader corporate structure, the department relies upon a corporate code of conduct, which is in place. In addition, critical issues facing the department are identified from the elected officials' perspective and from the Fire Paramedic Chief's perspective.

Critical Issues

Public safety agencies routinely face a complex array of new critical issues and emerging challenges. To the extent there is alignment between the elected officials and the Fire Paramedic Chief on the issues facing the fire department, there is a higher likelihood that these issues will be addressed. The following critical issues were identified for both elected officials and for the Fire Paramedic Chief:

Figure 10: Critical Issues

Elected Official Perspective	Fire Paramedic Chief Perspective
• Cost of service delivery	• System barriers to service efficiency – contract with the Winnipeg Regional Health Authority, so we do not have authority to upstaff; community paramedics
• Service level	• Cost of associated support services (Fire Prevention, Mechanics, etc.)
• Transparency	• Lack of strategic and master plan

The critical issues from the perspective of the elected officials and the Fire Paramedic Chief are significantly in alignment. The elected officials' top issue is aligned with the Fire Paramedic Chief's second critical issue. The elected officials' second critical issue is aligned with the Fire Paramedic Chief's top issue. The third issue for both the elected officials and the Fire Paramedic Chief are aligned to a certain extent in that the elected officials want transparency, and the Fire Paramedic Chief wants a published short- and long-term plan, which is transparency of direction for the organization. By conducting the planning referred to by the Fire Paramedic Chief, the future direction of the agency becomes clear to the Council, the community, and the department members.

Communications

WFPS invests considerable time and effort into its internal communication, including the industry best practice of having executive team members conducting ride-alongs with operational personnel on a weekly basis (during each executive team member's on-call rotation). This accessibility promotes two-way understanding and breaks down barriers. Staff meetings are convened weekly for senior executives, with operational and all executive meetings biweekly. Written memoranda are used to supplement staff meeting information. The Fire Paramedic Chief and his command staff subscribe to an open-door policy. More formal internal communication follows the chain of command, which is clearly outlined in the organization chart.

External communication is more passive, relying upon the website and broader City initiatives to communicate with the public. Social media platforms such as Facebook and Twitter are growing trends in the fire service. While guidance and effort must be expended routinely to make this an effective communication platform, it is bound to become an industry best practice method of communicating with constituents. WFPS does not have a Twitter account or Facebook site. Either or both platforms could become a powerful tool for communicating. The agency does not use focus groups or citizen advisory committees, which may be additional tools to consider when significant issues are facing the department and citizen guidance would be helpful and informative. The department does have in place a formal complaint process, which is followed.

Key Recommendation

- Consider developing a presence on Facebook and/or Twitter to enhance external communication.

Record Keeping and Documentation

In any organization, documentation of activities is of paramount concern. Sound management decisions cannot be assured without sound data, which is gathered in records routinely.

WFPS has implemented sound processes for document control. Public records access is provided for in City and department policy. Hard copy records are secured by lock and key in file cabinets or locked offices, but heavily relies upon electronic records. Electronic files are secured by passwords (as per City of Winnipeg IT Administrative Standard) which are assigned to users with rights to appropriate documents. Files are backed up daily on- and off-site. The Data & Application Services Division of the Winnipeg Corporate Support Services Department manages data systems, data retrieval, and reduces inefficient redundancies between departments in the City. The City Clerk's office has a City Records Manager/Archivist who manages archiving of key records and manages a thorough process on behalf of the City. These are consistent with industry best practices.

Financial reports are provided to elected officials on a quarterly basis, with management and operational reports provided annually. This includes significant performance metrics as managed internally and reported to Municipal Benchmark Network Canada (MBNC). WFPS is to be congratulated for its robust participation in this important program. The department has control over and administers all NFPA-required testing of equipment, air systems, and personal protective equipment (including protective clothing ensembles), which is an industry best practice.

Security

Facilities, equipment, "attractive assets," and records are all important elements to an emergency services agency. Significant investment of public dollars was made to provide for the services WFPS provides to the community. Thus, it is critical that proper precautions are taken to protect those investments and those records from loss, whether intentional or otherwise.

WFPS facilities are either secured by code-operated lock for older facilities or card access in new facilities that provides a history of access entries, so accountability is reinforced. The department has a plan in place to phase in all facilities with card access over the next several years. Similarly, individual offices are either secured with a standard lock and key for offices in older facilities, or card access with accountability for offices within new facilities.

Emergency response vehicles are typically stored within a secured facility until responding to alarms, while staff and support vehicles are under lock and key. Newer vehicles are secured with lock and key with anti-theft protection. As long as these security systems are used by the operators of the vehicles, the units should be safe. Other capital assets are maintained on an inventory list in centralized spreadsheets, but no other asset security system is used, such as bar-coded inventory and scanners. Assets are accounted for manually, but the interval varies by item. Vehicles, cardiac monitors, stretchers, stair chairs, and similar assets are accounted for weekly. Annual accounting is conducted for station inventory. IT services conducts quarterly asset accounting.

Monetary controls are in place. All cash access is controlled through the WFPS Finance Branch. Credit card expenditures are accounted for with confirmation of receipts by supervisors monthly. Purchasing controls are maintained through the WFPS Finance Branch and/or the WFPS Stores Branch, whichever branch incurs the expense, which is in alignment with corporate procurement rules. EMSB, Air Room, and Sewing Room purchasing is overseen by Branch Supervisors with WFPS Finance providing quality assurance.

Key Recommendation

- Consider publishing an electronic annual response performance report, complete with analysis, for internal and public consumption. Publish these reports on the WFPS website.

Financial Analysis

Historical Revenues and Expenses

The Winnipeg Fire Paramedic Service is one of a number of departments residing in the City's General Fund, comprising approximately 18.5 percent of the total expenditure budget in 2017. The City operates on a fiscal year which coincides with the calendar year. The budget process normally culminates in an adopted budget by the end of December of the year preceding the new fiscal year. Annual audits of City finances are currently performed by KPMG and the City follows Canadian Public-Sector Accounting Standards.

The department contains an imbedded finance section, headed by a Comptroller with a dual-reporting relationship to the Fire Paramedic Chief and City's Chief Finance Officer. This department-level, direct financial expertise and oversight provides the Fire Paramedic Chief with a high degree of budgetary control and planning assistance not normally available to the municipal fire service. This close relationship will allow the department to recognize and implement cost-saving measures more rapidly than might otherwise occur.

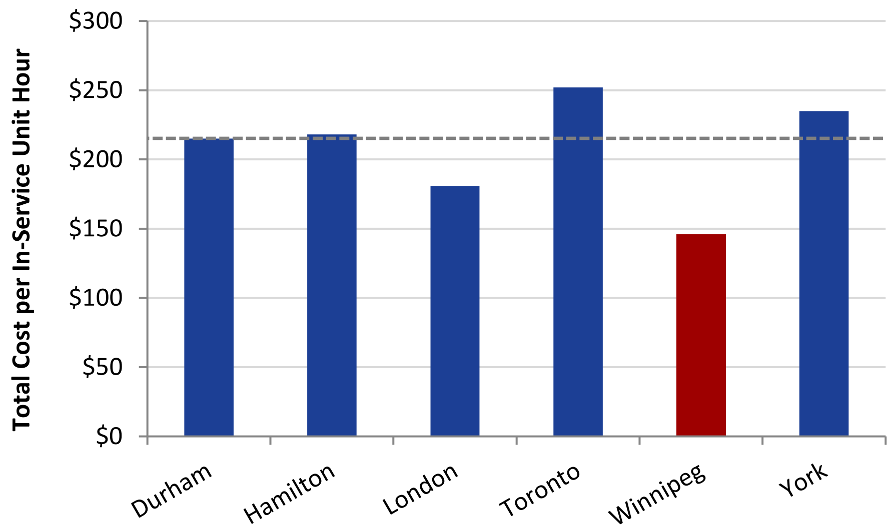
As a front-line department of the municipal General Fund, WFPS receives support from corporate service departments such as Human Resources, Budget and Finance, IT, and other services. The cost of this support is partially charged directly to the WFPS expenditure budget. These functions also have a devolved presence in WFPS, and these staff members maintain dual-reporting relationships to the Fire Paramedic Chief and a functional department head. This affords a high degree of budgetary transparency by ensuring that elected officials and the public understand the full costs of providing direct fire and paramedic service including the corresponding support service ("back office") costs required to provide emergency services to the public.

Through the ongoing integration of fire and paramedic services, the City has been able to eliminate the duplication of administrative and support function staff, and associated costs required for two separate departments, while maintaining the "boots on the ground." This has benefited the City of Winnipeg, the Winnipeg Regional Health Authority, and the Province of Manitoba as funders of the EMS system.

Consolidation has streamlined costs and allowed the City to maintain and even improve upon its prior level of service. WFPS leadership continues to work towards more fully integrating these major emergency services functions. A key example of further cost saving measures discussed elsewhere in this study is the elimination of separate fire and paramedic facilities that still exist through development, and implementation of a long-range capital (facilities) improvement plan.

Any successful organization should identify and monitor key performance indicators in an effort to improve agency performance while keeping costs as low as possible. As mentioned in an earlier section, the City of Winnipeg participates in a nationwide benchmarking program as the fifth largest City by population of the eleven peer cities reporting to the Municipal Benchmarking Network Canada (MBNC) in the *2016 Performance Measurement Report.*[17] Winnipeg compares favorably to its peers with respect to performance in many areas. However, it is also important to note that WFPS is a leader with respect to cost of both fire and paramedic service as shown in the following figure.

Figure 11: WFPS Ambulance Unit Total Cost per In-Service Unit Hour, 2016



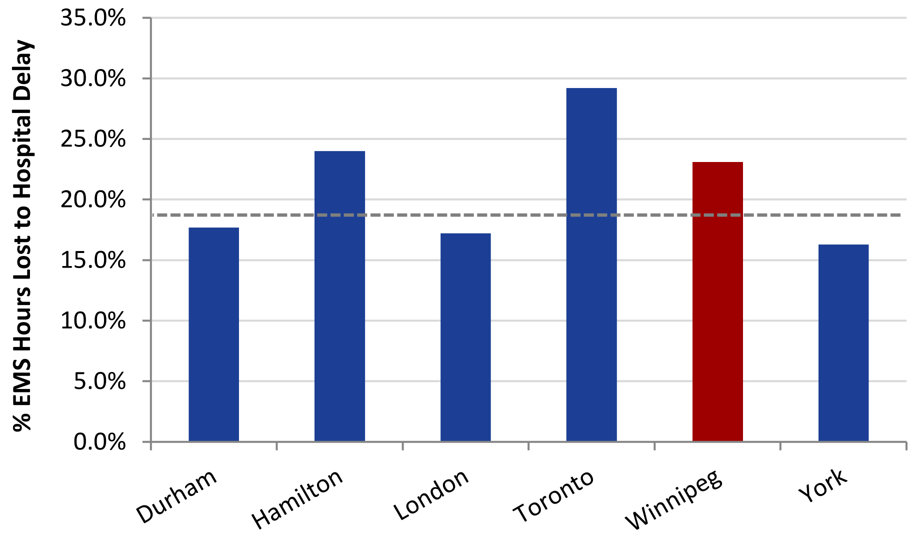
As a side note, one issue that many EMS agencies experience is a problem with hospital delays. Specifically, many hospital emergency rooms do not have sufficient staff to process patients in a timely manner; either treating and releasing or treating and admitting patients due to limited bed capacity for various reasons. As a result, paramedics end up remaining with their patients until ER staff become available to accept transfer of patient care.

Most agencies generally allow in the order of thirty minutes for patient transfer and ambulance turn-around at the hospital before they consider that the ambulance has been delayed at the ER. Departments generally track this delay as a critical system performance metric. The following figure illustrates this problem for WFPS and its peers. WFPS experienced a higher than median loss (19.8 percent for the peer group) of 23.1 percent of the available ambulance hours to hospital transfer of care delays. This loss of available capacity translates directly into longer response times to EMS calls and is an issue that should be vigorously pursued with local hospitals.

[17] *Municipal Benchmarking Network Canada*, 2016 Performance Measurement Report. Municipal Benchmarking Network Canada (MBNCanada), c/o City of Hamilton, 71 Main Street West, Hamilton, ON L8P 4Y5.

Staff report that WFPS has worked with Winnipeg Regional Health Authority (WRHA) and receiving facilities to address this problem in a systematic manner. In 2018, WFPS cut charges to receiving facilities and moved to an automatic transfer of care to improve turn-around time and free up emergency response resources. The percentage of transports resulting in hospital delays has come down from 25.1 percent in 2013, to 23.1 percent in 2016, and is anticipated to fall further as a result of the above, jointly negotiated systemic change. This will add critically needed ambulance capacity to the system.

Figure 12: Percentage of Available Ambulance Hours Lost to Hospital Delay, 2016



With respect to fire service, WFPS also compares favorably with its peers when examining response time and cost of service. Of the reporting peer group for 2016, almost all are very close (within 20 seconds) to the average 6-minute, 38-second, 90th percentile median response time for fire response, although WFPS is slightly above that. WFPS has one of the lowest costs per unit hour of operation of its peer group but is still very close to the median in terms of 90th percentile response time, suggesting a relatively high efficiency. For example, Calgary, with a 90th percentile response time within five seconds of Winnipeg's has a unit hour operating cost of $345; just over 25 percent higher than Winnipeg's.

Figure 13: 90th Percentile Fire Response Time, 2016

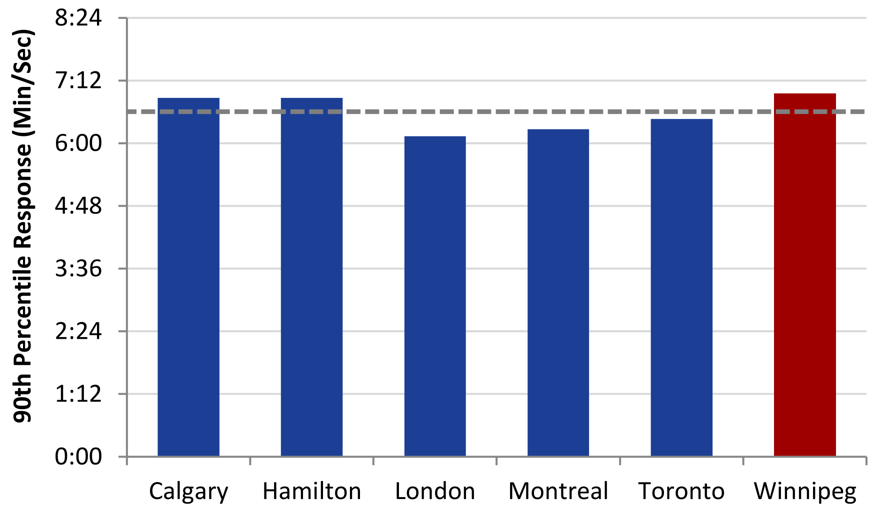
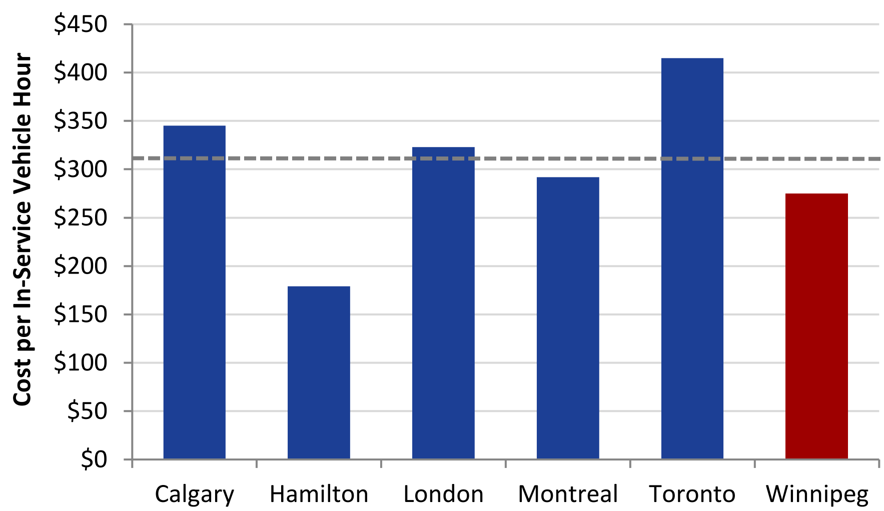


Figure 14: WFPS Fire Unit Total Cost per In-Service Unit Hour, 2016



In summary, steps taken by council and department leadership, including consolidation of the fire and paramedic services, have decreased overall cost of operations for both services while not negatively impacting level of service as seen with respect to the peer group in the 2016 benchmarking study. The department continues to seek ways and means of reducing operating costs while maintaining or improving services to the citizens and visitors of Winnipeg.

In the current economy, most agencies and their governing bodies are searching for additional ways to reduce expenditures while still maintaining levels of service. Simultaneously, as service demand continues to increase on an annual basis, emergency services organizations are finding it increasingly difficult to deliver the services that their customers expect and are often asking for more funding; even after cutting expenses. Further, as is the case with WFPS, deferred capital facility projects and lack of long-range capital improvement planning have created a capital funding deficit that grows larger each year. Therefore, it is important that WFPS understand their revenue and expenditure history, and adequately predict the trajectory of each with respect to the level of service that they will be expected to provide. Although Winnipeg uses external debt funding as well as direct taxation (cash to capital) for major capital projects, there still needs to be an appreciation of debt service expense and where those funds will come from as part of capital improvement planning.

Revenue Trends

No emergency services agency can survive without adequate funding. Funding should be based upon a defined, sustainable level of service understood and desired by the community and decision-makers, and based upon its collective willingness to fund that level of service (risk tolerance versus financial commitment). This funding, which may come from a variety of sources—such as ad valorem taxes, assessments, fees, grants, fund transfers, bonds, commercial loans, fundraisers, donations, etc.—forms the basis from which the agency is able to fund its operations and purchase the necessary equipment and facilities to fulfill its mission.

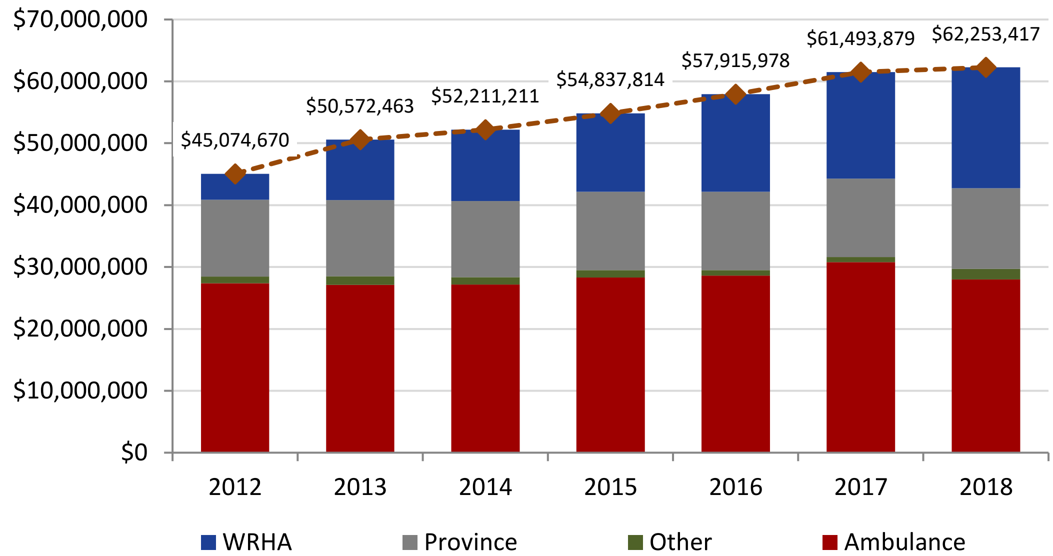
The next figure shows WFPS department-specific recurring and non-recurring revenue sources in the General Fund. These WFPS-specific revenues plus City of Winnipeg tax revenue and other general revenue sources are used to offset WFPS expenditures. Revenues classed as recurring are those reasonably expected to occur year-to-year with some degree of predictability such as the ambulance user fee and various other fees. Provincial grants are also included as recurring revenue as they are ongoing in nature or governed by negotiated agreements and are reasonably expected to continue in some form. It is worth noting that in 2017, the Winnipeg Regional Health Authority stepped away from the long-established funding formula for emergency ambulance services. As a result, the department and the Health Authority are in negotiations to establish a new funding framework for 2018, and future years. This will provide funding certainty for all parties and establish the totality of funding available to provide services.

Figure 15: WFPS Revenue Sources, 2012 Actual through 2018 Adopted

REVENUE	2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Adopted
Ambulance	$27,377,674	$27,141,250	$27,191,227	$28,292,387	$28,602,367	$30,784,843	$27,997,000
Other	$1,078,211	$1,371,256	$1,143,324	$1,196,930	$904,021	$853,732	$1,729,000
Province	$12,390,586	$12,321,451	$12,344,951	$12,655,700	$12,655,700	$12,656,000	$12,986,000
Building Manitoba Fund	*$5,035,600*	*$5,035,700*	*$5,035,700*	*$0*	*$0*	*$0*	*$0*
Fire Paramedics	*$0*	*$0*	*$0*	*$5,035,700*	*$5,035,700*	*$5,036,000*	*$5,036,000*
Fire Based EMS Grant	*$500,000*	*$500,000*	*$500,000*	*$500,000*	*$500,000*	*$500,000*	*$500,000*
EMS	*$5,250,000*	*$5,250,000*	*$5,250,000*	*$5,250,000*	*$5,250,000*	*$5,250,000*	*$5,250,000*
Amb. Oper. Grant[1]	*$1,604,986*	*$1,535,751*	*$1,559,251*	*$1,870,000*	*$1,870,000*	*$1,870,000*	*$2,200,000*
WRHA	$4,228,200	$9,738,506	$11,531,709	$12,692,797	$15,753,890	$17,199,305	$19,541,417
Base Grant	*$3,798,451*	*$7,928,053*	*$9,083,402*	*$14,277,724*	*$12,186,702*	*$13,517,049*	*$11,718,168*
Special Grant	*$1,538,999*	*$2,487,385*	*$2,831,132*	*$2,458*	*$5,437,193*	*$3,682,256*	*$5,227,249*
Amb. Oper. Grant adj.	*-$1,559,250*	*-$1,559,246*	*-$1,559,251*	*-$1,870,000*	*-$1,870,000*		*$0*
Fee stabilization	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$2,596,000*
MSP (Main Street Project)	*$450,000*	*$882,314*	*$1,176,426*	*$282,615*	*-$5*	*$0*	*$0*
Recurring Revenue	$45,074,670	$50,572,463	$52,211,211	$54,837,814	$57,915,978	$61,493,879	$62,253,417
Misc. Regulation Fees	$847	$1,277	$1,303	$2,504	$1,020,529	$649,275	$350,000
Misc. Sales of G&S	$1,783	$5,356	$1,640	$64,789	$31,249	$130,023	$0
Other revenue	$98,220	$97,167	$104,983	$235,272	$53,678	$236,640	$63,000
Non-Recurring Revenue	$100,850	$103,799	$107,926	$302,565	$1,105,456	$1,015,938	$413,000
Revenue Total	**$45,175,520**	**$50,676,262**	**$52,319,137**	**$55,140,379**	**$59,021,434**	**$62,509,817**	**$62,666,417**

[1]Ambulances provided by provincial government: this is a value-in-kind accounting adjustment to reflect the notional value of receiving ambulances for free and is offset by an equivalent cost in operating expenses.

Figure 16: WFPS Recurring Revenue Sources, 2012–2018 Adopted



The previous figure shows the four major classes of WFPS-specific recurring revenues (exclusive of City of Winnipeg General Fund tax revenue) available to partially offset operational expenditures from 2012 actual through 2018 adopted. These are ambulance user fees, provincial grants, Winnipeg Regional Health Authority (WRHA) grants, and other revenue. The other revenue category includes sundry fees and services, other sales of goods and services, and regulation fees. Total recurring revenues available each year are shown in orange diamonds and have steadily grown, ranging from $45,074,670 in 2012, to a high of $61,493,879 in 2017. WFPS recurring revenue has grown by $16,419,209 or 36.4 percent over the period. This represents an average annual growth rate of 6.5 percent for the period.

Ambulance user fee revenue (in red), in general, has grown slightly over the period, increasing from $27,377,674 in 2012, to $30,784,843 by 2017. Ambulance revenue has increased by $3,407,169 or 12.4 percent over the period for an average annual increase of 2.4 percent.

The following figure shows a breakdown of ambulance user fee revenue by category. Emergency transport user fee revenue is by far the largest component averaging 83 percent of the total ambulance revenue stream. It has varied over the period from $22,928,211 in 2012, dropping slightly to $22.7 million in 2014, then climbing to a period high of $24.8 million in 2016, before dropping back to $22,841,117 in 2017, as a result of the provincial mandate to reduce fees to patients. The WFPS is fully reimbursed for the patient fee reduction through additional grant funding of $4,356,733 in 2017. The average annual emergency transport fee revenue for the period is $24,078,776.

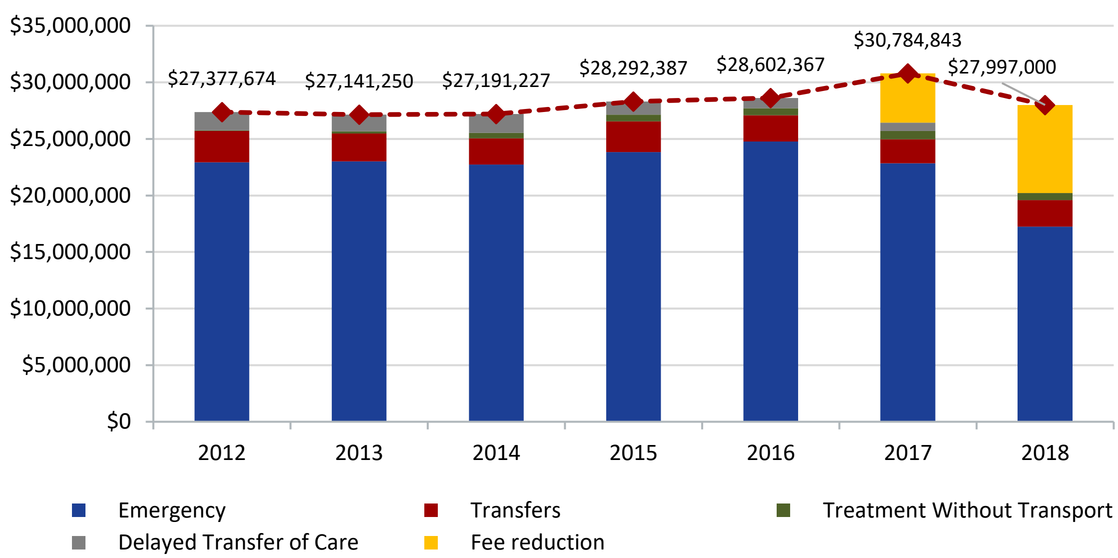
The 50 percent rate of recovery from user fees for emergency transport and treatment without transport user fees is mandated by the WRHA within the service agreement. This is a reflection of Manitoba Health policy. However, in 2016, the Government announced a fee reduction initiative that seeks to halve the cost paid by Manitobans who use ambulance services across the Province, over a number of years.

As ambulance fees are reduced as mandated, additional grant funding is provided to the WFPS to maintain the City's funding position. This is reflected by a "fee reduction" revenue line item whose value is shown in yellow in the following figure. This fee reduction grant funding was $4,356,733 in 2017, and is budgeted at $7,769,000 in 2018, as the patient fees are further reduced in that year.

Significantly, there is at present no social policy to address significant financial hardship for low income and senior (over 65) patients; a large Winnipeg demographic that makes up a major portion of the WFPS emergency medical service response. The latter group, prior to their 65th birthday, could otherwise be supported through the Province.

Patients are required to pay their invoice within three months otherwise a collection agency will become involved, causing an additional 17 percent increase to the invoice. This increase covers the charge made to the WFPS by the collection agency.

Figure 17: WFPS Ambulance Revenue by Category, 2012–2018 Adopted



Inter-facility transfers relate to the movement of patients between health care facilities and are fully funded by the WRHA. WFPS charges facilities for each trip, which only partially covers the cost of providing the service. The balance is funded through direct grant funding from the WRHA.

While payments from facilities for inter-facility transfers have varied between $2.13 and $2.76 million per year, averaging approximately $2.45 million annually, there is a general downward trend reflecting the respective volume of patient transfers. In 2018, the WFPS will cease charging most Winnipeg facilities for IFT and instead will seek grant funding from the WRHA.

Fees for on-scene treatment (which do not result in patient transport) have increased significantly from inception of fees for this service. In 2012, WFPS collected just $60,464 which jumped to $726,084 in 2017. It is reasonable to assume that this revenue stream will level off at some point with the annual increase mirroring the rate of increase observed for all emergency medical calls.

As mentioned elsewhere in this report, hospital delays are a significant strain on paramedic resources, as such the department has charged for excessive delays (turn-around time beyond 60 minutes). These fees have continued to come down from $1.6 million in 2012, to $0.7 million in 2017, as the parties to the Winnipeg EMS partnership (WRHA, WFPS, and receiving facilities) have made great efforts to address this problem and reduce transfer of care delays. Ambulance time lost to hospital delays has dropped from 25.1 percent in 2013, to 23.1 percent by 2016, and continues to decline.

In 2017, there was an expectation to reduce the 60-minute threshold for charging to 45 minutes and then again to 30 minutes later in the year. This was expected to increase the revenue from delays as facilities accustomed themselves to the new approach. In 2017, the government announced a major health care reform and so this initiative did not proceed.

The plan for 2018 is to move away from charging for delays and instead create an automatic transfer of care after 45 minutes (lowered to 30 minutes later in the year). This new approach will enable ambulances to return to the streets in a timelier manner and allow receiving facilities to focus on solving their respective internal patient flow issues. The major benefit to WFPS is the addition of available ambulance unit hours at no additional cost to the department.

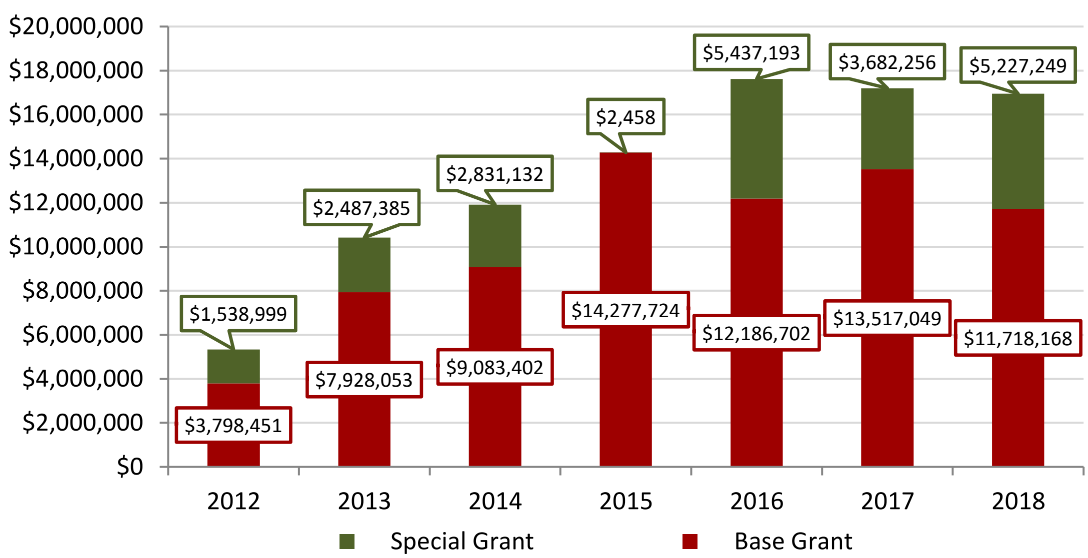
Ambulance user fee revenue as a percentage of total cost of emergency ambulance has been maintained at around 50 percent, but in relation to overall recurring revenues has declined from a 61 percent contribution to departmental revenue in 2012, to 50 percent as of 2017. This is primarily due to an annual increase in WRHA grant funding. The fee reduction grant funding provided by the Manitoba Government to offset the fee reduction initiative is included as part of the user fees.

As shown in the following figure, the WRHA grants are composed of two parts which are essentially the same revenue stream—a base grant which is flowed to the City in installments every two weeks and a special grant which is invoiced once the year ends. WFPS provides paramedic services under a service agreement with the WRHA and the base and special grants are effectively payment for this service provision. WFPS creates an invoice for the WRHA at the start of each year and reduces the receivable as electronic fund payments are received on a biweekly basis.

WRHA grant payments have increased significantly over the period, rising from $4,228,200 in 2012, to $17,199,305 in 2017; an increase of $12,971,105 or 307 percent during the period, or an average of 38.4 percent per year. This funding increase reflects a WFPS service level expansion over this time period.

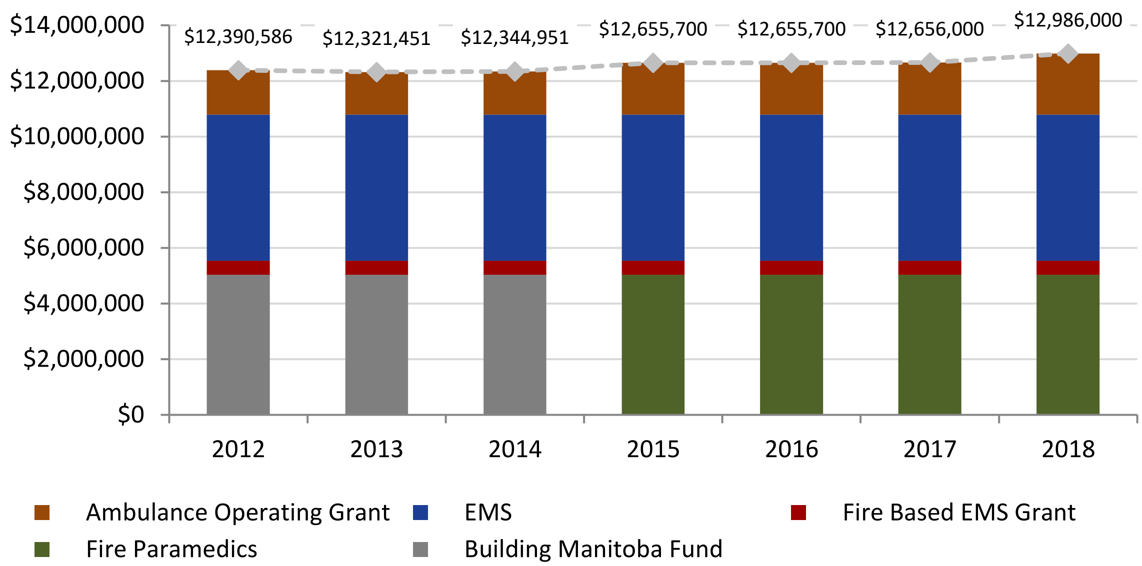
The ambulance operating grant was recorded as part of the WRHA grant through the early years of the period but is now recorded separately as part of funding from the Province. A manual adjustment is shown in the previous revenue table to provide consistency (shaded orange on the table in Figure 15). The ambulance operating grant is essentially a value-in-kind adjustment to reflect the notional value of WFPS receiving ambulances for free. This is offset by an equivalent cost in operating expenses and does not reflect the transfer of funds between the levels of government.

Figure 18: Winnipeg Regional Health Authority Grants, 2012–2018 Adopted



The department also receives annual grant funding from the Province of Manitoba for fire services, paramedic services, and fire-based EMS services. Provincial grant funding of $5.75 million is received by the WRHA and flowed to the City biweekly, in addition to the base grant (from 2018 onwards this is combined in the base grant). This predominantly supports paramedic EMS but also partially offsets the personnel costs relating to cross-trained firefighters who provide medical first response service prior to arrival of ambulance units. This approach significantly improves the level of medical response available to citizens and visitors of Winnipeg and enables the WFPS to begin medical treatment much faster than elsewhere in Canada.

Figure 19: Manitoba Provincial Grants, 2012–2018 Adopted



Ambulances are owned by the provincial government and provided to WFPS under a lease agreement with zero charges. A value-in-kind adjustment is recorded in the accounts to reflect this asset provision and includes lease, fuel, insurance, and maintenance costs. Essentially, a notional grant revenue is recorded from the province along with an equal and offsetting notional expenditure. The provincial grants have remained at a fixed level over the period, the value of which has declined annually as expenses have increased.

Non-recurring revenue sources have varied considerably, averaging just over $100,000 from 2012 through 2014, increasing to just over $300,000 in 2015, and averaging $1.05 million in 2016–17.

Funding for the Main Street Project (MSP) has always formed part of the overall WRHA grant funding but in the early years was recorded discretely. From 2016, the funding was recoded and reported as part of the base and special grant in the same manner as all other programs.

Non-recurring funding includes: Miscellaneous Regulation Fees such as fire department fees reduction, late payment charges and returned payment items; Miscellaneous Sales of Goods and Services such as surplus equipment, merchandise, environmental protection services, record searches, and printing services; and Other Revenue such as administrative charges, miscellaneous department revenues, leave of absence union duty pay, prior years surplus adjustments, donations, and year-end payable write-offs. These revenues are generally those that are highly variable and may or may not continue on a year-to-year basis. While grants are typically considered non-recurring, the large provincial and WRHA grants are based upon service provided, contractual or other mechanisms, and are generally anticipated to continue in some fashion.

Expense Trends

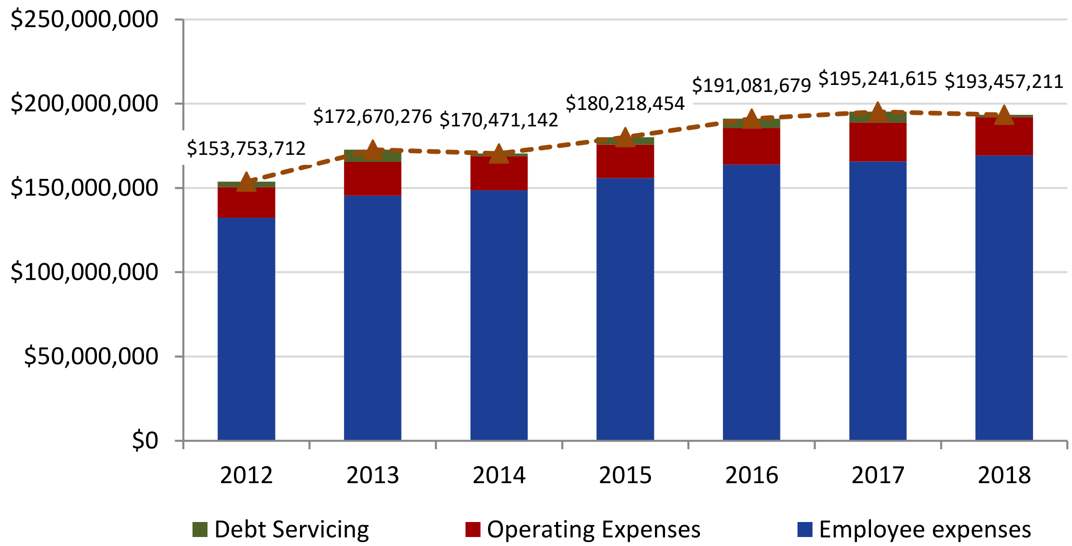
Figure 20 shows actual departmental expenses from 2012 through 2017, with adopted budget for 2018. Major budgetary categories are Employee Expenses for all departmental functions (fire and EMS operations, administration, finance, IT, communications, human resources, etc.), Operating Expenses, and Debt Service. Major capital expense is accounted for in either the City's Fleet Management Agency (for vehicle purchases, and then subsequently charged to the WFPS through fleet rental charges) or directly to the department through debt service and cash to capital charges for all other capital purchases.

Figure 20: WFPS Expenditures, 2012 Actual through 2018 Adopted

EXPENSES	2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Adopted
Salaries	$107,378,342	$114,841,099	$120,874,675	$125,454,059	$131,077,353	$134,025,414	$141,332,271
Overtime	$3,011,519	$5,335,300	$3,121,166	$4,489,254	$5,090,099	$3,273,387	$2,179,000
Salaries Subtotal	$110,389,861	$120,176,398	$123,995,841	$129,943,313	$136,167,453	$137,298,801	$143,511,271
Retirement (Pension)	$15,252,927	$18,073,388	$17,816,523	$19,007,480	$20,208,600	$21,389,872	$20,451,557
Insurance	$1,743,492	$2,093,338	$2,168,260	$2,045,272	$2,120,862	$1,906,558	$1,640,155
Workers Compensation	$3,155,636	$3,255,749	$2,766,982	$2,873,983	$3,150,733	$3,028,304	$1,664,091
Medical benefits	$1,612,715	$1,703,537	$1,734,498	$1,777,665	$1,856,769	$1,850,460	$1,865,897
Other	$214,785	$158,342	$260,542	$271,710	$283,038	$286,682	$250,000
Benefits Subtotal	$21,979,555	$25,284,354	$24,746,805	$25,976,111	$27,620,002	$28,461,876	$25,871,700
Employee Expenses	**$132,369,416**	**$145,460,752**	**$148,742,646**	**$155,919,423**	**$163,787,454**	**$165,760,676**	**$169,382,971**
Operating Services	$4,188,921	$4,718,263	$5,149,256	$5,222,825	$5,820,571	$6,444,243	$6,985,981
Operating Commodities	$6,988,253	$6,840,935	$6,895,935	$6,451,696	$7,171,580	$7,848,024	$5,888,000
Fleet Rental	$3,395,998	$4,133,709	$4,583,432	$4,838,393	$5,277,134	$5,309,073	$6,302,000
Fleet Maintenance	$1,025,871	$1,039,483	$708,902	$887,417	$882,356	$898,621	$901,000
Motor Fuels/Lubricants	$808,675	$743,891	$846,305	$631,282	$574,055	$678,913	$640,000
Accommodation Rental	$1,755,908	$1,796,540	$1,775,020	$1,775,018	$1,760,193	$1,760,193	$1,890,869
Transfers - Other	$0	$731,317	$332,432	$89,308	$295,355	$99,817	$92,745
Operating Expenses	**$18,163,626**	**$20,004,139**	**$20,291,282**	**$19,895,938**	**$21,781,245**	**$23,038,884**	**$22,700,595**
Principal	$2,261,596	$6,714,677	$1,003,636	$3,996,799	$5,065,298	$5,989,443	$912,732
Principal	*$1,161,685*	*$1,192,886*	*$772,058*	*$648,799*	*$692,391*	*$733,852*	*$808,818*
Tsf to General Capital fund	*$705,443*	*$521,791*	*$231,579*	*$0*	*$39,907*	*$44,590*	*$0*
Tsf to GCF - cash to capital	*$0*	*$5,000,000*	*$0*	*$3,348,000*	*$4,333,000*	*$5,211,000*	*$0*
Internal Financing-Principal	*$394,468*	*$0*	*$0*	*$0*	*$0*	*$0*	*$103,914*
Interest	$954,543	$465,949	$424,513	$401,587	$435,392	$441,125	$431,648
Interest	*$648,017*	*$465,949*	*$424,513*	*$401,587*	*$435,392*	*$441,125*	*$396,060*
Internal Financing-Interest	*$306,526*	*$0*	*$0*	*$0*	*$0*	*$0*	*$35,588*
Debenture Issue Expense	$4,532	$24,760	$9,065	$4,707	$12,290	$11,487	$29,265
Debt Servicing	**$3,220,671**	**$7,205,386**	**$1,437,214**	**$4,403,093**	**$5,512,980**	**$6,442,055**	**$1,373,645**
Expense Total	**$153,753,712**	**$172,670,276**	**$170,471,142**	**$180,218,454**	**$191,081,679**	**$195,241,615**	**$193,457,211**

The following figure shows the trend of historical expenditures by major budgetary category. In general, overall departmental expenditures have increased from 2012 through 2017, rising from $153,753,712 to $195,241,615 over the period; an increase of $41,487,903 or 27 percent, which averages 5 percent annually.

Figure 21: WFPS Historical Expenditures by Major Category



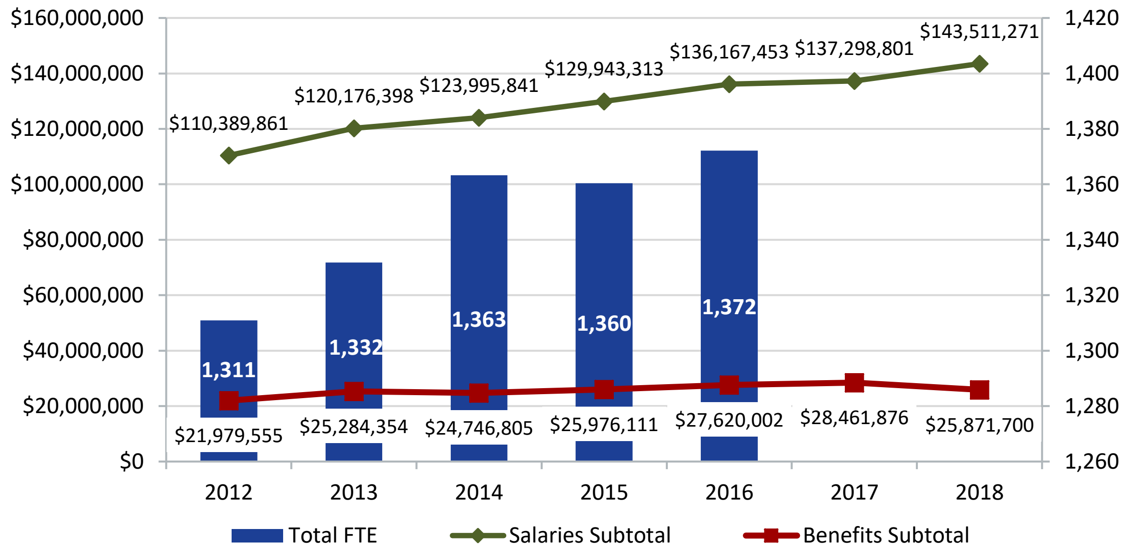
As with many career departments, employee costs comprise the majority of the WFPS annual operating budget, ranging from a low of near 84 percent, to a high of almost 88 percent, and averaging almost 86 percent of the total operating budget throughout the period.

While remaining flat at approximately $20 million from 2013 through 2015, Operating expenses have in general increased from $18,163,626 in 2012, to $23,038,884 in 2017. This represents an increase of $4,875,258 or 26.8 percent over the period, for an average annual increase of 5 percent.

Capital expense for facility construction and fleet acquisition/replacement are not budgeted directly. Rather, apparatuses are purchased from capital funds by the Fleet Management Agency using a scheduled replacement program. These acquisitions are then funded through the WFPS via monthly apparatus lease payments (an operating expense). Some capital equipment and all major facilities expenses are funded through debt servicing (principal, GCF cash to capital, and internal financing). The Transfer to General Capital Fund and the Transfer to GCF–Cash to Capital can both be considered as a single line item; cash to capital. Transfer to GCF relates to year end reviews of purchasing and the subsequent transfer to capital of large items incorrectly charged to operating. From an accounting standpoint, the operating budget is converted to capital and the operating cost is transferred to capital. Thus, this in essence works like cash to capital.

Debt Service, while variable, has increased over the period from approximately $3.2 million in 2012, to $6.4 million in 2017, and reflects the changes in the capital program identified by the department.

Figure 22: Salaries and Benefits (2012A–18B) versus FTE Count (2012–16)



Total WFPS salary and benefits through 2018 as budgeted, as well as actual total staff count (FTEs as calculated and provided by Human Resources through 2016), are provided in the previous figure. Salaries includes regular, specialty, and other pay, as well as overtime pay (also included here as part of the salary category are sick leave severance, special severance, and vacation/overtime pay. It should be noted that the City reports these items as benefits in its reporting).

The annual increase observed in salaries and benefits reflects both the addition and/or reclassification of various positions each year as well as any annual increases that were applied to both represented and non-represented employees in the department.

According to HR staff, the actual annual FTE numbers are calculated by taking the total number of hours paid divided by the regular compensable hours in a fiscal year. This includes permanent, temporary, full-time, part-time, salaried, hourly, seasonal, casual, and student positions. Therefore, the FTE counts used here are fractional and rounded to the nearest whole number and may not always add to the total. This calculation may overestimate the "real" number of FTE in the department but does give an estimation of the annual staffing effort used to support department operations in the various divisions.

The overall salary category has generally increased in a linear manner from $110,389,861 in 2012, to $136,167,453 in 2016, an increase of 23.4 percent or approximately 5.4 percent per year.

It is important to note that this average annual increase in the overall salary category does not reflect actual employee salary increases and is greater than the average CBA increase (approximately 3.3 percent from 2012–2016). The increase in salary category also reflects the addition of staff (discussed as follows) and any salary adjustments due to promotions or reclassification of positions.

Excluding overtime and other types of pay, the Salaries–Professional line item (511010) has increased from $101,358,659 in 2011, to $121,817,488 in 2016, an increase of $20,458,829 or 20 percent for an average annual increase of 4.7 percent compared to the weighted average CBA increase of 3.3 percent. The calculated average CBA increase uses only those increases from 2012–2016 for comparison with available financial information and FTE counts over the same period.

The following figure shows the effective annual salary increases applied as a result of collective bargaining with each union representing employees within WFPS. Salary increases were applied in two increments (generally six months apart) in the initial year they were applied but are shown as a single increase here for simplicity.

Figure 23: Effective Annual Salary Increase by WFPS Bargaining Unit (Year Applied), 2011–2016

Union	Contract Period – Effective Annual % Salary Increase[1]					
	2011	2012	2013	2014	2015	2016
Manitoba Government and General Employees' Union (MGEU) Local 911	4.5 (2013)	4.5 (2013)	3.75	3 (2015)	3.0	
United Firefighters of Winnipeg (UFFW) IAFF Local 867		4.0	3.25	3.0	3.0	3.0
Winnipeg Fire Paramedic Senior Officers Association (WFPSOA)	2 (2014)	4 (2014)	5 (2014)	2 (2016)	3 (2016)	4.0

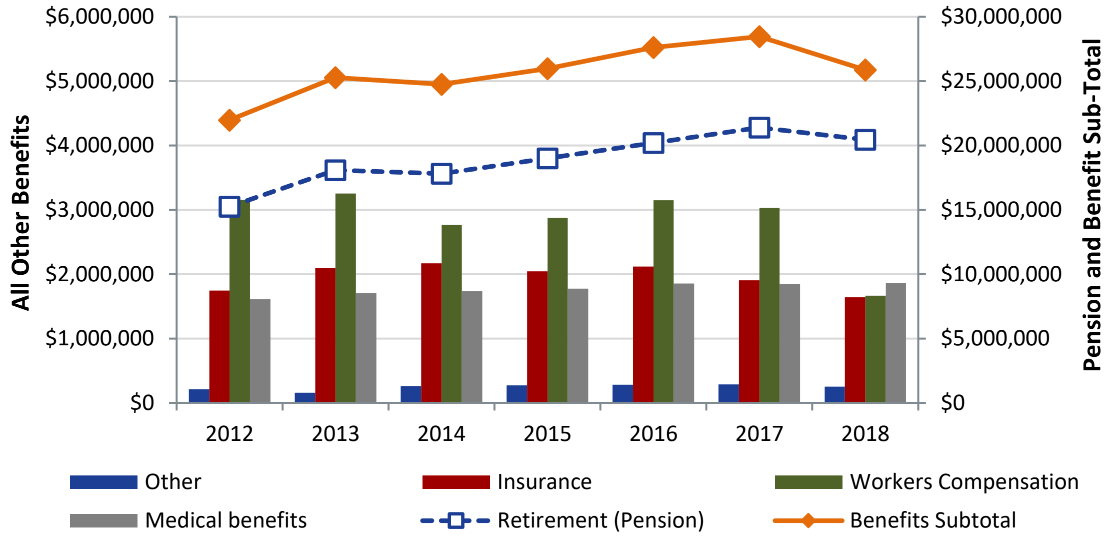
[1]Year salary increase applied shown in parentheses, if applied retroactively in a subsequent fiscal year.

The increase in total wages over the period reflects both retroactive and current year wage increases as well as the addition of staff to the department. Total FTEs rose from 1,311 in 2012, to 1,372 in 2016, an increase of 61 positions or 4.6 percent over the same period. The average annual increase in FTE count for the period 2012 to 2016 is 1.1 percent.

Departmental benefits have increased linearly from 2012 to 2016, with pension costs being the major driver as shown in the following figure. Total benefit costs (orange diamonds) and pension costs (blue squares with dashed line) are shown on the right vertical axis while all other benefit costs are shown on the left vertical axis.

Total benefits increased from $21,979,555 in 2012, to $27,620,002 in 2016, for a total increase of $5,640,467 or 25.7 percent, or an average increase of 6 percent per year.

Figure 24: Employee Benefits by Major Category, 2012–2018 Adopted



Pension costs as a percentage of total benefits have increased from just under 70 percent in 2012, to 73 percent by 2016, increasing to 75 percent in 2017. The employment/workers' compensation benefit, while fluctuating year-to-year, has generally averaged approximately $3 million annually. Insurance has fluctuated somewhat over time from a low of $1.7 million in 2012, to a high of $2.2 million in 2014, but has averaged approximately $2 million between 2012 and 2017.

Positions within the WFPS were allocated to two general operational categories; Fire Operations and EMS Operations, with all other positions allocated to the command/support/administrative category. While the increase in total fire positions (61) between 2012 and 2016 is not that significant with respect to the total budgetary increase for the period, the reclassifications within this category are more so. Firefighter Senior and Firefighter Senior II both experienced progressive declines, decreasing by 36 (28.6 percent) and 32 (15.4 percent); respectively. Conversely, the Firefighter PCP and Firefighter Senior PCP positions both experienced progressive increases, rising by 82 (35.8 percent) and 40 (800 percent); respectively.

Like the Fire Operations Division, the EMS Operations Division has seen a trend towards more qualified staff, certified at higher levels between 2012 and 2016. Again, the major financial impact has been in position reclassifications and/or promotions rather than the addition of new FTEs. Attendant Trainees have decreased from 43 to 0 between 2012 and 2014, when it was removed from the pay scale. The Emergency Paramedic 1 classification, after rising in 2013–14, has seen an overall decrease from 47 in 2012, to 23 in 2016, a reduction of 24 (51 percent). The position of Emergency Paramedic 2 with ACP has increased from 58 to 78 (34.5 percent), while the position of Emergency Paramedic 2 has increased from 77 to 130 (68.8 percent), during the period 2012 to 2016.

These trends reflect the department's ongoing commitment to integrated emergency service delivery. More firefighters are becoming certified as primary care paramedics and the paramedic services are being expanded into community-based models. The department has seen an improvement of paramedic services in general, with higher levels of EMS certification being attained by more staff across the organization. The incremental additional cost per position with increased position functionality should be considered a normal part of the annual employee cost increase.

Figure 25: WFPS Regular Salaries and Overtime, 2012–2018 Adopted

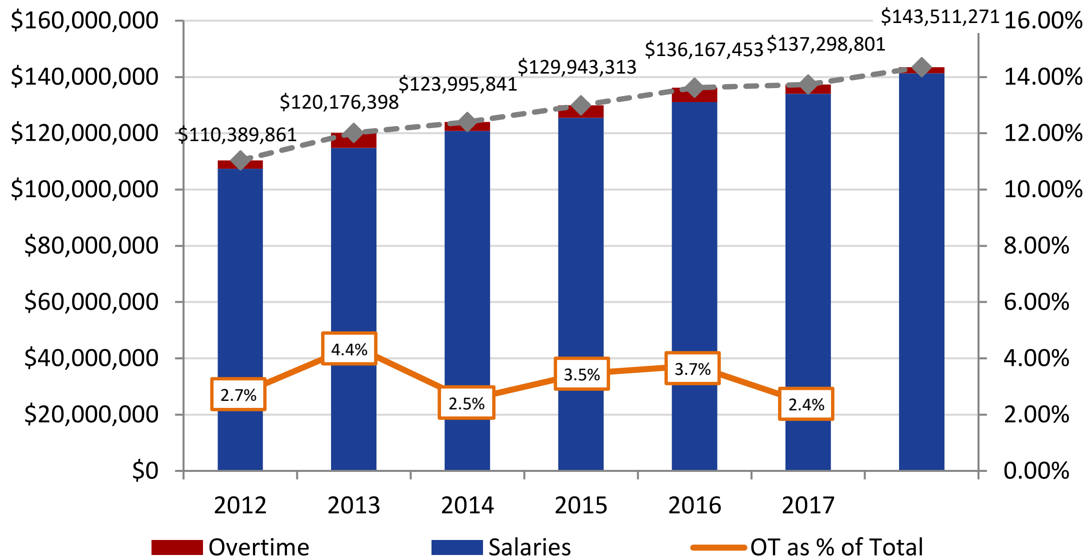


Figure 25 shows actual departmental salary (in blue) and overtime (in red) in dollars with overtime also reflected as a percentage of the total for the period 2012 through 2017, and budget 2018. Total salary is shown by the grey dashed line while overtime as a percentage of the total is shown by the solid orange line. This reflects contractual retroactive, promotional, and reclassification pay increases, as well as increases from additional staffing, as discussed above.

Salaries and wages have increased from $110,389,861 in 2012, to $137,298,801 in 2017. This is an increase of $26,908,940 or 24.4 percent over the period, and an average increase of 5.4 percent annually.

Actual overtime expense has varied considerably from year-to-year ranging from between a low of $3,011,519 in 2012, to a high of $5,335,300 in 2013, but averaging approximately $4 million annually. As a percentage of total wages, overtime has ranged from a low of 2.7 percent of total wages, to a high of 4.4 percent with an annual average of 3.2 percent.

Overtime expense is a function of multiple factors and, while it can and should be monitored and controlled to the maximum extent possible, a certain amount is to be expected in the efficient running of an emergency service. Emergency calls that extend beyond the normal shift, mandatory off-duty training requirements, sick and vacation coverage, and the interplay with minimum staffing requirements all combine to create overtime demands.

WFPS overtime percentages are not excessive with respect to other municipal departments. A detailed staffing study to examine leave accrual and usage by position, scheduling policies, minimum staffing, and what overtime is currently being used for was recently completed. The study showed that the majority of departmental overtime is related to necessary off-duty training, late calls, and other reasons rather than for coverage of sick and vacation absences.

Current staffing levels may or may not be sufficient to cover minimum staffing needs without resorting to the use of overtime as an initial tool.

Figure 26: WFPS Salaries and Benefits as Percent of Total, 2012–2018 Adopted

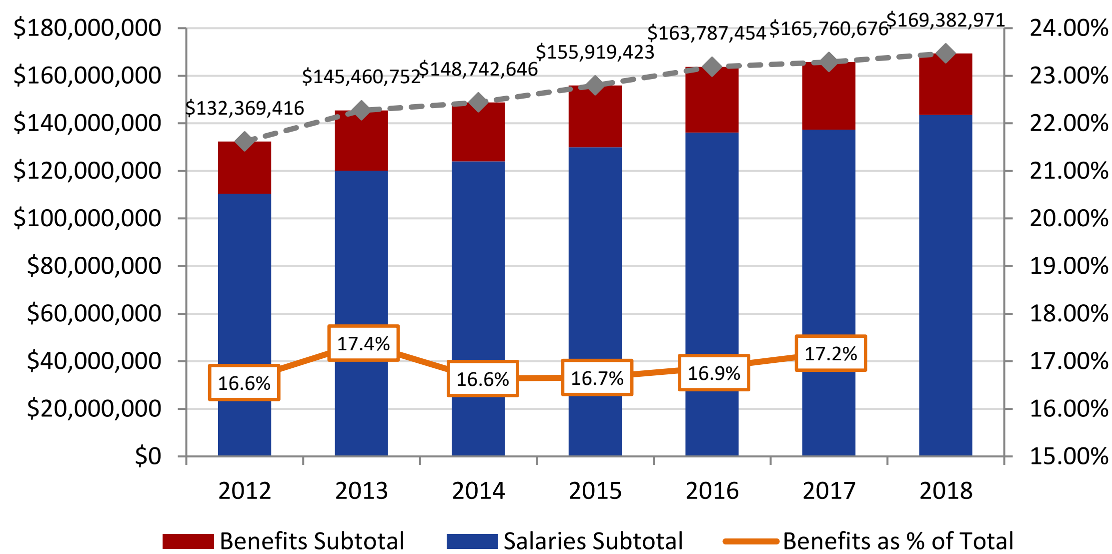
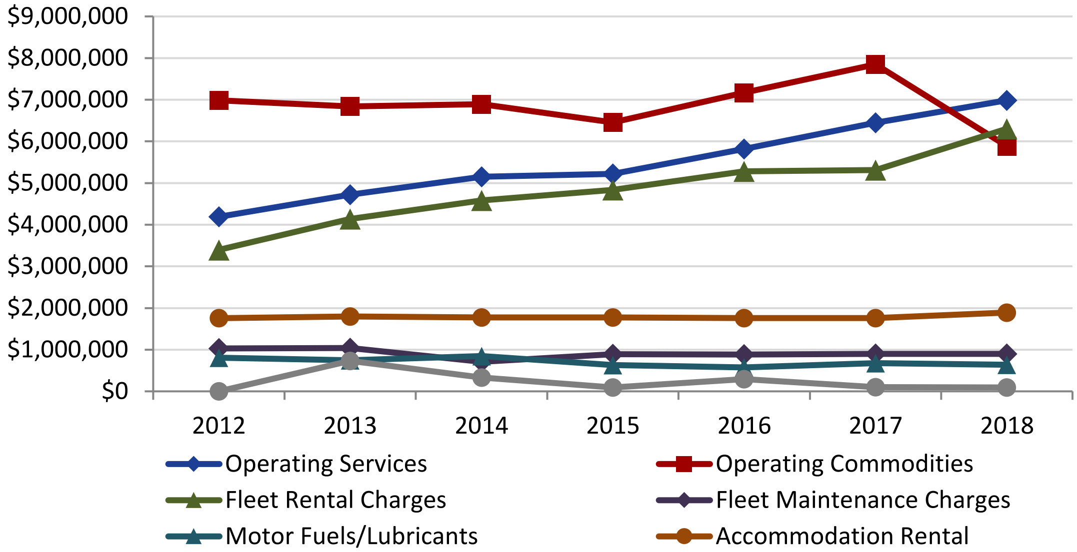


Figure 26 shows the relationship of actual salaries to benefits for the period 2012 through 2017, and 2018 adopted. Vacation and overtime cash-out expenses (this cost has increased from $1 million in 2012, to $1.4 million in 2017) are included in salaries. Benefits, which include rehabilitation payroll expenses, have generally increased linearly from $21,979,555 in 2012, to $28,461,876 in 2017. This represents an increase of $6,482,321 through 2017, or 29.5 percent which averages 6 percent per year.

Benefits as a percentage of total compensation have ranged from a low of 16.6 percent in 2012, to a high of 17.4 percent in 2013, but have averaged 16.9 percent. ESCI has typically seen municipal benefit rates for emergency services organizations range between 25–35 percent of total compensation.

The following figure illustrates historical WFPS operating expenses by major category. Total operating expenses have increased in a relatively linear fashion from $18,163,626 in 2012, to an expected $23,586,249 in 2017, for an increase of $5,422,623 or 29.9 percent over five years. The average annual increase of 5.5 percent is driven by increases in the operating services and fleet rental charge categories as seen in the next figure. All other categories have remained relatively static around an average figure for the entire period.

Figure 27: WFPS Operating Expenses by Major Category, 2012–2018



Operating commodities remained flat from 2012 through 2014, and have fluctuated around the period average of $7 million from 2015 through 2017. This category includes office supplies and associated equipment, operating supplies, uniforms and protective equipment, facilities and equipment maintenance, provision for bad debt, insurance claims, and various recoveries.

Fleet maintenance charges (heavy fleet maintained by WFPS) have averaged approximately $910,000 for the period 2012 through 2017, and have declined from just over $1 million in 2012 through 2013, to approximately $900,000 from 2014 to 2017.

Transfer to civic accommodations (facilities lease expense charged by square foot for buildings owned by Winnipeg but not those owned by WFPS) has averaged $1.77 million for the period.

Motor fuels/lubricants have declined somewhat from $808,675 in 2012, to an anticipated $678,913 in 2017, but have averaged approximately $714,000 annually. This is more reflective of declining fuel prices rather than usage.

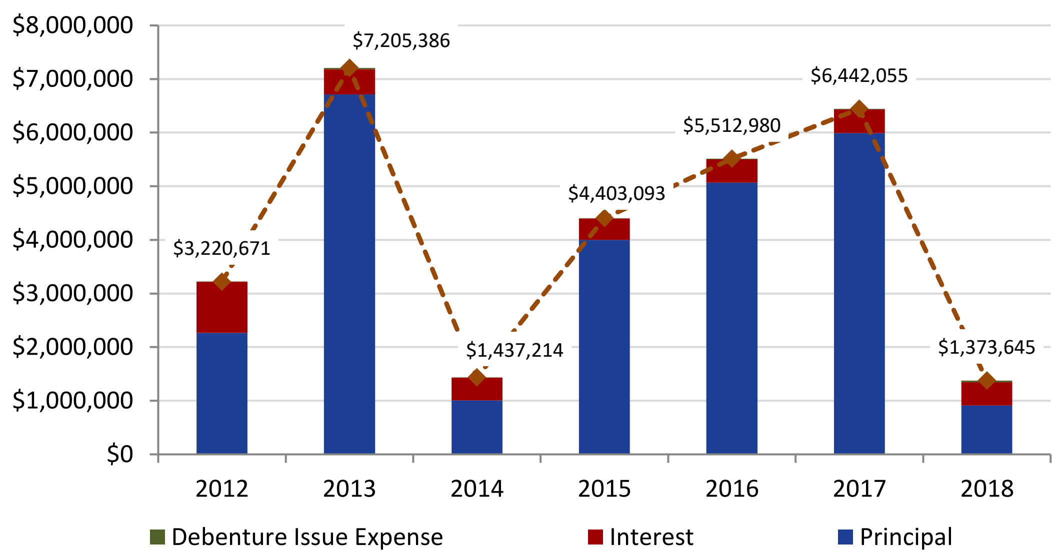
Other transfers, which include the transfer to commitment reserve and an inter-department transfer to GRF-HRPS, have fluctuated significantly but average approximately $260,000 annually from 2012 to 2017.

Operating services have increased from $4,188,921 in 2012, to $6,444,243 in 2017, an increase of $2,255,322 or 53.8 percent for the period which is an average annual increase of 8.7 percent. This category includes various professional services and fees, allocated departmental costs, utilities, rental and office maintenance costs, cleaning and laundry, communications, insurances and permit fees of various types, training, travel and related costs, memberships and professional development costs, and transportation expenses.

Fleet rental charges (included are fleet operating lease, fleet specification fees, fleet capital lease, equipment rental both internal, and external and fleet rental, both internal and external) have also increased significantly and in a linear manner from $3,395,998 in 2012, to an expected $5,277,134 in 2016, or $1,881,136 (35.6 percent) between 2012 and 2016, which represents an average annual increase of 11.8 percent. Fleet rental charges remained flat from 2016 through 2017, but are budgeted at $6.3 million in 2018, which puts spending in this category back on the historical trend observed from 2012 through 2016. This fee will be discussed in more detail as follows.

The department carries some debt servicing where capital facilities and purchases in the past have been financed from external debt, as shown in the following figure. This category also includes GCF Cash to Capital transfers.

Figure 28: WFPS Debt Servicing and Cash to Capital, 2012–2018 Adopted

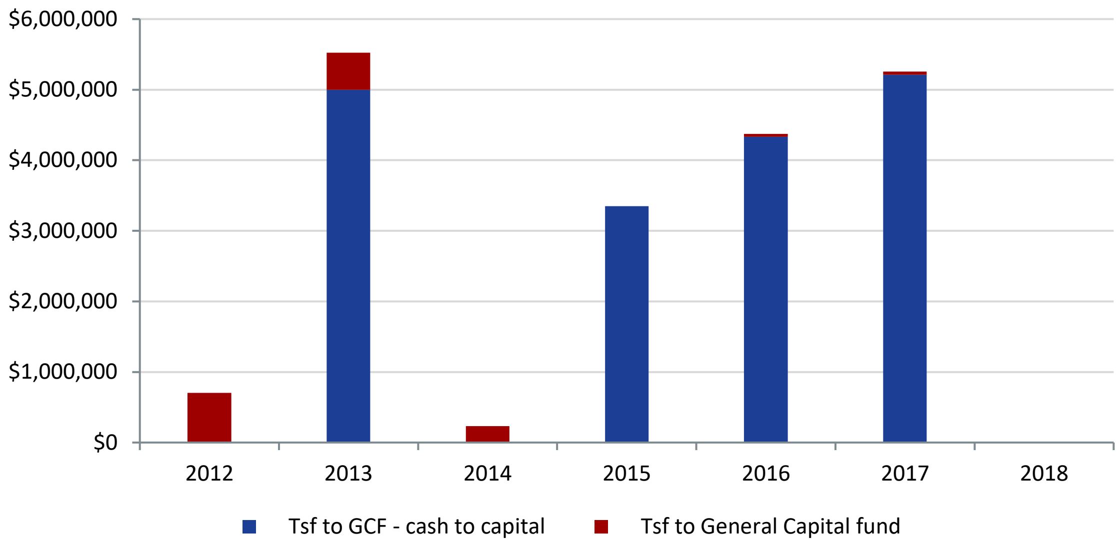


Total debt servicing has varied considerably from 2012 to 2017, and is driven by the GCF cash to capital transfer, shown in the next figure, which serves as a mechanism to tax fund capital items like major facilities. Rather than partially funding these projects with external debt, these items are fully charged through the cash to capital transfer in the initial year of the project.

Major equipment purchases such as Self-Contained Breathing Apparatus (SCBA), extrication, and other such large items are purchased using the GCF cash to capital funding mechanism.

The two transfer line items shown in the following figure should be considered together as cash to capital. Transfer to GCF relates to year end reviews of purchasing and the subsequent transfer to capital of large items incorrectly charged to operating. From an accounting standpoint the operating budget is converted to capital and the operating cost is transferred to capital. Thus, this in essence works like cash to capital.

Figure 29: Transfers to General Capital Fund (GCF Cash to Capital), 2012–2018 Adopted



The City has made, and continues to make, a significant investment in capital apparatus, equipment, and facilities used by the WFPS. Therefore, it is important to understand how those investments are maintained and replaced as they age.

APPARATUS

As discussed elsewhere in this report, it has been noted that the department works closely with the Province and the City Fleet Management Agency (FMA) to ensure that fire and EMS units are replaced on an appropriate cycle based upon age and usage, and following industry standards. Ambulances are provided by the Province which uses their own replacement schedule. The following figure identifies all costs associated with the WFPS vehicle maintenance and replacement program for the period 2012 through 2018, as budgeted.

Figure 30: WFPS Vehicle Maintenance/Replacement Program, 2012–2018 Adopted

APPARATUS PROGRAM	2012	2013	2014	2015	2016	2017	2018
Fleet Operating Lease	*$331,616*	*$369,280*	*$391,401*	*$394,776*	*$410,262*	*$418,595*	*$422,000*
Fleet Specification Fees	*$0*	*$67*	*$0*	*$0*	*$0*	*$0*	*$0*
Fleet Capital Lease[1]	*$1,957,763*	*$2,144,424*	*$2,567,326*	*$2,514,120*	*$2,961,892*	*$2,982,092*	*$3,620,000*
Equipment Rental-Internal	*$27*	*$0*	*$18*	*$0*	*$0*	*$0*	*$0*
Fleet Rentals Internal	*$40,334*	*$47,216*	*$47,167*	*$45,271*	*$20,342*	*$18,500*	*$45,000*
Equip. Rental-External[2]	*$1,052,283*	*$1,560,449*	*$1,559,898*	*$1,870,137*	*$1,871,688*	*$1,873,917*	*$2,200,000*
Fleet Rentals External	*$13,976*	*$12,272*	*$17,622*	*$14,090*	*$12,950*	*$15,969*	*$15,000*
Fleet Rental Charges	**$3,395,998**	**$4,133,709**	**$4,583,432**	**$4,838,393**	**$5,277,134**	**$5,309,073**	**$6,302,000**
Vehicle Maintenance	*$360,048*	*$445,300*	*$506,692*	*$392,472*	*$338,709*	*$270,013*	*$370,000*
Vehicle Maint.-Accidents	*$0*	*$0*	*$0*	*$0*	*$7,860*	*$0*	*$0*
Vehicle Maintenance-Tires	*$0*	*$69*	*$0*	*$0*	*$0*	*$0*	*$0*
Fleet Consumables	*$21,103*	*$23,271*	*$23,791*	*$32,378*	*$29,333*	*$45,055*	*$29,000*
Fleet Miscellaneous	*$43,300*	*$11,730*	*$18,555*	*$10,505*	*$3,362*	*$7,434*	*$5,000*
Fleet Manufacturing	*$1,481*	*$1,349*	*$0*	*$0*	*$1,611*	*$309*	*$0*
Fleet Manu. (non-veh.)	*$5,593*	*$12,772*	*$3,767*	*$31,057*	*$973*	*$7,030*	*$0*
Automotive Parts	*$594,347*	*$544,830*	*$159,918*	*$421,005*	*$500,510*	*$568,780*	*$497,000*
Inventory Auto. Parts	*$0*	*$162*	*-$3,821*	*$0*	*$0*	*$0*	*$0*
Fleet Maint. Charges	**$1,025,871**	**$1,039,483**	**$708,902**	**$887,417**	**$882,356**	**$898,621**	**$901,000**

[1]Capital fire apparatus "replacement" fund; department pays an annual lease cost over the life of the vehicle which offsets the cost paid by FMA to acquire the vehicle.
[2]VIK adjustment for the ambulances provided by the provincial government and offset by grant revenue from same.

WFPS is still transitioning from the previous model of directly purchasing vehicles to a leased model. Under this new model, the Fleet Management Agency (FMA) purchases fire apparatus and EMS staff vehicles and charges a capital lease to the department (Fleet Capital Lease in the previous figure). The department pays the capital costs over the life of the vehicle rather than purchasing it outright as it did under the past model. As previously owned (cost neutral) vehicles are retired, new leased vehicles will cause the annual leasing costs to steadily increase until all historic owned vehicles have been written off.

The annual fleet capital lease costs have risen from $1,957,763 in 2012, to $2,982,092 in 2017, an increase of $1,024,329 or 52 percent over the period which represents an average annual increase of 9 percent.

The department records a VIK adjustment (Equipment Rentals-External in the previous figure) to account for the annual cost of ambulances based upon information provided by VEMA (the provincial fleet agency).

Light fleet vehicles purchased through this program are maintained by the FMA through payment of an operating lease (Fleet Operating Lease in the previous figure) which has risen from $331,616 in 2012, to $418,595 in 2017, an increase of $86,979 (26.2 percent) over the period or 4.8 percent per year.

The department operates its own fleet maintenance shop co-located with the training/logistics facility. This shop handles all heavy and specialty vehicle apparatus maintenance. Annual maintenance costs for the vehicles maintained by the WFPS fleet shop averaged just over $1 million in 2012 to 2013, dropped to just over $700,000 in 2014, and have remained static at approximately $885,000 between 2015 and 2017.

FACILITIES/CAPITAL EQUIPMENT

Elsewhere in this study, ESCI examines facilities with respect to condition and need for relocation, renovation, and expansion or additional facilities. Combining fire and paramedic services has, in some cases, led to funding of duplicate facilities where fire and paramedic units could be combined into one. This duplication increases annual maintenance and repair costs as well as renovation costs as facilities age. Further, many of the current fire stations are in poor condition and need major renovation or replacement.

Although a VFA condition assessment has been performed, WFPS service staff members have stated that a long-range facility capital improvement plan (CIP) does not exist. This report may be used to assist with such a plan. Given the current condition of fire stations and potential need to construct new stations or perform major renovations, a funding source will need to be identified for the facility CIP.

The following figure groups facility maintenance and capital building costs in one table. It is important to note that debt service costs also fund major capital equipment purchases (e.g., SCBA) as well as major facility renovation/repair costs. A capital plan will need to separate equipment and facility costs.

Figure 31: WFPS Facility/Equipment Maintenance/Replacement Program, 2012–2018 Adopted

FACILITY/EQUIPMENT PROGRAM	2012	2013	2014	2015	2016	2017	2018
Real Prop Contracts-Const/Mtce	*$338,740*	*$707,141*	*$1,142,793*	*$897,097*	*$913,089*	*$839,054*	*$1,125,000*
Transfer to Civic Accommodations[1]	*$1,755,908*	*$1,796,540*	*$1,775,020*	*$1,775,018*	*$1,760,193*	*$1,760,193*	*$1,890,869*
Building Maintenance	*$4,313*	*$0*	*$858*	*$0*	*$1,099*	*$6,655*	*$0*
Grounds Maintenance	*$1,496*	*$0*	*$110*	*$0*	*$0*	*$0*	*$0*
Painting	*$0*	*$0*	*$116*	*$0*	*$0*	*$0*	*$0*
Overhead Door Repairs	*$28,806*	*$11,370*	*$201*	*$513*	*$0*	*$1,608*	*$0*
Facility Operating Expense	**$2,129,263**	**$2,515,052**	**$2,919,097**	**$2,672,628**	**$2,674,381**	**$2,607,510**	**$3,015,869**
Principal	$2,261,596	$6,714,677	$1,003,636	$3,996,799	$5,065,298	$5,989,443	$912,732
Principal	*$1,161,685*	*$1,192,886*	*$772,058*	*$648,799*	*$692,391*	*$733,852*	*$808,818*
Tsf to General Capital fund	*$705,443*	*$521,791*	*$231,579*	*$0*	*$39,907*	*$44,590*	*$0*
Tsf to GCF - cash to capital	*$0*	*$5,000,000*	*$0*	*$3,348,000*	*$4,333,000*	*$5,211,000*	*$0*
Internal Financing-Principal	*$394,468*	*$0*	*$0*	*$0*	*$0*	*$0*	*$103,914*
Interest	$954,543	$465,949	$424,513	$401,587	$435,392	$441,125	$431,648
Interest	*$648,017*	*$465,949*	*$424,513*	*$401,587*	*$435,392*	*$441,125*	*$396,060*
Internal Financing-Interest	*$306,526*	*$0*	*$0*	*$0*	*$0*	*$0*	*$35,588*
Debenture Issue Expense	*$4,532*	*$24,760*	*$9,065*	*$4,707*	*$12,290*	*$11,487*	*$29,265*
Capital Project/Equipment Funding	**$3,220,671**	**$7,205,386**	**$1,437,214**	**$4,403,093**	**$5,512,980**	**$6,442,055**	**$1,373,645**

[1]Facilities lease payment to Property Planning and Development Department (sq ft basis charge).

No new fire paramedic station construction has occurred since 2012; however, there have been capital improvements made to existing facilities between 2012 and 2017.

While spending within the "Real Property Contracts–Construction/Maintenance" line item has been quite variable with a spike at $1,142,793 in 2014, and a three-year spending plateau of approximately $900,000 from 2015 to 2017, the trend has been one of increasing spending. In 2012, WFPS spent $338,740 on this line item and estimates spending $1.125 million in 2018.

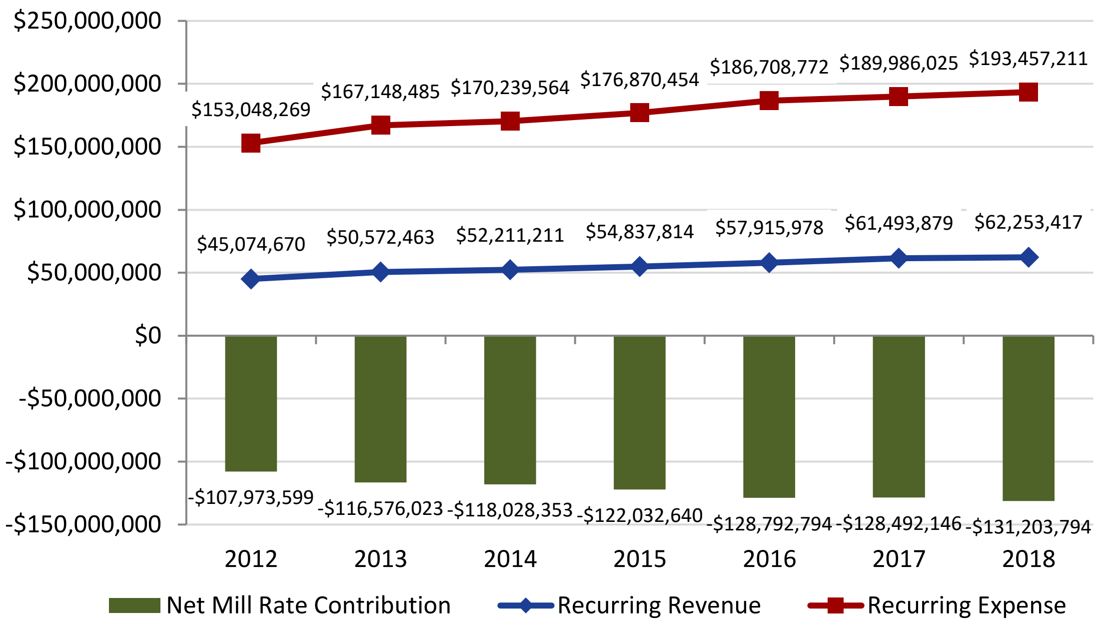
The line item, "Transfer to Civic Accommodations" is a lease payment for use of City-owned (non-WFPS owned buildings) facilities based upon square footage paid to the Property Planning and Development department. This line item has remained fixed at an average of $1.77 million per year since 2012.

The transfers to the General Capital Fund (cash to capital) are split between station capital maintenance projects and major equipment purchases. The department has a station optimization program for major renovations, such as expansion for additional bay and living space, as well as a station capital maintenance program for major building system work such as roofing, HVAC, etc.

Net Income/Deficit Trends

The following figure shows the relationship between department-specific recurring revenue and recurring expenses (excludes transfers for capital) for the period 2012 actual through 2018 adopted. If expenses (shown in red) exceed revenues (shown in blue) in any given year, then there is a mill rate contribution (shown in green bars) from the municipal General Fund. Because the WFPS budget is part of the City General Fund (GF), a mill rate (property tax revenue) contribution or other form of unrestricted General Fund revenue must be used to offset those expenses not funded by department-specific revenues.

Figure 32: WFPS Historical Revenue, Expense, and Mill Rate Contribution, 2012–2018



The net recurring mill rate support of the WFPS has steadily increased from $107,973,599 in 2012, through 2017 to $128,492,146. This $20,518,547 increase represents a 19 percent increase over the period or an average annual increase in GF mill rate support of 3.6 percent. This reflects a gradual increase in overall expenditures at a rate of increase faster than department-specific revenue. This rate of increase declined somewhat into 2017.

Key Recommendations

- The department should develop a comprehensive five-year financial model to include status quo projections of revenue and expense as well as various service level improvement scenarios. The model should integrate projected capital equipment and facility costs to provide uniform cash flow requirements over life of model (better prediction of expense to prevent spiking expenditure budget analogous to FMA leasing costs).
- Annual apparatus lease payments should be monitored versus actual apparatus purchases and cost of each apparatus type should be reviewed against industry inflationary trends.
- Develop and adopt a long-range equipment replacement program based upon expected life cycle and technology changes for SCBA, extrication, major medical, and other equipment systems.
- Develop a comprehensive ten-year facility capital improvement and maintenance plan to include new stations, major renovations, key building system replacement or upgrades, and an adequately funded routine (recurring) maintenance program.
- Closely monitor province ambulance fee reduction actions versus additional grant funding to determine impacts on CoW tax support of ambulance service.
- Monitor rising operating services costs and explore opportunities for cost reduction.

Staffing

An emergency services organization's most valuable asset is the personnel it employs to perform the myriad and complex activities necessary to function adequately. A high-level of attention must be paid to managing human resources in a manner that achieves maximum productivity, while ensuring employee job satisfaction. A critical element of this is to ensure consistent management practices along with fair and equitable treatment; a safe working environment; opportunities for input; and recognition of individual commitment to the organization. These features tend to contribute to employee job satisfaction.

The Winnipeg Fire Paramedic Service is a complex organization providing a broad spectrum of services to the community. In order to deliver such services and perform satisfactorily, the organization must employ a sufficient number of personnel in three important areas: administration, support services, and emergency operations. Given the constraints in resources typically found in most communities, a reasonable balance among these three areas must be attained.

Allocation of Staff to Various Functions & Divisions

The Winnipeg Fire Paramedic Service employs a total of about 1,401 full-time equivalents (FTE). The Fire and Paramedic Chief oversees the entire organization and is subordinate to the City of Winnipeg's Chief Corporate Services Officer. Three Deputy Chiefs oversee multiple divisions within Operations and Communications; Professional Development; and Support Services.

The following figure lists the number of FTEs assigned to the various divisions and branches within WFPS. For the purposes of this report, ESCI will use the terms "Division" and "Branch."

Figure 33: Staff Allocations by Divisions & Branches

Divisions	FTE[1]	% of Total Workforce[2]
Administration	**17**	**1%**
Fire Paramedic Chief	1	
Deputy Chiefs	3	
Assistant Chiefs	5	
Executive Assistant & Clerks	8	
Operations & Communications (excludes Deputy Chief)	**1,260**	**90%**
Communications	73	
EMS Operations (includes MSP & EPIC)	320	
Fire Investigations Coordinator	1	
Fire Operations (includes Fire Investigators)	866	
Professional Development (excludes DC)	**25**	**2%**
Service Quality	3	
Safety (includes Air Room staff)	5	
Fire Training Academy	10	
EMS Training Academy	7	
Support Services (excludes Deputy Chief)	**60**	**4%**
Fire Prevention	25	
Public Education (Fire & EMS)	6	
Light Fleet	7	
Emergency Mechanical Services Branch (EMSB)	12	
Stores	10	
Other Departments	**38**	**3%**
Emergency Management & Public Information	4	
Human Resources	12	
Finance	12	
Information Technology	10	

[1]Positions with FTEs above 0.5 rounded up [2]Percentages rounded

While the Information Technology, Finance, and Human Resources departments are fully funded from the WFPS budget, they have a dual reporting relationship to both the Fire and Paramedic Chief and specific corporate chief officers. In early 2017, the position of Assistant Chief of Emergency Management and Public Information was filled through the promotional process.

ADMINISTRATION & SUPPORT STAFFING

Two important components of a well-organized and effective organization consist of administration and support staffing. The primary responsibilities of these positions are to ensure that the operational elements of the organization have the means to effectively accomplish the tasks and responsibilities of emergent and non-emergent incidents. Emergency services organizations require adequate oversight, planning, records management, administrative support, training, and maintenance. As with the operational components, administration and support services require sufficient resources in order to function properly.

An appropriate balance of administration and support staffing to operations is essential to the success of an emergency services organization's mission and responsibilities. This can vary, depending on the type of organization and the services it provides. WFPS has an administrative and support staffing level of eight percent of total organizational staffing. This appears to be low in ESCI's anecdotal experience as compared to other organizations of similar size and scope. An analysis of these positions enables a clear understanding of the resources committed to these essential functions.

The Winnipeg Fire Paramedic Service has multiple positions assigned to administration and support functions. Based on experience in similar organizations, in this section ESCI will review and group these into various organizational levels.

It is important to note that the various staff positions within the WFPS can be viewed from different perspectives. For example, some chief officers in upper management positions may occasionally have a role in incident command at significant events. However, they typically perform non-combat responsibilities. Another example may be communications personnel who do not work in the field environment, but have a direct role in operations. In this section, ESCI seeks to distinguish administration and support staffing from fire and EMS operations.

The following figure lists executive-level management positions within the WFPS whose responsibilities consist *primarily* of administrative and support functions. These range from the level of Fire Paramedic Chief to Administrative Platoon Chief. There are a number of other positions within the WFPS that maintain administrative and support responsibilities, but whose roles are predominantly operational.

Figure 34: Executive Management Positions

Position Title	No. of Positions[1]
Fire Paramedic Chief	1
Deputy Chief, Operations & Communications	1
Deputy Chief, Professional Development	1
Deputy Chief, Support Services	1
Assistant Chief, Fire & Rescue Operations	1
Assistant Chief, Paramedic Operations	1
Assistant Chief, Prevention & Education	1
Assistant Chief, Service Quality	1
Assistant Chief, Emergency Management & Public Information	1
Financial Comptroller	1
Manager of Human Resources	1
Manager of Information Technology	1
Total Executive Management Positions:	**12**
Percent Executive Management to Total FTEs[2]	**< 1%**

[1]Does not necessarily represent one FTE [2]Figure is rounded

The next figure represents the various administrative positions assigned to different divisions within the organization.

Figure 35: Executive Assistant & Other Administrative Staff

Position Title	No. of Positions[1]
Executive Assistant	1
Senior Clerks	2
Clerks (A, B, & C)—assigned to various divisions	27
Total Other Administrative Staff Positions:	**30**
Percent Administrative Staff to Total FTEs[2]	**2%**

[1]Does not necessarily represent one FTE [2]Figure is rounded

When the staff positions are combined from the preceding two figures, they represent approximately three percent of the total workforce at the WFPS.

The next illustration represents various mid-level management positions. These include managers, coordinators, and directors of various branches within the organization.

Figure 36: Mid-Level Management Staff

Position Title	No. of Positions[1]
Administrative Platoon Chief	1
Safety Officer	1
Fire Academy Director	1
Paramedic Education Director	1
Director of EMSB	1
Fire Investigations Coordinator	1
WFPS/WRHA Liaison	1
Light Fleet Supervisor	1
Fire Prevention Director	1
Public Education Coordinator, Fire	1
Public Education Coordinator, EMS	1
Asset Program Manager	1
Coordinator of Financial Planning & Services	1
Manager of Stores	1
Total Mid-Level Management Positions:	**14**
Percent Mid-Level Management to Total FTEs[2]	**< 1%**

[1]Does not necessarily represent one FTE [2]Figure is rounded

ADMINISTRATIVE & SUPPORT SERVICES STAFFING BY DIVISION

The next figure presents yet another perspective of FTEs assigned to support functions within WFPS, and organized by division and branch. Combined, these staff positions represent around 8 percent of the workforce.

Figure 37: Administrative/Support Staff Positions by Division & Branch

Division/Branch	No. of FTEs
Professional Development Division	**27**
Service Quality (Medical Director part-time)	5
Fire Training Academy	8
Paramedic Education & Training	9
Safety (Safety officers, SCBA Technicians, Sewing Technician)	5
Support Services Division	**60**
Emergency Mechanical Services Branch	12
Light Fleet	7
Fire Prevention	25
Public Education (EMS & Fire)	4
Stores	10
Emergency Management & Public Information	**4**
Information Technology	**10**
Finance	**12**
Human Resources	**12**

[1]Positions with FTEs above 0.5 rounded up to nearest whole number; does not include seasonal/interns/students

ADMINISTRATIVE & SUPPORT SERVICES STAFFING NEEDS ASSESSMENT

The following section addresses the significant administrative and support staffing needs identified by ESCI.

Public Education—EMS

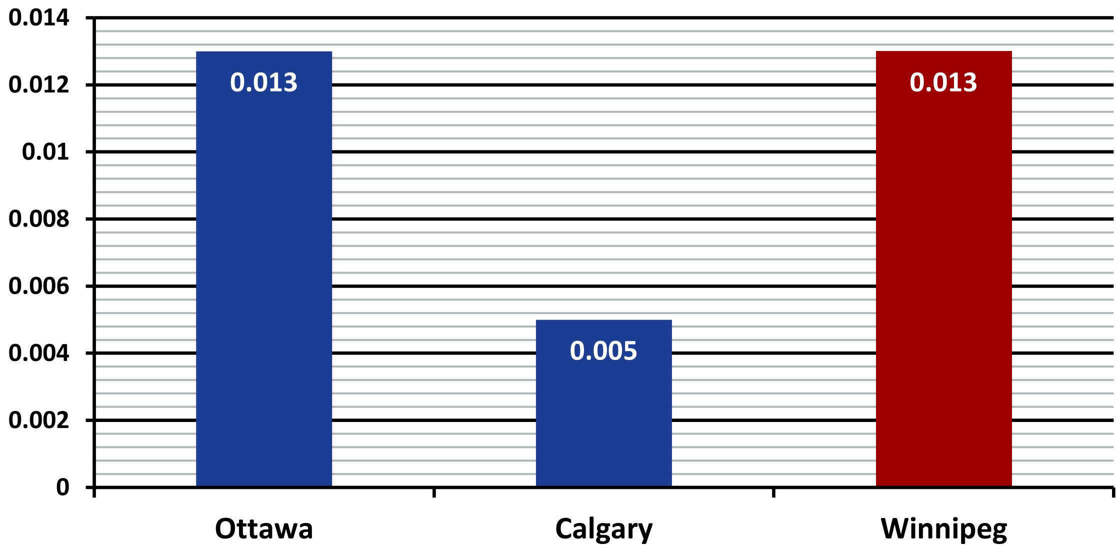
There is one EMS Public Education Coordinator and no subordinate positions. This individual is currently focusing on the growing problem of overdoses and deaths due to fentanyl (a synthetic narcotic) abuse, as well as fall prevention among the elderly.

While there are other programs outside of WFPS that address injury prevention and other issues, EMS Public Education appears understaffed. A large city like Winnipeg needs more qualified personnel devoted to EMS public education, and additional positions should be considered.

Fire Training Academy

The Fire Training Academy is managed by the Director under the supervision of the Deputy Chief of Professional Development. Training Officers (TO) comprise at total of 6.5 FTEs. Previously, there was an Assistant Director, but this position was replaced with a Senior Academy Officer with limited supervisory responsibilities.

Figure 38: Comparison of WFPS Fire Training Staff per 1,000 Population (2015)



The preceding figure represents a comparison of the per capita number of training staff at WFPS as compared to Ottawa and Calgary, since they are of similar size. Hamilton is not listed as it reports zero training staff per 1,000 population. The data was acquired from the *Municipal Benchmarking Network Canada* (MBNC), which conducted a comparative analysis of 11 municipalities in Canada.[18] This figure (and subsequent figures), are the "Aggregate" results from all 11 municipalities. The number of staff assigned to the Fire Training Academy at WFPS is slightly below the median found across all of the 11 municipalities. While equal to Ottawa, it is substantially higher than Calgary.

The results from the MBNC survey suggests that the number of fire training staff at WFPS is comparable to Ottawa and the median of all 11 communities surveyed. It does *not*, however, reflect the reality of what is occurring at the WFPS Fire Training Academy. There is a high employee turnover rate among the Training Officers. After three years at the Academy, Training Officers lose their seniority in the Fire Operations Division, which is likely a major contributor to the turnover.

[18] Five-Year Results Report, Data Tables Report, Municipal Benchmarking Network Canada (2015).

Another reason for the high turnover may be the pay differentials. Training Officers start at 121 percent of First Class Firefighter pay, which increases to 125 percent after five years. Pay is slightly higher for Captains and those certified as PCPs. In addition, only those with the rank of Captain and above can retain the current pay rate if they transfer in to the Fire Training Academy. None of the training staff are paid the 3 percent premium pay to maintain their PCP certification. There is a lack of available overtime pay, but a significant demand for it.

The high turnover rate has led to inexperienced training officers, because many return to Fire Operations or retire. As reported by staff, due to demands placed on training staff, the Fire Training Academy is unable to deliver all of the mandatory training requirements. WFPS should consider temporary assignments to the training program during academies to address the increased demand.

Aside from the issues with the training staff, the Academy Director must consistently address a growing amount of responsibilities related to staff and human resources, along with additional administrative tasks.

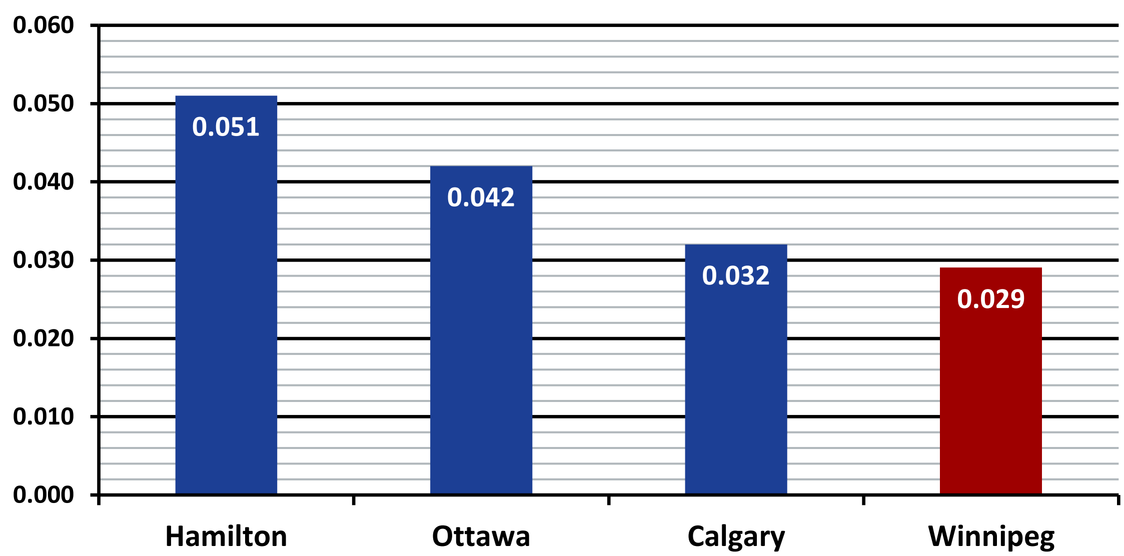
Key Recommendations

- WFPS should thoroughly evaluate its training program to determine if there are any unnecessary training demands that could be reduced or eliminated.
- Consider temporary assignments to the Fire Training Academy to bolster training staff when work demands surge.
- WFPS should re-evaluate its collective agreement to remove disincentives for Training Officers in order to attract and retain quality personnel.
- Consider changes to the collective agreement that balance seniority with a genuine desire and passion for education and training when selecting Training Officer candidates.
- Consider the addition of an Assistant Director position to assist with the growing administrative demands in the FTA.

Fire Prevention

Fire Prevention consists of four primary functions; fire prevention inspections, plans review, public education, and fire investigation. These four functions are discussed in significant detail in the *Fire Prevention* section of this report. From a fire prevention staffing perspective, the division is challenged in most areas to keep up with current workload and projected near future workload. Utilizing the MBNC data, the following illustration compares the per capita staff assigned to fire prevention. The results show an obvious staffing deficit at WFPS in comparison to other municipalities of similar size. Hamilton and Ottawa—which have populations closest to Winnipeg—devote substantially more staff to fire prevention. This could be partially attributable to their investigators being assigned to prevention, whereas WFPS investigators are assigned to fire operations. However, even with that difference taken into account, fire prevention staff at WFPS is well below the median results of the most comparable agencies and the aggregate of all 11 departments. Winnipeg's population demographics reflect a proportionally higher representation by citizens on the low end of the socio-economic scale. This population is very vulnerable. This demographic typically has a higher service need and reside in older buildings with higher service requirements, exacerbating the workload for fire prevention staff.

Figure 39: Comparison of Fire Prevention Staff per 1,000 Population (2015)



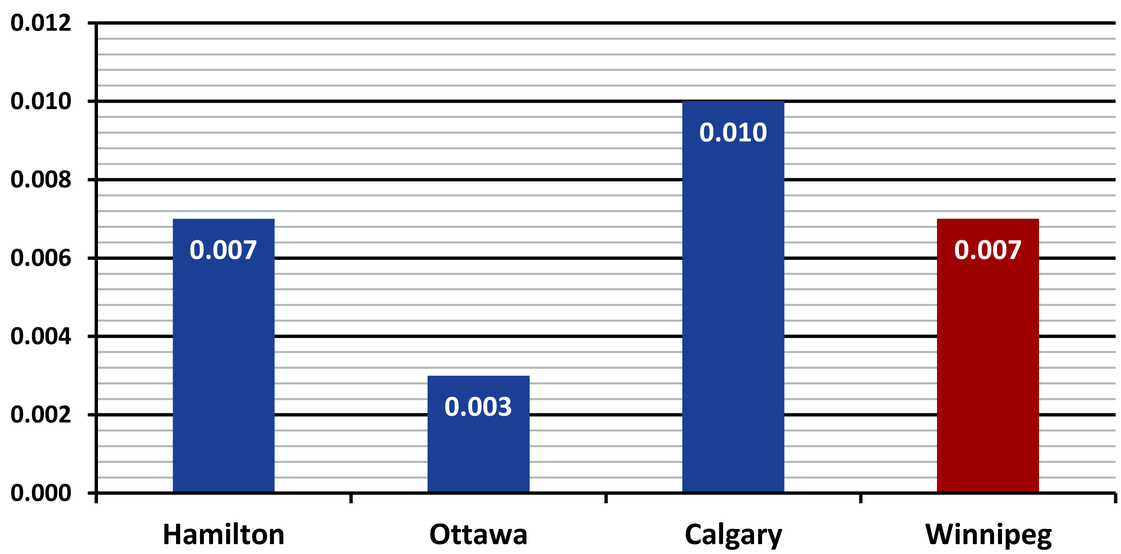
The Fire Investigation Coordinator and Fire Investigators are currently employed within the Fire Operations Division under the auspices of the Assistant Chief of Fire & Rescue Operations. One Fire Investigator is on-duty each shift, and not assigned to a fire apparatus or operational activities. Investigators respond to incidents in a fire investigation unit.

It would likely be more advantageous to re-assign the fire investigation staff to the Fire Prevention branch. This organizational structure is common in the North American fire service and allows allied activities to be shared across a wider base of personnel within fire prevention. The Deputy Chief of Operations & Communications and the Assistant Chief of Fire & Rescue Operations are responsible for the largest divisions within the department. Moving the investigation staff would provide some relief to these officers. More importantly, the resources would provide a greater positive impact to the Fire Prevention Branch, where workload is high and staff is comparatively low. The results and data acquired by the investigators during fire and arson investigations can be coordinated with the various activities in Fire Prevention and Fire Public Education to reduce future demand on both functional areas.

Public Education—Fire

This branch employs one Fire Public Education Coordinator and two Fire Public Education Officers. During the summer months, students are utilized for a fire safety program in which two fire-safety trailers are transported through the City to provide public education. In 2016, this program was able to reach 20,000 persons, which is a tremendous, positive impact. The following figure again uses the results acquired from the MBNC report and illustrates the number of staff devoted to fire prevention public education.

Figure 40: Comparison of Fire Public Education Staff per 1,000 Population (2015)



Although WFPS fire public education staffing is equivalent to Hamilton and the aggregate, it is well above Ottawa and below that of Calgary. This is somewhat surprising, as WFPS only has three FTEs assigned to fire education activities—relatively small numbers for a city the size of Winnipeg. In Winnipeg in 2015, the residential fire-related injuries per 100,000 population was 8.35 compared to the aggregate median of 11 municipalities of 5.25. In addition, the per capita rate of commercial and industrial structure fires with losses was 11.266 compared to the aggregate median of 6.094.

Despite the success of the summer student program, three FTEs assigned to provide fire prevention public education for a city the size of Winnipeg is insufficient, and additional staffing should be considered. WFPS has a single EMS Public Education Coordinator. There is no equivalent benchmark for EMS Public Education staff in the MBNC. This, too, appears to be lean given the percentage of emergency responses that are EMS related.

Key Recommendations

- Develop a plan to address the staffing gaps in the Fire Prevention Division. Recognizing that there will be budgetary constraints, this could be done incrementally over a period of 5 years.
- Reach a total of 32 fire prevention officers (from the current 21) by 2022, based on availability of funding.
- Reach a total of 3 Plans Reviewers/Fire Protection Engineers (from the current one) by 2022, based on availability of funding.
- Reach a total of 4 fire public education staff and 4 EMS public education staff by 2019, based on availability of funding.
- In the interest of officer safety, reach a total of 8 Fire Investigators as soon as practical, based on availability of funding.
  - Once the recommendation above is achieved, move the Fire Investigators to the Fire Prevention branch and expand their responsibilities to assist in those areas where there are staffing deficits.

Paramedic Education & Training

The Paramedic Education & Training (PET) branch is overseen by a Director, responsible for 12 personnel. Recent increased and anticipated responsibilities have made it difficult to perform the daily responsibilities of the position, despite working additional hours and occasional weekends. Changes in EMS education, such as accreditation and major curriculum development required by the Canadian Paramedic Profile; a new formalized budgetary process; business planning requirements; and performance management review have all increased the Director's workload. The Director has recently submitted a formal proposal to add a new position of Assistant Director to address some of the additional workload.

The PET branch employs six permanent FTEs as academy-based Instructors, responsible for program development and execution; development and delivery of lectures; clinical skills/scenario-based labs; and student evaluations. On occasion, the PET instructors must utilize Field Training Inspectors (FTI) when other instructor resources are depleted.

The four FTIs are field-based instructors responsible for ACP precepting; field training development and execution; and supplementing academy-based instructors when indicated. Prior to 2016, these were annual temporary (6–9 months) positions requiring a formal hiring process each year. Recently, the PET Director was able to obtain approval to keep these positions full-time and permanent; although this has yet to occur, and they remain in a temporary status. This has been problematic, as four previously hired FTIs left for more stable, permanent positions.

The PET branch also employs one full-time Clinical Education Coordinator, which is a highly specialized position responsible for coordinating students through clinical rotations and precepting; working with external partners for precepting; and validating student competency in clinical and precepting environments.

One permanent, full-time clerical support position is assigned specifically to PET. For the time being, one FTE seems to be sufficient. However, the branch is somewhat hampered when that individual is on leave.

As with the Fire Training Academy, the PET branch is inadequately staffed to meet the considerable and growing needs necessary to provide mandatory continuing medical education. WFPS is basing its EMS-related training initiatives on the results found in its quality management processes.

Key Recommendations

- As with the Fire Training Academy, WFPS should thoroughly evaluate its Paramedic Education & Training program to determine if there are any unnecessary training demands that could be reduced or eliminated.
- Consider adding 1–2 Instructors as a surge in demand occurs.
- An Assistant Director for the PET program should be considered.

Human Resources

The Human Resources (HR) branch has a current staff of about 12 FTEs. With such a substantial workforce at WFPS, there are additional needs within HR. These include the need for one additional HR Consultant and a Return to Work Coordinator.

Firefighters and EMS providers often deal with a multitude of tragedies. The addition of a Mental Health Coordinator to manage employee support programs and preventative activities related to employee mental health, post-traumatic stress disorder, and similar conditions should be considered. Although the City provides an employee assistance program (EAP), it may not be sufficient to address the needs of WFPS.

Emergency Management & Public Information

The Assistant Chief of Emergency Management & Public Information is a new position, and he is the only employee within that branch. The Assistant Chief reports directly to the Fire Paramedic Chief. Beginning in 2018, there is a plan to add five FTEs to this branch. This will include an Emergency Management Coordinator, two Emergency Management Officers, a Public Information Officer (PIO)—who will not be directly involved in media relations—and a Senior Clerk.

Uniformed officers and other individuals will, at some point, be provided with training on working with the media and on-camera interviews. In the future, additional PIOs may be hired to interact directly with the media and provide on-camera interviews at major incidents.

Administrative & Support Services Staffing Discussion

An organization the size and nature of WFPS requires a considerable amount of administrative and support services to function effectively. Currently, about 8 percent of the total WFPS workforce represents executive, administrative, and support staffing. This seems to be less than what may be needed to effectively meet the substantial administrative demands at WFPS.

In the preceding sections of this report, ESCI presented various comparative analyses of WFPS administrative and support services staffing to emergency services organizations in various Canadian municipalities. While the results do not necessarily mean that WFPS is overstaffed or understaffed, compared to other organizations, it does provide another perspective. There is a wide variety of variables that can impact an organization’s staffing needs, which can differ from the demands found in other municipalities.

Among some of the administrative and support staff, there is a concern about the lack of strategic and succession planning, and that organizational priorities have not been defined—or at least not shared with many of the subordinates.

ESCI recognizes that the organizational goals, regulatory environment, and workload are the actual drivers that determine the number of administrative and support staff necessary to deliver such services. With a City and emergency services organization the size of WFPS, ESCI believes there are substantial deficiencies in the number of staff and administrative capabilities within some of the divisions and branches that provide administrative and support services.

Key Recommendations

- WFPS should conduct a comprehensive analysis of its administrative and support staffing requirements.
  - As a result of the analysis, consider developing a short-, medium-, and long-term plan that would include prioritizing the staffing needs among each of the administrative and support services divisions and branches.
  - The plan should include organizational staffing goals, priorities, and succession planning.

Emergency Operations Staffing

In order to put appropriate apparatus and equipment to their best use in mitigating incidents, there must be adequate staffing of well-trained emergency personnel. Inadequate staffing on incident scenes can decrease response-effectiveness, and increase the risk of injury to both emergency responders and civilians.

Fire Operations and EMS Operations are two separate divisions within the purview of the Deputy Chief of Operations & Communications. Each of these divisions is overseen by an Assistant Chief. All positions within both Fire Operations and EMS Operations are staffed with career personnel. Fire Operations comprises approximately 62 percent of the total WFPS FTEs, while EMS Operations represents nearly 23 percent. Another 5 percent of the total staff is assigned to emergency communications.

FIRE OPERATIONS STAFFING

The following figure lists the various positions within the Fire Operations Division. A Fire Investigation Coordinator and four Fire Investigators are also assigned to this division.

Figure 41: Positions Assigned to Fire Operations

Position Title	No. of Positions
Assistant Chief	1
Platoon Chiefs	4
District Chiefs	16
Platoon Safety Officers	4
Captains & Captain PCPs (includes Training Captain)	108
Lieutenants & Lieutenant PCPs	68
Senior (I & II) Firefighters & Firefighters	662
Fire Investigation Personnel	4
Total Fire Operations Positions:	**867**
Percent Fire Operations Staff to Total FTEs[1]	**62%**

[1]Figure is rounded

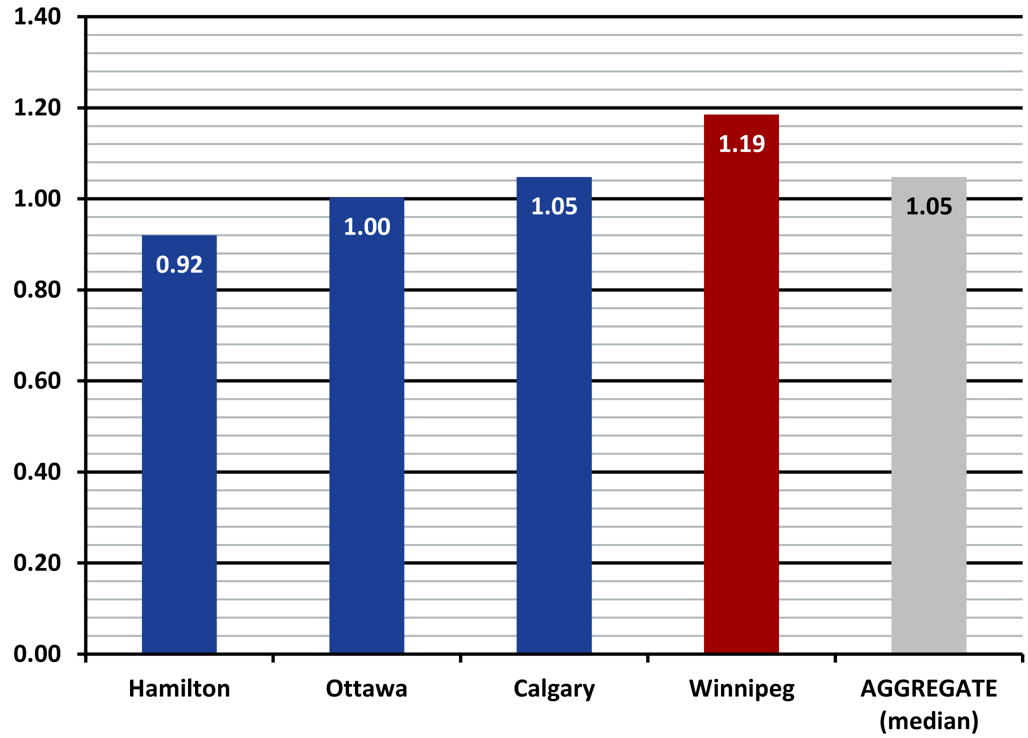
At the Captain level, there are three PCPs and one Training Captain. At the firefighter level, there are 327 at the level of Senior Firefighter I or II—all of whom exceed more than 10 years of service. Excluding line (or company) officers at the rank of Lieutenant or above, this represents approximately 49 percent firefighters in Fire Operations. The remaining 339 firefighters have less than 10 years of experience. The proportion of line officers to line firefighters is approximately 23 percent.

COMPARATIVE ANALYSIS OF WFPS FIRE SUPPRESSION STAFFING

In this section, ESCI reviews how firefighter staffing compares to other Canadian fire departments, as well as its U.S. counterparts.

The MBNC 5-year report included a comparison of personnel allocated to fire suppression in 2015. The following figure is an illustration of how WFPS compares to other municipalities.

Figure 42: Comparison of WFPS Firefighters per Capita to Other Municipalities (2015)



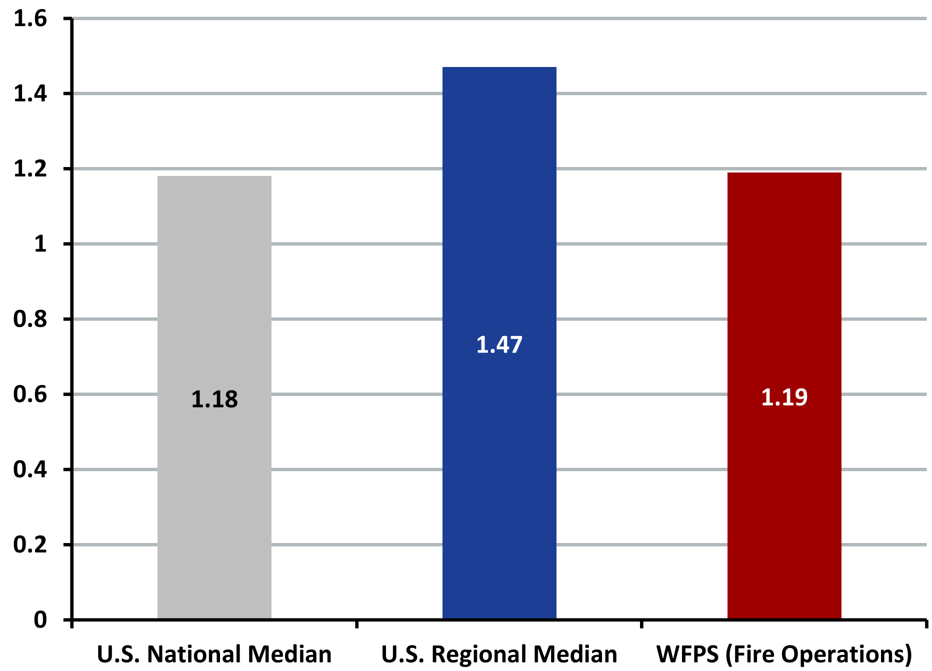
Based on 2015 data, WFPS ranks highest in per capita firefighters among the most comparable municipalities, and among the combined median of the 11 communities reporting. As mentioned previously, this does not necessarily indicate that the Fire Operations Division is overstaffed. At WFPS, the Fire Operations Division includes fire investigation personnel, which may have contributed to a slightly higher per capita number. The MBNC report did not clarify whether fire investigation personnel were included in their results. Further, it is silent to less tangible factors, such as differences in lower socio-economic conditions, or the age of the building inventory, both of which vary from community to community.

According to the City's 2016 *Community Trends & Performance Report*, the per capita firefighter personnel began to decline after 2009, to 1.19 per 1,000 citizens in 2013.[19] That year, WFPS maintained a higher number of firefighters per capita than the cities of Hamilton, Toronto, Ottawa, and Calgary. A realignment of the budget in 2014 brought the staffing ratio back to the 2009 level of 1.29. Current data, however, continues to show a rate of 1.19.

[19] City of Winnipeg, *Community Trends & Performance Report*, Volume 1 (2016).

The following figure illustrates the U.S. national and regional medians of the number of firefighters per 1,000 citizens, based on a similar workweek to WFPS. The regional statistics are based on the Northcentral United States as defined by the U.S. Census Bureau (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, and Ohio). Canadian fire departments tend to have lower staffing levels than their U.S. counterparts.

Figure 43: Comparison of WFPS Firefighters per Capita to U.S. National & Regional Medians (2016)



Source: National Fire Protection Association

It must be noted that NFPA results shown in the preceding figure are based primarily on population and does not consider geographical size, population density, building inventory, or socio-economic condition. Neither does it segregate those departments involved in the provision of ambulance transport service.

FIRE OPERATIONS: STAFF SCHEDULING METHODOLOGY

Fire Operations maintains four platoons. Shifts are broken into a 10-hour day shift (0800–1800 hours) and a 14-hour night shift (1800–0800 hours). A normal "tour" for line firefighters and officers consists of two day-shifts (10 hours each), followed by two night-shifts (14 hours each); or a total of 48 hours. A complete tour is followed by four days off. A duty week averages 42 hours, or 336 hours in an 8-week cycle.

FIRE OPERATIONS: DEPLOYMENT METHODS & STAFFING PERFORMANCE

WFPS maintains 27 stations for Fire Operations. These stations are staffed with combined EMS and fire personnel. All firefighters and officers are career staff. The Fire Operations Division provides services beyond suppression activities, and includes various other specialty services (i.e., vehicle extrication, high-angle rescue, trench/collapse rescue, swift-water rescue, confined space rescue, and hazardous materials response).

The following figure lists the minimum staffing by apparatus type. Command, investigator, and other similar vehicles and apparatus have been excluded from the list.

Figure 44: Minimum Apparatus Staffing in Fire Operations

Apparatus Type	Minimum Staff
Engine Companies	4
Ladder Companies	2
Squads	2
Rescue Companies	4
Specialty Vehicles[1]	2–4

[1]Varies by unit type

When indicated, hazmat units are cross-staffed with personnel from other companies. The next figure represents minimum staffing per each of the 27 stations (excluding EMS Operations staff).

Figure 45: WFPS Minimum Fire Operations Staffing by Station

Station	Minimum	Station	Minimum	Station	Minimum
Station 1	15	Station 10	6	Station 19	4
Station 2	5	Station 11	10	Station 20	4
Station 3	6	Station 12	4	Station 21	6
Station 4	10	Station 13	6	Station 22	4
Station 5	9	Station 14	4	Station 23	8
Station 6	10	Station 15	4	Station 24	6
Station 7	4	Station 16	6	Station 25	4
Station 8	8	Station 17	4	Station 26	4
Station 9	8	Station 18	4	Station 27	4

The preceding figure includes all minimum personnel assigned or related to the Fire Operations Division (e.g., command staff, officers, Fire Investigators, etc.).

FIRE OPERATIONS STAFFING DISCUSSION

There are a number of national and international standards that address and recommend fire department staffing. Typically, these reference minimum staffing for individual apparatus (e.g., "four personnel per engine company"). NFPA 1710 recommends minimum staffing for fire suppression apparatus. Such standards are often in the context of firefighter safety and sufficient personnel to accomplish the necessary tasks.

ESCI contends that the more important issue is the ability to assemble sufficient staff within a reasonable time, in order to ensure an *Effective Response Force* (ERF) necessary to mitigate an incident.

Both the NFPA and CFAI recommend four-person engine companies as the minimum staffing. This has been supported scientifically with two significant studies conducted by the U.S. Department of Commerce's National Institute of Standards & Technology (NIST). The first study, released in 2010, found that four-person firefighting crews were able to accomplish essential firefighting and rescue tasks 25 percent faster than three-person crews were.[20]

The second study, published in 2013, analyzed the effectiveness of firefighting crews in high-rise operations. The study found that firefighting crews of five or six members, instead of three or four, were significantly faster in completing search-and-rescue operations and extinguishing fires.[21]

ESCI believes that the Fire Operations Division is sufficiently staffed. All engine companies are staffed with a minimum of four firefighters, which is consistent with the NFPA 1710 standard.[22] Aerial apparatuses are staffed with a minimum of two firefighters, which does not meet the NFPA 1710 standard.[23] Although this does not meet the recommended NFPA standard, the Effective Response Force (ERF) for emergencies, ESCI was not made aware of any deficiencies.

Firefighter retirements are increasing at a rapid pace, which is leaving a young and inexperienced firefighter workforce. The Fire Training Academy lacks the resources to effectively increase training and education of the less experienced firefighters. Fire Operations management struggles with attempts to implement improvements through additional training and educational opportunities and other prospects. Comments from several stakeholders at many levels in the organization indicated that resistance by some of the unions has led to roadblocks and rejection of proposed improvements.

Key Recommendations

- Consider implementing a policy that mandates all new firefighter applicants have current PCP certification.
- Establish a minimum number of Primary Care Paramedic certified firefighters (FFPCP) to maintain on duty. Based on that plan, ensure that FFPCPs must maintain the certification as a condition of employment until promoted out of the position.

[20] Averill J, Moore-Merrell L, et al. "Report on Residential Fireground Field Experiments;" [NIST TN 1661], 2010.
[21] Averill J, Moore-Merrell L, et al. "Report on High-Rise Fireground Field Experiment;" [NIST TN 1797], 2013.
[22] NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (2016), Section 5.2.3.1.1.
[23] NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (2016), Section 5.2.3.2.1.

COMMUNICATIONS STAFFING

According to management, the Communications Division is sufficiently staffed with Communications Operators (call-takers and dispatchers) to address service-demand. Call-takers and dispatchers rotate between positions on a regular basis. Those assigned to EMS dispatch are often overwhelmed in comparison to those in fire dispatch. However, a new program has just been implemented that will balance the workload among the Communication Operators.

Although there are adequate personnel at the "front end" of Communications, there are deficiencies in support personnel. This includes administrative support, but more importantly technical support necessary to maintain the computer-aided dispatch (CAD) software and communications-related equipment. Currently, there is one IT person familiar with CAD, assorted communications equipment, and communications practices. With limited technical support, Communications could be in jeopardy in the event of catastrophic or significant equipment or CAD failures.

Management has difficulty in recruiting qualified personnel, in part due to the requirement to acquire and maintain Emergency Medical Responder (EMR) certification. Having multiple unions representing communications staff has also been a challenge. Leadership training for supervisors is limited, and tends to be inconsistent.

The Communications Division falls within the responsibility of the Deputy Chief of Operations & Communications. Opinions may vary on whether their role is a support function or an operational function. If Communications is included as a support role, then approximately 15 percent of the WFPS staff is assigned to administrative and support services. However, ESCI believes that Communications should be considered as an integral part of Operations.

Key Recommendation

- Consider eliminating the requirement of Communications Operators to maintain EMR certification, and replace this requirement with medical priority dispatch (MPD) training and regular continuing education in accordance with NFPA 1221.

EMS OPERATIONS STAFFING

Certified EMS personnel employed by the WFPS are designated as "paramedics." However, there are three levels among these: Primary Care Paramedic (PCP); Intermediate Care Paramedic (ICP); and Advanced Care Paramedic (ACP). Each has had minimum training at the PCP level, with ICP and ACP having additional training and a different scope of practice. The following figure lists the various positions within Emergency Medical Services Operations, which includes EPIC and MSP staff (see EMS section for descriptions).

Figure 46: Positions Assigned to EMS Operations

Position Title	No. of Positions
EMS Superintendents	4
Medical Supervisors	22
Paramedics (ACP/ICP/PCP); includes MSP & EPIC	292
Lead MSP Community Paramedics	2
Total EMS Operations Positions:	**320**
Percent EMS Operations Staff to Total FTEs[1]	**23%**

[1]Figure is rounded

EMS Operations employs seven part-time EMS providers for each shift, in order to supplement its full-time staff. The Division's goal is to acquire 10 part-time providers per shift.

EMS OPERATIONS: STAFF SCHEDULING METHODOLOGY

Like fire, EMS Operations maintains four platoons. EMS staff scheduling differs slightly from fire. Shifts are broken into a 12-hour day shift (0700–1900 hours) and a 12-hour night shift (1900–0700 hours). A normal "tour" consists of two day-shifts (12 hours each), followed by two night-shifts (12 hours each); or a total of 48 hours. A complete tour is followed by four days off. A duty week averages 42 hours, or 336 hours in an 8-week cycle. In addition, EMS Operations has staggered shift start times and peak-demand shifts with different schedules.

EMS personnel are allowed one 30-minute break during their 12-hour shift. Their labour contract requires that the break must occur sometime after the first four hours. Often, the crews either do not have an opportunity for a break or it is taken late into their shift.

During shift changes, no "down time" is allocated to the oncoming ambulance crew to prepare their vehicle for the next shift. If a call comes in, they are immediately dispatched. ESCI observed one instance of this occurring during a shift change. The oncoming crew was rapidly attempting to re-stock their vehicle and respond to the incident. It was noted that this ambulance had not been washed or cleaned by the previous crew. This may or may not be a typical scenario.

EMS OPERATIONS: DEPLOYMENT METHODS & STAFFING PERFORMANCE

Ambulances are deployed from combined fire and EMS stations, as well as three EMS-only stations. Ambulances are typically staffed with one ACP and one PCP. However, the limited number of EMS personnel often leads to some ambulances being staffed with two PCPs and capable of basic life support only.

Most of the ambulances operating within EMS Operations have high unit-hour utilization (UHU) rates well beyond accepted standards seen with either fire-based or third-service providers (discussed in more detail under the *EMS* section of this report).

EMS OPERATIONS STAFFING DISCUSSION

Comparing the number of FTEs allocated to Fire Operations to those in EMS Operations is not an equivalent measure. In order to safely and effectively mitigate working structure fires and other significant events, fire apparatus must be staffed with adequate personnel. Excluding high-acuity patients, the vast majority of EMS incidents and transports can be accomplished with two personnel. This does not disregard the substantial difference in workload between EMS Operations and Fire Operations.

The different shift schedules between EMS and fire has produced some challenges. For example, Fire Operations may schedule a Critical Incident Stress Management (CISM) session—for an incident involving both fire and EMS personnel at 6 PM. Because of their schedule, EMS personnel are often unable to attend, and do not receive the benefits of these sessions.

Employee feedback indicates that EMS employee "burnout" is increasing, along with workers' compensation claims, sick leave, and stress leave. There is a general perception that the wellbeing of EMS staff and their morale has declined substantially due to their workload. Actual attrition, Workers' Compensation Board (WCB), or sick/stress leave numbers do not reflect these perceptions. Among some employees, there was an indication of a lack of "buy-in" to the integrated model.

The "highly assertive unionized environment" is felt by others to generate divisiveness, but may result from different organizational cultures. There are limited methods for providing EMS personnel with feedback on their individual operational or clinical performance.

Undoubtedly, the leadership at WFPS is aware of the culture differences and some remaining acrimony between some segments of the firefighters and EMS providers. By most accounts this has improved, and for the most part personnel at the operations level work well together during incidents.

Firefighters and EMS personnel have different uniforms, emblems, logos, and vehicle decals. Fire apparatus are labeled, “Winnipeg Fire Department.” This undoubtedly promotes separation within the organization, and fails to contribute to the feeling of unity that should be found with an integrated emergency services organization. ESCI recognizes that the firefighters and EMS providers each have a proud history of the respective organizations, and a desire to preserve that history. While it is beyond the scope of this project, the WFPS needs to pursue methods to address these issues.

Key Recommendations

- WFPS should make it a priority to acquire personnel to staff additional ambulances in order to reduce Unit Hour Utilization rates. Alternatively, reducing ambulance wait times can have the same effect as acquiring additional personnel or ambulances.
- Consider collective agreement changes to hours of work, providing sufficient crew breaks per 12-hour shift.
- Evaluate options for efficient shift change intervals to allow for cleaning, washing, and re-stocking of the ambulances, such as staggered shift starts or stocked reserve apparatus swaps.

WFPS Bargaining Units

The Fire Paramedic Chief, Deputy Chiefs, and Assistant Chiefs are non-union exempt positions. The other employees at WFPS are represented by five separate bargaining units:

- *United Fire Fighters of Winnipeg, IAFF Local 867* (UFFW)—represents all firefighters and personnel in the Fire Operations Division, up to the rank of Platoon Chief; Fire Prevention staff; fire and EMS public education personnel; Fire Investigators; E-Learning Developer; Safety Officers; Sewing Room Technician; Fire Training Academy staff; Air Room Technicians; and all personnel in the Emergency Mechanical Services Branch.
- *Winnipeg Fire Paramedic Senior Officers' Association* (WFPSOA)—represents the EMS Superintendent; WRHA Liaison Officer; Medical Supervisors; Director of Paramedic Education & Training; EMS training staff; Communications Manager; Communications Supervisors; and the Light Fleet Supervisor.
- *Winnipeg Association of Public Service Officers* (WAPSO)—represents Emergency Preparedness staff; Information Technology employees; Finance Manager and staff (excluding Accounting Technicians); and the Stores Supervisor.
- *Manitoba Government & General Employees' Union* (MGEU)—represents Advanced, Intermediate, and Primary Care Paramedics in the EMS Operations Division (including MSP and EPIC staff); the ePCR Field Technology Support Specialist; Vehicle Services Attendants; Communications Operators (some blended with CUPE); and Store Keepers (some blended with CUPE).
- *Canadian Union of Public Employees* (CUPE)—represents the various clerk and senior clerk positions; and Accounting Technicians. Some Communications employees have blended agreements with CUPE.

Firefighter PCPs receive premium pay up to 3 percent of first-class firefighter pay, in accordance with the UFFW collective bargaining agreement. Contractual agreements with the MGEU, CUPE, WFPSOA, and UFFW enable additional pay and benefits.

Bargaining Units Discussion

The Winnipeg Fire Paramedic Service maintains a relatively large workforce comprised of numerous positions. The existence of five separate bargaining units has contributed substantial complexity towards the management of the organization. By all accounts, each of the unions attempts to operate in the best interests of their members—yet, their efforts do not necessarily produce the best results for the whole organization.

Concerns and complaints about the bargaining units were expressed to ESCI from a number of employees—representing all ranks and divisions. This included both union members and management. They expressed frustration and felt that constraints by some of the bargaining units have prevented growth and improvements within the organization.

Personnel Management & Employee Benefits

This section discusses the various areas related to employee benefits and management components.

RECRUITMENT, APPLICATION, & TESTING PROCESSES

WFPS utilizes a variety of methods to recruit new employees for EMS and fire operations. These include web-based advertisements on industry websites; sending announcements to various colleges; recruitment at local job fairs; and other more traditional methods of recruiting new employees.

The City of Winnipeg has a substantial process for individuals who desire to apply for a position within WFPS. The assorted minimum qualifications, application, and testing processes are published on the WFPS website. There are four primary positions with the organization, in which specific qualifications are listed on the website:

- Firefighter
- Firefighter Paramedic
- Primary Care Paramedic
- Communications Operator

For each of these positions, progression through the hiring process typically involves five steps. The application/pre-screening process requires a qualification check, reference check, and background check (Criminal Record check; Adult Abuse Registry check; Child Abuse Registry check; Vulnerable Sector check).

All positions are required to complete knowledge testing specific to the position in which they are applying. Firefighters, Firefighter Paramedics, and Paramedics must complete a physical fitness assessment conducted by the University of Manitoba. New recruits are provided orientation at the WFPS Training Academy, for the following durations:

- Firefighter: 6 weeks
- Firefighter Paramedic: 8 weeks
- Primary Care Paramedic (EMS Operations): 4 weeks
- Communications Operator: 7 weeks

PROMOTIONAL PROCESSES

Promotional processes differ among the collective agreements, depending the rank or position. Progression to First Class Firefighter requires the successful completion of four progressive written exams based on material from the International Fire Service Training Association (IFSTA). Lieutenants and Captains are promoted by seniority following completion of the Company Officer's Development Program.

District Chief positions are filled on a "senior qualified" basis after successful completion of the District Chief course. Platoon Chief candidates are interviewed by a Selection Panel, and those with seniority are considered for promotion.

In accordance with the WFPSOA agreement, when filling management positions within EMS Operations, if there are two or more individuals with the same qualifications and same performance in the selection process, the most senior qualified applicant is appointed.

Two or more paramedics (PCP/ACP) represented by the MGEU agreement and hired on the same day, are given seniority status following the completion of a competency assessment process. Individuals demonstrating the highest level of competency are given the most seniority; otherwise, seniority is based on the date of hire. Paramedics promoted to supervisory or management positions are placed under the WFPSOA agreement, and after one year lose all previous seniority from their former bargaining group.

EMPLOYEE BENEFITS

The WFPS provides comprehensive benefits to its employees. Although the benefit packages vary somewhat among the contracts with the bargaining units, most include:

- Health, dental, and vision insurance options
- Short-term disability (sick leave)
- Life insurance and the option to purchase additional life insurance
- Workers' Compensation and long-term disability benefits
- Federal Employment Insurance (EI)
- Canada Pension Plan (CPP) or the Winnipeg Civic Employees' Benefits Program (WCEBP)

COUNSELING SERVICES

The City of Winnipeg provides an employee assistance program (EAP) for all personnel through contract services with Blue Cross. In addition, Critical Incident Stress Management is provided regularly by WFPS to firefighters, paramedics, communications operators, and any other staff that desires to participate through an internal peer administered program. HR desires to strengthen these programs (see "Human Resources").

DISCIPLINARY PROCESS

Methods for discipline are specified in detail within the various collective bargaining agreements. Currently, only the ranks of Assistant Chief and above are allowed to administer discipline—although lower-ranked officers conduct investigations and may recommend discipline. WFPS is working towards improving its disciplinary policies.

PERSONNEL RECORDS MAINTENANCE

The HR branch maintains a personnel record on all employees, and historical records are archived. Performance evaluations, when conducted, are maintained by HR. Injury, accident, and exposure records are maintained in the WCB file and/or in the WFPS forms database. Occupational Health Services stores the health records of all employees.

SUMMARY

ESCI believes there are significant deficits in some areas of staffing throughout the organization, particularly in administration, training, and EMS Operations. The City of Winnipeg and WFPS should immediately undertake a comprehensive planning process to fill these positions. There is clear rationale for this. The following should be considered the highest priorities, although not in any particular order:

- Field personnel for EMS Operations, with an emphasis on Advanced Care Paramedics
- Training staff for the Fire Training Academy
- Additional staff for the Paramedic Education & Training Academy
- Technical support staff for Communications
- Human Resource Consultants and Return-to-work Coordinators

Undoubtedly, there is insufficient staffing in a number of other divisions and branches. The importance of these other needs should not be diminished. However, if not addressed, the areas described above have the potential to jeopardize the safety and well-being of both employees and the citizens of Winnipeg, along with exposing the City to unnecessary potential liability.

It should be noted that, on multiple occasions, ESCI sent e-mail inquiries to various WFPS mid-level and executive managers long after normal business hours. It was assumed that responses to these inquiries would occur sometime during the next business day. Surprisingly, ESCI received nearly immediate responses from these individuals at *very* late hours. This is certainly one indication of the level of dedication among the individuals employed at WFPS.

Emergency Medical Services

The goal of high-performance EMS systems is to deliver high quality, patient-centred care that produces the best outcomes for its patients. In order to accomplish this most effectively, EMS must include a number of inter-dependent components that comprise an EMS delivery system. Each element of a comprehensive and effective EMS system contributes to the outcome of ill and injured patients. In addition, for optimal EMS delivery, the system should also be integrated within a community's overall healthcare system. Having a single provider overseeing the management of these services creates a more nimble and flexible system to implement data-driven changes for improvements.

NFPA 450: *Guide for Emergency Medical Services & Systems* (2017) is a consensus document prepared by the *Technical Committee on Emergency Medical Services*. This document serves as a comprehensive guide to addressing the multiple components of EMS systems and will be utilized where applicable throughout this section of the report. In addition, current EMS standards from the *Commission on Fire Accreditation International* (CFAI) will be referenced.

Being an all-hazard emergency services organization places the Winnipeg Fire Paramedic Service in a position to respond rapidly with adequate personnel and equipment to time-critical events. Having medically trained personnel responding from fire and ambulance (paramedic unit) stations shortens the time between a life-threatening medical event and intervention by those trained to provide patient care.

From a fiscal perspective, an integrated EMS service-delivery model enables the organization to provide a broader range of services to its residents. The ability for municipalities to leverage the capacity inherent in the fire service to bolster medical response enables the most efficient use of existing resources. For area taxpayers, it is more fiscally advantageous to have a single, publicly-owned provider versus paying for two separate service-providers.

Other advantages to an integrated service-delivery model are the greater depth of resources. A fire department with numerous fire stations and trained personnel can usually provide more personnel than a separate organization or private company. Fire service members historically have greater service-longevity than private agencies, which translates to more experienced personnel at the scene.

History of EMS in Winnipeg

The Winnipeg Fire Department, as it was previously known, has a long history of providing emergency medical care, with the implementation of its first "rescue" vehicle in 1929.[24] The main function of this unit and personnel were to conduct search and rescue operations. The department also maintained the St. John Ambulance First Aid Team. However, these individuals did not perform rescue operations, and only provided patient care once a victim was extricated or rescued.[25] Additional rescue vehicles were added in the late 1950s and early 1960s.

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[24] Richardson, GR; "An Analysis of Fire Department and Ambulance Integration form a Process Perspective: Utilizing Winnipeg Manitoba as a Case Study." September 1996. Department of Graduate Studies, University of Winnipeg.
[25] Coulter, JT; "Proposal for Fire/Ambulance Amalgamation." 22 April 1980:5.

In 1974, all of the fire departments in the Winnipeg metropolitan area were consolidated into a single fire department. Prior to this, the five suburban fire departments had been providing some form of EMS. The primary role of the firefighters was to provide fire suppression but considered "ambulance work" as an adjunct to their principal duties. Medical training consisted primarily of Basic First Aid and CPR.

WINNIPEG AMBULANCE SERVICE

Prior to 1975, emergency medical transportation in the Winnipeg metropolitan and surrounding areas was provided by an assortment of public and private organizations. That year, the Winnipeg Ambulance Service (WAS) was created as an independent organization. Over a year later, the City of Winnipeg took over management of the service. During that period, the fire department continued to provide EMS in a first responder capacity.

In the early 1980s, there began years of contentious debate among numerous stakeholders; multiple studies by independent consultants and the Fire Paramedic Chief; discussions among the various labour unions; the pursuit of funding from the province; various committee reviews; and other controversies concerning ambulance service and the potential "amalgamation" with the fire department. When Winnipeg Ambulance Service (WAS) and Winnipeg Fire Department (WFD) first merged, the department was called Winnipeg Emergency Response Service (WERS), and was later changed to Winnipeg Fire Paramedic Service (WFPS).

In 2007, a number of grievances were resolved with settlement terms including WFPS providing administrative oversight of the two services. WFD was retained as the department name for fire and WEMS retained its name for EMS operations, both under the administrative oversight of WFPS.

General EMS System Description

The Winnipeg Fire Paramedic Service is the sole provider of paramedic services and ground emergency medical transport (GEMT) in Winnipeg. GEMT (and other paramedic services) is conducted through the EMS Operations Division utilizing ambulance-based paramedics. Although the Division is within WFPS, it operates somewhat separately and distinctly from the Fire Operations Division. The WFPS is the corporate authority of the Winnipeg Fire Department and Winnipeg Emergency Medical Services. They are the two main operational branches along with Communications.

The Fire Operations Division responds to some, but not all, EMS incidents along with EMS Operations units licensed Primary, Intermediate, and Advanced Care Paramedics. Some of the firefighters are certified as Primary Care Paramedics. In major EMS incidents, Fire Operations may or may not command the incident scene. In some cases, EMS Superintendents or Medical Supervisors serve as the EMS Section Chief in the Operations Branch of the Incident Command Structure.

EMS OPERATIONS DIVISION STRUCTURE

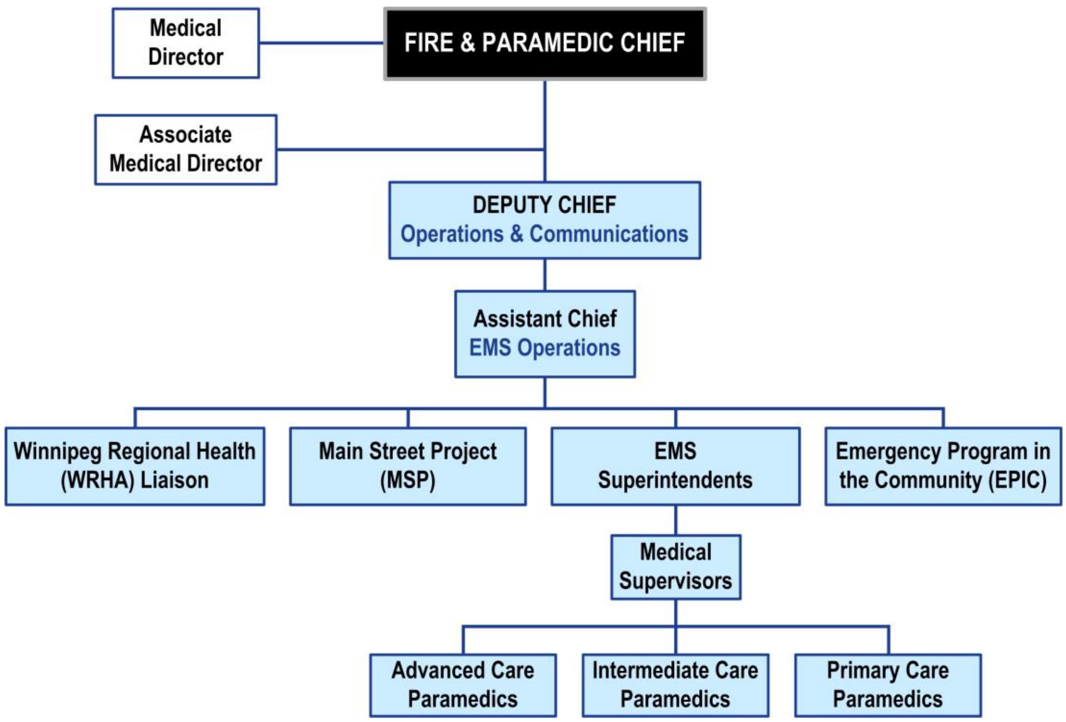
The EMS Operations Division is overseen by the Assistant Chief of EMS Operations, who reports to the Deputy Chief of Operations & Communications. The Deputy Chief is also responsible for Fire Operations and Communications, with Assistant Chiefs that manage those divisions.

EMS STAFFING & ADMINISTRATION

An Emergency Medical Services Superintendent is assigned to each of four platoons. They oversee a total of 21 Medical Supervisors, with a minimum of four scheduled daily. Currently, the EMS Operations Division employs a combination of 292 ACPs, ICPs, and PCPs. Twelve Community Paramedics are utilized for other programs (see "Special Operations").

The following figure illustrates the current (2017) organizational and administrative structure of the EMS Operations Division:

Figure 47: EMS Operations Division Organizational Chart



EMS OVERSIGHT & MEDICAL DIRECTION

This section describes the provincial organization responsible for overall governance of EMS, as well as a review of medical direction and on-line/off-line medical control in Winnipeg.

MANITOBA HEALTH, SENIORS, & ACTIVE LIVING

Manitoba Health, Seniors, & Active Living (MHSAL) is responsible for the governance of EMS agencies and personnel within the province. They are responsible for ensuring compliance with provincial legislation pertaining to the provision of EMS (currently in transition to Shared Health Services MB). These include:

- Emergency Medical Response & Stretcher Transportation Act
- Regional Health Authorities Act
- Land Emergency Medical Response System Regulations
- Stretcher Transportation Services Regulation
- Air Emergency Medical Response System Regulations

The authority of MHSAL allows them to grant licensure to EMS provider agencies, as well as individual EMS personnel, "stretcher attendant classification," aeromedical personnel, and dispatch personnel who have received training (from the *International Academy of Emergency Dispatch*), and provide Advanced Emergency Medical Dispatch. MHSAL does not have the authority to dictate or govern specific EMS agency policies or patient-care protocols, so long as EMS organizations and personnel operate within applicable provincial legislation.

MEDICAL DIRECTION & MEDICAL CONTROL

The WFPS maintains both a Medical Director and Associate Medical Director—both of whom hold fellowships (FRCPC) with the *Royal College of Physicians of Canada*. The Medical Director interacts with WFPS personnel on a daily basis, and occasionally does ride-alongs with the field providers. Both physicians are under contract to the City, with one assigned 0.6 FTEs, and one at 0.4 FTEs.

None of the hospitals within the WFPS service area provides on-line medical control. EMS providers operate in accordance with written patient-care protocols promulgated by the Medical Director. However, paramedics are required to contact a physician in STEMI cases, in order to obtain medical direction concerning the patient's disposition.

MEDICAL SUPERVISORS

A Medical Supervisor (MS) is assigned to one of four EMS Districts in the same structure as the District Chiefs in Fire Operations. These individuals serve a critical role in the EMS Operations Division. Their role is primarily administrative, but they also provide medical oversight and management of EMS personnel. Since not all of the paramedic units are capable of advanced life support, an MS will respond as ALS backup to incidents in which an ALS unit is not available.

An MS typically responds to high-profile incidents, and will provide backup in difficult situations (e.g., volatile patients, patient refusals, bariatric patients, etc.) when requested by EMS or fire crews. The Medical Supervisors also provide in-service training, investigate complaints, provide logistical support, and work on special projects.

Policy dictates that a Medical Supervisor be dispatched along with a paramedic unit in the following situations:

- Pediatric patients (Priority 4, ages 0–9)
- High-risk pregnancy patients
- AICD firing
- Dialysis patients in cardiac arrest
- Bariatric patient transports
- Assistance requested by on-scene crews
- Incidents at the airport
- Incidents requiring multiple EMS units

Medical Supervisors are also notified, but not necessarily dispatched, to other situations such as Tactical Team standbys, extrication incidents, and high-profile incidents.

EMS OPERATIONS & DEPLOYMENT

At WFPS, ground emergency medical transport vehicles are referred to as "Paramedic Units" (PU) or ambulances. Throughout this report, these terms will be used interchangeably.

SHIFT SCHEDULE

EMS Operations is comprised of four platoons. One tour of duty consists of four days, with two 12-hour day shifts and two 12-hour night shifts. This is followed by four days off. Day shifts begin at 0700 hours, and end at 1900 hours. However, day shifts may start as early as 0630 and end as late as 1930. Night shifts begin at 1900 hours. However, EMS also has staggered start times and schedules for both 24-hour and peak-activity units (PAU). PAU staff may start as early as 0800, and work as late as 0300. Ambulance crews are allowed a 30-minute break during 12-hour shifts. According to comments from some of the ambulance crews and supervisors, breaks are occasionally interrupted in order to respond to calls. A further challenge is occasionally not getting their break until late in their shift due to high call volume.

PARAMEDIC UNIT DEPLOYMENT

The EMS Operations Division deploys 28 paramedic units daily; each with a minimum staffing of two paramedics. Of these, 18 operate 24 hours, with 10 peak-activity units scheduled 12 hours per day, or 564 daily unit hours (205,860 annual unit hours).

WFPS does not use any form of System Status Management (SSM) or dynamic deployment. Ambulances are deployed from 21 fixed locations throughout the city. Three of those stations are ambulance-only, while the other stations are shared with the Fire Operations Division.

EMS IN FIRE OPERATIONS

Approximately 41 percent of the firefighters and officers within the Fire Operations Division are certified as Primary Care Paramedics (PCP). Fire is not always dispatched to EMS incidents. There are strict criteria that outline the incidents that they will attend. Typically, they do not attend low acuity incidents unless EMS is unavailable due to attending high acuity incidents or due to prolonged response time. When necessary, firefighters accompany the patient and ambulance crew during transport to assist where indicated.

COMMAND STRUCTURE AT EMS INCIDENTS

During a typical high acuity EMS incident (e.g., cardiac arrest; motor vehicle collision; etc.), the first-due fire officer is responsible for scene safety and overall incident command, while the ambulance paramedics from the EMS Operations Division are accountable for directing the clinical care of patients. In lower acuity incidents, EMS personnel will assume the command function. All staff within WFPS are trained in incident command and are expected to assume command if first on scene.

AEROMEDICAL SERVICE

The *Shock Trauma Air Rescue Service* (STARS) provides rotary (helicopter) air ambulance service, and is based in Winnipeg at the Richardson International Airport. Due to their vicinity by ground ambulance to the various hospitals and tertiary care centres, the WFPS typically does not utilize STARS for scene transports with the exception of motor vehicle accidents on the perimeter highway. With the construction of a helipad at the tertiary health care centre in Winnipeg, protocols and procedures have been developed to enable crews to identify when the use of STARS would benefit patient outcome.

EMS SPECIAL OPERATIONS

The EMS Operations Division provides several unique services and programs beyond ground emergency medical transport.

EPIC PROGRAM

The *Emergency Program in the Community* (EPIC) is a pilot program that was established in April 2013. It was essentially designed as a *Community Paramedicine* (CP) program (also referred to as “Mobile Integrated Healthcare-Community Paramedic”), similar to other CP programs found throughout Canada and the United States.

The primary objective of EPIC is to identify gaps in current health service provision, and work with community partners to bridge those gaps. A secondary outcome is the reduction in the substantial number of unnecessary emergency responses from 911 calls. This is typical of many CP programs. However, EPIC goes beyond that, and seeks to ensure that patients receive services more appropriate than ambulance transport to a local emergency department (ED). EPIC can be accessed directly by patients without the necessity of calling 911. EPIC defines four (4) types of services that it provides:[26]

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[26] Braedley, Susan (2015); “Promising Practices in Emergency Medical Response at Fire Rescue Services: Lessons from Winnipeg.” Ottawa: Carleton University School of Social Work.

- *Service Type 1:* Provide a mix of healthcare and medical assessment; case management; and patient monitoring and advocacy. Patients are typically frequent users of 911; do not have a family physician; may be living in poverty; disabled; have difficulty staying housed; and have complex medical histories and multiple chronic conditions.
- *Service Type 2:* WFPS paramedics and/or firefighters may identify certain "at-risk" individuals, which are subsequently documented in their ePCRs. FirstWatch® is a computerized software application integrated with the WFPS CAD system to help identify these patients and monitor trends. EPIC takes a pre-emptive approach by visiting them to address issues proactively.
- *Service Type 3:* EPIC also identifies locations or addresses that tend to access 911 on a frequent basis. This is another method of taking a proactive approach to minimizing unnecessary emergency responses.
- *Service Type 4:* This service involves patients who have been seen at an emergency department and had diagnostic testing completed, but left the facility prior to obtaining the results. EPIC works with the ED to find these individuals and initiate a return transport if indicated.

MAIN STREET PROJECT

The *Main Street Project* (MSP) is another Community Paramedicine program, which has been in operation since 2011. MSP paramedics practice in a fixed location facility. Since its inception, the MSP has reduced ambulance transport from its facility by more than 50 percent.[27] The original goal of the project was to provide medical clearance for individuals detained under the Intoxicated Person Detention Act, but has since expanded to provide:

- Primary and emergency care
- Advanced wound care
- Health promotion and risk reduction
- Point of care testing and results for HIV
- Referrals to other programs and services
- Coordinated care with other healthcare providers using shared electronic medical records

PACER PROGRAM

The *Paramedics Active in Community Education & Response Program* (PACER) was implemented in 2002. In consists of specially equipped paramedics who are deployed on bicycles. During the summer months, their role is to patrol parks, bicycle paths, and other public events, and respond to incidents to assess and treat patients until arrival of an ambulance. In addition, the PACER paramedics provide safety information at different events, along with promoting a healthy lifestyle and public safety. Staffing of this program is sporadic, based on staff availability. When there is insufficient staff, the program is not deployed in operations.

[27] Winnipeg Fire Paramedic Service website (www.winnipeg.ca/fps/).

MIRV UNIT

WFPS maintains a Major Incident Response Vehicle (MIRV), which is a 2007 specially converted transit coach bus. The MIRV can be employed for use in multiple capacities:

- Mass casualty incidents or interfacility transfers of multiple patients
- Evacuation of large facilities (e.g., nursing homes, apartment buildings, etc.)
- Bariatric transports
- Other significant or protracted events
- Rehabilitation of WFPS personnel at incidents

The MIRV is equipped with the capability to handle five patients on standard transport stretchers and three patients on portable stretchers.

EMS Service Delivery & Performance

In this section, ESCI reviews EMS service-delivery and performance from a variety of perspectives.

EMS Service-Demand

The following figure lists the service-demand (calls dispatched) and average calls per day for each of the 24-hour transport units during 2015 and 2016. Call volumes represents all incident types (not just EMS) in which a unit was dispatched.

Figure 48: Service-Demand of 24-Hour Paramedic Units (2015–2016)

	2015		2016		2015–2016	
Unit Number	No. Calls Dispatched	Average per Day[A]	No. Calls Dispatched	Average per Day[A]	TOTAL CALLS	DAILY AVERAGE
PU 1	3,684	10	3,869	11	**7,553**	**10**
PU 2	3,326	9	3,431	9	**6,757**	**9**
PU 5	3,390	9	3,600	10	**6,990**	**10**
PU 6	3,601	10	3,691	10	**7,292**	**10**
PU 11	2,736	7	3,029	8	**5,765**	**8**
PU 13	2,964	8	3,114	9	**6,078**	**8**
PU 14	2,878	8	3,017	8	**5,895**	**8**
PU 16	3,017	8	3,185	9	**6,202**	**8**
PU 18	2,271	6	2,395	7	**4,666**	**6**
PU 20	2,351	6	2,639	7	**4,990**	**7**
PU 22	2,782	8	2,877	8	**5,659**	**8**
PU 24	2,461	7	2,702	7	**5,163**	**7**
PU 25	1,851	5	2,014	6	**3,865**	**5**
PU 27	2,226	6	2,349	6	**4,575**	**6**
PU 41	3,787	10	3,712	10	**7,499**	**10**
MS72	1,583	4	1,729	5	**3,312**	**5**
MS73	2,239	6	2,408	7	**4,647**	**6**
MS74	2,381	7	2,450	7	**4,831**	**7**
MS75	1,950	5	2,224	6	**4,174**	**6**
PU 91	3,562	10	3,702	10	**7,264**	**10**
PU 93	1,757	5	1,301	4	**3,058**	**4**
PU 94[B]	256	1	242	1	**498**	**1**
PU 95	1,498	4	1,082	3	**2,580**	**4**
PU 100	751	2	465	1	**1,216**	**2**
Others	1,371	4	874	2	**2,245**	**3**
TOTALS:	**60,673**	**166**	**62,101**	**170**	**122,774**	**168**

[A] Assumes each of these units were in service 365 days during the year [B] Bariatric unit
Note: PU 93, 95 & 100 only staffed as "spare units when additional staff available, or during special circumstances."
MS 72, 73, 74, 75 are medical supervisor units.

The preceding figure represents a list of the frequency of calls in which a unit was dispatched; not individual incidents. Daily service-demand for the 24-month period ranged from a low of 0.4 calls per day to a high of 9.8 calls per day.

The following figure lists the service-demand (calls dispatched) and average calls per day for each of the peak-activity units during 2015 and 2016:

Figure 49: Service-Demand of Peak-Activity & Interfacility Units (2015–2016)

	2015		2016		2015–2016	
Unit Number	No. Calls Dispatched	Average per Day[A]	No. Calls Dispatched	Average per Day[A]	TOTAL CALLS	DAILY AVERAGE
PU 26	1,320	4	1,331	4	**2,651**	**4**
PU 31	1,850	5	1,967	5	**3,817**	**5**
PU 36	1,399	4	1,541	4	**2,940**	**4**
PU 43	1,722	5	1,766	5	**3,488**	**5**
PU 45	1,924	5	1,885	5	**3,809**	**5**
PU 48	1,494	4	1,573	4	**3,067**	**4**
PU 49	1,414	4	1,527	4	**2,941**	**4**
PU 92	3,297	9	3,391	9	**6,688**	**9**
EPIC 1	1,247	3	1,340	4	**2,587**	**4**
Subtotals:	**15,667**	**43**	**16,321**	**45**	**31,988**	**44**
All IFTs	7,470	20	7,139	20	**14,609**	**40**
TOTALS:	**23,137**	**63**	**23,460**	**64**	**46,597**	**64**

[A] Assumes each of these units were in service 365 days during the year.

As demonstrated by the preceding figure, daily service-demand for the PAUs ranged from a low of 3.4 calls per day (Unit 26), to a high of 8.5 calls per day (Unit 92).

The following figure represents the combined totals of the 24-hour paramedic units and peak-activity units. As shown, during the 24-month study period, daily service-demand was nearly 193 incidents per day.

Figure 50: Combined Service-Demand of All Paramedic Units (2015–2016)

	2015		2016		2015–2016	
Unit Type	No. Calls Dispatched	Average per Day[A]	No. Calls Dispatched	Average per Day[A]	TOTAL CALLS	DAILY AVERAGE
24-Hour Units	2015	166	62,101	170	122,774	168
PAU/IFT	23,137	63	23,460	64	46,597	64
TOTALS:	**83,810**	**230**	**85,561**	**234**	**169,371**	**232**

[A] Assumes each of these units were in service 365 days during the year.

The following two figures list EMS incident call volumes and averages by each station during 2015–2016. The results represent the actual station from which units were dispatched, and not the station to which units are normally assigned. The first figure lists Stations 1–20.

Figure 51-A: EMS Incidents by Station (2015–2016)

	2015		2016		2015–2016	
WFPS Station	No. Calls Dispatched	Average per Day	No. Calls Dispatched	Average per Day	TOTAL CALLS	DAILY AVERAGE
Station 1	5,356	14.7	5,507	15.1	**10,863**	**14.9**
Station 2	3,160	8.7	3,255	8.9	**6,415**	**8.8**
Station 5	6,299	17.3	6,609	18.1	**12,908**	**17.7**
Station 6	3,429	9.4	3,497	9.6	**6,926**	**9.5**
Station 10	1,394	3.8	196	0.5	**1,590**	**2.2**
Station 11	4,417	12.1	4,877	13.4	**9,294**	**12.7**
Station 13	2,791	7.6	2,957	8.1	**5,748**	**7.9**
Station 14	2,735	7.5	2,859	7.8	**5,594**	**7.7**
Station 16	2,833	7.8	3,026	8.3	**5,859**	**8.0**
Station 17	3,273	9.0	3,504	9.6	**6,777**	**9.3**
Station 18	2,148	5.9	2,282	6.3	**4,430**	**6.1**
Station 20	2,216	6.1	2,514	6.9	**4,730**	**6.5**

The following figure lists Stations 21–40. Note that Station 40 is not a staffed station but serves more as a storage facility for reserve apparatus and equipment, including the Bariatric Paramedic Unit.

Figure 52-B: EMS Incidents by Station (2015–2016)

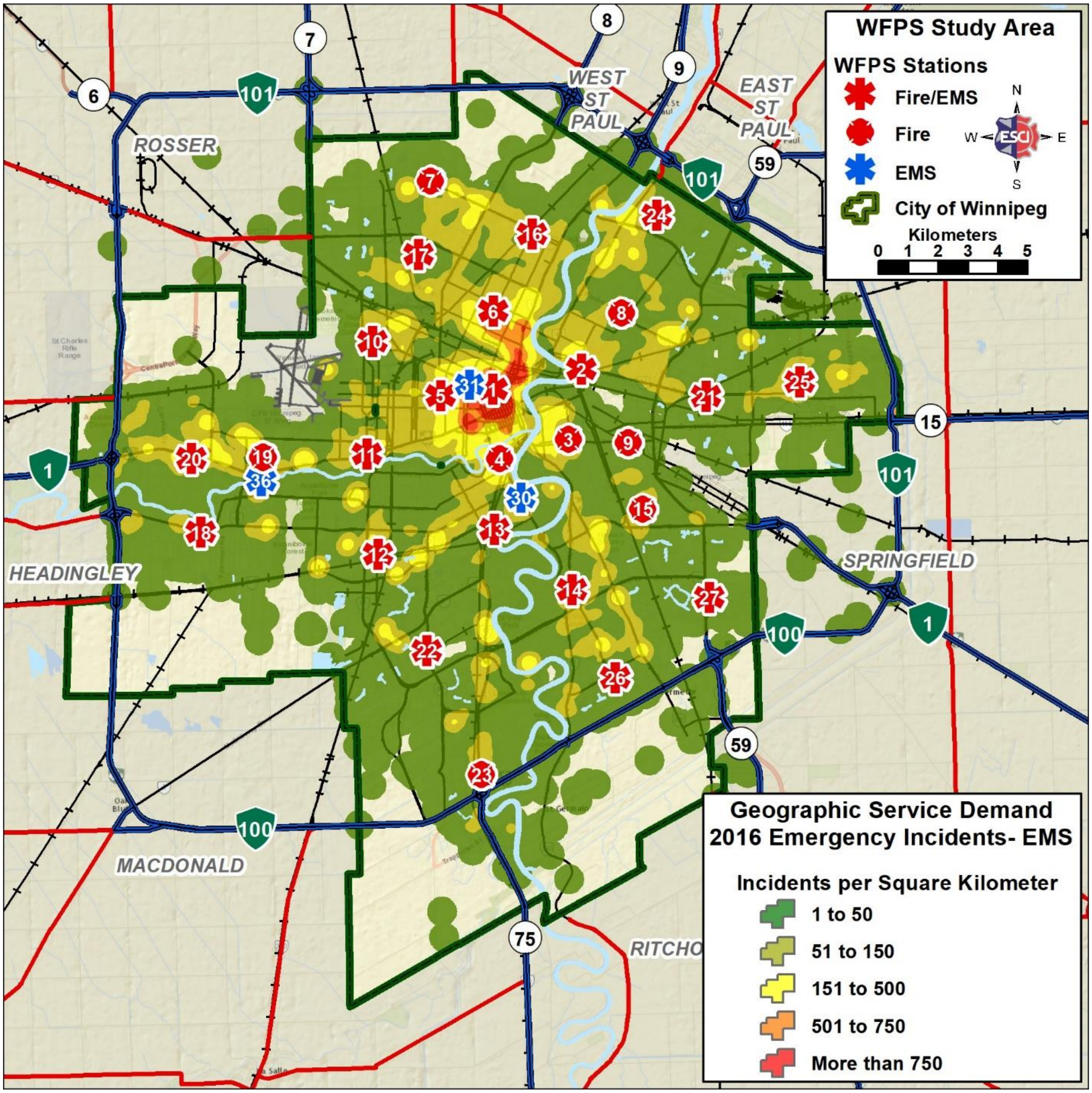
	2015		2016		2015–2016	
WFPS Station	No. Calls Dispatched	Average per Day	No. Calls Dispatched	Average per Day	TOTAL CALLS	DAILY AVERAGE
Station 21	2,624	7.2	2,860	7.8	**5,484**	**7.5**
Station 22	2,609	7.1	2,669	7.3	**5,278**	**7.2**
Station 24	2,327	6.4	2,543	7.0	**4,870**	**6.7**
Station 25	1,718	4.7	1,888	5.2	**3,606**	**4.9**
Station 26	1,232	3.4	1,260	3.5	**2,492**	**3.4**
Station 27	2,085	5.7	2,177	6.0	**4,262**	**5.8**
Station 30	3,891	10.7	6,183	16.9	**10,074**	**13.8**
Station 31	9,224	25.3	9,149	25.1	**18,373**	**25.2**
Station 36	1,437	3.9	1,510	4.1	**2,947**	**4.0**
Station 40	1,538	4.2	298	0.8	**1,836**	**2.5**

The results shown in the preceding two figures demonstrate that the five busiest stations for EMS calls during the 24-month period were: Stations 31, 5, 1, 30, and 11; in that order. Excluding Station 40, the five stations with the lowest EMS call volumes were Stations 10, 26, 36, 25, and 27.

EMS Geographic Service Demand

The next image is a geographic representation of EMS-incident service demand in the City of Winnipeg during 2016. Incidents are represented as incidents per square kilometer, with the lowest concentrations at 1–50 per square kilometer, and the highest at 750 or more per square kilometer.

Figure 53: EMS Incident Density in Winnipeg (2016)



The preceding image shows that the highest concentrations of EMS incidents occurred in the areas of Stations 1, 4, 5, 6, and 31. The image shows many other stations throughout the City with EMS incident densities exceeding 150 calls per square kilometer, and other exceeding 500 per square kilometer.

Paramedic Unit Time Commitment

The following figure lists the total time each paramedic unit committed to EMS incidents during 2016, along with the average time committed per incident. The time-commitment results represent the interval between the time the unit was dispatched and the time the unit returned to service and was available for another call. The figures include EMS calls only, and do not include occasional responses to fires and other non-EMS incidents.

Figure 54: Paramedic Unit Time-Commitment on EMS Calls, 2016

Paramedic Unit (24-hour units)	Total Time Committed	Average Time Per Call
PU 1	5239:48:44	1:21:21
PU 2	4766:18:48	1:23:24
PU 5	4704:04:55	1:18:29
PU 6	5147:00:51	1:23:41
PU 11	3841:46:06	1:16:07
PU 13	4428:49:07	1:25:22
PU 14	4258:15:39	1:24:43
PU 16	4451:49:41	1:23:57
PU 18	3332:19:11	1:23:33
PU 20	3342:51:08	1:16:02
PU 22	3734:28:03	1:17:56
PU 24	3797:34:30	1:24:20
PU 25	2755:12:47	1:22:12
PU 27	3280:07:06	1:23:56
PU 41	5007:59:56	1:21:00
MS 72	1100:45:06	0:38:13
MS73	1527:55:12	0:38:05
MS74	1545:14:05	0:37:51
MS75	1292:32:49	0:34:54
PU 91	5194:11:34	1:24:12
PU 93	1865:02:24	1:26:09
PU 94	392:04:39	1:37:13
PU 95	1500:04:18	1:23:16
PU 100	571:54:04	1:13:48
All Others	871:11:10	1:02:00

Format: hh:mm:ss

During 2016, the 24-hour paramedic units had a combined average time-commitment of nearly 1 hour, 15 minutes. The results in the preceding figure represented the total interval between the time the unit was dispatched until the time it was back in service (in accordance with the timestamp). Average times ranged from a low of nearly 35 minutes (Medical Supervisor 75), to high of just over 1 hour, 37 minutes (Paramedic Unit 94-Bariatric Unit).

The next figure lists the time commitment and averages for each of the peak-activity units during 2016.

Figure 55: Peak-Activity & IFT Unit Time-Commitment on EMS Calls, 2016

Peak-Activity & IFT Units	Total Time Committed	Average Time Per Call
PU 26	2020:59:40	1:31:06
PU 31	2716:33:39	1:22:54
PU 36	2112:40:40	1:22:25
PU 43	2548:59:35	1:26:42
PU 45	2707:46:42	1:26:17
PU 48	2344:54:09	1:29:30
PU 49	2150:53:51	1:24:41
PU 92	4819:36:37	1:25:17
IFT Units Combined	9635:10:30	1:21:16

Format: hh:mm:ss

During 2016, the average time-commitment per call for the PAUs ranged from a low of 1 hour, 22 minutes (PU 36), to high of just over 1 hour, 31 minutes (Paramedic Unit 26). The combined average time per incident of all peak-activity units was just over 1 hour, 20 minutes.

UNIT HOUR UTILIZATION

Unit hour utilization (UHU) is a calculation that measures workload. Essentially, UHU measures the percentage of on-duty time consumed by emergency operations. UHU is one of the most widely used and often misunderstood performance-measurement metrics. A unit-hour (UH) is defined as one hour of service by a fully equipped unit available for dispatch or assigned to a call. A 24-hour unit consumes 8,760 hours annually.

Some emergency services consider higher utilization rates as having a negative impact on personnel and contributing to personnel “burnout.” Those providing integrated emergency service delivery may choose a target of 0.15–0.25 (15–25%) in order to maintain effective response times. Although EMS Operations is a division within the Winnipeg Fire Paramedic Service, it is structured and operates as a distinct operational division of the service rather than a fire-based ambulance transport service.

Different types of EMS organization structures use varying levels of UHU as their benchmark for efficiency. Although there is no published standard for what this level should be, anecdotal data suggests the following thresholds, which can be used as a comparison.

Figure 56: Typical UHU Thresholds by Service Types

Service Type	UHU
Private or Public Utility	0.35–0.50
Third Service	0.25–0.35
Fire-Based Service	0.15–0.25

In the case of WFPS, the third service threshold would be the most applicable. The UHU value provides only one perspective on the workload placed on the various individual apparatus and medic units.

EMS OPERATIONS UNIT HOUR UTILIZATION

The following figure shows the UHU rates for the 24-hour WFPS paramedic units.

Figure 57: UHU Rates of 24-Hour Paramedic Units, 2015 & 2016

	— 2015 —		— 2016 —	
Paramedic Unit	UHU	UHU (%)	UHU	UHU (%)
PU 1	0.60	60%	0.60	60%
PU 2	0.54	54%	0.54	54%
PU 5	0.54	54%	0.54	54%
PU 6	0.58	58%	0.59	59%
PU 11	0.40	40%	0.44	44%
PU 13	0.50	50%	0.51	51%
PU 14	0.48	48%	0.49	49%
PU 16	0.50	50%	0.51	51%
PU 18	0.37	37%	0.38	38%
PU 20	0.39	39%	0.38	38%
PU 22	0.42	42%	0.43	43%
PU 24	0.42	42%	0.43	43%
PU 25	0.30	30%	0.31	31%
PU 27	0.37	37%	0.37	37%
PU 41	0.56	56%	0.57	57%
MS 72	0.11	11%	0.13	13%
MS 73	0.17	17%	0.17	17%
MS 74	0.18	18%	0.18	18%
MS 75	0.13	13%	0.15	15%
PU 91	0.58	58%	0.59	59%
PU 93 (spare)	0.30	30%	0.21	21%
PU 94 (bariatric)	0.05	5%	0.04	4%
PU 95 (spare)	0.25	25%	0.17	17%
PU 100 (spare)	0.10	10%	0.07	7%

The UHU rates in the preceding figure varied widely among the 24-hour Paramedic Units. UHU ranged from a low of 0.04 in 2016 (PU 94) to a high of 0.60 in 2015 and 2016 (PU 1). Of the 24 units listed, 15 units (63%) during 2015–2016 exceeded the maximum third-service threshold of 0.35, and four (17%) were below the minimum fire-based threshold of 0.15. Of the 24-hour Paramedic Units, during 2015 and 2016 combined, eight (33%) exceeded the maximum private service or public utility threshold of 0.50 (50%).

The next figure lists the UHU rates for the peak-activity and IFT units during 2015 and 2016.

Figure 58: UHU Rates of Peak-Activity Units, 2015 & 2016

	— 2015 —		— 2016 —	
PAU/IFT Unit	**UHU**	**UHU (%)**	**UHU**	**UHU (%)**
PAU 26	0.48	48%	0.46	46%
PAU 31	0.62	62%	0.62	62%
PAU 36	0.50	50%	0.48	48%
PAU 43	0.60	60%	0.58	58%
PAU 45	0.58	58%	0.62	62%
PAU 48	0.54	54%	0.54	54%
PAU 49	0.49	49%	0.49	49%
PAU 92	0.54	54%	0.55	55%
EPIC 1	0.17	17%	0.17	18%
IFTs Combined	0.39	39%	0.37	37%

For the peak-activity units, the UHU values ranged from a low of 0.17 in 2015 (EPIC 1), to a high of 0.62 in 2015 and 2016 (PAU 31). IFT units ranged from 0.24–0.46 during 2015 and 2016. All combined, for the 24-month study period, PAUs averaged a UHU of 0.50 (50%).

When combining the 24-hour Paramedic Units with the peak-activity units for the aggregate of 2015 and 2016, UHU results were as follows:

- UHU range of all units combined: between 0.05 (5%) and 0.62 (62%)
- Average UHU of all units combined: 0.40 (40%)

UHU DISCUSSION

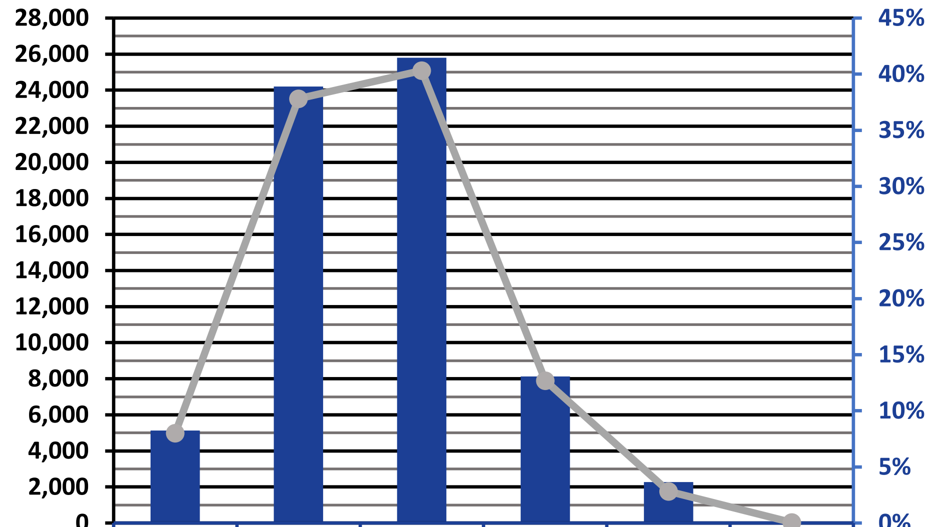
If considering UHU as an accurate measure of workload, the EMS Operations Division's paramedic units combined and operating during the 24-month study period, were over-utilized with an excessive service demand. This was also confirmed through stakeholder interviews with EMS personnel and supervisors. Among those units with the higher UHUs, there *may* be a greater potential for clinical errors and employee "burnout." For WFPS and the EMS Operations Division, this should be considered an issue that warrants immediate attention. Time lost to hospital turnaround is a contributing factor here. The UHU measures would be higher, were it not for paramedic staffed fire units that manage a significant number of calls.

EMS Call Concurrency

One way to evaluate resource workload is to examine the frequency of multiple calls occurring within the same time on the same day. ESCI examined EMS calls during 2016 to find the frequency that WFPS is handling multiple incidents within any time frame. Multiple calls occurring at one time can also stretch available resources and extend response times. It is important to note that the results do not take into account non-EMS incidents occurring simultaneously—which can further stretch resources.

As communities grow and the population ages, the propensity for concurrent calls tends to increase. When concurrency attains a level that stretches Paramedic Unit resources to near capacity, response times begin to increase. EMS incidents such as motor vehicle collisions, multi-casualty incidents, and extended rescue operations may require additional ambulances and can contribute to call concurrency and resource drawdown. The following figure lists EMS call concurrency during 2016.

Figure 59: WFPS EMS Call Concurrency, 2016



	1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	>= 26
Incidents	5,126	24,200	25,806	8,125	2,276	30
% of Total	8.0%	37.8%	40.3%	12.7%	2.8%	0.05%

The results shown in the preceding figure demonstrate that between six to twenty EMS incidents were in progress simultaneously nearly 91 percent (90.8%) of the time. Additionally, 21 or more EMS incidents occurred simultaneously approximately 3.3 percent of the time in 2016.

EMS Response Performance

In this section, ESCI has analyzed the various components that comprise total response time (interval between the time the call was received at dispatch until the time of apparatus arrival) on EMS incidents. All of the time-related calculations in this section only involve incidents dispatched as emergent (lights and sirens). The following figures show the 2015 and 2016 turnout times for EMS incidents among the engine companies and paramedic units.

Figure 60: WFPS Engine & Paramedic Unit Turnout Times, 2015 & 2016

	— 2015 —		— 2016 —	
WFPS Units	Average at 90th Percentile	Average Time	Average at 90th Percentile	Average Time
Engine Companies	0:02:12	0:01:35	0:02:14	0:01:35
Paramedic Units	0:02:13	0:01:15	0:02:32	0:01:26

At the 90th percentile, turnout times among each of the engine companies ranged from a low of 1 minute, 57 seconds in 2016 (Engine 14), to a high of 2 minutes, 39 seconds in the same year (Engine 22). Among the paramedic units, turnout times ranged from a low in 2015 of 26 seconds (Paramedic Unit 12) to a high of 6 minutes, 27 seconds in 2016 (Paramedic Unit 12).

The NFPA and Commission on Fire Accreditation International recommend a turnout-time benchmark of 60 seconds or less, at 90 percent for EMS incidents. While neither combined turnout times of the engine companies or the paramedic units met this standard, the results found in both years were anecdotally not unreasonable in most cases.

The following figure lists the travel times of engine companies and paramedic units during 2015 and 2016.

Figure 61: WFPS Engine & Paramedic Unit Travel Times, 2015 & 2016

	— 2015 —		— 2016 —	
WFPS Units	Average at 90th Percentile	Average Time	Average at 90th Percentile	Average Time
Engine Companies	0:04:52	0:03:11	0:04:59	0:03:15
Paramedic Units	0:07:50	0:04:52	0:07:56	0:04:39

Not surprisingly, the results showed that engine companies had considerably shorter travel times during both 2015 and 2016, than the paramedic units.

The following figure shows the total response time calculations among the engine companies and paramedic units during 2015 and 2016.

Figure 62: WFPS Engine & Paramedic Unit Total Response Times (2015 & 2016)

	— 2015 —		— 2016 —	
WFPS Units	**Average at 90th Percentile**	**Average Time**	**Average at 90th Percentile**	**Average Time**
Engine Companies	0:08:56	0:06:34	0:09:15	0:06:45
Paramedic Units	0:12:55	0:08:40	0:13:10	0:08:44

At the 90th percentile, among the engine companies, total response times ranged from a minimum 8 minutes, 7 seconds in 2015 (Engine 5), and a maximum of 11 minutes, 16 seconds during the same year (Engine 9). Among the paramedic units, response times ranged from a low of 9 minutes, 34 seconds in 2015 (PU 20), to a high in 2016 of 18 minutes, 58 seconds (PU 40, which is an IFT unit).

EMS INCIDENT TYPES

Understanding the types and frequency of EMS incidents that occur can help an organization identify the resources necessary for deployment, as well as topics for continuing medical education and quality management.

In its CAD system, WFPS lists a large number of very detailed incident-type descriptors. These are not necessarily consistent with the Canadian National Fire Information Database (NFID) codes. For this analysis, ESCI placed all of the EMS-related “Dispatch Determinant Descriptions” into groups. For example, eight separate types of “Abdominal Problems/Pain” were grouped into a single category.

The following figure lists the ten most frequent EMS incident-types (as identified in the CAD system) when combining responses from both EMS and fire, for the 24-month period between January 1, 2014 and December 31, 2015. The figure then illustrates the volume and percentage of the total for each division. Incidents classified as Interfacility Transports; urgent and non-urgent Palliative Care; Unknown Problems; and those that were undocumented were excluded from the totals. With these exclusions, this represented 127,745 responses from the EMS Operations Division, and 80,812 from the Fire Operations Division.

Figure 63: Ten Most Frequently Dispatched EMS Incident Types, 2014–2015

Incident Types (EMS/Fire Combined)	**EMS OPS (%)[1]**	**Fire OPS (%)[1]**
Ill Person (assorted causes)	20,243 (16%)	7,294 (9%)
Respiratory Problem	14,519 (11%)	10,801 (13%)
Fall (assorted injuries)	14,210 (11%)	10,134 (13%)
Chest Pain (non-traumatic)	11,141 (9%)	8,008 (10%)
Unconscious and/or Syncope	9,078 (7%)	6,048 (7%)
Seizure (assorted causes)	6,201 (5%)	3,586 (4%)
Hemorrhage/Laceration	5,257 (4%)	2,803 (3%)
Overdose/Poisoning	4,974 (4%)	(3%) *Ranked 11th*
Stroke or TIA	4,587 (4%)	2,611 (3%)
Assault/Sexual Assault	4,467 (3%)	(2%) *Ranked 14th*

[1]Represents the percentage of the total calls for that particular division.

Records from this dataset did not identify the severity of each of the patients. Assuming that the Dispatch Determinant Descriptions are relatively accurate, the frequency of some of the more obvious higher acuity (life-threatening and potentially life-threatening) incidents can be identified. It is important to note that these descriptions have been acquired from CAD data and are not necessarily consistent with the ultimate patient impression as determined by the on-scene paramedics.

The following figure lists EMS incident-types in which a paramedic unit was dispatched and may have been *potentially* critical or life-threatening—but *not* confirmed definitively.

Figure 64: Potential High-Acuity (Life-Threatening) EMS Incidents, 2014–2015

High-Acuity Incident Types	**Number of Calls**	**Percent of Total***
Chest pain (non-traumatic) or cardiac-related	13,528	11%
Overdose or poisoning	4,974	4%
Stroke or TIA	4,587	4%
Cardiac and/or respiratory arrest	3,387	3%
Motor vehicle vs. pedestrian or bicycle	1,427	1%
Stabbing, GSW, or penetrating trauma	617	0.5%
Subtotal:	**28,520**	**23.5%**
Traumatic injury	3,155	2.5%
Motor vehicle collision	2,548	2%
Respiratory problem	14,519	11%
Subtotal:	**20,222**	**15.5%**
Grand Totals:	**48,742**	**39%**

*Figures have been rounded.

In the preceding figure, the first group of incident-types includes “likely” or “highly likely” to be incidents involving high-acuity conditions. The second group includes those that have a significant possibility to be serious, but also may include an unknown number of low-acuity conditions. The data from this figure *may* indicate that approximately 23.5–39 percent of those in which a paramedic unit was dispatched, were potentially serious or life threatening.

Patient Transport Review

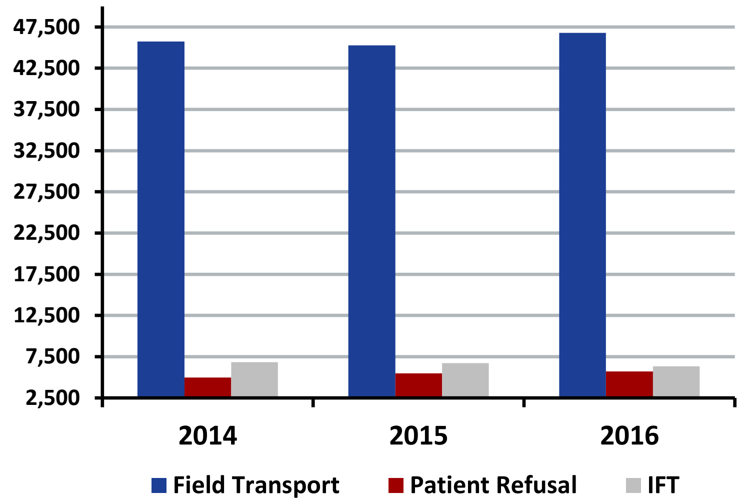
Between January 1, 2014 and December 31, 2016, the primary paramedic units and PAUs transported 135,877 patients to 36 area hospitals and facilities throughout Winnipeg. During the same period, an additional 19,959 patients were transported by three IFT units. The following figure lists the ten most frequent transport destinations during the 36-month study period (patients seen through EPIC and MSP were excluded from the results):

Figure 65: Ten Most Frequent Transport Destinations by Paramedic Units, 2014–2016

Hospitals & Facilities	Number of Calls	Percent of Total
Health Sciences Centre	29,344	22%
Seven Oaks General Hospital	23,609	17%
Grace General Hospital	19,993	15%
St. Boniface General Hospital	19,859	15%
Victoria General Hospital	17,043	13%
Concordia Hospital	14,664	11%
Children's Hospital	8,099	6%
Main Street Project	1,977	1%
Misericordia Urgent Care Centre	1,132	1%
Riverview Health Centre	86	<1%

The preceding figure shows that the four most frequent transport destinations represented 68 percent of the total patients transported. St. Boniface General Hospital, Health Sciences Centre, and Grace General Hospital accounted for the majority of IFT destinations, representing 70 percent of the total. The following figure illustrates the frequency of patients transported from the field, and the volume of patient refusals and IFTs.

Figure 66: Paramedic Unit Transports/Refusals/Interfacility Transports, 2014–2016



Between 2014 and 2016, the percentage of patients refusing treatment and/or transport (or not requiring treatment and/or transport) remained relatively consistent at 10–11 percent of the calls to which paramedic units were dispatched—resulting in the ratio of patients transported from 89–90 percent.

PATIENT DISPOSITIONS & OUTCOMES

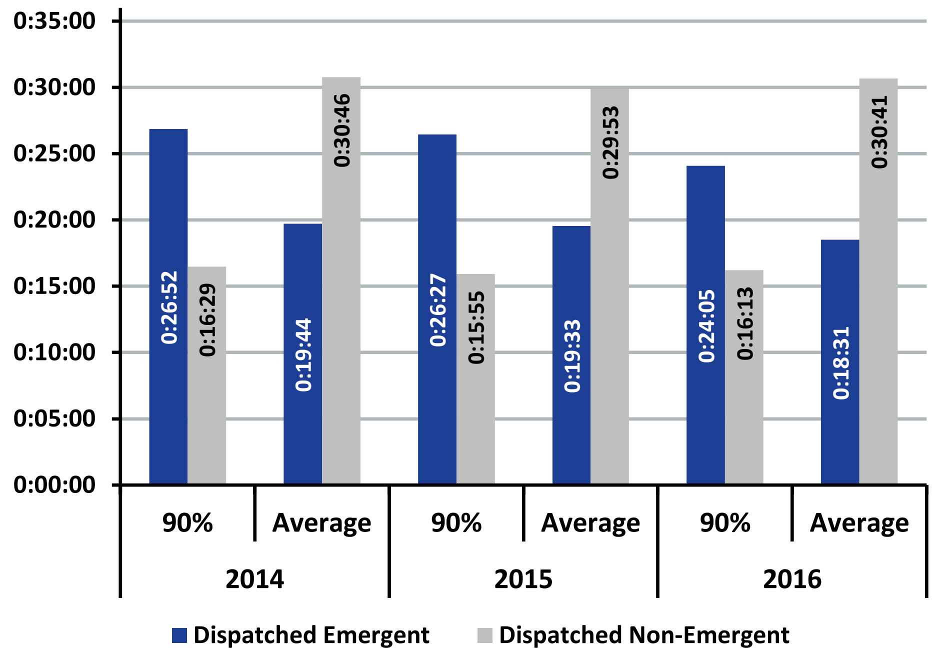
The dataset provided to ESCI contained a data field entitled, "Outcome," which is in the electronic patient care report. This is actually "Disposition." Patient outcomes are typically thought of in terms of the patient's final clinical outcome or discharge diagnosis. None of the datasets provided to ESCI contained actual patient outcomes, which is typical of most EMS systems. Patient-transport was the most frequent patient disposition documented. During 2014–2016 combined, the results of the analysis showed the following patient dispositions:

- Treated & transported by WFPS: 89.4%
- Treated & no transport: 6.2%
- Assessed & refused treatment: 4.1%
- Refused assessment: 0.3%

TRANSPORT & HOSPITAL OFFLOAD TIMES

In this section, ESCI examines the transport times and hospital offload (or hospital turnaround) times of the WFPS paramedic units. Transport time is defined as the interval between the time the ambulance left the scene to begin transport, and the time of arrival at the hospital or facility. Hospital offload time refers to the period between the time the ambulance arrived at the hospital or facility, and the time it left the facility and returned to service. The following figure illustrates the combined transport times at both the 90th percentile and average, by those dispatched as emergent (Priority 4) and those dispatched as non-emergent.

Figure 67: WFPS Paramedic Unit Transport Times, 2014–2016



The majority (90%) of patient transport times—whether dispatched as emergent or non-emergent—remained nearly the same from year to year. The aggregate transport time of emergent dispatched incidents over the 36-month study period was 25 minutes, 51 seconds at 90 percent (average of 20 minutes, 10 seconds), while non-emergent dispatched calls were 16 minutes, 24 seconds at 90 percent (average of 39 minutes, 59 seconds). Obvious outliers were excluded from the calculations.

HOSPITAL OFFLOAD TIMES

During 2014 through 2016, the majority (90%) of hospital-offload times for all paramedic units combined, and calls dispatched as emergent, was nearly 61 minutes. For incidents dispatched as non-emergent, hospital offload times were nearly 1 hour, 54 minutes at the 90th percentile.

Quality Management

Quality assurance (QA), continuous quality improvement (CQI), total quality management (TQM), and quality improvement (QI) are among the catch phrases used throughout the industry to give a name to the process that ensures EMS standards of patient care are met. Regardless of what moniker is used, quality management is a critical component of an effective EMS program.

In this section, ESCI reviews the existence of EMS quality management programs in two areas. Operational performance concerns the effectiveness and ability of the system to meet response times and other performance criteria, including other areas such as dispatch criteria and effective deployment. The other aspect involves clinical quality management—that is, areas involving specific patient care.

OPERATIONAL PERFORMANCE CRITERIA

The EMS Operations Division maintains a quality management program that identifies areas for improvement. The Division is currently developing EMS system performance criteria and objectives. In the meantime, system performance continues to be monitored.

CLINICAL QUALITY IMPROVEMENT

A comprehensive clinical QI program should include three components: A retrospective review of patient care reports after the fact; a concurrent real-time evaluation of patient care; and a prospective evaluation of any activity that occurs prior to being assigned to an incident. An effective clinical QI program tends to be non-threatening and non-punitive in instances of genuine clinical errors, with the primary goal of achieving the best care possible.

The EMS Operations Division has established an internal quality improvement committee. The Medical Director and Associate Medical Director participate in the QI process, and feedback is given to individual field providers. The Division has not established key performance indicators (KPIs) for clinical performance by EMS personnel. However, Medical Supervisors review 100 percent of cardiac arrest, STEMI, and pediatric calls.

Electronic patient-care reports are examined through a "Daily Trip Review" and spot-checked for accuracy by the Medical Supervisors. All cases of patient refusals are documented and ultimately reviewed by staff, using *FirstPass*® quality management software (Stout Solutions, LLC; Carlsbad, CA). They have also developed a process to address frequent users of the EMS system through their EPIC and MSP community paramedicine programs.

The Division is currently developing a process to publish regular reports on the results of its quality management process. WFPS occasionally participates in EMS research, and EMS Division staff consistently explores EMS best practices. The Division also works closely with the Medical Director in the development of local patient-care protocols.

EMS Dispatch Methods & Capabilities

The Winnipeg Police Services operates the 911/primary PSAP and forwards fire and EMS calls to WFPS Communications to triage and dispatch. WFPS Communications maintains comprehensive EMS dispatch standards, which are considered the minimum standard of practice in accordance with the *Land Emergency Medical Response System* in Manitoba.

Communications Operators (CO) and Dispatchers are trained and certified through the *International Academies of Emergency Dispatch* (IAED). Communications Quality Improvement (QI) Officers are responsible for monitoring performance of communications staff and the operational functions of the centre. Dispatchers are required to track and provide 30-minute meal breaks for the EMS crews. Policy allows a maximum of three units on a break simultaneously.

MEDICAL PRIORITY DISPATCHING

Communications Operators triage EMS calls utilizing the *Advanced Medical Priority Dispatch System* (Priority Dispatch Corporation, Salt Lake City, UT, USA). The software application is integrated with the CAD system and includes an extensive and detailed list of medical priority dispatch determinants. The system ensures that nearest proper resources are dispatched to EMS incidents.

EMS Discussion & Recommendations

Certainly, the leadership at WFPS is well aware of the cultural differences between EMS Operations and Fire Operations personnel, and the occasional contentious relationships between the two. While there are indications that this has improved since the early days of consolidation, there is a feeling among some individuals within EMS Operations that they are viewed as a "necessary evil," and that Fire Operations takes precedence. A number of employees expressed to ESCI their concern for a lack of "buy-in" by employees of the integrated model.

The fact that EMS Operations personnel wear different uniforms and emblems than the firefighters in Fire Operations, as well as using different decals on their vehicles and apparatus, helps to perpetuate a sense of disunity. Most fire apparatus are labeled as the "Winnipeg Fire Department," and EMS Operations units are labelled as "WEMS" rather than both being labeled WFPS. ESCI recognizes the history and proud heritage of both the fire and EMS services prior to integration. However, it is possible to honor both while fully embracing a single, unified emergency service to the citizens of the City of Winnipeg.

EMS OPERATIONS DIVISION EMPLOYEES

The majority of field providers in the EMS Operations Division are comprised of relatively young members with varied field experience. Although this may be anecdotal, ESCI received multiple comments from staff regarding "…increasing employee burnout," and increases in sick and/or stress leave and WCB claims. In addition, comments suggested that there are some EMS employees who are seeking other opportunities beyond WFPS. However, WFPS Human Resources data does not reflect a significant issue related to resignations and retirements from WEMS.

EMS SPECIAL OPERATIONS

Both the EPIC and MSP programs are model community paramedicine programs that should be continued and strengthened as necessary. EPIC has been successful in substantially reducing unnecessary emergency EMS responses. The PACER program is unique by not only providing paramedics on bicycle patrol to respond to medical emergencies in parks and other venues, but also as another means of providing public education and portraying WFPS positively to the community.

EMS TRAINING & CONTINUING MEDICAL EDUCATION

A number of issues concerning EMS training and CME are identified and addressed in the *Training* section of this report.

SERVICE-DEMAND & PERFORMANCE

Service demand from Stations 31, 5, 1, 30, and 11 was significant, ranging from nearly 13 calls dispatched per day, to just over 25 calls per day during 2015 through 2016. Stations 10, 26, 36, 25, and 27 had much lower call volumes, ranging from just over two EMS calls daily to nearly six calls per day during the same time period.

If the unit hour utilization threshold (0.25–0.35) for "Third Service" providers is considered acceptable, then the demand on many of the paramedic units is well above the maximum. In 2016, among the 24-hour paramedic units, fifteen (62.5%) exceeded a UHU of 0.35, while eight (33%) exceeded the maximum UHU threshold of 0.50 for private/public utility transport services. At the low end, eight (33%) paramedic units had UHU rates below the third service threshold.

Among the 12-hour peak-activity units, excluding EPIC 1, all (100%) exceeded the third service threshold, with UHU rates ranging from 0.46 to 0.62; with five (62.5%) of those exceeding the private/public utility threshold of 0.50.

The data analyses conducted by ESCI clearly indicated that, overall, the paramedic units operating out of the EMS Operations Division have exceeded a reasonable capacity. Although response times among the paramedic units and companies in the Fire Operations Division are reasonable, relatively long transport times and substantial hospital turnaround times contribute to the excessive UHU rates.

There is no question that the significant service demand is negatively impacting the EMS crews. Although ESCI did not have definitive evidence on the impact of excessive service demand on the quality of patient care, experience in other systems suggests there is a potential. In addition, this may also increase the City of Winnipeg's, WRHA, and Shared Health's exposure to liability.

There may be several strategies that WFPS could consider to address the excessive EMS service demand. For example, paramedic units assigned to the five stations with the lowest service demand could be reassigned to those stations with the highest service demand (assuming the busy stations have the capacity for another unit and additional personnel). The ESCI GIS travel-time study shows that the five slowest stations have other stations within a four-to-eight-minute travel time.

Another strategy would be to carefully review the historical EMS temporal analyses and consider adding more PAUs into the system. In 2016, EPIC 1 had a UHU of 0.18. WFPS should consider modifying its dispatch protocol to respond more frequently to other incidents. Adding 2–3 more EPIC units in strategic locations throughout the city, could be another strategy to balance service demand more effectively in EMS Operations.

Hazardous Materials Response

Hazardous materials (Haz-Mat) are defined as any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to people or the environment. In a location like WFPS, hazardous materials may be present in various locations throughout the city. The city contains industrial and agricultural environments with significant hazardous material release potential. The presence of significant rail and air modes of transportation also pose concerns.

WFPS has dedicated assets to respond to hazardous materials events. They include a Haz-Mat truck, a heavy rescue, a de-contamination trailer, a spills unit, and a trailer tow vehicle. The complement of apparatus provides equipment for level "B" incidents, equipment for level "A" incidents, equipment for decontamination, equipment for plume modeling/spot weather analysis, equipment for plugging/diking/spill containment, and gas monitoring capability for concurrent red zone and perimeter analysis. In short, the team is well equipped to address the vast majority of hazardous materials incidents.

However, having the right equipment is only part of the response requirement. The team has awareness certified personnel, operations certified personnel, and technician certified personnel. There are some additionally certified personnel in Weapons of Mass Destruction (WMD). Notable gaps include a lack of certified Haz-Mat Incident Commander certified personnel and Haz-Mat Safety Officer certified personnel.

The team is a mutual aid partner and regional team participant with other agencies in the region and is fully staffed and available for offensive level "A" entry. The team trains together regularly.

Given the significant risk Haz-Mat incidents pose to Winnipeg and WFPS personnel, WFPS has highly prioritized its response readiness to manage an incident of this nature. The amount of hazardous materials transiting the city via aircraft, rail, and highway is substantial. However, the transportation routes are not the only risk the community faces. Industrial warehousing activities increases risk due to the handling of these raw materials. Several hazardous materials response units are staffed by department personnel. Currently staffed with eight personnel per day is a Heavy Rescue and an Engine out of Fire Paramedic Station 9. This is a level "A" resource, the highest level of Haz-Mat response capability. To achieve level "A" capability, a combination of highly technical equipment is necessary, along with appropriately trained, technician-certified personnel. The department also staffs four (4) personnel out of Station 7 to conduct decontamination at a hazardous materials event. This station operates a decontamination trailer, a spills truck, and trailer with tow vehicle.

The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are hazard classification, cautionary labelling of containers, the provision of material safety data sheets (MSDS), and worker education and training programs. Each of the thirteen provincial, territorial, and federal agencies responsible for occupational health and safety has established employer WHMIS requirements within their respective jurisdictions.

The Manitoba Workplace Safety and Health Act Chapter W210 establishes workplace safety and health regulations for the jurisdiction. Included in this regulation are provisions for firefighters handling hazardous materials during emergency response. Haz-Mat certification levels are defined by NFPA 472: *Standard for Competence of Hazardous Materials/Weapons of Mass Destruction Incidents.* The highest level of certification for responders is the "Technician" level. Of the personnel in WFPS, approximately 48 individuals are certified at the Technician level, resulting in a considerable response capability when all members are on duty.

The National Fire Protection Association (NFPA) defines a Hazardous Materials Safety Officer certification level in their standard NFPA 472: *Standard for Competence of Hazardous Materials/Weapons of Mass Destruction Incidents*. WFPS does not have Hazardous Materials Technicians trained to this certification level, which is an industry best practice.

ESCI staff performed a comprehensive assessment based on industry standard practice and consistent with Canadian Centre for Occupational Health and Safety (CCOHS), The Manitoba Workplace Safety and Health Act Chapter W210, NFPA 472: *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, NFPA 471: *Standard for Responding to Hazardous Materials Incidents*, and the International Fire Service Training Association. Team leaders were interviewed for the purpose of identifying strengths and weaknesses within the team or team administration. The assessment is based on a minimum level of capability regardless of hazardous materials incident type.

Standard Operating Procedures, Policies, and Guidelines

The first area of evaluation involves the established standard operating procedures, policies, and guidelines used to manage the team. WFPS does have an Emergency Response Plan for Hazardous Materials Incidents. The existence of WFPS's Emergency Response Plan (ERP) is related to the mandate from the Manitoba Workplace Safety and Health Act Chapter W210, which requires that employers establish emergency procedures to be followed when responding to emergencies involving hazardous materials. This plan is available online to all employees and reflects pre-planning and coordination with outside shareholders.

The Incident Command System is a standard on-site command and control system used to manage emergency incidents and planned events. WFPS uses the ICS Canada system to manage their incidents. ICS Canada is the network of organizations working cooperatively to maintain a standard Incident Command System that enhances incident management response through improved interoperability. In the mid-1990s, this system was implemented on a large scale throughout the Province of British Columbia. In 2002, the system was mandated by the Canadian Interagency Forest Fire Centre for use in wildland fire management. Many of the non-wildland organizations have adopted its use. This system defines the lines of authority, roles, and responsibilities for managing large scale incidents. Furthermore, it designates a single Incident Commander as well as recognizes the Unified Command concept. Passing of command to senior officials is recognized and the Safety Officer is identified.

During hazardous materials responses, WFPS maintains available advanced life supports services on scene for responders during actual and potential immediately dangerous to life and health (IDLH) atmospheres. These advanced life support personnel are not specifically trained in the medical aspects of hazardous materials. However, the roles of the emergency medical support personnel are clearly defined. Medical treatment protocols for handling medical emergencies involving hazardous materials have not been approved by the organization's Medical Director. Medical treatment protocols for these types of exposures would benefit advanced life support personnel.

The Emergency Response Plan (ERP) used by WFPS addresses safe distances and areas of refuge for responders who may require it. It further identifies the required personal protective equipment to be employed along with emergency equipment. The plan identifies site security and control as well as establishes the usage of a personal accountability system. The ERP is thorough and details the use of emergency evacuation procedures, decontamination procedures to include collection and disposal of runoff. Finally, the report also details the procedures for after action reports and critiques. This ERP does not provide for deployment of resources outside of the jurisdiction.

The WFPS hazardous materials team does not have a personal protective equipment plan or program. Because this plan is not present, there are no outlined policies describing a method to address hazard-based selection of protective ensembles, their use and limitations, work mission duration, maintenance and storage, decontamination and disposal, training and fitting, donning and doffing, and inspection procedures. Manitoba Chapter W210, *The Workplace Safety and Health Act,* requires the employer to implement safe work procedures for the use of personal protective equipment in the workplace as well as train workers in its use. The act continues to require the employer to ensure that employees are complying with the regulations. It is highly recommended that WFPS develop a thorough personal protective equipment plan to satisfy these requirements. All personnel are required to use a minimum of positive pressure, self-contained breathing apparatus until the atmosphere has been quantified.

WFPS does not have policies and procedures that reference the usage of air monitors during the emergency response. However, WFPS does maintain documented maintenance procedures and calibration of air monitors. WFPS's ERP requires the establishment of a site-specific safety plan and has policies that reference a standardized methodology for assigning incident levels to hazardous materials emergencies. The ERP does not however, outline the specific procedures for various tasks that team members may be required to perform, such as spill or leak control. As of the writing of this report, the Assistant Chief of Operations has directed the Haz-Mat Coordinator to address the Personal Protective Equipment plan, policies, and procedures to ensure they are in place and up to date.

Human Resources

The Manitoba Workplace Safety and Health Act Chapter W210, which requires that employers ensure that firefighters establish teams when working and that a suitable rescue team suitably equipped is readily available when firefighters are required to engage in emergency responses that require specific and advanced training and specialized equipment. Listed specifically in the regulations are incidents involving hazardous materials. The accepted industry standard practice requires seven Hazardous Materials Technicians to facilitate a minimal entry during a hazardous materials response. These seven people must be dispatched on the initial hazardous materials emergency response once it is determined that an emergency does exist.

Of these seven, one should be the designated Hazardous Materials Safety Officer trained in accordance with NFPA 472: *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, and another the Incident Commander. WFPS does not have a minimum staffing requirement for hazardous materials technicians assigned for the day. WFPS staffs 12 personnel per shift between Fire Stations 7 and 9 with various levels of minimum staff daily having technician certification. Establishing a minimum staffing level of the required seven—thus ensuring that the initial alarm assignment meets industry best practice—should be a goal for the organization.

WFPS has a written medical surveillance plan for personnel assigned to the hazardous materials response team. This policy does not require an opinion from a physician, nor does it provide for periodic examinations as determined by the physician. The medical surveillance plan does provide for a medical assessment after exposures above the occupational exposure limit. All employees receive proper fitting for respiratory protective equipment.

Training

The WFPS hazardous materials team certifies that its members have achieved technician level training in accordance with International Fire Service Training Association (IFSTA) standards and NFPA 472: *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.* WFPS keeps records for documenting initial training and qualifications at the academy, and ongoing refresher training using the paper form and electronic report. WFPS requires the completion of a task book for all members and certifies all members who are required to use respiratory protection. All members have been trained to a minimum level of medical first responder. The WFPS hazardous materials team does not have a plan for annual refresher training or measurement of continued competency of all team members. One area of concern is the ability to deploy spill containment measures in maritime environments. WFPS should use maritime resources to train on these operations regularly.

Equipment

An objective review of equipment available for hazardous materials response was conducted. WFPS has an adequate supply of decontamination equipment. This equipment consists of the required containment and collection items as well as the necessary solutions for decontamination operations. Gross decontamination as well as technical decontamination operations were evaluated and found to be adequate for the type of operations WFPS may encounter.

The inherent ability of hazardous materials emergencies to progress into longer-term operations dictates the need for effective rehabilitative efforts. WFPS has arrangements in place for the sheltering of personnel during the rehabilitation process in an area out of the cold and elements. The means by which this is accomplished can be varied. Ambulances, buses, ventilated tents, and shelter are all possible means to achieve the desired outcome. WFPS has policies in place to obtain meals for responders during extended operations.

WFPS has various methods for analysis and detection of hazardous materials. This includes PH paper, multi-gas monitoring equipment, radiological monitors, and colorimetric chemical detection and analysis. There are also sufficient supplies for gathering and collecting samples. WFPS should consider increasing their ability from just detection to actual identification of specific compounds. Various industry-specific equipment is available for this task. WFPS does not have a flame ionization device and should consider adding this piece of equipment to its cache. Currently WFPS has five radiological personal dosimeters and one Alpha radiation detector. It is recommended that WFPS increase these numbers. The personal dosimeters should be maintained at eight to cover one per required technician with a spare in reserve. The Alpha radiation detector should be increased from one to two. This will allow for one in the decontamination line and one for the down range operations into the hot zone. This will help make operations more efficient.

Every member of the hazardous materials team operating on-scene needs to have radio communications with the safety officer and entry coordinator during entry operations. At a minimum, one portable radio must be available for every entry team member who is at any level of dress, (multiple entry teams and back up teams) as well as any team member who is coordinating a function (decontamination, science, safety, group leader, etc.). WFPS has the communication capability to fulfill this and has made it part of their standard operating procedures.

In the cases of liquefied petroleum gas and natural gas, WFPS relies on the specific carrier to handle major leaks and issues. WFPS does have an assortment of equipment to handle small leaks but relies on the carrier for major work. Further, spill and leak capabilities are available for various other types of hazardous materials releases. WFPS has a full array of chlorine leak kits at their disposal. Moving equipment for handling drums is also available. WFPS stocks more than the appropriate amount of overpack drum capabilities.

WFPS provides adequate fire protection capabilities with foam application, if required. There is an adequate amount of foam on hand as well as in reserve should the need materialize as well as the equipment to operate at 250 gallons per minute during application. WFPS does not have the capability for Class D metal fire extinguishers and relies on large amounts of water application, if necessary.

WFPS stocks the necessary medical equipment to monitor and provide treatment for team members during entry. As discussed earlier in the report, there are no medical treatment providers available with hazardous materials toxicology training. This training is recommended.

WFPS maintains an adequate number of reference materials and provides internet capabilities for research. WFPS does not employ a weather station for immediate, on-site analysis. This would be a helpful addition.

WFPS carries a standard complement of protective ensembles for rescuers. These include both sixty- and thirty-minute SCBA bottles with sufficient reserve bottles, as well as a cascade system to support long-term operations. WFPS also requires responders to bring their issued turnout gear to ensure each rescuer has adequate NFPA compliant protective equipment that has been sized appropriately. This reduces the amount of equipment required to be stored for deployment. Industry best practices require each person operating as part of the team to be assigned NFPA compliant firefighting protective equipment.

Key Recommendations

- Ensure Incident Commanders are trained in accordance with NFPA 1072: *Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications*.
- Ensure incident safety officers are trained in accordance with NFPA 472: *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.
- Ensure minimum staffing of seven Hazardous Material Technicians are assigned on initial alarm.
- Provide medical training for paramedics in hazardous material toxicology.
- Establish Medical Treatment Protocols for handling medical aspects of hazardous materials incidents.
- Develop a personal protective equipment plan describing a method to address hazard-based selection of protective ensembles, their use and limitations, work mission duration, maintenance and storage, decontamination and disposal, training and fitting, donning and doffing, and inspection procedures.
- Amend the ERP to outline specific procedures for various tasks that team members may be required to perform, such as spill or leak control.
- Consider the addition of specific and detailed compound analysis.
- Consider the addition of a flame ionization detector.
- Increase personal radiation dosimeters from five to eight.
- Increase the Alpha radiation detector from one to two.
- Consider the addition of a Class D metal extinguisher.
- Provide on scene weather analysis and updates.
- Provide joint maritime training for deployment of spill containment measures.

Technical Rescue

Much like hazardous materials incidents, WFPS needs to be prepared for technical rescue emergencies. Technical rescue includes vehicle machinery extrication, high angle rope rescue, confined space rescue, water rescue, trench rescue, and collapse rescue categories. Due to industrial, agricultural, rail, and air transportation activities in the urban environment, the likelihood of technical rescue incidents is high.

WFPS has an established Technical Rescue Team (TRT) to respond to technical rescue incidents. The disciplines for which the agency is prepared include confined space rescue, rope (high angle) rescue, vehicle/machinery rescue, trench rescue, ice, and surface water rescue. These specialties are staffed at the technician level, which is the highest level of certification. WFPS does not staff resources for structural collapse rescue, utilizing mutual aid resources to address that discipline. WFPS currently divides the disciplines involved in technical rescue between three distinct sub-groups. These are a vehicle machinery rescue group; a ropes, trench, and confined space group; and a water rescue group.

While this terminology is not their specific designation it is helpful for delineation within this report. The technical rescue operations are well structured. Resources for each group are separated and geographically located in specific fire houses. The vehicle machinery extrication group is split amongst six rescues geographically located throughout the City; three Heavy Rescue Units and three Rescue Engine Units located at Fire Stations 4, 5, 6, 8, 9, and 11. The rope, trench, and confined space group is located in Station 11 and operates with ten personnel assigned to an engine, a rescue, and a truck. Of these ten, there is a minimum of six trained technicians. The water rescue group is assigned to Fire Stations 3, 4, 13, and 23. Each of those stations will staff three to four Technician-level personnel. In addition, Stations 8 and 11 have a minimum of three trained personnel to assist when needed. There is a system-wide minimum staffing of 12 per day to operate various boats and rescue resources.

As with the *Hazardous Materials* section of this report, ESCI staff performed a comprehensive assessment of the technical rescue program based on the current standard practices consistent with Canadian Centre for Occupational Health and Safety (CCOHS), the Manitoba Workplace Safety and Health Act Chapter W210, Canadian Standards Association (CSA) Z1006: *Standard for Confined Spaces,* NFPA 1006: *Standard for Technical Rescuer Professional Qualifications*, NFPA 1670: *Standard on Operations and Training for Technical Search and Rescue Incidents*, OSHA 29 CFR 1920.120, and the International Fire Service Training Association. Team leaders for this program were also interviewed to identify strengths and weaknesses within the team or team administration. The assessment is based on a minimum level of capability.

Standard Operating Procedures, Policies, and Guidelines

The first area of evaluation involves the established standard operating procedures, policies, and guidelines used to manage the team. WFPS does have an Emergency Response Plan for Technical Rescue Incidents in accordance with Manitoba Workplace Safety and Health Act Chapter W210, which requires that employers establish emergency procedures to be followed when responding to emergencies involving water rescues, confined space entry, and high angle rescue. This plan is available online to all employees and reflects pre-planning and coordination with outside stakeholders. Members are also governed by specific Standard Operating Guidelines (SOGs) and Standard Operating Procedures (SOPs).

The Incident Command System is a standard on-site command and control system used to manage emergency incidents and planned events. WFPS uses the ICS Canada system to manage their incidents. ICS Canada is the network of organizations working cooperatively to maintain a standard Incident Command System that enhances incident management response through improved interoperability. In the mid-1990s, this system was implemented on a large scale throughout the Province of British Columbia. In 2002, the system was mandated by the Canadian Interagency Forest Fire Centre for use in wildland fire management. Many of the non-wildland organizations have adopted its use. This system defines the lines of authority, roles, and responsibilities. Furthermore, it designates a single Incident Commander as well as recognizes the "Unified Command" concept. Passing of command to senior officials is recognized and the safety officer is identified.

During technical rescue responses, WFPS maintains available advanced life support services on scene for responders during actual and potential immediately dangerous to life and health (IDLH) atmospheres. These advanced life support personnel are not specifically trained in the medical aspects of technical rescue incidents or hazardous materials. However, the roles of the emergency medical support personnel are clearly defined. Medical treatment protocols for handling medical emergencies involving technical rescue incidents have been approved by the organization's Medical Director. Medical Treatment Protocols are a definite benefit to advanced life support personnel.

The Emergency Response Plan (ERP) used by WFPS addresses the required personal protective equipment to be employed along with emergency equipment. The plan identifies site security and control, as well as establishes the usage of a personal accountability system. The ERP is thorough and details the use of emergency evacuation procedures. Finally, the report also details the procedures for after action reports and critiques. This ERP does not provide for deployment of resources outside of the jurisdiction. In addition to the ERP, WFPS has specific SOGs and SOPs for each discipline that provide further direction for personnel.

The WFPS TRT does have a personal protective equipment plan or program. The plan satisfies the Manitoba Workplace Safety and Health Act Chapter W210 requirements for protective equipment and outlines policies describing a method to address hazard-based selection of protective ensembles, their use and limitations, work mission duration, maintenance and storage, decontamination and disposal, training and fitting, donning and doffing, and inspection procedures. All personnel are required to use a minimum of positive pressure, self-contained breathing apparatus until the atmosphere has been quantified.

WFPS's TRT has established policies and procedures that reference the usage of air monitors during the emergency response. Furthermore, they maintain documented maintenance procedures and calibration of their air monitors which are separate from the hazardous materials response team. WFPS's ERP requires the establishment of a site-specific safety plan.

Human Resources

Search and rescue resource typing for light technical rescue teams typically mandates that six Technical Rescue Technicians should be present for light technical rescue operations as an industry standard practice.[28] Manitoba Workplace Safety and Health Act Chapter W210, requires that employers ensure that firefighters establish teams when working and that a suitably equipped rescue team is readily available, when firefighters are required to engage in emergency responses that require specific and advanced training and specialized equipment. Listed specifically in the regulations are water rescue, confined space entry, high angle rescue, and incidents involving hazardous materials. WFPS staffs a variety of technicians based on the described sub-groups above in excess of the minimum six to eight. WFPS takes it one step further by allowing for specialization in each discipline by these established sub-groups. Cross training of these groups was discussed by team leaders as an ultimate goal. It should be noted that the only differences in the operations of WFPS's TRT versus other teams of comparable size is the lack of structural collapse capabilities.

WFPS has a written medical surveillance plan for personnel assigned to the technical rescue team. This policy does not require an opinion from a physician, nor does it provide for periodic examinations as determined by the physician. Because the WFPS TRT is expected to perform rescues in confined spaces, the medical surveillance plan does provide for a medical assessment after exposures above the occupational exposure limit. All employees receive proper fitting for respiratory protective equipment for use during confined space entry.

Training

The WFPS TRT does not certify that its members have achieved technician level training in accordance with International Fire Service Training Association (IFSTA) and NFPA 1006: *Standard for Technical Rescue Professional Qualifications.* This is done by Manitoba Emergency Services College (MESC). WFPS does keep records for documenting initial and refresher training. The organization requires the completion of a task book for all members and certifies all members who are required to use respiratory protection. All members have been trained to a minimum level of medical first responder. The WFPS TRT has a plan for annual refresher training or measurement of continued competency of all team members. Annual skill assessment sheets are completed for all team members and annual requirements for confined space entries are maintained.

It is noted that the TRT management has identified difficulty in obtaining initial and continued training for team members. New team members must attend a long and extensive training regimen that requires significant commitment from the department to cover. As with many TRTs, the amount and variety of skills required to be maintained amongst the various disciplines often make it difficult to cover all of them frequently enough. Adequate training props has also been identified as a significant challenge for training team members. Training is often hampered by the short summer season.

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[28] *Florida Search and Rescue Resource Typing* is one such standard practice for setting light technical rescue operations staffing levels.

WFPS has identified that there is a significant need for training in dealing with large type automotive incidents. Buses, semi-tractor trailers, trains, and aircrafts can pose unique hazards and complications for rescuers. These incidents require specific training to ensure rescuers are prepared. Training in large vehicle operations should be considered.

WFPS does not currently have training in structural collapse, nor are they fully prepared to deal with these types of incidents. Structural collapse incidents are often part of the normal operating mission of technical rescue teams. WFPS would benefit from providing training in these types of events to ensure rescuers are prepared to adequately and safely deal with these emergencies. WFPS should also strive to provide the basic equipment needed to deal with these types of emergencies.

Equipment

The disciplines involved with technical rescue require an extensive amount of necessary equipment to meet the demands of the incident. WFPS uses a well-structured mix of deployment methods to deliver the necessary resources to the scene. The ability to assemble the equipment and resources is further complicated by the expensive nature of this equipment. ESCI used an objective evaluation of the equipment WFPS has to mitigate these emergencies. One area of concern is the lack of a capital expenditure plan for addressing large ticket items. For example, the extrication equipment employed by WFPS is from the year 1999. The automotive industry has made significant breakthroughs in technology and materials that older extrication equipment with cutting forces of around 60,000 psi struggles to be effective on. Upgrading extrication equipment to handle the newer high strength structural steel with a required cutting strength of 300,000 psi will ensure that rescuers have the best chance of succeeding. Because this equipment is expensive and does wear out over time, a replacement schedule much like those used for apparatus should be developed as well as the funding mechanisms to support it.

WFPS does have a strong complement of technical rescue equipment. These current capabilities can be augmented with some increased training and a dedicated capital expenditure plan for replacement. Team leaders have identified several of these shortfalls and have already begun the process of addressing them.

Key Recommendations

- Provide training for medical personnel in technical rescue specific emergencies and injuries.
- Establish a method of ensuring team members have been certified to the technician level.
- Develop a program to address initial and continued training of new and current team members.
- Develop a training program that will adequately cover annual refresher training with a variety of training props and locations.
- Provide large vehicle machinery extrication training.
- Provide awareness and operations level training program for structural collapse rescue.
- Purchase basic structural collapse rescue equipment for light technical rescue operations with the goal of achieving technician level training in the future.

Training Program

Undoubtedly, a comprehensive training program is one of the most critical factors for helping to ensure the safe and effective provision of emergency services. This is especially true of integrated organizations such as the Winnipeg Fire Paramedic Service, which provides a broad range of services throughout the community. To ensure maximum effectiveness and safety in complex environments, firefighters, officers, and EMS providers must acquire and maintain sufficient initial training, ongoing training, and continuing medical education (CME). Failure to provide necessary training endangers firefighters, EMS providers, and citizens, and exposes the fire department to liability. In addition, a well-trained workforce substantially contributes to better emergency incident outcomes and community services.

Training programs must go beyond simply fulfilling mandatory hours. Emergency services training administrators and instructors must ensure that firefighters, EMS personnel, and officers are not only competent, but also self-confident in the variety of skills necessary to perform effectively in high-stress situations. To accomplish this, emergency services organizations must have access to qualified instructors and training resources—either within the organization, externally with regional partners, or both.

WFPS Fire & EMS Training

Training at WFPS is provided through two different branches. Fire suppression and other typical fire department training activities are delivered through the Fire Training Academy (FTA), while EMS training and CME is provided through the Paramedic Education & Training Academy (PET). The Deputy Chief of Professional Development oversees both training branches, each with a Director.

In this section of the report, ESCI evaluates the various components of training in each of these branches separately. Issues related to training staff levels are addressed in more detail in the *Staffing & Personnel* section of this report.

Fire Training Academy

In the following section, ESCI has reviewed the various training practices and resources of the Winnipeg Fire Paramedic Service, compares them to both Canadian and American standards and best practices, and makes recommendations where indicated.

FIRE TRAINING ADMINISTRATION

Newly hired firefighters must participate in a structured recruit training and testing process. The National Fire Protection Association—in its standard NFPA 1001 (Firefighter I and II)—identifies the minimum training requirements that can serve as the basis for entry-level firefighters.[29] The NFPA recommends other standards that address initial and ongoing training for firefighters and officers in a variety of specific topics.

[29] NFPA 1001: *Standard for Fire Fighter Professional Qualifications* (2013).

Following initial training, firefighters (i.e., all emergency services personnel) must actively participate in ongoing training that includes testing and ensuring practical skills and knowledge are maintained. In its *Fire & Emergency Service Self-Assessment Manual (9th edition)*, the Commission on Fire Accreditation International (CFAI) addresses "Training and Competency," and lists a number of performance indicators under the headings of training and education program requirements, performance, and resources.

The following figure lists some of the components of administration, along with the budget, of the Fire Training Academy.

Figure 68: Fire Training Academy Administration & Budget

Survey Component	Observations
Training goals & objectives identified?	Yes, annually
Certified instructors used?	Must have minimum of Instructor I; eventually Instructor II
Annual training report produced?	No
Annual training hours tracked?	Electronic tracking by officers and Training Officers
Priority by management toward training?	Yes
Budget allocated to training:	$1.5 million
Adequate office space, equipment, supplies?	Insufficient; more classroom & office space needed
Administrative staff assigned to training:	1 FTE; another FTE assigned to reception

FTA BUDGET

For 2017, the Fire Training Academy has been allocated a total budget of $1.5 million. This includes all personnel wages and benefits, and operational expenses. No reserve funds have been allotted for improvements or upgrades to the FTA. The FTA has two clerical support staff, one of whom is assigned to the front-office reception area.

FTA INSTRUCTORS & INSTRUCTOR REQUIREMENTS

The FTA currently employs a Director and Academy Training Officers (ATO) at 6.5 FTEs. The minimum requirement to be an ATO is NFPA Instructor Level I, but at some point, must acquire NFPA Instructor II certification.

The current wage structure for ATOs creates disincentives for employees remaining more than three years at the Fire Training Academy (see *Staffing & Personnel, Fire Training Academy* section for an explanation). This has contributed to some extent a "revolving door" of instructors. However, it was related to ESCI that the current ATOs have good experience, aptitude, intelligence, and a strong work ethic.

FTA TRAINING RECORDS & RECORDKEEPING

The FTA is responsible for maintaining individual firefighter training records in both a paper and electronic format. Company and daily training records are maintained.

FTA TRAINING PROCEDURES & MANUALS

The FTA maintains a variety of training procedures and manuals in the WFPS Online Library, electronic versions on small computers, and other sources. All of the ATOs have access to the necessary manuals.

The FTA utilizes various accredited program lesson plans, as well as others such as the Loader Course, water rescue, technical rescue, EXO (personal escape system), and Firefighter I and II lesson plans published through *Jones & Bartlett*.

FIRE TRAINING OPERATIONS & PERFORMANCE

The FTA is ISO accredited in safety procedures, and all employees must attend the two-day ISO safety awareness course.

Training Methodologies

The following figure lists the basic training methodologies utilized by the WFPS Fire Training Academy.

Figure 69: Training Methodologies Utilized by the Fire Training Academy

Survey Component	Observations
Manipulative skills utilized	Yes
Task performances/frequency	Varies
Annual training hour requirements	Varies among the various programs
Night drills & frequency	Night drills are conducted occasionally at the company level
Multi-agency drills	Multi-agency drills conducted with a number of agencies
Inter-station drills	In-station, 6 days/week, 4 shifts per platoon
Disaster drills conducted	4–6 per year at the Winnipeg Airport Authority, Haz-Mat, Office of the Fire Commissioner, Winnipeg Police Service
Pre-fire planning included in training	No; *Fire Plan Pro* software and pre-inspections used in Ops
Post-incident analysis conducted	Conducted by the Platoon Chiefs in Fire Operations

FTA TRAINING PROGRAM PLANNING

Working with the FTA staff, the Academy Director develops an annual training plan with goals and objectives for the following year. This is accomplished through discussions with officers and staff from Fire Operations and other branches to identify training needs for current staff, along with the number of new firefighter recruits that will be required. Once these have been determined, additional training topics and sessions are added if adequate resources remain.

FIRE TRAINING COMPETENCIES

During 2016, the Training Division delivered a combined total of 98,821 training hours to 1,212 personnel. This included both fire and EMS education. The following figure lists the general training competencies adopted and utilized by the FTA.

Figure 70: WFPS General Fire Training Competencies

Survey Component	Observations
Recruit academy	About 3–4 classes annually (16–32 recruits); MESC for some courses
Incident Command System (ICS)	ICS 100–400; fireground tactics & strategies
Special rescue training	Rope, water, trench, confined space, vehicle, & tower rescue
Hazardous materials training	Awareness; operations; & Technician levels 1–3
Wildland firefighting	Includes both theory and hands-on training
Emergency vehicle operations (driving)	New recruits attend driving course; some have Manitoba Class 3 license with air-brake qualification
Vehicle extrication	Vehicle Rescue Technician course
Use, safety, and care of small tools?	Conducted in recruit academy; daily checks
Use, safety, and care of power tools?	Conducted in recruit academy; daily checks
Radio communications & dispatch	Hands-on training; WFPS Online; handout material
EMS skills/protocols (see “EMS Training”)	WFPS Online

Paramedic Education & Training Academy

This section addresses areas specific to EMS training and continuing medical education, which are provided primarily to the paramedics (PCPs and ACPs) assigned to the EMS Operations Division.

PET ADMINISTRATION

The Paramedic Education & Training Academy, also known as the “EMS Training Branch,” is overseen by the Director, who reports directly to the Deputy Chief of Professional Development. The Director is responsible for supervising the EMS Training Officers and faculty. One employee is assigned to provide administrative staff support. The Academy does not publish a formal annual report on the previous year’s EMS training and CME activities.

Figure 71: Training Administration & Budget

Survey Component	Observations
Training goals & objectives identified?	Informal; no long-term plan
Certified instructors used?	ACP-qualified and experienced; some have post-secondary education in a related field
Annual training report produced?	No formal report completed annually
Priority by management toward training?	Viewed as important and an asset; direction given ad hoc and with long-term vision or planning
Annual EMS training budget	$1,400,000
EMS training administration facilities	Facility not designed for education; fails to meet needs
Office space, equipment, supplies	Substantially inadequate; equipment & supplies adequate
Administrative staff assigned to training	One staff person

PET TRAINING PROGRAM PLANNING

Annual planning and the development of EMS training and CME goals and objectives are done informally, with minimal long-term planning.

PET INSTRUCTORS & INSTRUCTOR REQUIREMENTS

All instructors are ACP certified and qualified to conduct EMS-related training and continuing medical education. Several of the EMS instructors have post-secondary education in a related field.

PET TRAINING RECORDS & CLINICAL SKILLS DOCUMENTATION

EMS training and continuing medical education sessions are recorded electronically and maintained by the Academy faculty and administrative support staff.

Figure 72: EMS Recordkeeping & Clinical Skills Documentation

Survey Component	Observations
Individual EMS training files maintained?	Yes
Personnel training/CME records maintained?	Hard copies; some electronic for licensure
Clinical skills field performance documented?	Yes
Documentation method	Documented in ePCRs in EMS Operations
ALS clinical skills success rates documented?	Intubation and vascular access
Other clinical skills success rates measured?	Measurement rarely performed
EMS license renewal dates tracked internally?	Yes
Annual training hour requirements	Yes
Annual training hours tracked?	Yes
Responsibility for training records?	PET faculty & administrative support staff
Training equipment inventoried?	Inventoried annually

Individual records are kept on "hard copies," while CME records are kept electronically for the purpose of EMS licensure. The Academy tracks the license renewal dates for each of the EMS providers.

Clinical skills field performance is documented in the department's electronic patient-care reports but involves endotracheal intubation and vascular-access success rates only. Success rates of other basic and advanced skills are rarely measured.

EMS TRAINING COMPETENCIES

The following figure describes the general EMS training competencies utilized by the Paramedic Education & Training Academy. The Academy Director and staff are well-versed in the training needs and mandatory requirements of its EMS personnel.

Figure 73: General EMS Training Competencies

Survey Component	Observations
Policy & procedures in place?	Educational programs have student handbooks
Safety procedures in place?	Safe work procedures; safety policies for post-exposure and incident reporting
EMS recruit academy?	Multiple PCP classes per year
Special rescue & EMS training?	TEMS Program, Community Paramedic Program
Vehicle extrication?	Provision of concept familiarization for external party contract
Defensive driving?	EMS recruits, external party contract, & as required internally
Communications/dispatch protocols?	In process of improvement
EMS skills & protocols?	Conducted by EMS Training staff & Medical Supervisors

The Academy conducts several PCP classes annually for both EMS Operations Division and Fire Operations staff. In 2015, Advanced Care Paramedic training was modified from a two-year to a three-year program, resulting in a 33 percent increase in student volume. This has impacted the Academy by an increase in administrative functions; reporting; program oversight; and program coordinator support.

EMS TRAINING METHODOLOGIES & OPERATIONS

The following figure lists the various training methodologies applied by the Academy.

Figure 74: EMS Training Methodologies

Survey Component	Observations
Manipulative skills	Done in educational programs; limited in ongoing training
Task performances	Not for QI; done multiple times in educational programs
Use of lesson plans	Yes
Produced in-house or commercially?	In-house primarily; & Canadian Heart & Stroke materials
Night drills	Required four times annually
Multi-agency drills	Occasionally with Health Authority, airport, and police
Inter-station drills	Not done
Disaster drills conducted	Rarely
Safety incorporated in training	During recruit training & during educational programs
Post-incident analysis conducted	Training scenario debriefings conducted regularly
Training procedures manual?	Yes; required for accreditation

As seen in the preceding figure, the Paramedic Education Training Academy utilizes appropriate and effective training methodologies.

EMS INITIAL TRAINING & CME

The following figure lists the types of initial EMS training and CME delivered by the Academy in 2016.

Figure 75: EMS Initial Training & Continuing Medical Education

Survey Component	Observations
Total personnel provided with initial EMR training	None
Total provided with initial PCP training	None currently; inadequate space (16 in 2014)
Total provided with ACP training	14 graduates in 2016 (3-year program)
Other EMS-related training hours	*Documentation not provided*
Other non-EMS training hours	*Documentation not provided*
Continuing Medical Education	
Personnel provided with CME	750 (2016)
Total CME hours delivered	Approximately 14 hours
CME provided by	PET; delivered by Medical Supervisors
CME requirements met regularly?	Provincial licensing requirements met annually
Monitored for compliance?	Yes
Program & instructors regularly monitored & evaluated?	PET faculty, yes; Medical Supervisors, not monitored
EMS Field Training & Evaluation Program	Limited due to inadequate tools
Designated Field Training Officers (FTOs)	Four FTOs; not permanent positions
Other CME methods?	None supported by WFPS; financial assistance offered for those requesting attendance at other CME opportunities

No initial PCP training courses were provided by the Academy in 2015 or 2016, as it is a prerequisite. In 2016, there were 14 ACP graduates from the three-year program. The Academy attempts to provide an EMS Field Training & Evaluation (FTEP) program, but resources are limited. There are four Field Training Officers (FTOs), but they are not permanent positions.

OTHER EMS TRAINING ISSUES

The Academy has contractual relationships with other external educational institutions to provide preceptorships for EMS students. Other institutions have expressed interest in preceptor contracts with WFPS. These contracts produce revenue, but the Academy has been unable to further develop existing contracts or new contracts because of the lack of adequate staff to manage these.

The WFPS paramedic program is currently accredited by the Canadian Medical Association (CMA). The CMA will discontinue as the accrediting organization in 2018. While a new accrediting organization has yet to be determined, WFPS will need to decide its intent to renew its accreditation by 2019. This will require substantial staff time in order to accomplish renewal.

WFPS Training Facilities & Resources

Both the FTA and PET are housed within the same facility. The building previously contained the City's Public Works Department and was not originally designed for fire and EMS training. WFPS rents the building from the Winnipeg Planning Property and Development Department (PP&D). Although the facility is a large building, it is shared with the Emergency Mechanical Services Branch, stores, SCBA maintenance, and reserve apparatus storage. In this section, ESCI has reviewed the training facilities and resources for the FTA and PET.

Figure 76: Reception Area & Staff Offices

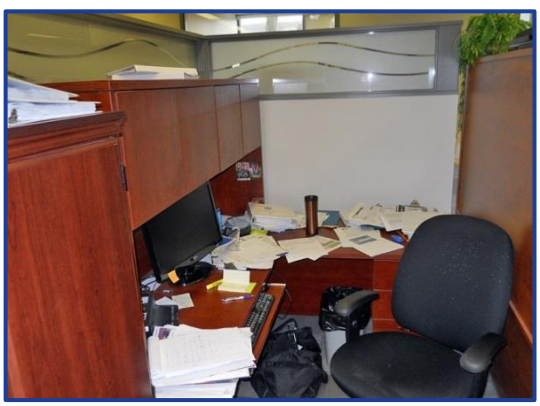
GENERAL FACILITIES OVERVIEW

The following describes various elements of the Training Centre. Since the facility is shared by FTA and PET, the various issues and problems apply to both branches. Specifics to each branch are described later in more detail.

OFFICE SPACE

The reception area of the Training Centre has limited space for students and visitors to wait until training and other activities begin. The main room that opens from the reception area is also used for staff office space using partitions.

Figure 77: Staff Member's Office Cubicle



Several staff cubicles are located in this area. Because of the configuration of these workspaces, there is no ability to have privacy, confidential discussions, or phone conversations.

CLASSROOMS

The quality and capacity of classrooms vary throughout the Training Centre. Several classrooms are configured adequately and are sufficient for small groups of 25–30 people. Other classrooms are grossly inadequate, lacking sufficient capacity and educational support equipment for providing effective education.

The Training Centre is housed in a very large building, with classrooms scattered throughout the facility. Fire and EMS classes are often conducted simultaneously. With such a large facility, students and instructors must walk considerable distances between offices and classrooms. The composition of the facility adds further inefficiencies and challenges in managing training sessions. A mobile classroom is located outside the main building, which does not have running water. A second one was installed in 2017.

OTHER FACILITY ACCOMMODATIONS

The building houses a single student lunchroom with a maximum capacity of 24, and no staff lunchroom. The lunchroom is also utilized as a classroom on occasion when the other classrooms are in use. This prevents other students and faculty from utilizing the lunch room for meals and breaks.

The following photos are two examples of relatively adequate classrooms with space and equipment for smaller groups. While the classroom shown on the left is functional, the large windows allow bright sunlight in, despite the use of the shades. This is distracting and makes it difficult for both students and instructors to utilize multimedia presentations.

Figure 78: Examples of Small-Group Classrooms

Other classrooms and/or "breakout" rooms are grossly inadequate for presenting didactic materials and/or conducting clinical or other practical skills. The photo shown below on the left represents a small breakout/classroom. In some cases, the tables and seating in the Training Centre kitchen are used as a classroom (see photo on the right, Figure 79).

Figure 79: Examples of Other Classroom Facilities

As mentioned previously, classrooms are scattered across a very large building shared with several other WFPS branches. In an effort to expand their classroom facilities, WFPS has added portable classrooms outside the main facility. An additional portable was added in 2017.

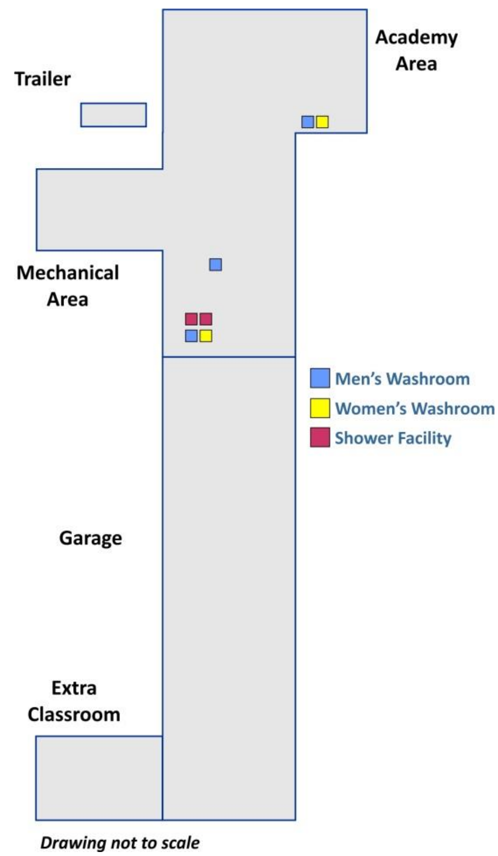
TRAINING CENTRE WASHROOM & SHOWER FACILITIES

The academy area of the facility has a women's washroom with three toilets, while the men's room contains two urinals and two toilets. The mechanical area is near the centre of the building and includes a single women's toilet and one shower. This area includes four men's toilets and four urinals, along with two showers.

The figure on the right is a simple drawing (not to scale) showing the locations of the washroom and shower facilities in the building.

The building houses 45 full-time staff, along with hosting 20–80 students daily—all of whom must share the washroom and shower facilities. In addition to the employees, during breaks in training sessions, students must walk a considerable distance to use the washroom facilities. Often, students must wait in line, and 15-minute classroom breaks typically extend into 30 minutes or more.

Figure 80: Washroom & Shower Facilities



During recruit training and outside drills, having only two showers for men and a single shower for women further contributes to the difficulties in providing both fire and EMS training at the Training Centre.

FIRE TRAINING FACILITIES & RESOURCES

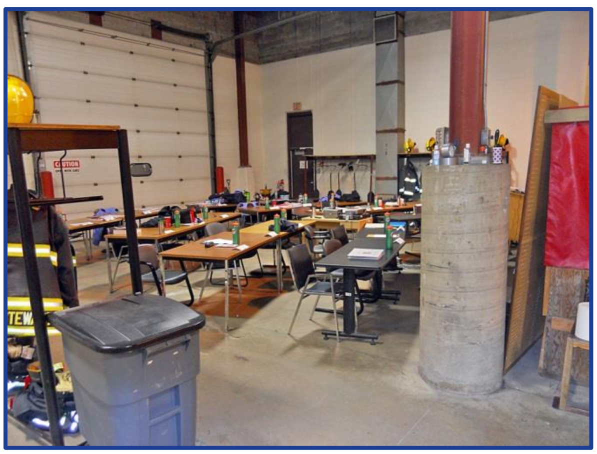
FTA maintains a training tower of modern design, which was originally designed to use natural gas to simulate heat and flame, as an alternative to burning Class A fuels. Due to safety concerns, the system was discontinued. It is a well-designed, four-story facility that enables a variety of other fireground skills practice and simulations.

Figure 81: WFPS Fire Training Tower

City ordinances prevent WFPS from utilizing donated structures for live fire training for new recruits or current firefighters. As a result, the FTA has no means to conduct and practice live fire training.

New firefighter recruits are provided with didactic training sessions in a garage facility, as there is no access to a permanent classroom large enough to accommodate them.

Figure 82: Classroom for Firefighter Recruits



Some of the props for firefighter training are also located within this garage space.

The harsh winter conditions in Winnipeg make it difficult, and potentially dangerous, to conduct outside training and drills similar to those conditions found during actual incidents.

The drill grounds are limited in size, and present various challenges. The garage bays used to house reserve apparatus and the Emergency Mechanical Services Branch (EMSB) open out to the drill grounds. With apparatus and vehicles being moved in and out of the garage bays, traffic around the drill grounds presents challenges to outside training and driving sessions. The following figure lists elements of the Training Centre facility and training equipment and resources.

Figure 83: Fire Training Facilities & Resources

Survey Component	Observations
Adequate training ground space/equipment	No, need more space for training, more props
Describe training facilities (tower, props, pits)	Classrooms, tower & building, training grounds, pit, live burn container, confined space prop
Live fire props	Flashover and observation cube
Drill & driving grounds	Yes, but minimal space for driving
Maintenance of training facilities adequate	Ongoing upgrades; overcrowding creates sanitary concerns
Classroom facilities adequate	Inadequate
Video, computer simulations available	Yes
Instructional materials available	Yes

Fire Training Equipment Inventory

The FTA maintains a paper-based inventory of training equipment. Currently, there are no plans to convert these records to an electronic format.

Figure 84: Fire Training Prop

EMS TRAINING FACILITIES & RESOURCES

The Paramedic Education & Training branch shares the same limited and inadequate facilities as the Fire Training Academy. The following figure describes a few of the elements related to EMS training facilities and resources.

Figure 85: EMS Training Facilities & Resources

Survey Component	Observations
Describe training facilities & adequacy	Substantially inadequate
Classroom facilities adequate?	Too small for larger class sizes; inadequate classrooms
Video, computer simulations	No computer lab; no EMS high-fidelity simulation lab space; smart whiteboards available, but not set up properly
Instructional materials adequate?	Yes
Training manikins & other simulators	Available, but cannot be utilized as intended

EMS Training Equipment & Inventory

Due to limited storage space, some of the EMS training equipment and supplies are stored in the "computer room" that houses communications equipment and the network computer server.

Figure 86: EMS Training Equipment Storage

The Paramedic Education & Training Academy conducts an inventory of its EMS training equipment and supplies annually.

The Academy maintains a somewhat functional "simulation lab" that includes manikins equipped with features that enable practicing a variety of ALS skills. It is not a true high-fidelity EMS simulation lab with a separate control room that would typically include cameras, microphones, and computer-controlled, interactive, wireless, and portable manikins.

Figure 87: Simulation Lab

When properly equipped, an EMS simulation lab enables instructors to present more realistic scenarios, as well as "changing the patients" presentation based on the student's interventions.

There is no computer lab at the PET Academy. Electronic whiteboards are located in some of the classrooms, but none have been set-up properly, and are used as simple dry erase boards.

Training Discussion

ESCI found that the Directors of both the FTA and PET are dedicated to providing quality education; intimately knowledgeable of the type of training and continuing education required for their respective internal customers; and attempting to fulfill the needs of the organization with limited facilities, resources, and staff. Each is aware of not only the mandatory requirements for firefighters and paramedics, but also the myriad additional educational needs of the organization.

The problems do not lie with the management and staff of the FTA and PET, but with insufficient staffing, lack of funding, and a substantially inadequate training facility.

The training facility represents the weakest part of the two branches. The building and drill grounds are inadequate to meet the continuing and growing demands of both fire and EMS. It is beyond the scope of this report to recommend, in detail, what would be required of a state-of-the-art fire and EMS training centre. However, it was evident to ESCI that WFPS needs to begin to address the recommendations identified in this report.

The importance of fire, EMS, and other emergency services training and continuing education cannot be overemphasized. To be most effective, educators must have adequate resources and the ability to provide education in an environment conducive to learning. The substantial insufficiencies within both training branches potentially jeopardize the safety of firefighters and EMS personnel; reduces the quality of service provided; negatively impacts the ability to mitigate emergency incidents; and ultimately exposes the City and WFPS to liability.

Key Recommendations

- WFPS should immediately begin seeking sufficient funding to develop and design a training centre sufficient to meet the needs of fire and EMS training.
- When considering designs, WFPS should refer to NFPA 1402: *Guide to Building Fire Service Training Centers*.
- A new training centre should include facilities and resources sufficient to provide live fire training; multiple classrooms (with moveable wall systems to enable multiple classroom configurations) and other facilities; space for apparatus driver training; sufficient washrooms and showers (both genders); and enough indoor space to allow for “outdoor” drills but sheltered from inclement weather.
- The Training Centre should have permanently assigned fire apparatus and an ambulance utilized solely for training (these apparatuses could be deployed for major incidents).
- Both training branches should annually publish reports on their previous year’s activities and training programs delivered (if sufficient administrative staff is added).
- EMS clinical skills practice and training should be based on the results of EMS quality improvement results and measures of skills success rates.

Fire Prevention, Public Education, and Fire Investigation

Overview

Community Risk Reduction is defined as "a process to identify and prioritize local risks, followed by the integrated and strategic investment of resources (emergency response and prevention) to reduce their occurrence and impact."[30] An aggressive risk management program, through active fire prevention, public education, and fire investigation, is a fire department's best opportunity to minimize the losses and human trauma associated with fires and other community risks.

> *The National Fire Protection Association recommends a multifaceted, coordinated risk reduction process at the community level to address local risks. This requires engaging all segments of the community, identifying the highest priority risks, and then developing and implementing strategies designed to mitigate the risks.*[31]

This section provides information about fire prevention, public education, and fire investigation programs as determined from information provided by Winnipeg Fire Paramedic Services (WFPS) and others. The intent of this assessment is to assist the City of Winnipeg in its long-range planning for Winnipeg Fire Paramedic Services (WFPS). This assessment relies on the use of both quantitative and qualitative data to describe the fire prevention needs of the community. As such, it is intended to provide insight into *what* needs exist, *where* those needs exist, and *how* those needs are expected to change in the future. The information is consistent with the guidelines found in:

- The Community Risk Assessment: Standards of Cover Manual, 6th Edition;[32]
- The Fire and Emergency Service Self-Assessment Manual, 9th Edition;[33] and
- NFPA 1730: *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations*, 2016 Edition.[34]

It should be understood that it is impossible to include, or predict, all aspects and indicators of hazards and risk. There are simply too many variables of weather, human behaviour, and systems malfunction. ESCI recommends that WFPS routinely and consistently review and update the fire prevention program. In this way, WFPS can ensure this document contains the most accurate and up-to-date information available about community hazards, risks, and needs.

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[30] Community Risk Assessment: A Guide for Conducting a Community Risk Assessment, Version 1.5; by John A. Stouffer, et.al; Vision 20/20, Warrenton, VA; 2015. Retrieved from http://strategicfire.org/wp-content/uploads/2016/04/Community-Risk-Assessment-Guide-v1.5.pdf

[31] Kirtley, Edward, *Fire Protection Handbook*, 20th Edition, 2008, NFPA, Quincy, MA.

[32] Center for Public Safety Excellence, Inc; Chantilly, VA; 2016.

[33] *Ibid*, 2015.

[34] National Fire Protection Association; Quincy, MA; 2017.

Note: The reporting structure of WFPS Fire Prevention, Public Education, and Fire Investigation differs from that of many other fire departments. Rather than combine all of these into a single organization, the WFPS organizational model includes Fire Investigations in the Operations Division and places the fire prevention and public education services under the Support Services Division. For the purposes of this report, these three functions are grouped together for the sake of discussion.

PROGRAM ASSESSMENT METHODOLOGY

ESCI used four primary tools to assess WFPS fire prevention, education, and investigation programs: the community risk assessment, historic fire loss information, Municipal Benchmarking Canada reports, and SWOT analysis of those programs. The key findings were then compared to the recommendations described in NFPA 1730 to develop conclusions and recommendations for the department.

Community Risk Assessment

Simply stated, risk is the potential or likelihood of an emergency to occur. Thus, risk may be quantified as the combination of the **probability** (or likelihood) of an event, and its **consequence** (or impact) as shown in Figure 88. Most often, as described in detail in the *Community Risk Assessment* section of this report, risk is most often categorized in the form of a risk rating matrix that allows differentiation beyond a single numerical value.[35]

Figure 88: Calculation of Risk

Risk = Probability x Consequence, or:

$$R = P_h \times C_h$$

Historic Fire Loss

Statistical information about historic fire loss provides valuable insight into where fires have occurred in the past and provide clues about the origin and cause of those fires. ESCI reviewed data provided by WFPS and other sources to identify common elements in those fires such as occupancy type and fire cause, to provide benchmarks as compared to other jurisdictions, and to gain understanding about the prioritization of public education and fire prevention efforts.

SWOT Analysis

SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats. A SWOT analysis is used to provide Information about what WFPS does well and should sustain in the future; areas of potential improvement; opportunities to enhance or provide value-added services; and activities external to the WFPS that may pose a strategic threat to sustaining WFPS operations.

[35] Risk rating matrices are usually two-axis models that use the traditional measures of probability and consequence; however, some risk planning models add additional variables such as current response capabilities, state of emergency planning, or impact on a specific service provider. The higher the number of variables, the more complex the analysis and interpretation becomes.

Comparison to NFPA 1730

NFPA 1730: *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations* is a new NFPA publication. This document establishes minimum standards for the organization and deployment of a fire prevention organization, or FPO, that includes code enforcement, plans examination, investigation, and public education. It also establishes inspection frequencies for different occupancy types based on risk.

KEY FINDINGS

- Given community needs and the recommendations of NFPA 1730, WFPS risk reduction efforts—fire prevention, public education, and fire investigation—are effective, on-target, and well managed, but understaffed.
- When compared to other Canadian cities of similar population:
  - The socio-economic demographics are different: Winnipeg has a higher rate of urban poverty and significant number of vulnerable, at-risk populations.
  - The needs of citizens in Winnipeg differ: Many require higher amounts of service and higher levels of staffing to provide those additional services.
  - The number of fires is higher, and the consequence or impact is greater.
- The reality of limited funding is a major constraint to staff expansion for fire prevention, public education, and fire investigation.
- There are opportunities to improve results by integrating the fire investigation function into the fire prevention branch.

Response Overview

- As discussed elsewhere in this report, WFPS manages a significant emergency service demand. When compared to other MBNC 2015 cities of similar size, Winnipeg has a significantly higher incidence rate of medical calls, fires, explosions, and alarms per 1,000 population.[36]

Figure 89: WFPS Responses by Type, 2016

Call Type	Observations	Percent
Fires	1,496	1.3%
Rupture or explosion	3	0.0%
EMS/Rescue	90,779	81.2%
Hazardous condition	865	0.8%
Service call	5,798	5.2%
Good intent call	1,298	1.2%
False call	7,742	6.9%
Severe weather	0	0.0%
Other	3,827	3.4%
Total	**112,053**	**100%**

[36] *Service Delivery & Performance* section.

At-Risk Populations

A recent study found that segments of the population are at a higher risk of injury or death due to fire.[37]

- **Older adults:** Adults ages 65 or older had a greater relative risk of dying in fires than the general population; 1.9 times higher for those age 65–74, and 4.6 times higher for those over 84 years.
- **Young children aged 5 and under:** Children under the age of 5 years account for the highest number of fire-related deaths and injuries when compared with older children (ages 5 to 14).
- **Gender**: Males were 1.3 times more likely to die in fires than females.
- **Indigenous populations:** Indigenous populations are at a greater relative risk of dying in a fire than the general population. In British Columbia, the fire-related fatality rate of First Nation's people is 9.4 times higher than that of the general population.
- **Risk by income level:** The danger of death or injury is closely tied to household income, and children and the elderly in the poorest homes are exposed to the greater risk.

Although not included in the study, when a language other than English is spoken in the home, it can increase difficulty in communication not only during an emergency, but also during fire prevention and public education efforts. ESCI has determined that a significant percentage of the population of the City of Winnipeg falls into one or more of these categories as shown in the following figure.[38]

Figure 90: At-Risk Populations, 2016

Description	Population	Percent
Total population	**705,244**	**100%**
Older adults over 65 years	110,335	15.6%
Young children under 5 years	39,205	5.6%
Gender, males	344,400	48.8%
Indigenous populations	84,305	12.0%
Persons at risk by income level (LICO-AT)	91,945	13.0%
Language other than English spoken at home	100,080	22.6%

CRITICAL ISSUES

WFPS faces a complex array of critical issues and emerging challenges given the context of the needs of the community/at-risk populations and limited funding. ESCI found that the critical issues facing the fire prevention services group were appropriately aligned with the perspectives of both elected officials and the Fire Paramedic Chief; thus, there is a higher likelihood that these issues should be included in the future direction of the department. Each of these is discussed in greater detail in the following sections.

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[37] *Fire and at-risk populations in Canada: Analysis of the Canadian National Fire Information Database*, Dr. Joe Clare and Ms. Hannah Kelly, Murdoch University and University of the Frasier Valley, December 2017.

[38] Census Profile, 2016 Census; Statistics Canada. Retrieved from: http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Geo2=PR&Code2=01&Data=Count&SearchType=Begins&SearchPR=01&TABID=1&B1=All&Code1=4611040&SearchText=winnipeg

Figure 91: Critical Issues

Perspective	Issues	Link
1. Staffing	1. Well-below NFPA 1730 recommendations 2. Cost of associated support services	Cost of service delivery Strategic Plan
2. Cost of service delivery	3. Limited available funding 4. Service levels needed for at-risk populations	Cost of service delivery
3. Organization	5. Loss of Arson Task Force	Strategic Plan

Fire Prevention Programs

CODES AND STANDARDS

The most effective way to combat fires is to prevent them from occurring in the first place. A strong fire prevention program, based on locally identified risk and relevant codes and ordinances, reduces loss of property, life, and the personal and community-wide disruption that accompanies a catastrophic fire.

The City of Winnipeg has established and adopted fire prevention and building codes. Sprinklers systems are installed as required by the Manitoba Building Code. They are maintained per the provisions of the Manitoba Fire Code and the referenced documents. The City of Winnipeg does not have a municipal sprinkler ordinance. The Manitoba Fire Code is the adopted version of the 2010 National Fire Code of Canada and was last updated in 2011, with added provincial amendments registered in 2015 (residential care facilities) and 2016 (hospitals and personal care homes).

CODE COMPLIANCE

The WFPS Fire Prevention Branch is the authority having jurisdiction (AHJ) for fire prevention and inspection within the City of Winnipeg. This authority is granted under the provincial Fires Prevention and Emergency Response Act, the City of Winnipeg Charter, and City by-laws and ordinances. As such, the WFPS Fire Prevention Branch is empowered to enforce (1) the Manitoba Fire Code and all documents, standards, and codes referenced within it; (2) the City of Winnipeg Fire Prevention By-Law 35/2017 and all documents, standards, and codes referenced within it; and (3) The City of Winnipeg Residential Buildings Fire Safety By-Law 4304/86.

In Manitoba, it is the property owner that is ultimately responsible for compliance with the Fire Code and associated legislation. Enforcement initiatives are implemented as required and may involve the required correction of deficiencies noted during the inspection of a specific occupancy or the correction of deficiencies identified for an entire category of occupancy.

Fire Inspectors attempt to gain compliance though education and buy-in on the part of the property owner. If that and the service charges associated with re-inspection fail to gain compliance, then enforcement will result. After consultation with their respective Senior Inspectors, Fire Inspectors will resort to enforcement action as a last resort when all other means of obtaining compliance have been exhausted, or the property owner has a history that clearly indicates failure to comply with regulations.

Based on the information provided, the WFPS code enforcement program appears to meet applicable mandates for inspection and code compliance. Legislatively-mandated fire inspections comprise the bulk of the inspections conducted by the Fire Prevention Branch. The process of mandating a fire inspection is one of evaluating and assessing community risk. For example, properties have been mandated for regular fire inspections based upon the risk associated with the activity within the property, vulnerability of the occupants, or a combination of both. Follow-up enforcement is conducted where necessary. There is no specific link to adopted enforcement objectives that are based on a well-defined community risk reduction program. This is a goal of the prevention branch; however, there are no resources available to implement such a program. Fire Prevention is working at capacity, with little operational flexibility for enforcement initiatives unless resources are shifted from one activity to another.

Key Recommendations

- Establish a formal Community Risk Reduction Program that includes specific enforcement objectives.
- Provide the resources necessary to implement such a program, beginning with one employee.

PLAN REVIEW PROCESS

The WFPS Fire Prevention Branch provides limited plan review services for new development or construction, improvements, and specific events such as large tents on behalf of the City's Planning, Property, and Development Department to ensure that Building Code requirements are met for water supply, firefighting access to buildings, and other fire protection systems. The number of plan examinations is dependent on the volume of permits obtained, and permit fees vary by project. The plans review process also includes a review of any required Fire Safety Plan. The Manitoba Fire Code describes buildings required to have a Fire Safety Plan as well as the content of the plan. The Plans Reviewer examines only those fire safety plans that are required at the time of permit application. The remainder are reviewed by Fire Inspectors when they request a copy at the time of inspection.

INSPECTION PROCESS

Fire Prevention Officers have the authority to conduct inspections on all occupancies within the City of Winnipeg except for one- and two-family dwellings; the inspection of one- and two-family dwellings requires the owner's consent or a warrant to enter for the purposes of a fire inspection. Since 2007, the province has mandated inspections for various occupancies at scheduled intervals. The Fire Prevention By-law also requires various scheduled occupancy inspections and some scheduled inspections are resulting from City Council decisions and may not be included in the regulation. All other occupancies are inspected on a complaint basis or at the discretion of the Director of Fire Prevention.

For WFPS to meet the legal requirements of these regulations, the costs associated with providing this service will be recovered (on a cost recovery basis) by means of inspection fees charged to the business owner and/or facility. The inspection fee is based on actual inspection time, the Fire Inspector's report writing time, and travel time for all initial and follow-up inspections. It is beyond the scope of this report to provide a detailed analysis of the inspection fee schedule.

Key Recommendation

- Review fee schedules for fire inspections periodically to ensure full cost recovery, or actual percentage thereof.

INSPECTION FREQUENCY[39]

Provincially-Mandated Inspections

The first regulation setting provincially-mandated inspections was registered under Regulation M.R. 73/2007 in 2007. It sets out the provincially-mandated inspections and their frequency by occupancy. In 2014, the requirement to inspect high hazard occupancies every two years was registered under Regulation M.R. 208/2014 of the Fires Prevention and Emergency Response Act (FPERA). The frequency of provincially-mandated inspections is shown in the following figure.

Figure 92: Provincially-Mandated Inspections

Frequency	Occupancy
Annual	Elderly Person's Housing or Hostels Personal Care Homes Child Care Centres Residential Care Facilities Hospitals
Every Two Years Beginning July 1, 2017	High hazard occupancies
Every Three Years	Private & public schools including Universities & Colleges Recreation Centres including Arenas, Community Clubs, & Curling Rinks Hotels and motels Restaurants located in residential buildings

Council-Mandated Inspections

A City of Winnipeg Council Directive sets out mandated inspections and their frequency by occupancy. The frequency of council-mandated inspections is shown in the following figure.

39 Source: The City of Winnipeg; Inspection Explanatory Notes; 2017; retrieved from http://www.winnipeg.ca/fps/FirePrevention/Inspections/Inspection_Explanatory_Notes.stm

Figure 93: Council-Mandated Inspections

Frequency	Occupancy
Annual	Converted residential dwellings with shared facilities Food trucks/trailers, food carts, commissaries* F1 High hazard industrial occupancy
Every 30 Months	Converted residential dwellings
Every Three Years	F2 Medium hazard industrial occupancies
Every Five Years	F3 Low hazard industrial occupancies

*added as Council-approved amendment

OTHER INSPECTIONS

The WFPS conducts regular fire inspections of its own facilities every 24 months. All other inspections, including complaints inspections, are conducted as follows.

Post Fire Inspections: Post fire inspections are conducted as a result of fire occurring in a building. The inspection is conducted to ensure that fire protection and life safety equipment is functioning properly and/or that a building is safe for occupancy. These inspections are identified as a result of information received from Fire Investigations and identified fires responded to by WFPS. There are fees with post fire inspections which are often recoverable through insurance.

Complaint-Generated Inspections: These inspections are generated as a result of complaints received from the general public, various other agencies, and from firefighters. The Fire Prevention Branch cannot predict the number of complaints that will be received during the year. There is no fee for the initial complaint inspection; there is a re-inspection fee for repeat inspections for the same violation.

License Inspections: The Fire Prevention Branch is mandated to conduct inspections of Converted Residential Dwellings where the ownership has changed; these inspections are in accordance with the City of Winnipeg licensing requirements regulated by the Doing Business in Winnipeg By-law 91/2008.

Occupancy Inspections: These are inspections conducted as a result of permit and plan reviews for new building construction, additions, and occupancy changes in existing buildings. The inspection fee is included in the permit fee.

Fireworks, Pyrotechnics, and Flame Effects: A permit is required for all fireworks, pyrotechnic displays, and flame effects, and for consumer fireworks displays on property citizens do not own (must include a permission letter from the property owner).

Open-Air Burning Permits: The number of burn permits issued varies from year to year. Since 2005, residential backyard burning in fire pits no longer require a permit while all other types of burning require a permit and a permit fee.

Property File Search: At the request of a lawyer on behalf of a client, a property file search is conducted by the City to determine if there are any outstanding violations and/or Orders from Health, Planning, Property and Development, or Fire Prevention Branch for a property. A property file search does not generate an inspection; it is merely a search of existing records. Property file searches are coordinated through Planning, Property, and Development and there is an associated fee.

Other Requested Inspections: These inspections are typically conducted at the request of lawyers or mortgage companies on behalf of their clients, when a property transaction takes place. However, any property owner can request an inspection. There is an hourly fee charged for this service.

LOSS REDUCTION BENCHMARKS[40]

The Winnipeg Trends and Performance Report identifies several performance metrics for the performance of fire prevention and injury and fire investigations within the City of Winnipeg as shown in the following figures. In contrast to comparator cities,[41] Winnipeg:

- Has a lower injury rate in residential fires with working smoke alarms;
- Highest rate of fatalities in residential fires;
- Substantially higher rate of residential fires;
- Substantially higher rate of commercial and industrial fires;
- Lowest number of fire prevention staff per capita; and
- Higher than average number of fire education staff per capita.[42]

[40] City of Winnipeg, 2018 Community Trends and Performance Report, Volume 1; The City of Winnipeg; 2017, (pages 132-135). Retrieved from http://www.winnipeg.ca/cao/pdfs/CommunityTrendsandPerformanceReportVolume1_2018.pdf

[41] Calgary, Hamilton, Ottawa, and Toronto.

[42] Given the individual workload, fire education staff levels are low in all major Canadian cities. Thus, a per capita comparison is misleading when taken out of context. Even though WFPS may appear to be better off than comparator cities, WFPS actually needs additional fire education resources to meet expectations and community needs, especially when the needs of at risk populations (young children, older adults, and indigenous populations) are considered.

Figure 94: Key Goals

Description	Key Goals
To reduce the incidence of illness, injury, death, and property loss due to fire, accident, or personal health by educating citizens regarding fire and life safety, and through the enforcement of the Manitoba Fire Code and the Fire Prevention By-law.	1. Provide fire and life safety educational programming to citizens of all ages to help prevent emergencies and reduce injury, death, and property loss. 2. Identify the need for, develop new educational programming, and deliver that programming to identified groups within our community. 3. Promote and participate in public safety initiatives with partner agencies. 4. Enforce structural fire and life safety standards through the provision of plan examination, building fire inspection services, and enforcement. 5. Ensure the required maintenance of fire and life safety systems is conducted by qualified individuals through the ongoing licensing of service persons. 6. Regulate potentially hazardous activities to ensure they are conducted in an approved and safe manner through permit processes.

Figure 95: Citizen Satisfaction with Fire and Injury Prevention Education

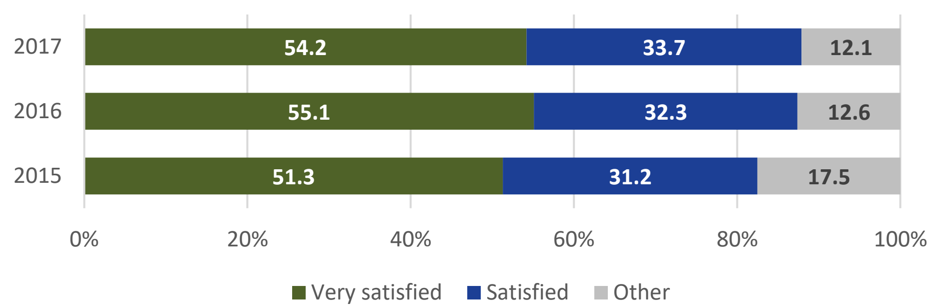


Figure 96: Citizen Satisfaction with Safety of Existing Buildings through Fire Inspections

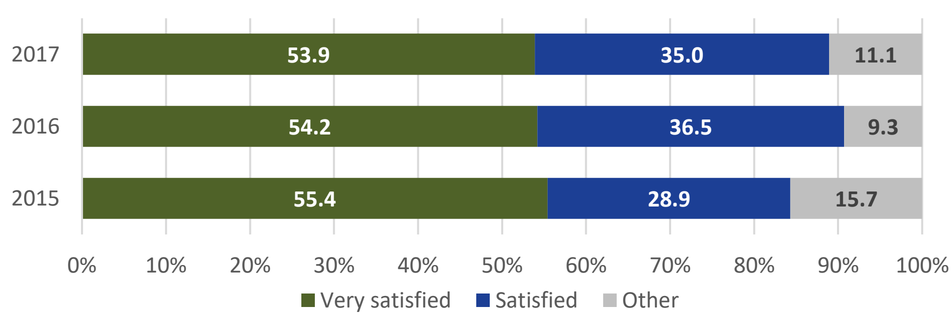


Figure 97: Service Statistics

Description	2014	2015	2016
Fire Prevention By-Law/Building Code Inspections [A]	7,719	9,692	10,901
Operations Inspections [B]	2,861	2,526	2,157
Permits Issued	286	279	269
Property File Searches/Plans Examined	927	957	959
Fire Safety House	190	211	205
Other Community Events	101	118	207
Fire Safety Lectures/Presentations	323	235	289
Medical/Injury Prevention Lectures/Presentations [C]	38	50	100
Youth Fire Stop	40	53	46
Career Symposiums	5	2	13
Car Seat Inspections [D]	210	91	247
Evacuation Fire Drills	144	117	119
Fire/Paramedic Station Tours	320	313	351
Public Service Announcements (Media)	24	22	20
Community Fire Prevention Partnership [E]	93	182	958
Arson Prevention in Schools [F]	53	51	79
Total Fire Inspections	**10,580**	**12,218**	**13,058**
Total Permits and Plans Examined	**1,213**	**1,236**	**1,228**
Total Fire Education Activities	**1,541**	**1,445**	**2,634**
Total Fire Prevention and Education activities	**13,334**	**14,899**	**16,920**

[A] Stable levels of Fire Prevention staffing resulted in more resources to respond to complaints and conduct additional inspections at industrial occupancies and rooming houses.
[B] 2015 restated to correct reporting error.
[C] The significant increase is due to the dedicated staffing levels in networking and promoting EMS programming.
[D] In 2016, there was increased diligence in activity reporting.
[E] In 2016, a new tracking process was developed and implemented.
[F] Arson Prevention in schools began in 2014 as a joint venture with Winnipeg Police Service.

CONTINUING EDUCATION

The Office of the Fire Commissioner requires anyone doing fire inspections to have at least Level I Fire Inspector before they will be designated to do fire inspections in the Province of Manitoba. All WFPS personnel assigned as Fire Prevention Officers are certified, at a minimum, to the Inspector Level II in accordance with NFPA 1031. Fire Prevention Officers receive continuing education in the form of training seminars incorporated into the monthly branch meetings. These seminars can last between one and two hours, depending on the topic. There are also additional training opportunities available in the form of seminars, conferences, and on-line classes.

Key Recommendations

- Provide opportunities for Fire Prevention Officers to enhance certification through Inspector III levels in accordance with NFPA 1031.
- Encourage advanced level CE and third-party certification and credentialing through NFPA, ICC, NICET, and others.

PROGRAM APPRAISAL

WFPS conducts a formal and documented appraisal, at least annually, to determine the impacts of the community risk reduction program and its efforts in risk reduction based on the Community Risk Assessment: Standards of Cover, and measures performance against adopted loss reduction goals. The formal appraisal is part of the City's ongoing and comprehensive efforts to benchmark performance and is documented in the annual City of Winnipeg's *Community Trends and Performance Report*.

Key Recommendation

- Sustain the formal appraisal process and include the information in the annual Community Trends and Performance Report.

Fire Education Programs

WFPS has a robust public education program that is consistent with the agency's mission, community risk assessment, and standards of cover. The public education program has specific and measurable, output-based performance goals (number and type of activities). However, there is no operational flexibility—any additional activity must take time away from another. Staff levels appear to be too low given individual workloads and expectations.

TARGET RISKS AND BEHAVIORS, INCLUDING HIGH-RISK AUDIENCES

The WFPS has established public educational and interventional programs that target specific risks, behaviours, and audiences identified through agency documentation of incidents and demographics. In-place programs have identified large loss potential or high-risk audiences, such as low socio-economic status, age, cultural, and/or ethnic differences where appropriate.

WFPS partners with other organizations to encourage public education programs to mitigate fires and other emergencies. The agency documents program results, tracks public education contacts, and plots incident type/frequency in education concentration areas.

YOUTH FIRE-SETTING INTERVENTION

WFPS has an established youth firesetter intervention program. The number of referrals from the judicial system—about 50 each year—seems somewhat low based on the number of fires—about 1,500 each year; however, given that juveniles are referred to the program mostly through the courts rather than through contact with fire officers, this is not unexpected. Also, given the rules surrounding juvenile offense records, there is no documentation of recidivism provided to WFPS.

Key Recommendations

- Sustain existing public education programs, especially those that target at-risk populations.
- Investigate the possibility of fire officers referring youths involved in fire setting, intentional or accidental, directly to the program without prior court intervention adjudication.
- Establish performance metrics that measure **outcomes**; *e.g.,* changes in behaviour or amount of fire loss, in addition to current measures of **output**; *e.g.,* number of activities.

Figure 98: Examples of Fire Education Activities[43]

[43] United Fire Fighters of Winnipeg, Local 867; Fire Prevention Week 2017, retrieved from http://uffw.ca/news.

Fire Investigation Programs

STATUTORY AUTHORITY

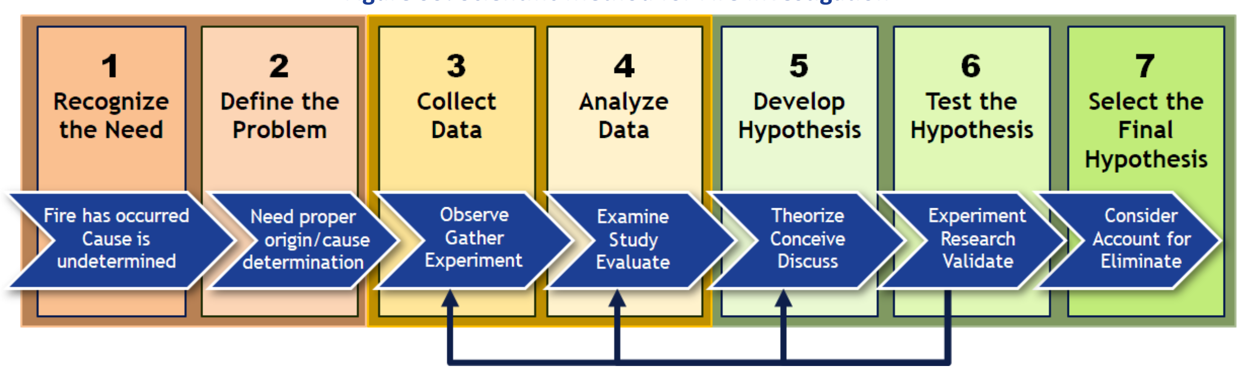
The WFPS is the local authority responsible to investigate the cause, origin, and circumstances of fires within the city limits and report the findings to the Manitoba Fire Commissioner.[44] The Fire Investigations branch resides within the Operations Division. Fires that are determined to be incendiary are developed jointly by the WFPS Fire Investigation unit and the Winnipeg Police Service (WPS) Major Crimes Unit. WFPS Fire Investigators work closely with the WFPS Fire Prevention Division and WPS Major Crimes Unit. As needed, WFPS Fire Investigators may request assistance from the Office of the Manitoba Fire Commissioner when investigating a fire.

SCIENTIFIC METHOD

All WFPS personnel assigned as Fire Investigators are certified Fire Investigators in accordance with NFPA 1033 and the principles of NFPA 921. Fire Investigators receive continuing education in the form of individual meetings with the Investigations Coordinator, plus also additional training opportunities available in the form of seminars, conferences, and on-line classes.

The science of fire investigation, credentialing of Fire Investigators, and operational protocols has been the subject of extensive investigation and review, most notably by the Innocence Project,[45] the Texas Forensic Sciences Commission,[46] and local fire marshal offices.[47] An adequate fire determination process for origin and cause should use consistent practices that include a systematic approach to investigation. The approach recommended and described in NFPA 921: *Guide for Fire and Explosion Investigations* is based on the Scientific Method, a seven-step process as shown in the following figure.

Figure 99: Scientific Method for Fire Investigation



44 Manitoba Fires Prevention and Emergency Response Act, C.C.S.M. c. F80.
45 https://www.innocenceproject.org/?s=arson&post_years=all
46 Report of the Texas Forensic Science Commission, Willingham/Willis Investigation, April 2011.
47 Arson Professional Standards: Final Report; prepared by the Harris County Fire Marshal’s Office, January 2016.

It is the intent of NFPA 921 to guide fire investigative activities and core competencies and ensure the use of forensic methods that are valid and reliable—fully researched, science-based, and academically sound—to determine the origin, cause, and responsibility for fires, explosions, over pressure accidents, and other incendiary or related events. WFPS Fire Investigators use this methodology, along with applicable local, provincial, and national protocols, to ensure consistent and thorough investigation and determination of the origin and cause for all fires and explosions.

AGREEMENTS AND PROCEDURES

Fire investigations are closely coordinated between WFPS operations personnel, Fire Investigators, and the WPS Major Crimes unit. There is one on-duty Fire Investigator assigned to each platoon, or shift. This working arrangement has created close working relationships between operations and investigation. Written safety procedures are in place and commonly practiced.

From the information provided, ESCI determined that WFPS fire operations officers investigate routine fires where the origin and cause are readily apparent as shown in the following figure. Fire Investigators are called to respond to, and investigate, any large-loss fire, fires with injuries or deaths (civilian or fire service), and any other fire where the cause cannot be readily determined by the commanding fire officer. Current practice automatically adds a Fire Investigator to any working fire that requires a second alarm response. The Fire Investigation Coordinator provides oversight, report approval, and consistency of all fire investigations. This practice is to be commended—it provides faster response and the opportunity for more conclusive witness interviews and observation of fire behaviour.

Figure 100: Fire Investigation Statistics

Description	2014	2015	2016
Total Fire Responses	1,596	1,535	1,496
Fire Investigations	285	344	330

It is not unusual for a single Fire Investigator to work a fire scene; however, that should not suggest the Investigator is working alone. Operations personnel and WPS Major Crimes officers work side-by-side, each with defined roles and responsibilities. This informal practice was first introduced as a cost-saving measure to replace a formal Arson Task Force comprised of WFPS Fire Investigators, Investigators, and Detectives assigned to the WPS Arson Unit, and Fire Investigators from the Manitoba Fire Commissioner's Office. This concept is relatively new and it is too early to draw conclusive findings; however, WFPS fire investigation personnel have expressed concerns that this change is a "step back" from a fire investigation viewpoint—the Major Crimes Unit is responsible for investigating a wide range of criminal offences, including arson, so there may be competing priorities that limit law enforcement resources available that are well-trained in fire investigations.

Likewise, there are operational factors yet to be determined. As these are resolved, there will be a need for review and update of existing written agreements and standard operating procedures regarding the investigation of fires. Such agreements are strongly recommended to ensure thorough, consistent, and appropriate scene processing and preservation, evidence collection and storage, reports and supporting documentation, and information sharing. Likewise, WFPS should review current effectiveness and efficiency measures in support of fire cause determination activities.

Further, there appears to be a significant discrepancy in how arson is reported, as shown in the following figure. This could be due to (1) fires investigated by the WPS Major Crimes Unit but not reported to, or investigated by, WFPS Fire Investigators; (2) incorrect dispatch coding of initial WPS response in support of WFPS fire responses; or (3) other reason. A detailed review of fire investigation and documentation protocols is beyond the scope of this report; however, additional study is warranted as part of the strategic planning process to reconciliate this discrepancy.

Figure 101: Arson Investigation Statistics

Description	2014	2015	2016
Number of Arson fires, as reported by WFPS	not reported	273	307
Number of Arson fires, as reported by WPS[48]	211	387	512

Finally, there is no Canadian national standard for reporting fire statistics; however, a 2012 research study concluded that creation of a National Fire Information Database (NFID) in Canada, similar to the National Fire Incident Reporting System (NFIRS) used in the United States, was feasible with the support of a broad base of partner stakeholders.[49] The initial research project is complete and is now the subject of sustainment discussions. Although a detailed discussion about NFID is beyond the scope of this report, ESCI encourages the City of Winnipeg to continue to support and provide information for NFID.[50]

PROGRAM APPRAISAL

WFPS conducts a formal and documented appraisal, at least annually, to determine the impacts of the community risk reduction program and measures performance against adopted loss reduction goals. The formal appraisal is part of the City's ongoing and comprehensive efforts to benchmark performance and is documented in the annual Community Trends and Performance Report. However, the formal appraisal process includes limited activity measures (number of fire investigations and number of arson fires).

[48] Winnipeg Police Service Annual Report(s) 2015 and 2016.

[49] Report on the Feasibility of a Canadian Fire Information Database, by P. Maxim, DI Plecas, and L. Garis; University of the Fraser Valley, School of Criminology & Criminal Justice, Centre for Public Safety & Criminal Justice Research, 2013.

[50] For more information about the Canadian National Fire Information Database, refer to http://nfidcanada.ca/

Key Recommendations

- Review current practices to develop and/or update policies and procedures for the thorough and systematic investigation of all fires and explosions by a WFPS Fire Investigator.
- Establish fire investigation performance measures and include the information in the annual *Community Trends and Performance Report*.
- Continue to monitor the current joint fire investigation program and consider the addition of another Fire Investigator to each shift, contingent upon available funding

Other Observations

It is important to review these statistics in the context of community characteristics and at-risk populations.

MBNCanada—2015 Performance Measurement Report
ESCI reviewed the information provided in the 2016 MBNCanada report, the last year for which data was available. Key observations from that report were:[51]

- **Residential fire-related injuries per 100,000 population** were slightly higher than the 10-city average, but have decreased 30 percent since 2014;
- **Residential fire-related fatalities per 100,000 population** were more than two times the 10-city average, but increased significantly in 2015; and
- **Residential Structural Fires with Losses per 1,000 Households** was 33 percent higher than the 10-city average but decrease 14 percent since 2015.

2018 Winnipeg Community Trends and Performance Report
ESCI reviewed the information provided in the 2018 Community Trends and Performance Report; 2017 was the last year for which data was available.[52] Key observations were:

- The City of Winnipeg has a significantly higher level of fire related losses than most comparator cities; *except* the number of injuries in residences with working smoke alarms is significantly lower;
- Most other metrics are **output** related (meaning number of activities or occurrences) rather than **outcome** related (meaning changes in behaviour and readiness);
- There is evidence to reflect fire inspections and plans examinations are increasing;
- There is evidence to reflect public education activities have fluctuated in several areas over the past few years;
- The overall level of satisfaction with fire and injury prevention has increased slightly since 2014, and is somewhat higher (88%) than the overall satisfaction for all City services (83%); and
- The overall level of satisfaction with safety of existing buildings has increased since 2014 and is somewhat higher (89%) than the overall satisfaction for all City services (83%).

You can't improve what you don't measure.

Municipal Benchmarking Network Canada—MBNCanada—is a partnership that allows Canadian municipalities to identify and collect consistent and comparable data on their service areas, report the findings annually, and analyze those results to see how they measure up.

The Fire Service Community

The goal of Fire Services is to protect the life and property of citizens and businesses from fire and other hazards. There are three primary fire safety activities included in the results:

- Public education and fire prevention
- Fire safety standards and enforcement
- Emergency response

—MBNCanada

[51] 2016 MBNCanada Performance Measurement Report, Municipal Benchmarking Network Canada; November 2017. Retrieved from http://mbncanada.ca/app/uploads/2017/11/MBNCanada_2016_Performance_Measurement_Report.pdf; page 63–68.

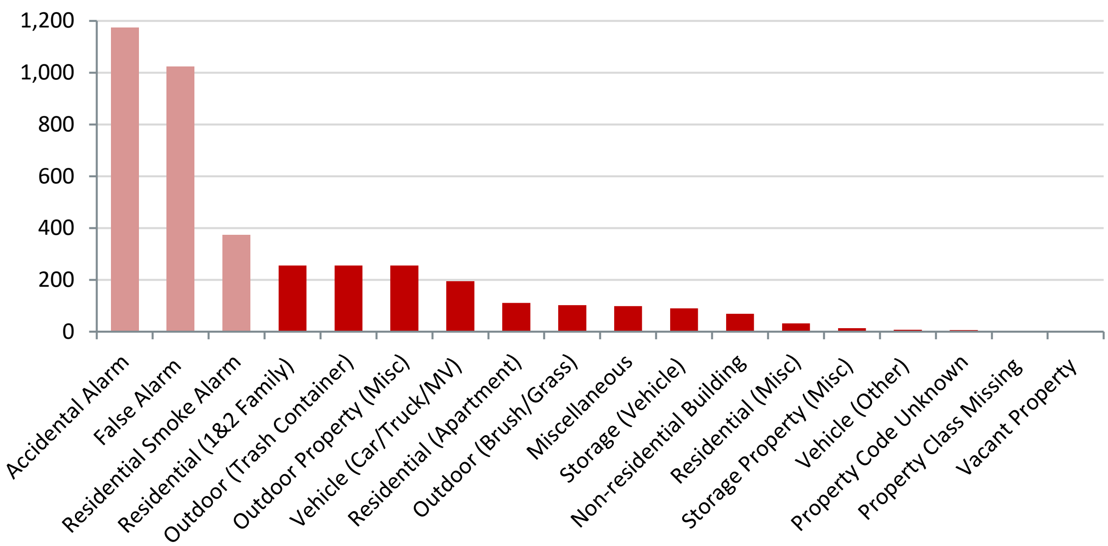
[52] 2018 Community Trends and Performance Report, Volume 1; The City of Winnipeg, 2017. Retrieved from http://www.winnipeg.ca/cao/pdfs/CommunityTrendsandPerformanceReportVolume1_2018.pdf; page 129–135.

WFPS Fire Incident Summary Report

ESCI reviewed the information provided in the 2016 WFPS Fire Incident Summary Report, the last year for which data was available.[53] Key observations from that report were:

- Most fires occurred in one-and-two family residential structures, outdoor trash containers, and other outdoor properties;
- There were more residential smoke alarm calls than residential fires; and
- There were almost twice as many accidental and false alarm calls (2,572) as there were actual fires (1,486).

Figure 102: Fire Incident Summary, 2016



These observations suggest there are several opportunities for community risk reduction as part of ongoing fire prevention activities. The data should be analyzed further to determine if there is a higher call incidence involving any at-risk populations—the elderly, young children, lower income families, or families with language barriers. Inclusion of fire data from earlier years may help focus short-term activities. As examples, WFPS could consider:

- Implementing a fire alarm education program to reduce false alarm calls by 15 percent before January 1, 2020.
- Implement a residential fire safety program to reduce fires in one- and two-family dwellings by 10 percent before January 1, 2020.[54]

Key Recommendation

- Use existing fire response data to develop and prioritize risk-based fire prevention programs.

[53] WFPS YTD Fire Alarms for 2016, City of Winnipeg, 2017.

[54] Discussions with WFPS fire officials suggest there is a growing trend for fires in vacant or poorly maintained structures, especially garages, in lower income neighborhoods possibly as a result of gang-related or drug-related activity. Another is the use of an intentional fire to cover the evidence of another crime.

Fire Risk Indices

One challenging aspect of fire inspection and code enforcement is how to deal with existing buildings that are being repurposed for a different intended use, remodeled, renovated, or enlarged. This is especially true for historic, heritage structures that pre-date modern codes. Current policy is to handle these buildings as "pre-existing, non-conforming," and develop some form of equivalent protection measures to compensate for possible fire safety deficiencies. This approach requires the Authority Having Jurisdiction (AHJ) to make case-by-case decisions and can be both daunting and confusing if there is no consistency to the decision-making process. Fortunately, there are two alternatives already in place and in common use.

This first is the concept of performance-based design. In this use, a design professional provides to the AHJ alternative suggestions for fire protection features that meet the intent of the code. The AHJ may require additional information, such as engineering studies or empirical data to support the proposal. Preparation of performance-based alternatives may be time-consuming and/or costly, so their use may be limited to complex, one-off projects. However, support information may be readily available or simple to produce, so this approach also works well with smaller, simpler projects. The key to successful, defendable implementation is thorough research and documentation.

The second is the use of adopted amendments to the Code in the form of published guidelines. The Manitoba Codes have guidelines, and point scores in the form of indices, that provide the needed assistance in most cases for repurpose, remodel, renovation, or enlargement of residential and office buildings in Winnipeg. [55] These are:

- Part 1. Contains general requirements related to the application of the guidelines;
- Part 2. Applies to most residential buildings (Group C major occupancy), except for some heritage buildings;
- Part 3. Applies to most office buildings (Group D major occupancy), except for some heritage buildings;
- Part 4. Applies to Group C occupancies in heritage buildings in the Exchange District; and
- Part 5. Applies to Group D occupancy in heritage buildings in the Exchange District.

[55] The Fire Risk Indices for the Application to the Rehabilitation and Re-Use of Existing Buildings in Manitoba for Residential and Business and Personal Services Occupancies; Prepared by Ken Richardson Fire Technologies Inc., for the City of Winnipeg; amended May 2017.

A detailed explanation of allowed fire indices is beyond the scope of this report but should be considered as part of the planning process for plans review and inspections. As mentioned earlier in this section, most of this responsibility will fall to the Building Department plans review process; WFPS plans review efforts are limited in scope to water supply, firefighting access to buildings, and other fire protection systems. This is not uncommon; in fact, it is the norm across most jurisdictions. The intent of this discussion is to encourage a strong, ongoing working relationship between WFPS fire prevention services and PP&D to identify "best practices" opportunities within the organizational structure of Winnipeg.

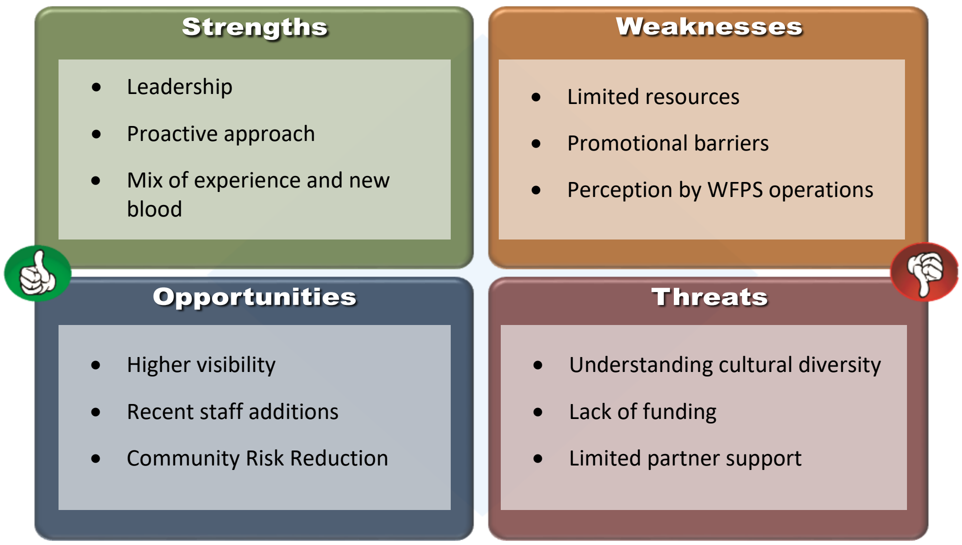
Key Recommendation

- Provide opportunities for WFPS fire prevention services to build relationships with PP&D in order to develop information-sharing and operational intelligence, especially when reviewing performance-based alternatives in the repurpose, remodel, renovation, or enlargement of residential and office buildings.

SWOT Analysis

ESCI conducted a SWOT Analysis—Strengths, Weaknesses, Opportunities, and Threats—of selected WFPS staff members for further consideration, analysis, and use as a planning tool and starting point for team discussions. Summary results of comments from member responses have been consolidated in a traditional SWOT matrix, with details to follow.[56] It must be noted that the responses are from WFPS members and have not been edited by ESCI; therefore, there may be need for additional discussion if the meaning behind the comment is not clear.

Figure 103: Summary SWOT Matrix



STRENGTHS (INTERNAL)

- Growing awareness within the City of Winnipeg planning and development areas for close communication and coordination with WFPS regarding urban growth and renewal, and related community risk.
- The current WFPS leadership is working hard to ensure an integrated and holistic approach for fire prevention and education efforts.
- All WFPS leaders of fire prevention, public education (fire and paramedic), and fire investigations branches demonstrate a strong passion for continuous improvement.

[56] For those readers not familiar with a SWOT analysis, the four factors are:
Strengths are those things the organization and its members do well. When aligned with customer expectations, strengths, an organization's strengths identify its capability of meeting or exceeding customer needs and expectations.
Weaknesses, or lack of performance, are also an important to identify and understand. To move forward, an organization must honestly and candidly identify the issues that have created barriers to success. Weaknesses are areas that need improvement; those issues and concerns that may slow or inhibit progress.
Opportunities are conditions in the external environment that are not under the organization's control; they are external, attractive factors that represent reasons or conditions favorable to future success.
Threats, like opportunities, are conditions in the external environment not under an organization's direct control. Threats are external, negative factors that represent reasons or conditions favorable to future lack of success.

- Building Fire Plan assessment and development is active; however, it lacks the ability to incorporate optimal education and training (e.g., Fire Warden) based on current resources.
- Paramedic public education is highly independent from other WFPS public education—a strength and a weakness. There is a progressive move on the paramedic public education end to seek outcomes data to support program activities and budgets.
- There are efforts to have proactive training and on-going education within fire investigations. Effective fire-cause determination has directly reflected in fire prevention and public education programs; e.g., Arson Task Force (now disbanded as part of cost-savings measures).
- There is an excellent working relationship between WFPS investigations, police, and Justice Manitoba.
- The WFPS is looking at new enterprise level integration platforms or systems including municipal data, fire reporting, risk analysis, and geospatial analysis tools and information.
- Public Education and Fire Prevention Branches are staffed by personnel that have significant operational field experience.
- Fire Public Education and Fire Prevention is a high priority for the current WFPS administration.
- Fire Prevention has a strong group of experienced Fire Inspectors at its core that are anticipated to remain within the branch in the long run.
- Fire Prevention Branch has a very strong Director of Fire Prevention.
- Operations provides in-service, checklist-based inspections, not to be confused with mandated inspections. Compliance issues are referred to the Fire Prevention Unit.
- Fire Prevention implements regulatory and policy changes well.
- Fire service is a budget priority for City Council despite austerity measures.
- EMS Public Education is staffed by a very motivated individual that is targeting programming to identified need rather than trying to spread programming too thin. Current member expected to remain in this position for the foreseeable future.
- New faces in Fire Prevention, Public Education, and Fire Investigation. Strongly-motivated and hard-working staff, just needs experience and ownership of the new positions.

WEAKNESSES (INTERNAL)

- History of separating fire prevention, fire-related public education activities, and fire investigation. These activities collaborate and work in tandem but are structurally separate.
- The current separation of fire investigations from fire inspections does not support optimal information management and analysis, and limits opportunities for staffing interaction and follow-ups.
- Specialized equipment and personal protection for fire investigations should be maintained and updated.
- Record keeping of all investigation and inspection files should be digitized for security, access, and continuity purposes.

- Challenges with recruitment and related training for fire investigations. Related challenges with seat availability from Provincial courses through OFC.
- General lack of succession planning within and between fire inspections and investigations.
- Mandated inspections take up the majority of resource time and necessary fiscal austerity measures do not allow the resources for a more robust and comprehensive approach.
- Resourcing for some public education has relied on informal assignments of staff on light duty or other.
- Generally low levels of administrative and support positions for public education activities including fielding calls and managing logistics.
- There is a need for clear and concise messages within the WFPS leadership to ensure Prevention and Education’s aspects for fire and paramedic needs and risks are a top priority. This emphasis needs to equitably reflect fire and paramedic needs and workloads.
- Generally, some enhancements to information management across all program areas is needed.
- There are challenges with some fire prevention and public education activities based on labour relations positions. This should be resolved through proactive labour management strategies.
- Lack of community needs and risk assessments.
- Public Education materials available in the stations are dated.
- Lack of budget allocation to fire safety trailers.
- Fire Public Education is reactive to demand rather than targeting priorities selected based upon empirical data.
- Contractual obligation to offer positions to the senior qualified applicant limits ability to select the best applicants for jobs.
- Fire Prevention is working at capacity. The high number of legally (provincially legislated or municipal by-law) mandated fire inspections and complaints leaves little room for discretionary enforcement efforts.
- Public Education—Small staff working at capacity means there is a limited capacity to respond to newly identified needs without sacrificing existing programming.
- Attitude of the UFFW (Fire Fighters Union) is very focused on the needs of operations. They have to date been tepid in their support for Prevention and Public Education if it impacts Fire Operations. They have the attitude that Fire Operations is being asked to do too much. Firefighter participation in Public Education and Fire Prevention programming is always met with resistance and portrayed as a threat to operational capacity. This contributes to a poor attitude among many firefighters when performing this sort of work.
- Lack of ongoing WFPS presence on social media limits capacity to respond to trending issues in a timely manner; limits capacity to respond to issues on a forum that reaches a very significant segment of the population and is a lost opportunity to deliver messaging to the public.

- Turnover in Fire and Injury Prevention (has been more stable in recent years due to leadership; however, the CA dictates a penalty to seniority in operations if staff stay beyond 3 years).
- Seniority based promotion system for UFFW creates challenges in selecting qualified candidates.
- Under staffed—require more Public Education officers needed to deliver programming to reach target groups consistently.

OPPORTUNITIES (EXTERNAL)

- Enhancing and nurturing partnerships between WFPS and other public-sector jurisdictions for coordinated and collaborative fire prevention and public education initiatives.
- There have been strong community efforts for some initiatives (e.g., arson prevention and falls prevention); however, those programs may not be sustainable based on current partnerships and resourcing demands.
- There is a need and opportunity for a stronger presence of WFPS leadership within the community for both fire and paramedic public education.
- Fire Public Education is currently going through a complete change in personnel due to retirements and transfers. This will bring openness to new ideas and new approaches to the branch.
- As a result of recent fires, the public profile of the Fire Prevention Branch has increased. This has also been accompanied by an increased commitment to the issue by City Council and greater public awareness.
- Chief Lane places a high priority on Prevention and Public Education. He sees the prevention of fire and injury as the most efficient and progressive way to deliver service. Previous administrations have lacked a vision for these branches of the service. Yes, they acknowledged their importance but did not follow through with making them a priority.
- Expectation that Standards of Coverage study will bolster argument to dedicate more resources to Prevention and Public Education. This presents an opportunity to shift fire investigation resources from Operations to Prevention.[57]
- The Manitoba Office of the Fire Commissioner (OFC) is more open to WFPS input on issues and is actively seeking out our opinions on matters more than in the past. This is allowing the WFPS greater input into Provincial OFC policy.
- New Fire Public Education staff (expected that entire staff will have turned over by summer).

[57] This needs to be considered carefully. The current platoon assignment of Fire Investigators has created a strong and successful team approach that may prove more effective in short term. This should be considered in light of potential long-term gains in cross-trained prevention/investigation officers, especially given the economic environment and expectation of fiscal austerity measures.

THREATS (EXTERNAL)

- Cultural and demographic factors contribute to fire-related attitudes, occurrences, and issues specific to the City of Winnipeg.
- The changing demographics and growth patterns within the City of Winnipeg need to be understood and used to inform City and WFPS practices for planning and development, and related consequences for fire prevention and public education.
- Need for greater integration of efforts between WFPS and other City departments for fire and paramedic public education.
- Need for greater community/business alliances to create a more proactive atmosphere for Prevention and Public Education initiatives.
- Challenges with availability for fire investigations support from the Provincial OFC.
- Climate of constant budget constraint makes expanding branches and programs difficult to achieve.

Key Recommendation

- Include a discussion about SWOT findings in the planning process.

Staffing

As mentioned earlier in this report, the most valuable WFPS asset is the personnel it employs to perform the myriad and complex activities necessary to function adequately. A high-level of attention must be paid to managing human resources in a manner that achieves maximum productivity, while ensuring employee job satisfaction. A critical element of this is to ensure consistent management practices along with fair and equitable treatment; a safe working environment; opportunities for input; and recognition of individual commitment to the organization. These features tend to contribute to employee job satisfaction.

While a formal workload analysis is outside the scope of this review, it appears the WFPS Fire Inspection Program does not have sufficient staff to meet established inspection goals and objectives for workload and service requirements. However, there are preliminary plans to expand the program budget and related support roles. As shown in the following figure, there are 28 WFPS personnel and supervisors, assigned to fire prevention activities—fire inspection, code compliance, public education, and fire investigation. Except for Fire Investigations, all assigned personnel report through the Assistant Chief, Prevention and Education. Fire Investigators report through the Assistant Chief, Fire Operations.

Figure 104: Fire Prevention Personnel

Position Title	No. of Positions
Assistant Chief, Prevention & Education	1
Fire Prevention Director	1
Fire Prevention Officers, Inspection & Code Enforcement	18
Plan Reviewer	1
Public Education Officers, Fire	3
Public Education Coordinator, EMS	1
Fire Investigation Coordinator*	1
Fire Investigation Officers, Investigation*	4

**Report to the Assistant Chief, Operations*

FIRE PREVENTION

Currently, there are 18 Fire Prevention Officers and one Plans Reviewer assigned to Fire Prevention. This includes two newly-hired Fire Inspectors.

Based on identified community risks, it does not appear that WFPS fire prevention programs have sufficient staff with the specific expertise to meet agency goals for the number of inspections and other community risk reduction program goals and objectives. From a recent study, one Inspector (Fire Prevention Officer) is recommended for every 550 inspections conducted annually.[58]

At current workloads, this suggests an additional six Fire Prevention Officers (24 total) are required to meet recommended caseloads. Based on availability of funding and given an annual increase of 6 percent in inspections, WFPS should plan to add eight additional Fire Prevention Officers over the next five years, for a total of 32 Fire Prevention Officers by 2022. This is shown in the next two figures.

Figure 105: Fire Prevention Officer Requirements, 2017

Description	2016 Inspections	Personnel Available	Actual Workload	Recommended Workload	Personnel Required
Fire Inspection Workload	13,058	16	816	550	24

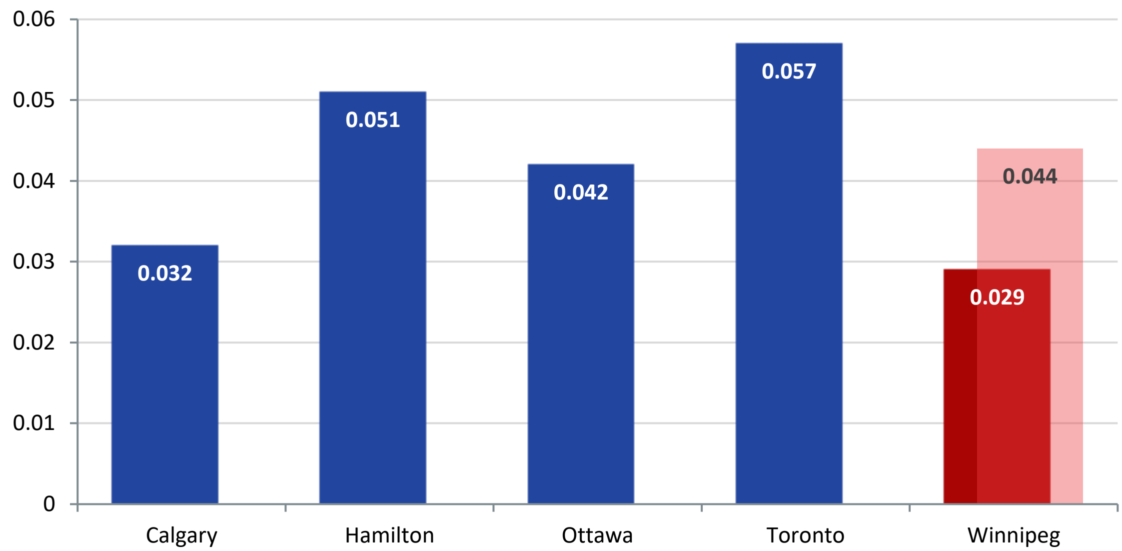
Figure 106: Fire Prevention Officer Requirements, 2018–2022

Description	Annual Growth	2018	2019	2020	2021	2022
Fire Inspections	6%	13,800	14,700	15,500	16,400	17,500
Fire Prevention Officers	6%	25	27	28	30	32

[58] *Fire Prevention Caseload and Resource Requirements*, prepared by M. Montgomery and K. Kistner for the Harris County (TX) Fire Marshal's Office, 2016.

This also correlates with the comparative data from the 2018 Winnipeg Community Trends and Performance Report as shown in the following figure. Hamilton and Ottawa—which have populations closest to Winnipeg—devote substantially more staff to fire prevention. While part of this discrepancy is due to inclusion of Fire Investigators in Fire Prevention staffing, WFPS is well below the median results of the aggregate of all 11 departments.

Figure 107: Fire Prevention Officers per 1,000 Population, 2015



Adding personnel for a total of 32 Fire Prevention Officers by 2022 would place the number of Fire Prevention Officers on par with comparator cities as shown above (light red bar). This number does not include Fire Investigators. On its surface, this number may appear to be shockingly high and unattainable given the current economic climate. However, the number recommended is conservative when compared to recommendations for ISO PPC—sufficient number of inspectors to conduct annual inspections of all commercial buildings; and is more in line with NFPA 1730—annual inspection of all high-risk structures, inspection once every two years for moderate risk structures, and once every three years for low risk structures. That said, it may not be feasible or realistic to reach this number by 2022, and a more measured approach over a longer period of time may need to be written into the Strategic Plan.

Key Recommendation

- Reach a total of 32 Fire Prevention Officers by 2022, based on availability of funding.

From the same study, one Plan Reviewer is recommended for every 420 plans reviewed annually.[59] At current workloads, this suggests an additional two plans reviewers (for a total of three) are required to meet recommended caseloads. Based on availability of funding and given an annual increase of one percent (1%) in plans reviewed, WFPS should add two plans reviewers (for a total of three) over the next five years. This is shown in the next two figures.

Figure 108: Plans Reviewer Requirements, 2017

Description	2016 Inspections	Personnel Available	Actual Workload	Recommended Workload	Personnel Required
Permits and Plans Workload	1,228	1	1,213	420	3

Figure 109: Plans Reviewer Requirements, 2018–2022

Description	Annual Growth	2018	2019	2020	2021	2022
Permits and Plans Reviewed	1%	1,240	1,250	1,265	1,280	1,300
Plans Reviewers	1%	3	3	3	3	3

Key Recommendations

- Reach a total of 3 Plans Reviewers by 2022, based on availability of funding.
- Consider adding a Fire Protection Engineer in lieu of a Plans Reviewer.
- Consider civilian positions for future Plans Reviewers and/or Fire Protection Engineers.

PUBLIC EDUCATION

This branch employs one Fire Public Education Coordinator, two Fire Public Education Officers, and one EMS Public Educator. All are trained to NFPA 1035 Fire and Life Safety Educator and Youth (Juvenile) Fire Setter Intervention Specialist standards. During the summer months, undergraduate education students are utilized for a fire safety program in which two fire-safety trailers are transported through the city to provide public education. In 2016, this program was able to reach 20,000 persons. Public Education Branch events vary greatly from small events such as babysitter training courses and senior injury prevention courses, to medium-sized events such as school assemblies and fire drills, and large events such as the Children's Festival and Teddy Bears' Picnic.

[59] *Ibid*, 2016.

Despite this success, based on the information provided and identified community risks, it does not appear that WFPS public education programs have sufficient staff to meet agency goals for the number of public education events and related community risk reduction program goals and objectives. As a result, the Public Education Branch has included partnerships with other agencies as a strategy to minimize costs and increase audiences. This cannot be sustained over the long-term.

Further, there is only one EMS Public Education Coordinator and no subordinate positions. This individual is currently focusing on the growing problems of drug overdoses and deaths due to fentanyl (a synthetic narcotic) abuse in at-risk populations, as well as fall prevention among the elderly. While there are other programs outside of WFPS that address injury prevention and other issues, EMS Public Education appears understaffed. A large city like Winnipeg needs more qualified personnel devoted to EMS public education, and additional positions, or cross-training of all public education personnel should be considered.

From a recent study, one Public Educator is recommended for every 500 public education activities—including social media and other public announcements.[60] At current workloads, this suggests combining fire and EMS public education efforts into a single, coordinated effort will provide short-term relief. If funding is available, given an annual increase of three percent (3%) in public education events,[61] WFPS should plan to add one public education staff for a total of six public education personnel (including the Coordinator) by 2019, and seven personnel by 2022 as shown in the following figures.

Figure 110: Public Fire and EMS Educator Staff Requirements, 2017

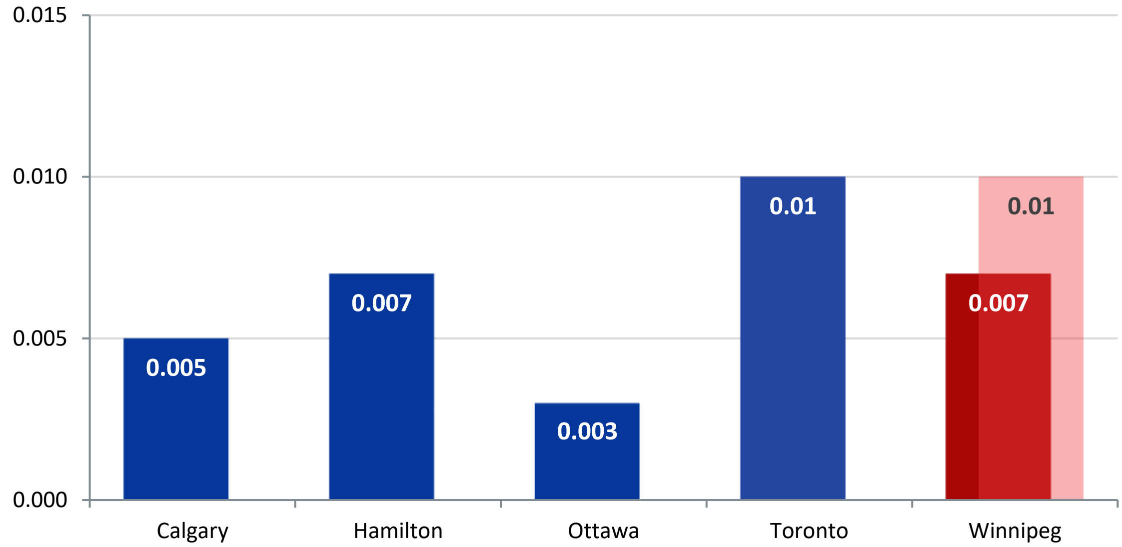
Description	2016 Events	Personnel Available	Actual Workload	Recommended Workload	Personnel Required
Public Education Workload, fire and EMS combined	2,634	4	658	500	5

Figure 111: Public Fire and EMS Educator Staff Requirements, 2018–2022

Description	Annual Growth	2018	2019	2020	2021	2022
Public Education Events	3%	2,700	2,800	2,900	3,000	3,100
Public Education Officers	3%	5	6	6	6	7

[60] *Ibid*, 2016.
[61] Three percent (3%) increase based on historical increase in service delivery from 2012–2016.

Figure 112: Public Education Staff per 1,000 Population, 2015[62]



These staff editions will place Winnipeg as a public education leader for comparator cities as shown in the previous figure. There are several reasons to support this recommendation:

- Winnipeg has a significant number of at-risk population groups and there is a need for additional fire and life safety education, including youth firesetter intervention programs:
  - Winnipeg has a higher-than-average rate of residential fires per property count (1.43 vs. 0.90) and commercial/industrial fires per property count (11.266 vs. 7.8) than comparator cities.[63]
  - Winnipeg has a higher-than-average rate of fire fatalities per 100,000 population (1.09 vs. 0.42) and fire-related injuries (8.35 vs. 7.31) than comparator cities.[64]
- Fire and life safety education reduces fire loss:
  - Winnipeg has a lower-than-average rate of fire injuries in homes with working smoke alarms (36.7% vs. 58%) for comparator cities;
  - Winnipeg has a higher rate of commercial and industrial structure fires with losses of 11.266 per 1,000 such properties as compared to the aggregate median of 6.094 per 1,000.

[62] 2018 Winnipeg Community Trends and Performance Report.
[63] 2018 Community Trends and Performance report, 2017.
[64] 2016 MBNCanada Performance Report.

- Small numbers of public education staff have a significant and proven negative effect on morale and program delivery.
    - High workload is hard on morale and contributes to job-related stress.
    - Staff turnover has a disproportionate impact on program capacity.
    - Extended absences have a disproportionate impact on program capacity; the EMS public education programs are particularly vulnerable.
    - After years of staff stability, there has been a complete staff turnover due to resignations and/or retirement.

Key Recommendations

- Continue to leverage existing public education resources through partnerships with other agencies, include public health, social services, and law enforcement to minimize costs and increase audience reach.
- Combine fire and EMS public education programs into a single, cross-trained unit.
- Reach a total of five public education staff by 2019, based on availability of funding.
- Expand use of in-service fire companies to deliver public education messages and deliver community risk reduction programs such as smoke alarm installations in high-risk households.
- Monitor program results to determine best efforts and return on investment; e.g., reduction in number of residential fires and number of fire injuries.

FIRE INVESTIGATION

WFPS Fire Investigators conduct investigations to determine the origin and cause of fires and explosions. Any determination of arson, or incendiary fire is referred to the WPS Major Crimes Unit for case development, follow-up and filing of charges. One Fire Investigator is recommended for every 200 fire investigations conducted annually.[65] However, in the interest of Investigator safety and to provide on-shift redundancy for simultaneous fires, ESCI suggests that WFPS consider adding four Fire Investigators (8 total) between now and 2022. These are in addition to the number of Fire Prevention Officers recommended earlier in this section. Based on availability of funding and given an annual increase of one percent in fire investigations,[66] this plan will allow WFPS to assign a Fire Investigator to more fires and reduce the investigation workload of Fire Company Officers. This is shown in the next two figures.[67]

[65] Montgomery and Kistner, 2016.

[66] One percent (1%) increase based on historical increase in service delivery from 2012–2016.

[67] The recommended caseload for a Fire Investigator who also conducts arson investigations and case development is 75 cases annually. If WFPS determined is was necessary to complete all phases of an arson investigation now performed by the WPS Major Crimes Unit, including evidence collection and processing, case follow-up, and related activities, this would increase the number of Fire Investigators from eight (two per shift) to twenty (five per shift). This is not a recommendation; it is included for informational purposes only.

Figure 113: Fire Investigator Requirements, 2017

Description	2016 Investigations	Personnel Available	Actual Workload	Recommended Workload	Personnel Required
Workload if all Fires Were Investigated by Fire Investigator	1,496	4	374	200	8
Current Practice Workload	330	4	83	200	4 (one per shift)

Figure 114: Fire Investigator Requirements, 2018–2022

Description	Annual Growth	2018	2019	2020	2021	2022
Fire Investigations	1%	1,510	1,525	1,540	1,560	1,575
Fire Investigators	1%	8	8	8	8	8

Number of personnel required may be reduced by working regular administrative hours with off-shift call-out.

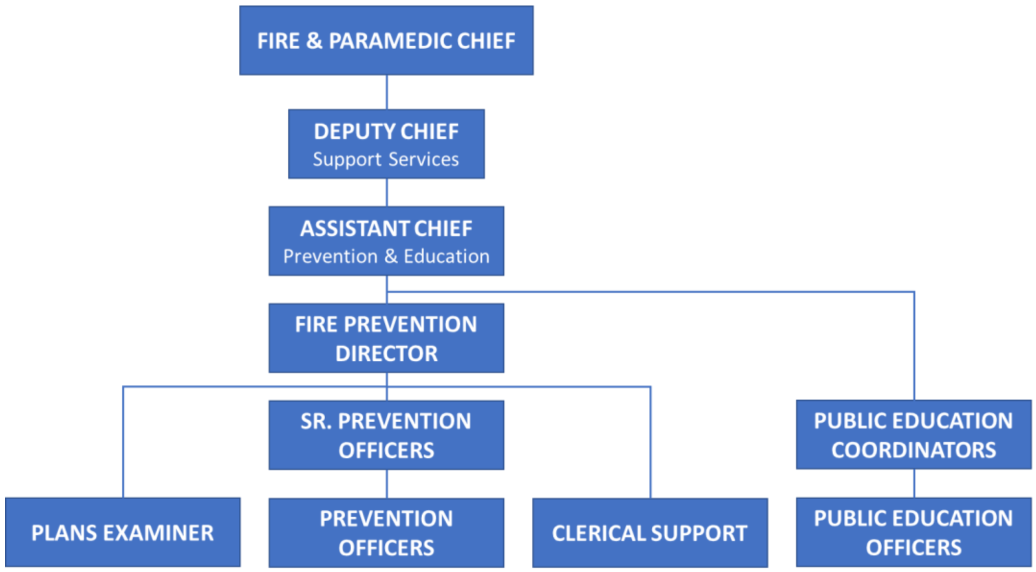
Key Recommendations

- Increase the number of trained Fire Investigators to allow the complete and thorough investigation of all fires and explosions by WFPS Fire Investigators.
- In the interest of Officer safety, reach a total of eight Fire Investigators as soon as practical, based on availability of funding.

ORGANIZATION

As shown in the following figure, all Fire Prevention staff, except Fire Investigators, report through the Assistant Chief, Prevention and Education to the Deputy Chief, Support Services.

Figure 115: Organizational Chart



The Fire Investigation Coordinator and Fire Investigators are currently employed within the Fire Operations Division under the auspices of the Assistant Chief of Fire & Rescue Operations. Currently, there are four Fire Investigators, one for each platoon, and not assigned to a fire apparatus or other operational activities. Investigators respond to incidents in a fire investigation unit. Based on identified community risks, individual workload, and Fire Investigation Officer safety, it does not appear that WFPS has sufficient Fire Investigation staff.

Although the current practice has the advantage of close working relationships within each platoon, it may be time to consider assigning the Fire Investigation staff to the Fire Prevention branch. This organizational structure is common in both the Canadian and American fire service. Advantages would include:

- Reduced supervisory workload on Operations Chief Officers;
- Coordination of results and data across the various Fire Prevention and Education activities; and
- A solid foundation and resources for a comprehensive risk reduction program of prevention, inspection, investigation, and education.

Key Recommendation

- Move the Fire Investigators to the Fire Prevention branch.

Summary

A wide-ranging program of fire prevention and life-safety services enables a fire department to minimize life and property loss and injuries associated with fires and other events.

> In December last, the Board was fortunate in arranging with Mr. Franklin H. Wentworth, Secretary of the National Fire Protection Association of America, to address the business men of Winnipeg on the subject of "Fire Prevention." A general meeting of the Board was called for the occasion, and also the various City officials and commercial organizations particularly interested in fire prevention were invited to attend. Mr. Wentworth, who has a national reputation as an expert authority on this subject, delivered an extremely interesting and valuable address to a large gathering on the 11th December, with the result that a branch of the Fire Prevention Association, following the lines of similar organizations existing in Eastern Canada and the United States, was organized in Winnipeg. Mr. Wentworth's address created a great deal of interest amongst citizens generally, and without doubt resulted in a fuller and more complete recognition of the importance of fire prevention and the great necessity existing for action in that direction in the City of Winnipeg.
>
> —*Winnipeg Board of Trade Report, May 1914*[68]

The need for effective fire prevention programs is as important today as it was in 1914. Currently:

- Winnipeg has a significant deficit of Fire Prevention staff on a per capita basis;
- Winnipeg's population demographics show a proportionally higher representation by at-risk citizens on the lower end of the socio-economic scale. This population is very vulnerable. They have a higher service need and reside in older buildings with higher service needs;
- Winnipeg has a large stock of older buildings;
- The Fire Prevention Branch is at, or over, capacity with no capacity for surge (additional workload) or discretionary resource allocation;
- The Fire Prevention Branch is unable to respond effectively to statistically identified issues beyond mandated services and fire hazard complaints.

In summary, the WFPS is positively moving forward with a proactive and progressive strategy for fire prevention, public education, and fire investigations. Focused and integrated public education efforts will ensure that the WFPS is not addressing community-based risk as a single department. A comprehensive risk management program provides the best opportunity to minimize the losses and human trauma associated with fires and other community risks. Robust communication and coordination with City planning and development can mitigate negative impacts to WFPS caused by new construction and changes to existing build-up. Ultimately, growth management strategies and code enforcement need to be directly supported by Prevention.

[68] *Winnipeg Board of Trade; Thirty-Fifth Annual Report of the Winnipeg Board of Trade*, May 1914; retrieved from https://books.google.com/

Emergency Management

This section describes emergency management and related matters for WFPS. The National Emergency Management Framework for Canada states, "The ultimate purpose of emergency management is to save lives, preserve the environment, and protect property and the economy. The protection of life is of paramount importance. In the broadest sense, emergency management raises the understanding of risks and contributes to a safer, prosperous, sustainable, disaster resilient society in Canada."[69] Central to the framework are the concepts and principles that:[70]

- Emergency management in Canada is based on an all-hazards approach that includes both natural and human-induced hazards and disasters;
- Most emergencies in Canada are local in nature, to be managed at the community, provincial, or territorial level;
- The likelihood for various types of catastrophes has increased;
- Local disasters could extend beyond geographic boundaries and challenge all levels of government;
- Each FPT government has a responsibility for emergency management and public safety in Canada;[71]
- There is a need to "enable and inspire" the collaboration of emergency management activities;
- The framework supports legal concepts, both Canadian and international, and nothing should be interpreted to limit or annul the authority or responsibility of any level of government;[72] and
- The framework is subject to revision every five years to ensure that it remains accurate and relevant.

The stated purpose of the framework is to (1) "guide and strengthen the way governments and partners assess risks and work together to prevent/mitigate, prepare for, respond to, and recover from the threats and hazards that pose the greatest risk to Canadians;" and (2) "strengthen FPT collaboration and ensure more coherent, complementary actions among the FPT governmental initiatives."[73]

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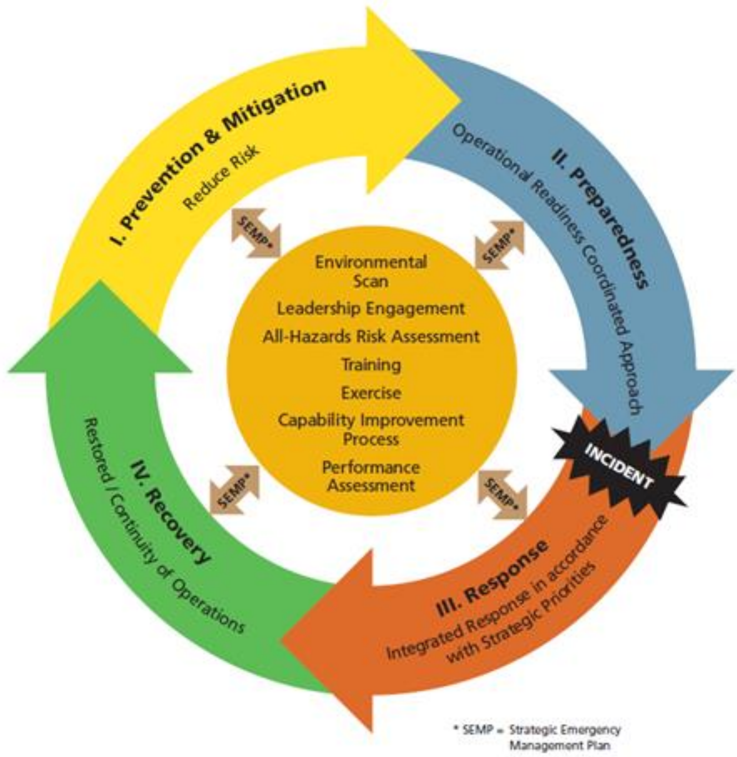
[69] *Building Resiliency Together: An Emergency Management Framework for Canada, Third Edition*. Ministers Responsible for Emergency Management, May 2017, retrieved from: https://www.publicsafety.gc.ca/
[70] *Ibid*, pages 4–5.
[71] Federal/Provincial/Territorial
[72] According to the Framework, it "aligns with key international agreements, including the Sendai Framework for Disaster Risk Reduction 2015–2030, which builds on previous agreements, including Hyogo (2005) and Yokohama (1994), to advance disaster risk reduction priorities globally. In addition, the Framework supports implementation of the Paris Agreement, aimed at reducing the impact of climate change, and the United Nations Sustainable Development Goals (SDGs). Each of these agreements aligns with the tenets of this Framework to advance Canada's domestic approach to Disaster Risk Reduction" (5).
[73] *Ibid*, page 6.

The emergency management process is comprised of four interdependent components: prevent, prepare, respond, and recover, as shown in the following figure.[74] As shown, the first two steps—prevention and preparedness—are the planning phase of emergency management and take place ***before*** an incident occurs; response to and recovery from an incident take place ***after*** an incident occurs.

Figure 116: The Emergency Management Continuum



All-Risk, All-Hazard Approach

Simply stated, a hazard is a ***condition*** that could cause harm to people, property, or the environment; risk is the ***potential*** of an incident to occur, and the resultant ***consequences*** of the incident. An all-risk, all-hazards approach identifies and integrates common elements of emergency management across all hazard types, thus enhancing both the effectiveness and efficiency of the emergency management process.

[74] Public Safety Canada (2010); *Emergency Management Planning Guide, 2010–2011*; Quebec, ON; page 4; retrieved from https://www.publicsafety.gc.ca/

Often, hazards are interrelated—hurricanes can cause flooding and tornadoes, fires can cause injuries that require medical intervention—so do not always lend themselves to siloed approaches to mitigate. Others contain elements that create a chain of events that may lead to "incidents within the incident"—severe storms may cause flooding that causes electrical outages, that lead to unplanned release of reactive materials that requires a fire/Haz-Mat response; while at the same time the flooding has stranded motorists that require water rescues and sheltering.

It should also be noted that some hazards, such as wildfire in a remote region may impact a large area yet cause little damage. On the other hand, other hazards like a tornado or structure fire may impact a relatively small area yet cause extensive property damage.

The critical, first step in the emergency management process is to conduct a community risk assessment, or CRA. A CRA is "the identification of potential and likely risks within a particular community, and the process of prioritizing those risks."[75] There are many models available to assist with the risk assessment process. It is important to use the same source and methodology for the entire analysis for consistency; thus, ESCI recommends the City of Winnipeg consider use of the template developed by the Manitoba Emergency Measures Organization included as Appendix B at the end of this report.[76, 77]

A detailed community risk assessment is included in the *Community Risk Assessment* section of the Standards of Cover for Winnipeg Fire Paramedic Service, a companion report issued concurrent to this report. For brevity, that information is not repeated here; however, a summary of hazard classifications are shown in the following figure.[78]

[75] Vision 20/20 (2016); Community Risk Assessment: A Guide for Conducting a Community Risk Assessment, revision 1.5; Warrenton, VA; page 2; retrieved from http://riskassessment.strategicfire.org/

[76] Province of Manitoba Municipal Emergency Plan 2017 Template, Appendix A. Manitoba Emergency Measures Organization, 2017. Retrieved from https://www.gov.mb.ca/emo/prepare/develop.html

[77] All Hazards Risk Assessment Methodology Guidelines 2012–2013, Public Safety Canada, 2012, retrieved from https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ll-hzrds-ssssmnt/index-en.aspx

[78] This approach is consistent with that recommended by CPSE and allows WFPS to characterise hazards with "all hazard" terms commonly-used in emergency management yet use NFID codes for "incident type found."

Figure 117: Hazard Classification by Primary Threat

Hazard Classification by Primary Threat	
Medical Hazards ▪ EMS ▪ Rescue – mass casualty trauma ▪ Hospitals – Pandemic/Public Health	**Technological Hazards** ▪ Transportation ▪ Dangerous Goods ▪ Utility failure
Natural Hazards ▪ Winter Storm/Blizzard ▪ Tornado ▪ Thunderstorms/Lightning ▪ Flooding ▪ Drought ▪ Heat event	**Human Hazards** ▪ Business Interruption ▪ Communication/Cyber Incident ▪ Terrorism ▪ VIP/Hostage Situation ▪ Civil Disturbance/Labour Action ▪ Bomb Threat
Fire Hazards ▪ Structure Fires ▪ Non-Structure Fires ▪ Wildfires	

The Emergency Management Process

Both the authority and responsibility for emergency management are shared between various levels of government: local, provincial or territorial, and national. The Manitoba Emergency Measures Organization (EMO) is responsible for "overseeing and coordinating all aspects of emergency preparedness in the Province of Manitoba, including managing, directing, and coordinating the response of all departments to a disaster or major emergency" and for coordinating the planning efforts of local government.[79] According to information provided by the Manitoba EMO, the "authority and responsibility for emergency management is established in a number of federal and provincial acts. Manitoba EMO has responsibility for the administration of two provincial acts and numerous regulations and standards, to include:"[80]

- The Emergency Measures Act, which includes:
  - The Local Authorities Emergency Planning and Preparedness Regulation:
    - NFPA 1600: *Standard on Disaster/Emergency Management and Business Continuity/Continuity of Operations Program*
    - Z1600-14: *Emergency and Continuity Management Program Standard*
  - Disaster Financial Assistance Policy and Guidelines (Private Sector) Regulations
  - Disaster Financial Assistance Policy and Guidelines (Public Sector) Regulations
- The Emergency 911 Public Safety Answering Point Act, which includes:
  - Emergency 911 Public Safety Answering Point Regulation Standards

[79] Source: Province of Manitoba Emergency Measures Organization, retrieved from http://www.gov.mb.ca/emo
[80] *Ibid*.

Many major Canadian municipalities have developed integrated and holistic municipal emergency plans that cover all elements of planning, response, and recovery. Even where such plans are not integrated, there are typically plans that cover these elements.

The City of Winnipeg has adopted the Fire Paramedic Service By-Law to identify various roles, responsibilities, and measures related to emergencies, and has established an Emergency Preparedness Program through Council motions including an Emergency Response Organization (i.e., an Emergency Control Committee, a Coordination Committee, and an Emergency Operations Centre). Supporting the above By-Law are several integral By-Laws including Fire Prevention and Fire Safety; each that directly impacts and influences overall community risk and the implications for emergency management. There is no specific Emergency Management By-Law that might speak to specific roles, responsibilities, and measures for major emergencies or disasters; that information is included in the City's Emergency Plan.

The City of Winnipeg Emergency Plan was last updated in 2012. The overall content within the Emergency Plan is basic and narrow—meaning it focuses on emergency response and is silent on crisis management, crisis communications, and business continuity (better known as a Municipal Recovery or Municipal Continuity Plan), and other key elements.

A detailed review of the Emergency Management Plan was outside the scope of this study. ESCI was not provided any information to suggest there is a comprehensive Information Technology Continuity or Disaster Recovery Plan. Likewise, ESCI was not provided with any detailed emergency response plans—plans outlining standard operating procedures for mitigating various emergency situations; however, reference to such plans is made in Section 8 of the current Emergency Plan.[81]

Key Recommendations

- Continue use of the current Emergency Preparedness Program, including the Emergency Response Organization, Emergency Control Committee, Coordination Committee, and Emergency Operations Centre.
- Update the current Emergency Plan.
- Consider use of the AHRA scoring tool to assess and quantify relative risk.

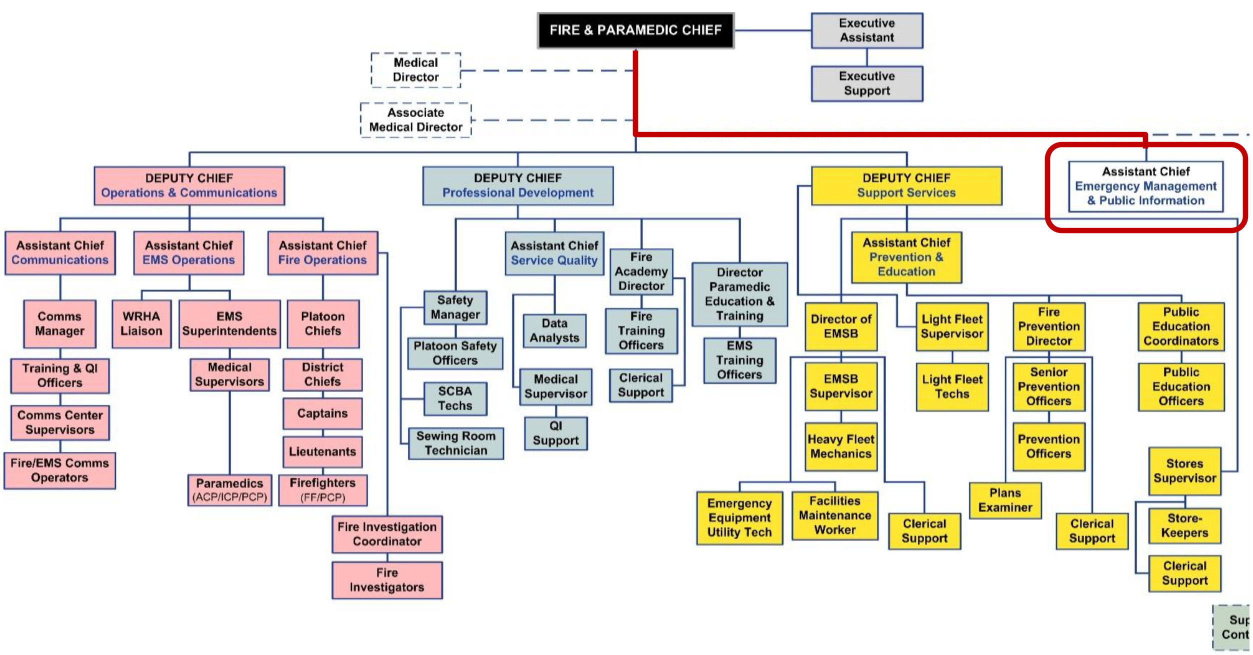
[81] According to the Plan, "plans outlining standard operating procedures are maintained by the sector Coordinators under the general direction of the Emergency Preparedness Coordinator. A complete set of sector plans will be kept in the EOC and the alternate EOC." Source: City of Winnipeg Emergency Plan, 2012, page 5.

Process Analysis

The WFPS has a lead role for Emergency Management within the City. Within WFPS, the emergency management function is a recently-developed organizational program under the leadership and direction of an Assistant Chief, Emergency Management and Public Information. The person holding this position is the Chair of the City of Winnipeg Coordination Committee and is responsible for coordination of emergency preparedness planning and response within the purview of the WFPS.[82] This program currently has minimal staffing support; however, there are plans to expand the program budget and related support roles.

From the organization chart provided by WFPS, it appears this Assistant Chief is a direct report to the Fire Paramedic Chief. If this is correct, this position is the only Assistant Chief that reports directly to the Fire Paramedic Chief; all other direct reports hold the rank of Deputy Chief with Assistant Chief reporting to the respective Deputy Chief as shown in the following figure. It is not clear if this rank designation is deliberate; regardless, the reporting structure and rank designation could create ambiguity or dilute the differential between the ranks of Assistant and Deputy Chief.

Figure 118: WFPS Organization Chart

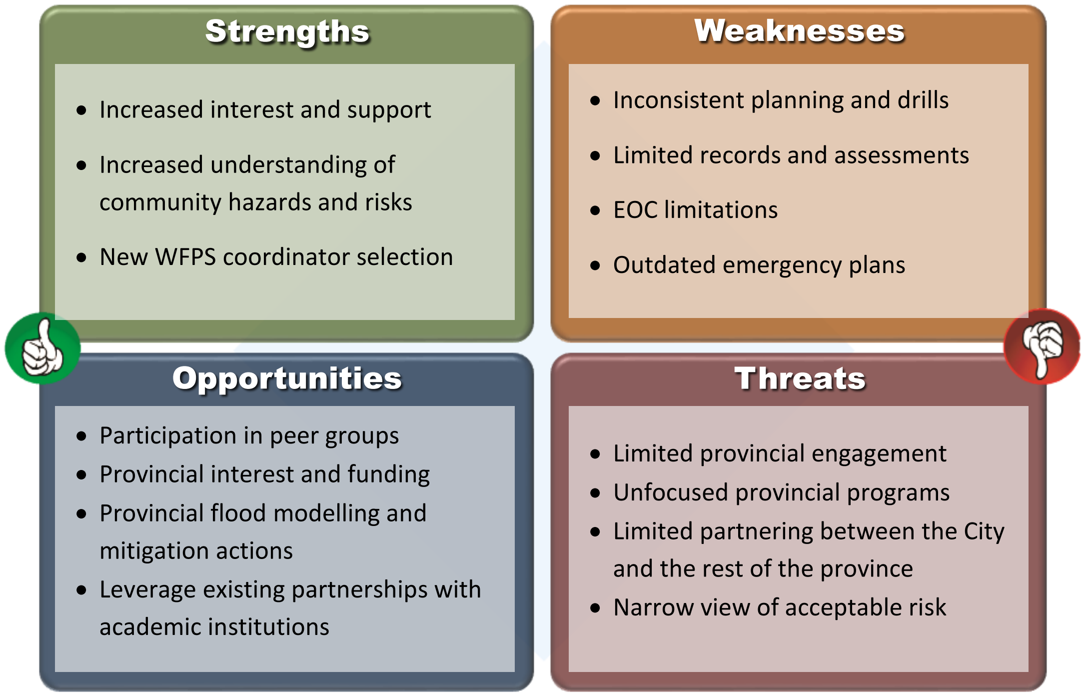


[82] Winnipeg Emergency Plan, page 2.

SWOT Analysis

ESCI conducted a SWOT assessment—Strengths, Weaknesses, Opportunities, and Threats—based on interviews of selected WFPS staff members and review of available materials. The key findings of that analysis are summarized in the following figure.

Figure 119: Summary of SWOT Findings



STRENGTHS (INTERNAL)

- Increasing interest and level of support by elected officials and senior WFPS administration.
- The WFPS leader of emergency management has a strong passion for continuous improvement.
- New coordinator for WFPS emergency management is educated, and capable to influence the direction of emergency management within the City while recognizing the need for broader and more comprehensive partnerships and collaboration with other entities—internal and external.
- There has been and is a strong sense of hazards and threats within the City by WFPS.
- There is an increasing sense of hazards and threats by City planning staff.
- There is a City of Winnipeg Emergency Plan.

WEAKNESSES (INTERNAL)

- There does not appear to be the use of best practices in emergency management.
- The City emergency response organization is very large and appears to not have the clear and concise processes for governance, decision-making, and authorities.
- Limited emergency management records regarding major emergencies and disaster events, programming objectives, assessments, education, and results.
- There is no recent nor comprehensive hazard risk vulnerability assessment (HRVA) for the City.
- Remnants of "local interests first" and "silos of excellence" in emergency management decisions.
- Emergency management is not standardized within and across all City departments.
- Different levels of interest, commitment, and participation in emergency management activities. (e.g., planning, education, exercises).
- City focused on liability rather than on a more comprehensive view of risk.
- Limited business continuity planning.
- The primary emergency operations centre (EOC) is minimally funded, resourced, and does not have the dedicated infrastructure necessary for modern EOCs.
- The current EOC is multi-function and creates challenges with operation and maintenance.
- The current design of the EOC does not appear to support optimal setup and operations.
- There is not a clear strategy for an alternate City (EOC).
- A need to standardize emergency management with the Incident Command System (ICS).
- A need to advance the plan and readiness of the City EOC (primary and alternate).

OPPORTUNITIES (EXTERNAL)

- The Big Cities Emergency Managers group is an excellent opportunity to advance emergency management within the City.
- With the City of Winnipeg having ~90 percent of the population for Manitoba, there should be distinct interest by the province and surrounding municipalities to ensure the WFPS emergency management program is supported, funded, and engaged.
- The province's flood modelling and mitigation actions; e.g., dikes and floodways, reflect a positive effort by the province toward prevention/preparedness rather than simply response/recovery.
- Consider partnerships with emergency management-related academic institutions within Manitoba and externally.

THREATS (EXTERNAL)

- Minimal emergency management at provincial level as compared to many Canadian jurisdictions.
- Lack of provincial programming has resulted in minimal strategies, funding, and initiatives for which WFPS might otherwise benefit from.
- Old hazard risk vulnerability assessment (HRVA) completed by the province many years ago did not include the City of Winnipeg; shows a lack of partnering between the major urban centre and the rest of the province.
- The provincial emergency management program has recently focused primarily on flooding and wildland fire hazards and threats and the consequences of such actual events within the province.
- There appears to be a narrow view of risk and a limited risk appetite for comprehensive emergency management programming within the province and by surrounding municipalities.

Key Recommendations

- Develop an increased understanding of hazards/risks with internal/external partners.
- Update the current Emergency Plan.
- Establish consistency in planning, exercises, and drills.
- Address EOC limitations.
- Increase participation in peer groups, with provincial partners, and academic institutions.

Performance Measures

A recent report identifies several areas and metrics for emergency management performance within the City.[83] The findings from that report were evaluated by ESCI and makes the following observations:

- The description and key goals for disaster preparedness and response remain unchanged from previous years;
- The number of presentations and consultations is down significantly from previous years;
- The number of disaster management training sessions, exercises, and people trained is up significantly from previous years;
- The number of EOC activations was up from 3 to 5, but the average number of days activated per activation was down from 5.3 days per activation to 1 day per activation;
- Citizen satisfaction remains high (87.9%) and has rebounded from a fall-off in 2015;[84]
- Percentage of City staff trained in emergency management remains unchanged;
- The number of emergency exercises was up significantly since previous years; and
- The per capita cost of dedicated emergency preparedness staff in the EOC has declined steadily since 2012.

[83] Community Trends and Performance Report, 2018 Budget – Volume 1, City of Winnipeg, July 2017.
[84] As compared to 74.1% for police response, 98.9% for fire response, and 86.6% for EMS response.

Ultimately, life safety, protection of property, protection of the environment, and the enhancement of community resiliency must be the desired, end-result outcomes for WFPS emergency management programs. From the information provided and through observation, ESCI was able to conclude that the City and WFPS are moving positively with a proactive and progressive strategy for emergency management. That said, emergency management cannot meet its potential by relying on "siloes of excellence." The success of WFPS emergency management requires inter-jurisdictional solutions and relationships with partner agencies, at the local, provincial, and national levels. These efforts will require continued commitment of both effort and funding to advance and achieve new results, both within the City of Winnipeg and the Province of Manitoba.

Key Recommendations

- Continue to develop a collaborative, holistic approach to emergency management.
- Review key aspects of the Winnipeg Emergency Plan annually, with updates planned every five years.
- Establish and sustain the resources necessary for adequate support staffing and program funding for planning and preparation activities, to include training, drills, and exercises.
- Encourage partnerships with local, provincial, and other stakeholders including NGOs (non-governmental organizations) such a non-profit and faith-based organizations.
- Use the initial community risk assessment provided in the Standards of Cover report as a foundation for future, comprehensive risk assessments that use quantitative analytical tools such as the AHRA prototype or the FEMA model described in Appendix B of this report.
- Establish outcome-based performance measures to complement existing output-based measures.
- Develop training scenarios based on actual Winnipeg incidents to enhance understanding of local conditions, hazards, risks, and capabilities.
- Begin capital improvement planning (CIP) for a comprehensive review of the City emergency operations centre (EOC) to include design, development, construction, operation, and maintenance of primary and alternate emergency operations centres.

Capital Assets and Assessment of Current Infrastructure

A master plan should be focused on existing infrastructure, its suitability for current use, and its likely utility for future use as community needs grow and change. The two key elements of the infrastructure include WFPS facilities—especially where critical emergency response services are delivered—and apparatus (emergency response vehicles). Maintenance and replacement must be preprogrammed to have any hope of being replaced in a timely manner, given the costs associated with replacement. These elements are addressed below.

Figure 120: Overview of Capital Assets

SURVEY COMPONENT	WFPS INFORMATION
FIRE STATIONS/STRUCTURES	
Capital Improvement Plan maintained?	Yes
Period of plan (from–to)	2017–2020
Funding mechanism identified?	Approved budget for facility optimization, station capital maintenance, and operational maintenance
APPARATUS	
Apparatus Replacement Plan maintained?	Yes
Period of plan (from–to)	2015–2020
Funding mechanism identified?	Approved budget for replacement of existing apparatus based on NFPA
SUPPORT EQUIPMENT	
Equipment Replacement Plan maintained?	Yes
Period of plan (from–to)	2016–2025
Funding mechanism identified?	Yes, equipment obsolescence budget; apparatus replacement budget; facility optimization budget
Purchase interval planned for by type?	Yes

Facilities

Each of the active WFPS facilities was toured and assessed by an ESCI associate who specializes in facilities and apparatus evaluation. The assessment was not a structural engineering evaluation, but an assessment of the condition of each facility, its effectiveness and functionality for its current use, its intended purposes, and its ability to meet the needs of the organization into the foreseeable future. Additional information regarding the facilities and equipment provided by WFPS was also reviewed. The following observations are provided for each facility evaluated. Each facility assessment concludes with a summary statement and any recommendation deemed appropriate.

Winnipeg Fire Paramedic Station No. 1
65 Ellen Street (27,000 s/f)

Fire Paramedic Station No. 1 was constructed in 1965. Typical staffing at this location is twenty-one (21) personnel. The majority of the building is at ground level with a small training room in a basement area. Women's washroom facilities are also located in the basement along with a workout area. The facility has a single dorm area with no dividers serving a mixed gender workforce. The dayroom is fairly small for the number of staff assigned to the station. Numerous pieces of old furniture were stored in the apparatus bay. The station has a turnout washer; though there is not a washer or dryer available for uniforms or bedding. The building is not protected by an automatic sprinkler system and does not have an alarm system. Exit lighting and signs appear to be non-functional. 110V smoke alarms were visible. Energy audits have not been conducted. The trailer mounted emergency generator stored in the apparatus bay is not used as a backup for the station; it is solely dedicated to communications in the event of a power loss.

Overall condition of the building is poor. At 52 years of age the facility should be considered for replacement.

Winnipeg Fire Paramedic Station No. 2
55 Watt Street (6,570 s/f)

Fire Paramedic Station No. 2 was constructed in 1990. Typical staffing at this location is nine (9) personnel. The majority of the station is single story with a mezzanine and basement. There are no provisions for a mixed gender workforce with the exception of an "OCCUPIED" sign on the restroom door. The dorm area is also used as a TV room with refrigerators and recliners, therefore the area does not function well for either purpose. The station has a turnout washer, but no washer or dryer for uniforms and bedding.

The building is not equipped with automatic fire sprinklers or an alarm system. Smoke alarms were visible. Exit signage was not present. There is no emergency generator and energy audits have not been conducted.

In general, the building is in good condition with the exception of the kitchen/dayroom area, which is in poor condition. The station should be considered for a remodel/update including the addition of an automatic sprinkler system and emergency power generator.

Winnipeg Fire Paramedic Station No. 3
337 Rue DeMeurons (7,815 s/f)

Fire Paramedic Station No. 3 was constructed in 1967. Typical staffing at this location is six (6) personnel. There is a mezzanine and a basement. The station is poorly configured and not practical for emergency response. There are no considerations for a mixed gender workforce and dorm access is through a storage area. The kitchen is in poor condition and extremely small in size. Lockers and shower areas are also in poor condition. Both the dorm and kitchen areas are a safety concern and holes were noted in several interior walls. The fitness equipment is located in the apparatus bay. The interior of the station is in poor condition and needs paint. Parking availability is minimal for the number of assigned staff. The station has a turnout washer, but no washer or dryer for uniforms and bedding. The building does not have an emergency generator, automatic fire sprinkler system, or an alarm system. Smoke alarms were visible. Energy audits have not been conducted.

Due to the age, condition, and design of this station it is recommended it be replaced.

Winnipeg Fire Paramedic Station No. 4
150 Osborne Street (4,672 s/f)

Constructed in 1955, Fire Paramedic Station No. 4 is more than 60 years old. Typical staffing at this location is ten (10) personnel. The station does not have a formal dorm area and the women's washroom is shared with the public. Workout equipment is located in the dorm area. Locker rooms and showers are not shared. The station is not designed for efficient emergency response. There is a turnout washer, but no washer or dryer for uniforms and bedding. There is no emergency generator, automatic fire sprinkler system, or alarm system. Smoke alarms were visible. It was noted that a pillow was being utilized to block outside air from entering the station around a wall mounted A/C unit. Energy audits have not been conducted.

In general, the station is in poor condition, the design is inefficient for emergency response, and is not large enough to house the number of personnel assigned. Due to these factors and the age of the facility it is recommended the station be replaced.

Winnipeg Fire Paramedic Station No. 5
845 Sargent Avenue (12,751 s/f)

Fire Paramedic Station No. 5 was constructed in 1919 and partially remodeled in 1984. Typical staffing at this location is twelve (12) personnel. While majestic in appearance, the building was not designed for modern day fire apparatus or efficient emergency response. The station is nearly 100 years old with the renovation completed almost 35 years ago. Roof leaks, damaged bay doors, and paint issues were noted throughout the building. The station has individual dorms, but shared washroom and shower facilities. Evidence of a rodent infestation was visible throughout the facility. There is a turnout washer, but no washer or dryer for uniforms and bedding. The building has an emergency generator; however, the building does not have an automatic fire sprinkler or alarm system. Smoke alarms were visible. Egress is likely to become quickly compromised in the event of a fire. Energy audits have not been conducted.

This facility is generally in poor condition. Due to the age, condition, and configuration of the building, it is recommended to be replaced.

Winnipeg Fire Paramedic Station No. 6
603 Redwood Avenue (6,860 s/f)

Fire Paramedic Station No. 6 was built in 1998. Typical staffing at this location is twelve (12) personnel. The station is one story with a large basement area that is utilized as a fitness area. At some point an additional apparatus bay was added to the facility. The attached, yet separate building appears to have been constructed to resolve a building code issue. Staff parking is inadequate for the number of assigned personnel. The station has a large mixed gender dorm area with dividers. There are dedicated men's and women's washrooms. A turnout washer is present, but there is no washer or dryer for uniforms and bedding. The station is not protected by an automatic fire sprinkler system.

In general, the station is in good condition. The kitchen area needs refurbishment. A remodel of the dorm area is recommended, potentially designed with individual dorms or a separate women's dorm. Also recommended is the addition of an automatic fire sprinkler system and an emergency power generator. Energy audits should be considered.

Winnipeg Fire Paramedic Station No. 7
10 Allen Blye Drive (8,500 s/f)

Fire Paramedic Station No. 7 was constructed in 1996. Typical staffing at this location is four (4) personnel. The station has a basement, which is utilized as a fitness area. The dorm area is mixed gender; however, there is a dedicated female washroom. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station does not have an automatic sprinkler nor an alarm system. Smoke alarms were visible.

Overall, the station is in good condition and of adequate design for emergency response. Continual regular maintenance will prolong the usable life of the facility. Energy audits are recommended, and installation of an emergency generator should be considered.

Winnipeg Fire Paramedic Station No. 8
640 Kimberly Avenue (6,524 s/f)

Almost 50 years of age, Fire Paramedic Station No. 8 was constructed in 1969. Typical staffing at this location is eight (8) personnel. Fitness equipment utilizes space in the apparatus bay. The station includes space to accommodate a mixed gender workforce; however, there are no actual designated areas. There is a turnout washer, but no washer or dryer for uniforms and bedding. There are no automatic fire sprinkler or alarm systems present. Smoke alarms were visible. The station does not have an emergency power generator.

The station is in fair condition. The kitchen area needs an update and the entire station should be painted. Energy audits should be conducted, and installation of an emergency generator is recommended.

Winnipeg Fire Paramedic Station No. 9
864 Marion Street (7,120 s/f)

Fire Paramedic Station No. 9 was built in 1955. This single-story station has three (3) apparatus bays. Typical staffing at this location is eight (8) personnel. The station is quite small for the assigned number of staff and is poorly designed for efficient emergency response. Some of the refrigerators were placed in the apparatus bay due to cramped kitchen conditions. In addition to their poor condition, the shower facilities are located off the apparatus bay and not easily accessible from the station's living quarters. The facility has no provisions for a mixed gender workforce. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station does not have automatic fire sprinkler or alarm systems. Smoke alarms were visible. Interior and exterior paint is in poor condition.

Overall, the station is in poor condition, poorly designed for emergency response, and too small for the number personnel assigned. It is recommended that the station be replaced.

Winnipeg Fire Paramedic Station No. 10
1354 Border Street (7,130 s/f)

Fire Paramedic Station No. 10 was constructed in 1969 with a partial remodel in 2016. Typical staffing at this location is ten (10) personnel. The station has one large dorm area divided by lockers. There is no women's dorm; though there is a dedicated women's washroom. The station layout is sufficient for emergency response. There are issues with the windows not securing properly allowing air leakage, which is especially notable during extreme weather conditions. The 2016 remodel was driven by a sewer gas issue. Repairs to the sewer mandated new flooring and other repairs in some areas of the station. All of the facility issues were not addressed at the time of this remodel. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station does not have an automatic fire sprinkler system, emergency generator, or alarm system. Smoke alarms were visible.

The station is in generally good condition with an appropriate layout for emergency response. Additional interior updates and maintenance will extend the life of the station. Installation of an automatic fire sprinkler system should be considered. Energy audits are recommended.

Winnipeg Fire Paramedic Station No. 11
1705 Portage Avenue (14,457 s/f)

Fire Paramedic Station No. 11 was constructed in 2013 and is one of the newer fire stations in Winnipeg. The two-story station is of modern design and well suited for emergency response. It is also properly configured to accommodate a mixed gender workforce. The station is of adequate size for the assigned staff of thirteen (13) personnel and should serve the City of Winnipeg for many years to come. The facility is protected by an automatic fire sprinkler system.

Fire Paramedic Station No. 11 is a well-designed and up-to-date facility. An adequate level of maintenance and repair will assure that the station serves the community for many years. The addition of an emergency generator along with energy audits is recommended.

Winnipeg Fire Paramedic Station No. 12
1780 Taylor Avenue (7,843 s/f)

Fire Paramedic Station No. 12 was constructed in 2012 and is another of the newer Winnipeg fire stations. Typical staffing at this location is six (6) personnel. The single-story station is well designed for emergency response. Individual dorm rooms and gender specific washrooms meet the needs of a mixed gender workforce. Addition of a turnout washer is planned. There is no washer or dryer for uniforms and bedding available. Although the station is relatively new, it was constructed without an automatic fire sprinkler system.

Overall the station is well designed. As the station is virtually new, an adequate level of maintenance and repair will allow the station to serve the community for many years. The installation of an automatic fire sprinkler system should be considered. Additionally, energy audits should be conducted, and installation of an emergency generator is recommended.

Winnipeg Fire Paramedic Station No. 13
799 Lilac Street (7,058 s/f)

Fire Paramedic Station No. 13 was constructed in 1979. Typical staffing at this location is eight (8) personnel. Crews indicate the station location is not optimal for emergency response. The single-story station with a mezzanine includes a mixed gender dorm with no dividers. There is a designated women's washroom. The locker area is adjacent to the kitchen and has no doors for privacy. The kitchen is in poor condition with missing doors on some cabinetry. Stair treads are in poor condition, which is a potential trip hazard. The fitness equipment is located in the dorm. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station is not protected by an automatic fire sprinkler or alarm system. Smoke alarms were visible.

Should the station's location be determined adequate, a complete remodel of the facility is recommended. Reconfiguration of the station would extend its life for several years. An automatic fire sprinkler system and emergency generator should be installed. Energy audits are recommended.

Winnipeg Fire Paramedic Station No. 14
1057 St. Mary's Road (3,963 s/f)

Fire Paramedic Station No. 14 was built in 1965. It was originally a police station with a basement shooting range. The fitness area is in the basement. There are no provisions for a mixed gender workforce. Parking is minimal for the six (6) personnel typically assigned to this location. The kitchen area is in extremely poor condition. The dorm exits through a storage area to the apparatus bay, which is not efficient nor safe for emergency response. Hanging wires were observed in the apparatus bay. There is only one shower in the building. The door to the basement bathroom does not lock. There is a turnout washer, but no washer or dryer for uniforms and bedding. There are no automatic fire sprinkler or alarm systems. Smoke alarms were visible.

Due to its age, condition, and layout, it is recommended the station be replaced.

Winnipeg Fire Paramedic Station No. 15
1083 Autumnwood Drive (6,330 s/f)

Fire Paramedic Station No. 15 was built in 1970. Typical staffing at this location is four (4) personnel. The station has multiple levels, which are served by a single interior stairwell. The station has no accommodations to support a mixed gender workforce. The kitchen area is in poor condition and extremely small. Fitness equipment is located in the apparatus bay. The locker and shower areas are quite small and in poor condition. The station is not well designed for effective emergency response. There is a turnout washer, but no washer or dryer for uniforms and bedding. Automatic fire sprinkler and alarm systems are not present. Smoke alarms were visible.

Due to the age, configuration, and condition of the facility it is recommended the station be replaced.

Winnipeg Fire Paramedic Station No. 16
1001 McGregor Street (9,000 s/f)

Constructed in 1971, Fire Paramedic Station No. 16 is 46 years old. Typical staffing at this location is eight (8) personnel. The station consists of multiple levels with an abundance of stairs resulting in a poor layout for effective and safe emergency response. There are no provisions for a mixed gender workforce. Exercise equipment is located in the basement. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station is not equipped with an automatic fire sprinkler or alarm system. Smoke alarms were visible. Energy audits have not been conducted.

Fire Paramedic Station No. 16 is in fair to poor condition. Due to the age of facility and the poor emergency response layout, the station has likely reached the end of its useful life and should be replaced.

Winnipeg Fire Paramedic Station No. 17
1501 Church Street (7,200 s/f)

Fire Paramedic Station No. 17 was built in 1969. Typical staffing at this location is seven (7) personnel. The station layout is not optimal for emergency response and it has no provisions for a mixed gender workforce; however, there is a lock on the washroom door. The cloak room also serves as a small workshop with grinding and other equipment. This is likely not the best environment for structural fire gear. Oxygen cylinders are stored directly below electrical panels, which is a safety issue. The wall-mounted urinal in the washroom was improperly installed. Use is facilitated by a wooden platform placed in front of the urinal, which is an unsafe and unsanitary solution. The fitness equipment shares space with the Paramedic dorm. Overall, the station is in poor condition especially the kitchen where the cabinets contain mold and several doors and drawers are missing. The station does not have an automatic fire sprinkler or alarm system. Smoke detectors were visible. Energy audits have not been conducted.

Due to the age, configuration, and condition of the facility, it is recommended the station be replaced.

Winnipeg Fire Paramedic Station No. 18
5000 Roblin Avenue (7,843 s/f)

Fire Paramedic Station No. 18 was built in 2012. Typical staffing at this location is six (6) personnel. The station is well designed for emergency response and is appropriately configured for a mixed gender workforce. There are individual dorms and separate washrooms. Overall, the facility is in good condition. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station was constructed without an automatic fire sprinkler system. Smoke alarms were visible. Energy audits have not been conducted.

Fire Paramedic Station No. 18 should serve the community for many years. Regular maintenance and repairs should be continued. The addition of an automatic fire sprinkler system should be strongly considered. Energy audits are recommended, along with the addition of an emergency generator.

Winnipeg Fire Paramedic Station No. 19
320 Whytewold Road (3,651 s/f)

Fire Paramedic Station No. 19 was constructed in 1959. Typical staffing for this location is four (4) personnel. The station layout is poorly configured for efficient emergency response. There is a common dorm area with one designated women's washroom and shower. Station space is limited, and the fitness equipment is located in the apparatus bay. A pull up bar is mounted in the kitchen. One of the overhead doors was replaced resulting in a set of mismatched doors. The apparatus door height is low; therefore, only two of the Winnipeg apparatus currently in use will fit inside the building. When normally assigned apparatus are out for service the department's training engine must be utilized. The station does not have an automatic fire sprinkler or system. Smoke alarms were visible. Energy audits have not been completed.

Fire Paramedic Station No. 19 has reached the end of its useful life. Approaching 60 years of age, the station layout, size, configuration, and its generally poor condition lead to the determination that the station should be replaced.

Winnipeg Fire Paramedic Station No. 20
525 Banting Drive (7,100 s/f)

Fire Paramedic Station No. 20 was built in 1971. Typical staffing for this location is six (6) personnel. There is a designated women's washroom; however, the shower area is mixed gender. There is at least one bed located in the fitness area. The station is in fair condition with a need for interior paint and general maintenance. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station does not have an automatic fire sprinkler or alarm system. Smoke alarms were visible.

A remodel and modernization of Station 20 is recommended as well as installation of an automatic fire sprinkler system. Energy audits are recommended, and the installation of an emergency generator is advised. Additionally, routine repair and maintenance should be conducted on a regular schedule.

Winnipeg Fire Paramedic Station No. 21
1446 Regent Avenue (6,860 s/f)

Fire Paramedic Station No. 21 was built in 2007. Typical staffing for this location is nine (9) personnel. Though it is one of the more modern stations, it was not constructed with a mixed gender workforce in mind. The station has a women's washroom and shower; however, the dorm area is not segregated. Fitness equipment is located in the basement. The layout is adequate for emergency response. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station is not equipped with an automatic fire sprinkler or alarm system. Smoke alarms were visible.

The station is generally in good condition. Interior paint and basic maintenance and repair would be beneficial. With some minor remodeling, a women's dorm area could be constructed. The addition of an automatic fire sprinkler system and emergency generator is recommended. Energy audits should also be conducted. With these improvements, the station will serve the community for several years.

Winnipeg Fire Paramedic Station No. 22
1567 Waverly Street (5,435 s/f)

Fire Paramedic Station No. 22 was built in 1983. Typical staffing at this location is six (6) personnel. The kitchen is in very poor condition; of note were several missing cabinet doors and drawers. The fitness area is also utilized as a dorm. The station has a designated women's washroom and shower; though the dorm is mixed gender. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station is poorly laid out for emergency response and does not have an automatic fire sprinkler or alarm system.

The station is in fair to poor condition overall. An extensive remodel to improve effective emergency response should be considered. The addition of an automatic fire sprinkler system and emergency generator is highly recommended. Energy audits should be conducted. The cost of a major renovation should be weighed against the cost of replacement due to the amount of work anticipated.

Winnipeg Fire Paramedic Station No. 23
880 Dalhousie Drive (4,500 s/f)

Fire Paramedic Station No. 23 was constructed in 1962. Typical staffing for this location is eight (8) personnel. The split-level station has living quarters on the upper floor with the offices on the main floor. The station design is not conducive to efficient emergency response. The multi-level structure has numerous stairwells throughout the building and the layout is quite confusing. The station does not have a women's dorm area, though it does have a women's washroom. One bed is located in the workout room and a ping pong table is set up in the main dorm. The crew reported the urinals are a constant issue. There were notices posted indicating the presence of asbestos. Additionally, the plumbing in the apparatus bay is covered with a decaying product likely to consist of asbestos containing materials. The station does not have automatic fire sprinkler or alarm systems. Smoke alarms were visible.

Due to the poor condition of the facility, likely presence of hazardous materials (asbestos), unworkable layout for effective emergency response, and the age of the building the station has reached the end of its useful life and should be replaced.

Winnipeg Fire Paramedic Station No. 24
1664 Rothesay Street (6,550 s/f)

Fire Paramedic Station No. 24 is more than 40 years old; constructed in 1974. Typical staffing for this location is eight (8) personnel. The kitchen area is heavily worn, and the station was not designed for mixed gender use. The fitness area is combined with the dorm area. Lockers and showers are shared, which forces personnel to wait while the opposite gender is using the room. The apparatus bays are extremely narrow; making it difficult to work on and around the vehicles. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station does not have an automatic fire sprinkler system, emergency generator or alarm system. Smoke alarms were visible. Energy audits have not been conducted.

Fire Paramedic Station No. 24 is in poor condition and a complete remodel of the living quarters may be advantageous; however, the width of the existing apparatus bays may be difficult and costly to overcome. Should a remodel be considered, the addition of a fire sprinkler system and emergency generator should be included; however, it is recommended the station be replaced.

Winnipeg Fire Paramedic Station No. 25
701 Day Street (6,860 s/f)

Fire Paramedic Station No. 25 was constructed in 1984 and is not well suited for a mixed gender workforce. Typical staffing at this location is six (6) personnel. There is a community dorm, though there is a dedicated women's washroom. The fitness area is co-located with the dorm. The station layout is adequate, but not optimally designed for effective emergency response. Floors are well worn, and the building appears to be in need of general maintenance. There is a turnout washer, but no washer or dryer for uniforms and bedding. There are no automatic fire sprinkler or alarm systems. Smoke alarms were visible.

A partial interior remodel will resolve the identified issues and improve emergency response. This coupled with routine maintenance and repair would extend the life of the facility. While not an optimal solution, many other stations are in greater need of replacement at this time. The addition of a fire sprinkler system and emergency generator is recommended.

Winnipeg Fire Paramedic Station No. 26
1525 Dakota Street (8,300 s/f)

A two-story building with three apparatus bays, Fire Paramedic Station No. 26 was built in 1991. Typical staffing at this location is six (6) personnel. The station is functional for a mixed gender workforce and laid out well for emergency response. Fitness equipment is located in the dorm space. There is a turnout washer, but no washer or dryer for uniforms and bedding. The station does not have an automatic sprinkler or alarm system. Smoke detectors were visible.

The station is acceptable for emergency response and mixed gender use. General repair and maintenance, such as painting, would be beneficial. Installation of an automatic fire sprinkler system and emergency generator is recommended. Energy audits should be completed.

Winnipeg Fire Paramedic Station No. 27
27 Sage Creek Blvd (7,843 s/f)

Fire Paramedic Station No. 27 was built in 2011 and is one of the newer Winnipeg stations. Typical staffing at this location is six (6) personnel. This single-story building includes drive-through apparatus bays, which eliminates the need to back apparatus into the station. The fitness area is small and a bit cramped. The station has individual dorms and washrooms for both genders. Some rooms in the building appear small, while other seem over-sized. The station is well designed for emergency response. A washer and dryer for uniforms and bedding is available as well as a washer for turnouts. Although a modern station, it is not equipped with an automatic fire sprinkler system.

The station is generally of good design for emergency response and well equipped for a mixed gender workforce. With routine general repair and maintenance, the facility will serve Winnipeg for many years. The installation of an automatic fire sprinkler system and emergency generator is recommended. Energy audits should be conducted.

Winnipeg Fire Paramedic Station No. 30
524 Osborne Street (8,480 s/f)

Fire Paramedic Station No. 30 was constructed in 1914; it is over 100 years old. The two-story building has undergone a number of partial remodels. The station houses Paramedic units as well as Paramedic supervision and training. No fire apparatus are assigned to this location. The number of personnel on duty varies, with as many as eleven (11) at night and typically six (6) during the day. The kitchen is in good condition; however, the remainder of the building is showing its age, being in relatively poor condition. There are washrooms for both genders with a common dorm. It appears that personnel often sleep on couches rather than in the dorm. Supply storage is located in the washroom area. The station is poorly designed for modern equipment and emergency response as well as a challenge for safe egress in the event of a fire or other emergency requiring a quick exit from the building. There are no facilities for washing uniforms or bedding. The station does not have automatic fire sprinkler or alarm systems. Smoke detectors were visible. Energy audits have not been conducted.

In light of its age, condition, and design it is recommend that Station No. 30 be replaced.

Winnipeg Fire Paramedic Station No. 31
726 Furby Street (4,258 s/f)

Fire Paramedic Station No. 31 was built in 1992. Typical staffing is five (5) personnel and no fire apparatus are assigned to this location, which only houses paramedic units. The facility does not have fitness equipment. The dorm and dayroom are combined. Assigned personnel sleep on couches rather than beds. A designated women's washroom is available. This is one of the only stations that is not equipped with an apparatus exhaust extraction system. The building interior is in fair condition. A washer and dryer to clean uniforms is not provided. The station is not equipped with automatic fire sprinkler or alarm systems. Smoke alarms were visible. Energy audits have not been conducted.

Though crews could be reassigned to other fire facilities if effective emergency response can be maintained; the preferred recommendation is to replace this facility due to its small size, lack of a dedicated fitness area, and absence of vehicle exhaust extraction and fire sprinkler systems.

Winnipeg Fire Paramedic Station No. 36
2490 Portage Avenue

Fire Paramedic Station No. 36 was built in 1989. The station houses one paramedic unit with two (2) personnel. There are no fire apparatus assigned to this location. The station has no fitness equipment or workout area. There is a women's washroom. The facility does not have a dorm; personnel sleep on couches in the dayroom. Showers and lockers are available. There are no available facilities for the cleaning of uniforms. The station is not equipped with apparatus exhaust extraction, automatic fire sprinkler or alarm systems. The building is in fair condition. Energy audits have not been conducted.

Due to its size and configuration, it is recommended that Station No. 36 be replaced, or the crew be moved to another station more suited for emergency response personnel.

Emergency Mechanical Services Branch (EMSB)
2546 McPhilips Street (71,287 s/f)

The building housing the Emergency Mechanical Services Branch was originally constructed in 1980. Co-located with EMSB is Fire Training, SCBA repair, turnout repair and maintenance, and general stores. The repair facility is located in a portion of the building which was originally designated for garbage truck repair. The repair area is small relative to the size of the Winnipeg fleet and the shop does not have a lift that would allow them to raise equipment for repair. The facility also has poor lighting, uneven floors, inadequate parts storage, and an under-powered air compressor.

A remodel of the facility with additional work and storage space should be considered. Staffing levels in the shop are low in relation to the volume of repairs and routine maintenance needed to support the fleet. Additional space and organization is necessary before more staffing may be fully utilized. The addition of an automatic fire sprinkler system and emergency generator is also recommended.

Apparatus

A survey of the City of Winnipeg, Manitoba, Canada fire department apparatus fleet was conducted January 23 through 27, 2017. The survey included an interview with the Emergency Mechanical Services Branch Supervisors and several Captains, Lieutenants, and firefighters regarding their assigned apparatus. An inspection was completed on each apparatus with the exception of two that were out to vendors for repair. Inspected apparatus included engines, ladders, squads, rescues, and a variety of specialized units. Staff vehicles and ambulances were not included in the survey.

Winnipeg apparatus receive maintenance based on calendar days with each apparatus scheduled four times per year. Fire department personnel conduct daily inspections and note any issues, which are submitted via computer. Anything requiring immediate repair is submitted to the Emergency Mechanical Services Branch (EMSB) at that time. Minor issues are compiled and resolved during the next scheduled preventative maintenance.

EMSB operates one shift from 0730 to 1600 Monday through Friday. There are currently five full-time Technicians with two being Emergency Vehicle Technicians with Master Certification. EMSB Technicians work exclusively on the fire department's heavy fleet. Light duty vehicles and staff vehicles are not serviced by EMSB. EMSB is authorized for seven positions but has been operating with five for approximately two years.

EMSB appears to be fairly well equipped and able to handle the majority of fire apparatus repairs. Several local commercial truck repair facilities are available to handle warranty issues. Specialized apparatus repair centres are also available for repairs the City Technicians are not trained to complete.

Annual pump testing is conducted by either firefighters assigned to assist EMSB or an EMSB Technician. A mobile pump test unit is utilized for this testing. A sampling of the pump test records was reviewed. Testing appears to utilize standard fire pump test criteria. Apparatus failing a pump test are repaired prior to returning to service. Aerial ladder testing is conducted by a certified contract agent. A sampling of ladder test records was reviewed. Testing and associated documentation follow nationally recognized aerial device testing requirements. Repairs are completed as necessary before returning to service.

Replacement of the fire fleet has not been consistent. Replacement is generally based on age, kilometers, hours, condition, and functionality. An apparatus may only be a few years old but meet the replacement criteria based on hours and kilometers. 10,000 hours and or 161,000 kilometers is generally held as the industry standard for fire apparatus replacement. Numerous apparatus currently meet or exceed this standard and several others are rapidly approaching these criteria. Using this standard, 25 Winnipeg units meet replacement criteria based on hours, 17 apparatus meet replacement criteria based on kilometers, and nine apparatus meet the criteria in both hours and kilometers. This is a significant portion of the existing fire fleet. Due to the department's high call volume, apparatus age, for all but the specialty response units, is not a practical replacement factor.

Many of the apparatus are in fair or good condition mechanically; though the harsh weather and road conditions have caused extensive corrosion and paint damage. Virtually all of the existing apparatus show signs of this type of damage along with a number of dents, scratches, bent bumpers, and loose interior parts. In discussion with EMSB, they indicate that these repairs are often not completed if they appear to be cosmetic wear. If the damage appears to be more than cosmetic, they remove the unit from service for repair. Crews indicate the current design of apparatus is functional.

Recommendations and Considerations

Fully staffing EMSB to seven technicians is essential. In addition, a full-time Parts Clerk should be considered. Mechanical Supervisors obtaining parts, maintaining inventory, and receiving deliveries are all taking away from their core mission. A dedicated parts person would assist with productivity as well as researching parts, pricing, and availability. All EMSB staff should obtain Emergency Vehicle Technician (EVT) certification status.

Consideration should be given to a preventative maintenance schedule based on hours of operation. Scheduled maintenance at intervals of 300 hours is generally considered the industry norm. This would likely mean that some apparatus will receive preventative maintenance more often, while others may be serviced less frequently. Annual service is the recommended minimum for all apparatus regardless of hours.

With more than 70 percent of Winnipeg's fire apparatus currently meeting industry standard replacement criteria and additional units soon to meet the criteria (in kilometers & hours), an aggressive fully funded replacement schedule needs to be established. While it is recognized that it will take a significant investment to bring the status of the fleet to a reasonable level, it is critical that this program be implemented. While it is possible to operate with a high kilometer, high hour fleet; it comes with extensive repair costs and significant out of service time. This places more burden on the reserve fleet and maintenance staff, and the potential of delayed response due to apparatus issues.

To help with reducing the cost of new apparatus the department may want to review the current engine configuration. For example, the existing fleet for the most part utilizes 6,624 lpm (1,750 gpm) pumps. Fire flow requirements should be evaluated. Specifying smaller pumps in new apparatus to be used in more residential areas where less fire flow is required, for example a 5,678 lpm (1,500 gpm) or 4,731 lpm (1,250 gpm) pump, allows for a smaller motor, which may lead to procurement savings.

Ladder trucks are a significant cost to all departments. As Winnipeg replaces older units, the department may want to look at various ladder options. The current fleet includes a platform and a Bronto as well as an assortment of other aerial designs. Straight stick ladders are generally less expensive. A mix of ladder types will provide for different capabilities. An evaluation of the apparatus ladder type best suited should be conducted prior to replacement.

The current practice of moving apparatus from a busy station to a slower station to even out the kilometers and hours should be re-evaluated. While this practice may extend the life of the fleet, it could come at significant cost as all apparatus come due for replacement at approximately the same time. Replacing busy units more frequently than slower units provides for a much more consistent replacement schedule and spreads the costs out more evenly.

Current practice is to replace all loose equipment at the time new apparatus is purchased. An evaluation of the loose equipment should be conducted, and only worn or outdated equipment should be considered for replacement. Equipment with remaining service life should be re-used in the new apparatus to help minimize costs. Evaluate the feasibility of replacing pre-plumbed foam systems with eductor systems on future apparatus.

Dents, scrapes, and corrosion damage should be repaired as quickly as feasible. These repairs will extend the life of the apparatus and inspire the crews to be more diligent in the care of the equipment. Overall engine design should be continually re-evaluated to assure that the current configuration continues to meet the needs of the department.

The following figure lists the current station assignment for each firefighting apparatus (as of January 27, 2017), the unit designator, the year in which the apparatus was built (if available), and the relative condition of the unit physically. Due to the lack of availability of paramedic units during the site visit, maintenance records were used to identify odometer readings rather than approximating unit condition. A more specific inventory of each firefighting apparatus is described in Appendix D of this report.

Figure 121: Apparatus Inventory and Approximate Condition

Station	Apparatus or Assignment	Year Built	Condition
Station 1	Engine 101	2015	Good
	Engine 103	2013	Good
	Ladder 1	2016	Good
	Squad 101	2008	Fair
	Squad 102	2001	Fair
	Platoon Chief	—	—
	EMS Supt.	—	—
	MIRV	—	—
	PU91	2016	28,636 kms
	PU31	2015	43,407 kms
Station 2	Engine 2	2015	Good
	Fire Invest.	—	—
	PU02	2016	28,013 kms
	PU40	2016	78,211 kms
Station 3	Engine 3	2008	Good
	Water 3	1988	Fair
	DC3	—	—
Station 4	Engine 4	2013	Good
	Rescue 4	2015	Good
	DC4	—	—
Station 5	Engine 5	2015	Good
	Rescue 5	2013	Good
	PSO	—	—
	PU05	2015	83,306 kms
	PU92	2016	31,667 kms
Station 6	Engine 6	2015	Good
	Rescue 6	2013	Good
	Squad 6	2006	Fair
	PU06	2015	93,360 kms
Station 7	Engine 7	2008	Good
	HazMat 7	1997	Fair
	Rehab Unit 7	1984	Fair
Station 8	Engine 8	2008	Good
	Rescue 8	1994	Fair
Station 9	Engine 9	2005	Good
	Rescue 9	2001	Fair
	HazMat 9	1996	Fair
Station 10	Engine 10	2008	Good
	DC10	—	—
Station 11	Engine 11	2013	Good
	Rescue 11	2005	Good
	Ladder 11	2008	Good
	PU11	2016	44,485 kms
	MS75	—	—
Station 12	Engine 12	2013	Good
	PU12	2016	57,116 kms

Station	Apparatus or Assignment	Year Built	Condition
Station 13	Engine 13	2008	Good
	Ladder 13	2001	Good
	PU13	2016	33,612 kms
	W131 Boat	2009	Good
Station 14	Engine 14	2008	Good
	PU14	2016	40,019
Station 15	Engine 15	2004	Good
Station 16	Engine 16	2008	Good
	Ladder 16	2005	Good
	PU16	2015	70,498 kms
Station 17	Engine 17	2004	Good
Station 18	Engine 18	2013	Good
	PU18	2016	35,212 kms
Station 19	Engine 19	2001	Good
Station 20	Engine 20	2008	Good
	PU20	2015	78,328 kms
Station 21	Engine 21	2013	Good
	Ladder 21	2005	Good
	PU49	2015	55,837 kms
Station 22	Engine 22	2008	Good
	PU22	2016	30,226 kms
Station 23	Engine 23	2006	Good
	Engine 231	2006	Good
	W23 Boat	1987	Fair
	T23	—	—
Station 24	Engine 24	2008	Good
	D4	—	—
	PU24	2016	32,479 kms
Station 25	Engine 25	2008	Good
	PU25	2014	102,854 kms
	Snuffer 25	1995	Good
Station 26	Engine 26	2005	Good
	PU26	2014	72,734 kms
Station 27	Engine 27	2006	Good
	PU27	2016	41,996 kms
Station 30	PU 17	2016	47,407 kms
	PU 43	2010	171,989 kms
	EPIC	—	—
Station 31	PU 01	2016	26,329 kms
	PU 41	2014	123,745 kms
	PU 45	2011	132,450 kms
Station 36	PU 36	2015	55,905

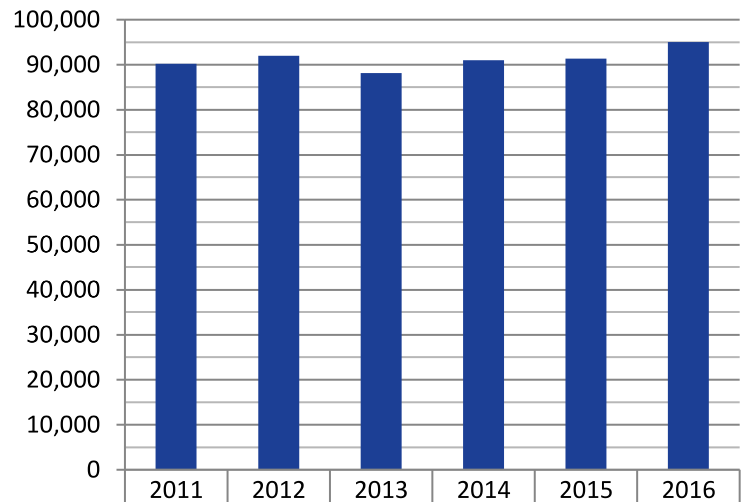
Service Delivery and Performance

The delivery of fire department emergency services is no more effective than the sum of its parts. It requires efficient notification of an emergency and a rapid response from well-located facilities in appropriate apparatus with a sufficient number of well-trained personnel following a plan of action. This section provides an analysis of current service delivery and response performance in the Winnipeg Fire Paramedic Service (WFPS) service area.

Demand Study

The demand study examines current and historical service demand by incident type and temporal variation. GIS software provides a geographic display of demand. The following figure demonstrates WFPS historical service demand from 2011 through 2016.

Figure 122: WFPS Historical Service Demand, 2011–2016

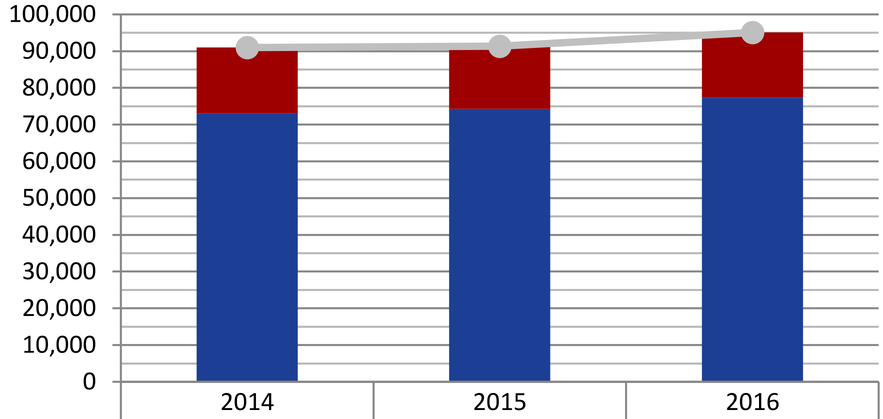


	2011	2012	2013	2014	2015	2016
Overall Service Demand	90,240	91,970	88,164	90,981	91,315	95,069

Overall, service demand increased by over five percent (5.4 percent) between 2011 and 2016. Demand for WFPS services decreased by approximately 2.3 percent between 2011 and the end of 2013. Between 2013 and 2016, service demand grew by 7.8 percent.

In the incident data provided by WFPS, incidents are delineated into two broad categories, EMS incidents that may or may not require a WFPS transport unit (ambulance) are identified as "WAD" in the incident data. Other incidents where the primary response unit is a fire apparatus are identified as a "WFD" incident. The following figure displays 2014 through 2016 service demand summarized by Call Type.

Figure 123: WFPS Service Demand by Call Type, 2014–2016



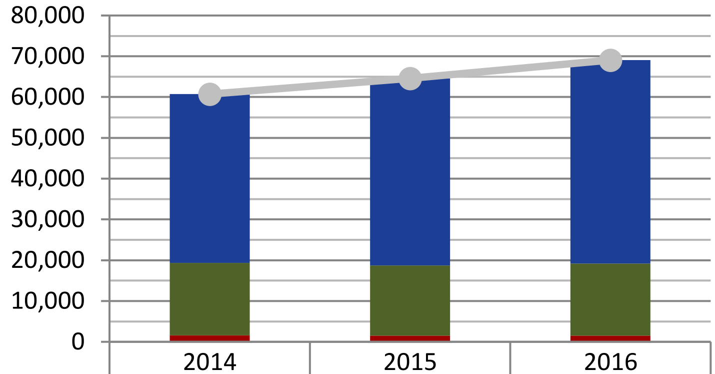
	2014	2015	2016
WFD	17,901	17,056	17,729
WAD	73,080	74,259	77,340
Total	90,981	91,315	95,069

Demand for WFPS EMS services (WAD incidents) grew by nearly six percent between 2014 and 2016 (5.8 percent). Fire operations division (WFD) service demand decreased by approximately one percent during the same time. Overall, service demand increased by 4.5 percent for the period displayed. It is important to note that while WFD incidents decreased slightly, workload for both WAD and WFD units increased during the time displayed; since WFD units respond to most WAD scene calls as a first responder.

Overall, EMS incidents represent approximately 81 percent of WFPS service demand; the remaining 19 percent of incidents are identified as Fire Division responses in the WFPS data. WFPS utilizes Fire Division apparatus and personnel as first responders for EMS incidents categorized as WAD responses. This improves response time performance and insures that adequate personnel are on scene to assist EMS personnel.

Incidents categorized as a WFD incident represent approximately 19 percent of total service demand; however, EMS (WAD) incidents represent a significant portion of Winnipeg Fire Division workload. The following figures use WFPS Fire Division (WFD) annual response data to display overall WFD workload and service demand categorized as Fire (any incident coded as an actual fire), EMS (incidents coded as a First Responder), and Other incidents (alarms-no fire, Haz-Mat incidents, rescue incidents, cancelled calls, and other miscellaneous incidents).

Figure 124: Winnipeg Fire Division (WFD) Service Demand, 2014–2016



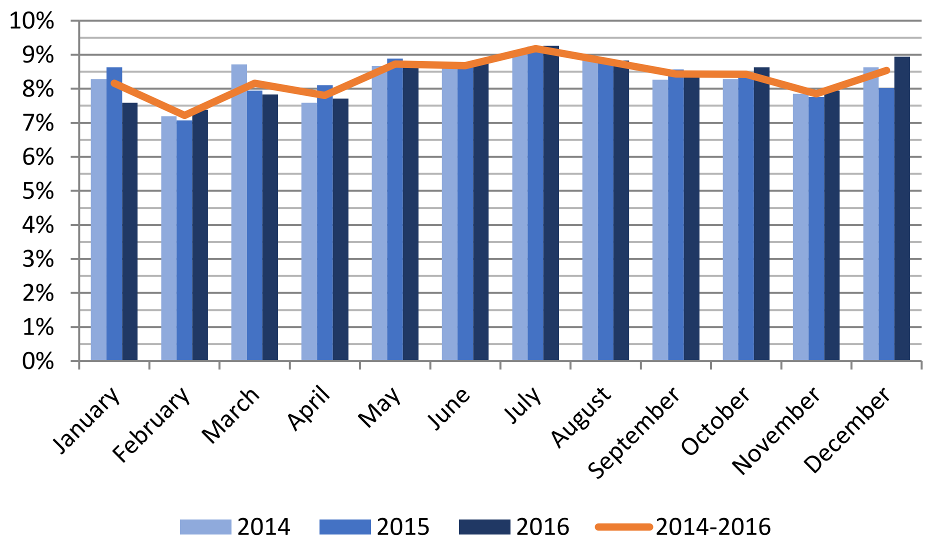
	2014	2015	2016
EMS	41,392	45,850	49,865
Other	17,735	17,176	17,710
Fire	1,596	1,535	1,496
Total WFD Workload	60,723	64,561	69,071

During 2016, WFPS fire units responded to over 49,800 (64 percent) of the approximately 77,340 incidents classified as an ambulance division (WAD) incident. WFD “Fire” and “Other” service demand remained flat between 2014 and 2016. However, WFD EMS first responder service demand increased by over 20 percent (20.5 percent). Overall, EMS incidents represent over 70 percent (70.5 percent) of WFD responses between 2014 and 2016.

Temporal Variation

It is useful to evaluate service demand temporally to determine if there are specific trends during certain periods where staffing can be modified to better fit the demand. The following figures display total service demand from 2014 to 2016, summarized by various measures of time.

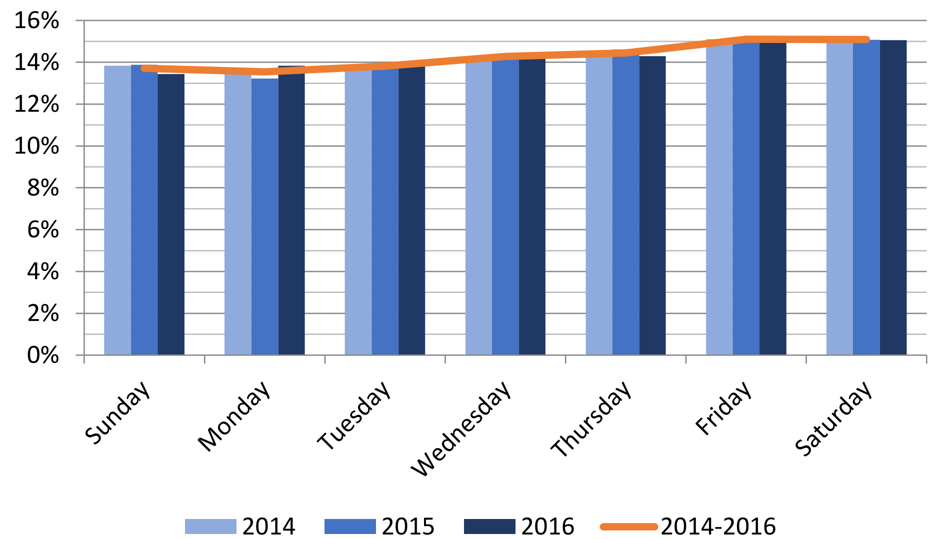
Figure 125: Service Demand by Month of the Year, 2014–2016



On average, WFPS responded to over 7,700 (7,705) incidents per month. Service demand varied within a range of 2.2 percent per month throughout the year. In general, the lowest service demand occurs during February, April, and November with June, July, and August demonstrating the greatest service demand over the three-year period displayed.

The next figure summarizes 2014 through 2016 service demand by day of the week.

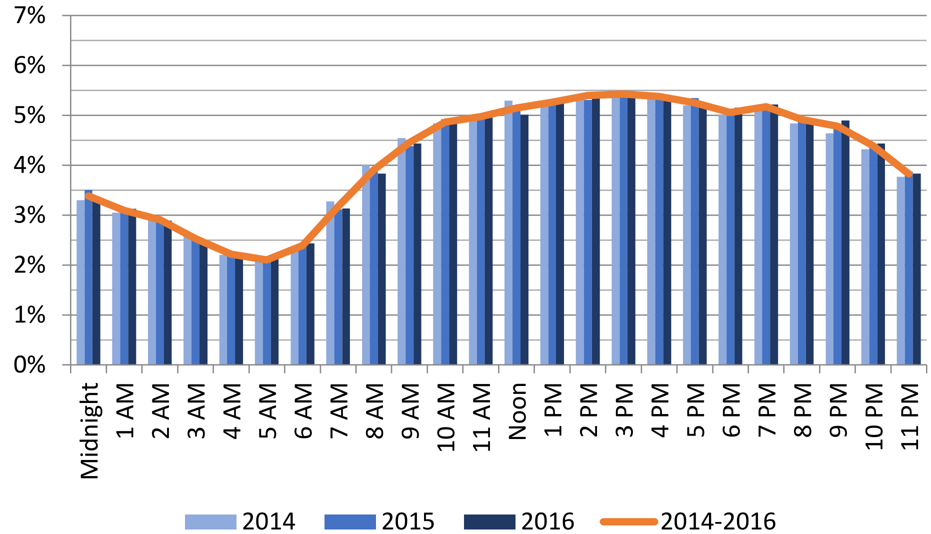
Figure 126: Service Demand by Day of the Week, 2014–2016



Over the three-year period displayed, service demand by day of the week varies within a range of approximately 1.6 percent. Fridays and Saturdays demonstrate the highest service demand. Overall, Mondays and Tuesdays demonstrate the lowest demand for WFPS services.

The greatest temporal variation in service demand is displayed when incident activity is examined by time of the day. The last figure in the temporal analysis displays service demand summarized by the hour of day.

Figure 127: Service Demand by Hour of the Day, 2014–2016

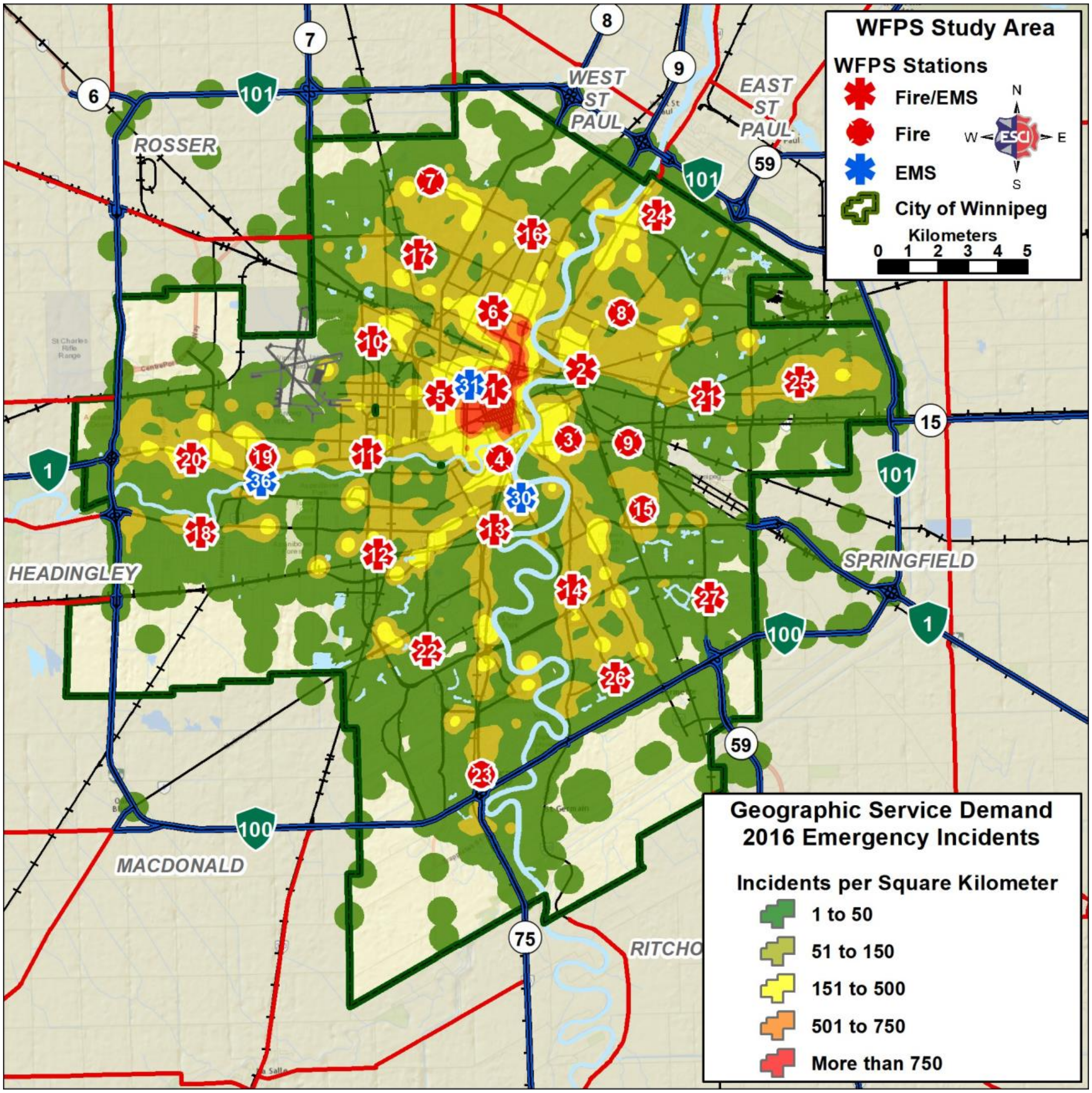


WFPS service demand correlates with the activity of people, with workload increasing during daytime hours and decreasing during nighttime hours as shown in this figure. Service demand begins to increase as the work day begins and peaks in the mid-afternoon; decreasing in the late evening. Approximately 60 percent of calls for service occurred between 08:00 AM and 08:00 PM. This is a predictable increase in service demand during the day. WFPS has anticipated the increased workload, primarily EMS incidents; and improved response reliability and performance by deploying additional EMS units during the periods of peak activity.

Geographic Service Demand

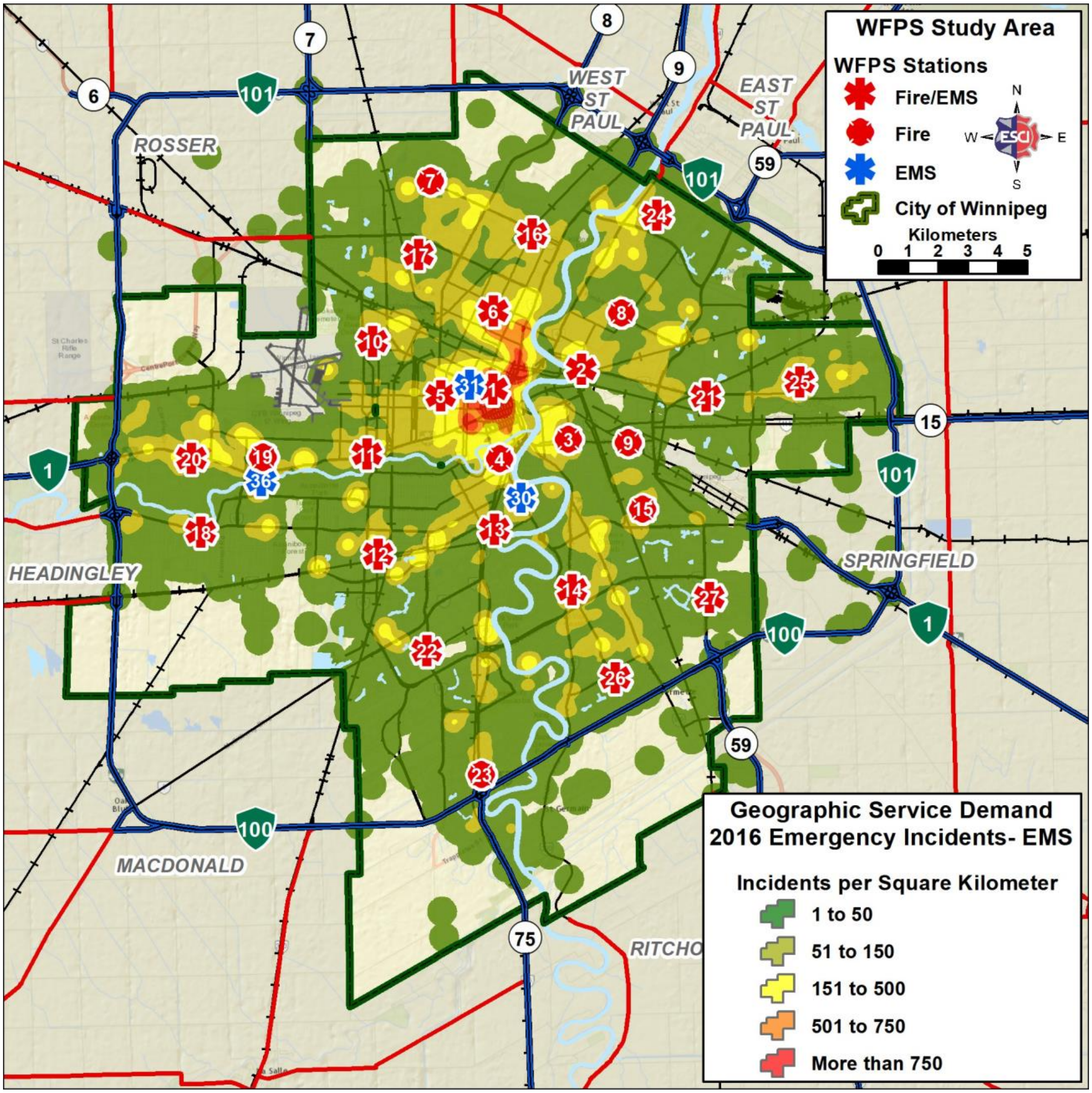
In addition to the temporal analysis of service demand, it is useful to examine the geographic distribution of service demand. Using incident location data provided by WFPS, ESCI plotted incidents and calculated the mathematical density of 2016 emergency service demand in the WFPS service area.

Figure 128: WFPS Geographic Service Demand, All Emergency Incidents, 2016



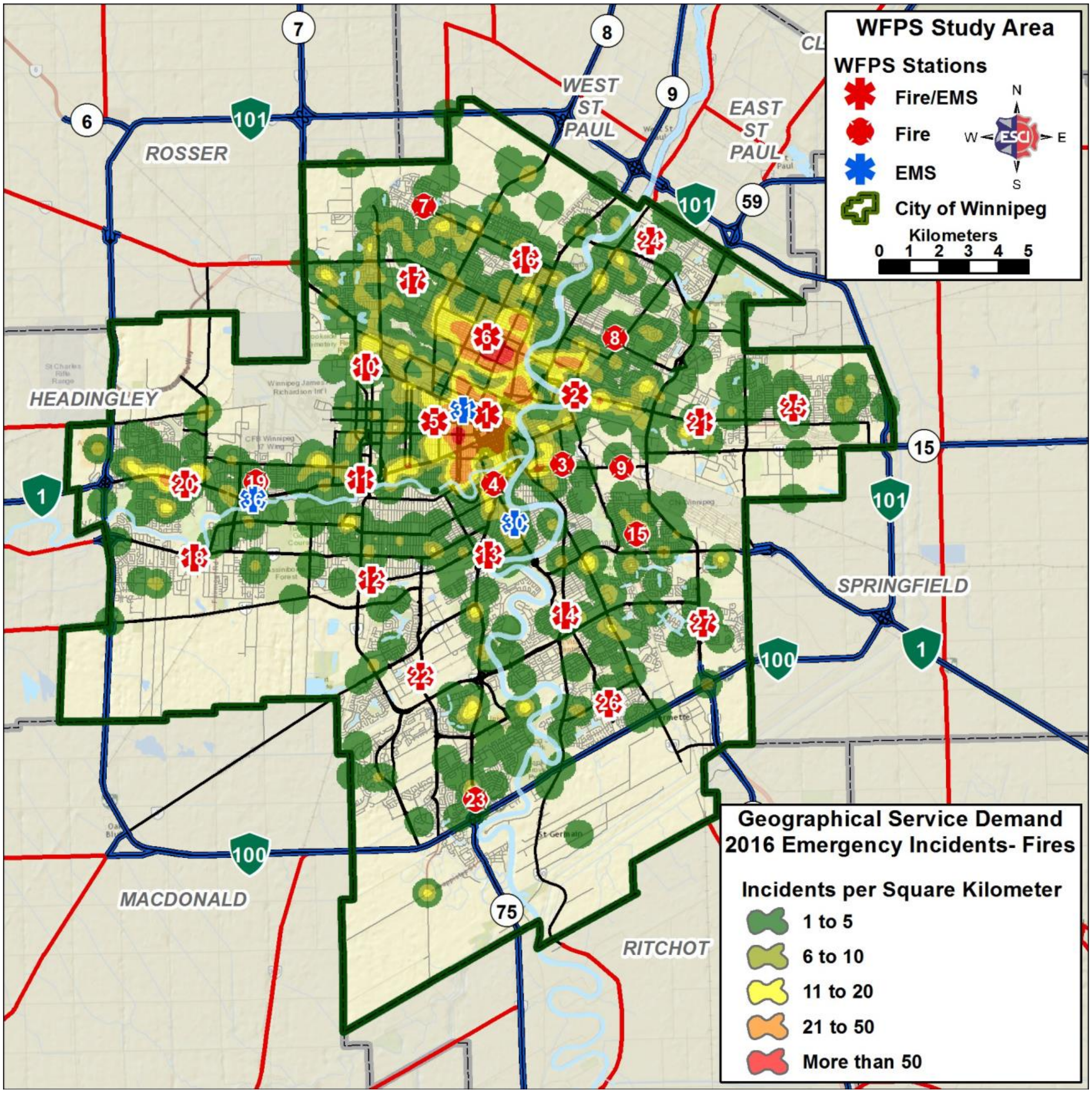
WFPS emergency service demand is distributed throughout Winnipeg. The core downtown area experienced the highest incident density in 2016, primarily in the first in districts of Stations 1, 4, and 6. Appropriately this area is served by the highest concentration of WFPS stations. As previously discussed, EMS incidents represent the majority of WFPS service demand. The next figure illustrates 2016 EMS emergency incident density.

Figure 129: WFPS Geographic Service Demand, Emergency EMS Incidents, 2016



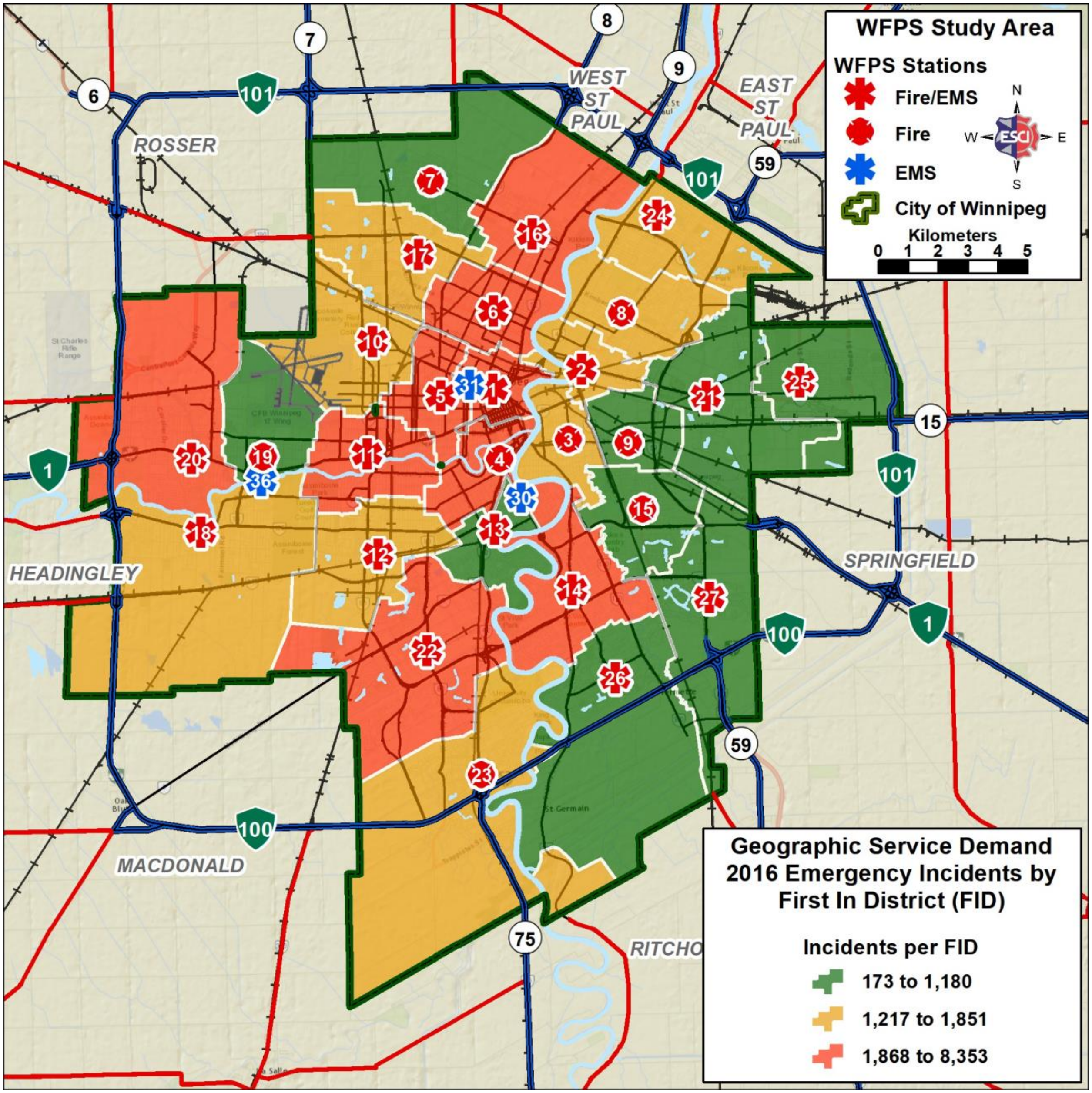
Not surprisingly, EMS emergency incident density is similar to the overall incident density displayed in Figure 128 since EMS comprises the majority of emergency responses in Winnipeg. The following figure displays incident density for any emergency incident coded as a fire in the WFPS data for 2016.

Figure 130: WFPS Geographic Service Demand, Emergency Fire Incidents, 2016



While the number of fires per square kilometer is much lower than the overall for EMS incident density, fire incidents are distributed in a similar pattern to that displayed in the previous figures.

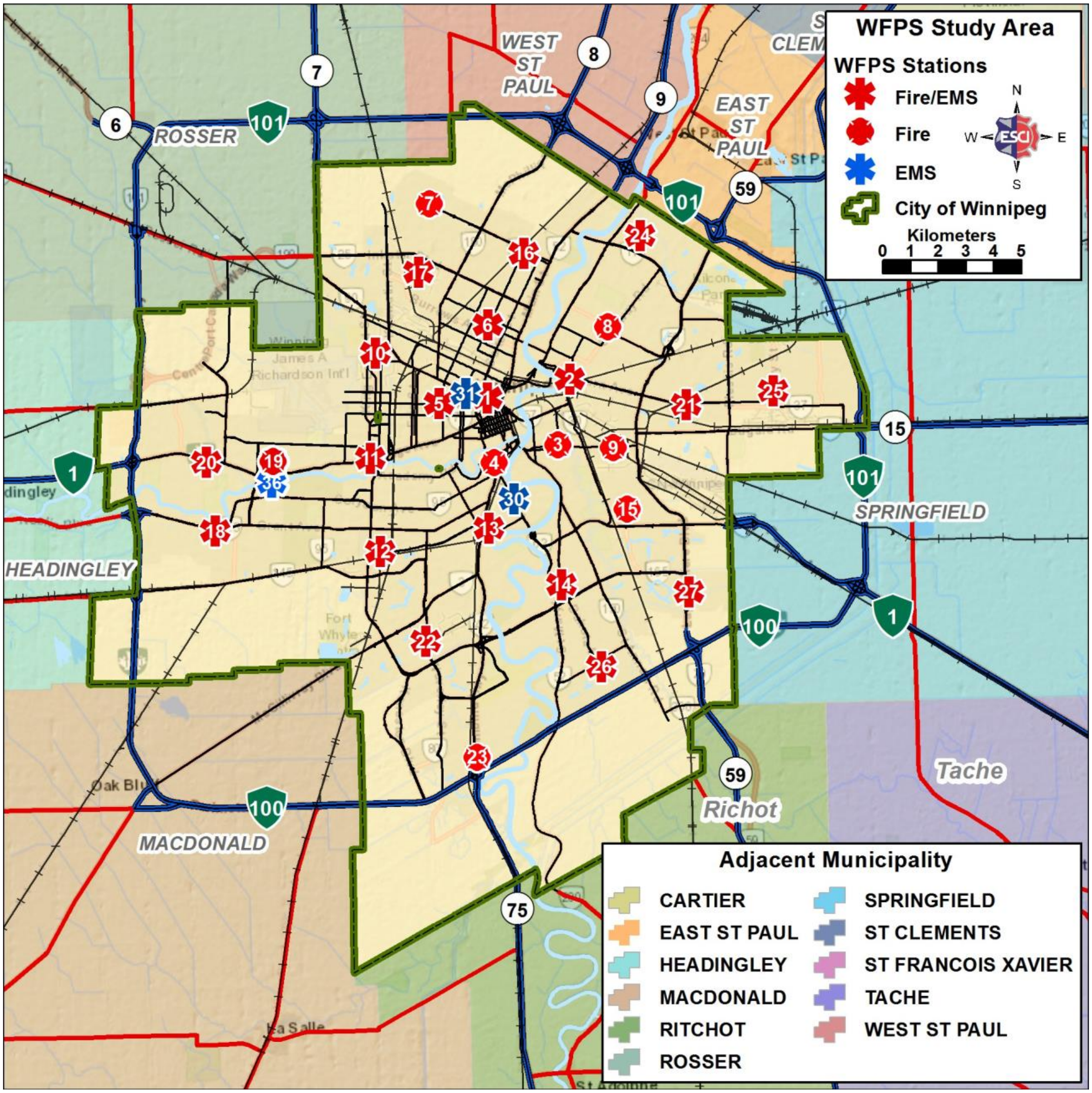
Figure 131: WFPS Emergency Incidents by First In District (FID)



Distribution Study

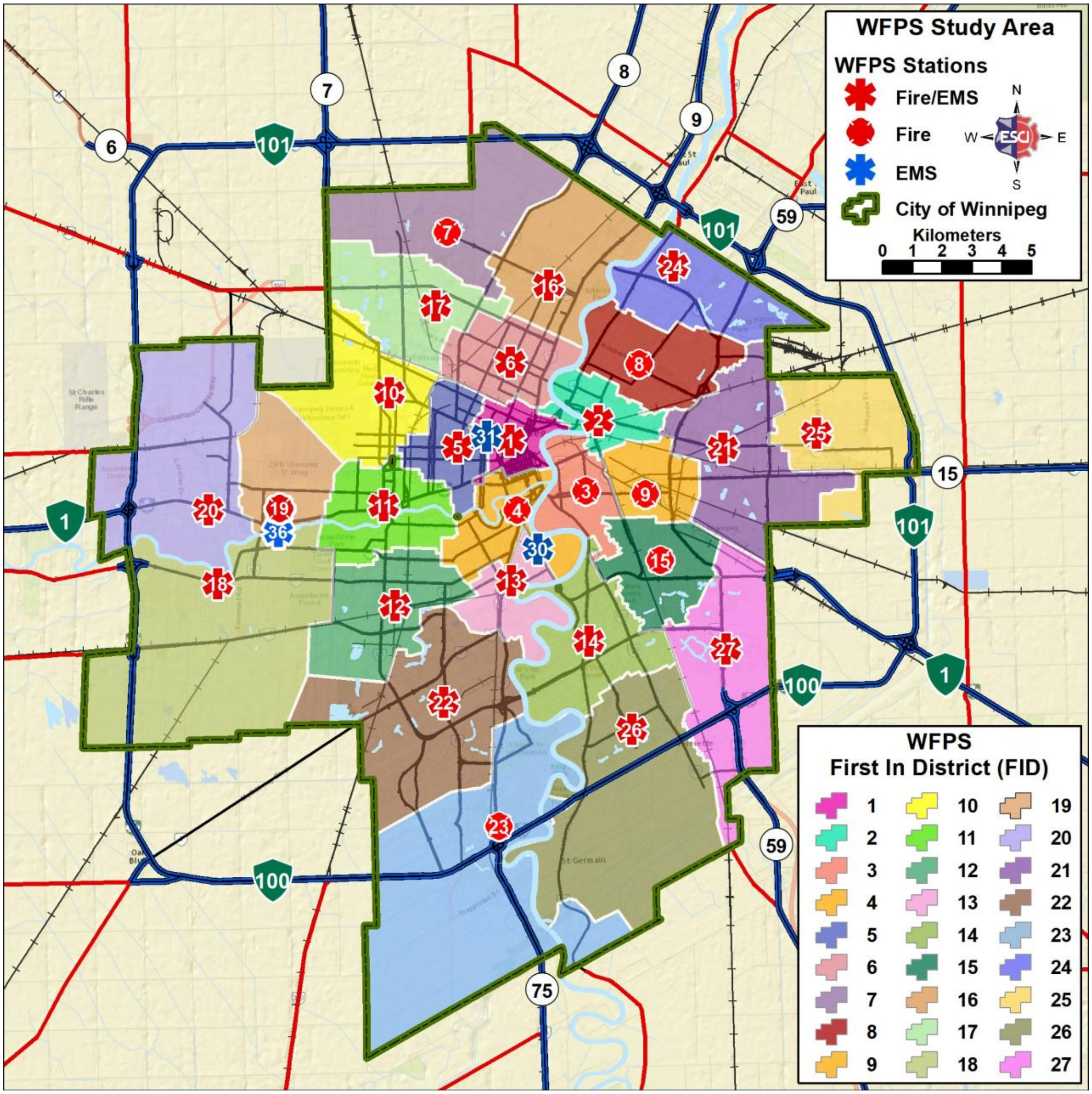
The distribution analysis presents an overview of the current deployment of WFPS facilities, apparatus, and personnel in the Winnipeg service area.

Figure 132: WFPS Service Area



WFPS is an all hazards fire and EMS department serving the City of Winnipeg. WFPS provides fire protection and EMS advanced life support (ALS) and basic life support (BLS) first responder and transport service within Winnipeg. The WFPS service area encompasses approximately 475 square kilometers (475.2) and is bounded by the rural municipalities displayed in Figure 132.

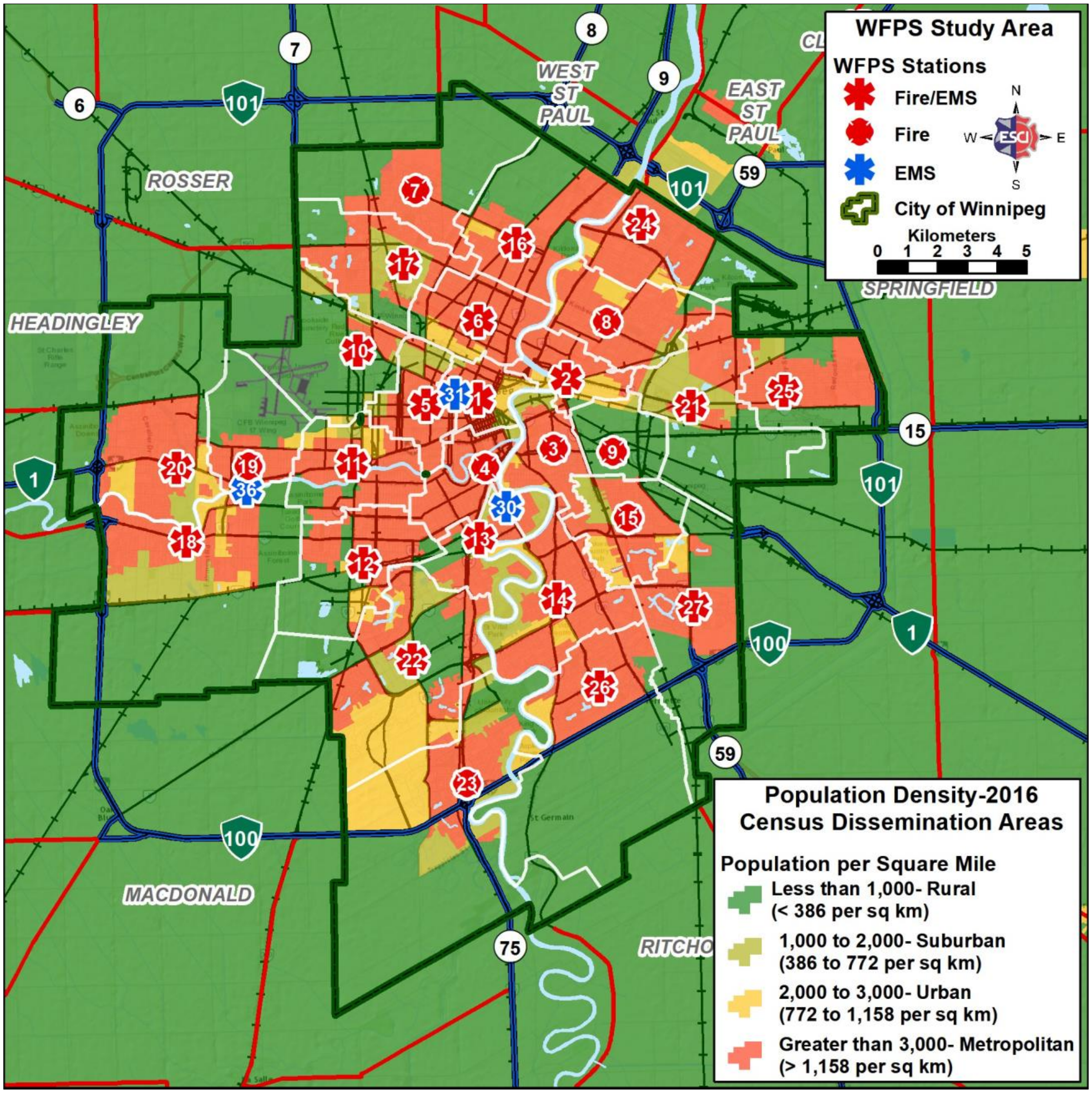
Figure 133: WFPS Fire Districts



WFPS currently operates from the 30 stations displayed in this figure. Fire and EMS transport resources are distributed throughout the service area; with some stations staffed exclusively with fire resources and three stations staffed with additional EMS units. The majority of WFPS stations house both fire and EMS transport units. Geographically, the service area is divided into 27 first in districts (FIDs).

The following figure displays the distribution of the approximately 726,700[85] individuals residing in Winnipeg. Statistics Canada 2016 Census data is utilized to categorize population per square mile as metropolitan, urban, suburban, and rural; based on the definitions of the Center for Public Safety Excellence/Commission on Fire Accreditation (CPSE/CFAI) *Standards of Cover, 5th Edition*.

Figure 134: WFPS Population Density

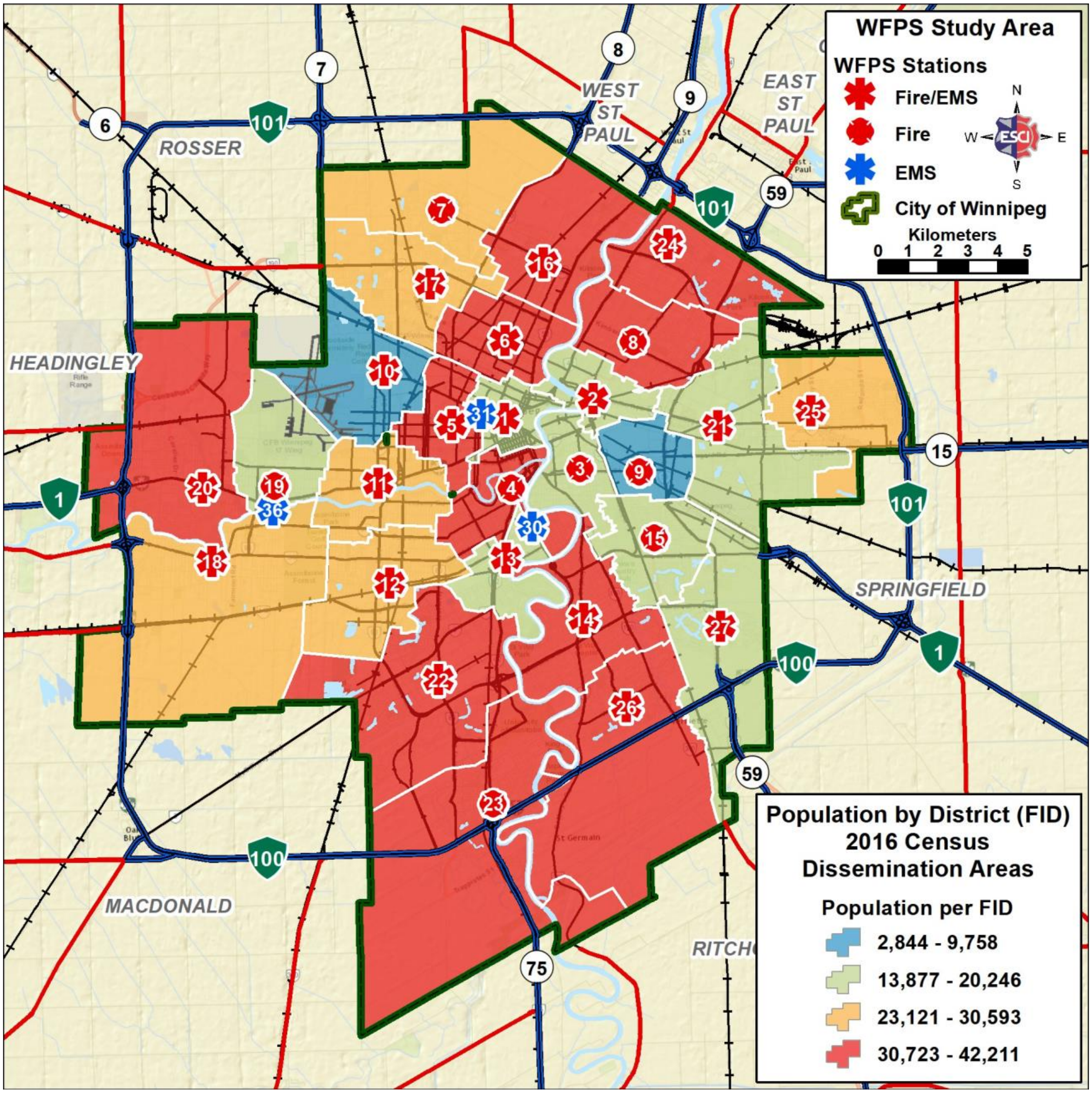


[85] City of Winnipeg 2016 Population, Housing, and Economic Forecast.

With an estimated population of 726,700 and an area of 475 square kilometers the overall population density within Winnipeg is approximately 1,532 per square kilometer; which constitutes a "large population centre" according to the definitions of Statistics Canada. Winnipeg is identified as the seventh largest population centre in Canada in Statistics Canada literature. Using the CPSE/CFAI classifications of population density, Winnipeg is considered a metropolitan city. The overall population density within the WFPS service area is approximately 3,971 per square mile.

The following figure displays the distribution of the population within Winnipeg, summarized by the WFPS geographic reporting districts (first in district or FID).

Figure 135: WFPS Population by First in District (FID)



Statistics Canada 2016 Census dissemination areas are a geographic subdivision of census tracts. Using the dissemination area population data, ESCI provides an estimated population within each of the WFPS reporting districts. The population per FID varies from a low of 2,844 in the Station 9 district to a high of over 42,000 (42,211) in the Station 4 reporting district.

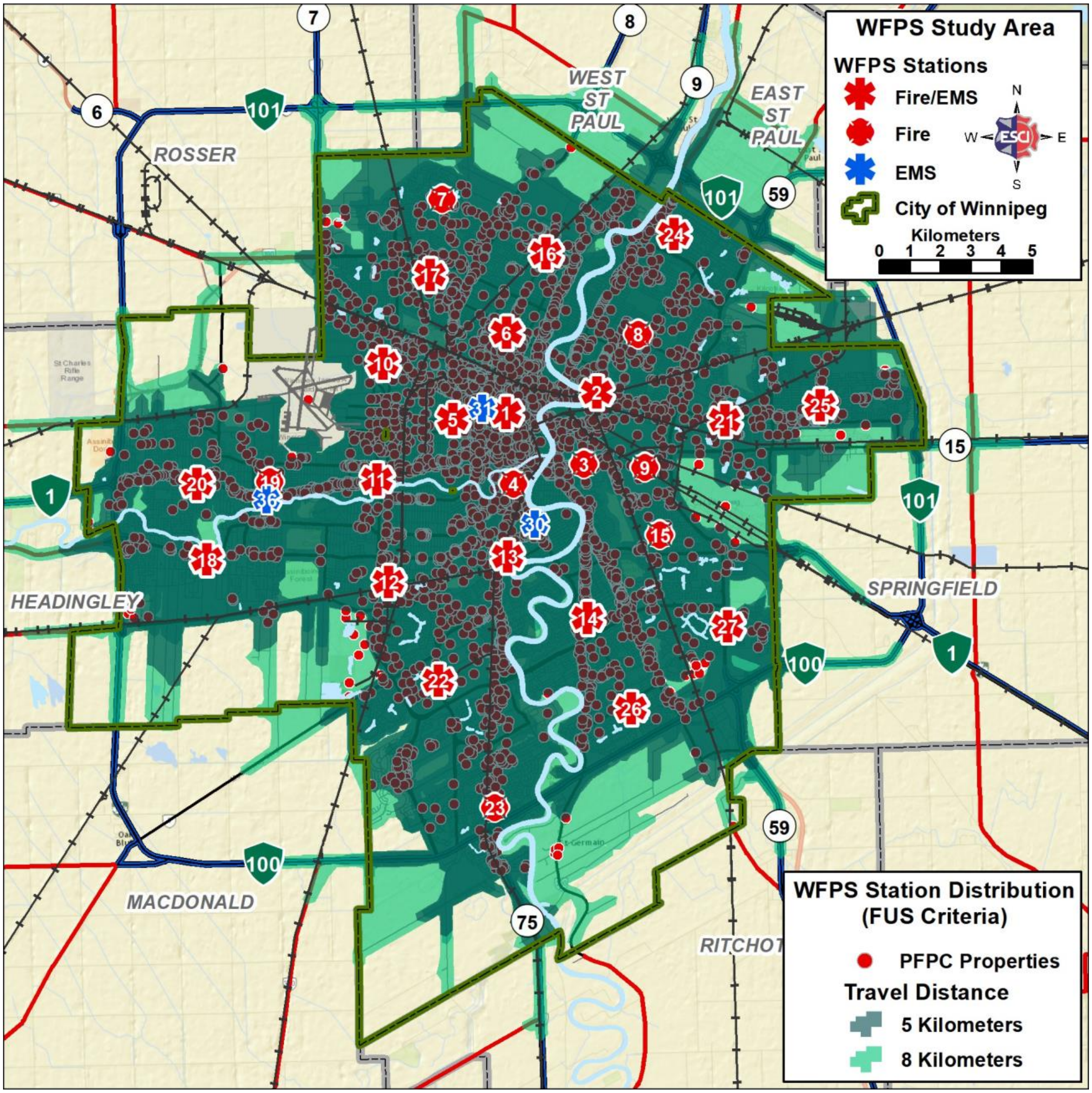
The Fire Underwriters Survey (FUS) is a national organization of private sector property and casualty insurance providers. FUS provides data from surveys of fire protection programs for all incorporated and unincorporated communities throughout Canada. The results of these surveys are utilized by insurance providers to establish the Public Fire Protection Classification (PFPC) and Dwelling Protection Grade (DPG) within a community.

The PFPC is a numerical grading system with Class 1 representing exemplary fire protection and Class 10 indicating little or no fire protection; which pertains to fire protection of multifamily residential, commercial, industrial, and institutional properties. The PFPC does not apply to properties beyond five kilometers travel over the existing road network from a recognized fire station.

The DPG is a numerical grading scale of 1 to 5 (1 being the highest grade and 5 is little or no fire protection); and assesses the protection of structures such as single-family residential properties. Properties must be within eight kilometers of a recognized fire paramedic station to receive a Dwelling Protection Grade (DPG).

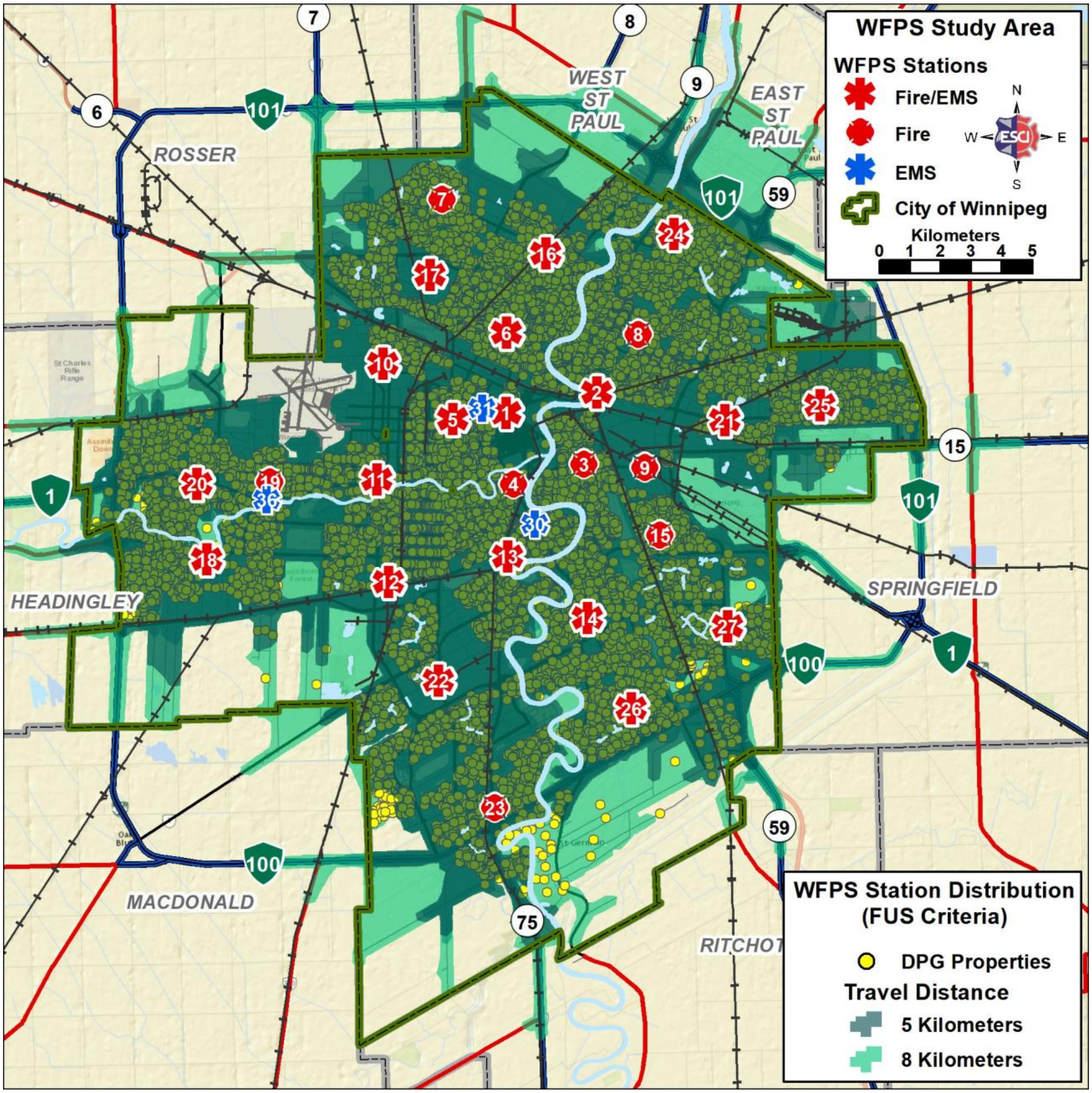
The following figures examine the distribution of WFPS stations based on the Fire Underwriters Survey (FUS) rating criteria.

Figure 136: WFPS Station Distribution, FUS PFPC Criteria



Ninety-eight percent of properties zoned as multifamily residential, commercial, industrial, or institutional (PFPC properties) are within 5 kilometers travel of a WFPS fire station.

Figure 137: WFPS Station Distribution, FUS DPG Criteria

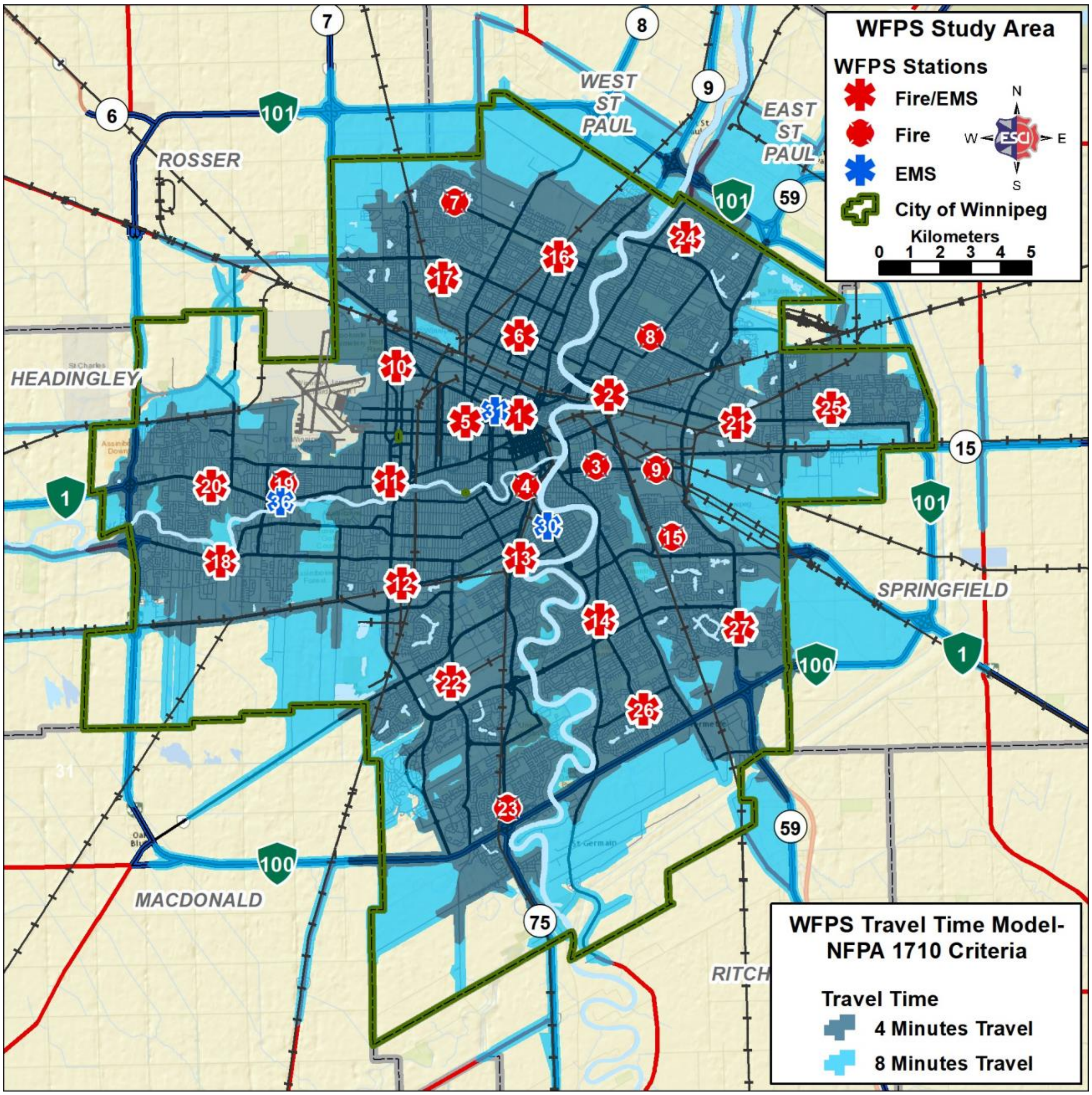


As in the previous figure, Figure 137 reveals that nearly all (99 percent) of the properties zoned as single or two family residential dwellings (DPG properties) are within 8 kilometers travel of a fire station. Note that travel time from the three EMS stations (30, 31, and 36) is not modeled in these figures.

In general, the WFPS fire stations are well located, based on the credentialing criteria of the Fire Underwriters Survey. The most recent FUS evaluation, completed in 2014, assigned the City of Winnipeg an overall PFPC grade of Class 4 for PFPC properties; and a DPG grade of Class 1 for DPG properties (Class 1 being the highest rating for both PFPC and DPG properties). The FUS rating and evaluation process is a complicated and proprietary process. The 2014 Fire Insurance Grading Review, conducted by SCM—Opta Information Intelligence™, provided 40 recommendations for WFPS leaders to consider.

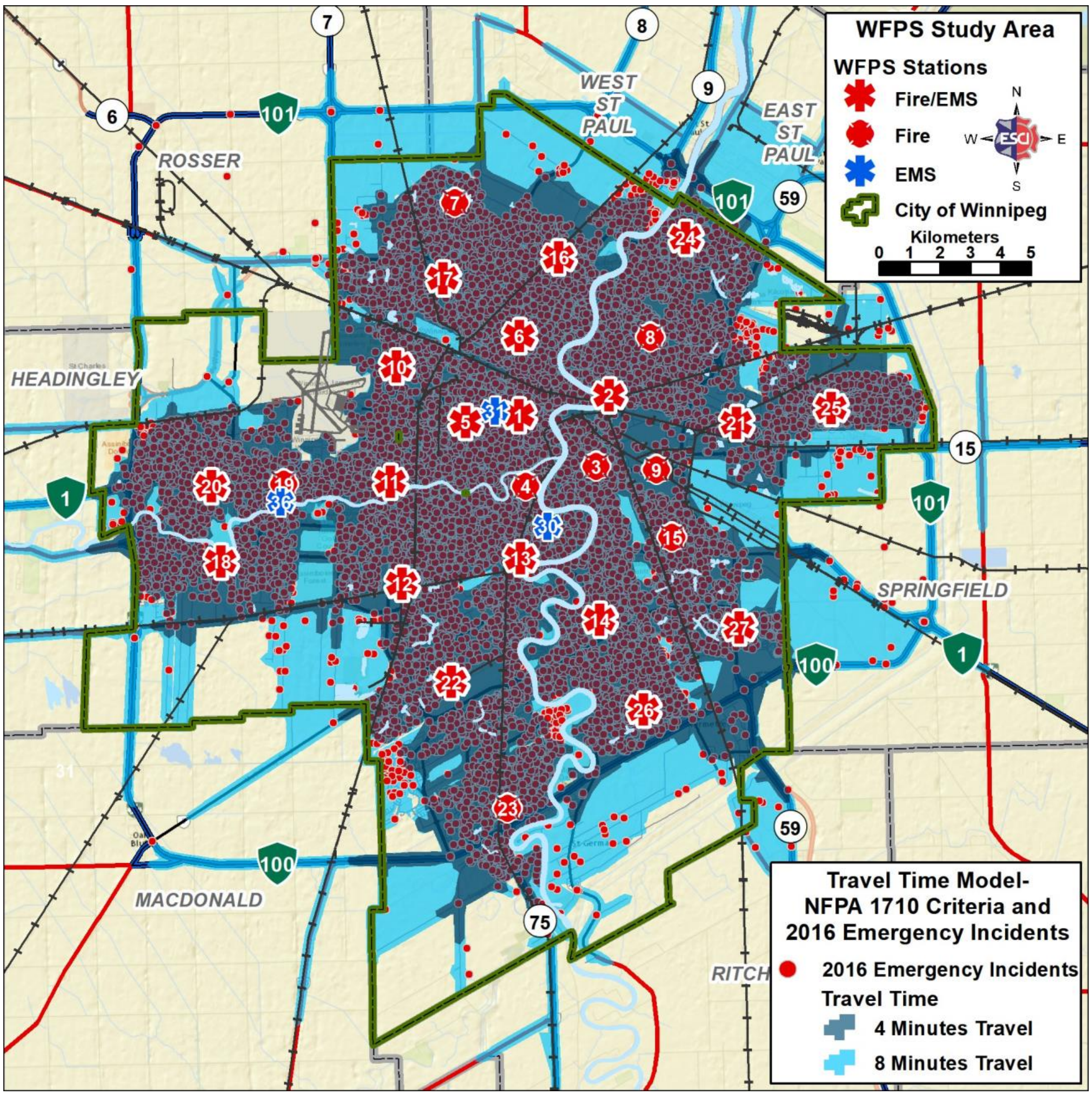
The Fire Underwriters Survey only addresses fire suppression activity; and is primarily concerned with a community's fire protection programs. For jurisdictions such as WFPS that respond to all types of emergencies and provide EMS transport; the travel time required to respond from a fire paramedic station to any type of emergency call for service is of equal importance. The following figures demonstrate travel time over the existing road network. Travel time is calculated using the posted speed limit and adjusted for negotiating turns and intersections.

Figure 138: WFPS Travel Time Model, NFPA 1710 Criteria



Fire service industry best practices documents such as the National Fire Protection Association (NFPA) 1710 Standard for Career Fire Departments, specify that career staffed, urban fire departments should deploy resources such that 90 percent of emergency service demand can be reached in four minutes travel or less.[86] Additionally, NFPA 1710 recommends that a full first alarm assignment should arrive in eight minutes' travel or less at a fire suppression incident (measured at the 90th percentile). The preceding figure demonstrates that the current deployment of WFPS resources provides good coverage to the most heavily populated and developed portions of Winnipeg. The following figure displays 2016 emergency service demand and the four- and eight-minute travel time model.

Figure 139: WFPS 2016 Emergency Service Demand and Travel Time Model



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[86] NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (National Fire Protection Association, 2016).

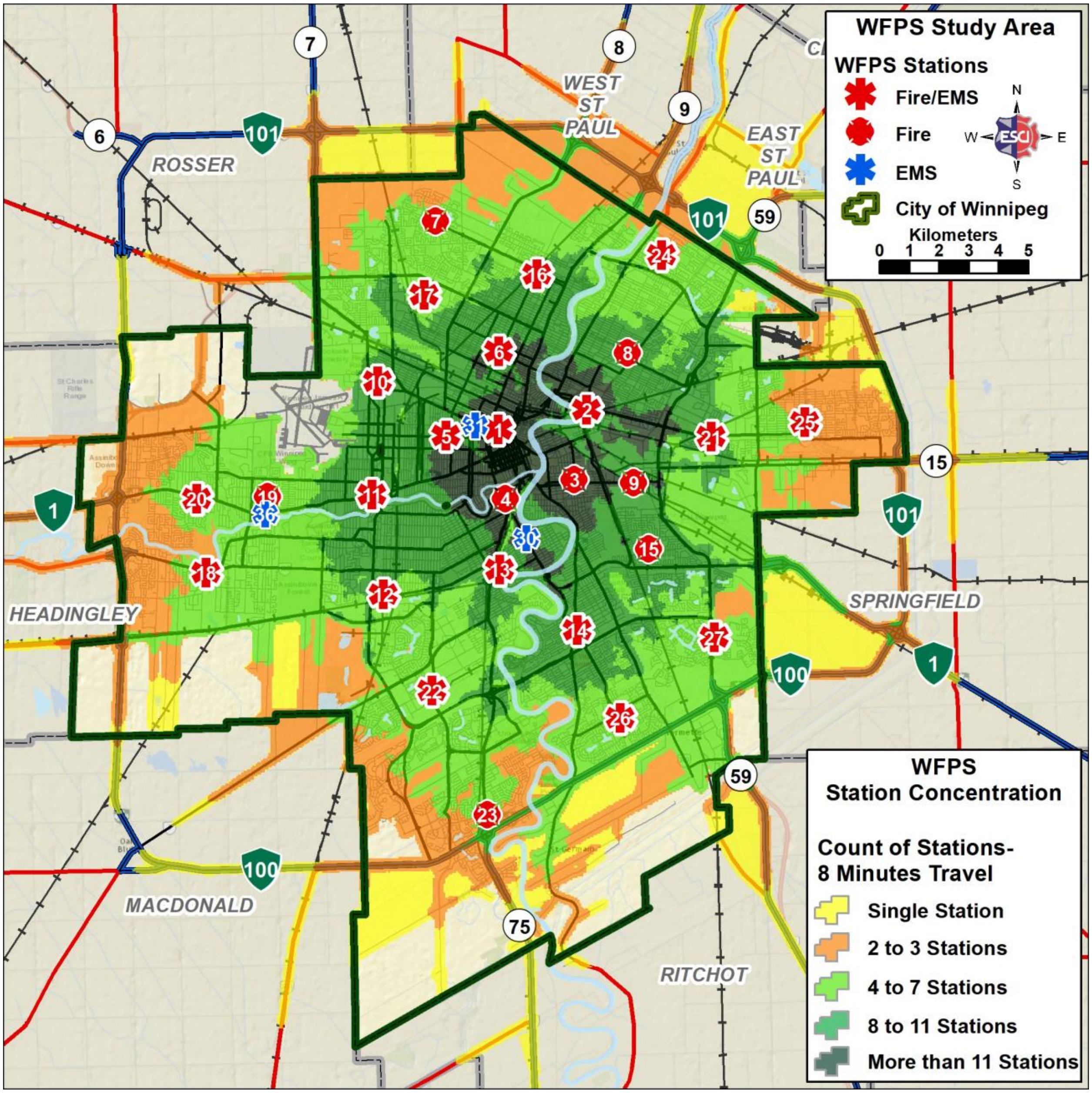
Figure 139 illustrates that based on the four-minute travel time model; WFPS apparatus can theoretically reach approximately 97 percent of current service demand in four minutes or less travel time. Note this analysis does not include incidents outside of the City of Winnipeg. Actual WFPS travel time and response time performance is discussed in the Response Performance Analysis later in this report.

Concentration Study

Accepted firefighting procedures call for the arrival of the entire initial assignment or effective firefighting force (sufficient apparatus and personnel to effectively mitigate an emergency based on its level of risk) within a reasonable amount of time. This is to ensure that enough people and equipment arrive soon enough to safely control a fire or mitigate any emergency before there is substantial damage or injury.

The following figure displays the concentration of stations available in eight minutes travel time or less. The eight-minute travel time criteria used for this analysis is based on the NFPA 1710 standard. The NFPA 1710 specifies that the full first alarm assignment should arrive at 90 percent of fire suppression incidents in eight minutes travel or less.

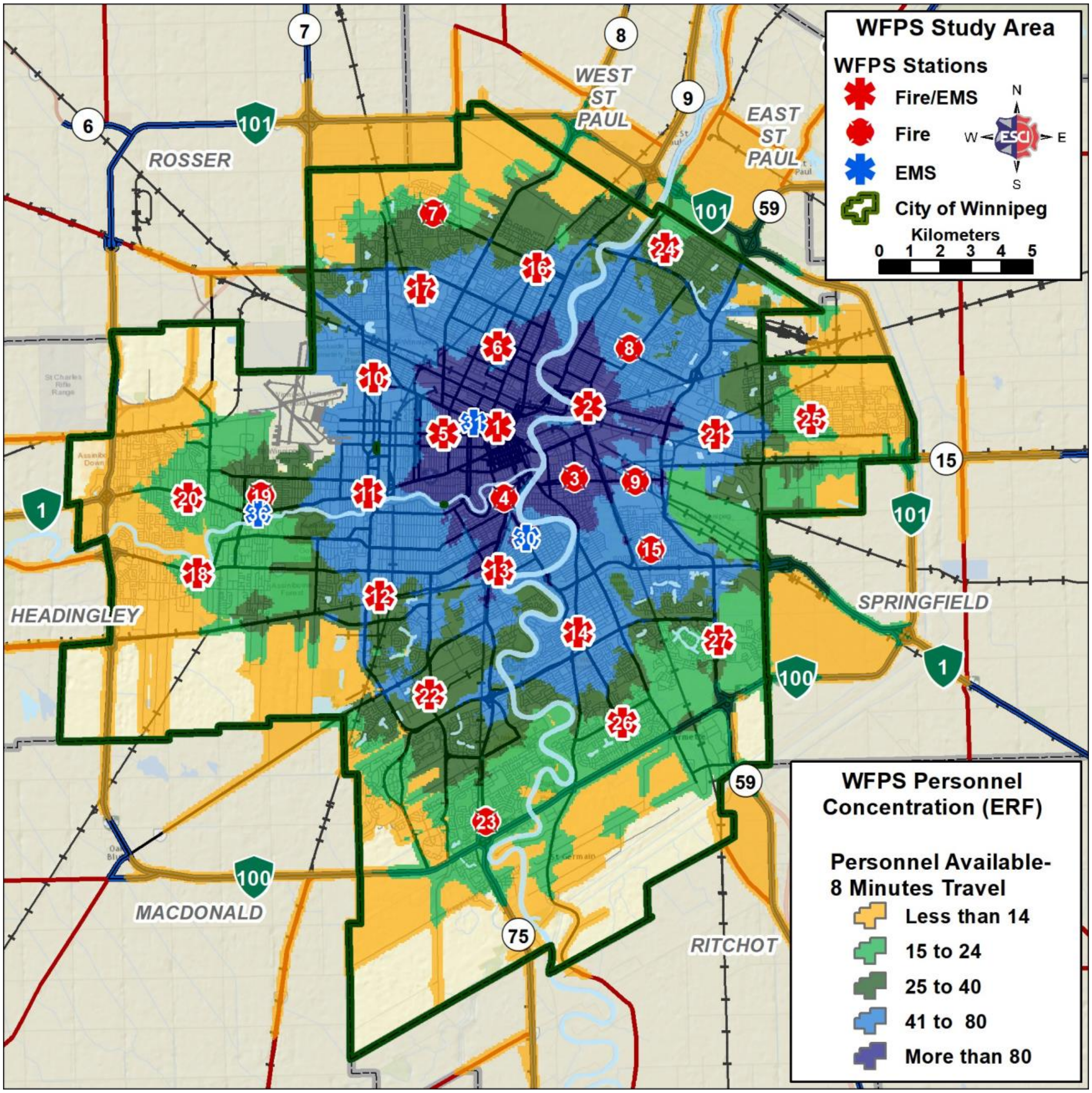
Figure 140: WFPS Station Concentration, Eight Minutes Travel



Appropriately, the highest concentration of stations occurs in the core downtown area of Winnipeg. This area demonstrates the highest emergency service demand and numerous moderate to high risks based on population, building type, and historical service demand. More than 11 WFPS stations can reach the downtown area in eight minutes travel time. Most of the area around downtown is within eight minutes travel of eight to eleven stations. The majority of the residential and commercial areas inside Winnipeg and the Provincial Highway 100/101 transportation corridor around Winnipeg are within eight minutes travel of at least four to seven WFPS fire stations.

The following figure displays the concentration of personnel available in eight minutes travel time, based on the current minimum staffing available at the WFPS fire stations. Note that WFPS Ambulance Division (WAD) personnel are not included in this analysis. Although WAD personnel often respond with WFD personnel to fill ancillary roles; WAD personnel are not incorporated into WFPS Fire Division (WFD) fireground operations.

Figure 141: WFPS Personnel Concentration (ERF), Eight Minutes Travel

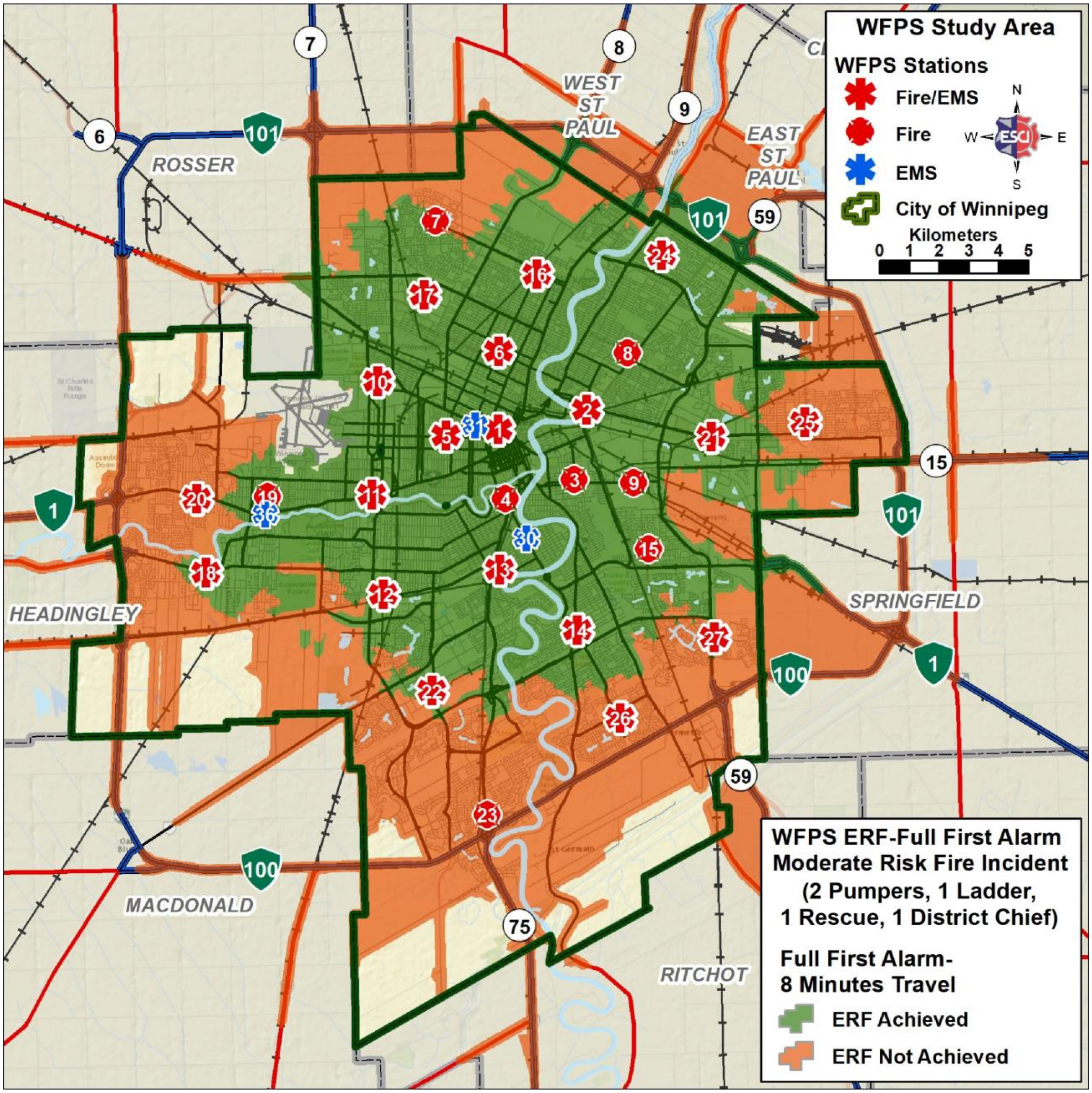


Fire service best practices documents recommend a minimum of 14 to 16 personnel to safely and effectively mitigate a moderate risk fire suppression incident.[87] Figure 141 demonstrates that WFPS personnel are distributed in the service area in a manner that provides adequate personnel throughout the majority of Winnipeg. In addition, as the concentration of stations increases in the middle of the city; more personnel are available in eight minutes. This insures that adequate personnel and apparatus are available to mitigate higher risk incidents, which are more likely in the downtown area. Also, adequate personnel are available to handle simultaneous incidents.

The WFPS dispatch protocols identify two pumpers, one ladder, one rescue, and a District Chief as the full first alarm assignment for a structure fire. The next figure displays the portions of the WFPS service area within eight minutes travel of a full first alarm assignment.

[87] National Fire Protection Association, *Standard for Organization and Deployment of Fire Suppression Operations, EMS Operations, and Special Operations* (NFPA 1710 and NFPA 1720); and the Center for Public Safety Excellence (CPSE) Community Risk Assessment: Standards of Cover, 6th Edition.

Figure 142: WFPS Full First Alarm (ERF), 8 Minutes Travel



The current first alarm contingent for a structure fire brings 16 personnel on four apparatus and a command officer to the scene, in eight minutes travel or less. Note the number of personnel meets the recommendation of at least 14 to 16 personnel for an effective response force. Compared to the personnel concentration map (Figure 141) the area within eight minutes travel of a full first alarm assignment is reduced. Examination of the GIS data reveals that, the department's ability to assemble a full first alarm is limited by travel time limitations of specific apparatus, primarily aerial apparatus and the District Chiefs.

Reliability Study

The workload of emergency response units can be a factor in response time performance. The busier a given unit, the less available it is for the next emergency. If a response unit is unavailable, then a unit from a more distant station (or mutual/automatic aid department) must respond, increasing overall response time. Although fire stations and response units may be distributed in a manner to provide quick response, that level of performance can only be obtained when the response unit is available in its primary service area.

Unit hour utilization (UHU) measures the amount of time that a unit is committed to an incident. The larger the percentage, the greater the unit's utilization and the less available it is for assignment to subsequent calls for service. The data used in this analysis includes emergency and nonemergency responses for all WFPS primary response units. Incidents coded as a prearrange standby event, community paramedic phone consultations, other data outliers, and invalid data points are removed from the data set.

The following figure displays the total time WFPS primary response apparatus were committed to an incident in 2015 and 2016, and expresses this as a percentage of the total hours available in the year. UHU rates for 12-hour peak activity units (PAU) are calculated based on 12-hour availability for the unit, instead of 24 hours.

Figure 143: WFPS Unit Hour Utilization (UHU), 2015 and 2016

Station	Unit Number	Count of Responses	Average Time Committed	Unit Hour Utilization	Count of Responses	Average Time Committed	Unit Hour Utilization
Station 1			**2015**			**2016**	
	E101	3,546	0:17:41	11.9%	3,710	0:18:10	12.8%
	E103	3,384	0:18:42	12.0%	3,539	0:18:31	12.5%
	L1	3,555	0:10:31	7.1%	3,519	0:10:38	7.1%
	SQ101	5,375	0:22:25	22.9%	5,717	0:24:29	26.6%
	SQ102	5,222	0:22:23	22.2%	5,537	0:24:25	25.7%
	PU91	3,562	1:25:42	58.0%	3,702	1:24:12	59.3%
	PU31 (PAU)	1,850	1:27:56	61.9%	1,967	1:22:54	62.0%
Station 2			**2015**			**2016**	
	E2	2,215	0:22:50	9.6%	2,415	0:21:22	9.8%
	Fire Investigator	364	2:37:57	10.9%	368	2:17:17	9.6%
	PU02	3,326	1:24:45	53.6%	3,431	1:23:24	54.4%
	PU40 (IFT/PAU)	1,632	1:25:37	53.2%	1,517	1:22:36	47.6%
Station 3			**2015**			**2016**	
	DC3	2,602	0:12:45	6.3%	2,785	0:12:11	6.5%
	E3	2,321	0:22:36	10.0%	2,349	0:21:54	9.8%

Station	Unit Number	Count of Responses	Average Time Committed	Unit Hour Utilization	Count of Responses	Average Time Committed	Unit Hour Utilization
Station 4		**2015**			**2016**		
	DC4	3,276	0:13:22	8.3%	2,544	0:12:51	6.2%
	E4	3,422	0:22:08	14.4%	3,624	0:21:25	14.8%
	R4	4,557	0:18:05	15.7%	4,646	0:18:18	16.2%
Station 5		**2015**			**2016**		
	E5	3,214	0:20:03	12.3%	3,365	0:21:23	13.7%
	R5	3,804	0:17:48	12.9%	3,805	0:18:53	13.7%
	PSO (S30)	892	0:42:10	7.2%	895	0:37:44	6.4%
	PU05	3,390	1:23:22	53.7%	3,600	1:18:29	53.7%
	PU 92	3,297	1:26:28	54.2%	3,391	1:25:17	55.0%
Station 6		**2015**			**2016**		
	E6	2,443	0:19:08	8.9%	2,685	0:20:24	10.4%
	R6	3,055	0:17:48	10.4%	3,424	0:17:30	11.4%
	SQ6	4,565	0:21:52	19.0%	4,910	0:22:19	20.8%
	PU06	3,601	1:24:30	57.9%	3,691	1:23:41	58.8%
Station 7		**2015**			**2016**		
	E7	1,771	0:24:34	8.3%	1,868	0:24:23	8.7%
Station 8		**2015**			**2016**		
	E8	1,890	0:23:09	8.3%	1,914	0:22:56	8.3%
	R8	1,981	0:20:10	7.6%	2,073	0:20:22	8.0%
Station 9		**2015**			**2016**		
	E9	847	0:20:34	3.3%	781	0:19:17	2.9%
	R9	1,344	0:16:21	4.2%	1,296	0:15:33	3.8%
Station 10		**2015**			**2016**		
	DC10	2,204	0:14:17	6.0%	2,078	0:13:34	5.4%
	E10	2,005	0:25:05	9.6%	2,023	0:24:31	9.4%
	PU95	1,498	1:28:24	25.2%	1,082	1:23:16	17.1%
Station 11		**2015**			**2016**		
	E11	2,104	0:23:17	9.3%	2,281	0:22:42	9.9%
	L11	1,748	0:11:16	3.7%	1,634	0:10:56	3.4%
	R11	2,642	0:17:57	9.0%	2,825	0:18:11	9.8%
	PU11	2,736	1:17:32	40.3%	3,029	1:16:07	43.9%
	PU75	1,950	0:36:11	13.4%	2,224	0:34:54	14.8%
Station 12		**2015**			**2016**		
	E12	2,365	0:24:51	11.2%	2,329	0:24:11	10.7%
	PU12 (IFT)	2,918	1:22:50	45.9%	2,872	1:21:01	44.3%

Station	Unit Number	Count of Responses	Average Time Committed	Unit Hour Utilization	Count of Responses	Average Time Committed	Unit Hour Utilization
Station 13		**2015**			**2016**		
	E13	1,737	0:22:42	7.5%	1,815	0:22:32	7.8%
	L13	1,850	0:11:31	4.1%	1,768	0:10:29	3.5%
	PU13	2,964	1:28:44	50.0%	3,114	1:25:22	50.6%
Station 14		**2015**			**2016**		
	E14	2,838	0:24:03	13.0%	2,807	0:24:24	13.0%
	PU14	2,878	1:28:06	48.2%	3,017	1:24:43	48.6%
Station 15		**2015**			**2016**		
	E15	1,420	0:25:26	6.9%	1,500	0:24:48	7.1%
Station 16		**2015**			**2016**		
	E16	2,589	0:23:03	11.4%	2,649	0:23:28	11.8%
	L16	1,116	0:12:01	2.6%	1,147	0:10:24	2.3%
	PU 16	3,017	1:26:33	49.7%	3,185	1:23:57	50.8%
Station 17		**2015**			**2016**		
	E17	1,893	0:25:37	9.2%	1,988	0:25:09	9.5%
	PU73	2,239	0:39:49	17.0%	2,408	0:38:05	17.4%
	PU48 (PAU)	1,494	1:34:50	53.9%	1,573	1:29:30	53.5%
Station 18		**2015**			**2016**		
	E18	1,476	0:23:29	6.6%	1,682	0:22:57	7.3%
	PU18	2,271	1:24:54	36.7%	2,395	1:23:33	38.0%
Station 19		**2015**			**2016**		
	E19	1,846	0:22:00	7.7%	2,055	0:22:57	9.0%
Station 20		**2015**			**2016**		
	E20	2,428	0:25:07	11.6%	2,656	0:23:49	12.0%
	PU20	2,351	1:27:07	39.0%	2,639	1:16:02	38.2%
Station 21		**2015**			**2016**		
	E21	1,689	0:23:47	7.6%	1,634	0:24:37	7.7%
	L21	856	0:11:45	1.9%	834	0:10:24	1.7%
	PU49 (PAU)	1,414	1:31:53	49.4%	1,527	1:24:41	49.1%
	PU72	1,583	0:37:54	11.4%	1,729	0:38:13	12.6%
Station 22		**2015**			**2016**		
	E22	2,460	0:24:26	11.4%	2,495	0:23:13	11.0%
	PU22	2,782	1:19:35	42.1%	2,877	1:17:56	42.6%
Station 23		**2015**			**2016**		
	E23	1,367	0:23:54	6.2%	1,348	0:23:25	6.0%
	E231	1,314	0:23:24	5.9%	1,299	0:23:36	5.8%

Station	Unit Number	Count of Responses	Average Time Committed	Unit Hour Utilization	Count of Responses	Average Time Committed	Unit Hour Utilization
Station 24		**2015**			**2016**		
	DC24	1,773	0:12:13	4.1%	2,068	0:12:49	5.0%
	E24	2,002	0:24:53	9.5%	2,023	0:25:24	9.8%
	PU24	2,461	1:30:44	42.5%	2,702	1:24:20	43.4%
Station 25		**2015**			**2016**		
	E25	1,294	0:24:07	5.9%	1,343	0:24:39	6.3%
	PU25	1,851	1:24:10	29.6%	2,014	1:22:12	31.5%
Station 26		**2015**			**2016**		
	E26	1,674	0:25:27	8.1%	1,645	0:25:00	7.8%
	PU26 (PAU)	1,320	1:36:04	48.3%	1,331	1:31:06	46.1%
Station 27		**2015**			**2016**		
	E27	880	0:23:38	4.0%	928	0:22:40	4.0%
	PU27	2,226	1:27:57	37.2%	2,349	1:23:56	37.4%
Station 30		**2015**			**2016**		
	PU 17 (IFT)	2,920	1:21:04	45.0%	2,750	1:20:12	41.9%
	PU 43 (PAU)	1,722	1:31:50	60.2%	1,766	1:26:42	58.2%
	PU 74	2,381	0:39:05	17.7%	2,450	0:37:51	17.6%
	PU 93	1,757	1:30:54	30.4%	1,301	1:26:09	21.3%
	EPIC 1	1,247	0:34:49	16.5%	1,340	0:34:21	17.5%
Station 31		**2015**			**2016**		
	PU01	3,684	1:25:52	60.2%	3,869	1:21:21	59.8%
	PU41	3,787	1:18:15	56.4%	3,712	1:21:00	57.2%
	PU45 (PAU)	1,924	1:19:00	57.7%	1,885	1:26:17	61.8%
Station 36		**2015**			**2016**		
	PU36 (PAU)	1,399	1:33:53	49.9%	1,541	1:22:25	48.2%
Station 40		**2015**			**2016**		
	Call In Units 94 (Bariatric), 95, 96, 97, 98	4,372	1:30:06	12.5%	2,979	1:23:47	8.0%

Not surprisingly, WFPS transport paramedic units display the highest UHU rates in this figure. Transport time to the hospital, patient handoff, and report writing; increase the time paramedic units are unavailable. The previous figure also displays the average time units are committed to an incident. On average, WFD units are committed to an incident 15 to 30 minutes. The average time WAD units are committed is approximately 1 hour, 15 minutes to 1 hour, 30 minutes. Transport time, patient handoff, and report writing contributes to the extended time committed for WAD units.

WFPS has identified patient handoff time as a factor affecting the time WAD units are out of service; and tracks this metric. Further discussion of unit hour utilization for EMS units is discussed in more detail in the *EMS* section of this report.

Simultaneous or concurrent incidents can affect a fire department's ability to muster sufficient resources to respond to additional emergencies.

Figure 144: WFPS Overall Concurrent Incidents, 2015 and 2016

2015		2016	
Concurrent Incidents	**Percentage**	**Concurrent Incidents**	**Percentage**
1–5	3.3%	1–5	5.9%
6–10	19.1%	6–10	30.7%
11–15	36.1%	11–15	41.9%
16–20	30.1%	16–20	18.4%
21–25	10.0%	21–25	2.8%
Greater than 25	1.0%	Greater than 25	0.3%

Overall in 2016, six to twenty unique incidents were in progress approximately 90 percent of the time WFPS units were committed to an incident. Note that this is a nearly five percent increase over 2015.

Figure 145: WFPS WAD Concurrent Incidents, 2015 and 2016

2015		2016	
Concurrent Incidents	**Percentage**	**Concurrent Incidents**	**Percentage**
1–5	7.8%	1–5	8.0%
6–10	38.2%	6–10	37.8%
11–15	38.1%	11–15	40.3%
16–20	13.2%	16–20	12.7%
21–25	2.5%	21–25	2.8%
Greater than 25	0.2%	Greater than 25	0.05%

The percentage of concurrent WAD incidents is similar to the percentages displayed in Figure 144. Since EMS incidents represent the majority of WFPS service demand; this is to be expected.

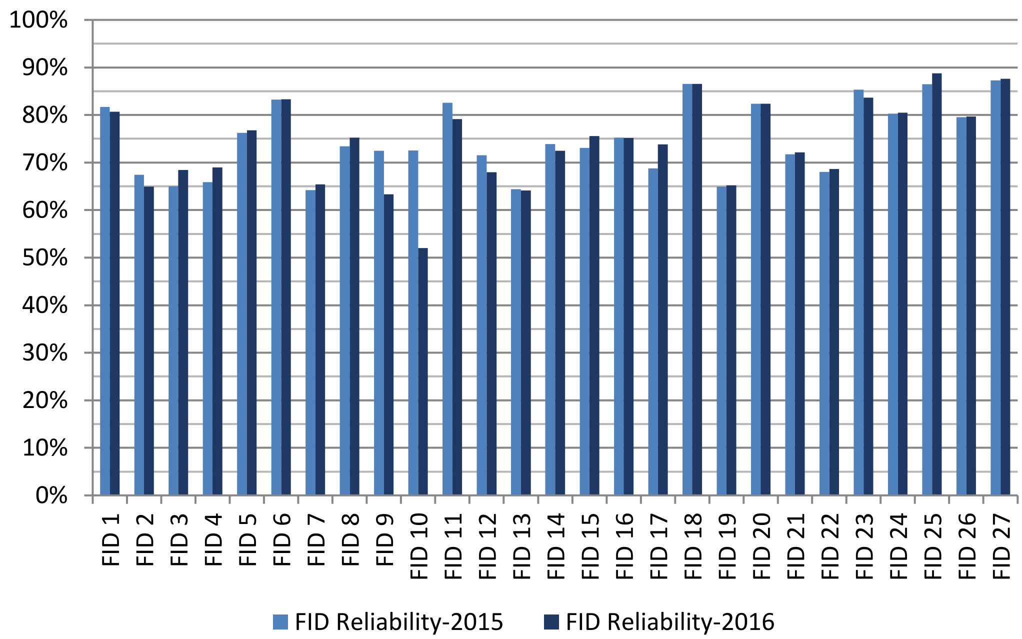
Figure 146: WFPS WFD Concurrent Incidents, 2015 and 2016

2015		2016	
Concurrent Incidents	**Percentage**	**Concurrent Incidents**	**Percentage**
Single Incident	38.7%	Single Incident	33.5%
2	33.8%	2	33.2%
3	17.3%	3	19.1%
4	6.6%	4	8.6%
5	2.2%	5	3.1%
Greater than 5	1.5%	Greater than 5	2.4%

Approximately 33.5 percent of WFD unique incidents occurred singly. For the remainder of the time WFD apparatus were committed to an incident; anywhere from two to five WFD incidents were occurring simultaneously.

The ability of a fire station's first-due unit(s) to respond to an incident within its assigned response area is known as unit or station reliability. The following figure demonstrates the percentage of emergency incidents that a first-due apparatus from each of the WFPS first in districts was the first apparatus on scene in their particular station area.

Figure 147: WFPS First In District (FID) Reliability, 2015 and 2016



In 2016, station reliability ranged from a low of approximately 52 percent in the Station 10 FID; to a high of nearly 89 percent in the Station 25 FID. The Station 10 reliability is skewed however, given that in 2016 Station 10 underwent a major renovation during which apparatus was relocated to other stations. Overall, station reliability fell slightly by approximately .6 percent between 2015 and 2016. Examination of the response data reveals that in many of the station districts with lower reliability rates; units from an adjacent first in district handle a significant percent of emergency responses. WFPS utilizes automatic vehicle location (AVL) technology to dispatch the closest unit available to emergency incidents. This may affect the reliability rate in some station districts. However, AVL technology and closest unit dispatch procedures is an effective methodology to improve response performance. Emergency response performance by FID is examined in the Response Performance analysis later in this section of the report.

In response to the high utilization of resources and the number of concurrent incidents, WFPS utilizes a high concentration of resources, peak activity units, and protocols for placing additional units in service during periods of high service demand.

Response Performance

Perhaps the most publicly visible component of an emergency services delivery system is that of response performance. Most citizens and policymakers alike want to know how quickly they can expect to receive services. In the response performance summary, ESCI examines emergency response performance in the WFPS service area during 2015 and 2016.

The 2015 and 2016 data used in this analysis is extracted from electronic records management system (RMS) data provided by WFPS. Non-emergency incidents, incidents outside the WFPS service area, data outliers, and invalid data are removed from the data set whenever discovered. In examining the emergency response data, ESCI discovered a significant number of either very small values (0 seconds) or very large values (greater than 30 minutes to over one hour) for all the components of response performance. To prevent outliers from skewing the results, ESCI applied the following filters to the data set:

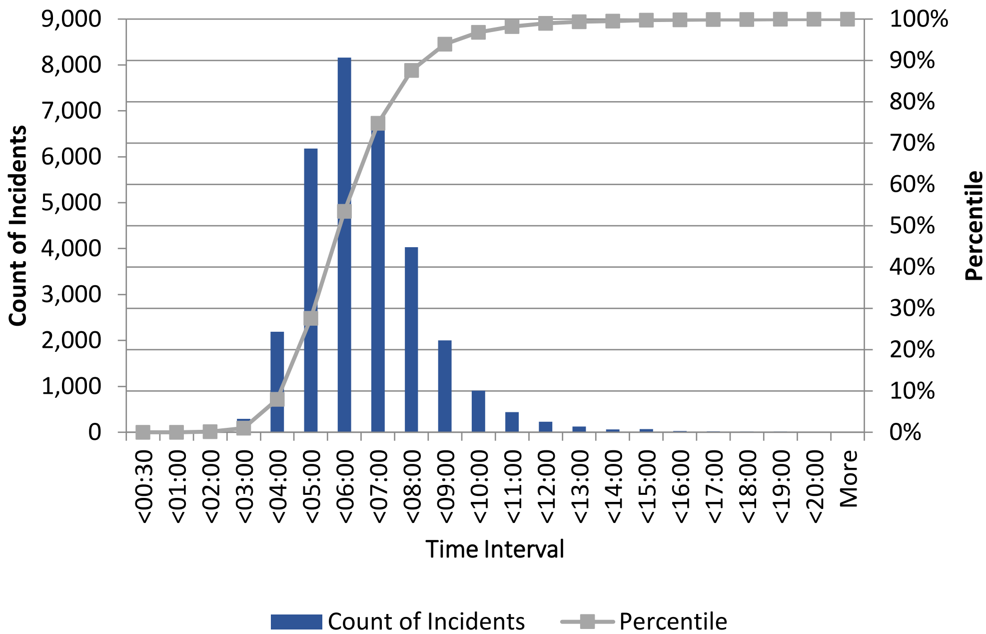
- Call Processing Time – greater than 0 and less than five minutes
- Turnout Time – greater than 0 and less than five minutes
- Travel Time – greater than 0 and less than 20 minutes
- Response Time – greater than 0 and less than 20 minutes

In addition, all interfacility transfers, community paramedic phone consults and follow ups, and pre-arranged standbys are removed from the data set. Emergency responses to truly life-threatening incidents (delta and echo responses) are included. This results in a data set consisting of approximately 15,700 unique emergency incidents in 2015 and 15,800 in 2016. ESCI calculates 90th percentile emergency response performance for these emergency incidents. The 90th percentile means that 10 percent of the values are greater than the value stated, and all other data is at or below this level. The use of percentile measurement of the components of emergency response time performance follows the recommendations of the NFPA 1710 Standard and the Center for Public Safety Excellence (CPSE) Community Risk Assessment: Standards of Cover.[88]

The following figure demonstrates the overall total response time (call received at dispatch centre to first unit on scene) frequency in the WFPS service area from January 2015 through December 2016.

[88] National Fire Protection Association, *Standard for Organization and Deployment of Fire Suppression Operations, EMS Operations, and Special Operations to the Public by Career Fire Departments*; and the Center for Public Safety Excellence (CPSE) *Community Risk Assessment: Standards of Cover, 6th Edition*.

Figure 148: WFPS Overall Total Response Time Frequency, January 2015 through December 2016, Emergency Incidents



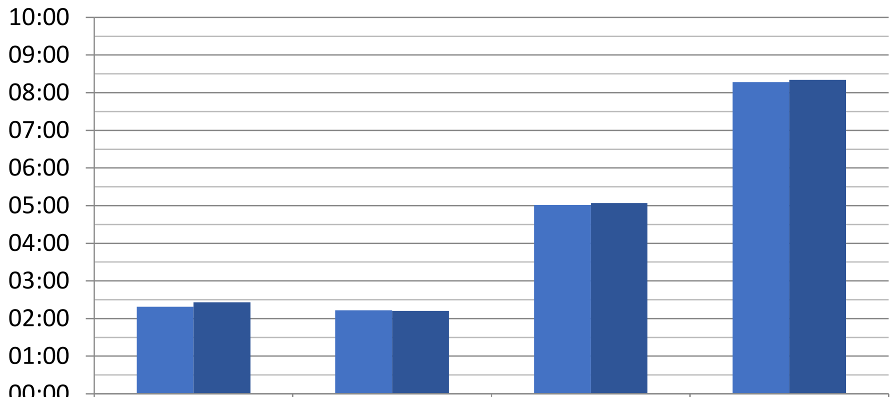
The most frequently recorded WFPS total response time is between five and six minutes. The mean or average total response time during the study period is 6 minutes, 7 seconds. During 2015 and 2016, the first WFPS apparatus arrived at 90 percent of emergency incidents in 8 minutes, 19 seconds or less from the time the call was received at the 911 centre. The previous figure measures total response time. Total response time is comprised of the following components:

- **Call Processing Time:** The amount of time between receipt of a call from a 911 caller and resources are dispatched. Since the 911-PSAP is at WPS and the call is transferred to the WFPS Communications Centre for dispatch, the 911 call taking is not included on the WFPS side. That portion can add an additional 30 seconds to the call processing.
- **Turnout Time:** The time interval between when units are notified of the incident and when the apparatus are en route.
- **Travel Time:** The amount of time the responding unit spends travelling to the incident.
- **Total Response Time:** Total Response Time equals the combination of "Call Processing Time," "Turnout Time," and "Travel Time."

WFPS appropriately tracks all the components listed above in their response performance measures. Tracking the individual pieces of total response time enables jurisdictions to identify deficiencies and areas for improvement. In addition, knowledge of current performance for the components listed above is an essential element for developing response goals and standards that are relevant and achievable.

The following figure displays WFPS emergency response performance (first apparatus on scene) for the components of total response time.

Figure 149: WFPS Components of Response Performance (90th Percentile), 2015–2016



	Call Processing	Turnout Time	Travel Time	Total Response Time
2015	02:19	02:13	05:01	08:17
2016	02:26	02:12	05:04	08:20

There is a slight increase in all the components of total response time between 2015 and 2016. Overall total emergency response time performance increased by just 3 seconds between 2015 and 2016. WFPS performance for the various components of total response time remained relatively consistent between 2015 and 2016.

NFPA 1710: *Standard for Career Fire Departments* is a fire service consensus standard for career-staffed urban fire departments.[89] The standard is not mandated or codified; however, this NFPA standard is an industry best practice that is based on current research and data that is periodically reviewed and updated. The NFPA standard is referenced by fire and EMS jurisdictions throughout North America. The following figure displays emergency response time performance recommendations from the NFPA 1710 standard.

[89] NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (National Fire Protection Association, 2016).

Figure 150: NFPA 1710 Emergency Response Performance Recommendations

Incident Interval	Performance Standard
911 call answer time (time from first ring to answer)	Within 15 seconds, 95% of the time Within 40 seconds, 99% of the time
Call transfer time (time from answer to acceptance at the secondary dispatch centre)	Within 30 seconds, 95% of the time
Call process time (time from acceptance at the dispatch centre until notification of response units • Emergency medical dispatch questioning and pre-arrival medical instructions • Calls requiring language translation • Calls requiring the use of a TTY/TDD device or audio/video relay services • Calls of criminal activity that require information vital to emergency responder safety prior to dispatching units • Hazardous material incidents • Technical rescue • Calls that require determining the location of the alarm due to insufficient information • Calls received by text message	Within 64 seconds, 90% of the time Within 106 seconds, 95% of the time • When addressing these types of response requests or additional challenges, alarm processing shall be completed within 90 seconds, 90% of the time and within 120 seconds, 99% of the time.
Turnout time (time from notification of response personnel until the initiation of movement towards the incident) Fire and Special Operations incidents	Within 80 seconds, 90% of the time
Turnout time (time from notification of response personnel until the initiation of movement towards the incident) EMS incidents	Within 60 seconds, 90% of the time
First engine company at a fire suppression incident (time from initiation of response until arrival at the incident)	Within 4 minutes travel, 90% of the time
First unit with first responder with automatic external defibrillator (AED) or higher-level capability at an emergency medical incident	Within 4 minutes travel, 90% of the time
Arrival of an advanced life support (ALS) unit at an emergency medical incident, provided a first responder with AED or basic life support (BLS) unit arrived within 4 minutes	Within 8 minutes travel, 90% of the time
Full effective response force travel time for fire suppression incidents other than high rise	Within 8 minutes travel , 90% of the time
Full effective response force travel time for high rise fire suppression incidents	Within 10 minutes, 10 seconds travel, 90% of the time

For comparison, the following figure displays overall WFPS emergency response performance from January 2015 to January 2017.

Figure 151: WFPS Components of Emergency Response Performance (90th Percentile), 2015–2016

Total Response Time Continuum				
	Call Processing	Turnout Time	Travel Time	Total Response Time
90th Percentile	02:22	02:12	05:02	08:19

CALL PROCESSING TIME

Comparing the previous two figures reveals that WFPS call processing time exceeds the 90-second NFPA 1710 recommendation by 52 seconds. ESCI notes that the WFPS Communications Centre is not the primary Public Safety Answering Point (PSAP) for 911 calls in Winnipeg. During ESCI's site visit, WFPS reported that call processing performance may be skewed by an inability to collect accurate data from the primary PSAP operated by the Winnipeg Police Service (WPS). Call answering and call processing time stamps are regularly monitored for compliance with industry standards. As discussed previously, call processing time stamps greater than five minutes were removed from the WFPS data set used in this section of the report. ESCI notes that the WFPS Dispatch Centre effectively utilizes the Medical Priority Dispatch system (MPDS) software to triage medical calls and provide pre-arrival instructions.

WFPS utilizes numerous older technologies which contribute to call processing delays, including use of manual cardsets for medical call triaging and a Computer Aided Dispatch (CAD) system that does not take advantage of newer engineered call taking and dispatch screens. Methods for improving call processing time include such newer technologies as follows:

- ProQA: a software adjunct to CAD which automates medical call triaging much more rapidly than use of manual cardsets.
- CAD: newer engineered call taking and dispatch screens, including these additional features:
  - Automated resource deployment, which automatically manages resource allocation.
  - Automated voice dispatching (e.g., *Locution* or similar product) which frees up dispatchers to perform support tasks without being tied up manually dispatching and voicing call information.

TURNOUT TIME

The second component of the response continuum, and one that can be directly affected by response personnel, is turnout time. Turnout is the time it takes personnel to receive the dispatch information, move to the appropriate apparatus, and proceed to the incident.

The NFPA 1710 performance standard for turnout time is within 80 seconds, 90 percent of the time for fire and special operations incidents, and within 60 seconds, 90 percent of the time for EMS incidents. As displayed in Figure 151, WFPS personnel required 2 minutes, 12 seconds to assemble and go enroute to an emergency in 2015 and 2016.

While WFPS turnout time performance does not meet the NFPA 1710 standard, it is ESCI's experience that the NFPA standard is difficult to achieve and turnout time standards of 90 to 120 seconds for career staffed fire jurisdictions are more reasonable and achievable. This is affirmed in a study published in 2010 by the NFPA research foundation.[90] Station design can have a significant impact on turnout time if poor station design creates numerous obstacles for rapid egress. As with call processing, there are numerous older technologies that are also in place at WFPS which contribute substantially to slow turnout times. Currently, there is no station-wide voice alert announcing the call type, location, or other pertinent data. Instead, a crewmember must go to the floorwatch to retrieve a hard copy printout of the response, then return to the appropriate unit for response. There are many new technologies that can be employed which will have a dramatic effect on turnout times, such as:

- Audible, station-wide alerting with voice announcement of call type, unit(s) dispatched, and location—eliminating the need for a hard copy of the dispatch.
- Automated station lighting, bay door activation, appliance shut-off programmed for the appropriate unit(s) and crew(s)—physical and visual safety systems activated automatically.

ESCI recommends that in addition to these improvements, WFPS should routinely monitor turnout time performance, identify deficiencies, and take steps to reduce turnout time. Turnout time is an area of total response performance that field personnel have some ability to control, given adequate information and facilities that allow for rapid and efficient movement of personnel.

TRAVEL TIME

The NFPA 1710 standard calls for a travel time of 4 minutes for the arrival of the first arriving unit to an emergency incident (Fire/Special Operations or EMS). Travel time is potentially the longest component of total response time.

Again, comparing

Figure 150 to Figure 151 reveals that WFPS emergency travel time performance does not meet the NFPA 1710 standard. During 2015 through 2016, the first WFPS unit arrived on the scene of an emergency incident in 5 minutes, 2 seconds (travel time), 90 percent of the time. As discussed in the *Distribution Analysis*, nearly 97 percent of emergency service demand occurred within 4 minutes travel of a WFPS station, based on the GIS travel time model.

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[90] Quantitative Evaluation of Fire and EMS Mobilization Times, May 2010, available at www.nfpa.org/foundation.

Factors that can affect travel time performance include traffic flow during morning and evening peak traffic periods, concurrent incidents which call for units from a more distant station to respond, or inadequate distribution of resources to cover the geographic service area. All these factors may to some degree affect travel time performance in the WFPS service area. Travel time can effectively be improved by using a Traffic Signal Pre-emption (TSP) system. TSP is a technological solution which allows fire apparatus to control traffic signals through a device mounted on the apparatus. This not only improves travel time performance, but also reduces the risk of collision. Implementation of a CAD system that interfaces with both Automatic Vehicle Locator (AVL) and Mobile Data Computers (MDCs) technologies mounted in each unit provides the CAD system with the closest physical unit to an emergency and provides the most effective response travel route, pre-arrival instructions, pre-fire plans of buildings, and dispatch updates in real time. These additional resources match the closest, most appropriate unit(s) to an emergency and arms responders with the best information available prior to arrival.

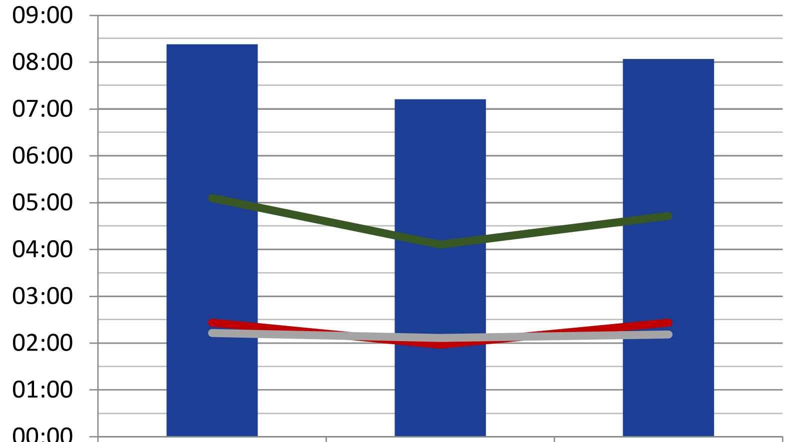
WFPS should consider initiating a study of the benefits and cost of a fully integrated technology package to enhance call processing, turnout, and travel times.

TOTAL RESPONSE TIME—FIRST UNIT ON SCENE

The following figures examine 2016 WFPS emergency total response time performance. The NFPA 1710 standard does not specify a performance goal for total response time. Combining the components of response time cited in the standard results in a total response time of 6 minutes or less (90th percentile) for EMS emergencies and 6 minutes, 20 seconds (90th percentile) for fires and all other emergency incidents.

The following figure displays total response time summarized as Fire, EMS, and Other emergencies in 2016. In this figure “Fire” refers to any incident coded as a fire in the WFPS data. The “EMS” category includes emergency calls for medical service including motor vehicle accidents and rescue calls where an ambulance was dispatched. The “Other” category includes Haz-Mat incidents, alarms (no fire), gas/odor investigations, and any other miscellaneous emergency incident (bomb threat, explosion—no fire, good intent calls, controlled burning, and weather-related emergencies, etc.).

Figure 152: WFPS Response Time Performance (90th Percentile), 2016



	EMS	Fire	Other
Total Response Time	08:23	07:13	08:04
Call Processing	02:26	01:58	02:26
Turnout Time	02:13	02:07	02:11
Travel Time	05:06	04:06	04:43

In 2016, the first WFPS unit arrived at all medical emergency incidents in 8 minutes, 23 seconds, 90 percent of the time. Total response time for Fire and Other emergencies was 7 minutes, 13 seconds for fires, and 8 minutes, 4 seconds for other types of emergencies. The previous figure demonstrates that increased call processing time and travel time for EMS incidents cumulatively causes an increase in total response time for these emergency incidents.

The next figure displays WFPS emergency response time performance, measured at the 90th percentile and summarized by hour of the day.

Figure 153: WFPS Response Time Performance by Hour of the Day (90th Percentile), 2016

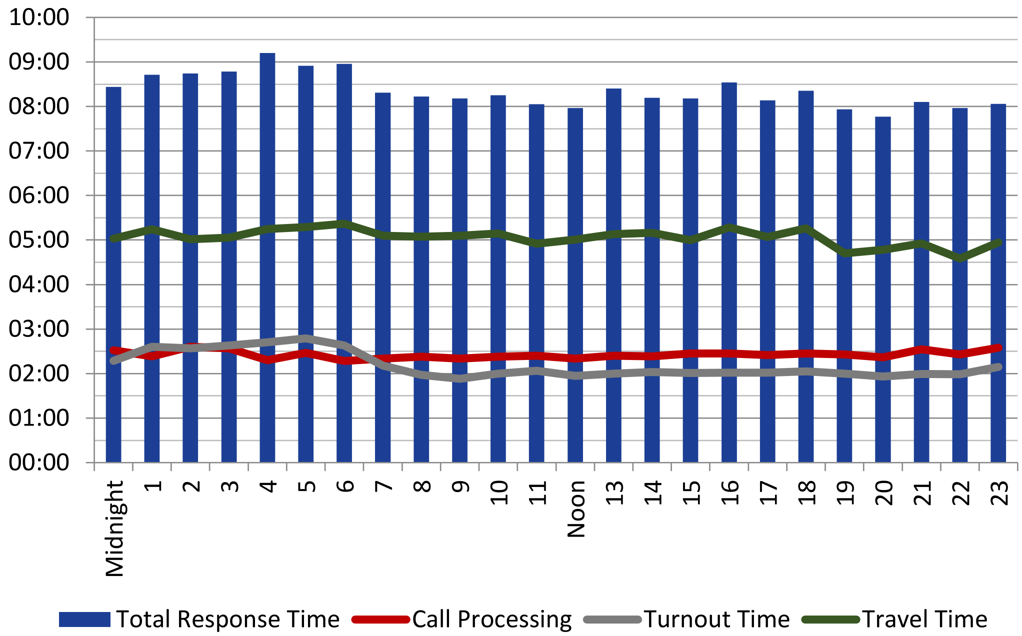
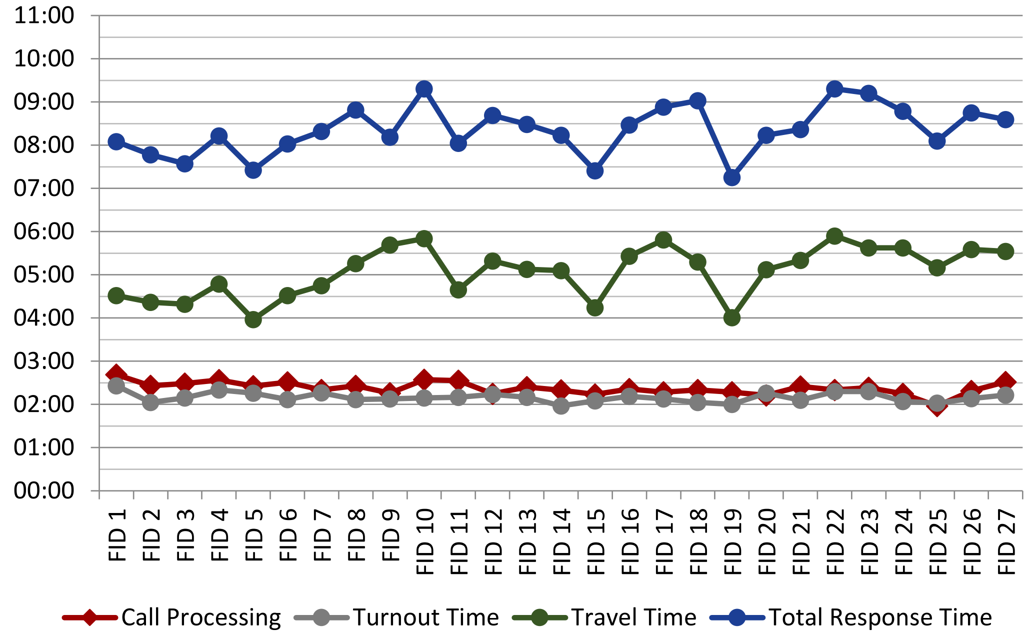


Figure 153 shows that emergency response times increase in the late evening and early morning hours and decrease during the day. The longest response times occur between 3 AM and 4 AM; while the best response time performance occurs in the evening around 8 PM. Note the distinct increase in turnout time performance between midnight and 7 AM.

The following figure demonstrates emergency response time performance in 2016 for each of the WFPS first in districts (FID).

Figure 154: WFPS 90th Percentile Response Time Performance by First In District (FID), 2016



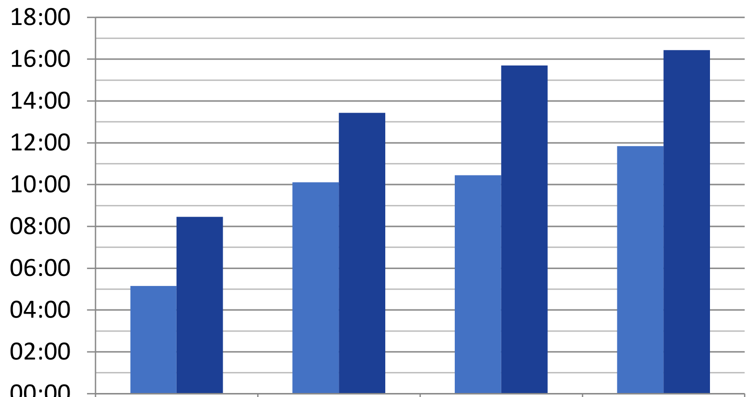
As would be expected, call processing time and turnout time are relatively uniform when summarized by FID. Call processing time fluctuates in a range from a low of just less than 2 minutes to approximately 2 minutes, 40 seconds. Turnout times range from a high of approximately 2 minutes, 20 seconds to a low of 2 minutes. This is a range of approximately 30 seconds for both these components of total response time. The variation in emergency travel time performance and total response time performance are greater. Travel time ranges from a low of 3 minutes, 58 seconds in the Station 4 FID to a high of 5 minutes, 58 seconds in the Station 22 FID (range of approximately 2 minutes). Total response time performance demonstrates a similar range of 2 minutes, 3 seconds between the high and the low. Note that there is almost a direct correlation between emergency travel time and total response time performance.

Effective Response Force Time Performance

Effective Response Force (ERF) is the number of personnel and apparatus required to be present on the scene of an emergency incident to perform the critical tasks in such a manner to effectively mitigate the incident without unnecessary loss of life and/or property. The ERF is specific to each individual type of incident, as are the critical tasks that must be performed. For the purposes of this analysis, the travel time and total response time performance for assembly of multiple resources is summarized by WFPS Ambulance Division (WAD) and Fire Division (WFD) emergencies.

The first figure displays the time necessary to assemble up to four apparatus at an incident identified as a Winnipeg Ambulance Division (WAD) emergency incident in the 2016 WFPS data.

Figure 155: WAD Emergency Incident ERF Response Time Performance (90th Percentile), 2016

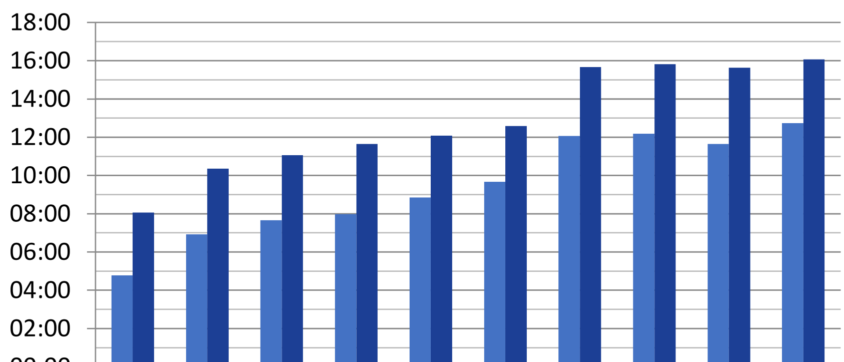


	First on Scene	2	3	4
Travel Time	05:09	10:07	10:27	11:51
Total Response Time	08:28	13:26	15:42	16:26

WFPS Ambulance Division emergency responses are typically handled by one or two units. Fire Division apparatus (WFD) are the first unit on scene at approximately 78 percent of WAD emergency incidents. There is a 4 minute, 58 second difference in travel time performance between the first arriving unit and the second unit on scene. Approximately 10 percent of WAD incidents required three or more units in 2016.

The next figure displays WFPS response time performance for the assembly of multiple resources at incidents categorized as Winnipeg Fire Division incidents in the 2016 incident data.

Figure 156: WFD Emergency Incident ERF Response Time Performance (90th Percentile), 2016



	First on Scene	2	3	4	5	6	7	8	9	10
Travel Time	04:47	06:55	07:39	07:59	08:51	09:40	12:04	12:11	11:39	12:44
Total Response Time	08:04	10:21	11:04	11:39	12:05	12:35	15:40	15:49	15:38	16:04

The NFPA 1710 travel time performance standard for the delivery of the full first alarm (ERF) to a moderate risk building fire is within eight minutes, 90 percent of the time. The WFPS full first alarm for a moderate risk structure fire calls for two pumpers, one rescue/pumper, one ladder truck, and a District Chief. This alarm assignment would require five apparatus to arrive in eight minutes travel or less. Figure 156 demonstrates that WFPS requires 8 minutes, 51 seconds travel time for the fifth apparatus to arrive at an emergency WFD incident, measured at the 90^{th} percentile. There is a 4 minute, 4 second difference in travel time between the first unit and the fifth unit on scene. The fifth apparatus arriving at an WFD incident requiring multiple apparatus arrived in 12 minutes, 5 seconds total response time, which is a difference of just over 4 minutes after the arrival of the first WFD apparatus to arrive (total response time). Examination of structure fire incident data reveals that five to eight WFPS apparatus arrived at over 81 percent of structure fires in 2016. Travel time for the eighth apparatus on scene in 2016 was 12 minutes, 11 seconds, 90 percent of the time; and total response time performance was 15 minutes, 49 seconds, 90 percent of the time.

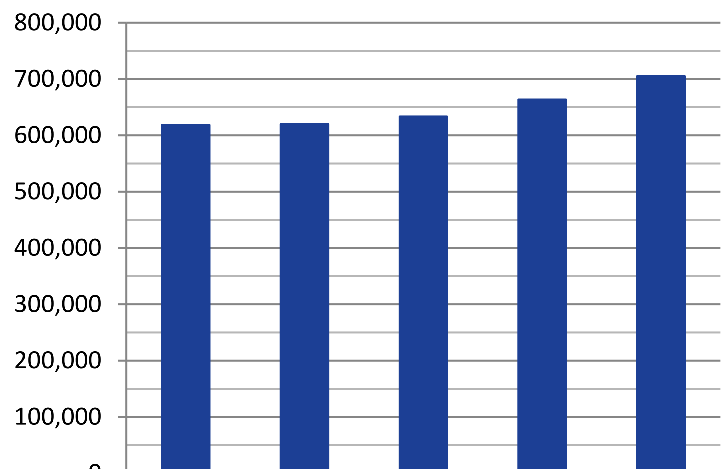
WFPS PROJECTIONS

Future service demand for emergency service providers is largely dependent on changes over time to the population and the activity of the population within the service area. The following analysis utilizes data and information from Statistics Canada; the City of Winnipeg 2016 Population, Housing, and Economic Forecast; and the Conference Board of Canada's Long-Term Population, Housing, and Economic Forecast for Winnipeg, prepared in October 2015.

Historical Population Growth

WFPS estimated the population of the Winnipeg service area as 718,400 as of 2015. The estimate for 2016 was 726,700 according to the City's 2016 Population, Housing, and Economic forecast. The following figure displays historical population change from 1996 through 2016, using Statistics Canada Census survey data.

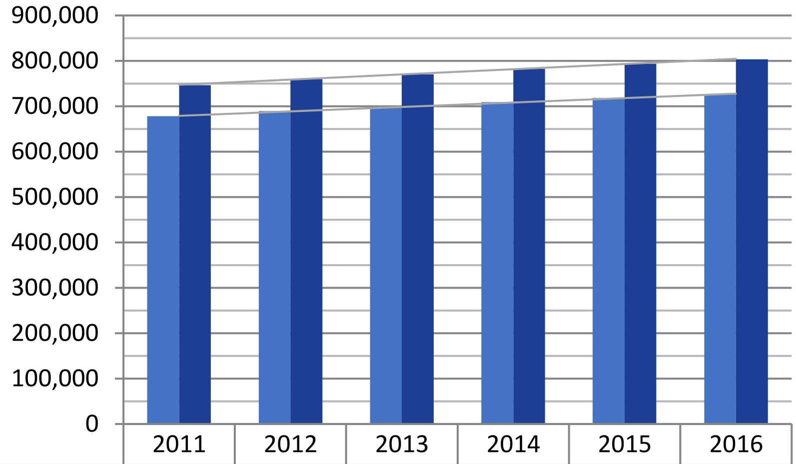
Figure 157: City of Winnipeg Historical Population Change, Statistics Canada Data



	1996	2001	2006	2011	2016
Census Survey Population	618,477	619,544	633,451	663,617	705,244

Based on the census survey data, the population of Winnipeg grew by 14 percent between 1996 and 2016, for an average annual growth rate (AAGR) of approximately 0.7 percent. Population growth was relatively flat between 1996 and 2001. Population growth increased between 2001 and 2016; with the AAGR increasing to 1.3 percent between 2001 and 2016. Note that the Statistics Canada census survey data population for the City of Winnipeg is considerably lower than the estimated population according to the Conference Board of Canada and City of Winnipeg estimates. The following figure displays annual population estimates from 2011 through 2016 within the City of Winnipeg and the Winnipeg census metropolitan area (CMA).

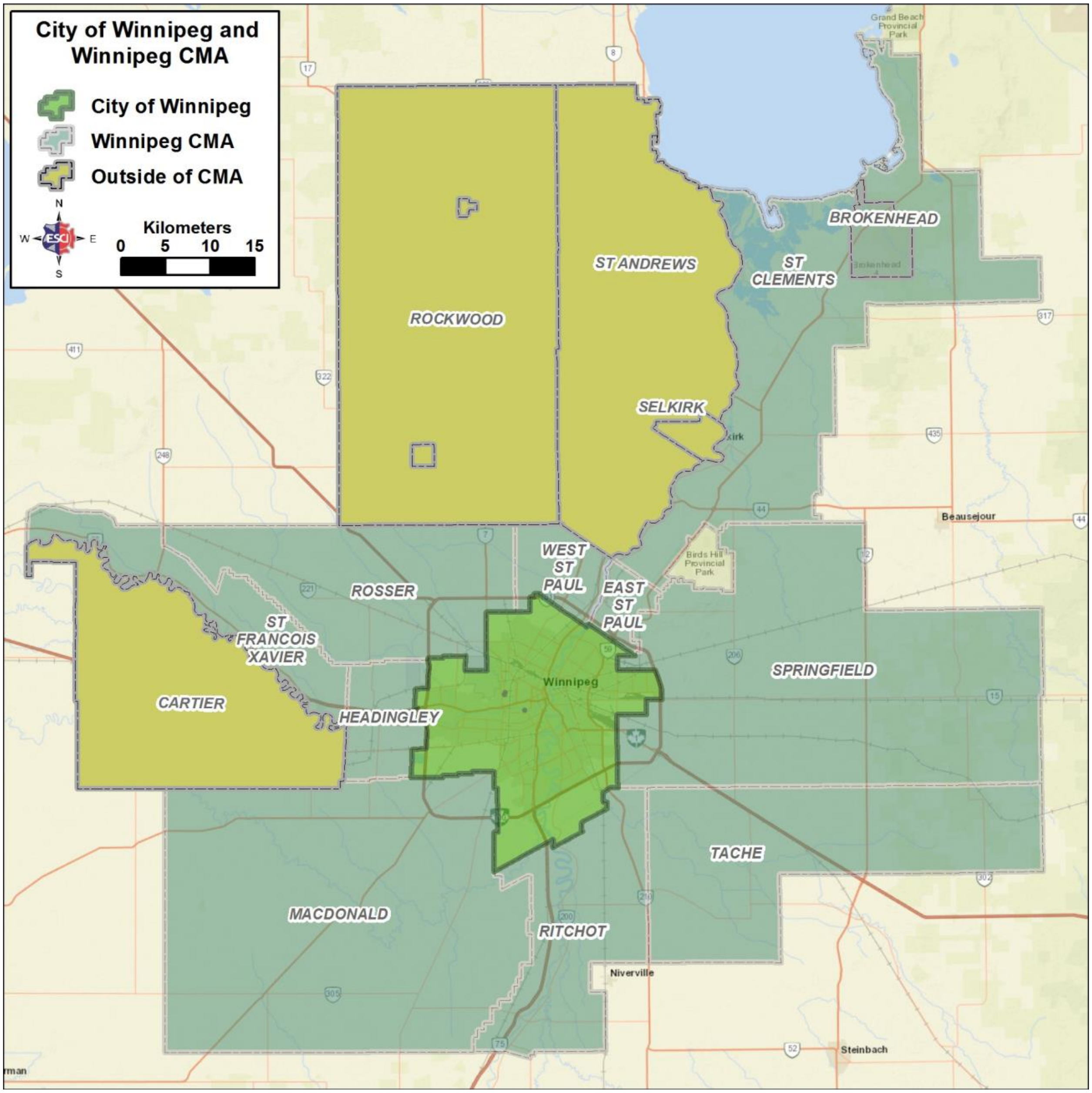
Figure 158: City of Winnipeg and Winnipeg CMA Annual Population Estimates



	2011	2012	2013	2014	2015	2016
City of Winnipeg	677,800	689,500	698,600	709,200	718,400	726,700
Winnipeg CMA	746,100	759,600	770,300	782,600	793,400	803,500

Based on the data displayed in this figure, the population of Winnipeg grew by over seven percent (7.2 percent) between 2011 and 2016. The population of the Winnipeg census metropolitan area grew by approximately 7.5 percent during the same period. Winnipeg and the neighboring municipalities that constitute the census metropolitan area are displayed in the following figure.

Figure 159: City of Winnipeg and Winnipeg Census Metropolitan Area (CMA)



The Winnipeg CMA is defined as a core City (Winnipeg) and neighboring municipalities where 50 percent or more of the population works in the core City. The Winnipeg CMA includes the following rural municipalities:

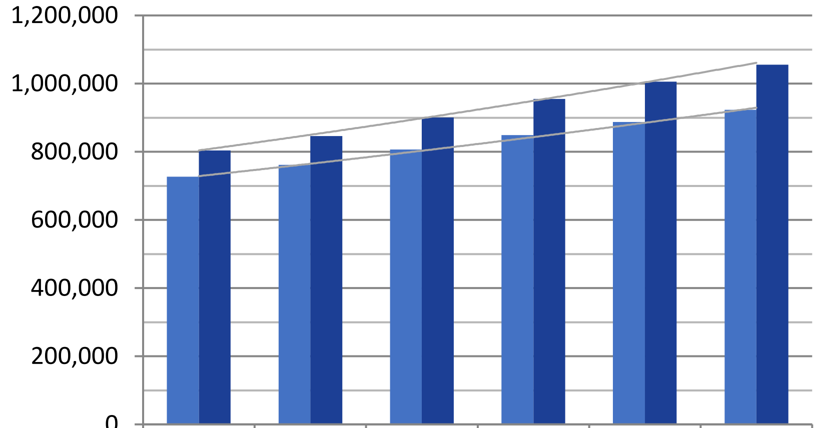
> Richot, Tache, Springfield, East St. Paul, West St. Paul, Rosser, St. Franscois Xavier, Headingley, St. Clements, MacDonald, and Brokenhead First Nation.

The population estimates for the Winnipeg CMA displayed in Figure 158 include the estimated population of Winnipeg and the rural municipalities listed above.

Population Growth Projections

The City of Winnipeg uses Conference Board of Canada population, demographic, and economic forecasts as the basis for the 2016 City of Winnipeg Population, Housing, and Economic Forecast. The following figure displays projected population growth from 2016 through 2040 from the City's 2016 forecast.

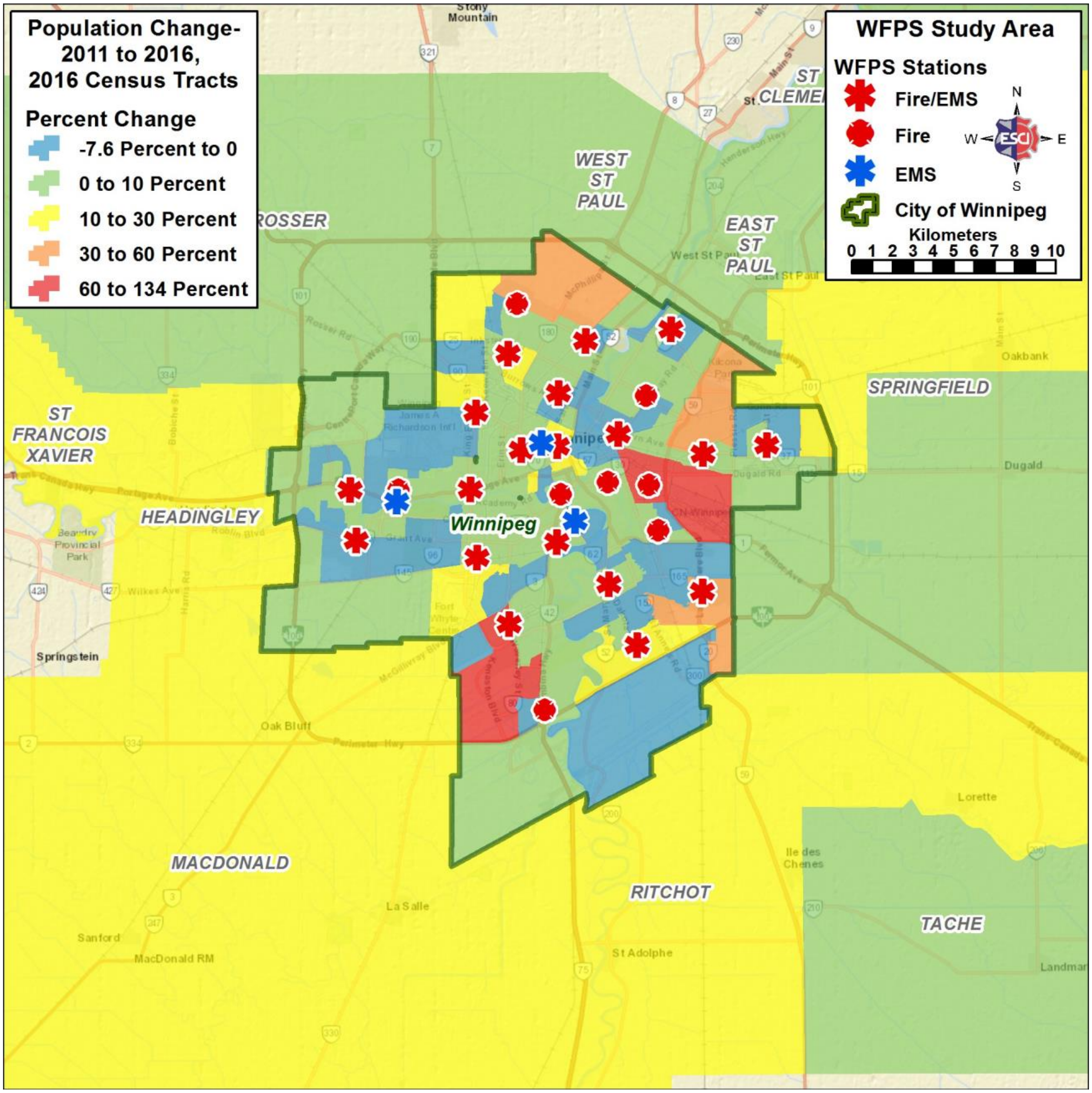
Figure 160: City of Winnipeg and Winnipeg CMA Population Forecast, 2016–2040



	2016	2020	2025	2030	2035	2040
City of Winnipeg	726,700	761,900	806,200	848,700	887,400	922,600
Winnipeg CMA	803,500	846,000	900,500	954,500	1,006,000	1,055,500

The population inside the City of Winnipeg is forecasted to grow from 726,700 in 2016, to approximately 922,600 in 2040; this represents a 27 percent increase in the population. The Winnipeg CMA is expected to grow by approximately 31 percent during the same time (803,500 to 1,055,500). The population of the Winnipeg CMA is forecast to exceed one million individuals by 2035. The population outside of the City of Winnipeg, but within the Winnipeg CMA is growing at approximately two percent annually, while the population within Winnipeg has grown at a rate of one percent annually. The following figure demonstrates the percentage of population change in Winnipeg and the area around Winnipeg between the 2011 and 2016 Census survey, using Statistics Canada census tract data.

Figure 161: Winnipeg Area Population Change, 2011–2016, 2016 Census Tracts



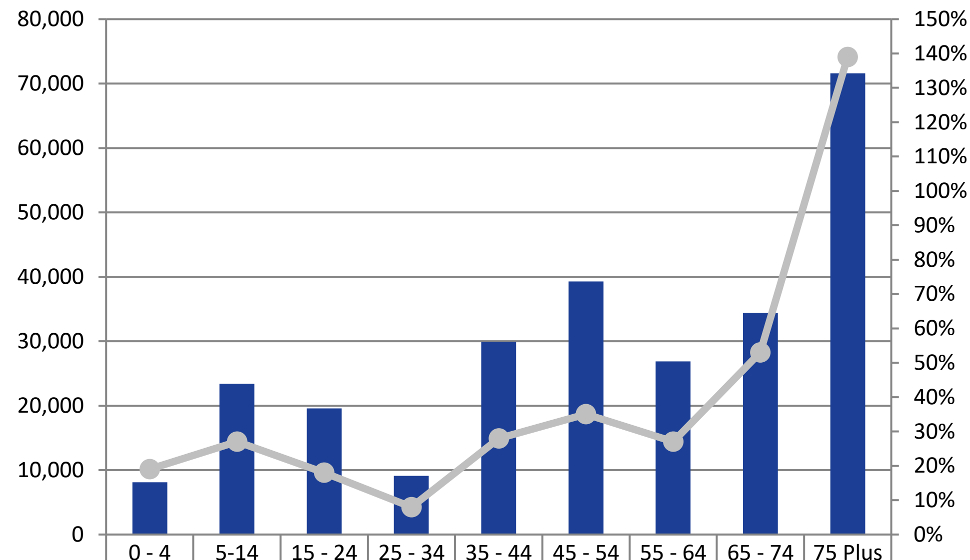
Based on the Statistics Canada census tract data, population growth varied in Winnipeg and the Winnipeg CMA between 2011 and 2016. Some census tracts inside Winnipeg experienced negative population growth. Examination of the census tract data reveals that on average, the population inside Winnipeg grew by approximately five percent between 2011 and 2016. During the same time, the population in the census tracts within the CMA but outside of the City of Winnipeg grew by around 8.6 percent.

The forecasted population growth in Winnipeg and the Winnipeg CMA is expected to be sustained by the healthy and diverse economy in Winnipeg. The 2016 City of Winnipeg forecast calls for the gross domestic product (GDP) to grow at an average annual rate of 2.1 percent between 2015 and 2040. Construction activity and infrastructure investment at the federal, provincial, and municipal level are predicted to support strong employment and wage growth, especially over the next five to ten years.

Net migration into the Winnipeg area is expected to be the primary driver of population growth. International immigration is predicted to comprise the majority of individuals migrating to Winnipeg or the Winnipeg CMA; attracted by the strong job market in Winnipeg.

A trend seen nationally in Canada and locally in the Winnipeg area is the gradual aging of the overall population. The following figure displays the change in the distribution of the population in the Winnipeg CMA from 2015 to 2040, summarized by age group.

Figure 162: Population Growth by Age Groups, 2015–2040



	0 - 4	5-14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75 Plus
Population Change	8,100	23,400	19,600	9,100	29,900	39,300	26,900	34,400	71,600
Percent Change	19%	27%	18%	8%	28%	35%	27%	53%	139%

The Conference Board of Canada data displayed in this figure, demonstrates the population in the Winnipeg CMA of the two oldest age groups (65 to 74, and 75 Plus) increasing by 53 and 139 percent respectively, by 2040. The overall average age in the CMA is expected to increase from approximately 39 to around 43 by 2040. It is important to note that the City of Winnipeg 2016 Population, Housing, and Economic Forecast points out that increase in the older population groups identified in the previous figure will place increased demand on the City of Winnipeg for emergency services.

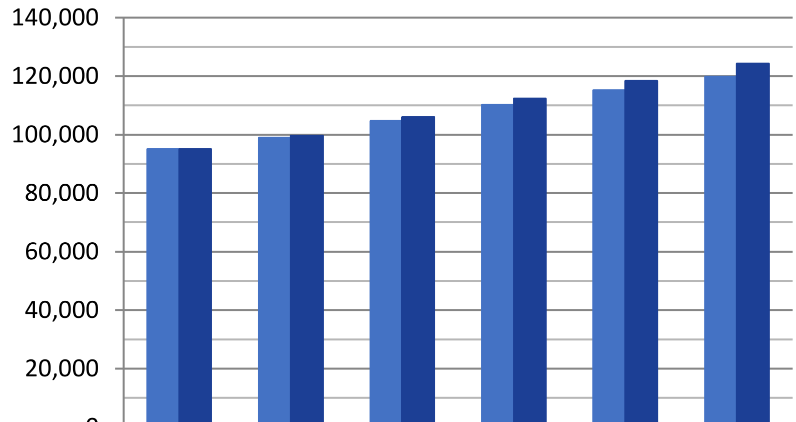
Service Demand Projections

In evaluating the deployment of facilities, resources, and staffing, it is imperative consideration be given to potential changes, such as population growth, that can directly affect emergency workload. Changes in service demand may require changes and adjustments in the deployment of staffing and capital assets to maintain acceptable levels of performance.

For the purposes of this study, ESCI uses the population projections for the City of Winnipeg and the Winnipeg CMA previously discussed; to develop projections for future service demand. In addition, a projection based strictly on historical service demand (2011–2016) is provided.

The current WFPS utilization rate is approximately 130 incidents per 1,000 population based on the population inside the City of Winnipeg; and approximately 118 incidents per 1,000 population based on the population of the Winnipeg CMA. ESCI applies these rates to the population projections provided in the 2016 City of Winnipeg Forecast to generate the service demand projections displayed in the following figure.

Figure 163: WFPS Service Area Service Demand Projections, 2016–2040



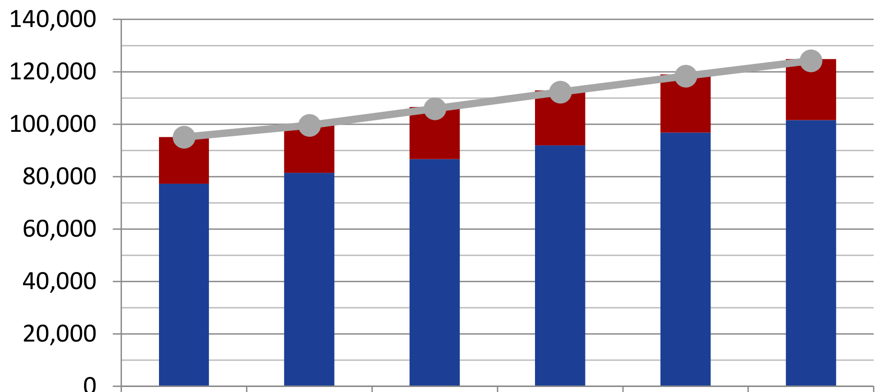
	2016	2020	2025	2030	2035	2040
City of Winnipeg	95,069	98,913	104,664	110,181	115,206	119,775
Winnipeg CMA	95,069	99,567	105,981	112,336	118,397	124,223

Based on the forecasted population in the City of Winnipeg, WFPS service demand increases to nearly 120,000 incidents (119,775) by 2040. Using the population projection for the Winnipeg CMA, WFPS service demand is projected to grow to over 124,000 incidents (124,223) by 2040. As discussed previously, the Winnipeg CMA includes the City of Winnipeg and neighboring rural municipalities where 50 percent or more of the population works in Winnipeg.

It is reasonable to include a projection based on the overall CMA population. Individuals residing inside the CMA, but outside the city limits of Winnipeg are not part of the City's population. However, these individuals commute into Winnipeg to work; and contribute to the overall activity of the population in Winnipeg which is a primary driver of WFPS service demand.

The following figure uses the WFPS service demand projection based on the Winnipeg CMA population forecast to display future service demand, summarized as Winnipeg Fire Division (WFD) or Winnipeg Ambulance Division (WAD).

Figure 164: WFPS Future Service Demand by Call Type, 2016–2040

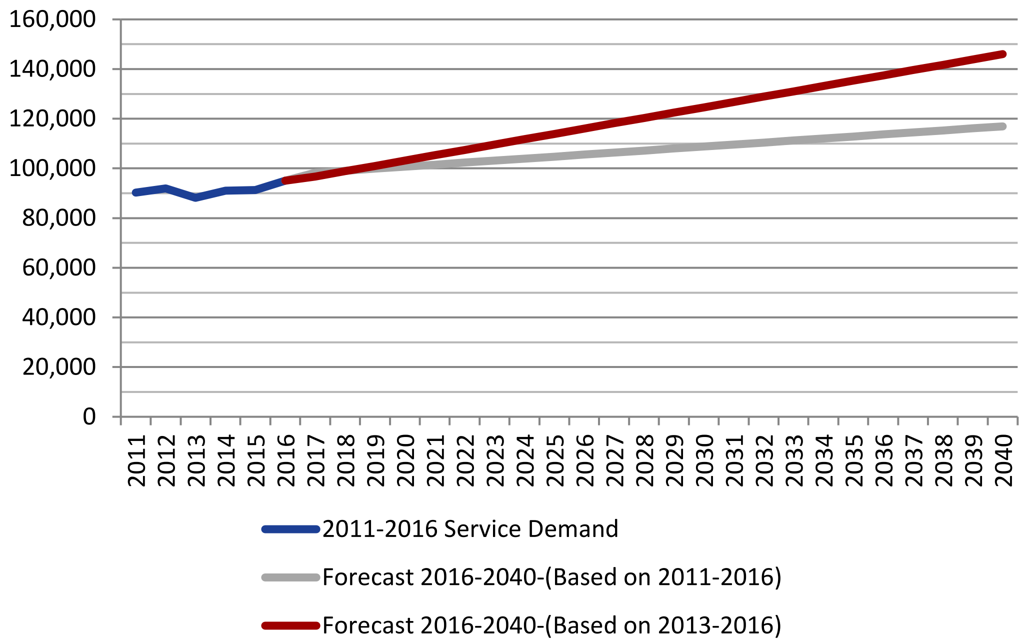


	2016	2020	2025	2030	2035	2040
WFD	17,729	18,667	19,869	21,061	22,197	23,289
WAD	77,340	81,431	86,677	91,874	96,831	101,596
Total	95,069	99,567	105,981	112,336	118,397	124,223

Not surprisingly, EMS incidents are predicted to continue to be the predominant driver of WFPS service demand. Figure 164 demonstrates WFPS Ambulance Division incidents exceeding 101,000 by 2040. Fire Division incidents are expected to exceed 23,000 in the same period. The reader is reminded that currently WFPS fire apparatus respond to approximately 64 percent (49,865 EMS incidents in 2016) of Ambulance Division incidents as a first responder.

The following figure uses a linear forecasting model to display two different projections of future service demand based on historical service. The first forecast is based on service demand from 2011 through 2016, overall there was a 5.8 percent increase in service demand between 2011 through 2016. The second forecast is based on 2013 through 2016 service demand, which eliminates the approximately 2.3 percent decrease in incidents between 2011 and 2013, which may be a data anomaly.

Figure 165: WFPS Future Service Demand, Linear Forecast Model



Based on 2011 through 2016 service demand (5.8 percent increase), the linear forecast model predicts WFPS service demand increasing to over 116,900 incidents in 2040. Based on the increased growth rate (7.8 percent) between 2013 through 2016, WFPS service demand is forecast to increase to over 146,000 incidents.

It is not the intent of this study to be a definitive authority for the projection of future population in the WFPS service area but rather to base recommendations for future WFPS emergency services needs on a reasonable association with projected service demand. Since human activity is a primary driver of emergency service demand, it is important to have a population-based projection of the future size of the community. Although population projections can vary, and may change over time; it is clear that demand for emergency services in Winnipeg will continue to increase. Planning should begin now to maintain the resources needed to meet the continuing demand for services.

STRATEGIC IMPLEMENTATION

This report has developed a clear picture of the current conditions of the Winnipeg Fire Paramedic Service as an emergency services provider as well as the various support services it relies upon to deliver those emergency services. Thus, this report also examines the conditions within each branch and division. Further, this report projects anticipated drivers of service: population growth, community development, and the emergency demands that attend growth. From this analysis, numerous recommendations are included which ESCI believes enhances existing service delivery. Recommendations are also provided to address the anticipated effects of continuous community growth. It is self-evident that continuing to serve a growing community with static resources is a recipe for failure to achieve the mission. This is not to suggest that creative problem-solving has no role in facing the challenge of serving a growing community.

The process of understanding, prioritizing, and implementing the recommended enhancements included in this report can be daunting, simply due to the amount of work that may be involved. This section of the report condenses the report recommendations into three categories: programmatic changes, staffing changes, and equipment changes. The capital facilities replacement is such a large, expensive, and logistically complex recommendation that it is treated as its own strategy. It is, however, a critical element to meeting the current and future needs of the community and should be addressed as a high priority.

Program Strategies

Administration

1. Seek accreditation as a logical next step to the creation of a Community Risk Assessment: Standards of Cover.

Training

1. WFPS should thoroughly evaluate its training program to determine if there are any unnecessary training demands that could be reduced or eliminated.
2. Consider temporary assignments to the Fire Training Academy to bolster training staff when work demands surge.
3. WFPS should re-evaluate its collective agreement to remove disincentives for Training Officers in order to attract and retain quality personnel.
4. Consider changes to the collective agreement that balance seniority with a genuine desire and passion for education and training when selecting Training Officer candidates.
5. Training Officers should be provided with ongoing training and other opportunities to maintain knowledge and practical skills.
6. As with the Fire Training Academy, WFPS should thoroughly evaluate its Paramedic Education & Training program to determine if there are any unnecessary training demands that could be reduced or eliminated.
7. Both training branches (Fire and EMS) should annually publish reports on their previous year's activities and training programs delivered (if sufficient administrative staff is added).
8. EMS clinical skills practice and training should be based on the results of EMS quality improvement results and measures of skills success rates.
9. WFPS should immediately begin seeking sufficient funding to develop and design a training centre sufficient to meet the needs of fire and EMS training.
    a. When considering designs, WFPS should refer to NFPA 1402: *Guide to Building Fire Service Training Centers.*
    b. A new training centre should include facilities and resources sufficient to provide live fire training; multiple classrooms (with moveable wall systems to enable multiple classroom configurations) and other facilities; space for apparatus driver training; sufficient washrooms and showers (both genders); and enough indoor space to allow for "outdoor" drills but sheltered from inclement weather.
10. The Training Centre should have permanently assigned fire apparatus and an ambulance utilized solely for training (these apparatuses could be deployed for major incidents).

Emergency Medical Services

1. Consider implementing a policy that mandates all new firefighter applicants to have current PCP certification.
2. Consider collective agreement changes to hours of work, providing sufficient crew breaks per 12-hour shift.
3. Evaluate options for efficient shift change intervals to allow for cleaning, washing, and re-stocking of the ambulances, such as staggered shift starts or stocked reserve apparatus swaps.

Communications

1. Consider eliminating the requirement of Communications Operators to maintain EMR certification and replace this requirement with medical priority dispatch (MPD) training and regular continuing education in accordance with NFPA 1221.

Hazardous Materials

1. Ensure Incident Commanders are trained in accordance with NFPA 1072: *Hazardous Materials/ Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications*.
2. Ensure Incident Safety Officers are trained in accordance with NFPA 472: *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.
3. Provide medical training for paramedics in hazardous material toxicology.
4. Establish Medical Treatment Protocols for handling medical aspects of hazardous materials incidents.
5. Develop a personal protective equipment plan describing a method to address hazard-based selection of protective ensembles, their use and limitations, work mission duration, maintenance and storage, decontamination and disposal, training and fitting, donning and doffing, and inspection procedures.
6. Amend the ERP to outline specific procedures for various tasks that team members may be required to perform, such as spill or leak control.
7. Consider the addition of specific and detailed compound analysis.
8. Consider the addition of a flame ionization detector.
9. Increase personal radiation dosimeters from five to eight.
10. Increase the Alpha radiation detector from one to two.
11. Consider the addition of a Class D metal extinguisher.
12. Provide on scene weather analysis and updates.
13. Provide joint maritime training for deployment of spill containment measures.

Technical Rescue

1. Provide training for medical personnel in technical rescue specific emergencies and injuries.
2. Establish a method of ensuring team members have been certified to the technician level.
3. Develop a program to address initial and continued training of new and current team members.
4. Develop a training program that will adequately cover annual refresher training with a variety of training props and locations.
5. Provide large vehicle machinery extrication training.
6. Provide awareness and operations level training program for structural collapse rescue.
7. Purchase basic structural collapse rescue equipment for light technical rescue operations with the goal of achieving technician level training in the future.

Fire Prevention

1. Sustain existing public education programs, especially those that target at-risk populations.
2. Investigate the possibility of fire officers referring youths involved in fire setting, intentional or accidental, directly to the program without prior court intervention adjudication.
3. Establish performance metrics that measure **outcomes**; e.g., changes in behaviour or amount of fire loss, in addition to current measures of **output**; e.g., number of activities.
4. Review current practices to develop and/or update policies and procedures for the thorough and systematic investigation of all fires and explosions by a WFPS Fire Investigator.
5. Establish fire investigation performance measures and include the information in the annual Community Trends and Performance Report.
6. Continue to monitor the current joint fire investigation program and consider the addition of another Fire Investigator to each shift, contingent upon available funding.
7. Continue to leverage existing public education resources through partnerships with other agencies, include public health, social services, and law enforcement to minimize costs and increase audience reach.
8. Combine fire and EMS public education programs into a single, cross-trained unit.
9. Expand use of in-service fire companies to deliver public education messages and deliver community risk reduction programs such as smoke alarm installations in high-risk households.
10. Monitor program results to determine best efforts and return on investment; e.g., reduction in number of residential fires and number of fire injuries.
11. Sustain the formal appraisal process and include the information in the annual Community Trends and Performance Report.
12. Establish a formal Community Risk Reduction Program that includes specific enforcement objectives.
13. Review fee schedules for fire inspections periodically to ensure full cost recovery, or actual percentage thereof.
14. Provide opportunities for Fire Prevention Officers to enhance certification through Inspector II and Inspector III levels in accordance with NFPA 1031.
15. Encourage advanced level CE and third-party certification and credentialing through NFPA, ICC, NICET, and others.
16. Pursue fire protection engineers to address building design features for enhanced fire mitigation and safety.
17. Use existing fire response data to develop and prioritize risk-based fire prevention programs.
18. Provide opportunities for WFPS fire prevention services to build relationships with PP&D in order to develop information-sharing and operational intelligence, especially when reviewing performance-based alternatives in the repurpose, remodel, renovation, or enlargement of residential and office buildings.
19. Include a discussion about SWOT findings in the planning process.
20. Move the Fire Investigators to the Fire Prevention branch.

Emergency Management

1. Continue use of the current Emergency Preparedness Program, including the Emergency Response Organization, Emergency Control Committee, Coordination Committee, and Emergency Operations Centre.
2. Update the current Emergency Plan.
3. Consider use of the AHRA scoring tool to assess and quantify relative risk.
4. Develop an increased understanding of hazards/risks with internal/external partners.
5. Establish consistency in planning, exercises, and drills.
6. Address EOC limitations.
7. Increase participation in peer groups, with provincial partners, and academic institutions.
8. Continue to develop a collaborative, holistic approach to emergency management.
9. Review key aspects of the Winnipeg Emergency Plan annually, with updates planned every five years.
10. Establish and sustain the resources necessary for adequate support staffing and program funding for planning and preparation activities, to include training, drills, and exercises.
11. Encourage partnerships with local, provincial, and other stakeholders including NGOs (non-governmental organizations) such a non-profit and faith-based organizations.
12. Use the initial community risk assessment provided in the Standards of Cover report as a foundation for future, comprehensive risk assessments that use quantitative analytical tools such as the AHRA prototype or the FEMA model described in Appendix B of this report.
13. Establish outcome-based performance measures to complement existing output-based measures.
14. Develop training scenarios based on actual Winnipeg incidents to enhance understanding of local conditions, hazards, risks, and capabilities.
15. Begin capital improvement planning (CIP) for a comprehensive review of the City emergency operations centre (EOC) to include design, development, construction, operation, and maintenance of primary and alternate emergency operations centres.

Financial Strategies

1. The department should develop a comprehensive five-year financial model to include status quo projections of revenue and expense as well as various service level improvement scenarios. Model should integrate projected capital equipment and facility costs to provide uniform cash flow requirements over the life of the model (better prediction of expense to prevent spiking expenditure budget analogous to FMA leasing costs).
2. Annual apparatus lease payments should be monitored versus actual apparatus purchases and cost of each apparatus type should be reviewed against industry inflationary trends.
3. Develop and adopt a long-range equipment replacement program based upon expected life cycle and technology changes for SCBA, extrication, major medical and other equipment systems.

4. Develop a comprehensive ten-year facility capital improvement and maintenance plan to include new stations, major renovations, key building system replacement or upgrades, and an adequately funded routine (recurring) maintenance program.
5. Closely monitor province ambulance fee reduction actions versus additional grant funding to determine impacts on CoW tax support of ambulance service.
6. Monitor rising operating services costs and explore opportunities for cost reduction.

Staffing Strategies

1. WFPS should conduct a comprehensive analysis of its administrative and support staffing requirements.
    a. As a result of the analysis, consider developing a short-, medium-, and long-term plan that would include prioritizing the staffing needs among each of the administrative and support services divisions and branches.
    b. The plan should include organizational staffing goals, priorities, and succession planning.
2. Consider the addition of an Assistant Director position to assist with the growing administrative demands in the Fire Training Academy.
3. An Assistant Director for the PET program should be considered.
4. Consider adding 1–2 Training Instructors as a surge in demand occurs.
5. WFPS should make it a priority to acquire personnel to staff additional ambulances in order to reduce Unit Hour Utilization rates. Alternatively, reducing ambulance wait times can have the same effect as acquiring additional personnel or ambulances.
6. Establish a minimum number of Primary Care Paramedic certified firefighters (FFPCP) to maintain on duty. Based on that plan, ensure that FFPCPs must maintain the certification as a condition of employment until promoted out of the position.
7. Ensure minimum staffing of seven Hazardous Material Technicians are assigned on initial alarm.
8. Consider adding a Fire Protection Engineer in lieu of a Plans Reviewer.
9. Consider civilian positions for future Plans Reviewers and/or Fire Protection Engineers.
10. Reach a total of 32 Fire Prevention Officers by 2022, based on availability of funding.
11. Reach a total of 3 Plans Reviewers by 2022, based on availability of funding.
12. Reach a total of 5 Public Education staff by 2019, based on availability of funding.
13. In the interest of officer safety, reach a total of 8 Fire Investigators as soon as practical, based on availability of funding.
14. Move the Fire Investigators to the Fire Prevention branch.
15. Increase the number of trained Fire Investigators to allow the complete and thorough investigation of all fires and explosions by WFPS Fire Investigators.
16. Add one new employee to implement and manage a Community Risk Reduction Program.

Equipment Strategies

The WFPS has an apparatus replacement schedule which is funded and financially contributed to by the department annually. The apparatus serving frontline duty were evaluated simultaneous to the facility assessments and are detailed in Appendix D of this report. However, the assessment did not include an assessment of ambulance units. They were all deployed while ESCI was on-site and were therefore unable to be evaluated. This alone indicates high utilization and a much shorter replacement schedule may be required. During the site visit, several units were behind on service or were out of service in need of repair.

As of the timing of the site visit, WFPS had eight units that exceeded replacement criteria and seventeen units that met replacement criteria. ESCI understands that since the site visit, several units have since been replaced. However, it is important to note that continuing to operate units that meet or exceed replacement criteria also render those units at higher risk of response failure, having a deleterious effect on response times. This also poses a significant risk for those people counting on the response.

NFPA 1901, 1911, and 1912 are applicable standards for the purchase, refurbishment, maintenance, and retirement of fire apparatus. ESCI supports Annex D of these standards as they relate to replacement schedules for heavy fire apparatus (engines, tenders, and ladder trucks). Generally, the annex recommends a maximum of fifteen years of frontline service, followed by a maximum of ten years in reserve status, followed by surplussing the unit from service. However, usage can have a significant effect on the resource reliability and maintenance costs during its life expectancy, as is the case in WFPS.

ESCI offers for consideration an alternative replacement schedule approach. The following is a formulaic approach to apparatus replacement based on a combination of age, travel distance and hours of operation, service type, general condition, and unit reliability based on maintenance intervals.

Figure 166: Apparatus Replacement Criteria

Evaluation Components	Points Assignment Criteria	
Age	One point for every year of chronological age, based on in-service date.	
Miles/Hours	One point for each 10,000 miles (16,093 km) or 1,000 hours.	
Service	1, 3, or 5 points are assigned based on type of service unit receives. (Example: fire engines would be given a 5 because it is classified as severe duty service, whereas support units might be given a 1 as limited duty.)	
Condition	This category takes into consideration body condition, rusted interior condition, accident history, anticipated repairs, etc. The better the condition the lower the points assignment (minimum of 1 point).	
Reliability	Points are assigned as 1, 3, or 5 depending on the frequency that a vehicle is in the shop for repair. (Example: a 5 would be assigned to a vehicle in the shop two or more times per month on average, while a 1 would be assigned to a vehicle in the shop an average of once every three months or more.)	
Point Ranges	**Condition Rating**	**Condition Description**
Under 18 points	Condition I	Excellent
18 to 22 points	Condition II	Good
23–27 points	Condition III	Consider Replacement
28 points or higher	Condition IV	Immediate Replacement

Capital Facilities Strategy

Training Centre

As identified earlier in this report, WFPS should remodel the training and maintenance facility with additional work and storage space. Staffing levels in the shop are low in relation to the volume of repairs and routine maintenance needed to support the fleet, but additional space and organization is necessary before more staffing may be fully utilized. The addition of an automatic fire sprinkler system and emergency generator is also recommended.

Alternatively, WFPS should begin seeking sufficient funding to develop and design a stand-alone training centre sufficient to meet the needs of fire and EMS training. When considering designs, WFPS should refer to NFPA 1402: *Guide to Building Fire Service Training Centers*. A new training centre should include facilities and resources sufficient to provide live fire training; multiple classrooms (with moveable wall systems to enable multiple classroom configurations) and other facilities; space for apparatus driver training; sufficient washrooms and showers (both genders); and enough indoor space to allow for “outdoor” drills but sheltered from inclement weather.

Response Facilities

The analysis of future resource deployment will be an ongoing process, not one that is decided at one point in time and remain static. Circumstances are sure to change as the WFPS service area grows. The facilities deployment presented should be reviewed and modified as circumstances change. The facility deployment is intended to provide guidance for future station deployment based on existing conditions and future growth and development projections for the community.

As discussed in the *Distribution Analysis*, WFPS currently operates from 27 fire stations and three additional EMS facilities. Based on GIS analysis, WFPS stations are distributed throughout Winnipeg in a manner that demonstrates an appropriate distribution of resources to achieve rapid travel times for the first unit on scene and an adequate concentration of resources to handle the number and type of risks present in the service area. While many fire and EMS jurisdictions need to add stations to decrease travel time and improve response performance, ESCI believes WFPS can reduce the number of WFPS facilities, while maintaining or improving the level of service provided.

This is significant for the following reasons:

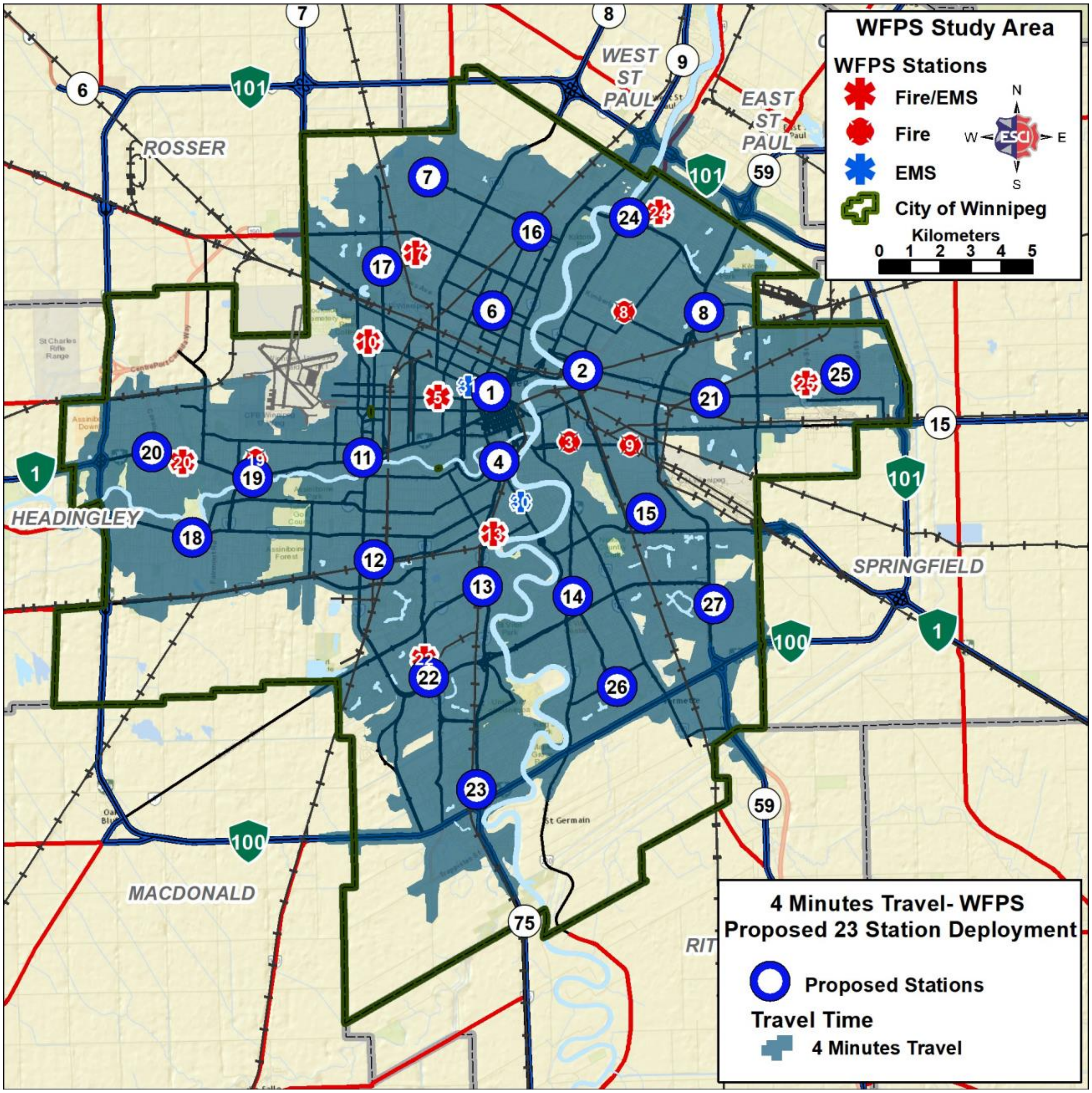
- Many of the WFPS facilities need significant remodeling or total replacement as determined by ESCI’s site assessment, thus any reconfiguration consideration is timely;
- Modern fire paramedic station design can be factored into these facilities, reducing turnout time for responding crews just by improving work flow within the station;
- While facility reconstruction is an expensive and complicated logistical endeavor, it is a one-time cost. Reducing the number of facilities that require maintenance is an ongoing cost avoidance strategy;

- Existing fire paramedic Station sites are utilized as much as practical to capture as much efficiency as possible and reduce expense;
- Existing inventory of facilities that become surplus to the needs of the City as a result of this strategy are able to be liquidated, with the proceeds of the sale of these properties reinvested in this strategy to offset the capital costs.

It is important to recognize that while ESCI is recommending the consolidation of certain fire stations—which includes the current EMS-only stations—ESCI is ***not*** recommending a reduction of apparatus or staff assigned to those stations being eliminated. Instead, existing apparatus and crew deployment would be moved to the consolidating stations, adding to the resource concentration within the City.

Using a resource allocation GIS model and the same street network data used in the *Service Delivery* section of this report; the following figure demonstrates a deployment model which distributes WFPS operational resources in 23 combined fire and EMS facilities throughout the WFPS service area.

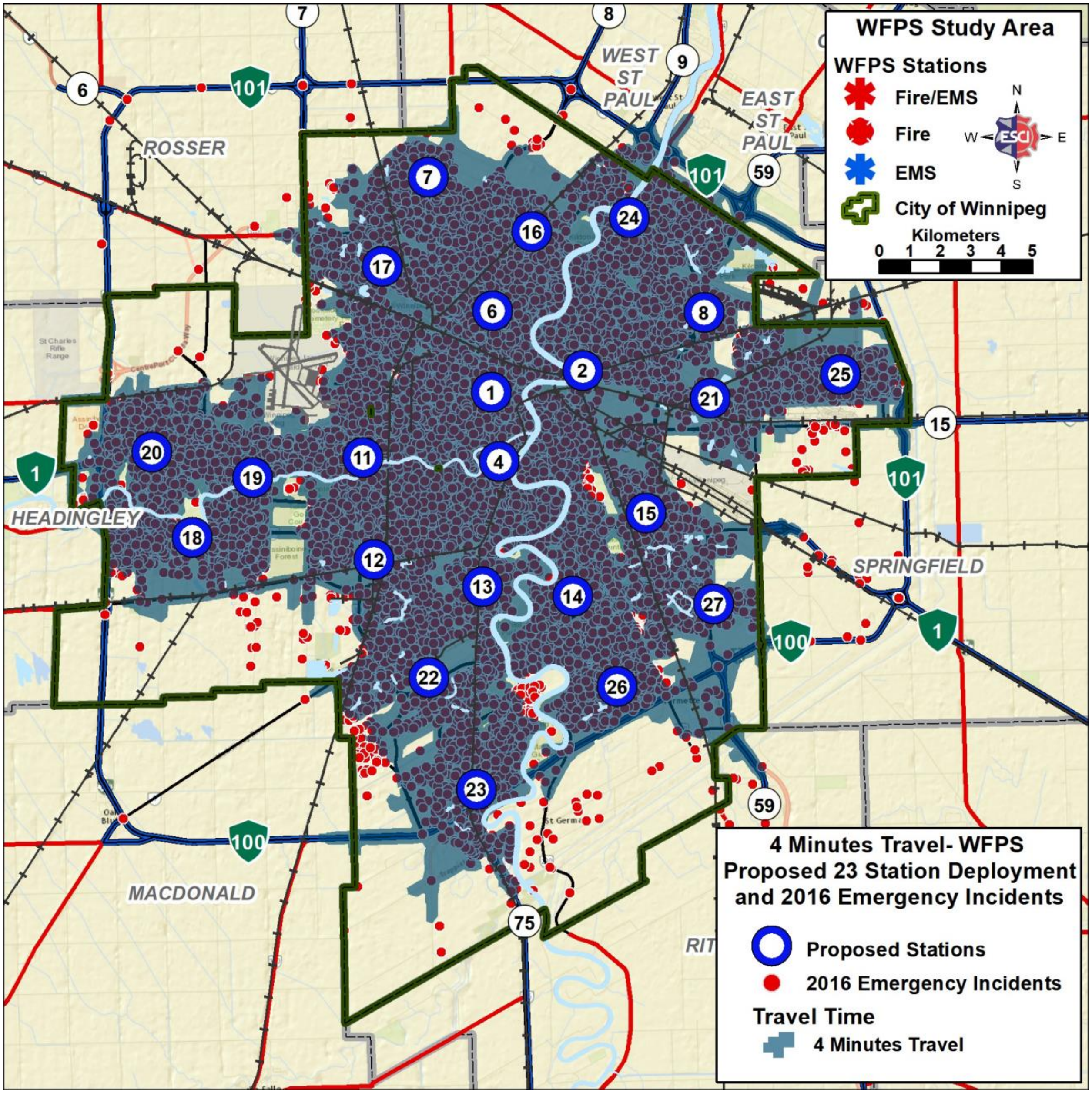
Figure 167: WFPS Proposed 23-Station Deployment



Multiple locations were evaluated to arrive at the station locations modeled in this figure. The model presented in this figure represents a mix of existing station locations and new locations. The proposed station locations are labeled with the number of the existing station they replace.

The following figure overlays the proposed station travel time model and 2016 emergency service demand.

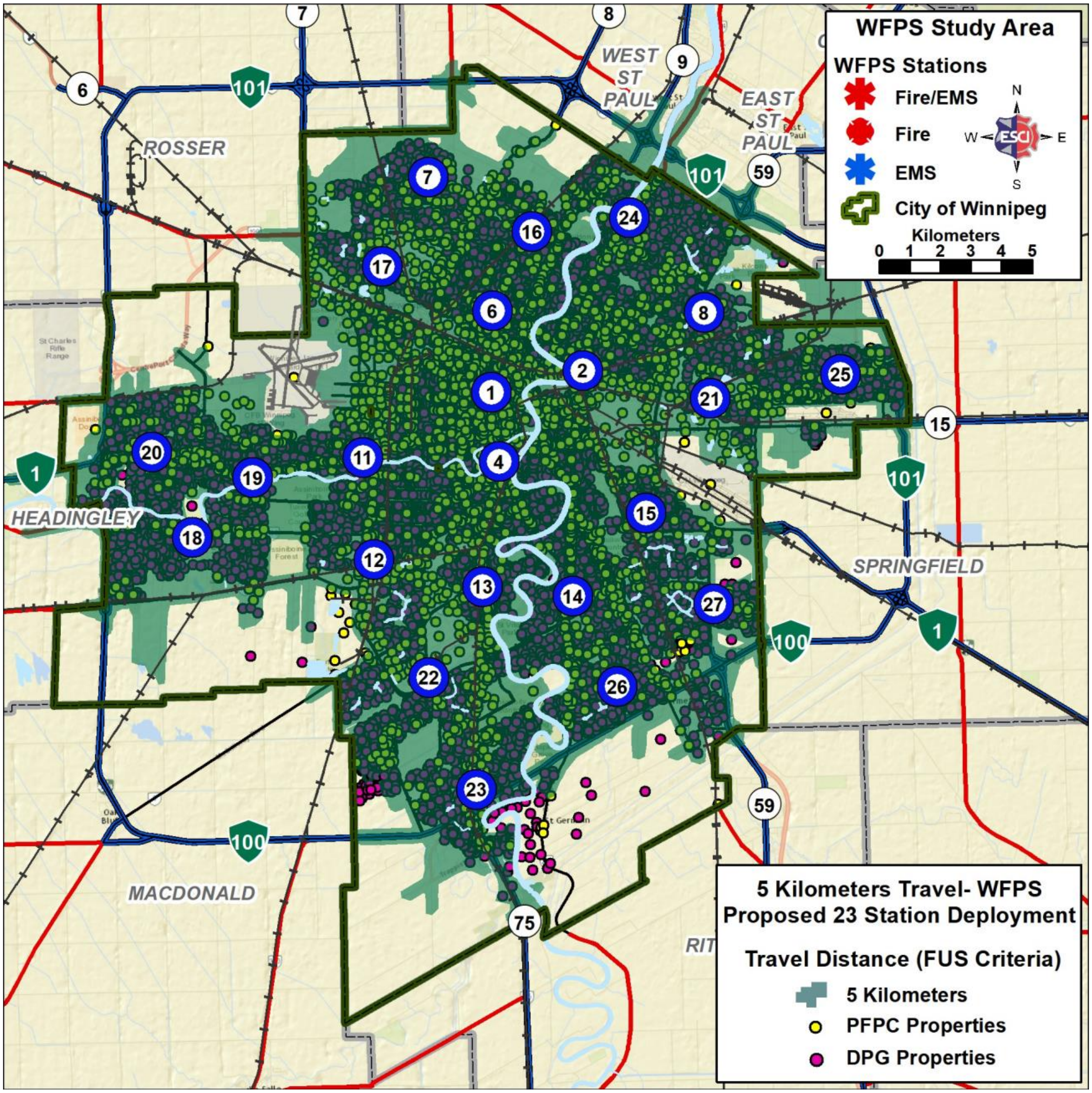
Figure 168: Proposed 23-Station Deployment Model and Service Demand, 4 Minutes Travel



Nearly 98 percent (97.7 percent) of 2016 emergency incidents are within four minutes travel or less (NFPA 1710 criteria) of a WFPS station using the 23-station deployment model displayed in this figure. This represents a slight improvement over the current WFPS station deployment, which is within four minutes travel or less of approximately 97 percent (97.2 percent) of 2016 emergency service demand. It is important to note that the proposed model achieves slightly better emergency service demand coverage than the current station deployment and reduces the number of WFPS stations from 30 to 23.

The following figure examines the distribution of WFPS stations based on the Fire Underwriters Survey (FUS) rating criteria.

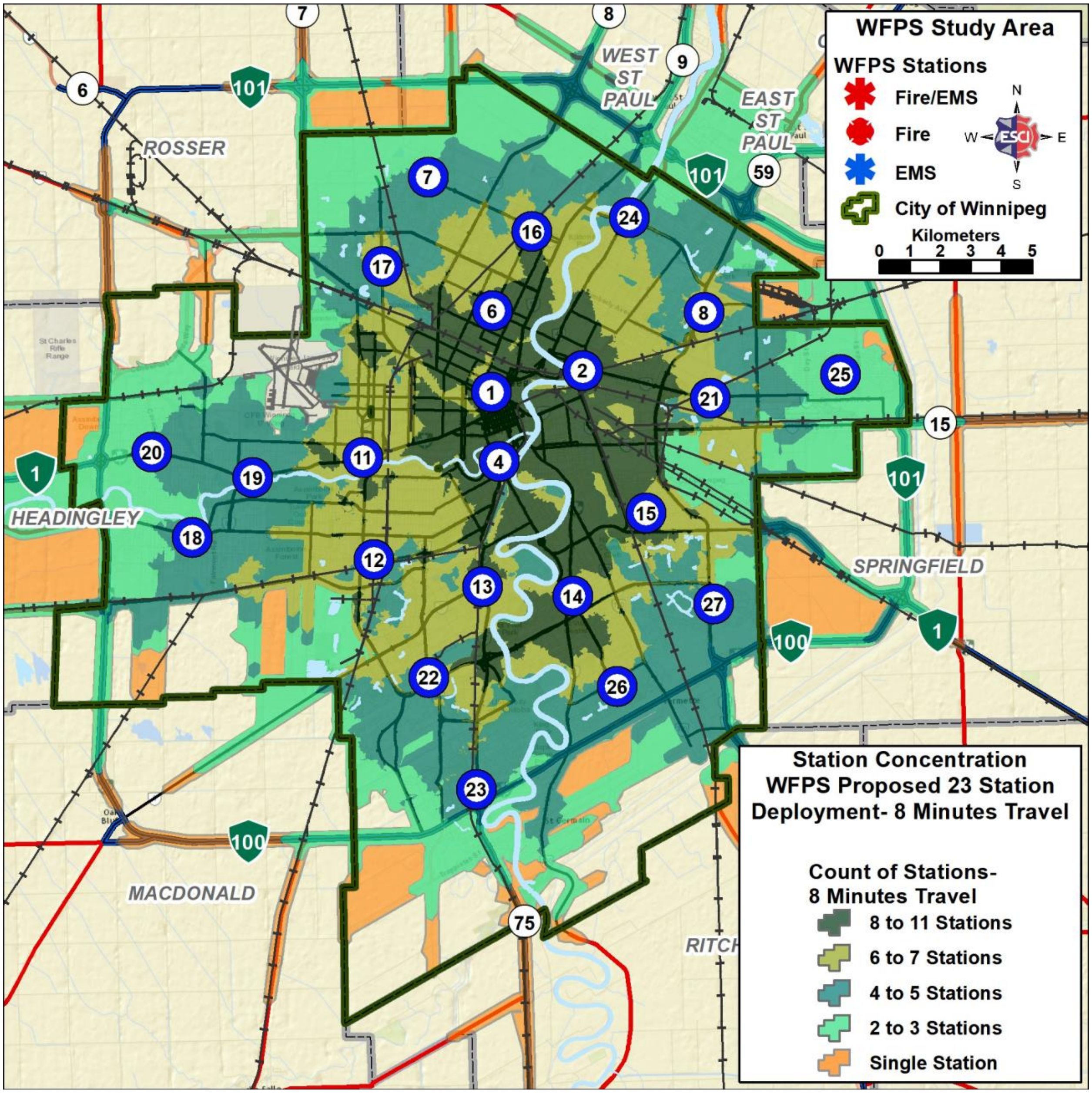
Figure 169: Proposed 23-Station Deployment Model—PFPC and DPG Properties, 5 Kilometers Travel Distrance



As in the previous figure, this figure demonstrates that based on the Fire Underwriters Survey (FUS) criteria; the proposed station deployment model provides a somewhat higher level of coverage. Ninety-nine percent (99%) of both the PFPC (commercial, industrial, and multifamily residential) and DPG (one or two family detached residential) properties are within five kilometers driving distance of a proposed fire paramedic station location.

The next figure models the proposed 23-station deployment at eight minutes travel; and displays the concentration of stations available in the WFPS service area.

Figure 170: Proposed 23-Station Deployment Station Concentration, 8 Minutes Travel Time



Appropriately, the greatest concentration of stations occurs in the central core of Winnipeg. Up to 11 stations are within eight minutes travel or less of the downtown core and the surrounding area. Over 40 percent of 2016 emergency service demand occurred in the area around Stations 1, 2, 4, and 6. It is essential that a high concentration of resources be available to handle the service demand in this area. As with the current deployment of stations, most of the portions of Winnipeg within the Highway 100/101 transportation corridor around the city are within eight minutes travel of four to seven WFPS stations.

Fire stations should be located, staffed, and equipped to provide response resources using two primary considerations:

1. Located to effectively intervene in requests for emergency service in a timely manner.
2. Assigned with sufficient resources to ensure a reliable response to any emergency service request.

The first consideration suggests that the facilities should be located so that resources deployed there can effectively respond to an incident based on risk. The second consideration suggests that during periods of higher incident activity, sufficient concentration of additional resources should also be available to respond.

While the proposed deployment model reduces the number of WFPS facilities, ESCI does not recommend that WFPS reduce the current apparatus or staffing levels. Instead, WFPS should redistribute personnel and apparatus (both fire and EMS), in a manner that effectively allocates resources to meet emergency response performance goals for the first unit on scene and a full first alarm or effective response force (ERF) at any emergency. Additionally, resources should be distributed in a manner to ensure that adequate resources are available to reliably handle emergency service demand at any time. ESCI notes that WFPS already employs a robust and responsive system for deploying additional resources during times of high service demand for EMS incidents, which represents the majority of WFPS service demand.

WFPS operates out of a variety of facilities, ranging from nearly 100 years old to less than five years old. While the proposed station deployment utilizes a number of the existing station locations, many of the stations are at the end of their useful life cycle and do not meet the current or future needs of the department. A thorough discussion of the current WFPS facilities is provided in the *Capital Assets* section of this report.

The proposed 23-station deployment plan represents a considerable cost to the fire department. In general, the cost to construct a modern well-designed fire paramedic station can range from $425 to $450 per square foot—according to Planning Property and Development and an independent architectural firm—and can be higher depending on local material and labour costs. Some stations will require remodeling or renovation, while demolition and construction of a new facility may be more cost effective in some cases. Not only is the cost of building a station significant, but the ongoing cost of a facility's continued, ongoing operation needs to be considered. The actual cost of construction varies widely based on several factors and variations in design, function, capacity, and site conditions. Prior to embarking on any plan to redistribute department stations and resources, ESCI recommends that WFPS consider the following:

- Conduct a facilities study of the current fire paramedic Station and conditions that provides recommendations and costs to address current essential facility, dual gender, and industry safety and functionality best practice standards.
- Conduct a fire paramedic station prototype study. A qualified architect firm utilizing a cross section of department members, administration, City representatives, and other desired stakeholders should conduct this study. The study should address basic spatial and square footage requirements for a variety of apparatus configurations. The study should also address station functions; workflow modeling and room adjacencies resulting in a WFPS station configuration standard. Station lay out consistency can lead to economies of scale, enhanced productivity, decreased turnout time (hence reduced response time), and increased employee satisfaction.
- Establish a capital fire facility funding and finance strategy. Work with City staff to evaluate and develop a funding strategy. Based on the findings and development of the station prototype requirements, a City (general or City capital fund) or community (essential facilities bond program) fund should be established. As fire stations are normally amortized as long-term assets and capital or debt financing is frequently limited, a phased or incremental approach to upgrade existing facilities or construct new fire stations is a common and often preferred approach.

Careful consideration should be given to the current and future needs of the WFPS prior to breaking ground for a new station or renovating an existing facility. A renovated or new station represents a large investment in both time and money for the department. Constructing a facility that will not meet the needs of the organization well into the future is a costly oversight that is not easily remedied. WFPS provides service to a large and diverse service area; some stations in the downtown core area may require four to six or more double bays. Two to three double bay stations may be adequate in some areas depending on the nature of risk present. All stations should provide adequate living quarters for current and future staffing.

The following figure provides a crosswalk that compares current facility recommendations with the future deployment strategy.

Figure 171: Capital Facility Matrix

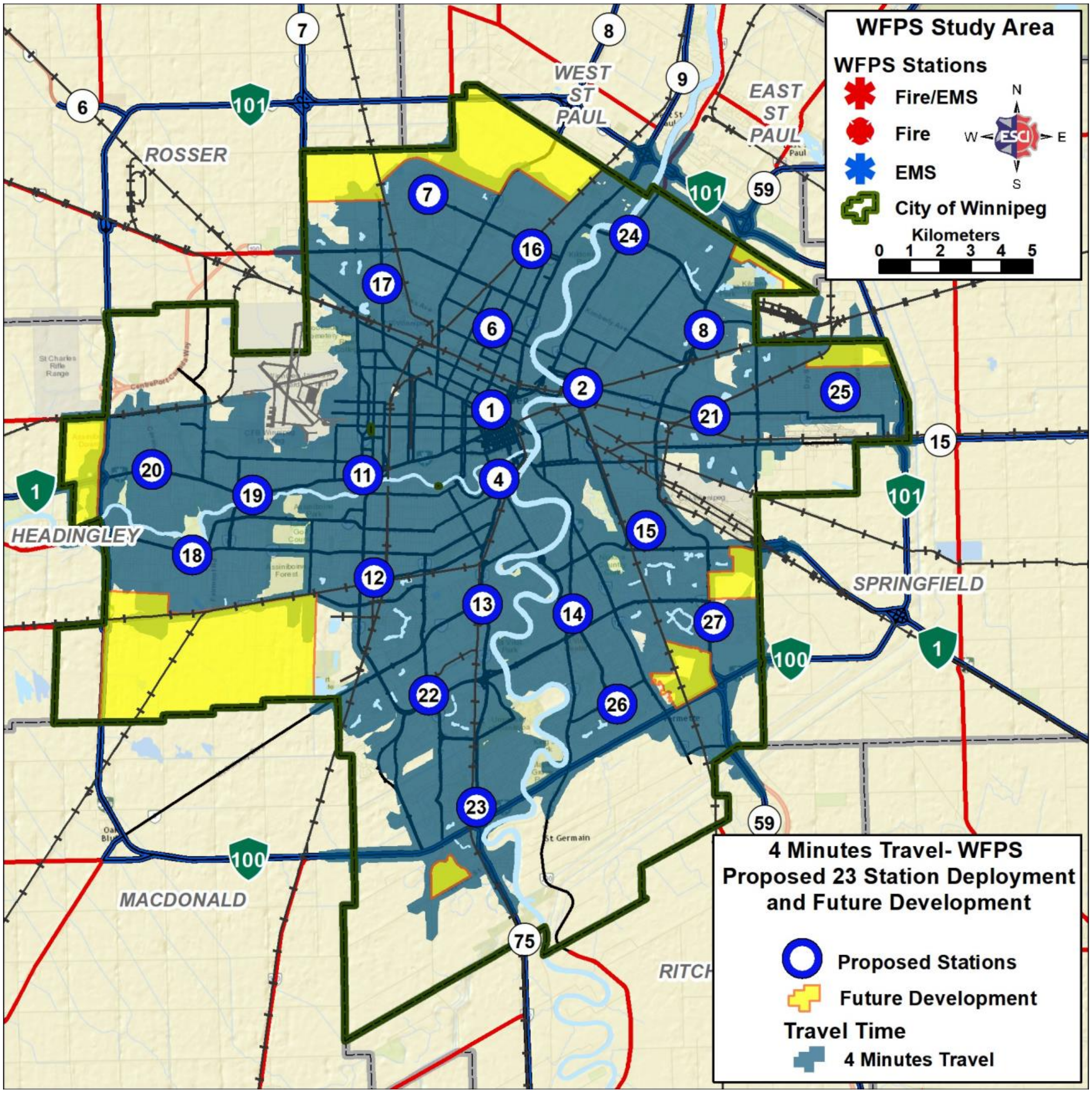
Facility	Current Condition Recommendations	Future Facility Deployment Strategy
WFPS Station No. 1 65 Ellen Street	Replace	Site of Consolidated Station with Stations 5 and 31
WFPS Station No. 2 55 Watt Street	Remodel/update including the addition of an automatic sprinkler system and emergency power generator.	Site of Consolidated Station with Station 3
WFPS Station No. 3 337 Rue DeMeurons	Replace	Consolidate with Station 2
WFPS Station No. 4 150 Osborne Street	Replace	Site of Consolidated Station with Station 30
WFPS Station No. 5 845 Sargent Avenue	Replace	Consolidate with Station 1
WFPS Station No. 6 603 Redwood Avenue	The kitchen area needs refurbishment and a remodel of the dorm area is recommended, potentially designed with individual dorms or a separate women's dorm. Add an automatic fire sprinkler system and an emergency power generator.	Remain Station 6
WFPS Station No. 7 10 Allen Blye Drive	Installation of an emergency generator.	Remain Station 7
WFPS Station No. 8 640 Kimberly Avenue	The kitchen refurbishment. Installation of an emergency generator.	Remain Station 8, but relocated east (area of Lagimodiere & Grassie)
WFPS Station No. 9 864 Marion Street	Replace	Consolidate with Station 15
WFPS Station No. 10 1354 Border Street	Installation of an automatic fire sprinkler system.	Consolidate with Station 17
WFPS Station No. 11 1705 Portage Avenue	Installation of an emergency generator.	Remain Station 11
WFPS Station No. 12 1780 Taylor Avenue	Installation of an automatic fire sprinkler system and an emergency generator.	Remain Station 12
WFPS Station No. 13 799 Lilac Street	Remodel the facility. An automatic fire sprinkler system and emergency generator should be installed.	Remain Station 13, shifted south (area of McGillivray & Pembina Highway)
WFPS Station No. 14 1057 St. Mary's Road	Replace	Remain Station 14
WFPS Station No. 15 1083 Autumnwood Drive	Replace	Site of Consolidated Station with Station 9
WFPS Station No. 16 1001 McGregor Street	Replace	Remain Station 16

Facility	Current Condition Recommendations	Future Facility Deployment Strategy
WFPS Station No. 17 1501 Church Street	Replace	Site of Consolidated Station with Station 10, but relocated to the west to better cover Station 10 area (area of Keewatin and Tyndall).
WFPS Station No. 18 5000 Roblin Avenue	Installation of an automatic fire sprinkler system and an emergency generator.	Remain Station 18
WFPS Station No. 19 320 Whytewold Road	Replace	Site of Consolidated Station with Station 36
WFPS Station No. 20 525 Banting Drive	Remodel facility, installation of an automatic fire sprinkler system and emergency generator.	Remain Station 20, shift station to the west if possible (area of Portage and Cavalier)
WFPS Station No. 21 1446 Regent Avenue	Minor remodeling, a women's dorm area should be added. Installation of an automatic fire sprinkler system and emergency generator.	Remain Station 21
WFPS Station No. 22 1567 Waverly Street	Extensive remodel, an automatic fire sprinkler system and emergency generator.	Remain Station 22; consider new facility due to condition. Shift to the south if possible (area of Waverly south of Scurfield)
WFPS Station No. 23 880 Dalhousie Drive	Replace	Remain Station 23
WFPS Station No. 24 1664 Rothesay Street	Extensive remodel or replace	Remain Station 24, shift station southwest if possible (Area of Henderson Highway & Chief Pegasus Trail)
WFPS Station No. 25 701 Day Street	Partial interior remodel will resolve the identified issues and improve emergency response. installation of an automatic fire sprinkler system and an emergency generator.	Remain Station 25, shift station east if possible (area of (Wayoata & Kildare)
WFPS Station No. 26 1525 Dakota Street	Installation of an automatic fire sprinkler system and an emergency generator	Remain Station 26
WFPS Station No. 27 27 Sage Creek Blvd	Installation of an automatic fire sprinkler system and an emergency generator.	Remain Station 27
WFPS Station No. 30 524 Osborne Street	Replace	Consolidate with Station 4
WFPS Station No. 31 726 Furby Street	Replace	Consolidate with Station 1
WFPS Station No. 36 2490 Portage Avenue	Replace	Consolidate with Station 19
Emergency Mechanical Services Branch (EMSB) 2546 McPhilips Street	Remodel facility, add work and storage space. Add automatic fire sprinkler system and emergency generator.	Not Applicable

Future Development

As discussed in the Population and Service Demand Projections, the population of Winnipeg is projected to grow to approximately 922,600 by 2040. The majority of the projected population growth is predicted to be fueled by migration into the City. Increased density and infill will accommodate the majority of new residents in Winnipeg. However, some new residential developments are planned in what is now primarily rural or agricultural land. The following figure displays areas identified for future development in City of Winnipeg planning documents.

Figure 172: Proposed 23-Station Deployment and Future Development



The areas identified for future development in this figure may or may not require additional WFPS facilities and resources in the distant future. It is difficult to assess until development occurs and a street network is in place to measure travel time performance from the nearest fire station. WFPS should work with City planners and developers to ensure that adequate planning for emergency services occurs prior to increased development in these areas.

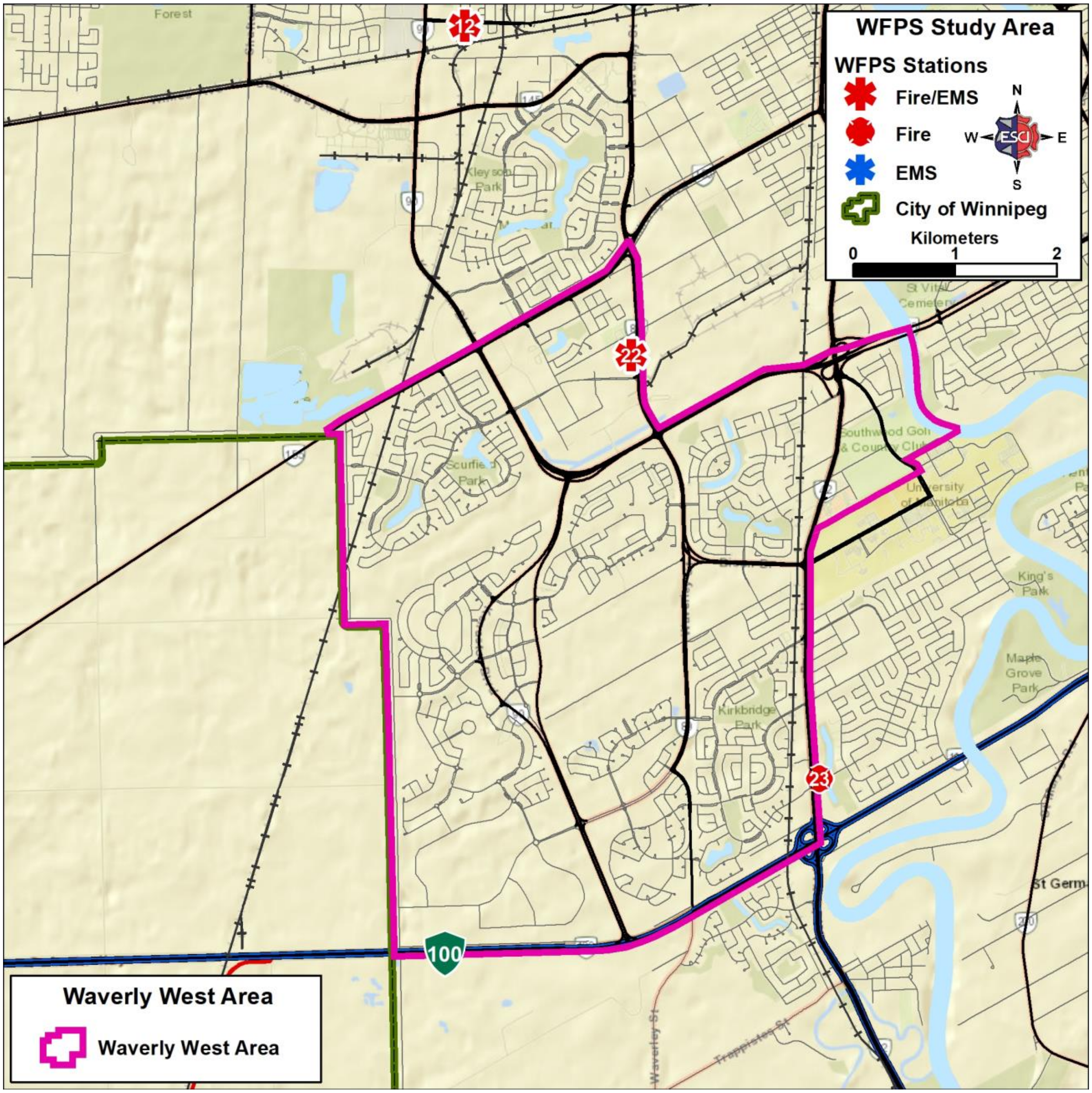
In addition to the areas identified for future development in the previous figure, infill and redevelopment in the already developed portions of Winnipeg will affect service demand and the nature of risks in the service area. To mitigate the effect of development and population growth on service demand and risk throughout the City, ESCI suggests that WFPS work cooperatively with City planners and developers to consider the following measures:

- Attention to future road networking and transportation planning to maximize fire department travel access;
- Use of traffic pre-emption technology to enhance response times;
- Implementation of proactive fire prevention and building design standards, such as fire sprinkler ordinances and other available initiatives, that will mitigate fire risk in newly developed areas.

Waverly West Area Discussion

Since ESCI completed the site visit in 2017, WFPS has identified an area of new development which has experienced both an increase in service demand and a degradation in response time performance due to increased development. The following figure displays the area that is referred to as the Waverly West neighbourhood.

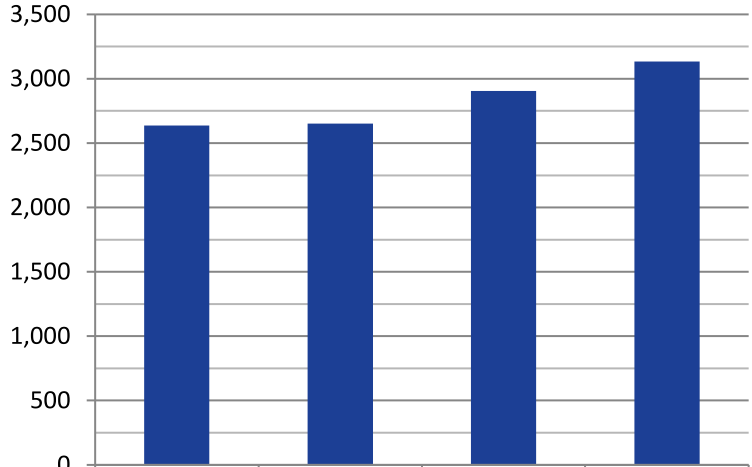
Figure 173: Waverly West Area



The Waverly West area is based on a pre-established electoral ward comprised of several neighbourhoods. The area is currently in the first in districts (FID) of Station 22 and Station 23 and is primarily zoned for residential and associated commercial development. According to Statistics Canada 2016 census tract data, the population in this area grew from approximately 31,100 in 2011 to over 42,700 in 2016; an increase of approximately 37 percent.

Using WFPS incident data for 2015 through 2018, the following figure displays service demand in the Waverly West Area.

Figure 174: Waverly West Service Demand, 2015–2018

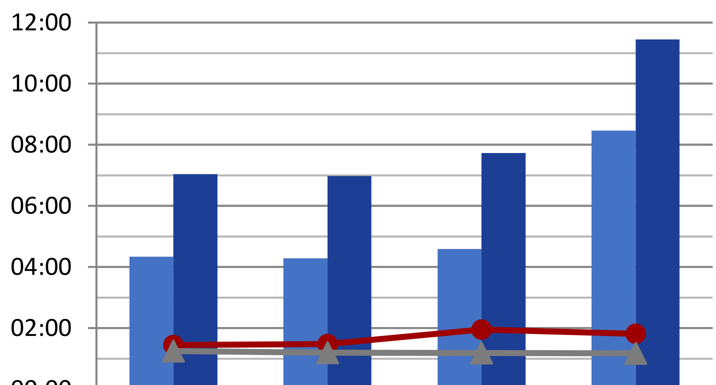


	2015	2016	2017	2018
Waverly Incidents	2,637	2,652	2,905	3,134

Overall, service demand in the Waverly West area increased by nearly 19 percent (18.8 percent) between 2015 and 2018. As displayed, most of the increase occurred between 2016 and 2018 (9.5 percent in 2017 and 7.9 percent in 2018). Note that overall workload in the Station 22 and Station 23 FID's, which includes areas outside of the Waverly West area increased by 17.6 percent (Station 22) and 16.1 percent (Station 23) between 2015 and 2018.

Since increased service demand can affect response time performance, it is important examine response time performance during the same time period. The following figure displays WFPS performance for the components of total response time in the Waverly West area from 2015 through 2018.

Figure 175: Waverly West Average Emergency Response Time Performance, 2015–2018



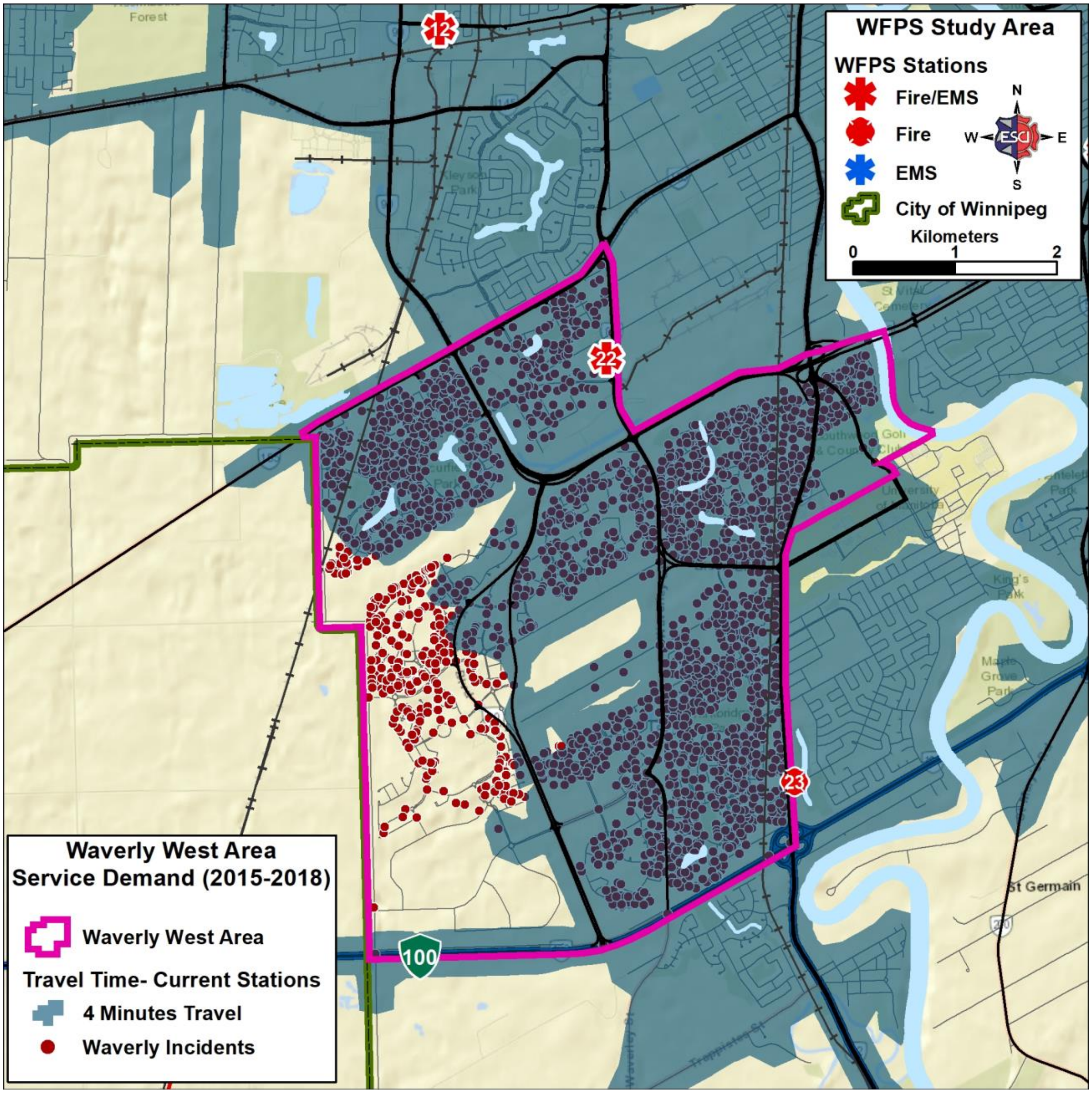
	2015	2016	2017	2018
Travel Time	04:20	04:17	04:35	08:28
Total Response Time	07:02	06:58	07:44	11:27
Call Processing	01:27	01:29	01:57	01:49
Turnout Time	01:15	01:12	01:11	01:11

Note that this figure reflects only Delta and Echo responses, which represent approximately 16 percent annually of the total incidents in the Waverly West incidents. ESCI calculates average instead of percentile measures of response performance, since averages are more suitable for demonstrating changes in smaller data sets.

Figure 175 demonstrates that call processing time and turnout time are relatively consistent in the 2015 through 2018 data. However, after remaining flat between 2015 and 2016; travel time performance began to lengthen in 2017 and increased by approximately 4 minutes in 2018, which results in an increase of over 4 minutes (04:25) in total response time between 2015 and 2018.

An increase in travel time and the resultant increase in total response performance may be attributed to longer travel times required for units from more distant stations to travel to Waverly West incidents; due to increased demand on first due stations (Station 22 or Station 23). Additionally, increased travel time may indicate new service demand in a developing area that is beyond the optimum travel time of the existing stations. The following figure displays Waverly West service demand and travel time capabilities from the current first due stations.

Figure 176: Waverly West Incidents and Current Travel Time Capabilities, 2015–2018

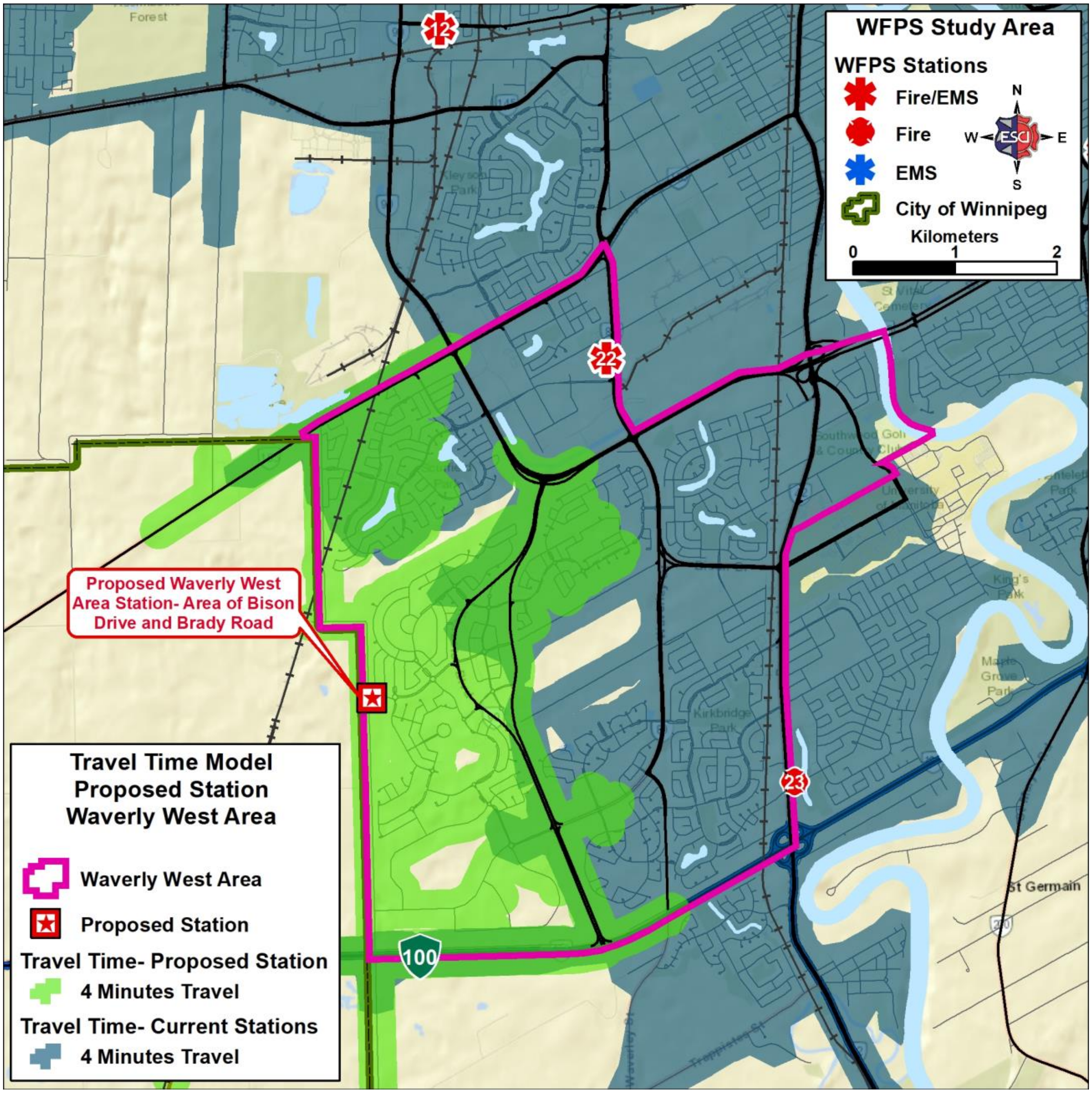


The incidents displayed in this figure represent all Waverly West incidents from 2015 through 2018 (approximately 11,328), since all these incidents affect workload in the Station 22 and Station 23 first in districts. The two stations are within four minutes travel of approximately 91 percent of the incidents displayed. The incidents beyond four minutes travel occurred in the newer development west of Kenaston Boulevard and east of Brady Road. Examination reveals that in 2015, a Station 22 or Station 23 apparatus was the first apparatus on scene at approximately 80 percent of all incidents in the Waverly West area, this decreased slightly to approximately 78 percent in 2018. The percentage for emergency incidents (Delta and Echo) was similar. While approximately 91 percent of service demand occurred within four minutes of a WFPS fire station, only 33 percent of emergency incidents were actually reached in four minutes travel time or less.

It appears that combination of new development, high service demand, and a lack of additional resources on the western edge of the WFPS service area are the primary factors that are negatively affecting emergency response performance in the Waverly West area.

The following figure demonstrates a travel time model for a possible future station location on the western edge of the Waverly West area. ESCI notes that much of the western portion of the Waverly West area (west of Kenaston Boulevard and east of Brady Road) is currently undeveloped. Future transportation network GIS data was not available. ESCI used parcel data to add a rudimentary street network through the area, which provides some idea of potential travel time. As previously discussed, ESCI encourages WFPS to work with transportation planners and developers to insure public safety infrastructure concerns are addressed as development occurs in the area.

Figure 177: Proposed Waverly West Future Station Travel Time Model

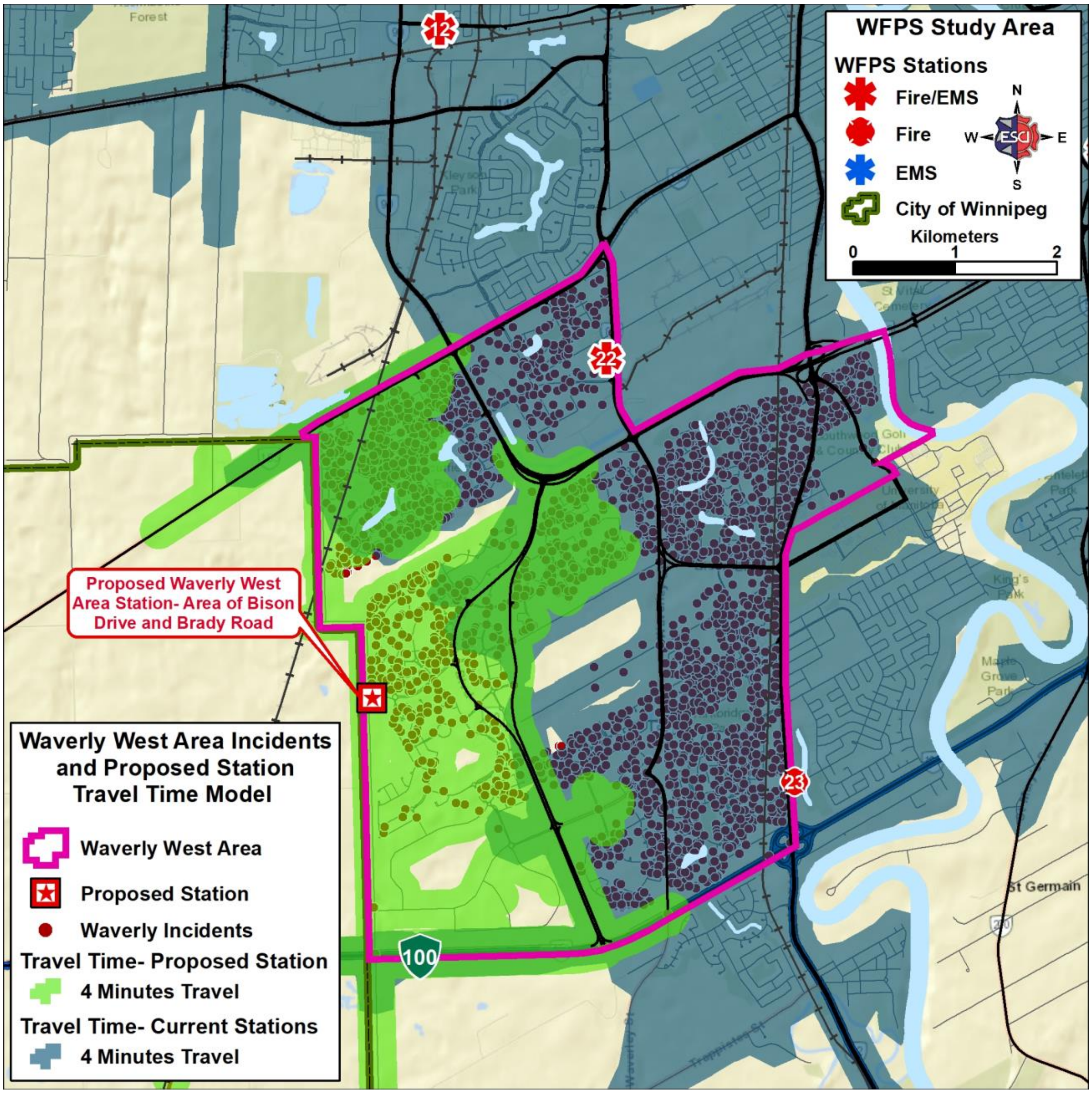


In evaluating travel time performance from the proposed station location, ESCI made the following assumptions based on the data available:

- Bison Drive will be extended and connected to Brady Road
- Waverly Street will be extended and connected to Brady Road
- Other new streets were added to the street network based on parcel data showing right of ways

ESCI ran multiple possible travel time models based on the street network displayed in this figure. The location displayed in the previous figure represents the optimum station location based on four minutes travel (NFPA 1710 criteria). The following figure displays the proposed station travel time model and 2015 through 2018 Waverly West service demand.

Figure 178: Proposed Future Waverly West Station and 2015–2018 Service Demand



A station in the area of Bison Road and Brady Road is within four minutes travel of all the service demand currently beyond four minutes travel of Station 22 or Station 23. Additionally, this location demonstrates sufficient overlapping coverage in the Waverly West area to increase response reliability within the four-minute service area of the existing stations. Based on the possible road network through the currently undeveloped portions of Waverly West, the Bison Drive/Brady Road location will provide good coverage to future development in the area.

Waverly West Conclusion

ESCI believes that reducing the current area beyond four minutes travel of a fire station, reducing the workload of the current first due stations in the Waverly West area, and addressing future development in presently undeveloped portions of the area will address both current and future goals in the Waverly West area. In addition to serving the Waverly West area, the proposed station location appears to have good access into other areas of Winnipeg projected to experience future growth. While the proposed station will most probably not meet future needs for first response capabilities in these other areas; the station increases the concentration of resources available on the southwestern perimeter of the WFPS service area.

APPENDICES

Appendix A: Table of Figures

Appendix B: Hazard Analysis[91]

Explanation

[Delete all unnecessary information from the explanation after the Hazard Analysis is completed.]

A hazard is described as a potential or existing condition that may cause harm to people or damage to property or the environment. Therefore, a hazard analysis is the systematic collection of past and present information relating to natural and human made emergencies or disasters aimed at estimating the future likelihood of an emergency.

The steps in a hazard analysis are:

1. Identify all potential hazards in your area;
2. Describe the hazards and the effects on your community;
3. Prioritize all the hazards using a system, such as the FEMA model. This model utilizes history, vulnerability, maximum threat, and probability to determine your top priorities.

Note: Models other than the FEMA model may be used. [Use the same model for entire analysis]

History: If a certain emergency has occurred in the past it may occur again unless those conditions no longer exist.

Rating	Criteria	Score
Low	0–1 Times in past 100 years	1
Medium	2–3 Times in past 100 years	5
High	4+ Times in past 100 years	10

Vulnerability: This has two parts and deals with property and people.

Rating	Criteria	Score
Low	1% of Community	1
Medium	% to 10 % of Community	5
High	>10 % of Community	10

[91] *Province of Manitoba Municipal Emergency Plan 2017 Template, Appendix A*. Manitoba Emergency Measures Organization, 2017. Retrieved from https://www.gov.mb.ca/emo/prepare/develop.html

Maximum threat: The worst-case scenario relating to human casualties and loss of property.

Rating	Criteria	Score
Low	5% of Community	1
Medium	5–25% of Community	5
High	>25% of Community	10

Probability: Things to consider in this part are likelihood of an event occurring, expressed as chances per year and take into account changes in technology or circumstance.

Rating	Criteria	Score
Low	Less than 1 in 1,000	1
Medium	Between 1 in 1,000 and 1 in 10	5
High	Greater than 1 in 10	10

EXAMPLE OF FEMA MODELLING

Type of Hazard		**Pandemic**				
Category		**Rating**	**Score**		**x Weight**	**Total**
Vulnerability	People	High	10	5.5	5	27.5
	Property	Low	1			
Max Threat		High		10	10	100
Probability		Medium		5	7	35
Total Risk						**172.5**

Potential Hazards

[Identify all potential hazards in your area.]

Description of Hazards and Effects on Community

[Describe the hazards and the effects on your community.]

Prioritization of Hazards

Type of Hazard		**Pandemic**				
Category		**Rating**	**Score**		**x Weight**	**Total**
Vulnerability	People	High			*5*	
	Property	Low				
Max Threat		High			*10*	
Probability		Medium			7	
Total Risk						

Type of Hazard		**Pandemic**				
Category		**Rating**	**Score**		**x Weight**	**Total**
Vulnerability	People	High			5	
	Property	Low				
Max Threat		High			10	
Probability		Medium			7	
Total Risk						

Type of Hazard		**Pandemic**				
Category		**Rating**	**Score**		**x Weight**	**Total**
Vulnerability	People	High			5	
	Property	Low				
Max Threat		High			10	
Probability		Medium			7	
Total Risk						

Type of Hazard		**Pandemic**				
Category		**Rating**	**Score**		**x Weight**	**Total**
Vulnerability	People	High			*5*	
	Property	Low				
Max Threat		High			*10*	
Probability		Medium			7	
Total Risk						

Type of Hazard		**Pandemic**				
Category		**Rating**	**Score**		**x Weight**	**Total**
Vulnerability	People	High			5	
	Property	Low				
Max Threat		High			10	
Probability		Medium			7	
Total Risk						

Type of Hazard		**Pandemic**				
Category		**Rating**	**Score**		**x Weight**	**Total**
Vulnerability	People	High			5	
	Property	Low				
Max Threat		High			10	
Probability		Medium			7	
Total Risk						

Appendix C: Community Trends and Performance Report—Volume 1[92]

Description

To provide a prompt and coordinated response by the City of Winnipeg to major peacetime disasters by:

- Minimizing the impact of an emergency or disaster on the City of Winnipeg.
- Protecting and preserving the health and property of the citizens of Winnipeg.
- Maintaining and restoring essential services during an emergency or disaster.
- Building resilient communities through sustainability, business continuity and enhanced recovery programs.

Key Goals

1. Prepare and test plans and strategies for new and emerging health risks and hazards.
2. Develop new and/or enhance current partnerships with other levels of government, authorities and community agencies.
3. Enhance the City's emergency plan to be more responsive to the needs of at risk populations (e.g. disabled, seniors, and children) and geographic communities and stakeholders within Winnipeg.
4. Provide emergency management education and training to staff, partnering agencies, and the general community.

Service Level Statistics

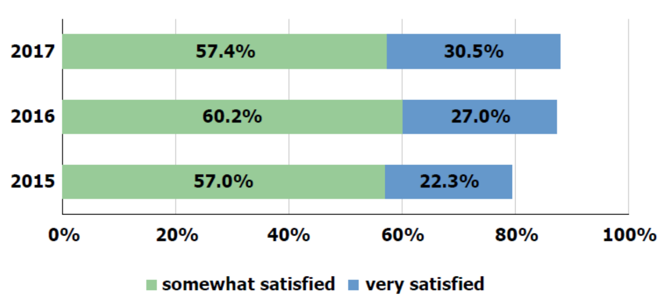
Description	2014	2015	2016
Presentations/Consultations	42	40	9
Disaster Management Training Sessions	6	7	16
Individuals Trained	161	160	200
Exercises (internal and with stakeholders) [A]	8	6	12
Emergency Operations Centre/Multiple Department Activation	2	3	5
Emergency Operations Centre - Days Activated	32	11	5
Number of People Evacuated / Evacuation Alert [B]	250	58	275
Number of People Directly Assisted	50	58	30

[A] In 2016, a new process encompassing monthly exercises with Emergency Preparedness Coordination Committee (EPCC) staff was implemented.

[B] A major gas evacuation in 2016 involved a large number of evacuees.

Effectiveness Measurements

Citizen Satisfaction with Level of City Preparedness, Ability to Respond, and Assist Residents (Natural and Human-Caused Disasters)



	2013	2014	2015	2016	2017
Total Satisfied	86.5%	89.3%	79.3%	87.2%	87.9%

Source: City of Winnipeg Annual Citizen Survey

Citizen satisfaction remains high with about 87.9% of citizens satisfied with disaster planning and response for emergencies like floods, tornadoes, train or airplane incidents.

92 Source: *Community Trends and Performance Report 2018 Budget—Volume 1*, City of Winnipeg, July 2017, page 139–14.

Percentage of City Staff Trained in Emergency Management

Wpg. Trend	2012	2013	2014	2015	2016
	12.0%	12.0%	11.5%	11.5%	12.0%

In 2016, 12% of all City staff were trained in Emergency Management. Training levels are on pace with the rate of personnel leaving due to retirements; a trend seen in other cities. Incident Command System (ICS) 200 and 300 level courses continue to be provided.

Training increases the level of awareness and planning for disasters and major emergencies within the city workforce and major partners.

Number of Mock or Real Emergency Responses

Actions	2012	2013	2014	2015	2016
Number of Emergency Exercises*	6	7	8	6	12
Number of EOC Events	2	2	2	3	5
Number of EOC Operational Days	4	2	32	11	5

The City continues to stage several mock disasters/exercises each year including partner agencies to ensure inter-agency awareness and effective working relationships are in place.

Real emergencies provide a practical application of the working knowledge and relationships developed during these exercises.

Efficiency Measurements

Emergency Operations Centre (EOC) Operating Cost per Capita

Wpg. Trend	2012	2013	2014	2015	2016
	$0.47	$0.45	$0.46	$0.44	$0.37

The per capita cost of dedicated emergency preparedness staff remains low.

Appendix D: Apparatus Details

Date Surveyed 2017-01-25 Shop # 8235551 License # CGE 677 Station # 1

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2016

Hours	km	Motor	Transmission
1,650	19,500	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☒ Excellent ☐ Good ☐ Fair ☐ Poor

Interior Condition ☒ Excellent ☐ Good ☐ Fair ☐ Poor

Exterior Condition ☒ Excellent ☐ Good ☐ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 101 is in excellent condition and is one of the newest Winnipeg engines. Based on current usage (kilometers/hours) it is anticipated E101 will reach recommended replacement criteria in 6–8 years.

Date Surveyed 2017-01-25 Shop # 9233951 License # CGT 059 Station # 1

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2013

Hours	km	Motor	Transmission
4,700	31,000	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600		

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 103 is four years old and in overall good condition. There are signs of corrosion in some areas and some body screws are missing. This unit will meet replacement criteria (hours) in 9 years.

Date Surveyed 2017-01-25 Shop # 8126991 License # CGT 049 Station # 1

Apparatus Type	Make	Model	Year
Ladder	E-One	Cyclone	2016

Hours	km	Motor	Transmission
1,100	17,000	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	None	None	Aux Power Unit

Aerial Type	Aerial Brand	Aerial Size
Platform	E-One	100’

Mechanical Condition ☒ Excellent ☐ Good ☐ Fair ☐ Poor
Interior Condition ☒ Excellent ☐ Good ☐ Fair ☐ Poor
Exterior Condition ☒ Excellent ☐ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 16 roof, 28 extension, 24 extension, 20 roof, (2) 35 extension

Comments:

Ladder 1 is in very good condition. There is body damage on a rear door and duct tape holding the driver side mirror together. It is recommended both be repaired. Based on current usage, Ladder 1 will likely meet replacement criteria (km/hours) in 9–10 years.

Date Surveyed 2017-01-25 Shop # 8339997 License # CGT 117 Station # 1

Apparatus Type	Make	Model	Year
Squad	Ford/Green Acres	F550	2008

Hours	km	Motor	Transmission
n/a	140,000	Ford Diesel	Automatic

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
N x G	250 gpm	1	200	20	None

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☐ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Squad 1 is approximately 9 years old. The exterior and mechanical compartments appear to be in good condition. The interior is in poor condition. The unit will meet replacement criteria (km) in the next 2 years.

Date Surveyed 2017-01-25 Shop # 8339999 License # CGT 114 Station # 1

Apparatus Type	Make	Model	Year
Squad	Ford E-One	-	2001

Hours	km	Motor	Transmission
n/a	179,720	Ford Diesel	Automatic

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Pneumax	250	1	200	20	n/a

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☐ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Squad 2 appears to be in good mechanical condition. The exterior is also in good condition with one damaged wheel cover (right front). The interior is in poor condition. Squad 2 exceeds recommended replacement criteria.

Date Surveyed 2017-01-24 Shop # 8235552 License # CGE 678 Station # 2

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2015

Hours	km	Motor	Transmission
1,406	19,971	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 2 is one of the newest engines in the Winnipeg fleet. The unit appears to be in good condition. At the current level of use Engine 2 will meet replacement criteria (km/hours) in 13–15 years.

Date Surveyed 2017-01-25 Shop # 8099839 License # CGT 056 Station # 3

Apparatus Type	Make	Model	Year
Water Rescue	GMC	Step Van	1988

Hours	km	Motor	Transmission
n/a	190,825	Gas	Automatic

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
n/a	n/a	n/a	n/a	n/a	n/a

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Water Rescue 3 has exceeded replacement criteria. There are numerous paint and corrosion issues. Equipment is somewhat haphazardly loaded due to lack of available space. A replacement unit is on order.

Date Surveyed 2017-01-25 Shop # 8239979 License # CGT 104 Station # 3

Apparatus Type	Make	Model	Year
Engine	E-One	Cyclone	2008

Hours	km	Motor	Transmission
8,283	53,275	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600 Imperial	20	Mounted

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 3 is in overall good condition. Based on current usage, the unit will likely meet replacement criteria (km) within the next 3 years.

Date Surveyed 2017-01-26 Shop # 8233955 License # CGT 063 Station # 4

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2013

Hours	km	Motor	Transmission
5,176	60,127	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	7,000 lpm	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 4 is approximately 4 years old and in good overall condition. There are paint issues that should be addressed. Crews indicated the chassis air bags are leaking. Based on current use it is anticipated that Engine 4 will meet replacement criteria in 6 years.

Date Surveyed 2017-01-26 Shop # 8235555 License # CGE 681 Station # 4

Apparatus Type	Make	Model	Year
Rescue	Spartan FG	Metro Star	2015

Hours	km	Motor	Transmission
2,378	22,899	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	7,000 lpm	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Rescue 4 appears to be the busiest unit in the department based on call volume. The unit is approximately 2 years old and in good overall condition. There is some torn upholstery needing repair. Rescue 4 will meet replacement criteria in approximately 8 years.

Date Surveyed 2017-01-23 Shop # 8229960 License # CGT 078 Station # 5

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Gladiator	2001

Hours	km	Motor	Transmission
15,434	224,860	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	400 Imperial	20	Yes

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☒ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 5 is in fair to poor condition and is 16 years old. Scene lighting is minimal. This unit exceeds replacement criteria in both kilometers and hours and should be replaced.

Date Surveyed 2017-01-23 Shop # 8233956 License # CGT 064 Station # 5

Apparatus Type	Make	Model	Year
Rescue	Spartan FG	Metro Star	2013

Hours	km	Motor	Transmission
4,712	36,666	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600 Imperial	20	Yes

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Rescue 5 is approximately 4 years old and in overall fair condition. Some paint and corrosion issues are present. At the time of survey, the apparatus was quite dirty due to poor weather conditions. Based on current activity Rescue 5 will meet replacement criteria in 8 years.

Date Surveyed 2017-01-24 Shop # 8235554 License # CGE 680 Station # 6

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2015

Hours	km	Motor	Transmission
4,078	58,231	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,740	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 6 is 2 years old and is in good overall condition. Due to the weather, the engine was quite dirty, which made it difficult to assess the condition of the paint. Scene lighting is minimal. Based on current use Engine 6 will meet replacement criteria in approximately 6 years.

Date Surveyed 2017-01-24 Shop # 8233953 License # CGT 062 Station # 6

Apparatus Type	Make	Model	Year
Rescue	Spartan FG	Metro Star	2013

Hours	km	Motor	Transmission
1,310	19,070	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	None

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 roof, 24 extension

Comments:

Rescue 6 is approximately 3 years old. The unit is in good overall condition. Scene lighting is minimal. Based on current use in kilometers and hours the replacement of this unit is well into the future.

Date Surveyed 2017-01-24 Shop # 8332000 License # CGT 088 Station # 6

Apparatus Type	Make	Model	Year
Squad	Ford	F550	2005

Hours	km	Motor	Transmission
10,000	167,285	Ford	Ford

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Pneumax	950 lpm	1	200	50	None

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Squad 6 is over 12 years old and in fair condition showing significant paint issues. This unit is beyond replacement criteria in both kilometers and hours.

Date Surveyed 2017-01-24 Shop # 8239977 License # CGT 102 Station # 7

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
10,482	144,277	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders Ladder rack, 14 extension, 30 extension

Comments:

Engine 7 is approximately 9 years old. Mechanically the engine appears to be in fair condition. The interior and exterior are in poor condition with paint and corrosion issues as well as damaged compartment doors. Engine 7 exceeds the hours replacement criteria and will soon reach the replacement criteria based on kilometers.

Date Surveyed 2017-01-24 Shop # 8329845 License # CGT 067 Station # 7

Apparatus Type	Make	Model	Year
Hazmat	E-One FG	Saber	1997

Hours	km	Motor	Transmission
9,408	15,696	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
n/a	n/a	n/a	n/a	n/a	None

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Hazmat 7 is approximately 20 years old. While having relatively low kilometers logged, it is approaching replacement criteria based on hours. The unit is in fair to poor condition with significant paint and corrosion issues. It also has a noticeable lean to the driver side, which may indicate a broken or weak leaf spring. Based on age and condition, Hazmat 7 should be considered for replacement.

Date Surveyed 2017-01-24 Shop # - License # CGS 787 Station # 7

Apparatus Type	Make	Model	Year
Rehab	GMC	6000	1984

Hours	km	Motor	Transmission
n/a	16,529	Gas/Propane	Automatic

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
n/a	n/a	n/a	n/a	n/a	Large/Propane

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Rehab 7 is more than 30 years old. The unit is in poor condition. Crews report the propane powered generator works poorly in cold weather and the entire unit no longer meets the needs of the department. NFPA lighting is marginal and the unit is minimally equipped. Rehab 7 should be considered for replacement.

Date Surveyed 2017-01-24 Shop # 8329844 License # CGS 806 Station # 8

Apparatus Type	Make	Model	Year
Rescue	E-One FG	Saber	1995

Hours	km	Motor	Transmission
15,946	152,342	Detroit	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
None	n/a	n/a	n/a	n/a	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☒ Poor
☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Rescue 8 is 22 years old. The overall condition of the apparatus is fair. The unit exceeds replacement criteria based on hours and will shortly exceed kilometer replacement criteria. Body damage and paint issues are prevalent. Rescue 8 should be replaced.

Date Surveyed - Shop # 8239978 License # CGT 103 Station # 8

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
10,982	30,052	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,500	1	600	20	-

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☐ Fully Equipped

Ground Ladders -

Comments:

Engine 8 was not evaluated as it was out at an external vendor facility for repair. Engine 8 is beyond replacement criteria based on hours.

Date Surveyed	2017-01-25	Shop #	8239967	License #	CGT ???	Station #	9

Apparatus Type	Make	Model	Year
Engine	E-One	Cyclone	2005

Hours	km	Motor	Transmission
8,104	114,838	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,250	1	400	20	On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 9 is 12 years old. Mechanically, the engine appears to be in fair condition while the interior is in good condition. The exterior is in poor shape. Repairs to address the paint and corrosion issues as well as installing NFPA striping should be completed to lengthen the life of the apparatus. Based on the established replacement criteria, Engine 9 will need to be replaced in 4–5 years.

Date Surveyed	-	Shop #	8329847	License #	CGT 085	Station #	9

Apparatus Type	Make	Model	Year
Rescue	Salsbury	-	2001

Hours	km	Motor	Transmission
8,807	121,000	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
n/a	n/a	n/a	n/a	n/a	On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☐ Fully Equipped

Ground Ladders

Comments:

Rescue 9 was not available for evaluation. At 16 years of age the apparatus will need to be replaced in the near future.

Date Surveyed 2017-01-25 Shop # 8329853 License # CGT 066 Station # 9

Apparatus Type	Make	Model	Year
Hazmat	Pierce FG	Lance	1996

Hours	km	Motor	Transmission
4,384	34,808	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
n/a	n/a	n/a	n/a	n/a	On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Hazmat 9 is over 20 years old. Due to limited use, the unit is in overall good condition with some paint and corrosion issues. Repairs should be completed to extend the life of the apparatus.

Date Surveyed 2017-01-26 Shop # 8239975 License # CGT 100 Station # 10

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
10,150	157,500	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,500	1	600	20	Mounted

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders Ladder rack, 14 extension, 24 extension

Comments:

Engine 10 is 9 years old. The apparatus is in fair to poor condition overall. Corrosion and paint issues were noted along with a dented front fender skirt and damaged front bumper. Engine 10 exceeds replacement criteria based on hours and will meet kilometer replacement criteria by year end at the current level of use.

Date Surveyed 2017-01-27 Shop # 8233957 License # CGT 065 Station # 11

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2013

Hours	km	Motor	Transmission
13,642	160,170	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	7,000 lpm	1	600 Imperial	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 11, while in good overall condition and only 4 years old, meets replacement criteria in both hours and kilometers due to apparent high call volume in its assigned response area.

Date Surveyed 2017-01-27 Shop # 8329843 License # CGS 799 Station # 11

Apparatus Type	Make	Model	Year
Rescue	Pierce FG	Saber	1994

Hours	km	Motor	Transmission
16,727	193,747	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
n/a	n/a	n/a	n/a	n/a	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☒ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

At the time of evaluation, Rescue 1 was apparently a reserve engine in front line status. This unit is 23 years old and in poor condition with body damage, paint and corrosion issues, torn upholstery, and duct tape holding dash components in place. The apparatus well exceeds all replacement criteria should be retired and replaced as soon as possible.

Date Surveyed 2017-01-27 Shop # 8289990 License # CGT 109 Station # 11

Apparatus Type	Make	Model	Year
Ladder	E-One	Cyclone	2008

Hours	km	Motor	Transmission
7,250	38,050	Detroit	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	6,000	1	300	n/a	On Board

Aerial Type	Aerial Brand	Aerial Size
Platform	E-One	Aluminum 100’

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☒ Good ☒ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 28 extension, 20 roof, (2) 16 roof, (2) 35 extension

Comments:

Ladder 11 is approximately 9 years old and in overall good condition. Repairs should be completed to address numerous paint issues and body damage. Based on replacement criteria and current use, Ladder 11 will need to be replaced in 8–10 years.

Date Surveyed - Shop # 8233952 License # - Station # 12

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2013

Hours	km	Motor	Transmission
4,349	65,428	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☐ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 12 is 4 years old. The apparatus was responding to alarms and unavailable for evaluation. Based on kilometers and hours Engine 12 will need to be replaced in 4–5 years.

Date Surveyed 2017-01-26 Shop # 8239976 License # CGT 101 Station # 13

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
8,100	30,133	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,500 gpm	1	600	20	On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 13 is 9 years old. While in overall fair condition, the apparatus has body damage and paint and corrosion issues as well as compartment doors that are not working properly. The unit has relatively low kilometers, but a high number of hours. Based on hours Engine 13 will meet replacement criteria within 3 years.

Date Surveyed 2017-01-26 Shop # 8129988 License # CGT 079 Station # 13

Apparatus Type	Make	Model	Year
Ladder	E-One	Cyclone	2001

Hours	km	Motor	Transmission
10,750	128-557	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	2,000 gpm	1	200	n/a	On Board

Aerial Type	Aerial Brand	Aerial Size
Platform	E-One	100’

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

Interior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders (2) 16 extension, 24 extension, 35 extension

Comments:

Ladder 13 is 16 years old. The overall condition is poor. The apparatus has paint and corrosion issues, dash components taped in place, and cardboard in front of the radiator as the unit does not get warm. The upholstery is torn, NFPA striping is not current, and loose equipment is stored in the cab. Ladder 13 has exceeded hours replacement criteria and added to its poor condition this unit should be replaced.

Date Surveyed - Shop # 8239974 License # CGT 099 Station # 14

Apparatus Type	Make	Model	Year
Engine	E-One FG	Typhoon	2008

Hours	km	Motor	Transmission
10,345	140,273	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☐ Fully Equipped

Ground Ladders

Comments:

Engine 14 is now 9 years old. This apparatus was not available for inspection at the time the survey was conducted. Based on hours, Engine 14 exceed the recommended replacement criteria and will likely also meet the kilometers criteria by year end. This unit should be scheduled for replacement.

Date Surveyed 2017-01-25 Shop # 8239966 License # CGT 090 Station # 15

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2004

Hours	km	Motor	Transmission
10,172	74,024	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	6,000 lpm	1	800	20	On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders Ladder rack

Comments:

Engine 15 is now 13 years old. The unit is in overall fair condition with some paint and corrosion issues and minor body damage. Engine 15 is the only apparatus in the fleet with a top-mount design, which is viewed by the crews as a poor fit with the harsh Winnipeg climate. Engine 15 is beyond replacement criteria based on hours. Due to its unsuitable configuration, number of hours and condition of the unit, it should be scheduled for replacement.

Date Surveyed 2017-01-24 Shop # 8239980 License # CGT 105 Station # 16

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
8,737	110,822	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	

Aerial Type	Aerial Brand	Aerial Size

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☐ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 roof, 30 extension

Comments:

Engine 16 is 9 years old and in fair condition with striping, paint and corrosion issues. The roof top air conditioning unit is missing. Repairs should be completed on this apparatus to extend its useful life. Based on current usage, Engine 16 will likely need to be replaced in 3–4 years.

Date Surveyed 2017-01-24 Shop # 8289989 License # CGT 057 Station # 16

Apparatus Type	Make	Model	Year
Ladder	E-One	Cyclone	2005

Hours	km	Motor	Transmission
5,205	80,627	Detroit	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	300	20	On Board

Aerial Type	Aerial Brand	Aerial Size
Skylift	Bronto	100’

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor
☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 12 extension, 24 extension, 16 roof, 18 extension, 35 extension

Comments:

Ladder 16 is approximately 12 years old and in fair to good condition. There is minor body damage and a broken light lens in need of repair. Based on replacement criteria (km/hours), this unit is approximately halfway through its life; however, Bronto trucks are complicated units and parts availability may be a concern. A replacement for Ladder 16 should be considered.

Date Surveyed	2017-01-27	Shop #	8239968	License #	CGT 094	Station #	17

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2004

Hours	km	Motor	Transmission
11,026	163,660	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,500 gpm	1	800 Imperial	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☒ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

☐ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders: Side Mount, 14 extension, 24 extension

Comments:

Engine 17 is 13 years old. While the engine appears to be in good condition, it meets replacement criteria in both kilometers and hours. The apparatus was repaired following heavy damage sustained in a collision, which explains its current appearance. Replacement of this unit should be scheduled.

Date Surveyed	2017-01-26	Shop #	8233950	License #	CGT 058	Station #	18

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2013

Hours	km	Motor	Transmission
2,934	57,359	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	7,000 lpm	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Exterior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders: 14 extension, 24 extension

Comments:

Engine 18 is 4 years old and in good condition; one of the best in the Winnipeg fleet. This apparatus should be considered for replacement in 5–7 years.

Date Surveyed 2017-01-26 Shop # 8239963 License # CGT 082 Station # 19

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2001

Hours	km	Motor	Transmission
10,475	88,341	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	6,000 lpm	1	800 Imperial	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☐ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders Ladder rack, 14 extension, 24 extension

Comments:

Engine 19 is 16 years old and in fair condition. It is one of two units of a design that will physically fit in Station 19. This unit has paint and corrosion issues, body damage, a bent front bumper, and loose wiring hanging below the chassis. Engine 19 exceeds hours replacement criteria and should be considered for replacement.

Date Surveyed 2017-01-26 Shop # 8239981 License # CGT 116 Station # 20

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
8,550	134,400	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,500 gpm	1	600		On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 20 is 9 years old. The exterior is in fair condition with several paint and corrosion issues. Mechanically the unit appears to be in good condition as does the interior. At current usage levels, this unit will meet replacement criteria in 2–3 years.

Date Surveyed	2017-01-24	Shop #	8289855	License #	CGT 097	Station #	21

Apparatus Type	Make	Model	Year
Ladder	E-One	Sabre	2006

Hours	km	Motor	Transmission
4,707	61,510	Detroit	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	2,000	1	n/a	n/a	Chassis Mount

Aerial Type	Aerial Brand	Aerial Size
Straight Stick	E-One	100’

Mechanical Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☒ Poor

Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 12 extension, 14 extension, 16 extension, 24 extension, 35 extension

Comments:

Ladder 21 is 11 years old and appears to be in good condition mechanically. The interior and exterior of the unit are in fair to poor condition. There is damage to the right front corner as well as several paint and corrosion issues. Based on replacement criteria, at current usage this apparatus should have remaining in-service life of 4–6 years. Repairs are recommended to extend the unit’s life.

Date Surveyed	-	Shop #	8233954	License #	CGT 061	Station #	21

Apparatus Type	Make	Model	Year
Engine	Spartan	Metro	2013

Hours	km	Motor	Transmission
3,276	50,097	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☐ Fully Equipped

Ground Ladders

Comments:

Engine 21 is 4 years old. The unit was not available for survey as it was out for repair. Based on current usage this unit should meet replacement criteria in 4–5 years.

Date Surveyed 2017-01-24 Shop # 8229961 License # CGT 081 Station # 21

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Gladiator	2001

Hours	km	Motor	Transmission
12,860	179,452	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	n/a	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

The unit in service as Engine 21 is now 16 years old. While a reserve apparatus, it is required to perform with high reliability. This unit is in fair to poor condition with some body and front bumper damage. This apparatus exceeds replacement criteria.

Date Surveyed 2017-01-27 Shop # 8329882 License # CGT 107 Station # 22

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
11,675	142,800	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	On Board

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders Ladder rack, 14 extension, 24 extension

Comments:

Engine 22 is 9 years old and in fair to poor condition. The unit was evaluated while under repair and multiple mechanical problems were noted in addition to several paint and corrosion issues. Compartment doors are dented and there is front end damage. Engine 22 exceeds hours criteria and will meet kilometer replacement criteria by year end.

Date Surveyed 2017-01-25 Shop # 8229958 License # CGT 113 Station # 22

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Gladiator	2001

Hours	km	Motor	Transmission
15,479	101,684	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	7,000 lpm	1	400	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

In service as Engine 22, this unit is 16 years old and in fair to poor condition with significant paint and corrosion issues. The apparatus far exceeds hours replacement criteria.

Date Surveyed 2017-01-25 Shop # 8229970 License # CGT 092 Station # 23

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2006

Hours	km	Motor	Transmission
9,913	166,574	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	6,000 lpm	1	800	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 23 is 11 years. Several compartment doors are damaged and paint and corrosion issues were noted. Overall, the apparatus is in fair to poor condition. This unit exceeds kilometer replacement criteria and will meet hours criteria within the year based on current usage.

Date Surveyed 2017-01-25 Shop # 8229969 License # CGT 091 Station # 23

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2006

Hours	km	Motor	Transmission
10,452	151,636	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	6,000 lpm	1	800	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 231 is 11 years old and in fair to poor condition. Paint and corrosion issues were noted along with difficult to operate compartment doors. E231 meets hours replacement criteria and will exceed kilometer criteria within the year.

Date Surveyed 2017-01-25 Shop # 8099833 License # CGT 055 Station # 23

Apparatus Type	Make	Model	Year
Water Rescue	GMC	Step Van	1987

Hours	km	Motor	Transmission
n/a	186,325	6.2 Diesel	Automatic

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
n/a	n/a	n/a	n/a	n/a	On Board (Diesel)

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☒ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
☐ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Water Rescue 23 is 30 years old and in poor condition. There is significant paint and rust issues and body damage was noted. This unit is recommended for replacement.

Date Surveyed: - | Shop #: 8329883 | License #: CGT 106 | Station #: 24

Apparatus Type	Make	Model	Year
Engine	E-One	Typhoon	2008

Hours	km	Motor	Transmission
10,467	85,684	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☐ Poor

☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☐ Fully Equipped

Ground Ladders

Comments:

Engine 24 is 9 years old and was unavailable for evaluation. This unit exceeds hours replacement criteria.

Date Surveyed: 2017-01-24 | Shop #: 8329884 | License #: CGT 108 | Station #: 25

Apparatus Type	Make	Model	Year
Engine	E-One	Sabre	2008

Hours	km	Motor	Transmission
11,757	193,267	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☒ NFPA Striping ☒ Fully Equipped

Ground Ladders: Ladder rack, 14 extension, 24 extension

Comments:

Engine 25 is 9 years old and in fair to poor condition. Paint and corrosion issues were noted as well as a damaged tailboard. This unit well exceeds replacement criteria.

Date Surveyed 2017-01-24 Shop # 8335750 License # CGT 110 Station # 25

Apparatus Type	Make	Model	Year
Snuffer	Ford	F550	1995

Pump Hours	km	Motor	Transmission
174	184,504	Ford Diesel	Automatic

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Snuffer			300		None

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☐ Scene Lighting ☐ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders None

Comments:

Snuffer 25 is now over 20 years old and in overall fair condition. Kilometers exceed recommended replacement criteria.

Date Surveyed 2017-01-25 Shop # 8229957 License # CGT 070 Station # 26

Apparatus Type	Make	Model	Year
Engine	Spartan	Salsbury	1998

Hours	km	Motor	Transmission
13,650	160,170	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,500	1	600	20	Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
Interior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor
Exterior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor
☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

This reserve engine, filling in as Engine 26, is now 19 years old. The unit is in overall fair condition with relatively new Cancer Awareness (pink) paint. This apparatus exceeds replacement criteria.

Date Surveyed 2017-01-25 Shop # 8229971 License # CGT 093 Station # 27

Apparatus Type	Make	Model	Year
Engine	Spartan FG	Metro Star	2006

Hours	km	Motor	Transmission
10,027	146,107	Cummins	Allison

Pump Brand	Pump Size	# Stages	Water Tank Size	Foam Tank Size	Generator
Hale	1,750	1	800		Portable

Aerial Type	Aerial Brand	Aerial Size
n/a	n/a	n/a

Mechanical Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Interior Condition ☐ Excellent ☐ Good ☒ Fair ☐ Poor

Exterior Condition ☐ Excellent ☐ Good ☐ Fair ☒ Poor

☒ Scene Lighting ☒ NFPA Lighting ☐ NFPA Striping ☒ Fully Equipped

Ground Ladders 14 extension, 24 extension

Comments:

Engine 27 is 11 years old and in fair to poor condition. Several paint and corrosion issues were observed. This unit exceeds hours replacement criteria and will meet kilometer criteria within the year.