DILLON CONSULTING

City of Lloydminster

Fire Services Master Plan

Draft Report

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Table of Contents

Figures

Tables

Appendices

Acronyms, Abbreviations, Definitions

A.B.C.	Alberta Building Code
A.F.C.	Alberta Fire Code
A.H.J.	Authority Having Jurisdiction
A.N.S.I.	American National Standards Institute
A.O.H.S.A.	Alberta Occupational Health and Safety Act
B.C.	British Columbia
C.F.A.I.	Commission on Fire Accreditation International
C.P.C.	Commission on Professional Credentialing
C.P.S.E.	Centre for Public Safety Excellence
C.R.A.	Community Risk Assessment
C.R.R.P.	Community Risk Reduction Plan
D.A.R.E.	Drug Abuse Resistance Education
E.M.S.	Emergency Medical Services
E.R.F.s	Emergency Response Facilities
E.R.U.s	Emergency Response Units
F.S.M.P.	Fire Services Master Plan
F.U.S.	Fire Underwriters Survey
G.I.S.	Geographic Information Systems
H.I.R.A.	Hazard Identification and Risk Assessment
I.D.H.L.	Immediately Dangerous to Health
I.D.P.	Inter-municipal Development Plan
I.M.S.	Incident Management Systems
L.E.R.L.	Lower Effectiveness Response Level
L.F.D.	Lloydminster Fire Department
L.O.C.C.	Lloydminster Operations Communications Center
M.D.P.	Municipal Development Plan
M.G.A.	Municipal Government Act
M.W.	Megawatt
N.B.C.	National Building Code
N.F.C.	National Fire Code

N.F.P.A.	National Fire Protection Association
N.I.S.T.	National Institute of Standards and Technology
O.H.S.	Occupational Health and Safety
O.F.C.	Office of the Fire Commissioner
O.F.M.E.M.	Office of the Fire Marshal and Emergency Management
P.F.S.G.	Public Fire Safety Guidelines
P.O.C.	Paid on Call
P.P.E.	Personal Protective Equipment
Q.M.P.	Quality Management Plan
R.C.M.P.	Royal Canadian Mounted Police
S.C.A.	Safety Codes Act
S.C.B.A.	Self-Contained Breathing Apparatus
S.O.G.s	Standard Operating Guidelines
S.O.H.S.R.	Saskatchewan Occupational Health and Safety Regulations
S.O.P.s	Standard Operating Procedures
S.W.O.C.	Strengths, Weaknesses, Opportunities, Challenges
U.E.R.L.	Upper Effectiveness Response Level
U.S.	United States

Executive Summary

In the past decade the delivery of fire protection services has become an increasingly challenging service for municipalities to sustain as a result of the associated financial costs, and the evolution of fire risk within communities as a result of historical human behaviours, and changing building stock that is more complex in its built form.

The Council of the City of Lloydminster, who have shown through their commitment to strategic community planning and growth, have identified the need to develop this ***Fire Services Master Plan*** (F.S.M.P.) and companion ***Community Risk Assessment*** (C.R.A.) to better inform their decision-making process related to the delivery of fire protection services to a growing community.

The City of Lloydminster is unique in its geographical location, straddling the borders of the Province of Alberta and the Province of Saskatchewan. As a result is has a very unique governance and operating model that is clearly defined within the ***City of Lloydminster Act*** or as referred to within this report the ***Lloydminster Charter.*** However, the unique nature of the community does not make it any more resilient to the probability and consequences of a fire than any other community.

The primary objective of this ***Fire Services Master Plan*** is to provide Council and senior corporate staff with a strategic planning framework for the delivery of fire protection services within the community, based on its future ten-year planning horizon. The analysis and recommendations presented within the F.S.M.P. and companion C.R.A. have been developed in consideration of the municipality's legislative requirements and current industry best practices, as informed by leading industry organizations such as the ***National Fire Protection Association*** (N.F.P.A.) and our knowledge and experience related to current municipal best practices. Consideration has also been given to the City's ***2017-2012-Strategic Plan*** that reflects a strong commitment to ensuring a safe, secure and healthy community, and strategic goals that in our view support the provision of fire protection services that provide the most value to the community.

To further assist Council this F.S.M.P. identifies ***"strategic priorities"*** that are intended to form the guiding principles in Council's decision-making process with respect to the future delivery of fire protection services by the ***Lloydminster Fire Department*** (L.F.D.). These proposed ***"strategic priorities"*** have been informed by a comprehensive analysis of the existing fire risks within the community as defined by the companion C.R.A. as ***"key findings".*** Where applicable, this F.S.M.P. will prioritize the implementation of risk reduction strategies through the application of an industry leading strategy referred to as the five "***E's***" including:

- ***Education;***
- ***Economic Incentives;***
- ***Enforcement;***

- ***Engineering; and***
- ***Emergency Response***

The analysis within this F.S.M.P. will identify how the ***Lloydminster Fire Department*** has evolved from its historical roots as a volunteer fire department that predominately provided fire suppression (i.e., firefighting) and response to motor vehicle accidents (e.g., patient extrication) services. The F.S.M.P. will also identify that the sustainability of utilizing paid-on-call (volunteer) firefighters as the primary providers of fire suppression services has become an increasingly challenging issue that in January 2019 resulted in an ***"interim staffing model"***. In its current form the ***Lloydminster Fire Department*** is defined as a ***"composite"*** fire department, including the use of both full-time staff and firefighters, and paid-on-call (or volunteer) firefighters.

This F.S.M.P. includes two types of recommendations to further enhance the fire protection services provided by the L.F.D. These include ***"Council Recommendations"*** defined as those recommendations that require a policy decision or financial commitment on behalf of the City, and ***"Operational Recommendations"*** that are defined as recommendations that can be administered and implemented by the Fire Chief within his current authority, although possibly requiring further documentation and reporting to Council for approval.

This F.S.M.P. also provides an implementation strategy that addresses the context of the recommendations in terms of the current financial and political realities of the City of Lloydminster. All decisions related to budget, policy, or bylaw will be brought back to Council prior to implementation.

Summary of Recommendations

Administrative Services

Council Recommendation #1: That consideration be given to approving the strategic priorities identified within the Fire Services Master Plan to guide the development and delivery of fire protection services within the City of Lloydminster over the next ten-year community planning horizon.

- ✓ ***The analysis of fire protection services provided to the community shall be fully informed by the development and ongoing review and update of a Community Risk Assessment to identify the fire related risks within the City of Lloydminster;***

- ✓ ***The primary objective of the Lloydminster Fire Department will be to optimize the use of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement, to enhance the fire and life safety within the community;***

- ✓ ***The City of Lloydminster will continue to prioritize the utilization of strategies that support the sustainability of Paid-on-Call firefighters, and the operation of a "Combination Fire Department" operating model that includes a balance of full-time staff and Paid-on-Call staff resources; and***

- ✓ ***The City of Lloydminster will continue to prioritize the delivery of a comprehensive fire protection model that provides the most effective and efficient level of fire protection services resulting in the best value for the community.***

Operational Recommendation #1: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to updating the Lloydminster Fire Department Mission Statement, develop a corresponding Vision Statement and renew the department's core values.

Operational Recommendation #2: That subject to Council's consideration and approval of the proposed Fire Services Master Plan a comprehensive review and update of all staff resource job descriptions be completed.

Operational Recommendation #3: That consideration be given to implementing an interim strategy to collocate the workspace of the Fire Chief, Assistant Fire Chief and Administrative Assistant in one location as presented within the proposed Fire Services Master Plan.

Operational Recommendation #4: That the Lloydminster Fire Department develop and implement a Senior Officer On-Call policy as presented within the proposed Fire Services Master Plan.

Operational Recommendation #5: That consideration be given to enhancing the effectiveness and efficiency of mutual aid agreements as presented within the proposed Fire Service Master Plan.

Operational Recommendation #6: That subject to Council's direction to update the Memorandum of Understanding with the Lloydminster Rescue Squad Inc. consideration be given to revising the agreement as presented within the proposed Fire Services Master Plan.

Operational Recommendation #6: That consideration be given to implementing a Standard Operating Procedure Committee as presented within the proposed Fire Services Master Plan.

Operational Recommendation #7: That the Lloydminster Fire Department prioritize the development of Standard Operating Procedures to provide clear direction to all staff regarding the delivery of fire protection services.

Operational Recommendations #8: That consideration be given to prioritizing the development of fire department policies to provide clear direction to all staff, and specifically in those areas that may require more defined direction than included within a Standard Operating Procedure.

Operational Recommendation #9: That priority be given to developing a comprehensive records management program, including the development of a Standard Operating Procedure for all records management practices within the Lloydminster Fire Department.

Operational Recommendation #10: That consideration be given to enhancing the fire department's Annual Report to include performance benchmarking to further enhance the department's reporting to Council and the community.

Fire Prevention and Public Education Services and Programs

Council Recommendation #2: That consideration be given to approving the proposed Routine Fire Inspection Program as presented within the proposed Fire Services Master Plan.

Council Recommendation #3: That consideration be given to hiring a full-time Fire Inspector/Fire and Life Safety Educator as presented within the proposed Fire Services Master Plan.

Operational Recommendation #11: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to developing a Fire Prevention Policy as presented within the proposed Fire Services Master Plan.

Operational Recommendation #12: That the training standards and qualifications for all staff assigned to the delivery of fire prevention and public education services and programs identified within the proposed Fire Services Master Plan be considered for implementation within the applicable job descriptions within the Lloydminster Fire Department.

Operational Recommendation #13: That consideration be given to developing a Standard Operating Procedure to identify the roles and responsibilities, objectives, targets and procedures for the delivery of the proposed Home Smoke Alarm/Carbon Monoxide Alarm Program as presented within the proposed Fire Services Master Plan.

Operational Recommendation #14: That consideration be given to enhancing the qualifications of the four full-time fire suppression Captains to include N.F.P.A. 1031 Fire Inspector I, and N.F.P.A. 1035 Fire and Life Safety Educator I as presented within the proposed Fire Services Master Plan.

Operational Recommendation #15: That consideration be given to implementing the proposed Commercial/Industrial Occupancy Pre-Planning Program presented within the proposed Fire Services Master Plan.

Operational Recommendation #16: That consideration be given to developing a comprehensive fire investigation Standard Operating Procedure as presented within the proposed Fire Services Master Plan.

Operational Recommendation #17: That consideration be given to developing a letter of understanding, or other written agreement between Superior Safety Codes Inc. and the Lloydminster Fire Department to coordinate the construction plan review and approval process.

Operational Recommendation #18: That consideration be given to developing and implementing a "pilot project" for facilitating a targeted fire safety program to children aged 10 to 12 within the community as presented within the proposed Fire Services Master Plan.

Operational Recommendation #19: That consideration be given to developing and implementing a targeted fire safety program for seniors (65+) within the community as presented within the proposed Fire Services Master Plan.

Operational Recommendation #20: That consideration be given to developing and implementing the proposed Community Fire Education Program presented within the proposed Fire Services Master Plan.

Training Program

Council Recommendation #4: That subject to Council's consideration and approval of the proposed Fire Services Master Plan consideration be given to developing a Comprehensive Recruitment and Retention Strategy that targets the sustainability of Paid on Call Firefighters as presented within the proposed Fire Services Master Plan.

Operational Recommendation #21: That the job description for the full-time Training Officer/Safety Officer Captain be updated to include the required qualifications, roles and responsibilities and hours of work of this position.

Operational Recommendation #22: That consideration be given to consolidating all current firefighter training initiatives into one Comprehensive Annual Training Program including performance goals and objectives to be defined within a department Standard Operational Procedure.

Operational Recommendation 23: That the proposed Comprehensive Annual Training Program include minimum requirements for attendance to maintain the required firefighting skills and competencies at all times.

Operational Recommendation #24: That consideration be given to developing a comprehensive Company Officer Training Program and supporting Standard Operating Procedure.

Operational Recommendation #25: That consideration be given to including incident command training for all officers within the Lloydminster Fire Department within the proposed comprehensive Company Officer Training Program and supporting Standard Operating Procedure.

Operational Recommendation #26: That the Fire Chief further investigate the alternatives for providing specialized technical rescue services including partnerships, shared services and contracting services to reduce the existing operational and training requirements of the Lloydminster Fire Department.

Operational Recommendation #27: That where applicable the further utilization of on-line training as a component of delivering the proposed Comprehensive Annual Training Program be considered.

Operational Recommendation #28: That the Fire Chief be direct to further investigate ad report to Council on the options for facilitating live fire training as presented within the proposed Fire Services Master Plan.

Operational Recommendation #29: That the requirements for annual live fire training be included within the proposed Comprehensive Annual Training Program and department Standard Operating Procedure.

Operational Recommendation 30: That any member of the Lloydminster Fire Department who is assigned the responsibility to deliver firefighter training be required to attain the qualifications of an Instructor Level I as defined by the N.F.P.A. 1041 Standard for Fire Service Instructor Professional Qualifications.

Operational Recommendation #31: That the full-time Training Officer/Safety Officer Captain be required to attain the qualifications of an Instructor Level II as defined by the N.F.P.A. 1041 Standard for Fire Service Instructor Professional Qualifications.

Operational Recommendation #32: That consideration be given to implementing the proposed Training Committee presented within the proposed Fire Service Maser Plan.

Operations / Fire Suppression

Council Recommendation #5: That the proposed Initial Arriving Company fire suppression performance benchmark targets presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.

Council Recommendation #6: That the proposed Initial Full Alarm Assignment fire suppression performance benchmark target presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.

Communications

Council Recommendation #7: That a defined Service Agreement be developed between the Lloydminster Operations Communications Center and the Lloydminster Fire Department that includes emergency call taking and fire dispatching performance benchmarks as referenced within the proposed Fire Serveries Master Plan.

Council Recommendation #8: That the proposed defined Service Agreement between the Lloydminster Operations Communications Center and the Lloydminster Fire Department include emergency response protocols for defining the dispatching of fire suppression services as referenced in the proposed Fire Services Master Plan.

Operational Recommendation #33: That the City and L.F.D. consider options for utilizing web-based / smartphone applications that provide paid on call and full-time (call-back) firefighters with the ability to communicate their response status to the stations and other department staff members.

Operational Recommendation #34: That the Fire Chief be directed to develop an ongoing communication strategy with the paid on call and full-time firefighters to enhance the "two way" communications within the Lloydminster Fire Department.

Proposed Organizational and Fire Suppression Deployment Model

Council Recommendation #9: That the City of Lloydminster prioritize consideration of increasing the minimum number of firefighters on duty at all times to four firefighters (one Captain and three firefighters) to increase the efficiency and effectiveness of the Initial Arriving Company as defined by the National Fire Protection Association.

Council Recommendation #10: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that the short-term priority be to increase the number of paid on call firefighters to a total complement of 50.

Council Recommendation #11: That consideration be given to implementing the proposed Paid on Call Firefighter Company Officer strategy presented within the proposed Fire Services Master Plan.

Council Recommendation #12: That consideration be given to implementing the proposed on duty shift schedule presented within the proposed Fire Services Master Plan.

Fire Stations and Apparatus

Council Recommendation #13: That consideration be given to creating a major apparatus reserve capacity, including a minimum of one service ready pumper.

Operational Recommendation #35: That consideration be given to strategies that target the mitigation of diesel emissions within both existing fire stations and any future fire stations.

1.0 Introduction

This ***Fire Services Master Plan*** (F.S.M.P.) was developed to provide Council and senior staff with a strategic framework to assist in guiding the delivery of fire protection services within the City of Lloydminster over the next ten-year community planning horizon. This plan presents a review of all current operations and services provided by the ***Lloydminster Fire Department*** (L.F.D.) including the organizational structure, staff resources, training, fire prevention, public education and fire suppression services provided to the community.

This F.S.M.P. has been informed by a comprehensive ***Community Risk Assessment*** (C.R.A.) that is included as (**Appendix A**). Over the past decade fire services and municipalities across Canada have been transitioning to the use of a comprehensive community fire risk assessment to guide their decision making with respect to the fire protection services that they should be providing. The development of the City of Lloydminster ***Community Risk Assessment*** has been guided by current industry best practices and standards as contained within the ***N.F.P.A. 1300 Standard on Community Risk Assessment and Community Risk Reduction Plan Development***, and ***N.F.P.A. 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations*** (2019 Edition).

The analysis and recommendations contained within this F.S.M.P. are guided by four ***"strategic priorities"*** that are presented to further assist Council's decision making process with regard to the types of services and programs, and the overall level of fire protection services to be provided by the Lloydminster Fire Department. Where possible the proposed services and programs include the use of risk reduction strategies referenced in the N.F.P.A. 1330 Standard and specifically the application of the five "***E's***" in response to the development of specific goals and objectives for the delivery of fire protection services within the City of Lloydminster. The five "***E's***" **include:**

- ***Education;***
- ***Economic Incentives;***
- ***Enforcement;***
- ***Engineering; and***
- ***Emergency Response***

The recommendations included within this F.S.M.P. are presented in the form of ***"Council Recommendations"*** reflecting those recommendations that require direct Council approval related to a potential financial impact, or to inform a municipal policy decision including a municipal service level, or where further direction to City staff may be required. The ***"Operational Recommendations"*** included reflect those recommendations that in our experience are consistent with the delegated authority provided to the Fire Chief by Council in fulfilling the regular roles and responsibilities of his position.

As a community, Lloydminster continues to grow as a place to raise a family, operate a business and enjoy a healthy life style. The City's most recent ***2017-2012-Strategic Plan*** was developed to focus on five pillars including; community sustainability, governance, culture, social, economy and environment.

In its current state the City reflects a diverse demographic of residents and business owners that are vulnerable to changing economic conditions. Many of the residents have long standing family roots within the community and take great pride in the accomplishments that they have made both individually, and as a community. As such this F.S.M.P. prioritizes the delivery of fire protection services that provide the most effective and efficient level of services that provide the most value to the community.

2.0 Governance/Legislation

The history of this unique community dates back to the early 1900's when the border for the provinces of Alberta and Saskatchewan was first created. The result was the amalgamation of two communities into one and the eventual incorporation of the City of Lloydminster. As a City, Lloydminster has continued to evolve as a hub to support the local mining, oil and gas industries, and as a major destination point for tourists traveling across Canada.

Due to its unique geographical location, including the City of Lloydminster being partially located in the Province of Alberta and partially in the Province of Saskatchewan, the City has a unique governance/legislation model. The ***City of Lloydminster Act*** referred to within this report as the ***Lloydminster Charter*** was enacted by ***Alberta Regulation 212/2012***. The ***Lloydminster Charter*** states the following:

"Principles and Purpose of the Charter
4(1) This Charter recognizes that:

(a) the City, as a local government,

(i) is a responsible and accountable level of government within its jurisdiction, being created and empowered by both Alberta and Saskatchewan,

(ii) has unique interests and challenges due to the fact that the City is located partly in Alberta and partly in Saskatchewan, and

(iii) is subject to certain limits and restrictions in the interest of the provinces as set out in this Charter and certain other enactments"[1]

The ***Municipal Government Act*** (Alberta) or the ***Municipalities Act*** (Saskatchewan) and the ***Lloydminster Charter*** provide the authority for the ***City of Lloydminster*** to pass bylaws and enter into agreements with other authorities for the joint use, control, and management of fire extinguishing and rescue apparatus and equipment. As a result of the City's unique governance and legislative model the ***Lloydminster Fire Department*** also has a unique relationship with the Office of Fire Commissioner in Alberta, and the Office of the Fire Commissioner in Saskatchewan. Our research in preparing this F.S.M.P. indicates that the L.F.D. currently utilizes the reporting process related to the statistical analysis of ***"all emergency responses"*** within the geographical boundaries of the City that is provided and supported by the Alberta Office of Fire Commissioner. The ***Lloydminster Charter*** also confirms that the ***City of Lloydminster*** applies the legislative regulations as contained within the ***National Fire Code*** (2019

[1] City of Lloydminster Act, The Lloydminster Charter, Alberta Regulation 212/2012, Principles and Purposes of the Charter, Section 3.

Edition) and ***National Building Code*** (2019 Edition) for all geographical areas of the City regardless of provincial borders.

2.1 Fire Bylaw No. 25-2015

The Lloydminster Fire Department (L.F.D.) has evolved from its historical roots as a volunteer fire brigade to its current organizational structure that includes both full-time and paid on call staff resources. Through this evolution the department has prided itself on providing effective fire protection services including firefighting (fire suppression) emergency response to motor vehicle accidents including performing patient extrication, providing fire prevention and public education activities, including attending numerous public events within the community and providing other emergency responses services.

The current organizational structure of the L.F.D. includes a full-time Fire Chief who, in addition to overseeing all operations of the fire department, is also responsible for the City's Emergency Management Agency[2]. The Fire Chief is supported by a full-time Assistant Fire Chief and administrative support position. The L.F.D. is a ***"Combination Fire Department"*** that includes the use of both full-time and paid on call firefighters. Currently this includes a full-time Training Officer, four full-time captains, four full-time firefighters and 31 paid on call firefighters. The department is currently operating within an ***"Interim Staffing Model"*** that was approved by Council as a short-term strategy to accommodate the development of this ***Fire Services Master Plan.***

The current organizational structure of the L.F.D. continues to reflect that of a small fire department with a Fire Chief and firefighters. The current ***Fire Bylaw No. 25-2015*** defines this by stating that ***"The Lloydminster Fire Department, a public organization that provides predominantly emergency firefighting and vehicle extrication services for the City of Lloydminster"***[3]. As such the current organizational structure of the L.F.D. does not have the defined divisional structure (Administration, Fire Prevention, Training etc.) that would be expected in a municipality the size of Lloydminster. Therefore the analysis within this F.S.M.P. will be presented in the form of the current primary functions of the department including administration, fire prevention/public education, training, fire suppression and facilities and apparatus.

The analysis presented within this F.S.M.P. is intended to assist Council, the Fire Chief and members of the Lloydminster Fire Department in strategically planning the evolution of the fire department as it strives to provide the optimal level of fire protection services. These challenges include evolving legislative change including a dedicated focus on the health and safety of firefighters, the sustainability

[2] City of Lloydminster - Job Description – Senior Manager, Emergency Services/Fire Chief.
[3] City of Lloydminster – Bylaw No. 25-2015 – Section 2, Definitions 2.1 (h)

of paid on call (volunteer) firefighters in recognition of work/life balance priorities, and evolving industry best practices that include more complex training requirements.

3.0 Industry Standards and Best Practices

Within the provinces of Alberta and Saskatchewan there is currently no specific legislated standard that a community must achieve with regard to the type of firefighter (full-time/paid on call/volunteer) or the number of firefighters and apparatus required to respond to any given incident.

The following sections present an overview of common terminology, current industry standards and guidelines representing current industry best practices within the fire service.

3.1 National Fire Protection Association

The ***National Fire Protection Association*** (N.F.P.A.) is an international non-profit organization that was established in 1896. The Association's mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. With a membership that includes more than 70,000 individuals from nearly 100 nations N.F.P.A. is recognized as one of the world's leading advocates of fire prevention and an authoritative source on public safety.

N.F.P.A. is responsible for over 300 codes and standards that are designed to minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation in the United States, as well as many other countries. N.F.P.A.'s more than 200 technical code and standard development committees are comprised of over 6,000 volunteer seats. Members vote on proposals and revisions in a process that is accredited by the American National Standards Institute (A.N.S.I.).

N.F.P.A. standards provide insight into best practices within the fire service industry. Applicable N.F.P.A. standards are presented within this F.S.M.P. as a resource / reference in presenting benchmarks for the City of Lloydminster to consider in providing the optimal level of fire protection services in response to the community's needs.

3.2 National Institute of Standards and Technology

The ***National Institute of Standards and Technology*** (N.I.S.T.) was founded in 1901 as a non-regulatory agency within the United States (U.S.) Department of Commerce. N.I.S.T.'s mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

In April of 2010 N.I.S.T. released their Technical Note #1661 ***"Report on Residential Fireground Field Experiments"*** reflecting a collaborative research analyses conducted by leading fire service agencies. The analyses within this report investigated the effects of varying crew sizes, apparatus arrival times and

response times on firefighter safety, overall task completion and interior residential tenability using realistic residential fires.

The result of a similar study identified in Technical Note #1797 ***"Report on High-Rise Fireground Field Experiments"*** was released in April 2013 that assessed the deployment of firefighting resources to fires in high-rise buildings. These studies are both examples of the technical research and analyses that is taken into consideration in order to develop and update the N.F.P.A. standards.

3.3 Commission on Fire Accreditation International

The ***Centre for Public Safety Excellence*** (C.P.S.E.) serves as the governing body for the two organizations that offer accreditation, education and credentialing: the ***Commission on Fire Accreditation International*** (C.F.A.I.) and the ***Commission on Professional Credentialing*** (C.P.C.).

The C.F.A.I. defines itself through its Mission: ***"to assist the fire and emergency service agencies throughout the world in achieving excellence through self-assessment and accreditation in order to provide continuous quality improvement and the enhancement of service delivery to their communities."***

The objective of the C.F.A.I. program is to define an accreditation system that is a credible, achievable, usable, and realistic model. The ultimate C.F.A.I. goal is to provide an accreditation process to improve the abilities of municipalities to both understand and recognize their respective community fire risks, provide balanced public/private involvement in reducing these risks and improve the overall quality of life for community members using the accreditation model. Of importance to this F.S.M.P. process is the C.F.A.I. strategy that seeks to achieve ***"continuous improvement"*** in the delivery of fire protection services.

3.4 Province of Ontario – Comprehensive Fire Safety Effectiveness Model

In Ontario, the Comprehensive Fire Safety Effectiveness Model identifies a fire protection planning strategy known as the ***"Three Lines of Defence".*** The application of this strategy further highlights the importance of recognizing that there are options other than just providing emergency response to developing an effective community fire safety plan. Although emergency response (firefighting) may be needed, there are other strategies that can be applied as elements of a broader community risk reduction strategy that can have a positive impact on reducing the need for emergency response and optimizing public safety within the community.

The fire prevention and public education services provided by a fire department are intended to optimize impact of applying the ***"Three Lines of Defence"*** identified within the Comprehensive Fire Safety Effectiveness Model including:

I. ***Public Education and Prevention;***
II. ***Fire Safety Standards and Enforcement; and***
III. ***Emergency Response.***

Further summary of the ***"Three Lines of Defence"*** model is found in **Table 1**.

Table 1: Ontario Three Lines of Defence Model

Lines of Defence	Description
I. Public Education and Prevention	*Educating residents of the community on means for them to fulfill their responsibilities for their own fire safety is a proven method of reducing the incidence of fire. Only by educating residents can fires be prevented and can those affected by fires respond properly to save lives, reduce injury and reduce the impact of fires*
II. Fire Safety Standards and Enforcement	*Ensuring that buildings have the required fire protection systems, safety features, including fire safety plans, and that these systems are maintained, so that the severity of fires may be minimized;*
III. Emergency Response:	*Providing well trained and equipped firefighters directed by capable officers to stop the spread of fires once they occur and to assist in protecting the lives and safety of residents. This is the failsafe for those times when fires occur despite prevention efforts.*

3.5 Province of British Columbia – Structural Firefighters Competency and Training Playbook

The Office of the Fire Commissioner in British Columbia, in consultation with the Fire Chiefs' Association of British Columbia, and the British Columbia Fire Training Officers Association has developed the ***Structure Firefighters Competency and Training Playbook*** *("**B.C. Playbook**")*. In our view, the most recent addition, amended in May of 2015, reflects a further example of best practices within the fire service industry. The Playbook is applicable to all fire services personnel within the Province of British Columbia as defined by their *Fire Services Act*. The principles of the Playbook indicate that it is the direct responsibility of the *"authority having jurisdiction"* (A.H.J.) to declare its firefighting service level. The declared fire suppression service level must then be established as a formal policy (by-law, policy or contract) and be fully reflected in operating guidelines within the fire department.

The service levels from which an A.H.J. may choose include: Exterior Operations Service Levels, Interior Operations Service Levels, and Full Service Level. In our view the ***"B.C. Playbook"*** provides valuable insight into identifying the options for fire suppression services that the City of Lloydminster may consider as part of this F.S.M.P. process.

4.0 Fire Services Master Planning Process

As previously referenced this F.S.M.P. has been informed by current provincial legislation, regulations and industry best practices. This includes a comprehensive analysis of current community fire risk and future community growth. The efficiency and effectiveness of the current services and programs provided by the Lloydminster Fire Department including the current emergency response capabilities and fire station location, staffing resources and deployment procedures, fire protection and education programs, apparatus and all related requirements, and service agreements. In our view this process is consistent with current industry best practices that indicate:

- ***The residents of any community are entitled to the most effective, efficient and safe fire services possible; and,***
- ***Those responsible must work within these parameters in making recommendations for improving municipal fire services.***
- ***The overall objective of any fire protection program is to provide the optimum level of protection to the community, in keeping with local needs and circumstances;***
- ***Extensive research has demonstrated that there are a variety of factors that will have an impact on the fire department's capacity to fulfill this objective;***
- ***Conversely, there are many different options that a municipality may pursue to improve the efficiency and effectiveness of its fire protection system;***
- ***Local circumstances will have a profound effect on which factors are most important for any one municipality, and what options are available for its fire protection system;***
- ***Selecting among these options is an extremely complex task; and***
- ***Success will require a combination of specialized expertise in fire protection, and a thorough appreciation of your municipality's economic, social and political circumstances.***

4.1 Analysis and Recommendations

This F.S.M.P. has been informed by the findings of the ***City of Lloydminster Community Risk Assessment*** and a comprehensive analyses of the current fire protection services provided by the Lloydminster Fire Department. This F.S.M.P. is intended to provide Council and senior staff with a strategic planning tool to assist in the decision making process for providing fire protection service over the next ten--year community planning horizon.

Options and recommendations for Council's consideration and approval are presented to clearly communicate the level of fire protection services to be provided to the community including where applicable proposed performance measures for ongoing monitoring and evaluation of the services to be provided.

To provide guidance and clarity around approval and implementation of the recommendations presented within this plan a classification system has been included to identify the recommendations as either ***"operational"*** or ***"council"*** that are defined as follows:

Operational Recommendations: *These include recommendations that can be administered and implemented within the current authority assigned to the Fire Chief. In some cases this may require the Fire Chief to prepare further documentation and internal reporting to Council for approval. An example of this is revising, or developing an Establishing and Regulating By-law. This is a process that can be led by the Fire Chief, and senior corporate staff and through normal reporting be brought to Council for consideration and approval.*

Council Recommendations: *These include recommendations that require the consideration and approval of Council related to a potential operating or capital financing impact or to inform a municipal policy decision including setting a municipal service level or where further direction to corporate staff may be needed.*

4.2 Strategic Priorities

In our experience, the fire services master planning process is intended to support the development and implementation of strategies that provide for effective and efficient delivery of fire protection services and therefore provide the most value to a community. Through the experience of our clients we have found that identifying guiding principles, or strategic priorities, to guide the decision making process provides a valuable tool for a municipal Council when considering the recommendations of a Fire Services Master Plan.

Based on our research and consultation in preparing this F.S.M.P. the absence of clearly defined Council approved fire protection services levels is one of the most significant challenges facing the L.F.D. today. In our view this challenge is directly related to the evolution of the department from its historical roots as a volunteer model operating under the direction of the former Fire Chief. Although it appears that this historical model served the community well, there is minimal evidence of interaction between previous Councils and the Fire Chief to identify fire protection services levels. Under the leadership of the current Fire Chief, who oversees a ***"Combination Fire Department"***[4] that includes both full-time and paid on call firefighters, and a Collective Agreement, there is an identified need for Council to identify the fire protection service levels they consider are required within the City of Lloydminster.

Through our analysis in preparing this F.S.M.P., including our review of related reports, plans, current operations of the L.F.D., and knowledge of current industry best practices we have identified the

[4] National Fire Protection Association 1720 Standard – Chapter 3 Definitions 3.3.15.1 Combination Fire Department

following strategic priorities for Council consideration to assist in the decision making process to approve and implement this F.S.M.P..

The proposed ***City of Lloydminster Fire Service Master Plan Strategic Priorities*** include the following:

- ✓ ***The analysis of fire protection services provided to the community shall be fully informed by the development and ongoing review and update of a Community Risk Assessment to identify the fire related risks within the City of Lloydminster;***

- ✓ ***The primary objective of the Lloydminster Fire Department will be to optimize the use of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement, to enhance the fire and life safety within the community;***

- ✓ ***The City of Lloydminster will continue to prioritize the utilization of strategies that support the sustainability of Paid-on-Call firefighters, and the operation of a "Combination Fire Department" operating model that includes a balance of full-time staff and Paid-on-Call staff resources; and***

- ✓ ***The City of Lloydminster will continue to prioritize the delivery of a comprehensive fire protection model that provides the most effective and efficient level of fire protection services resulting in the best value for the community.***

Council Recommendation #1: That consideration be given to approving the strategic priorities identified within the Fire Services Master Plan to guide the development and delivery of fire protection services within the City of Lloydminster over the next ten-year community planning horizon.

4.3 Internal Stakeholder Consultation

Stakeholders have provided valuable input during the preparation of this F.S.M.P. This has included the provision of a range of information regarding the context and background of Lloydminster Fire Department from a variety of different perspectives. In our experience, this engagement process is essential to both the development and ownership of the F.S.M.P. as it is considered for implementation. The information provided by senior staff is informative to defining the local ***"needs and circumstances"*** both internally and externally to the Fire Department. The stakeholder engagement process to inform this F.S.M.P. included a council educational workshop, presentations, senior corporate and department staff interviews, telephone and e-mail correspondence throughout the project.

4.3.1 Corporate and Department Interviews

Initial interviews were held with corporate and department staff on April 1st and April 2nd, 2019. The purpose of these interviews was to seek input from staff in respect to the current **S**trengths, **W**eaknesses, **O**pportunities and **C**hallenges (SWOC) affecting the operation of the L.F.D. Corporate and department interviews included the following:

- *City Manager*
- *Corporate Chief of Staff*
- *Fire Chief*
- *Fire Captains (2)*
- *Executive Manager Operations*
- *City Clerk*
- *Assistant Fire Chief*

In addition to a number of specific observations and individual feedback these interviews resulted in a number of themes of consensus amongst the participants. These included recognition of the absence of Council approved service levels, uncertainty of the short and long-term goals and objectives of the department, challenges associated with the sustainability of the paid on call firefighters in light of the increasing demands for training and emergency response and an overall sense of instability within the department as a result of recent events including the transition to a unionized environment.

4.3.2 Full-time Firefighters Consultation Workshop (April 1st, 2019)

This session included a facilitated PowerPoint presentation including an overview of the project scope, legislation and methodology. This session included the same opportunity for the participants to express their views on the current **S**trengths, **W**eaknesses, **O**pportunities and **C**hallenges (SWOC) affecting the operation of the department.

The participants expressed numerous examples of having no defined Standard Operating Guidelines, or department policies and procedures to define the expectations of the services they provide. These examples included many gaps related to health and safety concerns that have been raised to the Fire Chief and not addressed. The participants linked the absence of direction from Council on what service levels the department is expected to provide to the absence of guidelines, procedures and policies.

A number of comments were made regarding responding to medical related calls. Those present believe the department should be responding to these types of calls but have not been provided thorough training and given the right type of equipment. Similar comments were received about the absence of direction being provided regarding the emergency calls they do respond to, and having insufficient staff on the truck to do the tasks necessary. Current minimum staffing is two full-time firefighters and one Paid-on-Call firefighter referred to within this F.S.M.P. as the ***"Interim Staffing Model".***

There were numerous examples and concerns provided about the current condition of Fire Station No. 1 related to health and safety. It was identified that the majority of these have been forwarded to the Health and Safety Committee.

4.3.3 Paid-on-Call Firefighters Consultation Workshop (April 1st, 2019)

This session was facilitated with the same PowerPoint presentation as provided to the full-time firefighters including the **S**trengths, **W**eaknesses, **O**pportunities and **C**hallenges (S.W.O.C.) analysis. The participants expressed very similar concerns to the feedback received through the corporate and department interviews. In addition, the participants expressed growing concerns about the sustainability of paid on call firefighters. Numerous examples were provided of incidents whereby there was an insufficient number of paid on call firefighters who responded, there were no officers available for the second truck, and in some instances there was no qualified driver for the second truck.

Comments were provided that the transition to unionized model has not been as positive a process as was expected. Examples were presented indicating that there are a number of challenges associated with the process to fill the "third seat" on the truck by paid on call firefighters, and that the current process for scheduling people for this position may favour some over others. This may in part be due to the current 24 hour shift system that the paid-on-call firefighters suggested favour the full-time firefighters.

4.3.4 Council Educational Workshop

In our experience, it is extremely beneficial to engage members of Council in an educational forum at the onset of this type of project. The Dillon Project Team conducted an educational workshop with members of Council on August 15th, 2019. This educational workshop included a PowerPoint presentation attached as (**Appendix B**) to provide an overview of the scope of work, methodology, applicable legislation, and benefits of a Community Risk Assessment and Fire Services Master Plan.

The presentation served as an opportunity to educate members of Council in regards to current research related to fire behaviour, current industry standards and guidelines, and performance benchmarks. This session provided an opportunity to ensure that all members of Council have a clear understanding of the community risk assessment and fire master planning process.

Following the Council Educational Workshop the Mayor and each member of Council were offered an opportunity to meet with members of the Dillon Project Team to express their individual views on the current **S**trengths, **W**eaknesses, **O**pportunities and **C**hallenges (S.W.O.C.) within the L.F.D.

In summary, all members of Council expressed a high degree of appreciation for the work the fire department does. In our view there was also a strong consensus in regards to the importance of identifying strategies to further support the paid on call firefighters. Members of Council also commented on their support for additional fire prevention resources and the importance of fire prevention as the community continues to grow.

5.0 Related Reports and Plans

In preparing this ***Fire Services Master Plan***, a number of related plans and reports were reviewed to provide context for the current delivery of fire protection services within the ***City of Lloydminster***. These documents include the ***2013-2032 Municipal Development Plan*** and the ***City of Lloydminster 2017-2021 Strategic Plan*** both of which provided valuable insight into the community-driven strategic planning goals and objectives of the City.

5.1 2013-2032 Municipal Development Plan

Land use planning in Alberta is governed by the ***Municipal Government Act*** (M.G.A.) 2000 and is implemented through tools such as ***Inter-municipal Development Plans*** (I.D.P.), ***Municipal Development Plans*** (M.D.P.) and ***Area Structure Plans***.

The City's current ***Municipal Development Plan*** was approved by Council in 2013 to assist in guiding the City's' development and growth over the next 20-year community planning horizon. Since 2013 the M.D.P. has informed the development of a number of ***Area Structure Plans*** within the City such as those for proposed developments including Colonial Park, Hill Industrial and Wigfield Industrial.

The City's current ***Municipal Development Plan*** was also used to inform the current City of Lloydminster Land Use Bylaw No. 5-2016 approved by Council on August 25th,2016. Where applicable this F.S.M.P. has considered the future community planning objectives of the City as included within the current Municipal Development Plan, Area Structure Plans and By-law No. 5-2016.

5.2 2017-2021 Strategic Plan

The City's ***2017-2021 Strategic Plan*** provides valuable insight into the ***"vision"***, ***"mission"*** and ***"values"*** of the community that were developed though a comprehensive consultation process led by Council. This document reflects current municipal best practices in providing a strategic planning framework to assist in guiding public policy decisions, and municipal governance practices in achieving shared goals and objectives. The planning framework is guided by five pillars of community sustainability including:

> ***Governance:*** *The Governance includes the election process, management of resources, development and implementation of public policy, and the establishment of mechanisms through which citizens engage and interact with Council;*
>
> ***Culture:*** *Shared values, cultural and recreational activities that reflect the diverse traditions, customs, values, heritage, identity and history of Lloydminster;*
>
> ***Social:*** *Health, well-being, safety and quality of life for individuals, families and the community;*

Economy: *Achieving economic vitality, growth and development that simultaneously improves quality of life and the environment. It includes employment, income levels and the health, quality and diversity of employers, businesses and non-profit organizations in the community; and*

Environment: *Community environmental stewardship and the health, quality, diversity and abundance of local and global ecosystems, the state of the built environment and the services that support it.*

Where possible, the analysis and methodology applied to this F.S.M.P. will consider the goals, strategies, and performance measures outlined in the *2017-2021 Strategic Plan* document. The strategic priorities and recommendations made within this F.S.M.P. are in part guided by the goals of this strategic planning guide, specifically, with consideration to the eight high strategic priorities developed by Council.

6.0 Community Risk Assessment Summary

The process of assessing community risk is receiving increased attention within the fire protection industry in North America. A ***Community Risk Assessment*** (C.R.A.) is now considered fundamental to the development of a strategic ***Fire Services Master Plan***. Assessing community risk enables an understanding of local needs and circumstances which provides the foundation from which to develop and align the service levels established by the fire department. The results of the C.R.A., found in **Appendix A,** directly inform the recommendations of this F.S.M.P. and are used to identify existing service gaps across divisions, with particular connection to fire prevention, public education, training and emergency response.

This C.R.A. is based on a methodology founded in part on: the ***National Fire Protection Association*** *(N.F.P.A.) 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2016 Edition); N.F.P.A. 1300 Standard on Community Risk Assessment and Community Risk Reduction Plan Development*; Dillon's extensive experience in applying Ontario's Fire-Risk Sub-model; as well as broader risk management industry best practices**.** In addition, to guide some of the analysis, reference was made to the Office of the Fire Commissioner (O.F.C.)'s Fire Statistics Reporting Manual (March 2006). According to N.F.P.A 1730, the purpose of a Community Risk Assessment is to ***"assist in the development and implementation of a community risk reduction plan and programs to reduce, mitigate, or eliminate the community's risks"***.[5] N.F.P.A. 1730 outlines seven profiles that should be assessed and used to understand risk within the community. Exploration of the profiles is the first component of the C.R.A. methodology for this F.S.M.P. This includes the development of the following seven profile assessments:

- Geographic Profile;
- Building Stock Profile;
- Demographic Profile;
- Hazard Profile;
- Economic Profile;
- Fire Profile; and
- Response Profile.

5

Source: N.F.P.A. 1730: Standard on Organization and Deployment of Fire Prevention inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations, https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1730

These profiles are analyzed based on several sources of information, including data provided by the Lloydminster Fire Department (L.F.D.), Statistics Canada, and desktop research. To link the C.R.A. to the fire risks unique to specific occupancy types, this analysis utilizes the major occupancy classifications of the Alberta Building Code (A.B.C.) and the Alberta Fire Code (A.F.C.) to define the fire risk scenarios within Lloydminster. Throughout this assessment, the findings of the analysis will be highlighted and referred to as "***Key Findings***". This approach is designed to feature the findings that will be used to explicitly inform the F.S.M.P.

6.1 Key Findings Categorization

The results of the analysis of the seven profile assessments are categorised into "***key findings"*** based on how they will be used to inform the activities, strategies, and services provided by the L.F.D. Within the Community Risk Assessment the ***"key findings"*** are assigned utilizing to one of the ***Five "E's"*** of community risk reduction planning including; ***Education, Enforcement, Engineering, Economic Incentive and Emergency Response***. Within this F.S.M.P. the ***"key findings"*** are further categorized into one of the ***"Three Lines of Defence"*** in order to further illustrate the preferred risk reduction strategies that would be applicable within the City of Lloydminster, and implemented most effectively and efficiently by the Lloydminster Fire Department.

Table 2 illustrates how the ***"key findings"*** identified by the Community Risk Assessment have been further categorized into the ***"Three Lines of Defence"*** risk reduction strategies applied within this F.S.M.P.

Table 2: C.R.A. Key Findings Categorization

		1st Line of Defence	2nd Line of Defence			3rd Line of Defence
		Education	Enforcement	Engineering	Economic Incentive	Emergency Response
Profile	C.R.A. Analysis Outcome: Key Finding	For consideration within the proposed Public Education Program	For consideration within the proposed Inspection and Enforcement Program	For consideration within the proposed Inspection and Enforcement Program	For consideration within the proposed Fire Inspection and Enforcement Program	For consideration within the proposed Emergency Response Program
Geographic	Major road disruptions along Highway 16 which runs East/West through the City centre, could result in heavy traffic congestion and the rerouting of commercial trucks through the City leading to longer fire department response times both on the highway and within the City.					✓
	Rail lines within the City have been identified as hazardous material routes that may present a higher risk to the community.					✓
	The at-grade railway crossing on 50th Avenue located just north of Fire Station No. 1 creates a potential delay in emergency response times from this station to areas north of this at-grade rail crossing.					✓
	The City has a potential risk of wildland fire due to the wildland-urban interface primarily located outside of the urban settlement area.	✓	✓			✓

		1st Line of Defence	2nd Line of Defence			3rd Line of Defence
Building Stock	According to Statistics Canada, 90.5% of the City's existing building stock is comprised of Group C- Residential Occupancies.	✓			✓	✓
	The 2016 Census data indicates that 48% of the City's residential building stock was built prior to adoption of the 1992 Alberta Fire Code.	✓			✓	✓
	The 2016 Census data indicates that 24% of the City's residential building stock is comprised of attached dwellings representing a higher risk of fire exposure.	✓	✓		✓	✓
	The building stock within the downtown core includes a number of buildings with minimal separations between them presenting a greater fire risk to occupants and first responders.		✓		✓	✓
	The L.F.D. has not identified any building height concerns as part of the data collection process for this C.R.A. The L.F.D. may wish to consider tracking these types of occupancies to further assess fire risk with respect to building height within the community.					✓
	There are 14 buildings that present an increased fire risk due to their large floor areas.		✓	✓		✓
	Research identified seven High Life-Safety Risk Occupancies within the City of Lloydminster.	✓	✓	✓	✓	✓

		1st Line of Defence	2nd Line of Defence			3rd Line of Defence
Demographics	The 2016 Census data indicates that the percentage of persons aged 0 to 14 represent 23% of the City's total population in comparison to that of the province of only 18%.	✓				
	The 2016 Census data indicates that the percentage of seniors (those 65 or older) represent 11% of the City's total population in comparison to that of the province of 9%. Based on historical provincial data seniors have been identified as a high fire risk group.	✓				
	The 2016 Census data indicates that people between the ages of 45 and 64 represent 21% of the City's total population.	✓				
	From 2006 to 2016 the City experienced an increase of 11% in the number of immigrants living within the City.	✓				
Hazard	The City of Lloydminster Hazard Risk and Vulnerability Assessment identifies the top hazards within the City as hazardous materials spills, industrial fire, non-emergency events, overland flooding, rail Incident, urban fire, and wind event related to summer storms.		✓	✓	✓	✓

		1st Line of Defence	2nd Line of Defence			3rd Line of Defence
Economic	The City's top employers represent a potential high economic impact should a fire impact production, operations or services.		✓	✓	✓	✓
Fire	Residential occupancies account for 73% of property fires within the City when analyzing the proportion of fires that occurred within an Alberta Building Code major occupancy classification.	✓	✓	✓		✓
	Mercantile occupancies account for 11% of property fires within the City when analyzing the proportion of fires that occurred within an Alberta Building Code Major Occupancy major occupancy classification.	✓	✓	✓	✓	✓
	Properties that are not a part of an Alberta Building Code major occupancy classification (e.g., storage properties, special property and transportation equipment, etc.) account for 59% of the 221 fires occurring over the ten year period.	✓				✓
	For the period 2007 to 2016, four injuries occurred within Group C – Residential occupancies.	✓				✓
	Of the fires occurring in the City between 2007 and 2016, the leading known causes of unintentionally set fires was due to Mechanical/Electrical Failure/Malfunction at 22% of fires.		✓	✓	✓	✓
	Of the fires occurring in the City between 2007 and 2016, miscellaneous	✓	✓			

		1st Line of Defence	2nd Line of Defence			3rd Line of Defence
	acts or omissions was the most prevalent cause of fires (44%).					
	Of the fires occurring in the City between 2007 and 2016, 25% of fires were intentionally caused and classified as Arson or 'Set Fires'.	✓	✓			✓
	The most common known sources of ignition for fires within the City is due to Smoker's Material and 'Open' Flame at 12% and Exposure at 9%.	✓	✓	✓	✓	✓
	The ignition source for 52% of the City's fires was determined as "unknown".	✓	✓	✓	✓	✓
	Historical provincial data indicates that a high percentage of smoke alarms were found to have not activated, or it was undetermined if they activated.	✓	✓	✓	✓	✓
Response	The call volume in 2018 exceeded the 5-year annual call volume average of 365 calls by 12%.		✓		✓	✓
	Analysis of call volume by month for the period 2014-2018 indicates that the highest average call volume occurs in the month of May, exceeding the 5 year monthly average of 30 calls per month.	✓	✓	✓	✓	✓
	Analysis of call volume by day of week for the period of 2014-2018 indicates that the highest average call volume occurs on Saturdays, exceeding the 5 year daily average of 52 calls per day.	✓	✓	✓	✓	✓

		1st Line of Defence	2nd Line of Defence			3rd Line of Defence
	Analysis of average call volume by time of day for the period of 2014-2018 indicates that the highest average call volume occurs between 5pm and 7pm when the majority of individuals are travelling from work to home.	✓	✓	✓	✓	✓
	Alarm, No Fire calls are the most common response type accounting for 64% of all calls	✓	✓	✓	✓	✓

The recommendations of this F.S.M.P. have been informed by these ***"key findings"*** and will focus on the implementation of strategies to reduce community fire risk. This will include a focused and proactive approach to the reduction of fire risk through enhanced public education programs, fire prevention inspections, and fire code enforcement. Although it is a necessary and critical component of the services the L.F.D. provides to the community, the provision of fire suppression services shall be considered as a last resort, or failsafe to providing the optimal fire protection services model to the community.

7.0 Administrative Services

This section of the F.S.M.P. describes the roles and responsibilities of the administrative functions that provide strategic direction and overall administration and management to the Lloydminster Fire Department. This section also outlines and reviews the fire department's primary administration practices, department organizational structure, mission, management roles and responsibilities, applicable by-laws, current service agreements, departmental standard operating guidelines, department reporting, and records management procedures.

The Fire Chief is directly responsible for overseeing all administrative and financial functions of the Lloydminster Fire Department. This role also includes providing leadership, management and strategic direction for the overall fire department. Within this area of the department's current operation the Fire Chief is supported by a full-time Administrative Support position, and a full-time Assistant Fire Chief.

7.1 Fire Department Mission Statement

Industry best practices indicate that a mission statement should identify what an organization does, who it does it for, and how it does it. The current Mission Statement and core values of Lloydminster Fire Department are contained within Standard Operating Procedure (S.O.P.) #0002 dated February 5th, 2018. The L.F.D.s current mission statements is:

"A professional Fire Department providing the highest levels of service to our community"[6]

Mission statements are intended to be clear and powerful in defining the organization's purpose and primary objectives. They are also intended to express why the organization exists to both internal and external stakeholders. Use of the word ***"professional"*** in the mission statement could be interpreted by the public as the fire department being operated solely by full-time staff resources, and not reflecting the department's core strength as a ***"composite fire department"*** utilizing both full-time and paid on call firefighters. The current mission statement also suggests a very broad statement of ***"highest levels of service"*** that would be difficult for a member of the community to understand, or for the department to be able to define. Subject to Council's consideration and approval of this F.S.M.P. it is recommended that consideration be given to updating the department's mission statement.

Often, fire departments will have a vision statement in addition to a mission statement. A vision statement should identify a vision for the future that all individuals within the department can work towards. The L.F.D. does not currently have a vision statement. S.O.P. #0002 does include the current ***"core values"*** of the department that include:

[6] Lloydminster Fire Department, Standard Operating Procedure #0002

1. ***Customer Service*** *- Strive to exceed our resident's expectations;*
2. ***Professionalism*** *- All members will present themselves as a uniform image. As it is known that every member's actions reflects on the Fire Department as a whole;*
3. ***Honour*** *- We shall maintain the highest ethical standards expected of the Department. Act with sincerity, be honest, promote openness with the belief that every action reflects on all members of the department, both past and present; and*
4. ***Prowess*** *-The pursuit of excellence as a firefighter and the continued life-long learning is vital to the Department's success.*

This F.S.M.P. provides an opportunity for the L.F.D. and its members to reconsider its mission, vision and core values. In our experience the L.F.D. is at a point in its evolution that implementing a process to review these elements would also present a unique team building opportunity. It is recommended that the department consider developing an internal collaborative consultation process to renew the mission, vision and core values of the L.F.D.

Operational Recommendation #1: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to updating the Lloydminster Fire Department Mission Statement, develop a corresponding Vision Statement and renew the department's core values.

7.2 Current Organizational Structure

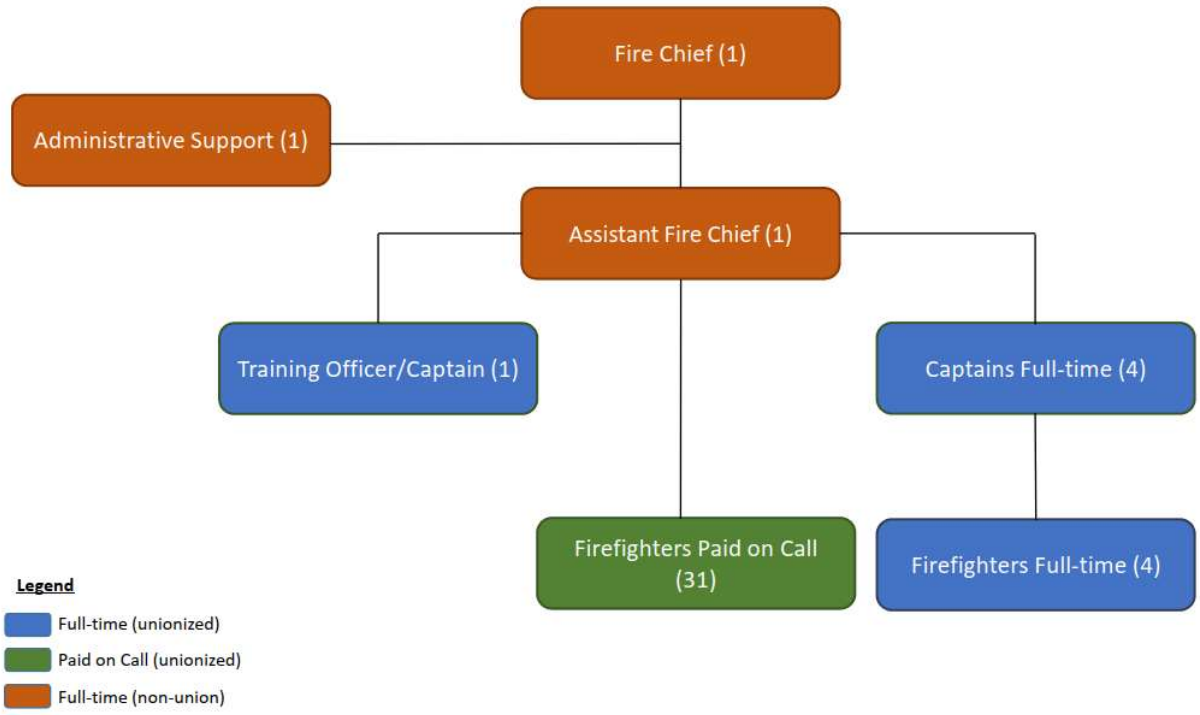
The analysis within this section provides an overview of the current organizational structure of the L.F.D., including both full-time and paid on call staff as presented in **Table 3** and the current organizational model illustrated in **Figure 1.** Information is also presented relating to the current roles and responsibilities of those staff assigned to the administrative functions of the department including the Fire Chief, Assistant Fire Chief and administrative support position.

Table 3: Current Organizational Structure

Role / Division	Full-time Staff Resources	Paid on Call Staff Resources
Administration		
Fire Chief	1	---
Assistant Fire Chief	1	---
Administration Support	1	---
Fire Suppression/Operations		
Captain	4	---
Full- Time Firefighters	4	---
Paid on Call Firefighters	---	31
Training		
Training Officer	1	---
Total Staff Positions	**12**	**31**

Source: Lloydminster Fire Department

Figure 1: Current Organizational Model



7.3 Fire Chief

The Fire Chief is ultimately responsible for the overall management and leadership of the Lloydminster Fire Department. This position reports directly to the City Clerk. The Fire Chief is responsible for overseeing and administering all aspects of L.F.D., including the quality of fire protection services, fire prevention and public education program development and delivery, emergency response (fire suppression) and technical rescue services, internal department training and fire safety inspection service delivery. The roles and responsibilities of this position also include overseeing the required health and safety programs within the department.

Research into preparing this F.S.M.P. identified the efforts of the current Fire Chief to better inform Council and senior staff in regards to the current challenges facing the L.F.D. including staffing and service levels. The analysis and recommendations presented within this F.S.M.P. have considered the Fire Chiefs in-depth analysis of the current state of the L.F.D., staffing options, and direct feedback garnered through the internal stakeholder consultation process. Additional input into the development of this F.S.M.P. was obtained from the Fire Chief through the process of presenting the ***"preliminary findings"*** of our analysis to prepare this F.S.M.P. The following illustrate examples of the current key roles and responsibilities of the Fire Chief:

- ✓ *Plans, organizes and directs all activities of the Fire Department.*
- ✓ *Act as the main public figure while representing the Fire Department for the Public, Elected Officials, and Executive Leadership Team.*
- ✓ *Reviews and analyzes policies, procedures, and operations. Makes recommendations for changes as necessary.*
- ✓ *Establishes budget priorities and prepares departmental budget. Monitors and controls expenditures of department.*
- ✓ *Develop long range operational and planning needs for the department. Including but not limited to apparatus, facilities, equipment, staffing, and programming.*
- ✓ *Develops, recommends, and implements plans, programs and SOP's for the Fire Department within Council approval.*
- ✓ *Prepares and monitors the annual and long-rang operational and capital budgets for the department in accordance with approved guidelines.*
- ✓ *Anticipates and projects staffing requirements; maintains necessary staffing levels. Ensures qualified personnel are recruited, hired, and trained.*
- ✓ *Responds to all major incidents and commands firefighting operations. Be able to be contacted at all times to assist others in the absence of the Fire Chief on the Emergency Scene.*
- ✓ *Investigates the source and circumstances of fires to detect their causes.*
- ✓ *Promotes positive customer service environment internally and externally.*
- ✓ *Oversee the development of the City of Lloydminster's Emergency Management Agency.*
- ✓ *Evaluates the work of subordinates, guides them and identifies needs for development.*
- ✓ *Maintains extensive contacts with outside agencies and the community. Attends meetings as the Department's representative and meets with citizens, citizens' groups.*
- ✓ *Enforces fire prevention legislation of Alberta and Saskatchewan and the fire prevention bylaws of the City. Liaises and provides necessary information and reports to both provinces.*

In our experience the roles and responsibilities identified within this job description are consistent with those of a typical Fire Chief of similar size and complexity of the Lloydminster Fire Department. The recent evolution to a unionized work force will in our experience result in an increased work load on the part of the Fire Chief, and senior corporate staff to manage the new Collective Agreement. At the time of initiating this fire services master planning process the Fire Chief's office was located in the R.C.M.P Detachment, adjacent to City Hall. Through consultation with senior City staff it was recommended that the Fire Chief be relocated to the same building as the Assistant Fire Chief and Administrative Assistant, as discussed below in the section titled 'Administrative Workspace'.

This F.S.M.P. will be recommending that strategies be developed to further enhance the communication process throughout the department, this includes communication at all levels of the department including the Fire Chief, Assistant Fire Chief and Administrative Assistant. Based on the findings of our internal consultation with both the full-time, and paid on call firefighters there is a need for more

regular interaction, and consultation with the Fire Chief. This type of feedback is not uncommon in a smaller fire department such as the L.F.D. It also identifies a potential gap in the communication process within the department between the Fire Chief and the full-time firefighters on duty. This may in part also be associated with the current 24 hour shift system that further minimizes the opportunities for daily interaction between the full-time firefighters and the Fire Chief. Enhancing communication strategies is, in our view, required in both daily face-to-face interaction and consultation, and formal written direction through enhanced Standard Operating Guidelines and Department Policies.

The recommendations contained within this F.S.M.P. will impact a number of current job descriptions subject to Council's consideration and approval of the proposed organizational structure. This may include the need to revise the roles and responsibilities of several existing positions, and the need to develop new job descriptions to support the proposed organizational structure. For example, a comparison of the current job description of the Fire Chief with that of the Assistant Fire Chief identifies that the Assistant Fire Chief's is more comprehensive and detailed. It includes both operational, administrative and strategic leadership roles and responsibilities compared to the Fire Chief's list of duties. The Assistant Fire Chief's job description also references the daily administration of the Collective Agreement that is not refined in the Fire Chief's job description. In our view the recommendations of this F.S.M.P. will result in the need to conduct a review of all current job descriptions including roles and responsibilities for all department positions.

Operational Recommendation #2: That subject to Council's consideration and approval of the proposed Fire Services Master Plan a comprehensive review and update of all staff resource job descriptions be completed.

7.4 Assistant Fire Chief

The current organizational structure of the L.F.D. includes a full-time Assistant Fire Chief. The Assistant Fire Chief is authorized to act in the role of the Fire Chief in his absence. The roles and responsibilities of this positon illustrate that the primary focus areas of this position are in the oversight and leadership of the operations (fire suppression) and firefighter training functions of the department. The current Assistant Fire Chief was retained by the City in January of 2019 and brings a wealth of experience and knowledge in the areas of fire suppression and training. In our view the optimization of this experience and qualifications are critical components of continued improvements by the L.F.D.

The stakeholder consultation process with the full-time and paid on call firefighters consistently identified the absence of Standard Operating Guidelines and Department Policies to provide direction to firefighters as one of the primary challenges facing the department. The development, maintenance and implementation of these documents is currently assigned to the Assistant Fire Chief. The following illustrate examples of the current key roles and responsibilities of the Assistant Fire Chief:

- ✓ *Lead the development of safe, sustainable and effective fire response strategies and systems for the City.*
- ✓ *Ensure all firefighting personnel are trained, equipped and qualified to safely deliver fire and medical first response.*
- ✓ *Ensure all required standards and regulations pertaining to the delivery of fire response are met or exceeded.*
- ✓ *Coordinate fire training for personnel.*
- ✓ *Lead the annual recruitment and training.*
- ✓ *Day to day administration of the Collective Agreement including representing the department at grievance meetings, when required.*
- ✓ *Develop Policy and Standard Operating Procedures including maintenance and implementation processes.*
- ✓ *Monitor and evaluate the efficiency and effectiveness of service delivery methods to external and internal customers.*
- ✓ *Establish and maintain requirements for quality records management.*

Based on our analysis the current roles and responsibilities of this position are overwhelming for one individual given the current status of the L.F.D. in the areas of firefighter training and fire suppression services. The recommendations and proposed organizational structure presented within this F.S.M.P. will seek to implement strategies that support this position through the delegation of functions and tasks where possible. In our view this must include the further delegation of roles and responsibilities to the full-time Captains and full-time firefighters.

7.5 Administrative Support

The current organizational structure of the department includes one full-time Administrative Assistant This position is responsible for providing administrative and clerical support to the various divisions within the department and the Fire Chief. The Administrative Assistant also responds to general public inquiries and serves as the customer service representative for the fire department. The following illustrate examples of the current key roles and responsibilities of the Administrative Assistant:

- ✓ *Provide administrative assistance to the fire services section including but not limited to receiving, recording and preparing correspondence and reports, organizing, creating and maintaining records and files, organizing, creating and maintaining databases, and organizing, creating and maintaining any related record keeping and documentation.*
- ✓ *Respond to general inquiries from the public.*
- ✓ *Managing incoming and outgoing mail.*
- ✓ *Monthly reports – collection of honorarium data, training statistics, incident statistics, reports as requested by the Fire Chief.*
- ✓ *Complying with all policies, rules, and regulations of the municipality and the provincial government*
- ✓ *Conducts data input and maintains active and concluded incidents.*

- ✓ *Processing of all motor vehicle accidents reports for submission to A/P for reimbursement which includes the calculation of the man hours and equipment used during an incident.*
- ✓ *Radio communication as required.*
- ✓ *Enters and calculation of monthly stats and preparing and submission of the information by utilizing the Fire Pro Computer Program.*
- ✓ *Assisting with Emergency Management (disaster services).*
- ✓ *Leads administrative special projects as assigned.*
- ✓ *Assists with researching and compiling information on a variety of departmental topics.*
- ✓ *Responsible for filing system for department, involves working closely with Records and Management Clerk.*
- ✓ *Decisions regarding research and compositions are at the discretion of the Fire Chief.*
- ✓ *Provides excellent internal and external customer service using good judgement and tact.*
- ✓ *Provides courteous, knowledgeable and professional communication with the public.*

The process to develop this F.S.M.P. included a significant component of data collection, data analysis and problem solving on behalf of this position to meet the needs of our analysis. Throughout this process and the stakeholder consultation process the incumbent in this position exhibited a high degree of proficiency and administrative experience. In our view there are additional administrative tasks that could be assigned to this position that would further enhance the overall administrative functions of the department, and thus provide some relief to the current administrative workload assigned to the Fire Chief.

7.6 Administrative Workspace

At the time of initiating this project the Fire Chief's workspace was located in the R.C.M.P. Detachment adjacent to City Hall. Since that time the Fire Chief has relocated his office to Fire Station No. 2. The Assistant Fire Chief and Administrative Assistants workspace is located at Fire Station No. 1.

The current condition of Fire Station No.1 has been identified by staff and confirmed through other analyses as a facility that has reached the end of its intended life cycle. This includes the functionality of the existing workspace for the Assistant Fire Chief and the Administrative Assistant. These areas are not conducive as effective and efficient workspaces to accommodate the current administrative functions and required interaction with the public and staff. Further financial investment into improving these areas is not recommended, given the overall condition of this facility.

The workspace for the Fire Chief located at Fire Station No. 2, although newer, was not designed to accommodate the administrative roles and responsibilities of the Fire Chief. As a result of the current workspace conditions at the fire stations the administrative functions of the L.F.D. remain decentralized. This results in a gap in communication and regular daily interaction of the administrative staff including the Fire Chief, Assistant Fire Chief and Administrative Assistant. In our view the current administrative workspace of the L.F.D. does not reflect the functional needs of the staff assigned to this area, and does

not meet the needs of the department in providing a collaborative workspace for the management team.

This F.S.M.P. supports the need to prioritize the replacement of Fire Station No.1 including the provision of workspace to accommodate the administrative functions, and management team of the L.F.D. This F.S.M.P. recognizes that the replacement of Fire Station No. 1 will require further research, including the completion of a design phase and construction process that may require a two to three year window to complete. It is recommended that in the interim consideration be given to implementing strategies that would consolidate the current workspace of the Fire Chief, Assistant Fire Chief and Administrative Assistant into one location. In our view the benefit of implementing this interim strategy is directly related to further enhancing the current efficiency and effectiveness of the department's management team, and subject to Council's consideration and approval implementing the recommendations of this F.S.M.P.

Operational Recommendation #3: That consideration be given to implementing an interim strategy to collocate the workspace of the Fire Chief, Assistant Fire Chief and Administrative Assistant in one location as presented within the proposed Fire Services Master Plan.

7.7 Senior Officer On-Call Schedule

Current industry, and municipal best practices reflect the need to ensure that a senior officer with the skills and experience to oversee (manage) any large scale emergency incident, or manage any significant administrative issue (e.g., health and safety) is available to the department, and Council at all times. For example, in the event of a major emergency incident within the community that results in the activation of the City's Emergency Management Plan there is an expectation that a senior experienced officer from the fire department is available to Council to assist in managing any public safety matter.

The Fire Chief's current job description states that the Fire Chief's duties include that he ***"Responds to all major incidents and commands firefighting operations; and be able to be contacted at all times to assist others in the absence of the Fire Chief on the Emergency Scene"***[7] and indicates that ***"The position is office based, with the requirement to respond to all large incidents and be accessible to staff at all times"***[8]. In a similar manner the Assistant Fire Chief's current job description states that he will ***"Respond as required to serious fire and rescue events in the City, designated rural response areas and mutual aid requests."***[9]

[7] Job Description – Senior Manager, Emergency Services/Fire Chief - Duties
[8] Job Description – Senior Manager, Emergency Services/Fire Chief – Working Conditions
[9] Job Description – Assistant Fire Chief – Duties and Responsibilities - Operations

In our experience, and based on our understanding of current municipal best practices, requiring the Fire Chief to be ***"accessible to staff at all times"*** is an unrealistic expectation. However, the intent of this expectation is consistent with that of having a senior officer on-call schedule defined within a department or corporate policy. A senior officer on-call schedule could be developed whereby either the Fire Chief, or Assistant Fire Chief is available at all times, and would be able to be contacted by corporate, or department staff, or be able to respond to a major incident if required within a pre-determined amount of time. The pre-determined amount of time should be defined based on realistic expectations of where their residence may be located and other factors. A period of thirty to sixty minutes from the time of notification to respond is common within the fire service.

Operational Recommendation #4: That the Lloydminster Fire Department develop and implement a Senior Officer On-Call policy as presented within the proposed Fire Services Master Plan.

7.8 Memorandum of Understandings

The ***Municipal Government Act*** (Alberta) and the ***Municipalities Act*** (Saskatchewan) and the ***Lloydminster Charter*** (AR212/2012) provide Council the authority to enter into agreements with other municipalities and authorities to provide and receive assistance in the delivery of fire protection and emergency services. The City of Lloydminster has developed several memorandums of understanding that include both mutual aid agreements and an agreement to purchase services. The following sections provide an overview of the current memorandum of understandings provided to inform this F.S.M.P.

7.8.1 Mutual Aid Agreement – Rural Municipality of Wilton

This mutual aid agreement was signed by the City of Lloydminster on March 28th, 2017 and will remain in force until such time as either the City of Lloydminster, or the Rural Municipality of Wilton provide three months' notice of an intention to terminate the agreement.

Mutual aid agreements are a common tool within the fire service for municipalities to develop a formal process for receiving additional fire protection services to support those of the requesting municipality. This agreement states this within the introduction section that indicates ***"At times it may be necessary for the parties' respective fire departments to respond to requests from the other to assist in helping combat a fire or effect a rescue"***[10].

Our review of this agreement indicates that it is consist with current municipal best practices in defining the roles and responsibilities of each municipality in regards to the emergency operations/rescue services to be provided. However, our research into preparing this F.S.M.P. could not determine if the participating fire departments have supporting Standard Operating Procedures that provide clear

[10] Memorandum of Understanding Firefighting and Rescue Services Mutual Aid Agreement- City of Lloydminster and Rural Municipality of Wilton – Page 3, Introduction (C)

direction to those firefighters that may be responding into another municipality as required by this agreement. There is also no evidence to indicate that there is a regular training program between the participating fire departments to maintain an acceptable level of efficiency and effectiveness. No evidence of efforts towards ensuring effective standardization of equipment, procedures and training levels could be identified.

Mutual aid agreements are an effective strategy to attaining additional resources and equipment in the event of a major incident. The utilization of them should be supported by common Standard Operating Procedures, regular joint training and sustaining effective interoperability.

Operational Recommendation #5: That consideration be given to enhancing the effectiveness and efficiency of mutual aid agreements as presented within the proposed Fire Service Master Plan.

7.8.2 Mutual Aid Agreement – Rural Municipality of Britannia No.502

This mutual aid agreement was signed by the City of Lloydminster on May 1st, 2017 and will remain in force until such time as either the City of Lloydminster, or the Rural Municipality of Britannia No.502 provide three months' notice of an intention to terminate the agreement.

The wording and intent of this agreement are the same as the mutual aid agreement with the Rural Municipality of Wilton and our review indicates the same concerns related to standardized equipment, procedures and training levels.

7.8.3 Memorandum of Understanding – Lloydminster Rescue Squad Inc.

The memorandum of understanding between the City and the Lloydminster Rescue Squad Inc. was approved by the City on May 2nd, 2016 and expired on December 31st, 2018.

In comparison to the mutual aid agreements with the Rural Municipalities of Wilton and Rural Municipality of Britannia No.502 this agreement defines the services, call out process and compensation to be paid to the Lloydminster Rescue Squad Inc. by the City of Lloydminster. The services defined by this agreement include, but are not limited to water/ice rescue, search and rescue, vehicle extrication, and traffic control. In our view the definitions of these services are very limited in comparison to current industry standards, and specifically the definition of water/ice rescue. There is no indication as to whether these services are shore-based only, or whether some other type of equipment or services are to be provided when the incident may not be accessible from shore. There is also no reference to the training qualifications for these services that will be administered by the Lloydminster Rescue Squad Inc. In our view this is a critical element as the resources of the Lloydminster Rescue Squad Inc. will remain under the overall command of the Lloydminster Fire Chief while on scene. Additional wording should also be considered to include to reference the Fire Chief or his/her designate.

Similarly to our review of the current mutual aid agreements listed above there is no evidence of joint training, or supporting Standard Operating Guidelines to clearly outline the roles and responsibilities of all firefighters and Lloydminster Rescue Squad Inc. staff resources when on scene together. It is recommended that, subject to Council's desire to continue purchasing services from the Lloydminster Rescue Squad Inc., that the current agreement be reviewed and revised as referenced within this F.S.M.P.

Operational Recommendation #6: That subject to Council's direction to update the Memorandum of Understanding with the Lloydminster Rescue Squad Inc. consideration be given to revising the agreement as presented within the proposed Fire Services Master Plan.

7.9 Department Policies/Standard Operating Procedures

Dillon's experience in working with fire departments across the country service reflects the use of department policies as the appropriate tool to communicate specific direction to all staff. In comparison to standard operating procedures, which are intended to provide a framework to guide decision making, department policies reflect more stringent and defined practices which minimize variance from the directive given. In many instance fire department polices may reflect the direction and broader corporate policies of the City. Our research into preparing this F.S.M.P. identified an absence of any current department policies. We do recognize that the City has just completed its first negotiation of a Collective Agreement that contains multiple articles related to the human resources and roles and responsibilities of applicable staff. However, in our experience there is now an even greater need to ensure that there are clearly defined department policies in place to avoid, where possible, any potential differences in opinion or interpretation. It is recommended that consideration be given to the development of department policies, where applicable, and where there needs to be more clearly defined direction to staff than that which may be included within Standard Operating Procedures.

Standard Operating Procedures (S.O.P.s) are commonly used within the fire service to establish a written statement to guide the performance or behaviour of departmental staff, whether functioning alone or in groups. Current industry best practices suggest the following core objectives for developing Standard Operating Procedures:

- ✓ *Enhance safety;*
- ✓ *Increase individual and team effectiveness;*
- ✓ *Improve training efficiency;*
- ✓ *Improve orientation for entry-level staff;*
- ✓ *Improve risk management practices;*
- ✓ *Prevent / avoid litigation;*
- ✓ *Create objective post-incident evaluations; and*
- ✓ *Permit flexibility in decision making.*

Current industry best practices indicate that creating and empowering a committee of fire service staff to research, develop, and draft standard operating procedures can be a successful model for

administering these core documents. Activities that impact on firefighter safety, the most common emergency operations, or high risk operations should be the top priority for a fire and emergency service to have in place.

The final versions of standard operating procedures should be approved by the Fire Chief prior to implementation. Direction should then be in place within the fire department to ensure that these procedures are distributed to, and comprehended by, all relevant staff and followed as directed. Applicable procedures to record this process of developing, approving and distributing must be in place to ensure due diligence on behalf of the fire department and the City, as the employer.

The Assistant Fire Chief and Training Officer currently lead an ongoing process to develop and update department S.O.P.s. Our review indicates that there are currently very few existing S.O.P.s within the L.F.D. Throughout the internal stakeholder consultation process the absence of S.O.G.s was identified as a current significant challenge within the L.F.D. Subject to Council's consideration and approval of this F.S.M.P. there will be a need to conduct a review of all existing procedures and where necessary develop additional S.O.P.s to reflect all levels of service approved by Council.

Standard operating procedures should be developed and informed by the intended goals and objectives of the activity, service or program indicated. These guidelines should be developed through research of applicable legislation and industry best practices. These documents should also include a standard format that includes the date of last revision, date of approval and signature of the Fire Chief as the authorizing person. Standard operating procedures should be formatted with an index that references primary divisions (e.g., fire prevention, suppression and training). All S.O.P.s should provide a clear framework to guide decision making to achieve the intended goals and objectives. There should be no overlap between a department policy and a standard operating procedure.

Developing and maintaining standard operating procedures that are current and reflect ongoing legislative requirements, and reference industry best practices can be a major challenge. Developing a committee consisting of a cross-section of department staff who are assigned this task can be an effective strategy to sustaining the currency of all standard operating guidelines. An important element of this strategy is defining a clear terms of reference for this type of committee. In our view this committee should be chaired by the Assistant Fire Chief. The terms of reference should include a requirement that all standard operating guidelines be reviewed prior to any proposed operational change, as a result of any legislative change, or annually.

Operational Recommendation #6: That consideration be given to implementing a Standard Operating Procedure Committee as presented within the proposed Fire Services Master Plan.

Operational Recommendation #7: That the Lloydminster Fire Department prioritize the development of Standard Operating Procedures to provide clear direction to all staff regarding the delivery of fire protection services.

Operational Recommendations #8: That consideration be given to prioritizing the development of fire department policies to provide clear direction to all staff, and specifically in those areas that may require more defined direction than included within a Standard Operating Procedure.

7.10 Department Records Management Practices

The reporting requirements for fire departments are significant, with documentation being a key method of exercising due diligence on behalf of the municipality. As a core administrative function, overseeing records management and reporting is critical for a variety of reasons including but not limited to fire suppression emergency response, firefighter training records, and measuring the effectiveness of fire prevention and public education programs.

The L.F.D. currently utilizes the FirePro software program that is specifically designed for fire department applications. The use of this software program and its application within the department was identified by the department as being under review and revision. In our experience to prepare this F.S.M.P. the availability of department records and historical data was a significant challenge for the department, and in many instances the data was not available.

Our review of the department's existing S.O.P.s and policies did not identify a policy or procedure for the management of department records. Records management plays a key role in every division of a fire department for a variety of reasons including, but not limited to, operations, emergency response, firefighter training records, as well as measuring the effectiveness of fire prevention and public education programs. An effective and efficient records management program includes the appropriate use and protocol by division of the records management systems in place; record retention schedules; standards for record quality; protocols for record security and integrity of hard-copy and electronic records; and outline other applicable codes, standards or industry best practices that may apply.

Records management is an area of the department that should be approached with a strategy of continuous improvement. Increasing the breadth and depth of use of FirePro software would be one opportunity for the department to improve the current internal data collection and records management process. This would provide the opportunity to develop a more robust data set for application in the ongoing monitoring of department performance and review of the department's progress as it grows and transitions into the future.

Operational Recommendation #9: That priority be given to developing a comprehensive records management program, including the development of a Standard Operating Procedure for all records management practices within the Lloydminster Fire Department.

7.11 Fire Department Annual Report

Current industry best practices recognize the importance of ongoing monitoring, evaluation and revisions to the fire protection services approved by Council. Fire services across the country have utilized annual reports to Council as a tool to provide a high degree of accountability and transparency on behalf of the Fire Chief in reporting to the community and Council on the level of fire protection services provided. This regular reporting process is also an ideal opportunity to update the Community Risk Assessment and fire related by-laws. This regular review process can provide further value in identifying changes or trends within the community.

The L.F.D. has provided a simplified form of annual reporting to Council in the past. Examples of the 2015 and 2016 department annual reports were provided to inform this F.S.M.P. In our experience a more comprehensive annual report could include highlights, such as public education events, program successes, as well as the number and type of emergency response calls. The reports can further be organized by division, providing details on staff, programs, changes and accomplishments.

Maintaining the information within a Community Risk Assessment as part of an annual report also enhances the level of information provided to Council and the public. In addition to the reporting benefit, the practice of issuing an annual report helps to ensure that the community risk assessment remains up to date, enhancing the fire department's understanding and presenting to Council any evolving trends within the community.

While annual reports have numerous benefits, they do require a considerable amount of resources to complete including data collection, inter-divisional communication, analysis, document design, reviews and approvals. Care in refining language and graphics used in an annual report is especially important if they are to be used as a tool for communicating level of service to the public. The demanding nature of the process in the context of the day-to-day operations of a department can be challenging to handle without sufficient resources.

The data collection process to develop this F.S.M.P. has created a unique opportunity for the fire department to evaluate its historical records management and data analysis processes. The Fire Chief has also expressed interest in collecting the required data and enhancing the Council and public reporting process in the future to include ongoing performance benchmarking. In our view the development of a more comprehensive annual report should be considered as a strategic goal of the L.F.D. and not an immediate priority.

Operational Recommendation #10: That consideration be given to enhancing the fire department's Annual Report to include performance benchmarking to further enhance the department's reporting to Council and the community.

7.12 Administration Summary and Recommendations

Our research indicates that this is the first time in the City's history that a strategic fire master planning and community risk analysis process have been undertaken. The analysis of the current administrative functions of the L.F.D. present the evidence that this fire department is at a unique point in its history and growth whereby there is an identified need to clearly identify the City's goals and objectives related to the delivery of fire protection services.

The current organizational structure of the L.F.D. has evolved from its historical roots as a volunteer fire department. The stakeholder consultation process to develop this F.S.M.P. consistently identified the need for Council's assistance in defining the fire protection services to be provided. In our view there is a strong consensus within the stakeholder group including Council, senior corporate and department staff and members of the L.F.D. to turn the page on the fire department's history and set a new path forward through the implementation of this F.S.M.P. The strategic priorities presented within this F.S.M.P are intended to provide a solid foundation for decision making to guide the L.F.D. as it embraces the many changes recommended within this F.S.M.P.

The historical organizational structure of the Lloydminster Fire Department served the community well in providing fire protection services. However, the increasing demands to respond to evolving legislative changes, including increasing health and safety requirements, data collection, data analysis and performance benchmarking, have in our view exceeded the capabilities of the current organizational structure. Our review of the current administrative functions of the department, including the current organizational structure, roles and responsibilities of staff assigned to administrative tasks, and current administrative processes reflects the symptoms of an organization that has exceeded its workload capabilities. There are multiple examples of the current administrative functions that have exceeded the workload capacity of the L.F.D.

This F.S.M.P. includes strategies, including a proposed revised organizational structure, to address the identified workload challenges and enhance the efficiency and effectiveness of the administrative functions and the department, overall. As a result of the review of the administrative functions, the following recommendations are presented for Council's consideration and approval:

Council Recommendations:

Council Recommendation #1: That consideration be given to approving the strategic priorities identified within the Fire Services Master Plan to guide the development and delivery of fire protection services within the City of Lloydminster over the next ten-year community planning horizon.

- ✓ ***The analysis of fire protection services provided to the community shall be fully informed by the development and ongoing review and update of a Community Risk Assessment to identify the fire related risks within the City of Lloydminster;***

- ✓ ***The primary objective of the Lloydminster Fire Department will be to optimize the use of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement, to enhance the fire and life safety within the community;***

- ✓ ***The City of Lloydminster will continue to prioritize the utilization of strategies that support the sustainability of Paid-on-Call firefighters, and the operation of a "Combination Fire Department" operating model that includes a balance of full-time staff and Paid-on-Call staff resources; and***

- ✓ ***The City of Lloydminster will continue to prioritize the delivery of a comprehensive fire protection model that provides the most effective and efficient level of fire protection services resulting in the best value for the community.***

Operational Recommendations:

Operational Recommendation #1: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to updating the Lloydminster Fire Department Mission Statement, develop a corresponding Vision Statement and renew the department's core values.

Operational Recommendation #2: That subject to Council's consideration and approval of the proposed Fire Services Master Plan a comprehensive review and update of all staff resource job descriptions be completed.

Operational Recommendation #3: That consideration be given to implementing an interim strategy to collocate the workspace of the Fire Chief, Assistant Fire Chief and Administrative Assistant in one location as presented within the proposed Fire Services Master Plan.

Operational Recommendation #4: That the Lloydminster Fire Department develop and implement a Senior Officer On-Call policy as presented within the proposed Fire Services Master Plan.

Operational Recommendation #5: That consideration be given to enhancing the effectiveness and efficiency of mutual aid agreements as presented within the proposed Fire Service Master Plan.

Operational Recommendation #6: That subject to Council's direction to update the Memorandum of Understanding with the Lloydminster Rescue Squad Inc. consideration be given to revising the agreement as presented within the proposed Fire Services Master Plan.

Operational Recommendation #6: That consideration be given to implementing a Standard Operating Procedure Committee as presented within the proposed Fire Services Master Plan.

Operational Recommendation #7: That the Lloydminster Fire Department prioritize the development of Standard Operating Procedures to provide clear direction to all staff regarding the delivery of fire protection services.

Operational Recommendations #8: That consideration be given to prioritizing the development of fire department policies to provide clear direction to all staff, and specifically in those areas that may require more defined direction than included within a Standard Operating Procedure.

Operational Recommendation #9: That priority be given to developing a comprehensive records management program, including the development of a Standard Operating Procedure for all records management practices within the Lloydminster Fire Department.

Operational Recommendation #10: That consideration be given to enhancing the fire department's Annual Report to include performance benchmarking to further enhance the department's reporting to Council and the community.

8.0 Fire Prevention and Public Education Services and Programs

Our research and stakeholder consultation completed while preparing this F.S.M.P. indicates that the delivery of fire prevention and public education services and programs by the L.F.D. has been limited in the past. This observation is supported by the direction of the current ***Fire Bylaw No. 25-2015*** that defines the current services and programs provided by the L.F.D. as ***"The Lloydminster Fire Department, a public organization that provides predominantly emergency firefighting and vehicle extrication services for the City of Lloydminster"***[11].

Within the data collection process, research and stakeholder consultation process to develop this F.S.M.P. the current fire prevention and public education services and programs were described as 'some fire inspections performed by the Fire Chief when a request or complaint is received', and 'a Voluntary Home Fire Safety Inspection program that includes some public fire safety messaging', and 'fire safety inspections of residential occupancies'. At the time of this review there were no Council approved fire prevention and public education programs and no dedicated staff resources assigned to fire prevention and public education services and programs.

In our view there is consensus within the stakeholder group including Council, senior corporate and department staff and members of the L.F.D that there is an identified need to implement a more proactive fire prevention and public education program. Our interpretation of this consensus in addition to our knowledge of current municipal best practices was considered in developing the proposed strategic priorities presented within this F.S.M.P., and specifically the following strategic priorities related to enhancing the department's current fire prevention and public education initiatives:

- ***The analysis of fire protection services provided to the community shall be fully informed by the development and ongoing review and update of a Community Risk Assessment to identify the fire related risks within the City of Lloydminster; and***

- ***The primary objective of the Lloydminster Fire Department will be to optimize the use of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement, to enhance the fire and life safety within the community.***

[11] City of Lloydminster – Bylaw No. 25-2015 – Section 2, Definitions 2.1 (h)

As a result of our research and consultation the analysis and recommendations presented within the following sections specifically target a transition from the department's historical level of fire prevention and public education initiatives to a more proactive and strategic approach to implementing risk mitigation strategies in response to the ***"key findings"*** of the ***Community Risk Assessment***. Where available, the following analysis provides an overview of the department's current fire prevention and public education initiatives. However, it should be noted that limited historical data, procedures and information was available to describe the current initiatives.

8.1 Current Fire Prevention and Public Education Industry Best Practices

In our view the current industry best practices to guide the delivery of fire prevention and public education services and programs is contained within the ***N.F.P.A. 1730: Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations to the Public*** (2019 Edition). This standard provides valuable insight into the development of applicable services and programs in the following core areas:

1) *Organization;*
2) *Community Risk Assessment;*
3) *Fire Prevention Inspection and Code Enforcement Activities in Existing Occupancies;*
4) *Plan Review;*
5) *Investigations; and*
6) *Public Education Programs.*

The essence of this standard is to ensure that in addition to a ***Community Risk Assessment*** a municipal also has a ***Community Risk Reduction Plan*** (C.R.R.P.) to inform and guide the delivery of fire prevention and public education programs within the community. A ***Community Risk Reduction Plan*** is utilized to identify the applicable services and programs that will be required to minimize and/or mitigate the existing fire related risks within the community. Risk mitigation strategies can include considering options such as enhanced fire inspection and fire code enforcement activities, plans review, fire investigations and targeted public education programs.

The N.F.P.A. 1730 standard has been instrumental to informing the current industry trend to emphasize fire prevention and public education within the fire service. Where applicable, this F.S.M.P. will present risk mitigation strategies in response to the findings of the C.R.A. to enhance the existing fire prevention and public education programs and services provided by the L.F.D.

8.1.1 N.F.P.A. Fire and Life Safety Ecosystem

The N.F.P.A. Fire and Life Safety Ecosystem is a framework of eight elements that work in conjunction with one another towards the minimization of fire risk. Together, they promote the prevention of fires and other hazard-related loss, injuries and fatalities. The eight components that comprise this framework include: government responsibility, development and use of current codes, reference

standards, investment in safety, skilled workforce, code compliance, preparedness and emergency response. This ecosystem is premised on the notion that the cause of all life safety incidents can be traced back to the breakdown of one or more of these components. N.F.P.A. is dedicated to protecting lives and property through the implementation of this ecosystem.

The Fire and Life Safety Ecosystem recognizes that fire prevention is multifaceted and there are various key components that need to work in tandem in order to cultivate an environment and culture of fire safety. Where applicable the recommendations presented within this F.S.M.P. seek to support the N.F.P.A. Fire and Life Safety Ecosystem.

8.2 Proposed Fire Prevention/Public Education Policy

Current industry best practices support the value of developing a Council approved ***Fire Prevention Policy*** to clearly define the fire prevention and public education services and programs to be provided to the community. Within the Province of Alberta a ***Quality Management Plan*** (Q.M.P.), as defined by the ***Safety Codes Act*** (S.C.A.), would represent a Council approved fire prevention policy. The City of Lloydminster does not currently have a Q.M.P. related to the delivery of fire prevention and public education programs.

Our research indicates that a fire prevention policy should include information relating to the following content:

- *Direction to conduct a Community Risk Assessment on a regular cycle to determine the needs of the community;*
- *Identification of the fire department programs and objectives that will address installation and maintenance of smoke alarms in residential dwelling units and home fire escape planning;*
- *Identification of the fire department programs and objectives that will provide appropriate public education to residents;*
- *Identification of how the fire department will provide fire prevention inspections at a minimum upon complaint or request;*
- *Identification of a routine fire inspection program based on the findings of the Community Risk Assessment;*
- *Identification of in-service inspection programs and objectives (on duty staff);*
- *Identification of home smoke alarm/carbon monoxide alarm programs and objectives;*
- *Identification of plans examination and new construction inspection programs and objectives;*
- *Identification of fire investigation programs and objectives;*
- *Identification of reporting and record keeping activities; and*
- *Direction that standard operating guidelines/policies for all fire prevention and public education activities be developed.*

It is recommended that subject to Council's consideration and approval of this F.S.M.P. that consideration be given to developing a proposed Fire Prevention Policy for Council's consideration and approval. Subject to Council's approval the Fire Prevention Policy should than be included within an updated Fire Bylaw to confirm the fire prevention and public education services and programs to be provided by the L.F.D.

The following sections of this F.S.M.P. present the proposed fire prevention and public educations services and programs recommended for the City of Lloydminster based on the findings of the Community Risk Assessment. It should be noted that these are "proposed" services and programs that will result in additional workload for the department, require additional staff training and qualifications and result in a significant cultural shift within the L.F.D. In addition to developing the proposed Fire Prevention Policy and updated Fire Bylaw there will be a need for effective leadership to manage this shift in prioritization of services within the L.F.D. and within the community.

Operational Recommendation #11: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to developing a Fire Prevention Policy as presented within the proposed Fire Services Master Plan.

8.3 Applicable Training Standards and Qualifications

At a minimum, all staff resources conducting fire inspections should have the skills and competencies included within the ***N.F.P.A. 1031 – Fire Inspector Level I***. Fire inspections involving more complex issues and requiring interpretation of various legislation and codes are recommended to have the Level II designation. Our research indicates that the Fire Chief is required to sustain the qualifications of a Fire Inspector II, and the Assistant Fire Chief is required to sustain the qualifications of a Fire Inspector I. Firefighters are not currently required to have the training and qualifications related to a fire inspectors.

Table 4 summarizes the different fire inspector designations included within the N.F.P.A. 1031 standard.

Table 4: N.F.P.A. - 1031 Standard Fire Inspector Designations

Fire Inspector	N.F.P.A. 1031 Standard
Fire Inspector I	An individual at the first level of progression who has met the job performance requirements specified in this standard for Level I. The Fire Inspector I conducts basic fire inspections applies codes and standards.
Fire Inspector II	An individual at the second or intermediate level of progression who has met the job performance requirements specified in this standard for Level II. The Fire Inspector II conducts most types of inspections and interprets applicable codes and standards.
Fire Inspector III	An individual at the third and most advanced level of progression who has met the job performance requirements specified in this standard for Level III. The Fire Inspector III performs all types of fire inspections, plans review duties, and resolves complex code-related issues.

8.3.1 N.F.P.A. 1033 – Standard for Professional Qualifications for Fire Investigator

Staff responsible for conducting fire investigations should have the skills and competencies included in ***N.F.P.A. 1033- Standard for Professional Qualifications for Fire Investigator***. Our research indicates that the Fire Chief and the Assistant Fire Chief are required to sustain the qualifications of N.F.P.A.1033. Firefighters are not currently required to have the training and qualifications related to this role.

Table 5: N.F.P.A. 1033 Standard for Professional Qualifications for Fire Investigator

Fire Investigator	N.F.P.A. 1033 Standard
Fire Investigator	An individual who has demonstrated the skills and knowledge necessary to conduct, coordinate and complete fire investigations.

8.3.2 N.F.P.A. 1035 – Standard for Professional Qualifications for Fire and Life Safety Educator, Public Information Officer, and Juvenile Firesetter Intervention Specialist.

At a minimum, all staff resources responsible for developing and delivering public education programs should have the skills and competencies included within the ***N.F.P.A. 1035 – Fire and Life Safety Educator I***. Our research indicates that there are no requirements for any member of the L.F.D. to achieve and retain these qualifications.

Table 6 summarizes the different public education designations included within the N.F.P.A. 1035 standard.

Table 6: N.F.P.A. - 1035 Standard for Public Education Designations

Fire and Life Safety Educator	N.F.P.A. 1035 Standard
Fire and Life Safety Educator I	The individual who has demonstrated the ability to coordinate and deliver existing educational programs and information.
Fire and Life Safety Educator II	The individual who has demonstrated the ability to prepare educational programs and information to meet identified needs.
Fire and Life Safety Educator III	The individual who has demonstrated the ability to create, administer, and evaluate educational programs and information.

In our view the identified N.F.P.A. qualifications presented above represent current industry best practices for delivering fire prevention and public education services and programs. The department's current Voluntary Home Fire Safety Inspection Outline consistently refers to the term "Inspection" that based on these industry best practices the firefighters delivering this program do not have the required qualifications. This F.S.M.P. will present recommendations to address this issue as due diligence on behalf of the City.

It is recommended that the L.F.D. consider the skills and competencies required within the identified N.F.P.A. standards in updating and developing the applicable job descriptions and qualifications required to facilitate the fire prevention and public education services and programs provided by the Lloydminster Fire Department. In our view the utilization of these standards reflect current municipal due diligence and best practices.

Operational Recommendation #12: That the training standards and qualifications for all staff assigned to the delivery of fire prevention and public education services and programs identified within the proposed Fire Services Master Plan be considered for implementation within the applicable job descriptions within the Lloydminster Fire Department.

8.4 Proposed Home Smoke Alarm/Carbon Monoxide Alarm Program

The National Fire Code requires that ***"Smoke Alarms shall be installed in each dwelling unit"***[12] and that ***"Smoke alarms within dwelling units shall be installed between each sleeping area and the remainder of the dwelling unit, and where sleeping areas are served by hallways, the smoke alarms shall be installed in the hallways"***[13]. The department's current Voluntary Home Fire Safety Inspections although referencing the installation, testing and maintenance of smoke alarms does not specifically reference the legislative requirements of the N.B.C. The current Voluntary Home Fire Safety Inspection program is described within S.O.P. #0011 dated July 3rd, 2018.

[12] National Fire Code, Part 2 Building and Occupant Fire Safety, 2.1.3.3 (1) Smoke Alarms.
[13] National Fire Code, Part 2 Building and Occupant Fire Safety, 2.1.3.4 (2) Smoke Alarms.

The proposed Home Smoke Alarm/Carbon Monoxide Alarm Program is intended to inform a risk reduction strategy in response to the following ***"key findings"*** of the ***Community Risk Assessment***:

- *90.5% of the City's existing building stock is comprised of Group C- Residential Occupancies;*
- *24% of the City's residential building stock is comprised of attached dwellings representing a higher risk of fire exposure;*
- *Residential occupancies account for 73% of property fires within the City;*
- *For the period 2007 to 2018, three fatalities have occurred;*
- *For the period 2007 to 2016, four injuries occurred within Group C – Residential occupancies; and*
- *Historical provincial data indicates that a high percentage of smoke alarms were found to have not activated, or it was undetermined if they activated.*

In our view the current Voluntary Home Fire Safety Inspections Outline should be replaced with the proposed ***Home Smoke Alarm/Carbon Monoxide Alarm Program***. Research indicates that the presence of working smoke alarms within the home will increase the survival rate of occupants during a fire emergency. Fire investigations indicate that occupants are most vulnerable when they are sleeping, which is when the majority of fatal fires occur. The risk of a fire related death or injury could be significantly reduced with the presence of working smoke alarms on every floor of the home and adjacent to sleeping areas. Working smoke alarms and a home fire escape plan provide occupants with the time necessary to successfully escape a fire.

The benefits of the proposed ***Home Smoke Alarm/Carbon Monoxide Alarm Program*** reflect an effective risk reduction strategy to enhance public fire and life safety education, and reduce the probability of a fire related injury or death, and include the opportunity for the department to:

- ✓ *Validate the presence of properly installed and working smoke alarms in all residential occupancies;*
- ✓ *Reduce the probability of fire related deaths and injuries as a result of a fire;*
- ✓ *Provide valuable educational information to home owners about the importance of maintaining working smoke alarms; and*
- ✓ *Inform occupants about the importance of having an effective home fire escape plan, and practicing the plan on a regular basis; and*
- ✓ *Improve the trend that historical provincial data indicates that a high percentage of smoke alarms were found to have not activated, or it was undetermined if they activated.*

The proposed ***Home Smoke Alarm/Carbon Monoxide Alarm Program*** should include public education regarding the benefits of a ***Home Fire Escape Plan*** that would provide occupants of the home with a predetermined course of action in the event of a fire. Through advance planning and practice, a home fire escape plan can enhance the occupants' fire and life safety knowledge. In the event of a fire, human behaviour suggests that you exit the room or building in the same manner that

you entered. During a fire, this exit path may not be available as a result of rising heat conditions or the presence of smoke and fire. Ensuring there are two exits from every room, which are easily accessible and functioning, is an important component of a home fire escape plan. The proposed home fire escape planning education should reference the following:

- ✓ The identification of a secondary exit from all rooms;
- ✓ Floor plans of the home that identify alternate exits such as windows;
- ✓ Identification of alternate exit paths such as porch or garage roofs;
- ✓ Recognition of individuals with disabilities who may need assistance and a plan to facilitate evacuation of these individuals; and
- ✓ Identification of a meeting place outside of the home for all occupants.

In our view the proposed ***Home Smoke Alarm/Carbon Monoxide Alarm Program*** should include clearly defined goals and objectives that include tracking compliance with the regulations of the N.B.C. and other fire safety concerns. The program should be designed to target an objective of attempting to visit and enter all Group C - Residential Occupancies on a regular cycle. Based on our experience this target should be once every five years. This program should strive to educate residents of the potential fire risks within their homes; verify the presence of working smoke alarms; install or replace batteries where required; and provide smoke alarms to residents without one.

It is recommended that the L.F.D. develop a more comprehensive S.O.P. that includes the goals and objectives of the proposed ***Home Smoke Alarm/Carbon Monoxide Alarm Program***, procedures for conducting the door to door campaign, and the inclusion of performance benchmarks to report on the number of homes targeted and visited on an annual basis. An important element of the proposed ***Home Smoke Alarm/Carbon Monoxide Alarm Program*** should be to identify and monitor the progress of achieving smoke alarm compliance as a method of evaluating the success of this initiative. The procedures for tracking the smoke alarm program statistics should also be included within the proposed S.O.P.

In our view this program can be effectively delivered by the on duty fire suppression crew from May 1st to September 30th each year. Industry best practices indicate that delivering this program during the hours of 18:00 to 21:00 during the week, and on Saturdays from 09:00 to 15:00 hours will be the most widely accepted by the community.

Operational Recommendation #13: That consideration be given to developing a Standard Operating Procedure to identify the roles and responsibilities, objectives, targets and procedures for the delivery of the proposed Home Smoke Alarm/Carbon Monoxide Alarm Program as presented within the proposed Fire Services Master Plan.

8.5 Proposed Routine Fire Inspection Program

The department's current fire inspection program is limited to responding to complaints or requests from the public. The current fire inspection program is not pro-active and is not informed by analysis of the existing fire risks within the community. All fire inspections are currently conducted by the Fire Chief.

The proposed ***Routine Fire Inspection Program*** is intended to inform a risk reduction strategy in response to the following ***"key findings"*** of the ***Community Risk Assessment*** including the following:

- *Currently there are seven identified high life-safety risk occupancies within the City of Lloydminster;*
- *There are 14 buildings that present an increased fire risk due to their large floor areas;*
- *The City of Lloydminster Hazard Risk and Vulnerability Assessment identifies the top hazards within the City as hazardous materials spills, **industrial fire**, non-emergency events, overland flooding, rail Incident, **urban fire**, and wind event related to summer storms;*
- *The call volume in 2018 exceeded the 5-year annual call volume average of 365 calls by 12%;*
- *The City's top employers represent a potential high economic impact should a fire impact production, operations or services; and*
- *The building stock within the downtown core includes a number of buildings with minimal separations between them presenting a greater fire risk to occupants and first responders.*

Development of the proposed ***Routine Fire Inspection Program*** has been guided by current industry best practices that target the major building occupancy types as defined by the National Building Code. This program would prioritize the following areas:

- ✓ *Conducting fire inspections related to the requirements of the National Fire Code;*
- ✓ *Verification of compliance, or non-compliance;*
- ✓ *Identification of violations, and options for attaining compliance;*
- ✓ *Fire Code advice;*
- ✓ *Compliance monitoring site inspections; and*
- ✓ *Maintaining files and records.*

Recognizing that in many situations pro-active fire inspections would be new to the City of Lloydminster it is recommended that the L.F.D. with the assistance of other corporate departments develop a pre-inspection checklist for business owners, store managers and maintenance personnel. This information could be distributed in advance of a fire inspection and posted on the City's website to assist the public in preparing for the inspection.

It is recommended that the L.F.D. implement the proposed ***Routine Fire Inspection Program*** utilizing the major building occupancy classifications contained within the National Building Code as illustrated in **Table 7.**

Table 7: Proposed Routine Fire Inspection Cycle

N.B.C. Major Building Occupancy Classification		Example Occupancies	Proposed Routine Fire Inspection Cycle
Group	Division		
Group A - Assembly	1, 2, 3 and 4	Schools, Recreation Centres, Arenas, Theatres	Once every 12 months
Group B – Care or Detention	1 and 2	Nursery/Day Care Facilities, Seniors Care Facilities, Hospital, Licensed Properties, Care and Detention Facilities, Churches	Once every 12 months
Group C - Residential	---	Houses, Townhomes, Apartments, Condominiums, Hotels, Inns, Motels, Hostels, Bed and Breakfast Establishments	Proposed Home Smoke Alarm/Carbon Monoxide Alarm Program
Group D - Business	---	Banks, Dental services, Dry Cleaning, Medical offices, small tool rental and service.	Upon request/ complaint
Group E - Mercantile	---	Department store, market, shops, stores, supermarkets, exhibition hall.	Upon request/complaint
Group F - Industrial	1	Flammable liquid bulk plant, cereal mill, distillery, feed mill, grain elevator.	Once every 12 months
	2	Cold storage, laboratories, service station, printing plant, repair garage.	Once every 24 months
	3	Factories, power plants, warehouses, laboratories, workshops.	Once every 24 months

In addition to the proposed ***Routine Fire Inspection Program*** it is recommended that the L.F.D. continue to provide fire inspections when request or complaints are received from the public. In our view the goals and objectives and directions to conduct the proposed ***Routine Fire Inspection Program*** and request/complaint fire inspections should be clearly defined within the proposed Fire Prevention Policy and described within a department Standard Operating Procedure.

Based on our review of the department's existing organizational structure, staff resources and staff qualifications it is recommended that the City consider the hiring of a qualified full-time Fire Inspector/Fire and Life Safety Educator. At a minimum this position should be required to have, or attain the N.F.P.A. qualifications related to a Fire Inspector II, Fire and Life Safety Educator II and the requirements of N.F.P.A. 1033 Fire Investigator. It is also recommended that the four fire suppression full-time Captains be trained to the qualifications of a Fire Inspector I, and Fire and Life Safety Educator I.

Providing access for fire suppression staff to attain the applicable N.F.P.A. fire prevention and public education qualifications is becoming a municipal best practice across the country. These added qualifications will provide the department with the ability to implement and sustain the proposed fire prevention and public education services presented within this F.S.M.P.

Council Recommendation #2: That consideration be given to approving the proposed Routine Fire Inspection Program as presented within the proposed Fire Services Master Plan.

Council Recommendation #3: That consideration be given to hiring a full-time Fire Inspector/Fire and Life Safety Educator as presented within the proposed Fire Services Master Plan.

Operational Recommendation #14: That consideration be given to enhancing the qualifications of the four full-time fire suppression Captains to include N.F.P.A. 1031 Fire Inspector I, and N.F.P.A. 1035 Fire and Life Safety Educator I as presented within the proposed Fire Services Master Plan.

8.6 Proposed Commercial/Industrial Occupancy Pre-Planning Program

The process of pre-planning within the fire service is intended to provide a proactive awareness about key building features, possible hazards, and other pertinent characteristics about an existing building occupancy and its intended use. Pre-planning is typically conducted by on duty fire suppression staff with information provided from a variety of sources including existing information from the City, information gathered from the building owner, and site visits. The value of a building pre-plan is to provide site specific education and information to fire suppression crews in advance of responding to an emergency incident. The proposed ***Commercial/Industrial Occupancy Pre-Planning Program*** is intended to inform a risk reduction strategy in response to the following ***"key findings"*** of the ***Community Risk Assessment*** including the following:

- *The L.F.D. has not identified any building height concerns as part of the data collection process for this C.R.A. The L.F.D. may wish to consider tracking these types of occupancies to further assess fire risk with respect to building height within the community; and*
- *The L.F.D. has not identified any potential high fire risk occupancies as part of the data collection process for this C.R.A. The L.F.D. may wish to consider tracking these types of occupancies to further assess high fire risk within the community.*

The L.F.D. conducts pre-planning on a semi-regular basis and has in the past developed a number of pre-plans for higher risk occupancies identified by fire suppression crews. There is currently no defined Standard Operating Procedure that would provide clear direction on how pre-plans are to be developed, how they may be prioritized or the information to be contained within a completed pre-plan. In our view there is an opportunity to enhance the efforts of the L.F.D. by linking the existing pre-planning initiatives to the proposed ***Routine Fire Inspection Program***. Utilizing the ***"key findings"*** of the C***ommunity Risk Assessment*** and the proposed routine fire inspection program on duty fire suppression staff can be directed to coordinate the an enhanced pre-planning process with the proposed ***Routine Fire Inspection Program.*** The implementation of this strategy would provide the L.F.D. with a coordinated approach of fire suppression staff to complete commercial/industrial pre-plans at the same time as the proposed full-time Fire Inspector is conducting a routine fire inspection. In our view this is an effective and efficient strategy for the L.F.D. to consider.

Operational Recommendation #15: That consideration be given to implementing the proposed Commercial/Industrial Occupancy Pre-Planning Program presented within the proposed Fire Services Master Plan.

8.7 Proposed Fire Investigation Program

The ***"key findings"*** of the ***Community Risk Assessment*** identify a number of statistical factors that in our view substantiate the need to develop a more comprehensive fire investigation program. Currently there is no defined Standard Operating Procedure or documentation that outlines the process, goals or objectives of completing a fire investigation.

Industry best practices reflect the importance of a fire investigation in determining the origin, cause and circumstance of a fire. Comprehensive fire investigations should be conducted in the event of a fatality, serious injury or damage to property as a result of a fire. The C.R.A. ***"key findings"*** include the following:

- *Of the fires occurring in the City between 2007 and 2016, the leading known causes of unintentionally set fires was due to Mechanical/Electrical Failure/Malfunction at 22% of fires;*
- *Of the fires occurring in the City between 2007 and 2016, miscellaneous acts or omissions was the most prevalent cause of fires (44%);*
- *Of the fires occurring in the City between 2007 and 2016, 25% of fires were intentionally caused and classified as Arson or 'Set Fires'.*
- *The most common known sources of ignition for fires within the City is due to Smoker's Material and 'Open' Flame at 12% and Exposure at 9%;*
- *Mercantile occupancies account for 11% of property fires within the City when analyzing the proportion of fires that occurred within a National Building Code Major Occupancy major occupancy classification; and*
- *The ignition source for 52% of the City's fires was determined as "unknown";*

Further analysis of these ***"key findings"*** and a more comprehensive fire investigation program would provide the L.F.D. a clearer understanding of the human behaviour factors, or in some instances the mechanical failure factors where there may be existing or evolving trends that should be considered within the department's fire inspection and public education programs. For example, these findings indicate that for the period from 2007 to 2016 ***"miscellaneous acts or omissions was the most prevalent cause of fires (44%)"***. In our view a more comprehensive fire investigation program should be able to determine if there is a related human behaviour of a specific age demographic that may in part be associated with these acts or omissions. In our experience it would not be surprising to identify that many of these fires were related to acts or omissions related to an aging seniors demographic.

In our view a more comprehensive fire investigation program would be an effective component of the department's risk reduction strategies. Therefore it is recommended that the L.F.D. develop a comprehensive Standard Operating Procedure for the completion of fire investigations that requires all

staff conducting fire investigations to have the qualifications of N.F.P.A. 1033, and includes defined goals and objectives for completing fire investigations that includes the identification of existing or evolving trends.

Operational Recommendation #16: That consideration be given to developing a comprehensive fire investigation Standard Operating Procedure as presented within the proposed Fire Services Master Plan.

8.8 Fire Safety Plans

The National Fire Code requires the development of Fire Safety Plans for specific occupancies types and uses. These occupancies include Group A – Assembly occupancies and Group B – Care or Treatment occupancies. All other occupancies require fire safety plans if the building requires a fire alarm system, demolition and construction sites or indoor/outdoor areas regulated under the N.F.C., or in areas where hazardous process are occurring. Fire safety plans, while approved by qualified personnel within a fire department, are utilized primarily by the occupants where appropriate, building staff, provide an avenue for training in the case of a fire incident; for example, care providers at a long-term care facility are made aware of their responsibility in an evacuation procedure.

In addition to being a legislative requirement, fire safety plans are a core component of a communities approach to fire safety. Our review indicates that the L.F.D. does not currently have an S.O.P., or defined process for the development, review and approval of fire safety plans. It is recommended that an S.O.P. be developed to provide guidance to staff in the process, and requirements to prepare and approve and inspect buildings requiring a Fire Safety Plan.

Operational Recommendation #17: That consideration be given to developing a Standard Operating Procedure for completing and approving Fire Safety Plans.

8.9 Building Construction Plans Review

It is our understanding that the City contracts ***Superior Safety Codes Inc.*** to administer, inspect and issue all building permits on behalf of the City as per the National Building Code requirements. Our research indicates that there is currently no defined process for consultation to occur between Superior Safety Codes Inc. and the L.F.D. when new construction applications are received, and the building plans review process is being completed. Municipal best practices highlight the importance of this consultation to occur so that fire departments are aware of planned new construction, the intended use of new occupancies within the community and to further inform the Community Risk Assessment process.

It is recommended that consideration be given to developing a letter of understanding, or some other type of written agreement between ***Superior Safety Codes Inc***. and the Lloydminster Fire Department to

formalize the roles and responsibilities, schedule, and process for consultation between these departments to review and approve new construction plans.

Operational Recommendation #17: That consideration be given to developing a letter of understanding, or other written agreement between Superior Safety Codes Inc. and the Lloydminster Fire Department to coordinate the construction plan review and approval process.

8.10 Proposed Public Education Program

In addition to the department's current Voluntary Home Fire Safety program, fire suppression staff attend public events, conduct fire station tours and focus on specific public education messaging throughout the year predominantly based on the seasons. With the exception of the Voluntary Home Fire Safety program there is no other defined Standard Operating Procedure that would describe the types of public education programs and goals and objectives of the department is this area.

The proposed ***Public Education Program*** is intended to inform risk reduction strategies in response to the following ***"key findings"*** of the ***Community Risk Assessment*** including the following:

- *Children between the ages of 0 to 14 represent 23% of the City's population;*
- *Adults between the ages of 45 to 64 represent 21% of the City's population;*
- *Seniors (those 65 and older) represent 11% of the City's population;*
- *Between 2006 and 2016 the City experienced an 11% increase in the number of immigrants living within the City;*
- *Properties that are not a part of the National Building Code major occupancy classification (e.g., storage properties, special property and transportation equipment, etc.) account for 59% of the 221 fires occurring over the past ten year period; and*
- *The City has a potential risk of wildland fire due to the wildland-urban interface primarily located outside of the urban settlement area.*

The experience of municipalities across the country has shown that expanding and enhancing public education efforts can be an effective strategy to mitigate emergency call volume and increase the overall level of fire safety within a community.

8.10.1 Proposed Child/Youth Education Program

A large percentage of the department's current activities targeting children and youth focus on fire station tours. In our view this is a very traditional approach to introducing children to the operations of a fire department with a limited amount of time targeted specifically to fire safety education. The department does participate in other activities that interact with this age demographic, however these are very limited largely as a result of the availability of staff resources.

Teaching children/youth fire safety education during their early development years has proven to be an effective strategy towards changing human behaviour. Other emergency services across the country such as the police services have utilized this strategy to educate children/youth through programs such as the Drug Abuse Resistance Education (D.A.R.E.) program with positive outcomes. In our view the development of targeted fire safety education programs for children ranging in the age of five to 14 should be a priority for the Lloydminster Fire Department. In our experience education programs that target this demographic can have a further positive impact on their siblings, parents, extend family members and friends.

The proposed enhanced child/youth education program would target children attending either grade four or five representing children ages 10 to 12. Through consultation with local schools, parents associations and others within the community the department should consider the development of a ***"pilot project"*** including a curriculum to teach these children about fire safety. In our experience there are many examples of these types of programs available both commercially, and through other fire departments. The proposed ***"pilot project"*** should include identified performance benchmarks and opportunities to seek feedback to assess the effectiveness of the program. In our view the proposed ***"pilot project"*** should also consider partnerships within the community that may willing to provide financial or other support to mitigate any costs associated with printed or other required materials. The development of this program should also consider the increasing immigrant demographic within the City that may require additional considerations.

In our view this program could be delivered by either the on duty fire suppression crew under the direction of the full-time Captain, or through the use of paid on call firefighters who may an interest in this type of program. In this instance the participating paid on call firefighters would require the qualifications included within the N.F.P.A. 1035 standard for a Fire and Life Safety Educator I.

Operational Recommendation #18: That consideration be given to developing and implementing a "pilot project" for facilitating a targeted fire safety program to children aged 10 to 12 within the community as presented within the proposed Fire Services Master Plan.

8.10.2 Proposed Seniors Fire Safety Program

Seniors and those aging towards being a senior represent approximately 32% of the population of the City of Lloydminster. Within the fire service, seniors are recognized as the most vulnerable demographic within our society. A large percentage of fire related injuries and deaths occur within the seniors demographic of a community.

Research indicates that the current seniors demographic of most communities, as well as the aging demographic have a strong desire to live in the family homestead has long has possible. The result is an aging demographic who live on their own and in many situations also have a diminishing capacity for personnel care and safety.

In our view these factors support the need to consider developing a dedicated adult/seniors fire safety education program. Enhancing existing community relationships and investigating additional partnerships may also be an effective strategy for consideration towards developing and implementing the proposed adult/seniors fire safety education program. Partnering with public facilities that see high volumes of people such as care facilities could enhance public education efforts in terms of distributing printed fire safety information. The utilization of a ***"pilot project"*** could also be considered as an implementation strategy for this program.

Operational Recommendation #19: That consideration be given to developing and implementing a targeted fire safety program for seniors (65+) within the community as presented within the proposed Fire Services Master Plan.

8.10.3 Proposed Community Fire Education Program

Two of the C.R.A. ***"key findings"*** relate to broader public fire education needs within the community related to general fire safety for buildings not included in the N.B.C. major building occupancy types such as storage buildings, farm buildings including silos and other support buildings, and vehicles including cars and trucks. The C.R.A. also identified wildland fires as a ***"key finding"*** do to the City's urban interface with large parcels of wildland.

Many municipalities within the province and across the country have similar fire risks and have developed or partnered in developing targeted public education programs for these risks. This may include public education materials in the form of pamphlets that can be provided to the demographics associated with these risks, or specific education programs that can be delivered through affiliated organizations, community interest groups or targeted areas of the City.

It is recommended that the L.F.D. review these key findings and consider what specific risk reduction strategies could be developed either internally within the department, or through partnership with other organizations or affiliated organizations within the community.

Operational Recommendation #20: That consideration be given to developing and implementing the proposed Community Fire Education Program presented within the proposed Fire Services Master Plan.

8.11 Fire Prevention and Public Education Summary and Recommendations

The analysis and recommendations presented within this section reflect a strategic change in the types of fire prevention and public education services and programs that the L.F.D. should be providing. This direction is recommended in response to the ***"key findings"*** of the ***Community Risk Assessment*** that has been developed as part of this fire master planning process.

In our view the L.F.D. is at a pivotal point in its evolution from its historical roots as a volunteer fire department to its current, and future state that require a more comprehensive level of fire protection services than just providing fire suppression services. Proactive fire prevention and public education services and programs informed by a Community Risk Assessment reflect current industry best practices. These municipal best practices are supported by significant evidence that support the benefits achieved in reducing injuries and fatalities as a result of fires, reducing property fire loss as a result of fires and reducing emergency response (fire suppression) call volume.

The implementation of the proposed fire prevention and public education programs will require the support of Council to hire the proposed full-time Fire Inspector/Fire and Life Safety Educator and the support of department staff including both full-time and paid on call firefighters to attain a higher degree of skills and competencies by attaining the applicable N.F.P.A. training qualifications.

It should be noted that this strategic change will require additional financial support, and strong leadership on behalf of Council and the department to successfully implement the recommendations in this section. As such every consideration should be given to introducing the proposed recommendations incrementally, and strategically to allow the department and the community to grow tighter in making the community a safer place to live and work.

As a result of the review of the current fire prevention and public education services and programs the following recommendations are presented for Council's consideration and approval:

Council Recommendations:

Council Recommendation #2: That consideration be given to approving the proposed Routine Fire Inspection Program as presented within the proposed Fire Services Master Plan.

Council Recommendation #3: That consideration be given to hiring a full-time Fire Inspector/Fire and Life Safety Educator as presented within the proposed Fire Services Master Plan.

Operational Recommendations:

Operational Recommendation #11: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to developing a Fire Prevention Policy as presented within the proposed Fire Services Master Plan.

Operational Recommendation #12: That the training standards and qualifications for all staff assigned to the delivery of fire prevention and public education services and programs identified within the proposed Fire Services Master Plan be considered for implementation within the applicable job descriptions within the Lloydminster Fire Department.

Operational Recommendation #13: That consideration be given to developing a Standard Operating Procedure to identify the roles and responsibilities, objectives, targets and procedures for the delivery of the proposed Home Smoke Alarm/Carbon Monoxide Alarm Program as presented within the proposed Fire Services Master Plan.

Operational Recommendation #14: That consideration be given to enhancing the qualifications of the four full-time fire suppression Captains to include N.F.P.A. 1031 Fire Inspector I, and N.F.P.A. 1035 Fire and Life Safety Educator I as presented within the proposed Fire Services Master Plan.

Operational Recommendation #15: That consideration be given to implementing the proposed Commercial/Industrial Occupancy Pre-Planning Program presented within the proposed Fire Services Master Plan.

Operational Recommendation #16: That consideration be given to developing a comprehensive fire investigation Standard Operating Procedure as presented within the proposed Fire Services Master Plan

Operational Recommendation #17: That consideration be given to developing a letter of understanding, or other written agreement between Superior Safety Codes Inc. and the Lloydminster Fire Department to coordinate the construction plan review and approval process.

Operational Recommendation #18: That consideration be given to developing and implementing a "pilot project" for facilitating a targeted fire safety program to children aged 10 to 12 within the community as presented within the proposed Fire Services Master Plan.

Operational Recommendation #19: That consideration be given to developing and implementing a targeted fire safety program for seniors (65+) within the community as presented within the proposed Fire Services Master Plan.

Operational Recommendation #20: That consideration be given to developing and implementing the proposed Community Fire Education Program presented within the proposed Fire Services Master Plan.

9.0 Training Program

The full-time Assistant Fire Chief is directly responsible for the delivery of the department's current training program for all full-time and paid on call firefighters. The full-time Training Officer/Safety Officer Captain reports to the Assistant Fire Chief and is responsible for delivery the current firefighter training program that provide four core areas of training that include onboarding, competency based, professional development and skills maintenance. These core areas focus on the development of the skills and competencies required to attain the qualifications of the applicable ***National Fire Protection Association Standards***. In our view the training curriculum to achieve the applicable qualifications contained within the N.F.P.A. standards represents current industry best practices within the fire service.

Firefighter training, including applicable training standards, qualifications and competencies has come under significant scrutiny within the industry over the past decade. The results of numerous investigations as a result of firefighter injuries, and fatalities have concluded that firefighter training must be considered a high priority for municipalities, in their roles as employers, as fire service leaders, and as supervisors as defined by applicable occupational health and safety legislation. This includes the ***Alberta Occupational Health and Safety Act*** (A.O.H.S.A.) and the ***Saskatchewan Occupational Health and Safety Regulations*** (S.O.H.S.R.).

The analysis within this section focuses on the provision of training to fire suppression staff, including both full-time and paid on call firefighters, and covers: training staff resources, training standards, current training program, and firefighter recruit training, specialized rescue training, and online training. Where any gaps are identified in achieving compliance with the applicable legislative requirements, or current industry best practices further strategies and recommendations are provided for consideration.

9.1 Full-time Training Officer/Captain

The full-time Training Officer/Safety Officer Captain reports directly to the Assistant Fire Chief. The job description provided as part of the data collection process to develop this F.S.M.P. provided only a simple framework to describe the roles and responsibilities, qualifications, duties and hours of work of this position. It is our understanding that this position is also identified as the department's ***"Incident Safety Officer,"*** however, there is no reference to these roles and responsibilities within the current job description.

The current full-time Training Officer/Safety Officer Captain also responds as a firefighter when required. This practice reflects the increasing importance of fire department staff being cross-trained in multiple skills and competencies in order to fulfill multiple roles. In our view this practice is consistent with current industry best practices, and supports the recommendations of this F.S.M.P. to require fire

suppression staff (firefighters) to become qualified in multiple areas including firefighting, fire prevention and public education.

Operational Recommendation #21: That the job description for the full-time Training Officer/Safety Officer Captain be updated to include the required qualifications, roles and responsibilities and hours of work of this position.

9.2 Full-time Captains

The four full-time Captains play an integral role in supporting the full-time Training Officer/Safety Officer Captain in the delivery of the department's current firefighter training program. This includes the delivery of training to both full-time and paid on call firefighters. The full-time Captains are required to attain the qualifications of the N.F.P.A. 1041 Standard for Instructor I.

The consultation process with the full-time firefighters, including the four full-time Captains, conducted as part of preparing this F.S.M.P. and individual interviews identified a common consensus that recently training within the department has improved significantly. There were, however, numerous examples of areas requiring improvement related to firefighter training including incident command, pump operations, and lack of Standard Operating Procedures.

In our view the full-time Captains and full-time firefighters are currently an integral element of the department's strategy to recruit and train the paid on call firefighters. In our view this strategy has been required due to the ongoing turnover rate of the paid on call firefighters and the department's evolution to a more comprehensive training program. This strategy is commonly referred to within the fire service as the ***"Train the Trainer"*** model. In our view it an effective strategy to providing and sustaining a more comprehensive firefighter training. However, this F.S.M.P. includes recommendations for the full-time firefighters to also become qualified in the areas of fire prevention and public education. Therefore this F.S.M.P. will be recommending that the ***"Train the Trainer"*** strategy be extended to include paid on call firefighters within a revised organization structure.

9.3 Training Qualifications

The Province of British Columbia ***"Structure Firefighters Competency and Training Playbook"*** (Playbook) provides valuable insight into the direct relationship between firefighter training and qualifications, and the level of fire suppression services to be provided by a municipality. The scope of the ***"Playbook"*** states that ***"This Playbook is intended to provide an industry recognized minimum standard of training that utilizes, and bridges to, the current National Fire Protection Association (N.F.P.A.) Firefighter qualifications"***[14]. In our view the Playbook is an important resource for Council in determining the level

[14] Province of British Columbia - Structure Firefighters Competency and Training Playbook, Page 3 – Scope.

of fire suppression (firefighter) service levels to be provided by the L.F.D. The fire protection service levels pretend within the "***Playbook"*** include the following:

- ***Exterior Operations Service Level:*** *Exterior Operations Level fire service firefighters shall not enter any building, vehicle, dumpster or other object if an IDLH atmosphere is present. If an IDLH atmosphere is present, Exterior Operation firefighters shall only engage in external fire suppression activities. Operational Guidelines that restrict them to Exterior Operations must be written and enforced by the department, even though they may possess equipment that would otherwise permit them to respond at a higher level*[15].

- ***Interior Operations Service Level:*** *Interior Operation Fire Departments may engage in internal fire suppression activities within simple structures or objects such as a vehicle, single family dwelling or other small structure. Interior Operations may also include larger or more complex structures that the AHJ has assessed and pre-planned for, such that it determines the structure to be safe for Internal Operations qualified firefighters. Firefighters must be trained specifically to the risks associated with these structures*[16].

- ***Full Service Level:*** *Full Service Operations Fire Departments are equipped and have completed the appropriate training identified in this Playbook to provide a full spectrum of fire services. These services are based on the Competencies included within the NFPA 1001 Firefighter 2 Standard and relevant NFPA 1021 Fire Officer Standards*[17].

Based on our research and consultation, it is our view that the L.F.D., in the absence of clearly defined direction from Council, is striving to attain the training qualifications, and provide the level of fire suppression services defined by the ***"B.C. Playbook"*** as a full service level fire department. Although this strategy may be correct in response to the ***"key findings"*** of the ***Community Risk Assessment,*** this existing gap in communication and direction between Council and the members of the L.F.D., including the Fire Chief and Assistant Fire Chief, is an area of focus of this F.S.M.P.

The L.F.D. is currently training towards compliance with the applicable N.F.P.A. training standards and qualifications. This strategy is consistent with the ***"B.C. Playbook"*** and current industry best practices. **Table 8** identifies the applicable N.F.P.A. 1041 Instructor Levels I, II and III, including the skills and competencies necessary to successfully achieve the requirements of each level to deliver a

[15] Province of British Columbia - Structure Firefighters Competency and Training Playbook, Page 17, Exterior Operations Service Level.
[16] Province of British Columbia - Structure Firefighters Competency and Training Playbook, Page 17, Interior Operations Service Level.
[17] Province of British Columbia - Structure Firefighters Competency and Training Playbook, Page 18, Full Service Level.

comprehensive firefighter training program. Our research indicates that at this time the Fire Chief and Assistant Fire Chief are required to attain the N.F.P.A. 1041 Instructor Level I. The current job descriptions for the full-time Training Officer/Safety Officer Captain and full time Captains do not include any reference to attaining the N.F.P.A. 1041 qualifications.

Table 8: N.F.P.A. 1041 Standard

Training Level	N.F.P.A. 1041 Standard
Instructor I	A fire service instructor who has demonstrated the knowledge and ability to: • deliver instruction effectively from a prepared lesson plan, including instructional aids and evaluations instruments; • adapt lesson plans to the unique requirements of the students and authority having jurisdiction; • organize the learning environment so that learning and safety are maximized; and • meet the record-keeping requirements of the authority having jurisdiction.
Instructor II	A fire service instructor who, in addition to meeting Instructor Level I qualifications, has demonstrated the knowledge and ability to: • develop individual lesson plans for a specific topic including learning objectives, instructional aids, and evaluations instruments; • schedule training sessions based on overall training plan of authority having jurisdiction; and • supervise and coordinate the activities of other instructors.
Instructor III	A fire service instructor who, in addition to meeting Instructor Level II qualifications, has demonstrated the knowledge and ability to: • develop comprehensive training curricula and programs for use by single or multiple organizations, conduct organization needs analyses; • design record keeping and scheduling systems; and • develop training goals and implementation strategies.

Industry best practices indicate that any fire service personnel who provide training instruction should have successfully completed the applicable N.F.P.A. 1041 qualifications for the level of training they are providing. For example, for a trainer to be qualified to deliver N.F.P.A. 1001 Level I training, he/she will have successfully completed N.F.P.A. 1001 Level I and N.F.P.A. 1041 Level I training. For a trainer to be qualified to deliver N.F.P.A. 1001 Level II training, he/she will have successfully completed N.F.P.A. 1001 Level II and N.F.P.A. 1041 Level II training.

9.4 Applicable Firefighter Training Regulations

Given its unique geographical location the L.F.D. has in place Health and Safety Committees at both of the City's fire stations. As each of the fire stations are physically located in different provinces they are, by regulation, required to apply the health and safety regulations of the applicable province. With reference to training requirements for firefighters the provinces are very similar as presented within the following sections.

9.4.1 Province of Alberta - Code of Practice for Firefighters

Training of firefighters is addressed in Part 1 of the O.H.S. Code under the definition of "*competent*" and in ***Section 15*** of the ***O.H.S. Regulation*** under "*Safety Training*".

Three characteristics are used to describe a worker as competent:

1) *Adequately qualified;*
2) *Suitably trained; and*
3) *With sufficient experience to safely perform work without supervision or with only a minimal degree of supervision.*

The required training provided to a firefighter must:

a) *Be provided before the firefighter is allowed to engage in emergency operations, except for on-the-job training assignments conducted under close supervision;*
b) *Be provided by competent persons (A competent person includes a person who has expertise or abilities in subject areas, whether or not the person is a member of a fire department);*
c) *Address occupational health and safety hazards associated with each of the operational assignments;*
d) *Match the duties, functions and role that the firefighter is expected to perform;*
e) *Address procedures required to perform operational assignments, including sudden changes in conditions;*
f) *Address the incident management system and personnel accountability systems used by the fire department;*
g) *Address the safe operation of equipment that is required to perform the operational assignments; and*
h) *Be reviewed periodically in consultation with workers to ensure its adequacy.*

9.4.2 Province of Saskatchewan – Occupational Health and Safety Regulations, 1996

Training of firefighters is addressed in **Part XXXII** of this regulation under ***"Additional Protection for Fire Fighters***" and includes:

Training of Firefighters

482*(1) An employer shall ensure that:*

i) All firefighters receive the training necessary to ensure that the fire fighter is able to carry out safely any emergency operation that the fire fighter will be expected to carry out;
ii) The training required by clause (a) is provided by competent persons; and
iii) A written record is kept of all training delivered to fire fighters pursuant to this Part.

9.5 Current Training Program

The department's current training program is overseen by the full-time Training Officer/Safety Officer Captain. This program was consistently described as being in its ***"infancy"*** throughout the internal stakeholder consultation process. Our research into preparing this F.S.M.P. confirmed that the department is currently in the process of assessing the department's training needs and in the initial stages of developing a training program for both full-time and paid on call firefighters.

As part of the data collection process to inform this F.S.M.P. the full-time Training Officer/Safety Officer Captain was able to provide draft terms of reference and overviews for the four main core areas of training that the department has identified, including onboarding, competency based training, professional development and skills maintenance. It is our understanding that the department will be utilizing the training standards developed by the N.F.P.A. to inform the department's training program where applicable. In our view the use of the N.F.P.A. training standards as the foundation for a comprehensive annual training program aligns with current industry best practices.

9.5.1 Onboarding

The draft terms of reference for this training identify the proposed training program for all new fire suppression staff (firefighters). The goals and objectives of this program target the training required for a new firefighter to achieve the N.F.P.A. 1001 Firefighter Level I qualifications, including certification by an external third party. This program consists of theory and practical training that is delivered within the department to learn and achieve the skills and competencies identified within this standard. As described within the draft terms of reference the goals and objectives of this program represent current industry best practices.

This program is currently targeted for delivery from October to May, requiring recruit firefighters to attend four hour training sessions twice a month. This program also includes a medical first responder program that is facilitated by an external trainer.

9.5.2 Competency-Based Training

The information provided describing the department's competency-based training represents a high level overview of the process for firefighters to further enhance their skills and competencies after completing the mandatory onboarding program. At this time the terms of reference do not identify the specific competency-based skills and competencies that firefighters are required to obtain. The terms of reference do provide valuable insight into the intent and processes related to competency-based training that will be valuable as the department moves towards formalizing a mandatory annual training program.

9.5.3 Professional Development

The terms of reference provided for professional development present the benefits of ongoing professional development for firefighters and officers. The terms of reference suggest that

"opportunities are offered in a wide variety of specialized training"[18] however there are no references to what specific training is available, or required.

As referenced in the preceding section the information within the terms of reference for professional development is informative and valuable. However, further specific details related to the required, or recommended professional development courses would assist a firefighter in career planning.

9.5.4 Skills Maintenance Training

The department's current skills maintenance training is described as the ongoing training required to sustain the skills and competencies of all firefighters and officers. The terms of reference provided provide a high level overview of the importance of ongoing training and recertification within the fire service. Although beneficial to understanding the importance of ongoing training the current terms of reference do not identify the training programs and courses that are required to be completed on a regular, or annual basis.

9.5.5 Current Training Program Summary

Table 9 presents a summary of the current fire suppression training qualifications of the staff resources assigned to delivering the department's fire suppression services. This summary compares the applicable N.F.P.A. standards with the current training qualifications of the existing staff resources. This summary does not include other training that may have been received internally as referenced in the four main core areas of training.

Table 9: Current N.F.P.A. Training Qualifications

Applicable N.F.P.A. Standard	Fire Chief	Assistant Fire Chief	Full-time Training Officer/ Safety Officer Captain	Full-time Captains	Full-time Firefighters	Paid on Call Firefighters
N.F.P.A. 1001- Firefighter Level I	1	1	1	4	4	25
N.F.P.A. 1001 – Firefighter Level II	1	1	1	4	4	24
N.F.P.A. 1002 – Driver/Operator						4
N.F.P.A. 1021 – Fire Officer Level I	1			2	1	1
N.F.P.A. 1021 – Fire Officer Level II				2		
N.F.P.A. 1006 – Technical Rescue						

Our research indicates that at this time only one S.O.P. has been developed and approved to guide the goals and objectives of the department's training program. ***S.O.P. #0016 – Driver/Operator Training*** was approved on January 5th, 2019 defining the process for a driver/operator trainee to become familiar

[18] Lloydminster Fire Department – Professional Development - Terms of Reference

with and qualified (internally) to drive and operate department fire suppression apparatus. This S.O.P. identifies the process for competency review and sign off by the full-time Training Officer/ Safety Officer Captain and a full-time Captain. At the time of preparing this F.S.M.P. all of the full-time Captains and full-time firefighters had completed the requirements ***S.O.P. #0016 – Driver/Operator Training***, and twelve of the paid on call firefighters have completed this program.

This summary illustrates that the L.F.D. is working towards attaining the applicable N.F.P.A. standards that are recognized within the fire service as municipal best practices for the delivery of fire suppression services. The terms of reference provided for the four main core areas of training the department, as identified, also indicate that the department has developed a framework for developing an annual raining program. In our view the department would benefit from developing a ***Comprehensive Annual Training Program*** that would be described within a department Standard Operating Procedure.

The goals and objectives of the proposed ***Comprehensive Annual Training Program*** should be to respond to the relevant N.F.P.A. standards, curriculum, and health and safety requirements, and include the following core functions:

- *Identifying training needs in relation to the fire suppression services provided;*
- *Coordinating/scheduling theoretical and practical training;*
- *Monitoring and evaluating in relation to outcomes achieved;*
- *Evaluating (on an ongoing basis) in relation to industry best practices and legislative requirements;*
- *Overseeing program objectives and records management; and*
- *Assessing (on an ongoing basis) program delivery for efficiency and effectiveness.*

Operational Recommendation #22: That consideration be given to consolidating all current firefighter training initiatives into one Comprehensive Annual Training Program including performance goals and objectives to be defined within a department Standard Operational Procedure.

9.5.6 Training Attendance

Based on our review of the terms of reference for the department's four main core areas of training, and our internal stakeholder consultation, there are existing requirements for firefighters to attend and complete specific areas of the current training initiatives, such as the onboarding and skills maintenance training requirements.

At the present time the department does not have an S.O.P. that relates to the requirements for training attendance. Industry best practices and occupational health and safety regulations identify the importance of ensuring that all firefighters maintain sufficient competencies, and experience to complete all tasks that they may be assigned. As such the proposed ***Comprehensive Annual Training Program*** and associated S.O.P. should include reference to the minimum competencies and experience that all firefighters must maintain at all times.

Operational Recommendation 23: That the proposed Comprehensive Annual Training Program include minimum requirements for attendance to maintain the required firefighting skills and competencies at all times.

9.6 Paid On-Call Firefighter Recruitment and Retention

Across Canada, paid on-call (or volunteer) firefighters made up 83% of the firefighting complement (for the period 2014-2016).[19] The service provided by paid on call firefighters is integral to fire safety in their communities; however, municipalities are increasingly facing challenges in paid on-call firefighter recruitment and retention.

Historically, paid on-call firefighters represented a portion of the community that lived and worked in close proximity to the fire station where individuals were allowed to leave work and respond to emergency calls. Providing a service to the community and being active within the community was, and continues to be, a major point of pride for paid on call firefighters. Financial compensation, although warranted, was not the only motivator for those seeking to become a paid on call firefighter.

There are numerous factors impacting paid on call firefighters across the province that can make recruitment and retention a challenge today. Some reasons could subjectively include shifting demographics, economic realities, household structures, and expectations of work-life balance. It is a certainty, however, that performance expectations, including sustaining training standards and attendance at training sessions, continue to increase the demands municipalities place on paid on-call firefighters in the interest of health and safety. Commonly, paid on call firefighters must also sustain minimum response attendance to emergency calls.

This result is an increasing demand on personal commitment to sustain a high degree of training competency and experience gained through responding to emergency calls. Maintaining an appropriate balance between the demands of being a paid on call firefighter and those of family and other commitments is becoming more difficult. Municipalities must begin to develop recruitment and retention strategies for paid on-call firefighters that recognize this evolution. The following sections present examples of the recruitment and retention strategies that have bene initiated in other jurisdictions across the country as established by the resources resulting from provinces, including Ontario, Nova Scotia, and Alberta. In the following sections, the term volunteer firefighter is used. This is considered interchangeable with the term “paid on call” firefighter, used in the City of Lloydminster.

[19] N.F.P.A. (2018, January). News and Research. Retrieved from Canadian Fire Department Profile: https://www.N.F.P.A.org/News-and-Research/Data-research-and-tools/Emergency-Responders/Canada-Fire-Department-Profile

9.6.1 Province of Ontario – Office of the Fire Marshal and Emergency Management

In October 2006, the Office of the Fire Marshal and Emergency Management (O.F.M.E.M.) in Ontario released ***Public Fire Safety Guideline (P.F.S.G.) 04-84-13 – "Volunteer Fire Service Personnel Recruitment and Retention"***. ***P.F.S.G. 04-84-13*** describes the benefits of having a Recruitment and Retention Program, including demonstrating the value and importance of volunteer (paid on call) firefighters and proactive versus reactive leadership. This P.S.F.G. identifies that a Recruitment and Retention Plan is cyclical in nature as shown in **Figure 2**. It also highlights the long-term challenge of retention. Retention is especially critical with the evolution of the demands on volunteer / paid on call firefighters since the time this P.F.S.G. was released.

Figure 2: Ongoing Annual Recruitment and Retention Program (P.F.S.G. 04-84-13)

9.6.2 Province of Nova Scotia - Volunteer Recruitment and Retention

In 2009, the Office of the Fire Marshal for the Province of Nova Scotia published a report on Volunteer Firefighter Recruitment and Retention that was developed in cooperation with the Fire Service Association of Nova Scotia.[20] Though targeted to Nova Scotia, this report has some tools that could be adapted to any department. For example, retention resources include guidance on performance

[20] The "*Volunteer Recruitment and Retention*" document released November 2009 is currently available at: https://novascotia.ca/dma/firesafety/docs/VolunteerRecruitmentandRetention.pdf

management, progressive discipline, succession planning, rewards and recognition, critical incident stress management, and exit interviews.

9.6.3 Province of Alberta - Volunteer Firefighter Recruitment and Retention Strategy

In May 2010, Volunteer Alberta released the ***Volunteer Firefighter Recruitment and Retention Strategy*** (Strategy*)* which was developed for the Alberta Fire Chiefs' Association.[21] The resulting document was informed by a scan of best practices, literature review, and experience across departments in Alberta and beyond.

A separate study conducted by Volunteer Alberta identified six known issues and barriers that are having an impact on the ability of municipalities to recruit and retain volunteer firefighters. As described in the Strategy, these issues and barriers include those that are: employer-related; family-related; availability of people; time commitment; perceptions and public image; and structural challenges.

The Strategy goes on to provide local and centralized initiatives that include the identified target audiences including: business owners and employers; community groups; residents (women, immigrant populations, First Nations populations); fire department members; and political stakeholders. There are fifteen local recommended initiatives that are complemented by a comprehensive toolkit to assist with implementation. The recommended local initiatives that can be explored by any municipal fire department include initiatives such as involving current firefighters in planning for formal recruitment drives, and establishing a proper volunteer screening process.

9.6.4 Proposed Paid On-Call Recruitment and Retention Strategy

Research into preparing this F.S.M.P. including the internal stakeholder consultation process identified a number of concerns related to the current paid on call recruitment and retention practices of the L.F.D. and specifically the sustainability of the use of paid on call firefighters. At the time of preparing this F.S.M.P. the total number of paid on call firefighters had declined to 26 members. In our view the development and implementation of strategies to enhance the recruitment and retention of paid on call firefighters ***must be considered a priority for the City of Lloydminster***.

To sustain the current fire suppression model and provide the best value to the community, it is proposed that the L.F.D. develop and implement a **Comprehensive *Paid On-Call Firefighter Recruitment and Retention Strategy***. The developed strategy should recognize the evolution of the role in conjunction with the demographic, economic, and cultural realities of the community and the recent

[21] The Volunteer Alberta "*Volunteer Firefighter Recruitment and Retention Strategy"* released May 2010 is currently available on the Alberta Fire Chiefs Association website at:
https://afca.ca/latest-news/item/238-volunteer-firefighter-recruitment-and-retention-toolkit.

evolution to a collective agreement. This section presents a range of resources that should be given consideration in development of a dedicated paid on call firefighter recruitment and retention strategy.

In our experience the proposed **Comprehensive *Paid On-Call Firefighter Recruitment and Retention Strategy*** will require the direct involvement of Council and senior City staff to be effective. In addition to the operational effectiveness and efficiency of a paid on call fire department it must be recognized that the utilization of a ***"combination fire department"***[22] including both full-time and paid on call firefighters is the most cost effective operating model for the City of Lloydminster.

Based on our consultation and research to prepare this F.S.M.P. the sustainability of the P.O.C. operating model will in our view rely significantly on the leadership of Council and senior corporate staff to support the Fire Chief and the L.F.D. In our view the first step in this approach should be to focus a targeted recruitment campaign towards existing City of Lloydminster staff. This should be followed by a comprehensive public education campaign that targets other City employers about the critical importance of sustaining paid on call firefighters.

Council Recommendation #4: That subject to Council's consideration and approval of the proposed Fire Services Master Plan consideration be given to developing a Comprehensive Recruitment and Retention Strategy that targets the sustainability of Paid on Call Firefighters as presented within the proposed Fire Services Master Plan.

9.7 Company Officer Training

The fire service is a para-military organization that relies on a rank structure to manage the roles and responsibilities of the organization and the operational services it delivers. This structure needs to include an appropriate span of control in order to be efficient and effective. The current organizational structure of the L.F.D. includes company officers who are defined as the Fire Chief, Assistant Fire Chief, the full-time Training Officer/ Safety Officer Captain and the four full-time Captains.

A sufficient number of officers are required to ensure that the function of incident command can be implemented at all emergency scenes, and depending on the incident action plan, have sufficient additional officers to facilitate other roles such as sectoring of the scene and Safety Officer.

Municipalities in Alberta are required to ensure a sufficient number of supervisors (officers) are trained to oversee the workforce. Within *Occupational Health and Safety Regulation,* Part 1, General, Section 13, General Protection of Workers, subsection (1) states that: "*If work is to be done that may endanger a worker, the employer must ensure that they work is done," …."(b) by a worker who is working under the direct supervision of a worker who is competent to do the work."* As an employer, the City of

[22] National Fire Protection Association 1720 Standard, Chapter 3 Definitions, 3.3.15.1 Combination Fire Department

Lloydminster is legislated by the applicable occupational health and safety legislation in Alberta and Saskatchewan to ensure that all supervisors, which includes the role of incident commander, be competent.

Industry best practices reflect that a Company Officer training program should be ongoing as an element of a broader Officer Development Program. This strategy further supports succession planning and career development for future senior officers. The ***N.F.P.A. 1021 - Standard for Fire Officer Professional Qualifications*** is a recognized industry best practice for this type of training.

As discussed within this F.S.M.P. the department has developed a framework for the departments training program and is currently developing a range of Standard Operating Procedures and policies. It would be appropriate to develop a comprehensive Company Officer Program contained within a department Standard Operating Procedure. Such a procedure should include:

- *Recognition of the role of competent supervisors in Health and Safety;*
- *Requirements around maintaining a compatible rank structure for all firefighters to ensure a ratio of supervisors is maintained at all time;*
- *The minimum requirements to become a Company Officer, and promotional process; and*
- *Expectations and requirements around Company Officer maintenance training.*

Consideration should be given to enhancing the requirements for promotion to company officer training to include pre-incident planning and incident safety officer, demonstrated leadership and communication, and thorough knowledge and understanding of applicable legislation and standards. In addition, should the department deem it appropriate, N.F.P.A. 1041 instructor Level 1 could also be a requirement for Company Officers.

Ongoing implementation and review of the Company Officer Program as part of the proposed Comprehensive Annual Training Program will help the department ensure that its commitment to and recognition of the importance of a sufficient number of appropriately training company officers is maintained.

Operational Recommendation #24: That consideration be given to developing a comprehensive Company Officer Training Program and supporting Standard Operating Procedure.

9.7.1 Incident Command Training

Incident Command Training should be considered a core element of the proposed comprehensive ***Company Officer Training Program***. Incident Command Systems are an industry best practice designed to positively influence the outcome of an emergency scene operation and the health and safety of firefighters. These systems can have a dramatic effect on the efficiency and effectiveness of the emergency response and safety on the emergency scene. This includes all incidents that the fire

department may respond to including the fireground, hazardous materials incidents, automobile extrications, water/ice rescues and any other incident the fire department responds to where emergency responders and apparatus must be coordinated.

Incident command should be established by the first arriving officer and be sustained until the emergency is mitigated. The Incident Commander (officer) is responsible for all aspects of managing the emergency incident including developing an ***"Incident Action Plan***" and managing all operations on scene. This includes:

- ✓ *Establish immediate priorities, especially the safety of responders, other emergency workers, bystanders, and people involved in the incident;*
- ✓ *Stabilize the incident by ensuring life safety and managing resources efficiently and cost effectively;*
- ✓ *Determine incident objectives and strategies to achieve the objectives;*
- ✓ *Establish and monitor incident organization;*
- ✓ *Approve the implementation of the written or oral Incident Action Plan; and*
- ✓ *Ensure adequate health and safety measures are in place.*

There are a number of recognized Incident Command Systems including the "Phoenix Fireground Command System". This system was developed by Alan V. Brunacini, the former Fire Chief of the Phoenix Fire Department. Chief Brunacini is a renowned expert on incident command. The ***"Blue Card"*** program, currently utilized by O.F.D., is a program that provides incident command training and is based on the work of Fire Chief Brunacini and is of one of the most widely utilized programs in the fire service. The program utilizes both on-line and in-class simulation training which focuses primarily on Incident Command training for structural fire responses, but is applicable to all emergency incident responses. Incident command training is core to the competencies required for a Company Officer.

It is recommended that the "Blue Card" incident command training program be included within the proposed comprehensive ***Company Officer Training Program*** and supporting ***Standard Operating Procedure.***

Operational Recommendation #25: That consideration be given to including incident command training for all officers within the Lloydminster Fire Department within the proposed comprehensive Company Officer Training Program and supporting Standard Operating Procedure.

9.8 Specialized Technical Rescue Training

Specialized technical rescues are considered as those services that require a higher standard of training, competency and certification, in addition to regular firefighter training. Although the frequency of incidents requiring this type of training is significantly lower than that of traditional firefighting, the technical and health and safety requirements are typically significantly higher. The level of training required is established through the identified service level for each technical rescue service.

As referenced previously within this F.S.M.P. the City of Lloydminster currently has a memorandum of understanding with the Lloydminster Rescue Squad Inc. to provide certain specialized technical rescues including water/ice rescue, search and rescue, and vehicle extrication. The current agreement does not reference the applicable training qualifications for these services that will be administered by the Lloydminster Rescue Squad Inc.

Specialized technical rescues, as defined within the ***N.P.F.A. 1006 Standard for Technical Rescue Personnel Professional Qualifications*** and applicable to the City of Lloydminster, include:

- *Rope Rescue;*
- *Structural collapse rescue;*
- *Confined space rescue;*
- *Machinery rescue;*
- *Surface water rescue;*
- *Vehicle rescue;*
- *Animal rescue;*
- *Wilderness rescue;*
- *Trench rescue;*
- *Swiftwater Rescue; and*
- *Ice rescue;*

9.8.1 Applicable Specialized Technical Rescue Training

The skills and competencies to complete technical rescues can be categorized into three levels of training as established in the ***N.P.F.A. 1006 Standard for Technical Rescue Personnel Professional Qualifications*** *including*:

- ***Awareness Level*** *– reflecting the minimum capability of organizations;*
- ***Operations Level*** *– reflecting the capability of organizations to respond, use equipment, and apply techniques to support and perform a technical rescue; and*
- ***Technician Level*** *– reflecting the capability of organizations to not only provide the Operations Level of services but also to coordinate, perform, and supervise a technical rescue.*

Our research indicates that a limited number of members of the L.F.D. have completed specialized technical rescue training related to rope rescue and confined space rescues. There has also been some training completed regarding grain bin rescues. However, there is currently no defined Standard Operating Procedures related to the training requirements for these services, or the level of services to be provided by the department.

Technical rescues typically represent a small portion of the total emergency call volume of a fire department. Analysis of the historical emergency calls for the period 2014 to 2018 indicates that rescue type calls represented 5% of the department total annual emergency call volume. This represents the department's response to all types of rescue calls, only a portion of which would be defined as specialized technical rescues.

In our view there is a need for all firefighters to have basic training to understand and be able to identify the characteristics of a specialized technical rescue. For example, there needs to be sufficient training to identify the characteristics of a confined space. At this time it is recommended that the Fire Chief be directed to assess the ***"key findings"*** of the ***Community Risk Assessment*** and investigate further options for developing partnerships, shared services, or further extending the purchasing of contracted services for the delivery of technical rescues services. In addition, Council should be further engaged to establish the level of service for each specialized technical rescue type considering the cost for maintaining any identified service level and the associated training qualification for members of the L.F.D.

Operational Recommendation #26: That the Fire Chief further investigate the alternatives for providing specialized technical rescue services including partnerships, shared services and contracting services to reduce the existing operational and training requirements of the Lloydminster Fire Department.

9.9 Online Training

Access to online training programs can provide greater flexibility in delivering the comprehensive training program recommended, particularly for paid on-call firefighters. Online programs can be designed to meet varying learning styles and objectives. As well, they provide flexibility through access from the fire station or at home. Participation in online training can be delivered as either individual sessions or in groups. With online training, all participating firefighters can access course materials at any time, outside of the regular training schedule, to provide flexibility and convenience. This would support the schedules of the shift-workers and oilfield workers that exist within L.F.D. The availability of online training has the added benefit of allowing for better use of in-person class training time.

The terms of reference provided to inform our analysis of the department's current training program identify the use of on-line training programs. In our view the use of on-line training programs should be optimized by the L.F.D. and specifically for theory based learning to optimise the work life balance of paid on call firefighters, and utilize face to face training opportunities to maximize practical training scenarios requiring group participation.

Operational Recommendation #27: That where applicable the further utilization of on-line training as a component of delivering the proposed Comprehensive Annual Training Program be considered.

9.10 Live Fire Training

The purpose of live fire training is to provide realistic fire training simulations under safe and controlled conditions. With relatively low volumes of fire calls it is important that the department provides access for all firefighters to simulate safe and effective fire suppression operations in an appropriate training facility. Live fire training exercises are intended to simulate the actual fire conditions that a firefighter may encounter and provide simulated heat, humidity, restricted vision and smoke conditions. This type

of training is also very beneficial for firefighters in learning to understand fire behaviour including identifying evolving smoke conditions as they may relate to the potential for fire extension or conditions such as ***"flashover."***

The importance of sustaining practical training utilizing live fire simulations is directly related to enhancing firefighter safety and to providing an effective fire protection service to the community. This is especially significant in a municipality, such as Lloydminster, with a relatively low volume of structure fire calls. Responding to fewer working fires increases the importance of regular training in live fire situations in order to sustain the required skills and competencies of today's firefighters and officers.

At the present time there is no defined Standard Operating Procedure to define the amount of life fire training a firefighter receives. Through the internal consultation process this was described as an area of concern for the firefighters. The department does have access to a site on the northern end of the City that is utilized for other types of practical training such as vehicle extrication. It is our understanding that in the past there was some live fire training conducted at this site, however this practice has ceased as a result of health and safety and other factors.

In our view life fire training should be a core element of the firefighter recruit onboarding program and the proposed comprehensive annual training program. In our experience there are several types of pre-manufactured buildings and live fire burning props that could be placed at the current training site to facilitate and effective live fire training program.

Operational Recommendation #28: That the Fire Chief be direct to further investigate ad report to Council on the options for facilitating live fire training as presented within the proposed Fire Services Master Plan.

Operational Recommendation #29: That the requirements for annual live fire training be included within the proposed Comprehensive Annual Training Program and department Standard Operating Procedure.

9.11 Proposed Training Resource Plan

The research and consultation conducted to prepare this F.S.M.P. indicates that the L.F.D. has taken proactive steps towards developing the proposed ***Comprehensive Annual Training Program***. The terms of reference provided by the department for the four main core areas of training in our view provide a very good foundation for moving forward. Our review of the current applicable N.F.P.A. training qualifications of the members of the L.F.D. is summarized in **Table 10.**

Table 10: Current L.F.D. Training Qualifications

Applicable N.F.P.A. Standard	Fire Chief	Assistant Fire Chief	Full-time Training Officer/ Safety Officer Captain	Full-time Captains	Full-time Firefighters	Paid on Call Firefighters
N.F.P.A. 1041 – Instructor Level I	1	1	1	4	1	3
N.F.P.A. 1041 – Instructor Level II				2		
N.F.P.A. 1006 – Technical Rescue						

This analysis indicates that in addition to the full-time Training Officer/ Safety Officer Captain there are ten other members of the L.F.D. who have attained the N.F.P.A. 1041 Instructor Level I qualifications. Two of the full-time Captains have attained the Fire Instructor II qualifications.

In our view, at a minimum, any member of the L.F.D. who are assigned the responsibility for delivering firefighter training should have the skills and competencies included within the N.F.P.A. 1041 – Instructor Level I. It is our interpretation of the N.F.P.A. 1041 standard that there should be at least one member of the L.F.D. with a minimum of the Instructor Level II accreditation, and ideally the Instructor Level III accreditation. In our view the full-time Training Officer/ Safety Officer Captain should be required to achieve the qualifications of an Instructor Level II and preferably Instructor Level III.

Operational Recommendation 30: That any member of the Lloydminster Fire Department who is assigned the responsibility to deliver firefighter training be required to attain the qualifications of an Instructor Level I as defined by the N.F.P.A. 1041 Standard for Fire Service Instructor Professional Qualifications.

Operational Recommendation #31: That the full-time Training Officer/ Safety Officer Captain be required to attain the qualifications of an Instructor Level II as defined by the N.F.P.A. 1041 Standard for Fire Service Instructor Professional Qualifications.

9.12 Proposed Training Committee

Under the leadership of the Assistant Fire Chief, the purpose of the proposed Training Committee would be to provide coordinated leadership and oversight of a unified department-wide training program within a defined terms of reference approved by the Fire Chief. This committee would include membership of the full-time Training Officer/ Safety Officer Captain, a full-time Captain, a full-time firefighter and a representative group of paid on call firefighters. The roles and responsibilities of this committee would be to develop the structure and program elements of the proposed Comprehensive Annual Training Program curriculum, including knowledge-based and practical training, sign-off components, and records management. The proposed Training Committee would be required to benchmark and follow the principles of N.F.P.A., Alberta Code of Practice for Firefighters, the National

Fire Code – 2019 Alberta Edition, municipal policies and procedures and the best practices within the fire service.

Operational Recommendation #32: That consideration be given to implementing the proposed Training Committee presented within the proposed Fire Service Maser Plan.

9.13 Training Program Summary and Recommendations

Our analysis of the Lloydminster Fire Department's current firefighter training program illustrates the positive steps that have been made towards formalizing and developing a proactive firefighter training program. The analysis also indicates that there is an ***immediate need*** to consider the current training and qualifications of the current members of the L.F.D. in relation to the fire suppression services that the department is able to safely and effectively provide today.

The stakeholder consultation process with the full-time and paid on call firefighters consistently identified ***"training"*** as an area of existing weakness within the department. The analysis within this F.S.M.P. confirms that there is an absence of Standard Operating Procedures and training programs that support the current fire suppression services being provided by the L.F.D.

The recommendations of this F.S.M.P. are intended to build on the framework that the L.F.D. as developed to create the proposed ***Comprehensive Annual Training Program***. In our view the implementation of this program will result in the enhancement of the skills and competencies of the current members of the L.F.D. and further support the sustainability of paid on call firefighters.

As a result of the review of the current training programs the following recommendations are presented for Council's consideration and approval:

Council Recommendations:

Council Recommendation #4: That subject to Council's consideration and approval of the proposed Fire Services Master Plan consideration be given to developing a Comprehensive Recruitment and Retention Strategy that targets the sustainability of Paid on Call Firefighters as presented within the proposed Fire Services Master Plan.

Operational Recommendations:

Operational Recommendation #21: That the job description for the full-time Training Officer/ Safety Officer Captain be updated to include the required qualifications, roles and responsibilities and hours of work of this position.

Operational Recommendation #22: That consideration be given to consolidating all current firefighter training initiatives into one Comprehensive Annual Training Program including performance goals and objectives to be defined within a department Standard Operational Procedure.

Operational Recommendation 23: That the proposed Comprehensive Annual Training Program include minimum requirements for attendance to maintain the required firefighting skills and competencies at all times.

Operational Recommendation #24: That consideration be given to developing a comprehensive Company Officer Training Program and supporting Standard Operating Procedure.

Operational Recommendation #25: That consideration be given to including incident command training for all officers within the Lloydminster Fire Department within the proposed comprehensive Company Officer Training Program and supporting Standard Operating Procedure.

Operational Recommendation #26: That the Fire Chief further investigate the alternatives for providing specialized technical rescue services including partnerships, shared services and contracting services to reduce the existing operational and training requirements of the Lloydminster Fire Department.

Operational Recommendation #27: That where applicable the further utilization of on-line training as a component of delivering the proposed Comprehensive Annual Training Program be considered.

Operational Recommendation #28: That the Fire Chief be direct to further investigate ad report to Council on the options for facilitating live fire training as presented within the proposed Fire Services Master Plan.

Operational Recommendation #29: That the requirements for annual live fire training be included within the proposed Comprehensive Annual Training Program and department Standard Operating Procedure.

Operational Recommendation 30: That any member of the Lloydminster Fire Department who is assigned the responsibility to deliver firefighter training be required to attain the qualifications of an Instructor Level I as defined by the N.F.P.A. 1041 Standard for Fire Service Instructor Professional Qualifications.

Operational Recommendation #31: That the full-time Training Officer/ Safety Officer Captain be required to attain the qualifications of an Instructor Level II as defined by the N.F.P.A. 1041 Standard for Fire Service Instructor Professional Qualifications.

Operational Recommendation #32: That consideration be given to implementing the proposed Training Committee presented within the proposed Fire Service Maser Plan.

10.0 Operations/Fire Suppression

Prior to January 2nd, 2019 the Lloydminster Fire Department had historically operated as a ***"volunteer"*** fire department. Research into preparing this F.S.M.P. indicates that there is limited statistical data to assess the efficiency and effectiveness of this former operating model. In our experience the absence of procedures, policies and statistical data to guide the operations of a solely volunteer fire department are not uncommon. Information provided by the department indicates that within this former operating model it was common for a single person, either in a department vehicle or a personal vehicle, to respond to an emergency incident.

Our research indicates that the operations/fire suppression services provided by the L.F.D. prior to January 2nd, 2019 appear to have been very consistent with the current ***Fire Bylaw No. 25-2015*** that defines the services of the L.F.D. to be ***"The Lloydminster Fire Department, a public organization that provides predominantly emergency firefighting and vehicle extrication services for the City of Lloydminster"***[23]. Our findings also indicate that there is limited information to assess, and or compare the historical operations/fire suppression services provided by the L.F.D. prior to January 2nd, 2019 with the current ***"Interim Staffing Model"*** implemented by the City on January 2nd, 2019. Therefore this F.S.M.P. focuses on analysis of the current ***"Interim Staffing Model"*** as the foundation for developing the proposed operations/fire suppression performance benchmarks and service levels based on the findings of the ***Community Risk Assessment***.

The ***"Interim Staffing Model"*** includes the availability of one full-time captain, one full-time firefighter, and one paid on call firefighter on duty at Station No.1 at all times (on duty crew). The on duty crew has the flexibility to respond in either Car 16 (pumper) or Car 17 (rescue) depending on the type of incident. The on duty crew is supported by ***"on call crews,"*** including three paid on call firefighters at each of the department's two stations. When required, the department is able to alert both the off duty full-time and paid on call firefighters to respond, such as in the event of a large scale incident.

At the time of preparing this F.S.M.P. the total complement of firefighters included four full-time captains, four full-time firefighters and twenty six paid on call firefighters. Within the industry the L.F.D. is described as a ***"Combination Fire Department"*** as defined by the N.F.P.A. 1720 standard as ***"A fire department having emergency services personnel comprising 85 percent majority of either volunteer or career membership"***[24]. Within the City of Lloydminster, the term ***"paid on call"*** is used in the place of the word ***"volunteer"*** and ***"full-time"*** is used in place of ***"career".*** The Assistant Fire Chief is responsible for overseeing the operations/fire suppression services provided by the department.

[23] City of Lloydminster – Bylaw No. 25-2015 – Section 2, Definitions 2.1 (h)
[24] National Fire Protection Association 1720 Standard, Chapter 3 Definitions, 3.3.15.1 Combination Fire Department

Under the leadership of the Fire Chief and Assistant Fire Chief, the L.F.D. is in transition from its historical roots and volunteer operating model to becoming a fire department that provides a wide range of programs and services that focus on fire risk mitigation/prevention and effective and efficient fire suppression services based on current municipal best practices. At the time of preparing this F.S.M.P. information was presented by the department that identified the types of programs and levels of services that are envisioned by the department, and in some instances, where the department has started to develop initiatives and/or implement a broader range of services than those referenced with the current ***Fire Bylaw No. 25-2015***.

The research and analysis presented within this F.S.M.P. provides a comprehensive review of current industry best practices related to delivering fire suppression services within the City of Lloydminster. It provides an overview of fire suppression staffing needs, operations and service levels, statistical trend analysis of historical performance, and emergency response capabilities with consideration of future growth. This analysis is presented with recommendations for Council's consideration in adopting the most effective and efficient fire suppression deployment model that provides the most value to the community. This includes utilizing the findings of the Community Risk Assessment and related strategies to optimize public education and fire prevention programs, and further the use of fire safety standards and enforcement.

10.1 Current Industry Guidelines, Standards and Municipal Best Practices

There is currently no specific legislated standard in the provinces of Alberta and Saskatchewan that define the level of fire suppression services a municipality must provide, or the type of firefighter (full-time/ paid on call/ volunteer) or the number of firefighters and apparatus required to respond to any given incident. Current legislation authorizes municipalities such as Lloydminster to define what types of fire protection programs and services should be provided.

Over the past decade there has been a transition within the fire service industry across North America to the utilization of community risk-based analysis to determine the appropriate level of firefighter deployment based on the critical tasks to be performed to effectively, efficiently and safely conduct fire suppression operations.

In our view, the process for determining best practices within the fire service across Canada should consider the research and experiments conducted by the ***National Institute of Standards and Technology*** including their report on ***Residential Fireground Field Experiments*** and ***Report on High-Rise Fireground Field Experiments***. The results of these experiments contribute to expanding the knowledge and experience of the fire service in addition to providing the technical analysis that contributes to the development of the National Fire Protection Association standards.

10.2 National Fire Protection Association

The ***National Fire Protection Association*** (N.F.P.A.) develops and manages a series of codes and standards which guide fire protection service delivery across North American. The following standards are provided for background and consideration for assessing the delivery of fire suppression services by the Lloydminster Fire Department.

10.2.1 N.F.P.A. 1710 Standard (2016 Edition)

N.F.P.A. 1710 ***"Standard for the Organization and Deployment of Fire suppression Operations, Emergency medical Operations, and Special Operations to the Public by Career Fire Departments"*** provides a resource for determining and evaluating the number of career firefighters required based upon recognized industry best practices. This standard is designed for larger municipalities that, as a result of many factors, are operating their fire department utilizing primarily full-time (career) firefighters. The applicable references within the N.F.P.A. 1710 standard include:

- *This standard applies to the deployment of resources by a fire department to emergency situations when operations can be implemented to save lives and property; and*
- *The standard is a benchmark for most common responses and a platform for developing the appropriate plan for deployment of resou*rces for fires in higher hazard occupancies or more complex incidents.

These N.F.P.A. references support the strategic priority of saving lives and property, as well as recognizing the standard as a ***"benchmark"*** for determining the appropriate level of resources based on the complexity and level of risk present. This standard identifies the recommended minimum number of firefighters to be deployed as either the ***"Initial Arriving Company",*** or the ***"Initial Full Alarm Assignment"*** required based upon the type of fire risk present.

10.2.1.1 Initial Arriving Company

The N.F.P.A. 1710 standard refers to the ***"Initial Arriving Company"*** as an ***"Engine Company"*** and further defines the minimum staffing level of this apparatus as four firefighters whose primary functions are to pump and deliver water and perform basic firefighting at fires, including search and rescue. Within the fire service the term ***"Engine Company"*** can also be described as a Pumper, Pump/Rescue or Quint. The L.F.D. currently defines this apparatus as ***"Car 15"*** located at Station No. 1 and staffed by the on duty crew of full-time and paid on call firefighters.

The Initial Arriving Company is also commonly referred to as the "***Initial Response"*** that is defined as the number of firefighters initially deployed on the first apparatus responding to an incident. Fire service leaders and professional regulating bodies have agreed that until a sufficient number of firefighters are assembled on-scene, initiating tactics such as entry into the building to conduct search and rescue, or initiating interior fire suppression operations are not safe practices. If fewer than four firefighters arrive

on scene, they must wait until a second vehicle, or additional firefighters arrive on scene to have sufficient staff to commence these activities.

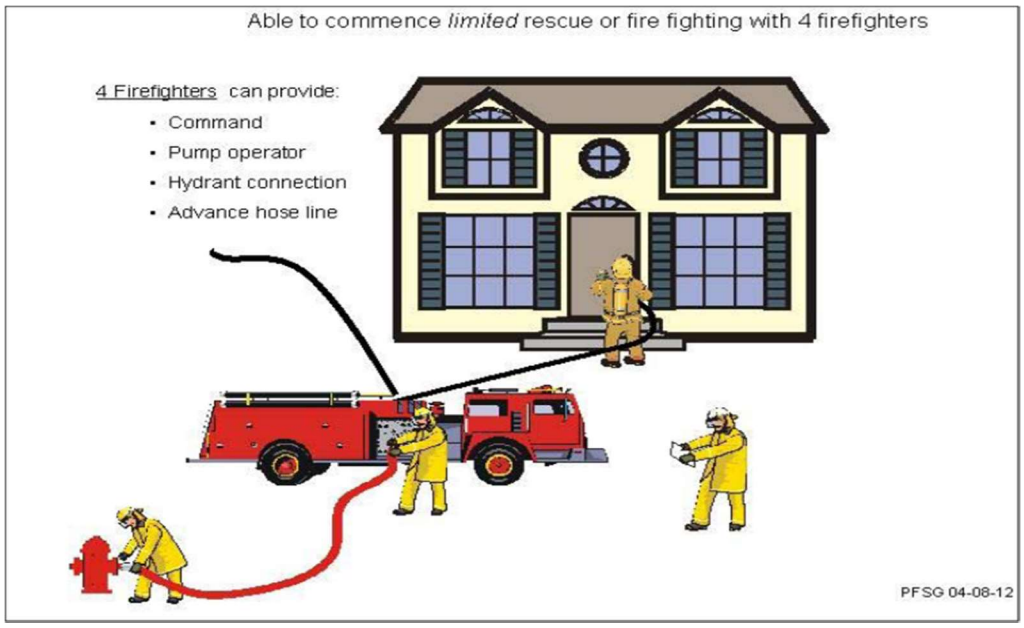
An initial response of four firefighters, once assembled on-scene, is typically assigned the following operational functions. The officer in charge shall assume the role of Incident Commander; one firefighter shall be designated as the pump operator; one firefighter shall complete the task of making the fire hydrant connection; and the fourth firefighter shall prepare an initial fire attack line for operation.

The assembly of four firefighters on the fire scene provides sufficient resources to safely initiate some limited fire suppression operations. This first crew of four firefighters is also able to conduct the strategic operational priority of "size-up" whereby the officer in-charge can evaluate the incident and where necessary, request an additional depth of resources that may not have been dispatched as part of the initial response.

The performance benchmark for the ***"Initial Arriving Company"*** identified in the N.F.P.A. 1710 Standard is ***"Four firefighters arriving on scene within a four minute travel time to 90% of fire suppression incidents"***.

Fire scene responsibilities of an ***Initial Arriving Company*** are highlighted in **Figure 3.**

Figure 3: Initial Arriving Company



(Office of the Fire Marshal, Ontario, Public Fire Safety Guideline 04-08-12, December, 2001)

10.2.1.2 Single-Family Dwelling - Initial Full Alarm Assignment

In addition to defining the deployment requirements of the ***"Initial Arriving Company"*** the N.F.P.A. 1710 standard also identifies the recommended minimum number of ***"total firefighters"*** that should be deployed based on the building occupancy type and fire risk present.

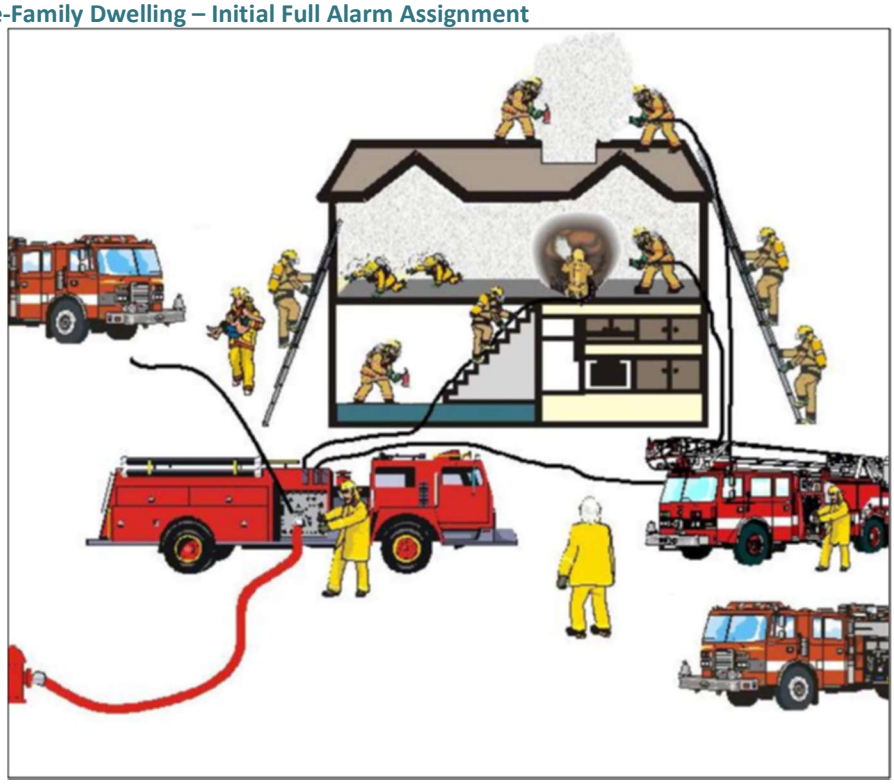
The N.F.P.A. 1710 standard defines a ***"Single-Family Dwelling"*** as a 2,000 ft^2 (186 m^2), two-storey single-family dwelling without a basement and with no exposures present. This represents a typical home of wood frame construction located in a suburban neighbourhood. This standard recommends a minimum deployment of fourteen firefighters, and fifteen if an aerial device is required to respond to a fire in a single-family dwelling.

It is very important to recognize that the ***"Initial Full Alarm Assignment"*** is referring to the ***"total number"*** of firefighters ***"initially"*** assigned to an incident. The total number of firefighters assigned to an incident can vary based on the type of occupancy and the level of fire risk present. Fires involving occupancies that have been assigned a higher level of fire risk such as high risk or high-rise high risk occupancies will require a higher number of firefighters as part of the initial full alarm assignment.

The performance benchmark for the "***Single-Family Dwelling – Initial Full Alarm Assignment"*** identified in the N.F.P.A. 1710 Standard is ***"Fifteen firefighters arriving on scene within an eight minute travel time to 90% of moderate risk fire suppression incidents"***.

The N.F.P.A. 1710 fire scene responsibilities for a single-family dwelling including an aerial are highlighted in **Figure 4**.

Figure 4: Single-Family Dwelling – Initial Full Alarm Assignment



(Shown including an aerial device – 15 firefighters) Modified from the Office of the Fire Marshal, Ontario, Public Fire Safety Guideline 04-08-12, December, 2001.

10.2.1.3 Open-Air Strip Shopping Centre – Initial Full Alarm Assignment

The N.F.P.A. 1710 standard (2016 Edition) defines a typical open-air strip shopping centre as ranging from 1203m^{2}to 18,209m^2 (13,000ft^2 to 196,000 ft^2) in size requiring a minimum of 25 firefighters (26 if an aerial device is required) within a travel time of 8 minutes to 90% of the fire related incidents.

10.2.1.4 Apartment – Initial Full Alarm Assignment

The N.F.P.A. 1710 standard (2016 Edition) defines an apartment as a typical 1200 ft^2 (111 m^2) apartment within a three-story, garden style apartment building. Based on this type of building occupancy and fire risk this standard recommends a minimum deployment of 25 firefighters (26 if an aerial device is required) within a travel time of 8 minutes to 90% of the fire related incidents.

10.2.1.5 High-Rise – Initial Full Alarm Assignment – Depth of Response

High-rise buildings pose unique risks for fire suppression. The 2016 Edition of the N.F.P.A. 1710 standard introduces specific considerations and targets for response time and staffing levels for fire incidents in high-rise buildings. The standard recommends 610 seconds (10 minutes, 10 seconds) or

less travel time for the deployment of suppression staff to a high-rise fire incident. Recommended staffing levels are outlined based on critical fire-scene tasks, totaling 39 firefighters for an initial full alarm assignment to a fire suppression incident at a high-rise high risk building. The timelines and staffing levels correspond to the challenges related to vertical response and specific operational requirements for structural firefighting in high-rises.

Prior to the development of this standard, municipalities had begun to create their own guidelines and/or procedures to follow during a high-rise fire. The common guidelines or procedures found revolve around how to ascend a building when the fire service elevators are not working and how long it will take and how many firefighters or apparatuses are required to arrive at high-rise building fires.

10.2.2 N.F.P.A. 1720 Standard (2010 Edition)

N.F.P.A. 1720 ***"Standard for the Organization and Deployment of Fire suppression Operations, Emergency medical Operations, and Special Operations to the Public by Volunteer Fire Departments"*** provides a resource for determining and evaluating the number of paid-on-call (volunteer) firefighters required based upon recognized industry best practices. In our view this standard is most applicable to the delivery of fire suppression services as currently provided by the L.F.D.

The N.F.P.A. 1720 standard further supports the minimum initial response staffing to include four firefighters including ***"Initial firefighting operations shall be organized to ensure that at least four fire fighters are assembled before interior fire suppression operations are initiated in a hazardous area".*** This particular standard recognizes that the four firefighters may not arrive on the same vehicle, but that there must be four on the scene prior to initiating any type of interior firefighting operations.

Within this standard the N.F.P.A. identifies five different categories described as ***"Demand Zones"*** that relate to the type of risk that may be found within a typical community; either by population density, travel distance, or special circumstances. The standard then identifies a minimum level of firefighters that would be recommended for each of these categories. **Table 11** presents the N.F.P.A. 1720 standard minimum staffing levels by demand zone.

Table 11: N.F.P.A. 1720 – Minimum Staffing Levels

Demand Zones	Demographics	Minimum # of Firefighters Responding	Response Time (Turnout + Travel) in Minutes	Performance Objective
Urban Area	>1000 people per square mile	15	9	90%
Suburban Area	500-1000 people per square mile	10	10	80%
Rural Area	<500 people per square mile	6	14	80%
Remote Area	Travel Distance + or – 8 miles	4	Dependent upon travel distance	90%
Special Risks	To be determined by municipality	To be determined by municipality	To be determined by municipality	90%

The N.F.P.A. 1720 standard utilizes population density as a factor in evaluating the minimum number of firefighters recommended for depth of response. As a standard primarily for use by paid on call (volunteer) fire departments it recognizes lower population densities are typically found in smaller communities in comparison to much higher population densities found in large urban centres.

The N.F.P.A. 1720 standard is consistent with the N.F.P.A. 1710 standard in recommending that the initial arriving company include a deployment of four firefighters to effectively, efficiently and safely conduct initial fire suppression operations.

10.3 National Institute of Standards and Technology

The National Institute of Standards and Technology (N.I.S.T.) is an industry recognized leader in fire service research. Many of the guidelines and standards referenced within this F.S.M.P. have considered the research completed by N.I.S.T. This research includes two significant reports including the ***"Report on Residential Fireground Filed Experiments"*** completed in 2010, and the ***"Report on High-Rise Fireground Field Experiments"*** completed in 2013.

In contrast to a fire in a typical single-family dwelling that may include one or two storeys a fire in a mid-rise, or tall building requires fire suppression resources to access multiple stories above ground level. Within the fire service this is commonly referred to as ***"vertical response"***. Vertical response refers to the additional fire suppression resources and response time required to transition from the curbside of an affected mid-rise or tall building to the location of the actual emergency incident on an upper storey.

10.4 Province of Ontario – Office of the Fire Marshal and Emergency Management

The Office of the Fire Marshal and Emergency Management (O.F.M.E.M.) is the agency responsible for overseeing the delivery of fire protection services within the Province of Ontario. ***Public Fire Safety Guideline 04-08-10 – Operational Planning: An Official Guide to Matching Resource Deployment and Risk*** was released by the O.F.M.E.M. in January of 2011. This guideline is intended to be an element of a municipality's risk management process. This guideline states that "*The purpose of this guideline is to*

encourage municipalities and fire departments to use this tool so that they can make informed decisions regarding the delivery of fire suppression services."[25]

This guideline includes a *"Critical Task Matrix"* that is defined by the O.F.M.E.M. as *"The critical Task Matrix is based on the Incident Management System (I.M.S.). It will assist in identifying fireground staffing capabilities based upon low, moderate, high and extreme risk levels within your community. The O.F.M.E.M. has identified the critical tasks from the Incident Management System that are used during fireground operations. These tasks are consistent with applicable legislation, industry best practices and the Ontario Fire College Curriculum."*[26] The matrix recognizes that within the I.M.S. that:

- *Upon arrival and rapid size-up, the incident commander can upgrade or downgrade response*
- *Crews can be reassigned to other tasks once original assignments are complete;*
- *Response protocols can be established with specific risk levels used to assist with pre-planning to obtain more resources based on the escalating nature of the emergency;*
- *Fire departments perform rescue and building personnel conduct evacuations according to their approved fire safety plans; and,*
- *Some tasks will never be assigned based on the tactical approach chosen by the incident commander (offensive versus defensive).*

The matrix identifies the lower effectiveness response level (L.E.R.L.) and upper effectiveness response level (U.E.R.L.) indicating the range of firefighters required to effectively, efficiently and safely conduct fire the identified suppression fireground critical tasks associated with each level of risk present. For example, the range of firefighters required to respond to a fire in a single family residential dwelling (Group C- Residential Occupancy) identified within the Community Risk Assessment as a moderate risk occupancy would be from 16 to 43 firefighters. Whereas the response to a registered care facility (Group B- Care or Detention Occupancy) identified within the Community Risk Assessment as a high risk occupancy would be from 36 to 83 firefighters. **Table 12** reflects the fire suppression deployment ranges included within P.F.S.G. 04-08-10.

[25] PFSG 04-08-10 Operational Planning: An Official Guide to Matching Resource Deployment and Risk
[26] PFSG 04-08-10 Operational Planning: An Official Guide to Matching Resource Deployment and Risk

Table 12: O.F.M.E.M. P.F.S.G. 04-08-10 Critical Task Matrix

	Fireground Critical Task	Low Risk		Moderate Risk		High Risk		Extreme Risk	
		LERL	UERL	LERL	UERL	LERL	UERL	LERL	UERL
Incident Response (Note: Where zero or no number has been assigned, the task may be performed at the direction of the incident commander.)	Incident Command*	1	1	1	1	1	1	1	1
	Pump Operator	1	1	1	1	1	1	1	1
	Attack Line (Confine and Extinguish)	2	2	2	2	2	2	2	2
	Additional Pump Operator(s)	0	0	0	2	2	4	4	6
	Additional Attack Line Backup	0	0	0	4	4	8	8	**12**
	Search and Rescue	0	0	2	4	2	6	2	8
	Initial Rapid Intervention Team (IRIT)	0	0	4	6	8	**16**	**12**	**22**
	Ventilation	0	2	2	2	2	4	2	8
	Water Supply – Pressurized	0	1	1	1	1	1	1	2
	Water Supply – Non Pressurized	0	3	1	4	2	6	4	8
	Forcible Entry Team	0	0	0	0	0	1	0	1
	Utilities	0	1	1	1	1	1	1	1
	Laddering (Ground Ladders)	0	2	0	2	0	4	0	6
	Laddering (Aerial or Elevating Device Operator)	0	0	0	2	0	2	0	2
	Exposure Protection			0	4	2	6	2	6
	Incident Safety Officer			0	1	1	1	1	1
	Accountability			1	1	1	1	1	1
	Entry Control			0	2	1	4	1	4
	Rehabilitation			0	1	1	1	1	1
	Salvage			0	2	2	2	2	2
	Lighting					0	2	0	2
	Directing Occupants					0	4	0	4
	Scribe					1	1	1	1
	Sector Officers					1	4	1	4
	Air Management (Air Refilling Station, etc.)							1	2
Other Or Additional Response Consideratio	Logistics Officer								
	Administrative and/or Finance Officer								
	Planning Officer								
	Evacuations (Large Scale)								

Fireground Critical Task		Low Risk		Moderate Risk		High Risk		Extreme Risk	
		LERL	UERL	LERL	UERL	LERL	UERL	LERL	UERL
	Communications (Dispatch)								
	Public Information Officer								
	Overhaul								
	Additional Firefighters								
Summary	Incident Response Range	4	13	16	43	36	83	49	108
	Total Fire Department Including External								
	Fire Call Incident Response Range								

Notes:

- L.E.R.L. = Lower Effective Response Level
- U.E.R.L. = Upper Effective Response Level (together form the critical staffing range)
- This tool provides a range of staffing requirements only. Actual numbers may vary depending on the fire risk that exists in the municipality. Tasks performed on fireground based on decisions made by Incident Commander.
- Planning moderate, high and extreme risk occupancies/locations will further validate staffing requirements to ensure the optimum level of protection for the municipality.
- Simultaneous events will require further consideration due to additional personnel requirements beyond the scope of the matrix.
- Incident Command will assume responsibilities for the accountability and entry control tasks when no person has been assigned, or until a person has been assigned the task.

Source: P.F.S.G. 04-08-10 - Operational Planning: An Official Guide to Matching Resource Deployment and Risk

10.5 Province of British Columbia – Office of the Fire Commissioner

The Office of the Fire Commissioner in British Columbia, in consultation with the Fire Chiefs Association of British Columbia, and the British Columbia Fire Training Officers Association has developed the ***Structure Firefighters Competency and Training Playbook*** *(“**B.C. Playbook**”)*.

In our view the most recent addition amended in May of 2015 provides valuable insight into determining the level of fire suppression services to be provided by a municipality including those in other provinces. In further support of the O.F.M.E.M Public Fire Safety Guidelines and N.F.P.A. standards, the “***B.C. Playbook”*** identifies three specific fire suppression service levels for Council’s consideration towards identifying the appropriate fire suppression service levels for the City of Lloydminster. In addition to response times, and the number of firefighters responding, the “***B.C. Playbook”*** links the training qualifications of firefighters to fire suppression service levels.

The “***B.C. Playbook”*** is applicable to all fire services personnel within the Province of British Columbia as defined by their ***Fire Services Act.*** The principles of the “***B.C. Playbook”*** indicate that it is the direct responsibility of the “*authority having jurisdiction”* (A.H.J.) to declare its firefighting service level. The declared fire suppression service level must then be established as a formal policy (by-law, policy or contract) and be fully reflected in operating guidelines within the fire department.

The Playbook identifies the following service levels from which an A.H.J. may choose.

10.5.1 Exterior Operations Service Level

The "***B.C. Playbook"*** recognizes that based on local needs and circumstances a fire department may only be able to attack (suppress) a fire from the exterior of the building or structure. Exterior Operations Level fire service firefighters shall not enter any building, vehicle dumpster or other object if an immediately dangerous to health (I.D.H.L.) atmosphere is present. If an I.D.L.H. atmosphere is present, Exterior Operation firefighters shall only engage in external fire suppression activities. Operational Guidelines that restrict them to Exterior Operations must be written and enforced by the department, even though they may possess equipment that would otherwise permit them to respond at a higher level.

On occasion where the department responds to a simple incident and an I.D.L.H. atmosphere does not yet exist, it is reasonable to address the issue from inside the structure. However, if an I.D.L.H. atmosphere develops or the fire progresses beyond the object of origin, or the environment or structure become compromised in any way, all firefighters must immediately withdraw to the exterior and combat the situation from the outside. Where the I.D.L.H. atmosphere no longer exists as a result of fire suppression operations or otherwise, subject always to an appropriate risk assessment by the Incident Commander, it may be appropriate for members of an Exterior Operations Service Level department to enter the structure.

Where there is a potential risk of an I.D.L.H. atmosphere developing, or risk from smoke or particulate matter when conducting external operations (including overhaul), Self-Contained Breathing Apparatus (S.C.B.A.) must be worn in accordance with WorkSafe BC requirements.

10.5.2 Interior Operations Service Level

Interior Operation Fire Departments may engage in internal fire suppression activities within simple structures or objects such as a vehicle, single family dwelling or other small structure. Interior Operations may also include larger or more complex structures that the A.H.J. has assessed and pre-planned for, such that it determines that structure to be safe for Internal Operations qualified firefighters. Firefighters must be trained specifically to the risks associated with these structures.

Interior Operations Level fire services will have Operational Procedures/Guidelines, that must be written and enforced by the department, that describe advanced training in fire operations activities that allow for a calculated fire attack within permitted structures and objects.

Interior Operations must be undertaken in accordance with the requirements of WorkSafe B.C. (including, in particular, S. 31.23 of the Occupational Health and Safety Regulation). The Incident Commander must recognize the need, and staff appropriately, for a Rapid Intervention Team (R.I.T.) with trained firefighters following the WorkSafe B.C. requirements.

10.5.3 Full Service Level

Full Service Operations Fire Departments are equipped and have completed the appropriate training identified in the "***B.C. Playbook"*** to provide a full spectrum of fire services. These services are based on the Competencies included within the N.F.P.A. 1001 Firefighter Level II Standard and relevant N.F.P.A. Fire Officer Standards.

Full service fire departments will have Operational Procedures/Guidelines that must be written and enforced by the department, that describe advanced training in fire operations activities.

These fire departments are organized such that the suppression activities that occur are based on response protocols which include the appropriate staffing levels, and number and type of apparatus on scene.

10.6 Commission on Fire Accreditation International

The ***Centre for Public Safety Excellent*** (C.P.S.E.) serves as the governing body for the two organizations that offer accreditation, education and credentialing within the fire service across North America: the ***Commission on Fire Accreditation International*** (C.F.A.I.) and the ***Commission on Professional Credentialing*** (C.P.C.).

The Commission on Fire Accreditation International (C.F.A.I.) defines itself through its Mission: *"to assist the fire and emergency service agencies throughout the world in achieving excellence through self-assessment and accreditation in order to provide continuous quality improvement and the enhancement of service delivery to their communities."*

The objective of the C.F.A.I. program is to define an accreditation system that is a credible, achievable, usable, and realistic model. The ultimate C.F.A.I. goal is to provide an accreditation process to improve the abilities of municipalities to both understand and recognize their respective community fire risks, provide balanced public / private involvement in reducing these risks and improve the overall quality of life for community members using the accreditation model.

The '**Principles of Accreditation**' are defined by the C.F.A.I. as follows:

- ***Accreditation:*** A process by which an agency evaluates and recognizes a program of study as meeting certain predetermined standards or qualifications. It applies only to institutions or agencies and their programs of study or their services;
- ***Certification/Professional Designation:*** Certification is a process whereby an individual is tested and evaluated in order to determine his or her mastery of a specific body of knowledge. Professional designation is similar to certification and is proven by which an individual is evaluated based upon experience, education and related accomplishments and is awarded a designation based upon this third party evaluation; and

- ***Standardization:*** A process by which a service is assessed against some fixed standard of performance and quality.

The **"C.F.A.I. Accreditation Model"** is comprised of the following required elements:

- ***Organizational Self-Assessment;***
- ***Standards of Cover;***
- ***Community Risk Analysis; and***
- ***Strategic Plan.***

The C.F.A.I. accreditation process relies significantly on fire suppression standards such as N.F.P.A. 1710 and 1720. However, in many areas the C.F.A.I. utilizes broader and different definitions in comparison to those utilized by N.F.P.A. For example, the term ***"Effective Response Force"*** (E.R.F.) is used by the C.F.A.I. rather than the N.F.P.A. ***"Initial Full Alarm Assignment"***. The C.F.A.I. ***"Effective Response Force"*** is defined as the *"minimum amount of staffing and equipment that must reach a specific emergency response zone location within a maximum prescribed total response time and is capable of initial fire suppression, E.M.S. or mitigation. Effective Response Force is the result of critical tasking analysis as part of the community risk assessment."*

Of interest to this Fire Services Master Planning process is the importance of ***"continuous improvement"*** that is recognized by the C.F.A.I. accreditation process. In our view the development of the Community Risk Assessment and this Fire Services Master Plan support Council's commitment to sustaining and improving the services provided by the Lloydminster Fire Department.

10.7 Importance of Time with Respect to Fire Growth

Time is a critical component with respect to the growth of a fire and the success of intervention by firefighters. Industry research conducted by the National Research Council of Canada indicates that a fire in a non-sprinklered residential occupancy can spread from the room where the fire originates in ten minutes or less. Tests have shown that the fire can extend from the room of origin in as little as three minutes, under fast fire growth conditions.

As a component of the High-Intensity Residential Fires efforts, the Province of Alberta has launched a fire safety campaign called the '***3 minute drill***' to teach people how to prevent, detect and escape from residential fires. This campaign states that ***"Unlike 25 years ago, a house fire today can turn deadly in as little as 3 minutes. When you consider it will take the fire department 7 minutes or more to respond, learning how to prevent, detect and escape a fire has never been more critical."***[27] The

[27] http://www.3minutedrill.alberta.ca/

analysis within this F.S.M.P. will identify that the L.F.D. is currently unable to deploy an initial arriving company including four firefighters within a total response time of seven minutes.

Fire growth rates, defined by the Society of Fire Protection Engineers as slow, medium and fast, are listed in Table 13. The fire growth rates are measured by the time it takes for a fire to reach a one megawatt (M.W.) fire. This is roughly equivalent to an upholstered chair burning at its peak. A two M.W. fire is approximately equal to a large upholstered sofa burning at its peak.

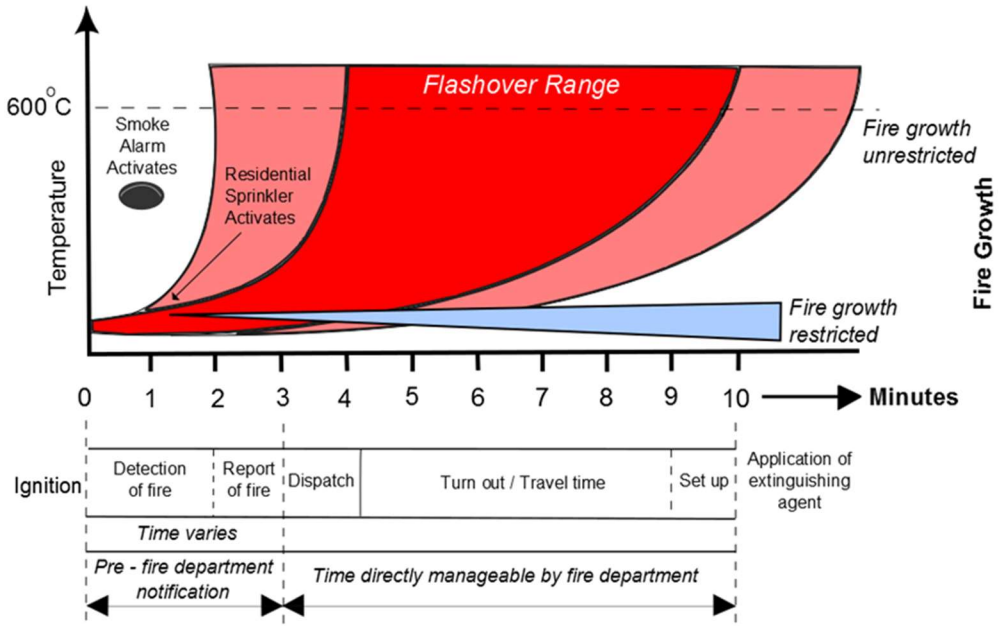
Table 13: Time to Reach 1 M.W. and 2 M.W. Fire Growth Rates in the Absence of Fire Suppression

Time to Reach 1 MW and 2 MW Fire Growth Rates in the Absence of Fire Suppression		
Fire Growth Rate	**Time in Seconds to Reach 1MW**	**Time in Seconds to Reach 2 MW**
Slow	600 seconds	848 seconds
Medium	300 seconds	424 seconds
Fast	150 seconds	212 seconds

(Source: "Operational Planning: An Official Guide to Matching Resource Deployment and Risk", Office of the Fire Marshal and Emergency Management*, January 24, 2011, p. 4).*

Within the ten-minute time period, flashover conditions can occur. Flashover occurs when the combustible items within a given space reach a temperature that is sufficiently high for them to auto-ignite. The graph in Figure 5 highlights the importance of the first two lines of defence, including early detection actions of the occupants. Early detection occupant actions include working smoke alarms, home escape planning, and prompt notification of the fire department. The success of firefighting intervention, given the exponential increase in fire temperature and the potential for loss of property/loss of life with the progression of time, further support the importance of public education and prevention programs.

Figure 5: Example Fire Propagation Curve



Source: *Fire Underwriters Survey "Alternative Water Supplies for Public Fire Protection: An Informative Reference Guide for Use in Fire Insurance Grading" (May 2009) and N.F.P.A. "Fire Protection Handbook" (2001)*

The fire propagation curve reflects the importance of time during the Detection *'detection – report'* stage. This is the time period not impacted by any actions by the fire department. The time period controlled by the fire department begins when the call is initially received by dispatch and includes several other components leading up to the initiation of intervention by fire operations staff.

Understanding factors such as "growth rate" and "time" in terms of how quickly a fire can reach a critical stage such as flashover are important considerations in assessing fire operations performance targets. For example, where areas of the community may have extended response times due to long travel distances, (i.e., in excess of ten minutes), the potential for the fire to have spread from the room of origin or to have already reached a flashover state will be significantly higher.

In these situations, consideration should be given to the first two lines of defence, including the provision of more public education and fire prevention activities as a means to inform the public on how to be prepared and react in the event of a fire.

10.7.1 Fire Suppression Response Times

Within the fire service fire suppression response times are measured and analyzed according to percentile ranking (i.e., percentage of responses meeting a specified timeframe). The 90th percentile (i.e., where 90% or 90 out of 100 responses meet a specific response time target) is a common industry best practice for reporting and understanding emergency first responder performance. Fire and

emergency services commonly measure and report 90th or 80th percentile response time data for system planning and resource deployment purposes.

Within the fire service, ***Total Response Time*** is calculated by assessing three primary factors that include the following:

Dispatch Time + Turnout Time + Travel Time = Total Response Time

10.7.1.1 Dispatch Time

Within the fire service the definition of dispatch time is best defined within the by the ***N.F.P.A. 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*** (2016) that includes the following:

"Emergency Alarm Processing / Dispatching: A process by which an alarm answered at the communications centre is transmitted to emergency response facilities (E.R.F.s) or the emergency response units (E.R.U.s) in the field."[28]

The N.F.P.A. 1221 standard is an industry best practice for fire department dispatch time requirements. It requires that 95% of alarms received on emergency lines shall be answered within 15 seconds, and 99% of alarms shall be answered within 40 seconds. It requires processing of the alarm call (dispatching) to be completed within 64 seconds, for 90% of all calls (90th percentile), and within 106 seconds for 95% of calls. This means that 90 out of 100 calls are required to be dispatched within 64 seconds and that 95 out of 100 calls must be dispatched within 106 seconds.

10.7.1.2 Turnout Time

Within the fire service the definition of turnout time is best defined within the by the *N.F.P.A. 1710 Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments* as:

"the time interval that begins when the emergency response facilities (ERFs) and emergency response unit (ERUs) notification process begins by either an audible alarm or visual annunciation of both and ends at the beginning point of travel time."[29]

Within the City of Lloydminster this definition is applicable to both the on duty crew of full-time/paid on call firefighters, and other responding paid on-call firefighters. The turnout time begins when the firefighters are alerted by the dispatch provider to respond and ends when they arrive at the fire station

[28] N.F.P.A. 1221 2016 Edition
[29] N.F.P.A. 1710 Standard 2016 Edition

and acknowledge they are ready to respond on a fire apparatus. Further analysis of the historical L.F.D. turnout times is included within the following sections of this F.S.M.P.

10.7.1.3 Travel Time

Travel time is also appropriately defined within the *N.F.P.A. 1710 Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments* as:

"The time interval that begins when a unit is enroute to the emergency incident and ends when the unit arrives at the scene."

Within this F.S.M.P. this reflects the amount of time from when the responding apparatus leaves the fire station until that apparatus arrives at the emergency incident. Further analysis of the historical L.F.D. travel times is included within the following sections of this F.S.M.P.

10.8 Historical Emergency Response Analysis

This section presents analysis of historical emergency response capabilities of the L.F.D. for the period from January 1st, 2014 to December 31st, 2018. This includes an analysis of annual call volume, call volume by month, day of the week the time of day and response type.

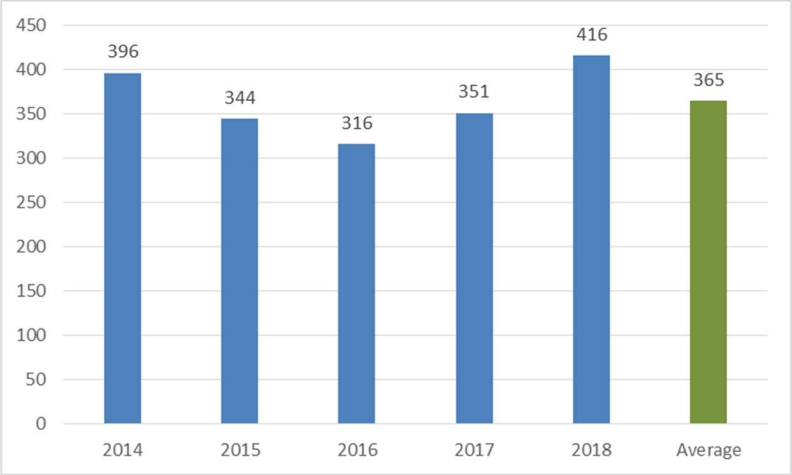
Our analysis of the emergency call data provided by the L.F.D. for the period from January 1st, 2014 to December 31st, 2018 identified several inconsistencies related to the data input that resulted in an inability to assess the dispatch time, turnout time and travel times of the L.F.D. for this period. Our research also indicates that during this time period the L.F.D. fire suppression deployment model allowed for individual, or personal firefighters vehicles to respond to emergency incidents. As a result there is no data available to assess the turnout time or travel time of these vehicles.

The department turnout time and travel time for the first, second and third responding apparatus for the period from January 2nd, 2019 to July 15th, 2019 was assessed to determine the L.F.D. existing fire suppression deployment capabilities.

10.8.1 Annual Emergency Call Volume – All Incidents

A summary of the total number of calls within the City from 2014-2018 is shown in **Figure 6**. The annual call volume provides an understanding of the probability of incidents occurring within Lloydminster.

Figure 6: Annual Call Volume – All Incidents (2014-2018)

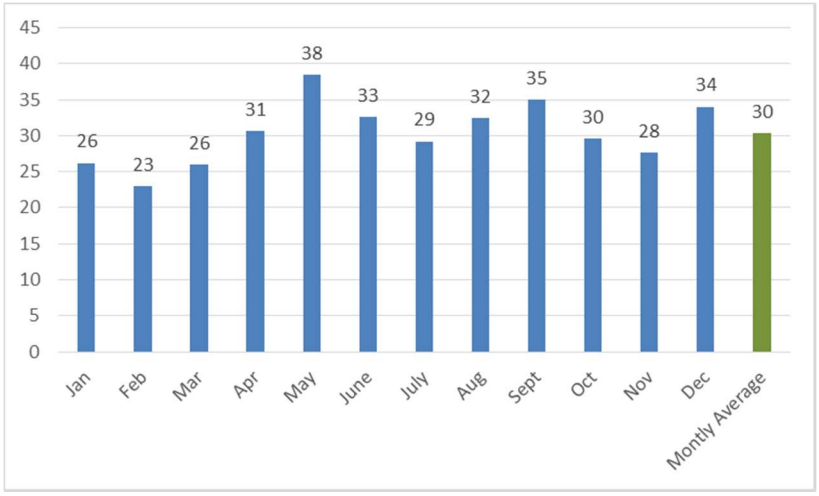


Overall, the number of calls responded to by the L.F.D. has increased by 5% from 2014 to 2018, with the lowest number of calls received in 2016. The most dramatic increase in call volume occurred between 2016 and 2018 over this five year period with an increase in 100 calls. The five-year average annual call volume responded to by L.F.D. is 365 calls. This is roughly equivalent to a call per day, which is a typical threshold at which paid on call operational models transition to composite operational models.

10.8.2 Average Emergency Call Volume by Month – All Incidents

As shown in Figure 7, call volume by month is for all incidents is fairly consistent across all months. On average, the highest call volume occurs in May while the lowest call volume occurs in February. The difference between the highest average call volume and lowest average call volume by month is 15 calls.

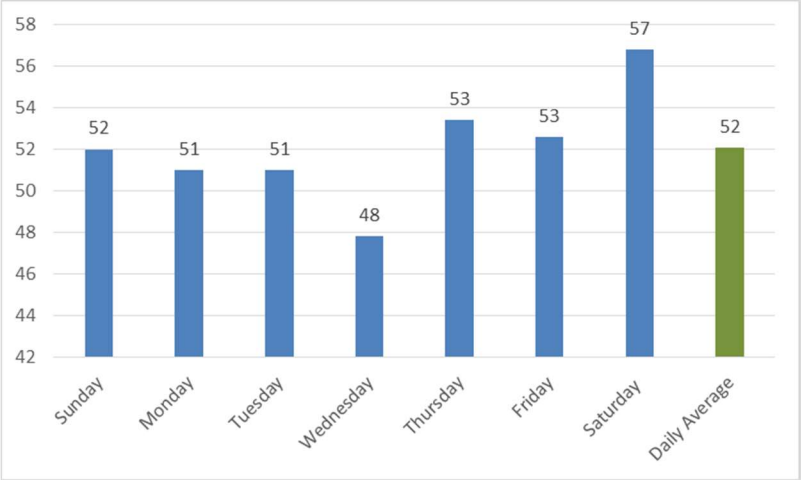
Figure 7: Average Call Volume by Month – All Incidents (2014-2018)



10.8.3 Average Emergency Call Volume by Day of Week – All Incidents

Similar to call volume by month, call volume is fairly consistent across all days of the week, as Figure 8 below illustrates. On average, highest call volume occurs on Saturdays, while the lowest call volume occurs on Wednesdays. The difference between the highest and lowest call volumes is nine calls.

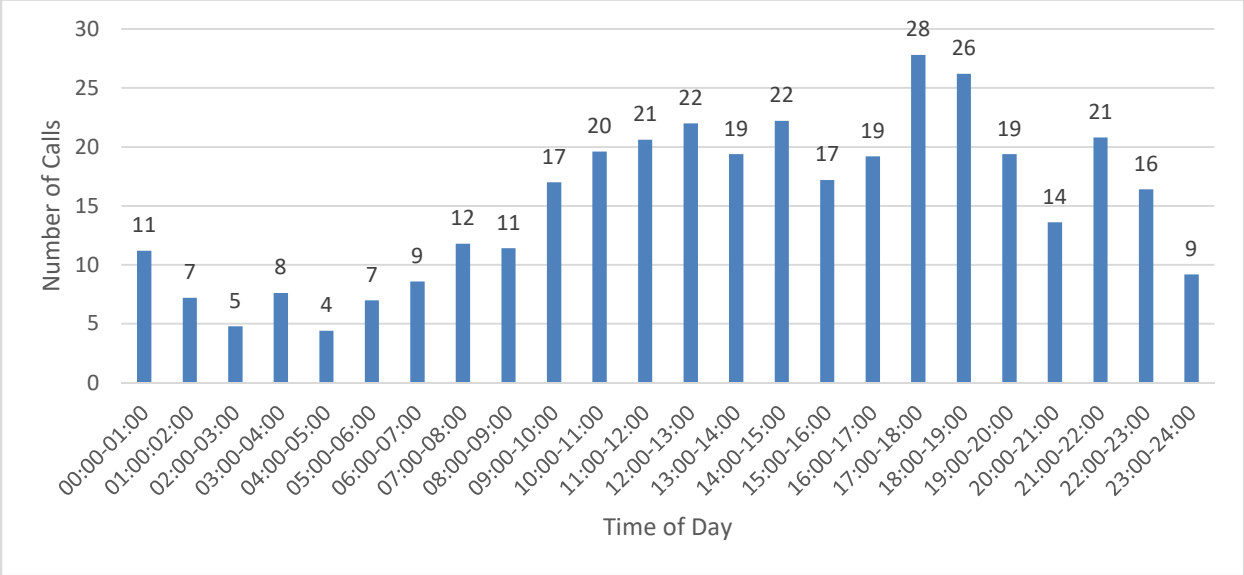
Figure 8: Average Call Volume by Day of Week – All Incidents (2014-2018)



10.8.4 Average Emergency Call Volume by Time of Day - All Incidents

Figure 9 indicates that on average, there is a higher occurrence of calls between 5:00 PM and 7:00 PM. The lowest average call volume takes place between the hours of 11:00 PM and 9:00 AM. This trend of high call volume between 5:00 PM and 7:00 PM coincides with daily times of higher commuter traffic and the lowest average call volume between 11:00 PM and 9:00 AM occurs when the majority of the population is typically asleep.

Figure 9: Average Call Volume by Time of Day – All Incidents (2014-2018)

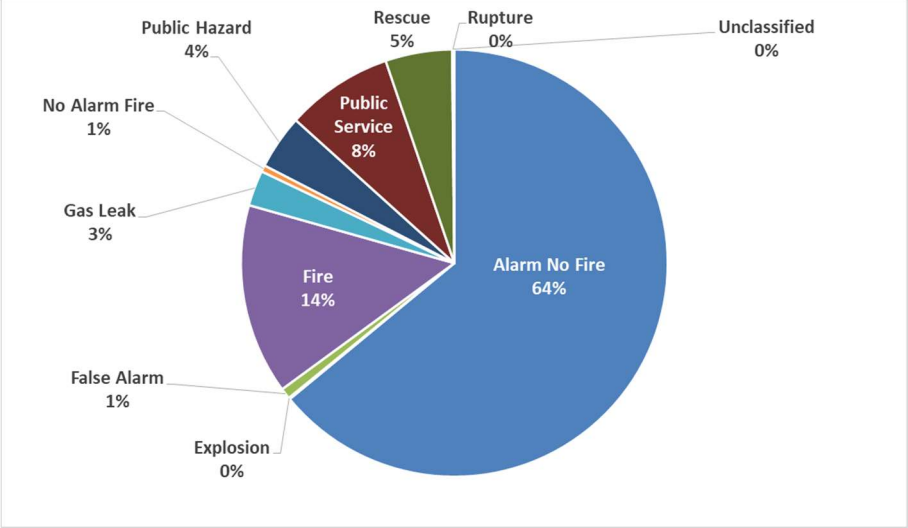


10.8.5 Emergency Calls by Response Type

Figure 10 shows the percentage of calls responded to by the L.F.D. by response type. Alarm, No Fire calls are the most common response type accounting for 64% of all calls. Alarm, No Fire calls include unknown odours investigated, fumigation, smoke or steam mistaken, sprinkler surge or discharge, detector activated, miscellaneous and accidental miscellaneous[30]. This indicates that alarm, no fire calls result in a significant demand on the current resources of the L.F.D. In our experience, these findings support further consideration of a more comprehensive strategy that includes an enhanced and targeted public education campaign, and increased fire inspections of properties where repeat false alarms occur. Additionally, fire calls include fire calls, no loss rubbish or grass fires, and 'no alarm fire – not responded to by fire department'. Fire calls account for 14% of calls responded to and public service calls account for 8%.

[30] Source: Fire Statistics Reporting Manual, Alberta Office of the Fire Commissioner website, last revised March 2006, https://www.alberta.ca/fire-reporting.aspx

Figure 10: Call Volume by Response Type (2014-2018)



10.8.6 Emergency Call Turnout Time – All Incidents (2019)

The "***Interim Staffing Model"*** was implemented on January 2nd, 2019 that includes an on duty crew consisting of one full-time captain, one full-time firefighter and one paid on call firefighter. This model also includes the scheduling of three paid on call firefighters to be available at each of the fire stations to staff the second, third responding apparatus. To determine the 80th and 90th percentile turnout times of the responding apparatus for the period from January 2nd, 2019 to July 15th, 2019 a comprehensive analysis of all incident reports was conducted. Anomalies, including turnout times of less than ten seconds, or more than five minutes, and incidents with missing data such as the "enroute" time were excluded from the data analysis.

Table 14 illustrates that the initial apparatus responding from Station #1 had an 80th percentile turnout time of 3 minutes for the period from January 2nd 2019 to July 15th, 2019 and a 90th percentile turnout time of 3 minutes and 45 seconds.

Table 14: Turnout Time All Incidents (2019)

Responding Apparatus	Station #1		Station #2	
	80th Percentile Turnout Time (min:s)	90th Percentile Turnout Time (min:s)	80th Percentile Turnout Time (min:s)	90th Percentile Turnout Time (min:s)
Initial Responding Apparatus	3:00	3:45	4:20	4:46
Second Responding Apparatus	8:24	10:06	6:33	7:27
Third Responding Apparatus	12:21	14:46	11:00	16:00

10.8.7 Emergency Call Travel Time – All Incidents (2019)

A similar analysis of the historical travel times of the three initial responding apparatus since January 2nd, 2019 was completed. The travel time analysis compared the department capabilities in comparison to the following performance benchmarks:

- ***N.F.P.A. 1720 Suburban Area Demand Zone Performance Benchmark:*** Including a minimum staffing of 10 firefighters arriving on scene within a 10 minute response time (turnout time + travel time) to 80% of the fire related incidents.
- ***N.F.P.A. 1720 Urban Area Demand Zone Performance Benchmark:*** Including a minimum staffing of 15 firefighters arriving on scene within a 9 minute response time (turnout time + travel time) to 90% of all fire related incidents; and

Table 15 illustrates that in comparison to the N.F.P.A. Suburban Area Demand Zone performance benchmark for travel time the initial responding apparatus would have 7 minutes 0 seconds of available travel time as described by this standard. The second responding apparatus would have 5 minute and 40 seconds, and the third responding apparatus would have 3 minutes and 27 seconds of available travel time as described by this standard. This analysis highlights that only the first four responding apparatus have a turnout time that is less than the proposed ten minute total response time (turnout time + travel time).

Table 15: N.F.P.A. 1720 Suburban Area Travel Times - All Incidents (2019)

Responding Apparatus	Station Responding	N.F.P.A. 1720 "Suburban Area" Demand Zone Performance Benchmark Including a 10 Minute Response Time		
		Response Time (min:s)	Turnout Time (min:s)	Available Travel Time (min:s)
Initial Responding Apparatus	1	10:00	3:00	7:00
Second Responding Apparatus	2	10:00	4:20	5:40
Third Responding Apparatus	2	10:00	6:33	3:27
Fourth Responding Apparatus	1	10:00	8:24	1:36

Table 16 illustrates that in comparison to the N.F.P.A. Urban Area Demand Zone performance benchmark for travel time the initial responding apparatus would have 5 minutes and 15 seconds of available travel time as described by this standard. The second responding apparatus would have 4 minute and 14 seconds, and the third responding apparatus would have 1 minutes and 33 seconds of available travel time as described by this standard. This analysis highlights that only the first three responding apparatus have a turnout time that is less than the proposed nine minute total response time (turnout time + travel time).

Table 16: N.F.P.A. 1720 Urban Area Travel Times - All Incidents (2019)

Responding Apparatus	Station Responding	N.F.P.A. 1720 "Urban Area" Demand Zone Performance Benchmark Including a 9 Minute Response Time		
		Response Time (min:s)	Turnout Time (min:s)	Available Travel Time (min:s)
Initial Responding Apparatus	1	9:00	3:45	5:15
Second Responding Apparatus	2	9:00	4:46	4:14
Third Responding Apparatus	2	9:00	7:27	1:33

10.9 Historical Emergency Response Summary

Our analysis of the 2016 Census data indicates that the current population density of the City of Lloydminster (Alberta + Saskatchewan) is approximately **1,922 people per square mile**. Based on the application of the current industry best practices as described within the N.F.P.A. standards presented within this F.S.M.P. the applicable fire suppression performance benchmark for the City of Lloydminster would be contained within the ***N.F.P.A. 1720 Urban Demand Zone*****.** This would include an ***initial arriving company consisting of a minimum of four firefighters*** (one company officer and three firefighters) and a ***minimum of fifteen firefighters arriving on scene within a response time (turnout time + travel time) of nine minutes to 90% of the fire related incidents*** within the City.

Our analysis of the L.F.D.s historical and current ***"Interim Staffing Model"*** indicates that these performance benchmarks exceed the fire department's current fire suppression deployment capabilities. The ***"Interim Staffing Model"*** includes an initial arriving company total minimum complement of one company officer (full-time captain) and two firefighters (one full-time and one paid on call) and includes three paid on call firefighters scheduled to be available at each of the City's two fire stations. This represents a total deployment capability at all times of a minimum of nine firefighters in comparison to the N.F.P.A. 1720 Urban Area Demand Zone performance benchmark requiring a minimum of fifteen firefighters.

During normal business hours Monday through Friday, and subject to their availability (vacation, sick time, and other approved absences), the full-time Fire Chief, Assistant fire Chief and Training Officer/ Captain may also be available to increase the minimum number of responding fire suppression staff to twelve. Other paid on call and off duty full-time firefighters may also be available to respond to a fire related incident however, it is expected that their turnout time to respond to one of the fire stations would be similar to that of staffing the third responding apparatus of approximately ten minutes.

In our view the analysis of the L.F.D. historical and current fire suppression capabilities presented within this F.S.M.P. confirms a number of gaps in the existing qualifications, and availability of a sufficient number of firefighters to consistently attain the fire suppression performance benchmarks contained within the applicable ***N.F.P.A. 1720 Urban Demand Zone*** standard.

In our view the implementation of the ***"Interim Staffing Model"*** in 2019 is consistent with the strategy of ***"continuous improvement"*** as recognized by the ***Commission on Fire Accreditation International*** process, and was a positive step towards improving the fire suppression capabilities of the L.F.D. in response to the identified fire risks within the community.

10.10 Proposed Fire Suppression Performance Benchmarks Targets

We believe the goal of the City of Lloydminster, and the Lloydminster Fire Department, should be to develop a fire suppression deployment model that is able to attain the performance benchmarks contained within the ***N.F.P.A. 1720 Urban Demand Zone*** standard.

However, in the short-term the City and the fire department should consider the ***N.F.P.A. 1720 Suburban Demand*** standard as the initial ***"continuous improvement"*** target for improving the delivering of the current fire suppression services provided by the L.F.D. This will require revisions to the ***"Interim Staffing Model"*** to ensure sufficient qualified fire suppression resources (firefighters) are available at all times to achieve the identified performance objectives contained within the ***N.F.P.A. 1720 Suburban Demand*** standard.

In our view the N.F.P.A. 1720 initial arriving company performance benchmark outlined as ***"Initial firefighting operations shall be organized to ensure that at least four fire fighters are assembled before interior fire suppression operations are initiated in a hazardous area"***[31] should be adopted by the City of Lloydminster. This performance benchmark recognizes that the four firefighters may not arrive on the same vehicle, but that there must be four on the scene prior to initiating any type of interior firefighting operations. This performance benchmark is also consistent with the fire suppression service levels presented with the "***B.C. Playbook***".

Table 17 identifies the proposed Initial Arriving Company fire suppression performance benchmark targets.

Table 17: Proposed Initial Arriving Company Performance Benchmark Targets

Fire Suppression Deployment	Proposed Fire Suppression Performance Benchmark Targets
Initial Arriving Company	A minimum of four qualified firefighters including a Company Officer (e.g., Captain) and three firefighters (full-time/paid on call) be assembled on-scene before initiating any interior fire suppression operations.
Initial Arriving Company	A minimum of four firefighters arriving on scene within a four minute travel time to 80% of fire suppression related incidents within the geographical area of the City.

[31] National Fire Protection Association 1720 Standard Chapter 4, Section 4.6.1 Initial Firefighting Operations.

Council Recommendation #5: That the proposed Initial Arriving Company fire suppression performance benchmark targets presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.

10.10.1 Proposed Initial Full Alarm Assignment Fire Suppression Performance Benchmark Target

The objective of this F.S.M.P. is to provide the City of Lloydminster and the L.F.D. with a strategic planning framework for enhancing the efficiency and effectiveness of the fire suppression services being provided to the community in response to the identified fire risks. In the short-term it is recommended that the City of Lloydminster target the fire suppression performance benchmarks contained within the N.F.P.A. 1720 Suburban Area Demand Zone. This includes ***deploying a minimum of ten firefighters within a ten minute response time (turnout time + travel time) to 80% of the fire related incidents.***

In our view adopting this fire suppression performance benchmark as a short-term goal represents due diligence on behalf of the City in adopting an achievable level of fire suppression capabilities as part of a strategy that focuses on ***"continuous improvement".*** The implementation should coincide with additional data collection and analysis to monitor the L.F.D.'s capabilities as this strategy is implemented. Further consideration should then be given as the L.F.D. moves forward into adopting the fire suppression performance benchmarks included within the N.F.P.A. 1720 Urban Area Demand Zone.

Table 18 identifies the proposed depth of response performance benchmark identified in N.F.P.A. 1720:

Table 18: Proposed Initial Full Alarm Assignment Fire Suppression Performance Benchmark Target

Fire Suppression Deployment	Proposed Fire Suppression Performance Benchmark Target
Initial Full Alarm Assignment	A minimum of ten firefighters arriving on scene within a ten minute turnout time + travel time to 80% of the fire suppression related incidents within the geographically area of the City.

Council Recommendation #6: That the proposed Initial Full Alarm Assignment fire suppression performance benchmark target presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.

10.11 Existing Fire Suppression Deployment Capabilities

This section details our analysis of the existing emergency response deployment capabilities of the L.F.D. The analysis was carried out using Esri's Geographical Information System (G.I.S.) software and online platforms. The modelling scenarios assess the travel time-based response coverage currently experienced within the City. This analysis is completed in reference to the proposed Initial Arriving Company and Initial Full Alarm Assignment fire suppression performance benchmark targets including:

Initial Arriving Company: *A minimum of four qualified firefighters including a Company Officer (e.g., Captain) and three firefighters (full-time/paid on call) be assembled on-scene before initiating any interior fire suppression operations;*

Initial Arriving Company: *A minimum of four firefighters arriving on scene within a four minute travel time to 80% of fire suppression related incidents within the geographical area of the City; and*

Initial Full Alarm Assignment: *A minimum of ten firefighters arriving on scene within a ten minute turnout time + travel time to 80% of the fire suppression related incidents within the geographically area of the City.*

10.11.1 Modelling Methodology

This section provides a brief outline of the methodology used to provide insight into the modelling procedures applied to assess existing response coverage, station location considerations and staff deployment options.

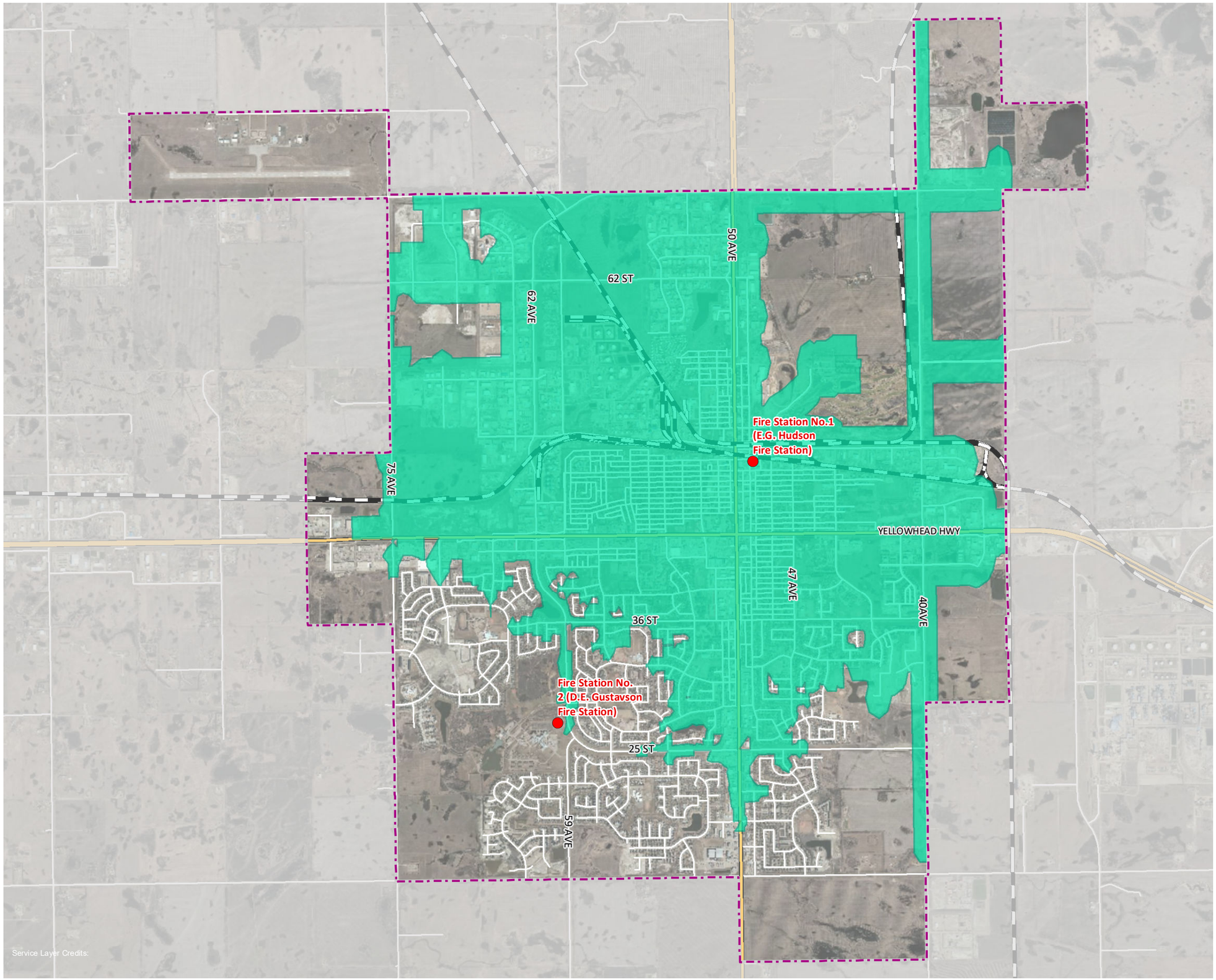
A roads- based GIS program, using the online ESRI calibrated transportation network, was used to assess the Lloydminster Fire Department's response coverage capabilities. The online ESRI platform provides base road information, such as road length, address ranges, and road travel speeds. The model reflected travel speeds at 12:00 noon on weekdays. This was applied as a proxy to represent the general traffic conditions experienced by responding apparatus.

The existing conditions were based on the existing road network and City boundary. This information, combined with the station location, was used to build graphical "response polygons" around the stations. These polygons represent the coverage the station can provide in the specified amount of time. This assesses whether the City is providing adequate emergency response coverage in comparison to the requirements of N.F.P.A. 1710 and N.F.P.A. 1720. As previously mentioned, modelling was completed to assess the department's ability to meet the N.F.P.A. 1710 initial arriving company performance measure and the sub-urban demand zone performance measure identified in N.F.P.A. 1720. This analysis also identifies the areas where the fire department is not currently able to achieve the response time elements or the staffing elements of the performance measures.

10.12 Existing Initial Arriving Company Emergency Response Capabilities

The existing Initial Arriving Company fire suppression deployment model as defined by the ***"Interim Staffing Model"*** includes a Company Officer (full-time Captain) and two firefighters (one full-time and one paid on call firefighter). Based on this staffing model that includes only three firefighters the L.F.D. is ***currently unable to achieve the Initial Arriving Company fire suppression performance benchmark targets presented within this F.S.M.P.***

However, **Figure 11** illustrates that the current on duty crew, although only including a minimum staffing complement of three firefighters is able to respond with an apparatus from Fire Station #1 to provide emergency response coverage to approximately 70% of the roads within the City within a seven minute travel time as defined by the ***N.F.P.A. 1720 Suburban Area Demand Zone*** (3 minute turnout time + 7 minute travel time = 10 minute response time). Increasing the current minimum on duty staffing to a minimum of four firefighters (Company Officer) and (three firefighters) would allow the L.F.D. to achieve this level of fire suppression services as it applies a short-term ***"continuous improvement"*** strategy to attain the proposed fire suppression performance targets presented within this F.S.M.P.



CITY OF LLOYDMINSTER

FIRE SERVICES MASTER PLAN

EXISTING INITIAL ARRIVING COMPANY COVERAGE

FIGURE 11

- Existing Station
- City Limits
- Primary Highway Connector
- Road
- Rail
- Station 1 - 7 minute Travel Time

Approximately 70% of roads are covered by 7 minute travel time band from Station 1.

SCALE 1:35,000

0 250 500 1,000 m

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY CITY OF LLOYDMINSTER

MAP CREATED BY: LK
MAP CHECKED BY: SCD
MAP PROJECTION: NAD 1983 UTM Zone 12N

DILLON CONSULTING

PROJECT: 19-9358

STATUS: DRAFT

DATE: 2019-10-23

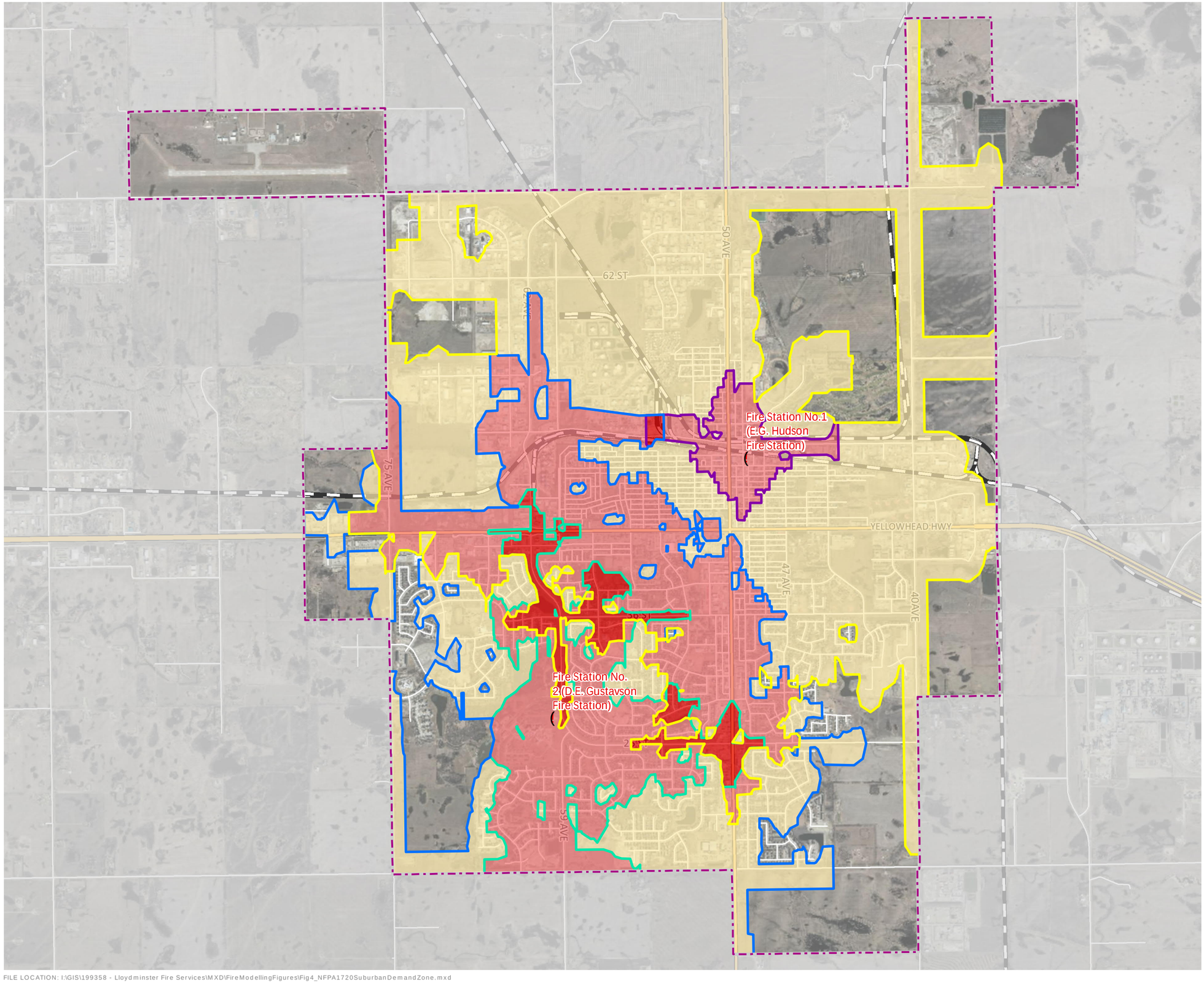
FILE LOCATION: I:\GIS\199358 - Lloydminster Fire Services\MXD\FireModellingFigures\Fig3_Station1_CompanyCoverage_ 7min.mxd

10.13 Existing Initial Full Alarm Assignment Capabilities

The analysis within this F.S.M.P. recommends that the L.F.D. target a fire suppression performance benchmark that includes deploying ***"A minimum of ten firefighters arriving on scene within a ten minute turnout time + travel time to 80% of the fire suppression related incidents within the geographically area of the City".*** The current fire suppression deployment model utilized by the L.F.D. includes the on duty crew from Fire Station #1 (3 firefighters) and a crew of three paid on call firefighters scheduled to respond from both Fire Station #1 and #2. This deployment model represents a total scheduled deployment of nine firefighters.

At times, including Monday through Friday daytime, the current deployment model benefits from the availability of the Fire Chief, Assistant Fire Chief and full-time Training Officer/ Safety Officer Captain. Depending on the type of incident the L.F.D. is also able to deploy off duty full-time firefighters and non-scheduled paid on call firefighters. However, these additional deployment capabilities are subject to the availability of these individuals which can vary as a result of illness, vacation and other reasons. Industry best practices and standards rely upon protocols and deployment models that are able to consistently deploy an identified number of firefighters at all times.

Our analysis of the department's deployment capabilities from January 2nd, 2019 to July 15th, 2019 indicates that four apparatus including a minimum of 12 firefighters were deployed to serval incidents representing a response of the proposed ***Initial Full Alarm Assignment***. **Figure 12** illustrates the ***Initial Full Alarm Assignment*** coverage that these four apparatus are able to provide. Within the current deployment model the L.F.D. is unable to deploy an ***Initial Full Alarm Assignment*** including a minimum of ten firefighters within a total response time of ten minutes (turnout time + travel time) to any areas of the City. The currently deployment model is able to assemble nine firefighters in ten minutes to approximately 5% of the roads within the City, and six firefighters to approximately 38% of the roads within the City.



CITY OF LLOYDMINSTER

FIRE SERVICES MASTER PLAN

EXISTING INITIAL FULL ALARM ASSIGNMENT COVERAGE

FIGURE 12

- Existing Station
- City Limits
- Primary Highway Connector
- Road
- Rail

Service Area

- Truck 1 (Station No. 1) - 7min Travel Time Availability
- Truck 2 (Station No. 2) - 5min 40s Travel Time Availability
- Truck 3 (Station No. 2) - 3min 27s Travel Time Availability
- Truck 4 (Station No. 1) - 1mine 36s Travel Time Availability

Staffing Coverage

- 3
- 6
- 9

Staff	Percentage of Roads Covered
3	50%
6	38%
9	5%

SCALE 1:35,000

0 250 500 1,000 m

2

MAP DRAWING INFORMATION:
DATA PROVIDED BY CITY OF LLOYDMINSTER

MAP CREATED BY: LK
MAP CHECKED BY: SCD
MAP PROJECTION: NAD 1983 UTM Zone 12N

DILLON CONSULTING

PROJECT: 19-9358

STATUS: DRAFT

DATE: 2019-10-23

FILE LOCATION: I:\GIS\199358 - Lloydminster Fire Services\MXD\FireModellingFigures\Fig4_NFPA1720SuburbanDemandZone.mxd

10.14 Summary of Operations/Fire Suppression

Our analyis of the existing fire suppression deployment capabilities of the L.F.D. indicates that the department is currenlty unable to attain the proposed fire suppression performance benchmark targets for both the "***Initial Arriving Company"*** and ***"Initial Full Alarm Assignment".***

Based on our research into preparing this F.S.M.P. it is evident that the introduction of the ***"Interim Staffing Model"*** reflects a significant improvement in the ***"Initial Arriving Company"*** capabilities and overall delivery of fire suppression services by the L.F.D. in comparison to the fire suppression services provided prior to January 2nd, 2019.

The analyses within this F.S.M.P. also confirms that the L.F.D. is in a state of transition as it begins to identify its short and longer-term goals for improving the level of fire suppression services and overall fire protection model in response to the ***"key findings"*** of the ***Community Risk Assessment.*** In our view the immediate goals for Council and the fire department should be to identify achievable short-term goals and objectives in terms of fire suppression performance benchmark targets, and the implementation of staff resource strategies that address the provision of a sufficient number of qualified company officers (supervisors), a minimum on duty staffing of four firefighters at all times, and an increase in the total number of paid on call firefighters to provide greater flexibility to achieve the proposed ***Initial Full Alarm Assignment*** capabilities of the fire department.

As a result of the review of the current operations/fire suppression services and programs the following recommendations are presented for Council's consideration and approval:

Council Recommendations:

Council Recommendation #5: That the proposed Initial Arriving Company fire suppression performance benchmark targets presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.

Council Recommendation #6: That the proposed Initial Full Alarm Assignment fire suppression performance benchmark target presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.

11.0 Communications

11.1 Emergency Call Taking/Fire Dispatching

Within the City of Lloydminster the ***Lloydminster Operations Communications Center*** (L.O.C.C.) is identified as the public service answering point for all emergency calls that the L.F.D. responds to. Staff assigned to this C.O.C.C. are responsible to receive the emergency call from the public, collect the required information to inform the dispatching of the L.F.D. and support responding fire apparatus as they respond to emergency incidents, and when necessary dispatch additional L.F.D. resources or request other agencies to respond.

The C.O.C.C. utilizes the FirePro dispatch software to assist in the dispatching process and to record the applicable dispatching information. At the time of preparing this F.S.M.P. there were no Standard Operation Procedures that defined the required protocols and dispatching process utilized by the C.O.C.C. In our view the applicable industry best practice and standard for emergency call taking and fire dispatching is contained within the ***N.F.P.A. 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*** (2016) that includes the following:

"Emergency Alarm Processing / Dispatching: A process by which an alarm answered at the communications centre is transmitted to emergency response facilities (E.R.F.s) or the emergency response units (E.R.U.s) in the field."[32]

11.2 Emergency Response Dispatching Protocols

It is our understanding that the L.F.D. is in the process of developing what has been referred to as a ***"three-alarm call stratification system"*** as the protocol for dispatching fire apparatus to an emergency incident. Our review of this proposed system indicates that it is consistent in prioritizing the dispatching of fire apparatus based on the severity, complexity and fire risks present. The proposed system includes three protocols for a "first alarm", "second alarm" and "third alarm". In our experience these protocols are very consistent with typical industry best practices.

We do have a concern that the proposed ***"three-alarm call stratification system"*** designates the responsibility to determine the applicable protocol; first/second/third alarm to the first point of contact within the L.F.D. Subject to the information provided by the C.O.C.C. the L.F.D. first point of contact is then required to make the decision as to what response should be provided; first/second/third alarm. In our experience, and based on our knowledge of the L.F.D. current fire suppression operations, the first point of contact within the L.F.D. is most likely to be the on duty full-time captain. In our opinion

[32] N.F.P.A. 1221 2016 Edition

determining what response is to be provided (e.g., first, second or third alarm) is directly related to the fire suppression service level to be provided by the City. The proposed ***"three-alarm call stratification system"*** allows for individual decision-making on behalf of the first point of contact that may, under certain circumstances, result in the inconsistent deployment of fire suppression services. In our view the proposed ***"three-alarm call stratification system"*** presents unnecessary additional risk to the City of Lloydminster that could be better managed through a defined service agreement with the C.O.C.C.

In our view the proposed ***"three-alarm call stratification system"*** should be revised to include defined protocols within a defined Standard Operating Guideline and contractual agreement with the C.O.C.C. that would inform what level of alarm should be dispatched directly by the C.O.C.C. The approved protocols should clearly define what information received from the public would generate the need for either a first, second or third alarm.

Council Recommendation #7: That a defined Service Agreement be developed between the Lloydminster Operations Communications Center and the Lloydminster Fire Department that includes emergency call taking and fire dispatching performance benchmarks as referenced within the proposed Fire Serveries Master Plan.

Council Recommendation #8: That the proposed defined Service Agreement between the Lloydminster Operations Communications Center and the Lloydminster Fire Department include emergency response protocols for defining the dispatching of fire suppression services as referenced in the proposed Fire Services Master Plan.

11.3 Digital Response Communication System

There are opportunities to leverage available technologies that could assist the department with improving turnout times and providing additional communication about the depth of response available. One such application of technology is a web-based / smartphone-based application called 'IamResponding.' The program tracks the response of the paid on call or full-time call-back firefighters as they are responding (or not responding) to emergency calls.

Since the paid on call firefighters are paged by dispatch through a one-way form of communication, the IamResponding technology provides a method for them to respond to their station and fellow members to indicate if they are available and responding, enroute or not able to attend. It provides valuable information to the station to assist with the decision making, such as whether to send a truck to scene or hold the truck for the arrival of more staff. Many departments across the province and Canada have implemented the use of similar technology. The feedback from is generally positive, supporting that the technology works well and is a valuable tool for operations. The main challenge noted is some staff members have concerns that the mobile smartphones used to support this system are owned by the individual firefighters and not provided by the municipality.

Operational Recommendation #33: That the City and L.F.D. consider options for utilizing web-based / smartphone applications that provide paid on call and full-time (call-back) firefighters with the ability to communicate their response status to the stations and other department staff members.

11.4 Internal Communications

Internal communications within a composite fire department is an ongoing challenge. Due to the nature of the model where full-time and paid on call firefighters may not be attending every training session, or every emergency incident, the level of internal communications can fluctuate. Our consultation sessions with the paid on call firefighters revealed the symptoms of not having the optimal level of internal communications.

This F.S.M.P. presents proposed staff resource strategies. In alignment with these strategies, the department should prioritize two way internal communications, including the paid on call and full-time firefighters, led by the L.F.D.'s management team.

Operational Recommendation #34: That the Fire Chief be directed to develop an ongoing communication strategy with the paid on call and full-time firefighters to enhance the "two way" communications within the Lloydminster Fire Department.

11.5 Summary of Communications

The following recommendations relate to the department's communications:

Council Recommendations:

Council Recommendation #7: That a defined Service Agreement be developed between the Lloydminster Operations Communications Center and the Lloydminster Fire Department that includes emergency call taking and fire dispatching performance benchmarks as referenced within the proposed Fire Serveries Master Plan.

Council Recommendation #8: That the proposed defined Service Agreement between the Lloydminster Operations Communications Center and the Lloydminster Fire Department include emergency response protocols for defining the dispatching of fire suppression services as referenced in the proposed Fire Services Master Plan.

Operational Recommendations:

Operational Recommendation #33: That the City and L.F.D. consider options for utilizing web-based / smartphone applications that provide paid on call and full-time (call-back) firefighters with the ability to communicate their response status to the stations and other department staff members.

Operational Recommendation #34: That the Fire Chief be directed to develop an ongoing communication strategy with the paid on call and full-time firefighters to enhance the "two way" communications within the Lloydminster Fire Department.

12.0 Proposed Organizational and Fire Suppression Deployment Model

The analysis within this F.S.M.P. highlights the direct relationship between firefighter qualifications and the level of fire suppression services to be provided by a municipality. The current ***Fire Bylaw No. 25-2015*** does not identify to what level of service the L.F.D. should be providing fire suppression services, it only identifies that the L.F.D. is "***a public organization that provides predominantly emergency firefighting and vehicle extrication services for the City of Lloydminster"***[33].

The proposed ***Organizational and Fire Suppression Deployment Model*** is intended to provide Council with strategies to further inform the efficiency and effectiveness of the ***"Interim Staffing Model"*** in developing a more comprehensive approach to delivering fire suppression services based on the ***"key findings"*** of the Community Risk Assessment. This includes strategies to better align the qualifications and training of all Company Officers and firefighters (full-time and paid on call) with the fire suppression services to be provided by the L.F.D. This strategy targets achieving the proposed ***Initial Arriving Company*** and ***Initial Full Alarm Assignment*** fire suppression performance benchmark targets recommended within this F.S.M.P. and targeting the fire suppression service levels identified by the ***"B.C. Playbook"***.

12.1 Applicable Community Risk Assessment Key Findings

The proposed ***Organizational and Fire Suppression Deployment Model*** is specifically intended to respond to the following ***"key findings"*** of the ***Community Risk Assessment*** including:

- *According to Statistics Canada, 90.5% of the City's existing building stock is comprised of Group C- Residential Occupancies;*
- *The 2016 Census data indicates that 24% of the City's residential building stock is comprised of attached dwellings representing a higher risk of fire exposure;*
- *The building stock within the downtown core includes a number of buildings with minimal separations between them presenting a greater fire risk to occupants and first responders;*
- *There are 14 buildings that present an increased fire risk due to their large floor areas;*
- *Research identified seven High Life-Safety Risk Occupancies within the City of Lloydminster;*
- *The City of Lloydminster Hazard Risk and Vulnerability Assessment identifies the top hazards within the City as hazardous materials spills, industrial fire, non-emergency events, overland flooding, rail Incident, urban fire, and wind event related to summer storms;*
- *The call volume in 2018 exceeded the 5-year annual call volume average of 365 calls by 12%;*

[33] City of Lloydminster – Bylaw No. 25-2015 – Section 2, Definitions 2.1 (h)

- *Major road disruptions along Highway 16 which runs East/West through the City centre, could result in heavy traffic congestion and the rerouting of commercial trucks through the City leading to longer fire department response times both on the highway and within the City;*
- *Rail lines within the City have been identified as hazardous material routes that may present a higher risk to the community;*
- *The at-grade railway crossing on 50th Avenue located just north of Fire Station No. 1 creates a potential delay in emergency response times from this station to areas north of this at-grade rail crossing; and*
- *The City has a potential risk of wildland fire due to the wildland-urban interface primarily located outside of the urban settlement area.*

12.2 Future Community Growth Considerations

Future community growth considerations within this F.S.M.P. for the City of Lloydminster have been informed by the ***2013-2032 Municipal Development Plan's Future Land Use Concept*** map created July 7th, 2013. The City identified that for the purposes of this study it was appropriate to reference the Future Land Use Concept presented in the 2018 - 2032 MDP as shown in **Figure 13** The future land use concept shows areas within and beyond the current municipal boundary that are designated growth areas.

To further inform the proposed ***Organizational and Fire Suppression Deployment Model*** Dillon worked with the City to identify the future community growth anticipated to occur within City boundaries over the short-term (10+ years), medium-term (20 years) and long-term (20+ years) horizon as shown in **Figure 13**.

According to this map, there are several areas planned for residential development within the next 10 years south of Highway 16 which is anticipated to continue in some areas in the medium and long-term as well. Some short-term industrial development is anticipated for the City's northwestern corridor and in one area south of Highway 16 and east of 40th Avenue. There is some mixed use development planned in the northeastern section of the City, north of highway 16 and east of 50th Avenue for the medium and long-term. In addition, within the anticipated residential growth areas south of Highway 16, there is a small section designated for commercial use in the short-term.

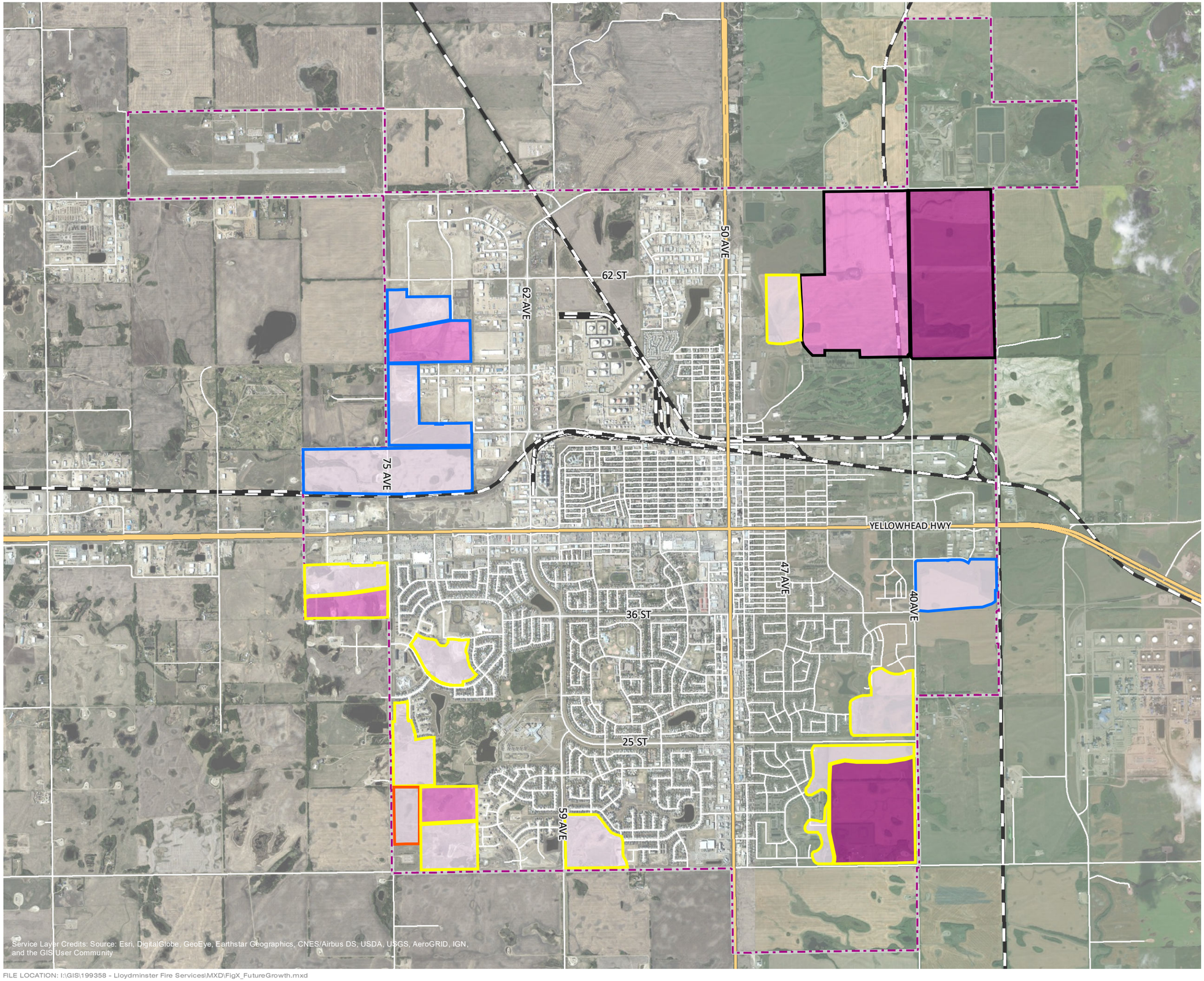
The proposed ***Organizational and Fire Suppression Deployment Model*** is intended to assist Council in further developing the existing fire protection services, and specifically the fire suppression services currently provided by the L.F.D. to address projected future community growth.

CITY OF LLOYDMINSTER

FIRE SERVICES OPERATIONAL REVIEW

FUTURE LAND USE CONCEPT

FIGURE 13



City Limits
Primary Highway Connector
Road
Rail

Future Land Use

Industrial
Commercial
Residential
Mixed Use

Future Development Horizon

10 Years
20 Years
20+ Years

SCALE 1:35,000

0 250 500 1,000 m

N
W E
S

MAP DRAWING INFORMATION:
DATA PROVIDED BY CITY OF LLOYDMINSTER

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 12N

DILLON CONSULTING

PROJECT: 19-9358
STATUS: DRAFT
DATE: 2019-10-02

FILE LOCATION: I:\GIS\199358 - Lloydminster Fire Services\MXD\FigX_FutureGrowth.mxd

12.3 Proposed Fire Suppression Deployment Model

12.3.1 Proposed Minimum Number of Firefighters on Duty

The research and analysis presented within this F.S.M.P. supports the need for Council to consider approving a strategy to increase the minimum on duty staffing at Fire Station #1 to a minimum of four firefighters at all times. The implementation of this strategy would result in the L.F.D. being able to deploy an ***Initial Arriving Company*** of four qualified firefighters at all times to achieve the proposed fire suppression performance benchmark target of deploying of ***"A minimum of four qualified firefighters including a company officer (e.g., captain) and three firefighters (full-time/paid on call) be assembled on-scene before initiating any interior fire suppression operations".*** In our view this strategy could be implemented by either increasing the number of full-time firefighters, or alternatively increasing the number of paid on call firefighters on duty at all times.

Increasing the minimum on duty staffing at Fire Station #1 to a minimum of four firefighters at all times was one of the most consistent items raised within the internal consultation process that included input from fire department staff. This feedback, and the analysis within this F.S.M.P. support the need for this recommendation to be considered a priority for the City for implementation as soon as possible. As such, scheduling one more paid on call firefighter to each shift is in our view the most efficient strategy to implement this recommendation in the short-term.

Council Recommendation #9: That the City of Lloydminster prioritize consideration of increasing the minimum number of firefighters on duty at all times to four firefighters (one Captain and three firefighters) to increase the efficiency and effectiveness of the Initial Arriving Company as defined by the National Fire Protection Association.

The implementation of this strategy will also result in an improvement of the efficiency and effectiveness of the L.F.D. towards achieving the proposed fire suppression performance benchmark target of deploying ***"A minimum of four firefighters arriving on scene within a four minute travel time to 80% of fire suppression related incidents within the geographical area of the City".***

12.3.2 Proposed Increase of Paid on Call Firefighters

This F.S.M.P. includes recommendations that target the sustainability of utilizing paid on call firefighters as a critical element of delivering fire suppression services. Properly trained and qualified paid on call firefighters represent an effective operational strategy, and fiscally responsible model, for delivering fire suppression services within the City of Lloydminster. In our view the sustainability of paid on call firefighters is an integral component of enhancing the L.F.D.'s existing fire suppression capabilities in order to attain the proposed fire suppression performance benchmark target of deploying ***"A minimum of ten firefighters arriving on scene within a ten minute turnout time + travel time to 80% of the fire suppression related incidents within the geographically area of the City"***.

At the time of preparing this F.S.M.P. there were 26 active Paid on Call Firefighters within the L.F.D. Based on our research the department is approved for a total complement of 40 Paid on Call Firefighters. As such, this F.S.M.P. includes a recommendation for the City to develop a ***"Comprehensive Recruitment and Retention Strategy".*** In our view this is an immediate need for the fire department to recruit the 14 paid on call firefighters to fil the existing vacancies. Following this the department should target increasing the total complement to 50 paid on call firefighters (25 at each station) as soon as possible.

Council Recommendation #10: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that the short-term priority be to increase the number of paid on call firefighters to a total complement of 50.

12.3.3 Proposed Implementation of Paid on Call Company Officers

Current industry best practices and occupational health and safety regulations support the need for ***"competent supervisors"***. Our review of the current organizational structure of the L.F.D. and the internal consultation process identifies that at times apparatus staffed with paid on call firefighters respond to emergencies without an identified company officer (supervisor). The N.F.P.A. standards referenced within this F.S.M.P. highlight the importance of all responding apparatus designated as a ***"Company"***[34] and defined as ***"under the direct supervisor of an officer"***[35] have a qualified company officer.

In our view the organizational structure of the L.F.D. should reflect a ratio of one company officer for every four firefighters. The principal of this ratio has been established by the ***"Interim Staffing Model"*** that includes a full-time captain (company officer) on each on duty crew. In our view the L.F.D. needs to consider the implementation of a revised organizational structure that is able to consistently provide a qualified ***"Company Officers"*** (supervisors) on all responding fire apparatus, and to support recognized incident management practices that support the need for a rank structure, and ratio of qualified ***"Company Officers"*** (supervisors) to firefighters.

It is recommended that the L.F.D. implement a "Company Officer" (supervisor) structure within the paid on call firefighter contingent. In our view this should include one paid on call company officer at each of the fire stations who is assigned the roles and responsibilities for overseeing, and leading, the paid on call firefighters assigned to that fire station. There will be a need for broader internal discussion to define the specific roles and responsibilities and rank of this position. However, in our view, this position should hold the rank of paid on call captain. In addition to these two positions the department should consider the implementation of a sufficient number of additional paid on call "company officers" to

[34] National Fire Protection Association 1710 Standard, Chapter 3 Definitions, Section 3.3.13 Company
[35] National Fire Protection Association 1710 Standard, Chapter 3 Definitions, Section 3.3.13 Company

attain the proposed ratio of one qualified ***"Company Officer"*** (supervisor) for every four paid on call firefighters.

In our experience the rank of a ***"Lieutenant"*** that provides basic supervision to firefighters in the department when required, and that provides leadership on emergency scenes, in the station and in the public, would be an appropriate rank for consideration within the paid on call contingent. These ***"Company Officers"*** (supervisors) would be required to respond to emergency incidents of all types performing various operational tasks when needed. Paid on call Lieutenants could participate in leading and overseeing facility and equipment maintenance, training and professional development activities as well as fire prevention and education programming within the community and at the station.

Council Recommendation #11: That consideration be given to implementing the proposed Paid on Call Firefighter Company Officer strategy presented within the proposed Fire Services Master Plan.

12.3.4 Interim Staffing Model on Duty Shift Schedule

Implementation of the ***"Interim Staffing Model"*** included the implementation of a 24 hour work schedule for the on duty crew. Over the past decade the introduction of 24 hour shift systems has become more common within the fire service. In many situations this implementation has been done through the collective bargaining process and included trial periods to assess the efficiency and effectiveness of the applicable 24 hour shift schedule. Many fire departments remain in the trial period as historical data is collected to accurately define the benefits or challenges with this type of shift schedule.

Based on our experience 24 hour shift systems are more common in larger fire departments operating multiple fire stations and multiple fire companies, including only full-time firefighters. Even in these larger departments, municipalities have reported increased sick time, increased overtime, and difficulty achieving mandatory training requirements as ongoing challenges with managing 24 hour shift systems. Operational challenges have also been reported in the event of multiple large emergency calls within a 24 hour period. In these instances firefighters can become fatigued quickly, resulting in increased health and safety concerns for municipalities. There are larger fire department that require a ***"rest period"*** for ***"Initial Arriving Companies"*** to be rehabilitated prior to being reactivated to be able to respond to other emergency calls.

The internal consultation process with the full-time and paid on call firefighters presented varying and sometimes opposing views on the benefits of the current 24 hour shift system. The full-time firefighters expressed positive comments about the benefits to their personal work life balance and an overall support for continuing the current 24 shift system. The paid on call firefighters acknowledged the benefits for the full-time firefighters as being positive, however, several comments were presented such as it being difficult for paid on call firefighters to commit to a 24 hour period to participate in the schedule for filling the paid on call duty position. Other comments were received regarding the potential

negative impact on the ability for training to be facilitated consistently, and that based on the current 24 hour shift system there is limited interaction between on duty crews and the Fire Chief, Assistant Fire Chief and full-time Training Officer/ Safety Officer Captain.

Based on our experience and review of the L.F.D. current 24 hour system two significant concerns were identified including the following:

- ***Based on the current deployment model of the L.F.D. the on duty crew is the primary responder to all emergency related incidents within a 24 hour period. Review of the historical emergency call volume indicates that emergency call volume is increasing. In the event of more than one moderate to significant emergency incident, or multiple smaller emergency responses within the 24 hour period that the on duty crew is working there is a high risk that the on duty firefighters may have insufficient time for rehabilitation. The result could be a high risk to the health and safety of these firefighters.***
- ***Based on our consultation with the paid on call firefighters, and our experience in assessing and recommending fire suppression deployment models, including those that utilize paid on call (volunteer) firefighters, it is our view that the current 24 hour system being utilized by the L.F.D. is not the most effective and efficient model for supporting the utilization of paid on call firefighters to partially staff the on duty crew. In our view a four platoon system that includes a fire suppression on duty shift model comprised of four 10 hour days and four 14 hour nights (i.e., four on four off) would be more conducive to supporting the utilization of paid on call firefighters.***

In our view a ***"four on four off***" shift schedule would provide greater flexibility of paid on call firefighters to participate in the current on duty scheduling process. In our view the "***four on four off"*** shift schedule would also result in more consecutive days of interaction with the Fire Chief, Assistant Fire Chief and full-time Training Officer/ Safety Officer Captain on a regular basis. In our view this would further promote communication, training and the collaboration that will be required to implement the recommendations contained within this F.S.M.P.

It is recommended that the L.F.D. revise its current 24 shift system to a shift system that includes four consecutive 10 hours days (08:00 to 18:00), followed by four consecutive days off, and then four consecutive 14 hour nights (18:00 to 08:00) followed by four days off.

Council Recommendation #12: That consideration be given to implementing the proposed on duty shift schedule presented within the proposed Fire Services Master Plan.

12.4 Proposed Organizational and Fire Suppression Deployment Model Summary

The analysis and recommendations presented within this section are intended to support the proposed ***"strategic priorities"*** presented within this F.S.M.P. and further inform Council in the process to consider the applicable fire suppression services that should be provided within the City of Lloydminster based on the ***"key findings"*** of the Community Risk Assessment.

In our view Council with the support of senior corporate and fire department staff took the first step towards developing a comprehensive fire protection plan for the City of Lloydminster by approving and implementing the ***"Interim Staffing Model".*** The recommendations contained within this section of the F.S.M.P. are intended to build on the foundation the ***"Interim Staffing Model"*** has created in guiding the City of Lloydminster towards implanting the further efficiency and effectives of the Lloydminster Fire Department in providing effective fire suppression services based on the fire risks present.

The following recommendations are presented for Council's consideration and approval:

Council Recommendations:

Council Recommendation #9: That the City of Lloydminster prioritize consideration of increasing the minimum number of firefighters on duty at all times to four firefighters (one Captain and three firefighters) to increase the efficiency and effectiveness of the Initial Arriving Company as defined by the National Fire Protection Association.

Council Recommendation #10: That subject to Council's consideration and approval of the proposed Fire Services Master Plan that the short-term priority be to increase the number of paid on call firefighters to a total complement of 50.

Council Recommendation #11: That consideration be given to implementing the proposed Paid on Call Firefighter Company Officer strategy presented within the proposed Fire Services Master Plan.

Council Recommendation #12: That consideration be given to implementing the proposed on duty shift schedule presented within the proposed Fire Services Master Plan.

13.0 Fire Stations and Apparatus

This section provides an overview of the department's existing fire stations and presents a review of the fire department vehicles, apparatus, equipment and related maintenance.

13.1 Existing Fire Stations

The L.F.D. operates from two existing fire stations, described below. The locations of the two stations within the City are shown in **Figure 14.**

13.1.1 Fire Station No. 1

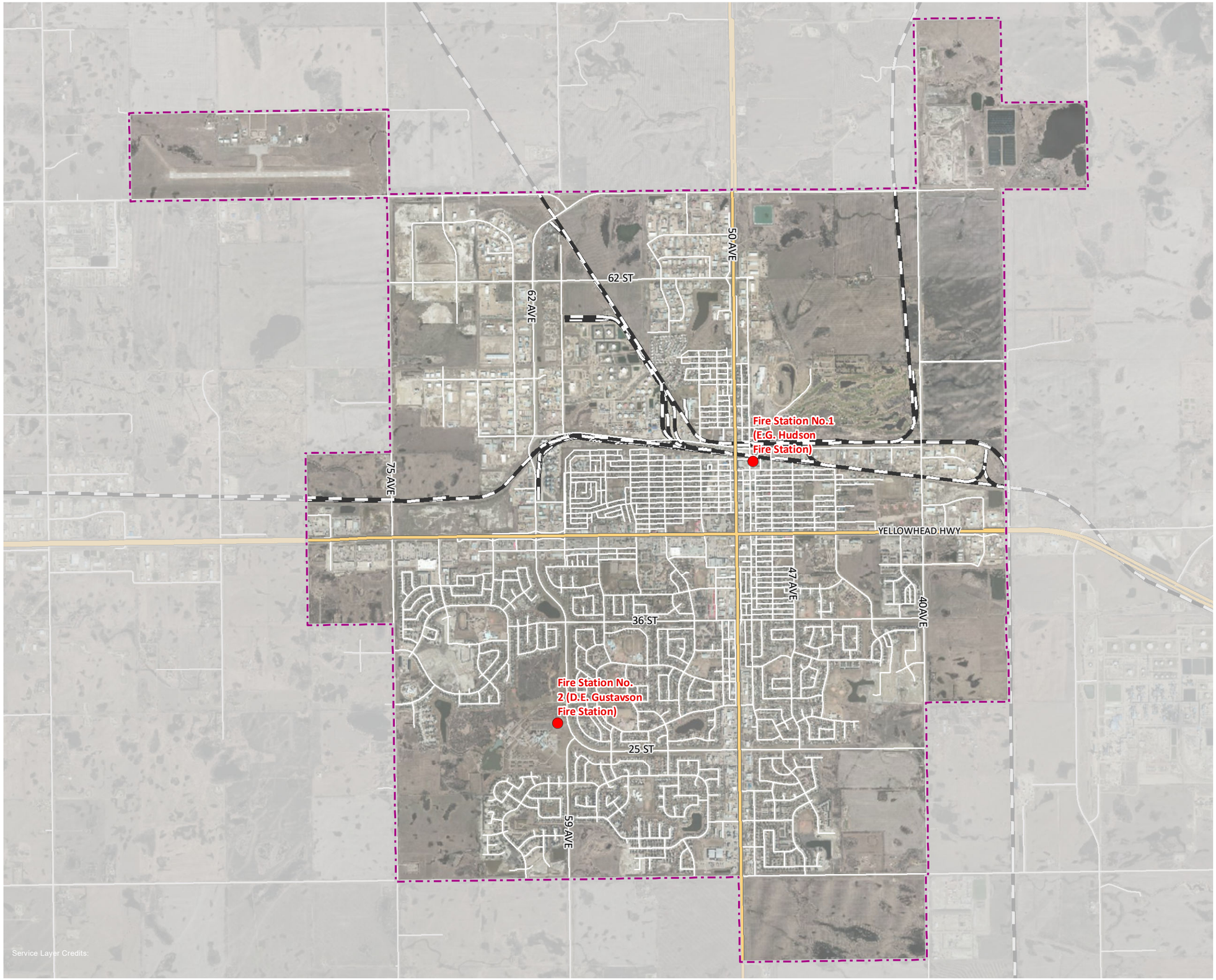
Fire Station No. 1 (E.G. Hudson Fire Station) is located in the downtown of the City of Lloydminster at 5013-49 Avenue, Lloydminster, Saskatchewan. This station, originally built in 1949, is the oldest of the two fire station facilities. The four bay station house two pumpers, an aerial and an equipment unit. There are two offices within the station, which are currently occupied by the Assistant Fire Chief and the Administrative Assistant. The station has a small kitchen, small assembly area and basic amenities for the firefighters. Four dorms for the fire suppression staff on overnight shifts are located in a modular trailer behind the fire station. No diesel emissions controls were observed within the station and the bunker gear is currently stored in open shelving units on the apparatus bay floor. Municipal best practices for modern fire stations would recommend diesel emissions controls on the bay floors and separate and ventilated storage for the bunker gear.

The City has undertaken a Needs Assessment study for this fire station as signs indicate that it has reached the end of its life cycle. It is anticipated that, as a result of the Needs Assessment study, the City will plan for the design and construction of a new Fire Station No. 1 facility. Consideration should be given to designing the new station as a headquarters for the fire department, equipped with sufficient office space for the existing and planned future needs of the department. This would address the administrative workspace challenges identified in **Section 7.6**.

13.1.2 Fire Station No. 2

Fire Station No. 2 (D.E. Gustavson Fire Station) is located in the southern part of the City at 2716 – 59 Avenue, Lloydminster, Alberta. The station, built in 2010, is in very good overall condition. It is our understanding that the station was designed and constructed to accommodate future expansion, if / when required. There are two offices located at this station which currently accommodate workspace for the Fire Chief and the Training Officer.

This station also operates as an alternate Emergency Operations Centre and it includes a built-in, oversized generator (to accommodate for potential facility expansion). Neither of the station's two apparatus bays are drive-through bays. The station does not currently have diesel emissions controls and the bunker gear is stored in open cages on the apparatus floor, not separated and ventilated. An area for fire department staff to exercise is located on the apparatus bay floor. Ideally, exercise space would be separated from areas exposed to diesel emissions.



CITY OF LLOYDMINSTER

FIRE SERVICES MASTER PLAN

EXISTING FIRE STATION LOCATIONS

FIGURE 14

- Existing Station
- City Limits
- Primary Highway Connector
- Road
- Rail

SCALE 1:35,000

0 250 500 1,000 m

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY CITY OF LLOYDMINSTER

MAP CREATED BY: LK
MAP CHECKED BY: SCD
MAP PROJECTION: NAD 1983 UTM Zone 12N

DILLON CONSULTING

PROJECT: 19-9358

STATUS: DRAFT

DATE: 2019-10-21

FILE LOCATION: I:\GIS\199358 - Lloydminster Fire Services\MXD\FireModellingFigures\Fig1_ExistingFireStations.mxd

13.1.3 Diesel Emissions

Within the fire service there is a growing recognition of health and safety concerns related to diesel exhaust emissions from major apparatus stored within a fire station. Municipal best practices reflect a number of actions to limit the exposure of the diesel emissions. This includes the installation and use of a diesel exhaust system for the apparatus floors of all fire stations. The exhaust system may be a direct capture type exhaust system (or 'direct connection' system) that connects diesel exhaust hose lines to the exhaust pipes of individual vehicles or alternatively ceiling-mounted exhaust systems.
In our experience, the ceiling-mounted diesel exhaust systems are more effective. The direct connection systems are prone to human-error if they are not connected to the vehicle exhaust pipes at all time while in the station. The ceiling mounted systems are more consistent with industry best practices.

During the station tours conducted for this F.S.M.P. there were several items noted related to diesel emissions concerns. Neither of the department's existing two fire station apparatus bays currently have diesel exhaust systems in place. There is also a gym / exercise area at Fire Station No. 2 is on the apparatus floor, exposing it to diesel emissions, as noted above. From a health and safety perspective the gym area should be relocated or modified to be separate from the apparatus bay with its own ventilation.

Related to these considerations, municipal best practices for bunker gear storage reflects the use of separated, ventilated (exhausted to outdoors) storage rooms. Once again neither of the two existing fire stations have separate, closed and ventilated rooms for the bunker gear. This practice is considered critical to the life span of the gear and the long term health of the firefighters. It protects the bunker gear from exposure to diesel emissions, which can cause deterioration of the equipment overtime. The bunker gear itself, after use at active calls, can also release toxins into the air of the station. It is recommended that station revisions (Fire Station No.2) or designs (new Fire Station No. 1) be considered to provide separate and exhausted storage for bunker gear.

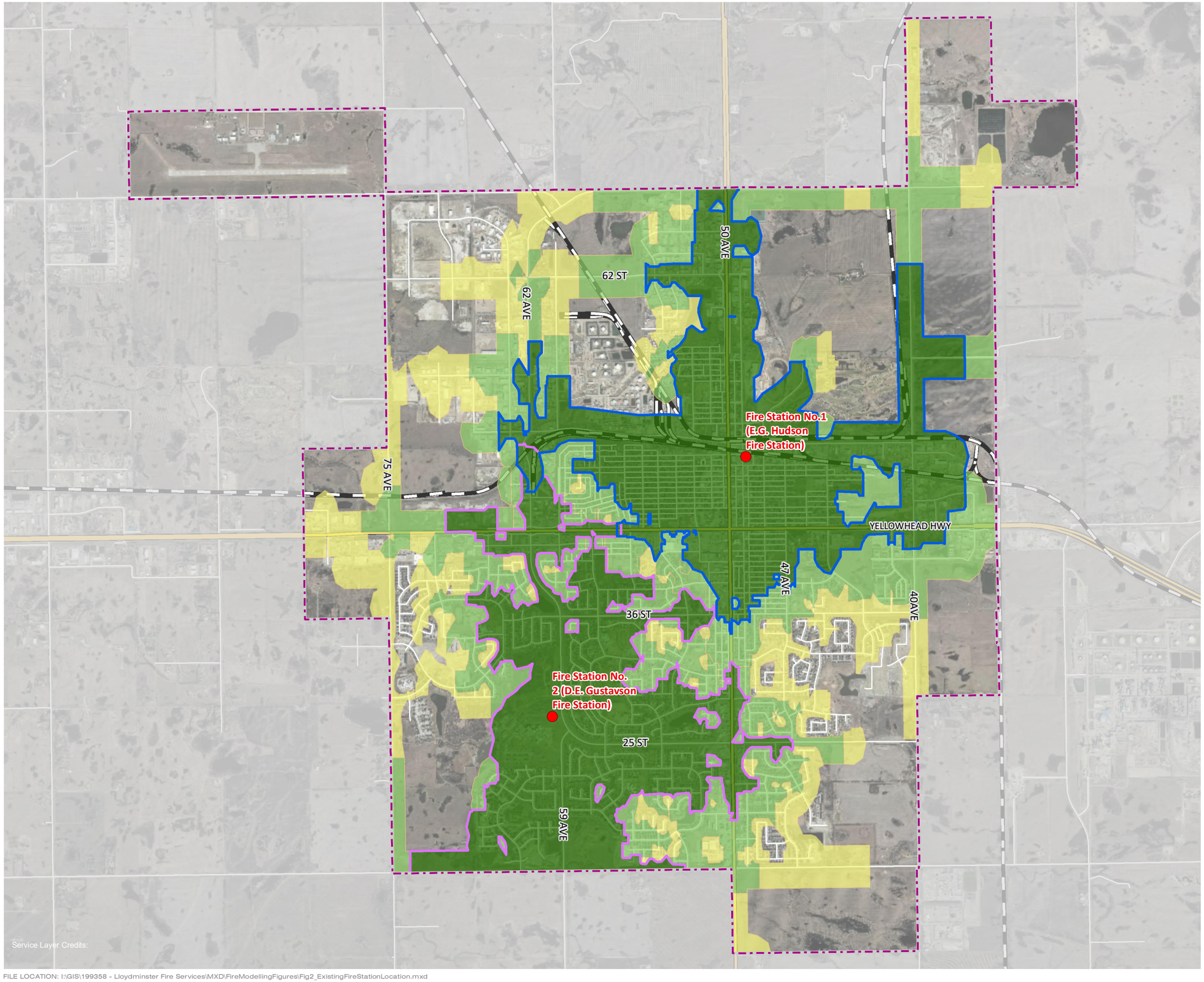
Operational Recommendation #35: That consideration be given to strategies that target the mitigation of diesel emissions within both existing fire stations and any future fire stations.

13.2 Consideration of Fire Station Locations

Current industry best practices for assessing fire station locations are typically founded upon the utilization of a four minute travel time emergency response performance benchmark. This process aligns with current industry standards related to fire suppression performance benchmarks, such as N.F.P.A. 1710.

The analysis within this section illustrates the predicted initial response coverage from the existing two station locations, based on the travel times of the first apparatus deployed from each existing fire station location. This analysis was completed using the G.I.S. based modelling methodology outlined within the Operations / Fire Suppression section. **Figure 15** shows the emergency response coverage

capabilities within ***"a four minute travel time"*** performance benchmark in dark green. The model predicts that 53% of the City's roads would be covered within a four minute travel time from the existing fire stations. The model also identified the five minute and six minute coverage areas from the existing stations. Within five minutes of travel time it is predicted that 77% of the City's road could be covered from the existing fire station locations. Within six minutes of travel time it is predicted that 91% of the City's road could be covered from the existing fire station locations. This indicates that the existing station locations are well-placed within the City. A visual review of the coverage areas also indicates that the stations provide a good amount of coverage, without significant overlap or loss of coverage beyond the boundaries of the City. It should be noted that this analysis only refers to the travel time coverage of the deployed apparatus and ***does not*** include any analysis of how many firefighters may be responding on this apparatus. It also does not account for turnout time.



CITY OF LLOYDMINSTER

FIRE SERVICES MASTER PLAN

EXISTING FIRE STATION LOCATIONS PREDICTED INITIAL RESPONSE COVERAGE

FIGURE 15

- Existing Station
- City Limits
- Primary Highway Connector
- Road
- Rail
- Fire Station No. 2 (D.E. Gustavson Fire Station) 4 Minute Travel Time
- Fire Station No.1 (E.G. Hudson Fire Station) 4 Minute Travel Time

Travel Time (Minutes)

- 4
- 5
- 6

Time Band	Percentage of Roads Covered
4	53%
5	77%
6	91%

SCALE 1:35,000

0 250 500 1,000 m

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY CITY OF LLOYDMINSTER

MAP CREATED BY: LK
MAP CHECKED BY: SCD
MAP PROJECTION: NAD 1983 UTM Zone 12N

DILLON CONSULTING

PROJECT: 19-9358
STATUS: DRAFT
DATE: 2019-10-23

FILE LOCATION: I:\GIS\199358 - Lloydminster Fire Services\MXD\FireModellingFigures\Fig2_ExistingFireStationLocation.mxd

13.3 Apparatus and Equipment

The Assistant Fire Chief position is responsible for the management and oversight of the L.F.D.'s vehicles, apparatus and equipment resources, including the coordination of maintenance.

13.3.1 Standard Operating Procedures

It is our understanding that at this time only one S.O.P. has been developed relating to apparatus and equipment - ***S.O.P. #0018 – Fire Station Apparatus Bay.*** This S.O.P. outlines the activities that occur within the apparatus bays of the fire stations.

As identified in other areas of this F.S.M.P., there is a need for the department to develop additional S.O.P.s relating to the roles, duties, requirements, expectations and rules relating to vehicles, apparatus and equipment, including maintenance.

13.3.2 Maintenance

The City contracts maintenance services for the fire department vehicles, fleet and equipment to local, private shops, as well as to Rocky Mountain Phoenix, based in Red Deer. Rocky Mountain Phoenix has mobile repair teams and also has certified Emergency Vehicle Technicians on staff to conduct inspections / routine maintenance / repairs on fire apparatus. The inspections, maintenance and repairs of department equipment is also outsourced. Firefighters are responsible for conducting routine inspections only and for reporting any service needs to the Assistant Fire Chief. The department is currently reviewing their maintenance procedures and creating daily, weekly and monthly vehicle and equipment checks. Once developed, an S.O.P. should be developed to outline the maintenance procedures.

13.3.3 Records Management

As noted in other areas of this F.S.M.P., there is a need to improve the use of the department's Records Management practices and procedures. This includes enhancing the use of the FirePro software, and using the capacity of the software to meet the records management needs of all areas of the L.F.D. The records maintained for apparatus and equipment should meet the guidelines of records retention outlined by the City of Lloydminster as well as those required by regulatory / government agencies (e.g., Alberta Transportation).

13.3.4 Types of Major Fire Apparatus

N.F.P.A. 1901 *Standard for Automotive Fire Apparatus* (2009 Edition) is a reference for the standards that should be considered in determining the appropriate apparatus for a community. N.F.P.A. 1901 provides the following definitions of major fire apparatus:

Pumper: Fire apparatus with a permanently mounted fire pump of at least 750 gpm (3000L/min) capacity, water tank and hose body whose primary purpose is to combat structural and associated fires.

Initial Attack Apparatus: Fire apparatus with a fire pump of at least 250 gpm (1000L/min) capacity, water tank, and hose body whose primary purpose is to initiate a fire suppression attack on structural, vehicular, or vegetation fires and to support associated fire department operations.

Mobile Water Supply Apparatus (Tanker or a Tender): A vehicle designed primarily for transporting (pick-up, transporting, and delivering) water to fire emergency scenes to be applied by other vehicles or pumping equipment.

Quint: Fire apparatus with a permanently mounted fire pump, a water tank, a hose storage area, an aerial ladder or elevating platform with a permanently mounted waterway, and a complement of ground ladders.

Special Services Fire Apparatus: A multipurpose vehicle that primarily provides support services at emergency scenes.

In addition to N.F.P.A. 1901, the industry commonly refers to the following types of major fire apparatus:

Rescue: A vehicle specifically designed for the purposes of transporting specialized rescue equipment such as vehicle extrication equipment, water/ice rescue equipment, hazardous materials equipment, and additional fire suppression support equipment such as additional self-contained breathing apparatus.

Pump/Rescue: A vehicle that combines the traditional functions of a pumper and a rescue apparatus into one multi-functional apparatus.

Aerial Device: A vehicle equipped with an aerial device, elevating platform, or water tower that is designed and quipped to support firefighting and rescue operations by positioning personnel, handling materials, providing continuous egress, or discharging water at positions elevated from the ground.

13.3.5 Current Major Apparatus Fleet

The current major apparatus of the L.F.D. includes pumpers, an aerial, and a heavy rescue. As a general guideline, specifications of apparatus should consider the capacity requirements, such as pump capacity for pumpers and tank capacity for tenders, as outlined within the Fire Underwriters Survey (F.U.S.) Dwelling Protection Grade requirements. The following schedule is used as a guideline for apparatus replacement as part of the F.U.S. survey process:

- Major cities 12 – 15 years, with an additional five years in reserve.
- Medium size cities 15 years, with additional five years as back up, and five years in reserve.
- Small municipalities 20 years, with an additional five years second line or reserve.

As a smaller City, the applicable replacement strategy for the City of Lloydminster would likely reflect a 20 year front-line (primary use) life cycle with an additional five year (reserve use) overall life cycle plan. The existing life cycle of L.F.D. apparatus is 25 years. It is important that the front-line life cycle be 20 years and that the additional five years of use be in capacity as a reserve or service-ready apparatus for the department. F.U.S. also requires additional annual testing and inspection for fire apparatus that are maintained in service for longer than 20 years.

Table 19 summarizes the existing L.F.D. major apparatus and lists the replacement year according to the 20 year life cycle (and the 25 year reserve life cycle).

Table 19: Current Major Apparatus

Station #	Type of Apparatus	Make/Description	Year	Projected 20 Year Front-line Life Cycle (25 Year Reserve Life Cycle)
Fire Station No.1	C14 Pumper	Superior Pumper	1994	2014 (2019)
	C20 Pumper	*Delivery planned by end of 2019 – to replace C14*	2020	2040 (2045)
	C16 Pumper (front-line)	Rosenbauer Pumper	2010	2030 (2035)
	C17 Technical Support Unit (specialty)	Rosenbauer Heavy Rescue	*1987*	2007 (2012)
	C18 Aerial (specialty)	Rosenbauer T-Rex 115 foot Articulating Platform Aerial	2015	2035 (2040)
Fire Station No.2	C15 Pumper	Superior Pumper	2003	2023 (2028)
	C19 Pumper (front-line)	Rosenbauer Pumper	2015	2035 (2040)

As shown above, pumper C14 is due for replacement by pumper C20 (on order), planned for delivery by the end of 2019. The Heavy Rescue is past due for replacement. It is our understanding that pump repairs were completed on C15 Pumper in 2019. If maintenance / repairs costs continue to be an issue, the department may want to consider an earlier replacement cycle for that unit.

L.F.D. also operates a small fleet of light vehicles. Typically a 10 year life cycle is applied to light vehicles. These are listed below in **Table 20**.

Table 20: Current Light Vehicle Fleet

Description	Make	Year	Replacement Year (10-year Life Cycle)	Station
C1 – Fire Chief	Ford Explorer	2012	2022	Fire Station No.2
C3 – Assistant Fire Chief	Ford Explorer	2016	2026	Fire Station No.1
C4 – Training / Administration	Ford Explorer	2012	2022	Fire Station No.1

13.3.6 Proposed Formal Fleet Replacement Plan

Life cycle planning is a core component of the capital planning process for fire departments across Canada. Establishing a formal fleet and equipment replacement plan is recommended within this F.S.M.P. The replacement plan is based on 20 year life-cycle (plus an additional five years in reserve capacity) for heavy apparatus and a 10 year life-cycle for light vehicles. The life cycle of equipment varies and should be based on the recommendations of the manufacturer. Replacement of apparatus and vehicles should be timed to avoid significant increases in maintenance costs, which can occur with units which are kept in-service beyond the recommended life-cycles.

13.3.7 Reserve Apparatus

The L.F.D. does not currently have any identified service-ready reserve apparatus. This is an important consideration in the event that one of the current front-line apparatus is out of service for maintenance or as a result of a mechanical breakdown.

Current industry best practices indicates that a municipality the size of Lloydminster should have a minimum of one service-ready (reserve) apparatus. Developing some reserve apparatus capacity for use in the event of a front-line apparatus breakdown, and to increase the depth of firefighting capacity could be achieved by extending the life cycle of the next major apparatus to be replaced (e.g., pumper). Through the purchasing process the apparatus planned for replacement could be retained as a service ready apparatus when the new apparatus is but in service.

Council Recommendation #13: That consideration be given to creating a major apparatus reserve capacity, including a minimum of one service ready pumper.

13.4 Equipment

The fire service requires an extensive inventory of equipment for fire suppression, technical rescues and firefighter safety. This includes firefighter protective clothing (bunker gear), self-contained breathing apparatus (S.C.B.A.) firefighting hose and nozzles, ladders, automobile extrication tools and many specialized pieces of equipment required for the specialized fire protection and rescue services provided. As previously mentioned, equipment maintenance, including repairs, are currently outsourced, however, there is currently no process in place to ensure third party inspections of gear are

completed. Industry best practices and manufacturers' directions suggest personal protective equipment, such as firefighter bunker gear, should be replaced based on a ten-year life cycle. Bunker gear is currently replaced on a 10-year life cycle. Targeting an annual replacement strategy of six to ten sets per year is one way to manage the capital costs of this strategy, as well as maintain an appropriate life cycle replacement plan. There is currently no formal life cycle equipment replacement plan for the department.

The department needs to establish a system for tracking the maintenance of bunker gear and P.P.E. Maintenance of bunker gear was identified through the data collection process. Bunker gear should be properly cleaned on a regular basis, particularly following use at any active fire scene. Currently the department does not own gear cleaning equipment. It is recommended that the City consider purchasing a bunker gear washing and drying machine in order to clean gear in-house.

Flow testing of the S.C.B.A. packs were completed in 2019.Currently the stock of S.C.B.A.s and air cylinders are not standardized. As the department works towards a regular replacement cycle, it should target standardization of this equipment.

Where life cycles and conditions warrant, small equipment replacement (e.g., portable pumps, generators, etc.), should coincide with the apparatus capital replacement plan. The department should also budget for equipment replacement within the annual operating budget for smaller equipment replacement.

13.5 Apparatus, Equipment and Fire Station Recommendations

Lloydminster Fire Department operates from two fire stations located strategically within the City. Fire Station No.1 has reached the end of its expected life cycle and requires replacement. The department is well-equipped with apparatus and has been applying an informal replacement schedule of 25 years. The department has identified a number of areas to improve the standard operating procedures and administration of apparatus and equipment. This F.S.M.P. is supportive of those identified areas of improvement.

Our review of the fleet, facilities and equipment of the L.F.D. has identified the following recommendations for consideration:

Council Recommendations:

Council Recommendation #13: That consideration be given to creating a major apparatus reserve capacity, including a minimum of one service ready pumper.

Operational Recommendations:

Operational Recommendation #35: That consideration be given to strategies that target the mitigation of diesel emissions within both existing fire stations and any future fire stations.

14.0 Implementation Plan

The recommendations of this F.S.M.P. have been developed in consideration of the strategic priorities identified within this plan. To achieve this objective, this F.S.M.P. includes an implementation strategy that categorizes the recommendations of this plan into those that can be implemented by the Fire Chief within the boundaries of his current authority delegated by Council, these are presented as Operational Recommendations. Recommendations that require direct Council approval related to policy decisions, or financial commitments are presented as Council Recommendations. The following tables provide a proposed template of an implementation plan, including estimated time horizons. The associated budget items and timelines of the F.S.M.P. recommendations are expected to be prepared and finalized through the Fire Chief's implementation plan.

14.1 Council Recommendations

Council Recommendations include those that require a policy decision or financial commitment on behalf of the City. **Table 21** summarizes the recommendations of this F.S.M.P. that have been deemed as Council Recommendations.

Table 21: Council Recommendations

Recommendation No.	Council Recommendations	Proposed Schedule
1	That consideration be given to approving the strategic priorities identified within the Fire Services Master Plan to guide the development and delivery of fire protection services within the City of Lloydminster over the next ten-year community planning horizon.	Immediate-term (12 months)
2	That consideration be given to approving the proposed Routine Fire Inspection Program as presented within the proposed Fire Services Master Plan.	Immediate-term (12 months)
3	That consideration be given to hiring a full-time Fire Inspector/Fire and Life Safety	Short-term (1-3 years)

Recommendation No.	Council Recommendations	Proposed Schedule
	Educator as presented within the proposed Fire Services Master Plan.	
4	That subject to Council's consideration and approval of the proposed Fire Services Master Plan consideration be given to developing a Comprehensive Recruitment and Retention Strategy that targets the sustainability of Paid on Call Firefighters as presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
5	That the proposed Initial Arriving Company fire suppression performance benchmark targets presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.	Immediate-term (12 months)
6	That the proposed Initial Full Alarm Assignment fire suppression performance benchmark target presented within the proposed Fire Services Master Plan be adopted by the City of Lloydminster.	Immediate-term (12 months)
7	That a defined Service Agreement be developed between the Lloydminster Operations Communications Center and the Lloydminster Fire Department that includes emergency call taking and fire dispatching performance benchmarks as referenced within the proposed Fire Serveries Master Plan.	Immediate-term (12 months)
8	That the proposed defined Service Agreement between the Lloydminster Operations Communications Center and the Lloydminster Fire Department include emergency response protocols for defining	Immediate-term (12 months)

Recommendation No.	Council Recommendations	Proposed Schedule
	the dispatching of fire suppression services as referenced in the proposed Fire Services Master Plan.	
9	That the City of Lloydminster prioritize consideration of increasing the minimum number of firefighters on duty at all times to four firefighters (one Captain and three firefighters) to increase the efficiency and effectiveness of the Initial Arriving Company as defined by the National Fire Protection Association.	Immediate-term (12 months)
10	That subject to Council's consideration and approval of the proposed Fire Services Master Plan that the short-term priority be to increase the number of paid on call firefighters to a total complement of 50.	Short-term (1-3 years)
11	That consideration be given to implementing the proposed Paid on Call Firefighter Company Officer strategy presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
12	That consideration be given to implementing the proposed on duty shift schedule presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
13	That consideration be given to creating a major apparatus reserve capacity, including a minimum of one service ready pumper.	Short-term (1-3 years)

14.2 Operational Recommendations

Table 22 summarizes the recommendations of this F.S.M.P. that have been deemed as Operational Recommendations that can be administered and implemented by the Fire Chief within his current authority. In some cases this may require additional work by the Fire Chief in preparing further documentation and reporting to Council for approval. An example of this is updating the current Fire

By-law. This is a process that can be led by the Fire Chief, and senior corporate staff and through normal reporting be brought to Council for consideration and approval.

Table 22: Operational Recommendations

Recommendation No.	Operational Recommendations	Proposed Time Horizon
1	That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to updating the Lloydminster Fire Department Mission Statement, develop a corresponding Vision Statement and renew the department's core values.	Short-term (1-3 years)
2	That subject to Council's consideration and approval of the proposed Fire Services Master Plan a comprehensive review and update of all staff resource job descriptions be completed.	Immediate-term (12 months)
3	That consideration be given to implementing an interim strategy to collocate the workspace of the Fire Chief, Assistant Fire Chief and Administrative Assistant in one location as presented within the proposed Fire Services Master Plan.	Immediate-term (12 months)
4	That the Lloydminster Fire Department develop and implement a Senior Officer On-Call policy as presented within the proposed Fire Services Master Plan.	Immediate-term (12 months)
5	That consideration be given to enhancing the effectiveness and efficiency of mutual aid agreements as presented within the proposed Fire Service Master Plan.	Short-term (1-3 years)
6	That subject to Council's direction to update the Memorandum of Understanding with the	Immediate-term (12 months)

Recommendation No.	Operational Recommendations	Proposed Time Horizon
	Lloydminster Rescue Squad Inc. consideration be given to revising the agreement as presented within the proposed Fire Services Master Plan.	
7	That the Lloydminster Fire Department prioritize the development of Standard Operating Procedures to provide clear direction to all staff regarding the delivery of fire protection services.	Immediate-term (12 months)
8	That consideration be given to prioritizing the development of fire department policies to provide clear direction to all staff, and specifically in those areas that may require more defined direction than included within a Standard Operating Procedure.	Immediate-term (12 months)
9	That priority be given to developing a comprehensive records management program, including the development of a Standard Operating Procedure for all records management practices within the Lloydminster Fire Department.	Short-term (1-3 years)
10	That consideration be given to enhancing the fire department's Annual Report to include performance benchmarking to further enhance the department's reporting to Council and the community.	Short-term (1-3 years)
11	That subject to Council's consideration and approval of the proposed Fire Services Master Plan that consideration be given to developing a Fire Prevention Policy as presented within the proposed Fire Services Master Plan.	Immediate-term (12 months)

Recommendation No.	Operational Recommendations	Proposed Time Horizon
12	That the training standards and qualifications for all staff assigned to the delivery of fire prevention and public education services and programs identified within the proposed Fire Services Master Plan be considered for implementation within the applicable job descriptions within the Lloydminster Fire Department.	Short-term (1-3 years)
13	That consideration be given to developing a Standard Operating Procedure to identify the roles and responsibilities, objectives, targets and procedures for the delivery of the proposed Home Smoke Alarm/Carbon Monoxide Alarm Program as presented within the proposed Fire Services Master Plan.	Immediate-term (12 months)
14	That consideration be given to enhancing the qualifications of the four full-time fire suppression Captains to include N.F.P.A. 1031 Fire Inspector I, and N.F.P.A. 1035 Fire and Life Safety Educator I as presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
15	That consideration be given to implementing the proposed Commercial/Industrial Occupancy Pre-Planning Program presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
16	That consideration be given to developing a comprehensive fire investigation Standard Operating Procedure as presented within the proposed Fire Services Master Plan.	Immediate-term (12 months)
17	That consideration be given to developing a letter of understanding, or other written agreement between Superior Safety Codes Inc. and the Lloydminster Fire Department to	Immediate-term (12 months)

Recommendation No.	Operational Recommendations	Proposed Time Horizon
	coordinate the construction plan review and approval process.	
18	That consideration be given to developing and implementing a "pilot project" for facilitating a targeted fire safety program to children aged 10 to 12 within the community as presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
19	That consideration be given to developing and implementing a targeted fire safety program for seniors (65+) within the community as presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
20	That consideration be given to developing and implementing the proposed Community Fire Education Program presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
21	That the job description for the full-time Training Officer/ Safety Officer Captain be updated to include the required qualifications, roles and responsibilities and hours of work of this position.	Immediate-term (12 months)
22	That consideration be given to consolidating all current firefighter training initiatives into one Comprehensive Annual Training Program including performance goals and objectives to be defined within a department Standard Operational Procedure.	Immediate-term (12 months)
23	That the proposed Comprehensive Annual Training Program include minimum requirements for attendance to maintain the required firefighting skills and competencies at all times.	Immediate-term (12 months)

Recommendation No.	Operational Recommendations	Proposed Time Horizon
24	That consideration be given to developing a comprehensive Company Officer Training Program and supporting Standard Operating Procedure.	Short-term (1-3 years)
25	That consideration be given to including incident command training for all officers within the Lloydminster Fire Department within the proposed comprehensive Company Officer Training Program and supporting Standard Operating Procedure.	Short-term (1-3 years)
26	That the Fire Chief further investigate the alternatives for providing specialized technical rescue services including partnerships, shared services and contracting services to reduce the existing operational and training requirements of the Lloydminster Fire Department.	Short-term (1-3 years)
27	That where applicable the further utilization of on-line training as a component of delivering the proposed Comprehensive Annual Training Program be considered.	Short-term (1-3 years)
28	That the Fire Chief be direct to further investigate ad report to Council on the options for facilitating live fire training as presented within the proposed Fire Services Master Plan.	Short-term (1-3 years)
29	That the requirements for annual live fire training be included within the proposed Comprehensive Annual Training Program and department Standard Operating Procedure.	Short-term (1-3 years)
30	That any member of the Lloydminster Fire Department who is assigned the responsibility to deliver firefighter training be required to attain the qualifications of an Instructor Level I as defined by the N.F.P.A. 1041 Standard for	Short-term (1-3 years)

Recommendation No.	Operational Recommendations	Proposed Time Horizon
	Fire Service Instructor Professional Qualifications.	
31	That the full-time Training Officer/ Safety Officer Captain be required to attain the qualifications of an Instructor Level II as defined by the N.F.P.A. 1041 Standard for Fire Service Instructor Professional Qualifications.	Short-term (1-3 years)
32	That consideration be given to implementing the proposed Training Committee presented within the proposed Fire Service Maser Plan.	Short-term (1-3 years)
33	That the City and L.F.D. consider options for utilizing web-based / smartphone applications that provide paid on call and full-time (call-back) firefighters with the ability to communicate their response status to the stations and other department staff members.	Short-term (1-3 years)
34	That the Fire Chief be directed to develop an ongoing communication strategy with the paid on call and full-time firefighters to enhance the “two way” communications within the Lloydminster Fire Department.	Short-term (1-3 years)

Appendix A

Community Fire Risk Assessment

DILLON CONSULTING

DILLON CONSULTING

City of Lloydminster

Community Risk Assessment

Project Number: 19-9358
Submission Date: October, 2019

Table of Contents

Figures

Tables

1.0 Introduction

The process of assessing fire risk within a community is receiving increased attention within the fire protection industry in North America. A Community Risk Assessment (C.R.A.) is fundamental to the development of a Fire Services Master Plan (F.S.M.P.). Assessing community fire risk informs the understanding of local needs and circumstances which can then be applied to align the fire protection service levels provided by the municipality. The results of this C.R.A. directly inform the recommendations of the F.S.M.P. and are used to identify existing service gaps across divisions, with particular connections to fire prevention, training, and fire suppression. This appendix to the Fire Services Master Plan outlines the methodology and sources of information used to assess community fire risk in the City Lloydminster (City).

This C.R.A. is based on a methodology founded in part on: the *National Fire Protection Association (N.F.P.A.) 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition); N.F.P.A. 1300 Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition)*; Dillon's extensive experience in applying Ontario's Fire-Risk Sub-model; as well as broader risk management industry best practices**.** In addition, to guide some of the analysis, reference was made to the Office of the Fire Commissioner (O.F.C.)'s Fire Statistics Reporting Manual (March 2006). According to N.F.P.A 1730, the purpose of a Community Risk Assessment is to assist in the development and implementation of community risk reduction planning and determine service levels within the fire department. N.F.P.A. 1730 outlines seven profiles that should be assessed and used to understand risk within the community.

Exploration of the profiles is the first component of the C.R.A. methodology for this F.S.M.P. This includes the development of the following seven profile assessments:

- Geographic Profile;
- Building Stock Profile;
- Demographic Profile;
- Hazard Profile;
- Economic Profile;
- Fire Profile; and
- Response Profile.

Throughout this assessment, the findings of the analysis will be highlighted and referred to as "***Key Findings***". This approach is designed to feature the findings that will be used to explicitly inform the F.S.M.P. More information on how the findings will be used to inform the F.S.M.P. can be found in **Section 9 – Applying Risk Outcomes.**

1.1 Data Collection and Sources

These profiles were analyzed based on several sources of information, including data provided by the Lloydminster Fire Department (L.F.D.), Statistics Canada, data from the Alberta Office of the Fire Commissioner website and desktop research.

Demographic information was sourced from the 2016 Census (Statistics Canada). The 2016 Census recognizes Lloydminster's unique geography on the Alberta/Saskatchewan border by separating the City's demographic data into two parts; one for the population residing in Alberta and the other for the population residing in Saskatchewan. Throughout the demographic profile of this Community Risk Assessment, our team has combined both data sets in order to capture the entire demographic of Lloydminster. Where possible, City demographics have been compared to both the Province of Alberta and the Province of Saskatchewan.

The City of Lloydminster is uniquely situated partially in the Province of Alberta, and partially in the Province of Saskatchewan. As such, the City has a unique governance/legislation model. The ***City of Lloydminster Act*** (Lloydminster Charter) was enacted by ***Alberta Regulation 212/2012***. The ***Lloydminster Charter*** states the following:

> ***"Principles and Purpose of the Charter***
>
> *4(1) This Charter recognises that:*
>
> *(a) the City, as a local government;*
>
> *I. is a responsible and accountable level of government within its jurisdiction, being created and empowered by both Alberta and Saskatchewan,*
>
> *II. has unique interests and challenges due to the fact that the City is located partly in Alberta and partly in Saskatchewan, and*
>
> *III. is subject to certain limits and restrictions in the interest of the provinces as set out in this Charter and certain other enactments"*[1]

The City of Lloydminster Charter allows the City to amend, repeal or replace any provision of the codes that are in force. The City of Lloydminster adheres to the 2015 National Building Code of Canada as well as the National Fire Code of Canada. As such, to link the C.R.A. to the fire risks unique to specific occupancy types, this analysis utilizes the major occupancy classifications of both codes to define the fire risk scenarios within Lloydminster.

Data for the analysis of fire loss and occurrences within the City was sourced from the Alberta Office of the Fire Commissioner website for the years 2007 to 2016. Similar data for the Saskatchewan side of Lloydminster was not available as part of the data collection process. The City has provided additional information surrounding three fatalities occurring in 2010, 2013 and 2018.

[1] City of Lloydminster Act, The Lloydminster Charter, Alberta Regulation 212/2012, Principles and Purposes of the Charter, Section 3.

2.0 Geographic Profile

A geographic profile reviews key natural and human-made features within a jurisdiction. According to N.F.P.A. 1730, a geographic profile should consider highways, bridges, railroads, water features, geographic landforms, and the wildland-urban interface.

2.1 Geographical Snapshot of Lloydminster

Located on the Alberta-Saskatchewan border, the City of Lloydminster is a growing community intersected by two major highways: Highway 16 and Highway 17 making it accessible to economic markets and larger Canadian cities such as Edmonton, located approximately 250 km to the west of Lloydminster. The City's population centre covers a land area of approximately 21.71 square kilometres and is comprised of mixed land uses, a large portion of which is designated as industrial located in the City's norther corridor. Rural land uses include agriculture, forestry, a golf course and some residential dwellings.

2.2 Road Network

Road networks within a municipality are important from a risk and emergency response perspective since vehicle related incidents are a common source of call volume for a municipality. The road network is also how fire apparatus travel through a municipality; thus, it is valuable to consider where there may be a lack of connectivity due to natural (e.g. river) or human-made barriers (e.g. rail line with no crossing, road network design, cemeteries and golf courses).

Lloydminster is serviced by a number of provincial highways, major and minor arterial roads, major and minor collector roads, and local roads. There are two provincial highways located within the City namely: Highway 16 (running east to west through the City centre) and Highway 17 (north to south) which intersect each other in close proximity to the geographical centre of the municipality.

Bus services to and from the City of Lloydminster are provided by K.C.T.I. Travels which connects municipalities including Saskatoon, Edmonton, North Battleford, Lloydminster, Vermilion, and Vegreville. Lloydminster Handivan, also known as Border City Connects, provides transportation services to the residents of Lloydminster and area that have special needs or mobility issues.

In 2016, the City of Lloydminster retained the services of I.S.L. Engineering and Land Services to update their Transportation Master Plan (T.M.P.). This long-term planning document aimed to identify current and future transportation needs and more specifically aimed to address congestion and accessibility issues along many of the City's corridors and major highways. The T.M.P. identified ideal networks to support future growth as well as multiple road, sidewalk and trial improvements.

A road network may also impact emergency response travel times due to congestion. The 2016 T.M.P. identified that there is traffic congestion and accessibility issues experienced along major roadways including Highway 16 and Highway 17. These highways experience large volumes of traffic on a regular basis, much of which consists of heavy truck traffic.

Should an incident occur on Highway 16 through the City's centre, there are no bypass options for heavy trucks, forcing them to reroute to residential and commercial roadways that are not intended for the traffic volume of large trucks.[2] A disruption to a major roadway could cause further congestion within the City. This could result in delayed emergency response times both within the urban and rural areas as well as responses onto the highway.

Key Finding: Major road disruptions along Highway 16, which runs East/West through the City centre, could result in heavy traffic congestion and the rerouting of commercial trucks through the City leading to longer fire department response times both on the highway and within the City.

2.3 Railways

Rail lines are considered in this C.R.A. for a few key reasons related to emergency services. The potential for a rail-based transport incident is a major consideration as a derailment or accident involving the goods being transported (hazardous materials) could occur, requiring hazardous materials response. Also, the physical barrier created by the rail infrastructure itself, such as a rail yard or the placement of rail infrastructure within and throughout a municipality can slow down emergency response.

Lloydminster is serviced by both Canadian National and Canadian Pacific Railroads which both have switching yards in the City, one of which is located on the north side of the downtown core. Due to its significant oilfield industry, a large volume of various hazardous materials are frequently transported throughout the City. Two predominant businesses operate their own rail sidings for loading product, both of which do not have barrier protection and rely heavily on human controlled traffic.[3]

At-grade rail crossings (an intersection at which a road crosses a rail line at the same level) can create delays in emergency response by inhibiting emergency response vehicles and apparatus from accessing a road. Nine at-grade rail crossings were identified throughout the City through visual assessment. At-grade rail can be found crossing:

- Highway 16, east of Range Road 3275;
- Highway 17, south of 54 Street;
- Highway 17, north of 51 Street;
- Range Road 13, north of Highway 16;
- 75 Avenue, north of Highway 16;
- 62 Avenue, north of Highway 16;
- 49 Avenue, south of 54 Street;
- 49 Avenue north of 50 Street;
- 48 Avenue, north of 50 Street;
- 52 Street, east of 49 Avenue;
- 40 Avenue, north of 52 Street;
- 40th Avenue, south of 52 Street;
- Township Road 502, north of 67 Street;

[2] Source: Hazard, Risk and Vulnerability Assessment, City of Lloydminster.
[3] Source: Hazard, Risk and Vulnerability Assessment, City of Lloydminster.

- 62 Street, west of 62 Avenue; and
- 67 Street, north of 62 Street.

The location of the railway north of Fire Station No. 1, running East/West through the City presents the potential for fire service delivery interruptions and delayed travel response times to the northern corridor of Lloydminster.

Key Finding: Rail lines within the City have been identified as hazardous material routes that may present a higher risk to the community.

Key Finding: The at-grade railway crossing on 50th Avenue located just north of Fire Station No. 1 creates a potential delay in emergency response times from this station to areas north of this at-grade rail crossing.

2.4 Airport

Airports can be an essential component of a municipality facilitating the movement of goods and services and in providing another mode of transportation. However, they also present unique hazards with special considerations to aircraft accidents and incidents, hazardous materials and fuel load concerns. Lloydminster and its surrounding area are serviced by the Lloydminster Municipal Airport, which is owned and operated by the City of Lloydminster. The airport is Transport Canada Class 2 Certified accommodating domestic passenger aircraft as well as fuel servicing and aircraft maintenance for charter and rental flights.

2.5 Bridges

Bridges are considered within a C.R.A. because of two main considerations: potential for crossing restrictions due to weight; and potential for impact on network connectivity if a bridge were to be out of service. As part of the data collection process for this report, the L.F.D. has not identified bridges with weight restrictions in the City of Lloydminster.

2.6 Waterways and Conservation Areas

Waterways (creeks and lakes) and Conservation Areas are important from a community risk perspective as they may be popular destinations for recreational activities. There may also be natural hazards such as flooding associated with waterways that may necessitate ice water/swift water rescue.

There are no large bodies of water in the City of Lloydminster, however spatial analysis indicates there are a number of retention ponds and small water bodies throughout the municipality, some of which are located near public recreational facilities. The City issues frozen retention lake warnings to the public advising them to refrain from skating on them in winter months and encourages residents to skate on one of several publicly accessible and maintained outdoor ice surfaces during winter months.

Although there are no Conservation areas in Lloydminster, the City's parks and green space team maintains 35 parks, and 790 acres of green space.[4] The City's largest park geographically is the Bud Miller All Seasons Park located south of Highway 16 and West of Highway 17. Park amenities include biking trails, cross country skiing, fishing, ice skating, picnicking and walking paths.

2.7 Wildland-Urban Interface

N.F.P.A. 1730 identifies wildland-urban interface as a geography-based risk for consideration. This interface refers to the area of transition between unoccupied land and human development. This transition area can be comprised of a mix of woodlots, bush or grass.

Lloydminster is surrounded by an abundance of agricultural lands and many residential neighbourhoods are located in the vicinity of woodlots, bush or grass. Our research suggests that wildfires have occurred in and around the area of Lloydminster in the past and smoke from wildfires has affected the City on a number of occasions, in some instances resulting in reduced visibility and poor air quality. Based on past experience, there may be a need to enhance training of personnel with regards to this type of fire. Fire prevention policies including enforcement and public education can be used to manage and mitigate the risk through open air permit systems.

Key Finding: The City has a potential risk of wildland fire due to the wildland-urban interface primarily located outside of the urban settlement area.

[4] Source: "2017 Report to the Community", City of Lloydminster Website, https://www.lloydminster.ca/en/your-city-hall/report-to-the-community.aspx

3.0 Building Stock Profile

N.F.P.A. 1730 highlights a number of characteristics of building stock that should be considered pertaining to fire risk which are analyzed below. This includes: building stock, building density, building age and construction, potential high-fire risk occupancies, vulnerable occupancies, and historic or culturally significant buildings.

3.1 National Building Code of Canada (N.B.C.) Occupancy Classifications

The Lloydminster Charter, or, Alberta Regulation 212/2012 establishes the building standards to which the City must follow. Due to the City's unique geographical placement in both the Province of Alberta and the Province of Saskatchewan, Lloydminster follows both the National Building Code and National Fire Code.

Buildings within the National Building Code of Canada are categorized based on their major occupancy classification. These occupancy classifications, as defined within the code, provide a recognized definition and baseline for developing the building stock profile. The N.B.C. includes six major building occupancy classifications (groups). Within each group the occupancies are further defined by division. The N.B.C. major classification groups and divisions are presented in **Table 1.**

Table 1: N.B.C. Major Occupancy Classification

Group	Division	Description of Major Occupancies
Group A	1	Assembly occupancies intended for the production and viewing of the performing arts
	2	Assembly occupancies not elsewhere classified in Group A
	3	Assembly occupancies of the arena type
	4	Assembly occupancies in which occupants are gathered in the open air
Group B	1	Detention occupancies
	2	Treatment occupancies
	3	Care occupancies
Group C	---	Residential occupancies
Group D	---	Business and personal services occupancies
Group E	---	Mercantile occupancies
Group F	1	High-hazard industrial occupancies
	2	Medium-hazard industrial occupancies
	3	Low-hazard industrial occupancies

Source: 2015 National Building Code

All occupancies have unique fire risks based on their occupancy classification group. Within the groups, the buildings themselves can also be very different. For Group C - Residential occupancies, there are

many types of buildings that can meet this description, each presenting its own unique fire risks - for example, mobile homes/travel trailers versus a single-detached dwelling. Consideration also needs to be given to high-rise residential occupancies which represent unique risk and operational challenges.

Group D – Business and Personal Services occupancies can also be located in different types of buildings, such as remodeled single-family dwellings, low-rise and high-rise buildings. Each of these building types can present different fire risks, including egress for firefighting operations and evacuation by occupants. Group E – Mercantile occupancies also present varied fire risks depending on the type of building which houses them. They range in size and potential risk from smaller neighbourhood corner stores to the large "big box" industrial style buildings. Large volumes of combustibles may be present in all forms of mercantile and business and personal services occupancies. Within the fire service, these two occupancy types are often considered together as "commercial uses."

While building variation applies within Group B – Care or Detention occupancies, the important consideration in this case is the nature of the occupancy. Such occupancies are for individuals that require special care or treatment due to cognitive or physical limitations. These occupancies could also be for individuals who are incapable of self-evacuation in the event of an emergency due to restraint. Regardless of the type of building Group B – Care or Detention occupancies inhabit, this critical aspect of risk remains the same.

As shown in **Table 1,** the Group F – Industrial occupancy group is divided into low-hazard (Division 3), medium-hazard (Division 2) and high-hazard (Division 1) based on the combustible, flammable or explosive materials present and the potential for rapid fire growth. The potential for major fires within this occupancy type is related to the high levels of combustibles and/or flammable or explosive materials used in the manufacturing process and present in storage.

This profile assesses the property stock within the community of Lloydminster by applying the major occupancy group classifications of the N.B.C. discussed above to the City's property stock.

3.2 City of Lloydminster Property Stock by Major Occupancy Classification

A summary of the City's property stock by major occupancy classification is provided in **Table 2**. For most Canadian municipalities, the majority of building stock is comprised of Group C – Residential Occupancies. While the City of Lloydminster does not track and maintain a detailed building stock profile based on N.B.C. major occupancy classifications, it is similarly comprised mostly of Group C – residential occupancy types. To inform the City's building stock profile analysis listed below in **Table 2**, multiple sources including Statistics Canada, the data platform Townfolio as well as data provided by the City were used. According to Statistics Canada, there are 12,995 residencies within the City of Lloydminster, accounting for approximately 90.5% of the City's total building stock. Group D and E - Business and Personal Services/Mercantile occupancy types account for 7.5% of the city's overall building stock.

Table 2: City of Lloydminster Building Stock

Occupancy Classification N.B.C.	Occupancy Description	Number of Occupancies	Percentage of Occupancies
Group A – Assembly	Assembly Occupancies	6	0%
Group B – Care or Detention	Care or Detention Occupancies	1	0%
Group C – Residential	Residential Occupancies	12,995	90.5%
Group D/E – Business/Mercantile	Business and Personal Services/Mercantile	1,086	7.5%
Group F – Industrial	Industrial occupancies	248	2%
Other	Not classified within the N.B.C.	7	0%
	Total	**14,343**	**100%**

Sources: L.F.D., Statistics Canada, Townfolio

Source: L.F.D.

Given the proportion of fire loss, fire related injuries and death rates within this occupancy classification, the prominence of Group C occupancies present a greater fire risk. The first two lines of defence – public education and prevention and fire safety standards and enforcement – are significant measures that can be taken to mitigate fire risk within residential occupancies. This entails implementing smoke alarm programs, home escape planning, the identification of vulnerable groups specific to each municipality, regular fire inspection cycles and programs specific to each occupancy type, as well as implementing stricter enforcement measures related to licencing and prosecutions for fire code violations. Fire loss trends for the City are discussed in greater detail in **Section 7.0**.

Key Finding: According to Statistics Canada, 90.5% of the City's existing building stock is comprised of Group C- Residential Occupancies.

3.3 Building Age and Construction

The first National Building Code of Canada (N.B.C.) was published in 1941 with subsequent editions published in 1953, 1960, 1965, 1970, 1975, 1977, 1980, 1985, 1990 and 1995, 2005, 2010 and 2015, the most recent edition. The N.B.C. details the technical requirements for the design and construction of new buildings and the alteration (or demolition) of existing ones across Canada. Complementary to the N.B.C., the National Fire Code (N.F.C.), was published in 1963; subsequent editions were published in 1975, 1977, 1980, 1985, 1990 and 1995, 2005, 2010 and most recently 2015. This Code sets forth the minimum requirements regarding fire safety for existing buildings and facilities.

Together, the N.B.C. and N.F.C. provide the foundation for eliminating many of the inconsistencies in building construction and maintenance that were present before their adoption and both contain provisions for fire safety of people and buildings. These codes provide for specific fire safety measures that are designed to address the intended use of the building including requirements such as exits/means

of egress including signs and lighting, fire alarm and detection equipment, fire department access and the inspection, testing, and maintenance of the building fire protection systems.

In many situations the age and construction of a building can be directly associated with whether the building was constructed prior to, or after the introduction of these codes. For example, during the late 19th century and early 20th century, balloon frame construction was a common wood framing technique that was used in both residential and small commercial construction.

This technique allowed for exterior walls to be continuous from the main floor to the roof in some cases extending multiple stories through a building. The result was the potential for fire and smoke to spread unobstructed from the basement to the roof of a building. In many cases the result was a fire that started in the basement spreading to the roof very quickly and without the knowledge of building occupants or fire service personnel. Modern construction techniques have introduced the use of platform construction whereby each level is built as a component of the overall structure. This technique in addition to the use of fire stops has reduced the extension of fire and smoke by creating horizontal barriers.

Modern construction materials tend to burn faster and hotter than those built in the past. This is compounded by the amount of synthetic materials that are being used in today's furnishings. With fires growing faster and building failing sooner, occupants have less time to evacuate safely and there is increased risk for responding firefighters due to potential structural collapse. These risks may be mitigated through public education campaigns specific to home escape planning and smoke alarm initiatives.

Understanding building construction and building materials is a critical component for firefighters in determining the appropriate type of fire attack and safety measures that need to be in place. As such, having knowledge of the age of a building that may be directly related to the type of construction methods and materials is why building age and construction is a component of this Community Risk Assessment.

Table 3 illustrates the age of buildings (2016 Census Data) within the City in comparison to the Province of Alberta and the Province of Saskatchewan. This analysis indicates that 8% of the City's residential building stock was built prior to 1960, preceding when N.F.C. came into effect in 1963. The percentage of building stock built prior to 1963 may be slightly higher given how the census years do not perfectly align with the timing of the N.F.C. This represents a key fire risk within the community.

By comparison, 12% of the residential building stock in the Province of Alberta and 24% of Saskatchewan's residential building stock were built prior to 1963. This indicates that the City has a relatively newer building stock than both Provinces.

Table 3: Age of Construction of Residential Dwellings (2016 Census – 25% sample data)

Period of Construction	City	% of Units	Alberta	% of Units	Saskatchewan	% of Units
Prior to 1960	935	8%	177,780	12%	101,805	24%
1961 to 1980	3,005	25%	439,505	29%	150,440	35%
1981 to 1990	1,740	15%	193,360	13%	62,270	14%
1991 to 2000	1,275	11%	216,410	14%	33,495	8%
2001 to 2005	1,340	11%	157,420	10%	17,905	4%
2006 to 2010	1,575	13%	180,645	12%	28,610	7%
2011 to 2016	1,975	17%	162,560	10%	38,095	9%
Total	**11,845**	**100%**	**1,527,680**	**100%**	**432,620**	**100%**

3.4 Building Density and Exposure

Closely spaced buildings, typical of historic downtown core areas and newer infill construction, have a higher risk of a fire spreading to an adjacent exposed building. A fire originating in one building could easily be transferred to neighbouring structures due to their close proximity. The close proximity of buildings can also impede firefighting operations due to the limited access for firefighters and equipment.

An understanding of the breakdown of residential dwelling type (presented in **Table 4**) can provide some indication of exposure risk for residential property stock within the City. Residential structural dwelling type data from the 2016 Census reveals that Lloydminster's structural dwellings consist mainly of single-detached houses (49%), slightly higher than Alberta (47%) by 2% and lower than Saskatchewan (59%) by 10%. A significant portion (24%) of the City's property stock includes other types of attached residential dwellings (semi-detached, row housing, apartments or flats in a duplex or apartment building with fewer than five storeys) with a large portion of attached dwellings being apartments with fewer than five storeys (14%). These dwellings have a higher risk of a fire spreading to an adjacent exposed dwelling.

Overall, the City has a residential dwelling profile that represents a similar density compared to the Province with very few apartments in high-rise buildings resulting in less risk from the perspective of building density. The building stock in the downtown area is typical of that of many Canadian towns and cities, and includes a mix of occupancy types. Through the data collection process, the L.F.D. advised that there are buildings in the downtown core area in close proximity to one another, specifically along 50 Street and 51 Street that present an increased risk of exposure.

It was also noted that there are a few industrial occupancies that due to the nature of the materials being processed at those facilities, naturally present an exposure risk. These are discussed further in **Section 6.0** of this report.

Table 4: Residential Structural Dwelling Types (2016 Census)

Structural Dwelling Type	City		Alberta		Saskatchewan	
	Total Dwellings	Total % Dwellings	Total Dwellings	Total % Dwellings	Total Dwellings	Total % Dwellings
Single-detached house	7,620	49%	946,225	47%	314,340	59%
Apartment in a building that has five or more storeys	110	1%	62,395	3%	10,520	2%
Movable dwelling	330	2%	47,970	2%	9,325	2%
Other attached dwellings	3,770	24%	471,090	24%	98,435	19%
Semi-detached house	330	2%	86,765	5%	12,705	2%
Row house	1,045	7%	116,625	6%	18,535	3%
Apartment or flat in a duplex	140	1%	43,090	2%	9,385	2%
Apartment in a building that has fewer than five storeys	2,255	14%	223,360	11%	57,115	11%
Other single-attached house	5	0%	1,245	0%	700	0%
Total	**15,605**	**100%**	**1,998,765**	**100%**	**531,060**	100%

Key Finding: The 2016 Census data indicates that 24% of the City's residential building stock is comprised of attached dwellings representing a higher risk of fire exposure.

Key Finding: The building stock within the downtown core includes a number of buildings with minimal separations between them presenting a greater fire risk to occupants and first responders.

3.5 Building Height and Area

Buildings that are taller in height, or contain a large amount of square footage (footprint) can have a greater fire loss risk and life safety concern. One of the unique characteristics and risks of tall / multi-storey buildings is known as the "stack effect". This is characterized as vertical air movement occurring throughout the building, caused by air flowing into and out of the building, typically through open doors and windows. The resulting buoyancy, caused by the differences between the indoor/outdoor temperature and elevation differences, causes smoke and heat to rise within the building. This can have a dramatic effect on smoke permeation throughout the common areas and individual units within the

building. This can be directly related to the high percentage of deaths that occur in high-rise buildings as a result of smoke inhalation.

The nature of taller buildings also brings the presence of higher occupant loads and higher fuel loads due to the quantity of furnishings and building materials. Efficient evacuation can also be a challenging process due to a lack of direction, signage, knowledge, or familiarity of the occupants which may result in overcrowding of stairways and exit routes. Ensuring all required life safety systems are in place and functioning is a priority for these occupancies. Taller buildings can experience extended rescue / fire suppression response times for firefighters to ascend to the upper levels. This is commonly referred to as "vertical response" representing the time it takes for firefighters to gain entry into the building and ascent to the upper floors by the stairwells. Options such as "shelter-in-place" whereby occupants are directed by the fire department to stay within their units can be an effective life safety strategy. However, ensuring internal building communications systems are in place and functioning is critical to the success of this strategy. Targeted campaigns addressing strategies like shelter in place are also critical to educating building occupants.

The L.F.D. has not identified any high-rise buildings; however, there are several facilities that may present a risk due to their large floor areas, some of which may have the potential for fuel load concerns. Large buildings, such as industrial plants and warehouses, department stores, and "big box" stores, can contain large volumes of combustible materials. In many of these occupancies, the use of high rack storage is also present. Fires within this type of storage system can be difficult to access and cause additional risk to firefighter safety, due to building collapse. Buildings that occupy large areas are included in **Table 5**.

Table 5: Buildings with Large Area Considerations

Building Name	Address
Golden Horse Casino	3910- 41 Street
Lloydminster Mall	5211- 44 Street
Servus Sports Centre	5202- 12 Street
Real Canadian Superstore	5031- 44 Street
Co-op Marketplace	3606- 50 Avenue
Sobeys	4227- 75 Avenue
Walmart Supercentre	4210- 70 Avenue
Home Depot	7705- 44 Street
Canadian Tire	4215- 70 Avenue
Lloydminster Exhibition	5521- 49 Avenue
City of Lloydminster Operations Centre	6623- 52 Street
Atrium Centre	5012- 49 Street

Building Name	Address
Pioneer Lodge/House	5722- 50 Street
Prairie North Plaza	4910- 50 Street

Source: L.F.D.

There are 14 buildings that have been identified as having large floor areas in Lloydminster, some of which contain hazardous materials or high fuel load. Pre-planning of some of these facilities would benefit the fire department by providing awareness to suppression crews about key building features, possible hazards, and other pertinent characteristics about the occupancy and site.

One of the sites identified is a retirement home. Retirement homes are an important consideration for the fire service from the perspective of fire risk as they are considered a high life-safety risk occupancy. High fire life safety risk occupancies are further described in **Section 3.7.**

Key Finding: There are 14 buildings that present an increased fire risk due to their large floor areas.

Key Finding: The L.F.D. has not identified any building height concerns as part of the data collection process for this C.R.A. The L.F.D. may wish to consider tracking these types of occupancies to further assess fire risk with respect to building height within the community.

3.6 Potential High Fire Risk Occupancies

Potential high-fire risk occupancy consideration is another factor within building stock profile per N.F.P.A. 1730. High fire risk can be linked to a combination of factors such as building density (exposures). This section of the C.R.A. will focus primarily on fuel load for industrial occupancies. Fuel load typically refers to the amount and nature of combustible content and materials within a building. This can include combustible contents, interior finishes as well as structural materials. Combustible content tends to create the greatest potential fire loss risk. This can include industrial materials, commercial materials or typical office furnishings. Higher fuel loads result in increased fire loss risk due to increased opportunity for ignition and increased fire severity.

In many communities large amounts of fuel load can be contained within a single occupancy such as a building supply business, within a large multi-unit residential building, or within a historic downtown core. As presented previously within this report, the age and construction of a building can also have an impact on fuel load given that older buildings likely have a larger volume of combustible construction materials such as wood framing rather than newer construction utilizing concrete and steel products. The L.F.D. has not identified any potential high fire risk occupancies as part of the data collection process for this C.R.A.

Key Finding: The L.F.D. has not identified any potential high fire risk occupancies as part of the data collection process for this C.R.A. The L.F.D. may wish to consider tracking these types of occupancies to further assess high fire risk within the community.

3.7 Potential High Life-Safety Risk Occupancies

Fire risk does not affect all people equally. Those who are at an increased risk of fire injury or fatality are known as vulnerable individuals. They can be someone with mobility limitations, cognitive limitations, persons with developmental disabilities or those who are unable to move on their own due to physical limitations or restraint. In the event of a fire, these individuals may be unable to self-evacuate and/ or require assistance in their evacuation efforts. Identifying the location and number of vulnerable individuals or occupancies within the community provides insight into the magnitude of this particular demographic group within a community.

From an occupancy perspective, occupancies with potential high life-safety risk contain vulnerable individuals who may require assistance to evacuate in the event of an emergency due to cognitive or physical limitations. These occupancies house individuals such as seniors or people requiring specialized care. It is important to note, however, that **not all vulnerable individuals live in** potential high life-safety risk **occupancies**; for example, some seniors who are vulnerable due to physical limitation can live on their own or in subsidized housing making them a key demographic to reach.

Table 6 lists potential high life-safety risk occupancies within Lloydminster as identified by the L.F.D.

Table 6: Potential High Life-Safety Risk Occupancies – City of Lloydminster

Property Name	Address	Number of Stories
Pioneer Lodge/Pioneer House	5722 50 Street	2
Dr. James W. Hemstock Assisted Living Lloydminster Residence	4202 54 Avenue	2
Jubilee Home	3902 45 Avenue	1
Points West Living Lloydminster	4025 56 Avenue	2
Dr. Cooke Extended Care	3915 56 Avenue	1
Lloydminster Continuing Care Centre	7402 29 Street	1
Halls Holme Apartment	4510 49 Avenue	6

Source: L.FD.

Identifying additional potential high fire life-safety risk considerations is important from the perspective of risk and for the purposes of the services provided by the fire department, including enhanced and targeted fire inspections and public education programming. For example, this may include day care centres or schools, where due to their age, children might have limitations that prevent or delay self - evacuation in the event of an emergency.

Key Finding: Research identified seven High Life-Safety Risk Occupancies within the City of Lloydminster.

3.8 Historic or Culturally Important Buildings

An understanding of the location of historic or culturally important buildings or facilities is an important consideration within the building stock profile of a C.R.A. Such buildings or facilities may be keystone features to the community that provide a sense of heritage, place, and pride and act as tourism destinations which could result in an economic impact in the case of their loss. Historic areas can also present a high fire risk due to their age, the materials used to construct the buildings, the exposure to other buildings, and their importance to the community.

The Old Post Office located at 5001 50 Avenue is a heritage building completed in 1931. This two storey heritage property houses a corner entry clock tower that contributes to the historical significance of Lloydminster. Further information about the age and construction of the City's building stock is discussed in **Section 3.3** of this report.

4.0 Demographic Profile

As included in N.F.P.A. 1730, the demographic profile assessment includes analysis of age, gender, educational attainment and socioeconomic make-up, vulnerable individuals/occupancies, ethnic and cultural considerations, and population shifts. The following sections consider these demographic characteristics within the City of Lloydminster. Data from Statistics Canada was used to assess the demographics of Lloydminster. Given the City's location on the Alberta/Saskatchewan provincial border, there are two sets of data included in the 2016 Census for the City. These data sets have been combined to represent the total population of the City. Where possible, provincial comparisons are made for both the Province of Alberta and the Province of Saskatchewan.

4.1 Population and Age

The total population of Lloydminster has increased steadily over a 15 year timeframe (2001 – 2016). **Table 7** indicates that the City experienced its highest growth in population between 2006 and 2011 with an increase in population of 16%. The highest increase in total private dwellings also occurred between 2006 and 2011.

Table 7: Historic Growth in Population and Households in Lloydminster – City of Lloydminster (2016, 2011, 2006, 2001 Census)

Year	Population	% Change	Total Private Dwellings	% Change
2001	20,988	-	8,106	-
2006	24,028	15%	9,542	18%
2011	27,804	16%	11,453	20%
2016	31,410	13%	12,353	8%

Population and age are important risk topics to include within a Community Risk Assessment given that people are predominantly the source of emergency calls and certain demographics are at greater risk than others. Canada's aging population has been recognized as one of the most significant demographic trends. On July 1 2015, for the first time ever, there were more Canadians over the age of 65 (16.1% of the population) than there were children aged 0 to 14 (16.0%).[5]

Based on analysis of data from the Alberta Fire Commissioner's Statistical Report, 2013-2014, seniors represent one of the highest fire risk groups in the Province of Alberta. **Table 8** below was prepared using information found within the 2013-2014 report as well as demographic information reported in the 2016 Census from Statistics Canada. The information displayed in the table indicates that although seniors represent only 11% of the provincial population, they account for 27% of fire fatalities.

[5] Source: "The Daily: Age and Sex and type of dwelling data: key results from the 2016 Census." Statistics Canada, date modified: 2017-05-03, https://www150.statcan.gc.ca/n1/daily-quotidien/170503/dq170503a-eng.htm?HPA=1

Table 8: Fire Fatalities by Age Group (Alberta, 2014)

Category	Age	% of Provincial Population	% of Fire Fatalities
Children and Youth	14 years and under	18%	5%
Adults	15 to 64 years	71%	68%
Seniors	65 years and older	11%	27%

Source: Analysis of Data from the Alberta Fire Commissioner's Statistical Report, 2013-2014, 2016 Census, Statistics Canada

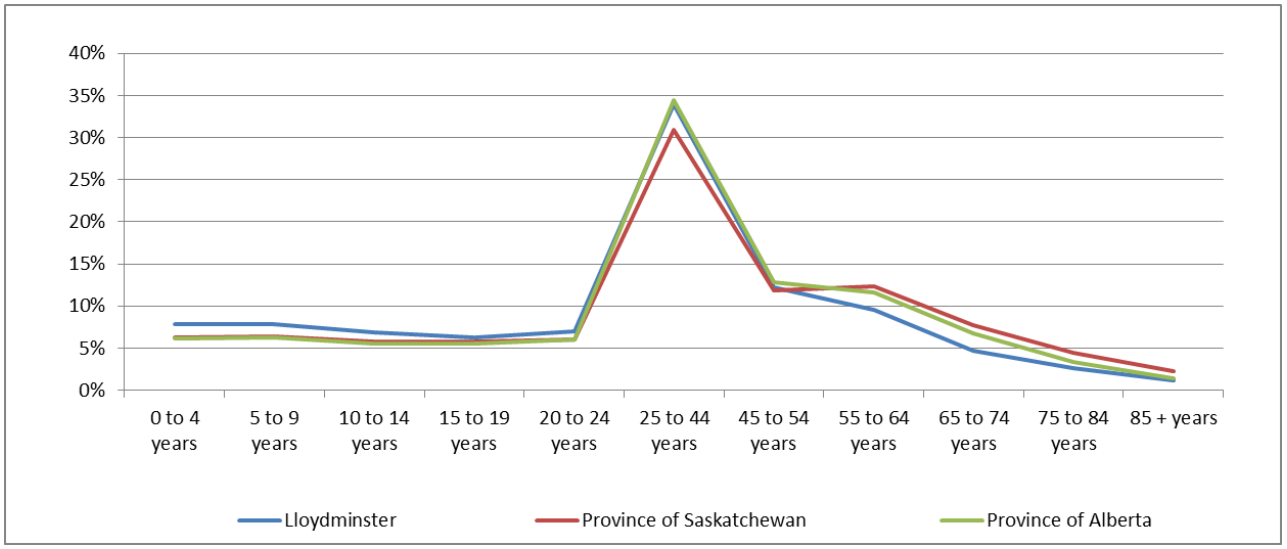
Identifying a community's population by age is a core component of developing a Community Risk Assessment and identifying specific measures to mitigate the risks associated with a specific age group such as seniors. **Table 9** provides a comparison of the City's population by age group based on the 2016 Census compared to that of the Province.

Table 9: Population by Age Group – Lloydminster, Alberta and Saskatchewan (2016 Census)

Age Group	City of Lloydminster		Province of Alberta		Province of Saskatchewan	
	Population	%	Population	%	Population	%
0 to 4 years	2,455	8%	266,515	6%	73,130	6%
5 to 9 years	2,480	8%	270,715	6%	74,460	6%
10 to 14 years	2,155	7%	241,920	6%	68,095	6%
15 to 19 years	1,960	6%	240,035	6%	67,660	6%
20 to 24 years	2,195	7%	261,830	6%	70,060	6%
25 to 44 years	10,670	34%	1,492,655	34%	361,645	31%
45 to 54 years	3,820	12%	553,340	13%	138,825	12%
55 to 64 years	2,990	9%	501,770	12%	144,110	12%
65 to 74 years	1,460	5%	290,715	7%	90,970	8%
75 to 84 years	840	3%	146,120	3%	52,515	4%
85 + years	385	1%	63,385	1%	26,940	2%
Total	**31,410**	**100%**	**4,329,000**	**100%**	**1,168,410**	**100%**
Median Age of the Population	33	-	37	-	38	-
Population aged 14 and under	7,090	23%	779,150	18%	215,685	18%
Population aged 65 and over	2,685	9%	500,220	11%	170,425	15%

The 2016 census identified a total population of 31,410 for the City. **Table 9** indicates that seniors represent 9% of the City's population, 2% lower than the Province of Alberta (11%) and 6% lower than the Province of Saskatchewan (15%). Approximately 21% of the population falls between the age of 45 and 64 years, representing a portion of the population that is aging towards the seniors demographic of 65 and over. The age distribution of Lloydminster, Alberta and Saskatchewan are further illustrated in **Figure 1. Figure 1** highlights that a significant portion of the population is comprised of children and adolescents, 5% higher in comparison to both Provinces (23% versus 18%). Due to their age, children should be considered when developing targeted public fire safety education programs.

Figure 1: Population Distribution – City, Province of Alberta, Province of Saskatchewan (2016 Census)



Key Finding: The 2016 Census data indicates that the percentage of persons aged 0 to 14 represent 23% of the City's total population in comparison to that of the both the Province of Saskatchewan and the Province of Alberta.

Key Finding: The 2016 Census data indicates that the percentage of seniors (those 65 or older) represent 11% of the City's total population. Based on historical provincial data seniors have been identified as a high fire risk group.

Key Finding: The 2016 Census data indicates that people between the ages of 45 and 64 represent 21% of the City's total population.

4.2 Gender

In examining the proportion of males versus females overall for the City, they are approximately evenly split at 50% male and 50% female as reflected in **Table 10**. Due to the minor variations in the proportions, it may be challenging to target public education information without considering this information spatially. When specific age groups are reviewed, there is a more noticeable difference in the age group of 85 years and over where males account for 36% and females 64% of that population. However, based on these statistics, it is not anticipated that public education programming would be refined based on gender.

The impact of gender distribution on public education programming would be more notable in a community with unique demographics such as those that have transient populations due to employment, for example:

Table 10: Gender Distribution by Age Group – Lloydminster (2016 Census)

Age Group	Total Population	Male	%	Female	%
0 to 4 years	2,455	1,270	52%	1,185	48%
5 to 9 years	2,480	1,265	51%	1,215	49%
10 to 14 years	2,145	1,085	51%	1,060	49%
15 to 19 years	1,950	1,000	51%	950	49%
20 to 24 years	2,200	1,110	50%	1,090	50%
25 to 44 years	10,670	5,410	51%	5,260	49%
45 to 54 years	38,35	1,905	50%	1,930	50%
55 to 64 years	2,975	1,525	51%	1,450	49%
65 to 74 years	1,465	700	48%	765	52%
75 to 84 years	830	330	40%	500	60%
85 + years	385	140	36%	245	64%
Total	31,390	15,740	50%	15,650	50%

4.3 Socioeconomic Circumstances

A significant factor that can impact fire risk is the socioeconomic circumstances of a community. Socioeconomic status is reflected in an individual's economic and social standing and is measured in a variety of ways accounting for a person's status in the labour force, their income, level of education and occupation. These factors can be reflected in the analysis of socioeconomic indicators such as labour force status, family structure, educational attainment and income as well as household tenure, occupancy, suitability, and cost.

Socioeconomic factors intersect in a number of ways and can have a direct and indirect impact on fire risk. For example, households with less disposable income may be less likely to purchase fire safety products (e.g., smoke alarms, fire extinguishers, etc.), which puts them at higher risk of experiencing consequences from a fire. Another consideration is that households living below the poverty line may have a higher number of persons per bedroom in a household and/or children who are more likely to be at home alone. These circumstances would impact both the probability and consequence of a fire.

While the complex relationships between socioeconomic circumstance and probability / consequence of a fire are not well understood within the fire service, this C.R.A. seeks to explore these factors at a high level for the City in comparison to the Province of Alberta and the Province of Saskatchewan.

It should be noted that, if viewed at a finer level of detail (e.g. census tract or neighbourhood level) consideration could be given to how these factors intersect and compound each other. For example, a neighbourhood that has a high proportion of seniors, immigrants, and unemployed residents may be at higher risk than a neighbourhood with just a high proportion of seniors.

The factors reviewed at a high level have been selected based on the data available from Statistics Canada. Factors that are highlighted in this section include:

- Labour force status
- Immigrant status
- Family structure
- Educational attainment
- Household tenure
- Household occupancy
- Household suitability
- Household costs

4.3.1 Labour Force Status

Labour force status is a possible indicator of income levels which directly influence fire risk (e.g. lower income, increased fire risk). The participation rate (i.e. the proportion of residents in the labour force) can also be an indicator of income and can be considered alongside unemployment rates (e.g. lower participation rate and higher unemployment could mean lower income, high fire risk). In terms of labour force status, **Table 11** below shows the City of Lloydminster has a higher participation rate than the Province of Alberta and the Province of Saskatchewan and a lower unemployment rate than both Provinces, suggesting a slightly lower amount of fire risk from the perspective of labour force status.

Table 11: Labour Force Status – Lloydminster, Alberta and Saskatchewan (2016 Census)

Status	City	%	Province of Alberta	%	Province of Saskatchewan	%
In the Labour Force	18,260	77%	2,302,945	72%	585,540	68%
Employed	16,175	68%	2,096,105	66%	544,095	63%
Unemployed	2,090	9%	206,835	6%	41,445	5%
Not in the Labour Force	5,575	23%	903,105	28%	271,760	32%
Total	**23,835**	**100%**	**3,206,050**	**100%**	**857,295**	**100%**

4.3.2 Family Structure

Family structure is another indicator of socioeconomic status and level of income. For example, single parent families are often more economically challenged due to the fact that there is only one income. These households also have fewer resources to arrange childcare, increasing the likelihood of fires caused by unsupervised children. For example, a higher proportion of lone-parent families could reflect lower household income and therefore a higher fire risk.

Table 12 indicates that of the families with children in Lloydminster, 17% are lone-parent families, slightly higher than the percentage of lone-parent families in Alberta (14%) and Saskatchewan (16%). This suggests that the City experiences a higher fire risk than the Province with respect to family structure and lone-parent families in particular.

Table 12: Family Structure – Lloydminster, Alberta and Saskatchewan (Census 2016)

Family Structure	City	%	Alberta	%	Saskatchewan	%
Couple-Only	3,055	36%	443,665	40%	129,085	43%
Couple Families (with children)	4,045	48%	509,655	46%	123,685	41%
Lone-Parent Families	1,415	17%	161,260	14%	49,490	16%
Total	**8,515**	**100%**	**1,114,585**	**100%**	**302,260**	**100%**

4.3.3 Educational Attainment and Income

The relationship between educational attainment and income is complex. An analysis conducted by Statistics Canada has found that high-income Canadians are generally more likely to be highly educated. Over two thirds (67.1%) of the top 1% had attained a university degree compared to 20.9% of all Canadians aged 15 and over.[6]

Based on this national trend and for the purposes of this Community Risk Assessment it is assumed that a higher education is associated with more disposable income and lower fire risk. It is also assumed that these households are more likely to invest in the fire life safety products such as fire extinguishers and smoke alarms, reducing their fire risk.

Table 13 displays the educational attainment status for the portion of the population 15 years of age and older in private households.

Table 13: Educational Attainment – City, Alberta and Saskatchewan (2016 Census)

Educational Attainment	City	%	Province of Alberta	%	Saskatchewan	%
No Certificate; Diploma or Degree	3,690	21%	540,665	17%	177,210	21%
High School Diploma or Equivalent	5,625	31%	895,885	28%	261,210	30%
Postsecondary Certificate; Diploma Or Degree	8,725	48%	1,769,500	55%	418,880	49%
Total	**18,040**	**100%**	**3,206,050**	**100%**	**857,295**	**100%**

According to the 2016 Census, 48% of residents in Lloydminster have a postsecondary Certificate, Diploma or Degree, which is 8% lower than the Province of Alberta and 1% lower than the Province of

[6] Source: "Education and occupation of high-income Canadians,: Statistics Canada, Last modified: 2018-07-25, https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-014-x/99-014-x2011003_2-eng.cfm

Saskatchewan. Twenty-one percent (21%) of the City's population have no certificate, diploma or degree, which is higher than the Province of Alberta's percentage in this category at 17% and on par with Saskatchewan. This level of educational attainment could be linked to higher median household income. The median total income of households in 2015 for the City was $93,253, very similar to Alberta's median total income per household of $93,835 and higher than Saskatchewan's median total income per household of $75,412. This suggests that the City as a whole has a lower fire risk from the perspective of income using educational attainment as an indicator.

Another way to analyze income is through income decile groups. As stated by Statistics Canada, a "decile group provides a rough ranking of the economic situation of a person based on his or her relative position in the Canadian distribution of the adjusted after-tax income of economic families". Economic family income decile group for the population in private households is presented in **Table 14** illustrating that a higher portion of the population (61%) in Lloydminster falls within the top distribution of income decile groups, only 1% lower than the Province of Alberta total (62%) and 8% higher than Saskatchewan (53%).

Table 14: Economic Family Income Decile Group for the Population in Private Households (City and Province of Alberta)

Income Decile Group	City		Province of Alberta		Saskatchewan	
	Population	%	Population	%	Population	%
In the bottom half of the distribution	11,985	39%	1,527,695	38%	506,050	47%
In the top half of the distribution	18,935	61%	2,450,450	62%	564,510	53%
Total	**30,920**	**100%**	**3,978,145**	**100%**	**1,070,555**	**100%**

4.3.4 Household Tenure, Occupancy, Suitability and Costs

Table 15 summarizes household statistics for the City, the Province of Alberta and the Province of Saskatchewan including tenure, occupancy, suitability and costs.

Housing tenure reflects socioeconomic status whereby a low home ownership rate may reflect lower incomes in the community and a higher overall fire risk. The City has a lower proportion of dwellings that are owned versus rented when compared to both Provinces (69% owned in Lloydminster versus 73% in Alberta and 74% in Saskatchewan). A higher proportion of multiple persons per household can result in increased fire loss (consequence) resulting in a higher risk. In the City, only 2% of the households have more than one person per room.

Similarly, the 2016 Census reports on housing suitability which refers to whether a private household is living in suitable accommodations according to the National Occupancy Standard. Suitable accommodations are defined by whether the dwelling has enough bedrooms based on the age and relationships among household members. Based on this measure, only 4% (490) of the City's households are not suitable compared to 5% for both Alberta and Saskatchewan respectively. From the perspective of housing suitability, the City has a lower fire risk than the Province.

Shelter costs further provide some indication of the amount of disposable income within a household. Households with less disposable income have fewer funds to purchase household fire life safety items resulting in a higher risk. In Lloydminster, 21% of households spend 30% or more of the household total income on shelter costs. This is similar to the Province of Alberta (21%) and the Province of Saskatchewan (20%).

Looking closer at shelter costs, the median value of dwellings in Lloydminster is $339,768 ($60,336 less than the Province of Alberta and $40,162 higher than in Saskatchewan). This analysis suggests that the City experiences low fire risk from the perspective of shelter suitability, cost and the impact on income.

Table 15: Household Tenure, Occupancy, Suitability and Costs – City and Province of Alberta (2016 Census)

Description	City	%	Province of Alberta	%	Province of Saskatchewan	%
Household Tenure						
Owner	8,200	69%	1,105,795	73%	311,470	74%
Renter	3,645	31%	412,150	27%	109,685	26%
Total Households	**11,845**	**100%**	**1,517,945**	**100%**	**421,155**	**100%**
Household Occupancy						
One person or fewer per room	11,610	98%	1,494,875	98%	422,915	98%
More than one person per room	240	2%	32,805	2%	9,705	2%
Total Households	**11,850**	**100%**	**1,527,680**	**100%**	**432,620**	**100%**
Housing Suitability						
Suitable	11,365	96%	1,458,550	95%	412,220	95%
Not suitable	490	4%	69,125	5%	20,410	5%
Total Households	**11,855**	**100%**	**1,527,675**	**100%**	**432,630**	**100%**
Shelter Costs						
Spending less than 30% of household total income on shelter costs	9,405	80%	1,170,780	79%	316,505	80%
Spending 30% or more of household total income on shelter costs	2,410	20%	308,485	21%	80,295	20%
Total Households	**11,815**	**100%**	**1,479,265**	**100%**	**396,800**	**100%**
Median value of dwellings	$339,768		$400,104		$299,606	
Median monthly shelter costs for owned dwellings	$1,633		$1,481		$1,001	
Median monthly shelter costs for rented dwellings	$1,085		$1,243		$965	

Source: Statistics Canada, 2016 Census

4.4 Ethnic and Cultural Considerations

Cultural diversity and ethnic background can be factors for fire service providers to consider in developing and delivering programs related to fire prevention and public education. Communication barriers, in terms of language and the ability to read written material, can have an impact on the success of these programs. There may also be familiarity challenges related to fire safety standards within recent immigrant populations.

A high proportion of immigrants could demonstrate a higher fire risk due to a large population that may have the potential for lack of familiarity and/or experience with local fire life safety practices or possible language barriers. **Table 16** presents the overall immigration status of the population in Lloydminster. The City's total population is comprised of a much lower percentage of immigrants (14%) compared to Alberta as a whole (21%) but also slightly higher than Saskatchewan by 3%. When looking at the data by year of immigration, lower levels of immigration in the City compared to the Province of Alberta is a consistent trend, however 8% of the immigrant population arrived in recent years between 2011 and 2016. Recent immigration is higher in Lloydminster when compared to Alberta (5%) and Saskatchewan (4%). This may suggest a need for targeted fire safety education in areas of the City that are predominantly comprised of a recent immigrant population who may be unfamiliar with local fire safety practices.

Table 16: Immigration Status – City and Province of Alberta (2016 Census)

Status	City	%	Alberta	%	Saskatchewan	%
Non-immigrants	25,955	84%	3,062,775	77%	945,810	88%
Immigrants	4,450	14%	845,220	21%	112,490	11%
Before 1981	370	1%	163,460	4%	16,650	2%
1981 to 1990	100	0%	86,350	2%	5,545	1%
1991 to 2000	215	1%	131,560	3%	9,315	1%
2001 to 2005	350	1%	109,145	3%	8,670	1%
2006 to 2010	1,060	3%	146,910	4%	24,370	2%
2011 to 2016	2,365	8%	207,790	5%	47,935	4%
Non-permanent residents	510	2%	70,155	2%	12,255	1%
Total	**30,915**	**100%**	**3,978,150**	**100%**	**1,070,555**	**100%**

Key Finding: From 2006 to 2016 the City experienced an increase of 11% in the number of immigrants living within the City.

Table 17 provides a breakdown of the knowledge of official languages based on the 2016 Statistics Canada census information. As shown, 95% of people in the City speak English only. In addition, approximately 5% of the population state that they know both English and French, 115 people have no knowledge of English or French, and 10 people speak French only. These percentages reflect a lower fire risk from the perspective of language within the City.

Table 17: Knowledge of Official Languages (2016 Census)

Language	City		Alberta		Saskatchewan	
	Total	% Total	Total	% Total	Total	% Total
English Only	29,525	95%	3,698,765	92%	1,023,400	94%
French Only	10	0%	3,895	0%	535	0%
English and French	1,450	5%	264,720	7%	51,360	5%
Neither English nor French	115	0%	59,280	1%	7,945	1%
Total Population (non-institutional)	**31,100**	**100%**	**4,026,660**	**100%**	**1,083,240**	**100%**

4.5 Population Shift

The population within a community can shift at various times during the day or week and throughout the year. Population shift can be a result of a number of factors including employment, tourism, and education. In some municipalities, residents occasionally leave the community for employment. Other communities may be major tourist and vacation destinations resulting in large population shifts related to seasonal availability of tourism activities. This can present a number of unique risks and associative challenges for response efforts. As such, it is important to consider population shifts from a fire protection, education and prevention standpoint. Specific fire protection strategies to address population shifts should be accommodated as part of broader services, such as pro-active fire inspections of the facilities occupied by these demographics. The L.F.D. has identified several key facilities that serve as venues for many recreational activities which attract residents and non-residents alike throughout the year. A few of these features include:

- Bud Miller All Seasons Park
- Servus Sports Centre
- Lloydminster Culture and Science Centre
- Gold Horse Casino
- Civic Centre
- Lloydminster Golf and Curling Centre
- Vic Juba Community Theatre

These venues do not contribute to a significant shift in the population in terms of tourism accommodation, however, they may provide an opportunity for the L.F.D. to distribute fire life safety information and messaging to large numbers of people.

Lloydminster is home to one of two campuses comprising Lakeland College. Academic streams include agricultural sciences, business, environmental sciences trades, human services, fire and emergency services among other programs of study. Educational institutions are a key source for population shift in larger communities as they attract people from outside of the typical community. They are important to

consider since they may have school-based residences, or contribute to a population that is not captured through the census.

5.0 Hazard Profile

Hazards are important to consider from a fire risk, emergency response and overall public safety perspective. N.F.P.A. 1730 identifies three types of hazards: natural, human-caused, and technological. This section presents a summary of Hazard Identification Risk Assessments in Alberta and the City of Lloydminster.

5.1 Hazard Identification and Risk Assessment (H.I.R.A.) in Alberta

A hazard is defined as a phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.[7] Hazards can be natural, human-caused or technological. It is important to identify and consider these hazards from a fire risk, emergency response and public safety perspective in order to assist local emergency response personnel prepare for and mitigate the risks within their communities, allowing for the creation of exercises, training programs and plans based on hazardous scenarios.

Under the Local Authority Emergency Management Regulation (under the authority of the *Emergency Management Act*) which is anticipated to come into force on January 1, 2020, municipalities are required to conduct a hazard and risk assessment as a component of their individual emergency management program.[8] The hazard identification and risk assessment results are used to categorize the hazards into risk levels with the ultimate goal of aiding the municipality in its emergency management efforts and programming.

Alberta municipalities have access to the Community Emergency Management Program (C.E.M.P.), an on-line tool that provides access to emergency management related modules, one of which includes community risk assessment. The C.E.M.P. provides a risk assessment tool using Hazard Identification and Risk Assessment methodology.[9]

[7] Source: "Terminology", United Nations Office for Disaster Risk Reduction website, last updated Feb. 2, 2017, https://www.unisdr.org/we/inform/terminology
[8] Source: Alberta Regulation 203/2018, Section 4.d
[9] Source: "Model Plan for Municipalities", Alberta Government website, https://www.alberta.ca/model-plan-for-municipalities.aspx

5.2 City of Lloydminster Hazard Risk and Vulnerability Assessment (H.R.V.A.)

The City recently completed a Hazard Risk and Vulnerability Assessment (H.R.V.A.) which evaluated a total of 51 potential risks resulting in 24 of those risks presenting a moderate or high risk rating. The risk prioritization matrix indicated that there are six hazards that rank the highest. These are listed below in alphabetical order:

1. Hazardous materials spills
2. Industrial fire
3. Non-emergency events
4. Overland flooding
5. Rail incident
6. Urban fire
7. Wind event related to summer storms

Key Finding: The City of Lloydminster Hazard Risk and Vulnerability Assessment identifies the top hazards within the City as hazardous materials spills, industrial fire, non-emergency events, overland flooding, rail Incident, urban fire, and wind event related to summer storms.

6.0 Economic Profile

According to N.F.P.A. 1730, the Economic Profile of a community considers particular facilities, employers, or events in a community that may contribute to its financial vitality and sustenance. If these facilities, employers, or events are impacted through a fire or emergency event, it could have a negative impact on the overall well-being of the City.

6.1 Top Employers in Lloydminster

Certain industries, employers and events contribute to the economic vitality and well-being of a community. If these facilities, employers or events are impacted through a fire or other emergency, it could have a negative effect on the overall financial stability and/or vitality of a municipality. The City of Lloydminster is located in close proximity to major urban centres such as Edmonton and Saskatoon and is well connected to these markets via Highway 16 and Highway 17. It is also accessible via air through the Lloydminster Municipal Airport and it is one of only five communities in the Province of Alberta with access to Canadian National and Canadian Pacific Rail.

The City's economy is based on natural resource extraction and processing and is deeply rooted in the petroleum industry. A key facility in the City's east end, the Husky Oil Refinery converts heavy oil to a high-quality synthetic oil.[10] This refinery also produces multiple grades of asphalt.

Agriculture is another contributor to the City's economy given its geography, accessibility and historical roots. Typical crops include wheat, barley and canola which account for approximately 30% of agricultural yields in the area.[11] The City's top employers as identified by the L.F.D. can be found in **Table 18**.

Table 18: Lloydminster Top Employers

Employer	Address
Husky Locations: Administration Offices (within City limits); Refinery (within City Limits); Upgrader (close to City of Lloydminster limits); and Pipelines.	4805 62 Avenue
Weatherford	Multiple Locations
Foremost	6614 50 Avenue
Synergy Credit Union	Multiple Locations

[10] Source: Husky website, https://huskyenergy.com/operations/downstream.asp
[11] Source: "Business and Growth", City of Lloydminster website: https://www.lloydminster.ca/en/business-and-growth/business-and-growth.aspx

Employer	Address
Servus Credit Union	Multiple Locations
Sobey's	4227 75 Avenue
Superstore	5031 44 Street
Prairie North Health Region	3820 43 Avenue and 4701 36 Street
Lloydminster Co-op	Multiple Locations
Lloydminster School Catholic Division	5411 50 Avenue
City of Lloydminster	4420 50 Avenue
Bea Fisher Centre	3514 51 Avenue and 5101 32 Street
Wal Mart	4210 70th Avenue

Source: L.F.D.

Key Finding: The City's top employers represent a potential high economic impact should a fire impact production, operations or services.

7.0 Fire Profile

Past fire loss statistics can be assessed to understand trends within a community and design a community risk reduction plan accordingly including proactive public education programming and inspection cycles. This section reviews overall fire loss, fires loss by occupancy type, death or injury by occupancy type, source of ignition, reported fire cause, and smoke alarm status. Data for this profile was sourced from the Alberta Office of the Fire Commissioner website for the years 2007 to 2016. Similar data from the Saskatchewan Fire Commissioner's Office was not available.

7.1 Past Loss

Analysis of historical data provides valuable insight into understanding the specific trends within a community. Assessing the key factors of life safety risk and fire risk in relation to provincial statistics provides a foundation for evaluating where specific programs or services may be necessary.

7.1.1 Overall Fire Loss

Analysis of historical data provides valuable insight into understanding the specific trends within a community. Assessing the key factors of life safety risk and fire risk in relation to provincial statistics provides a foundation for evaluating where specific programs or services may be necessary. The overall property loss as a result of fires is displayed in **Table 19** showing the total number of fires and property loss for the City of Lloydminster and the Province of Alberta for the period of 2007 to 2016. During this period, Lloydminster experienced a total of **221** property fires leading to **$9,625,222** in property loss.

Table 19: City of Lloydminster and Province of Alberta Property Loss Fires (2007-2016)

Year	City of Lloydminster		Province of Alberta	
	# of Fires	$ Loss	# of Fires	$ Loss
2007	39	$1,021,691	5,312	$336,369,045
2008	39	$1,353,566	5,711	$395,618,839
2009	14	$498,171	5,276	$524,773,346
2010	19	$589,819	5,059	$396,164,981
2011	17	$949,739	7,011	$836,538,313
2012	23	$651,624	5,456	$488,109,434
2013	22	$948,260	5,210	$498,323,983
2014	20	$1,163,980	5,157	$443,638,009
2015	13	$378,071	5,527	$619,620,130
2016	15	$2,070,301	16,268	$2,228,521,312
Total	**221**	**$9,625,222**	**65,987**	**$6,767,677,392**

Source: Office of the Fire Commissioner, Interactive Fire Data Analysis

The analysis of historical fires by occupancy type highlights the occupancies which may be more vulnerable to fires than others. To assess the fire loss by occupancy classification, data retrieved from the Office of the Fire Commissioner was analyzed with reference to the O.F.C.'s Fire Statistics Reporting Manual (March 2006). Data for fire loss within the City by property classification is shown in **Table 20** for a ten year period from 2007 to 2016. As previously mentioned, of the 221 property fires that occurred between 2007 and 2016, there was a total property loss of $9,625,222.

The majority of property loss (46%) took place in Group C – Residential occupancies with a dollar loss of $4,452,778. Group C – Residential occupancies also accounted for 73 fires (33%) over the ten year period. When the categories that do not directly align with the N.B.C. major occupancy classifications are removed from the calculations, fires in Group C – Residential occupancies account for 79% of all fires and fires in Group E – Mercantile occupancies account for 11% of fires.

Properties that are not a part of an N.B.C. major occupancy classification (e.g., storage properties, special property and transportation equipment) account for 59% of the 221 fires occurring over the ten year period.

Table 20: City of Lloydminster Fire Loss by Property Classification (2007-2016)

Group	Occupancy Classification	Fires	% Fires	Property Loss	% Property Loss
Group A	Assembly	4	2%	$1,835,624	19%
Group B	Care or Detention	0	0%	$0	0%
Group C	Residential	73	33%	$4,452,778	46%
Group D	Business and Personal Services	3	1%	$499,633	5%
Group E	Mercantile	10	5%	$293,834	3%
Group F	Industrial	2	1%	$230,001	2%
Other	Storage Properties	6	3%	$336,223	3%
	Special Property and Transportation Equipment	105	48%	$1,734,651	18%
	Miscellaneous Property	18	8%	$232,868	2%
Total		**221**	**100%**	**$9,615,612**	**100%**

Source: Office of the Fire Commissioner, Interactive Fire Data Analysis

Key Finding: Group C – Residential occupancies account for 73% of property fires within the City when analyzing the proportion of fires that occurred within an National Building Code major occupancy classification.

Key Finding: Group E – Mercantile occupancies account for 11% of property fires within the City when analyzing the proportion of fires that occurred within an National Building Code Major Occupancy major occupancy classification.

Key Finding: Properties that are not a part of an National Building Code major occupancy classification (e.g., storage properties, special property and transportation equipment, etc.) account for 59% of the 221 fires occurring over the ten year period.

7.1.2 Civilian Fire Fatalities and Injuries

As shown in **Table 21**, during this ten period (2007-2016), there were no fatalities and four reported injuries within Lloydminster. All injuries and fatalities within the City occurred in Group C – Residential occupancies. This finding is consistent with the fire loss statistics by occupancy, whereby the majority of fire losses within the City occurred in Group C – Residential occupancies.

Table 21: City of Lloydminster Reported Civilian Injuries and Fire Fatalities (2007-2016)

Group	Occupancy Classification	Injuries	Fatalities
Group A - Assembly	Assembly occupancies	0	0
Group B - Care or Detention	0	0	0
Group C - Residential	0	4	0
Group D - Business	0	0	0
Group E - Mercantile	0	0	0
Group F - Industrial	0	0	0
Other	0	0	0
	0	0	0
	0	0	0
	0	0	0
Total		0	0

In addition to the data presented above from the Alberta Office of the Fire Commissioner website for the years 2007 to 2016, the L.F.D. has indicated that there have been three fatal fires; one in 2010, one in 2013 and one as recently as 2018.

Key Finding: For the period 2007 to 2016, four injuries occurred within Group C – Residential occupancies.

Key Finding: For the period 2007-2018, three fire fatalities have occurred.

7.1.3 Reported Fire Cause

Assessing the possible cause of the fires reported is an important factor in identifying potential trends, or areas that may be considered for introducing additional public education or fire prevention initiatives. Analysis was carried out on the Alberta Fire Commissioner's Statistical Reporting for fire losses by major act or omission for the City of Lloydminster data as presented in **Table 22**. This analysis was completed with reference to the Office of the Fire Commissioner's Fire Statistics Reporting Manual (March 2006). The highest proportion of fire causes by act or omission were unintentional fires classified as miscellaneous act or omission (44%) and Mechanical/Electrical Failure/Malfunction (22%). Arson or 'Set Fires' are the third most prevalent cause of fires accounting for 16% of all fires occurring in Lloydminster over the ten year period.

Table 22: City of Lloydminster Fire Loss by Major Acts or Omissions (2013-2017)

Act or Omission	Fires	% of Fires	Property Loss ($)	% Property Loss
Mechanical/Electrical Failure/Malfunction	49	22%	$1,940,117	20%
Arson or 'Set Fires'	35	16%	$1,114,637	12%
Human Failing	22	10%	$656,229	7%
Misuse of Source of Ignition	9	4%	$463,168	5%
Misuse of Material Ignited	5	2%	$84,000	1%
Construction, Design, Installation Def.	1	0%	$100,500	1%
Vehicle Accident	2	1%	$36,514	0%
Misuse of Equipment	1	0%	$8,000	0%
Miscellaneous Act or Omission	97	44%	$5,222,057	54%
Total	**221**	**100**	**$9,625,222**	**100**

Key Finding: Of the fires occurring in the City between 2007 and 2016, the leading known causes of unintentionally set fires was due to Mechanical/Electrical Failure/Malfunction at 22% of fires.

Key Finding: Of the fires occurring in the City between 2007 and 2016, miscellaneous acts or omissions was the most prevalent cause of fires (44%).

Key Finding: Of the fires occurring in the City between 2007 and 2016, 25% of fires were intentionally caused and classified as Arson or 'Set Fires'.

7.1.4 Ignition Source

Table 23 illustrates the fire loss by source of ignition based on an analysis of the data provided from 2007 to 2016 from the Office of the Fire Commissioner for the City of Lloydminster and with reference to the O.F.C.'s Fire Statistics Reporting Manual (March 2006). The most common known ignition sources within the City are Smoker's Material & 'Open' Flame (12%) followed by Exposure (9%). Over this period, the source of ignition could not be determined for 114 fires (or 52%). The General category refers to cases where there was no igniting object, but were ignited through lightning.

Table 23: City of Lloydminster Fire Loss - Reported Source of Ignition (2007-2016)

Reported Ignition Source	Number of Fires	% of Fires	$ Losses	% Property Loss
Appliances & Equipment	5	2%	$39,656	0%
Cooking Equipment	13	6%	$315,997	3%
Electrical Distribution Equipment	10	5%	$635,730	7%
Heating Equipment	7	3%	$308,470	3%
Smoker's Material & 'Open' Flame	26	12%	$1,217,317	13%
Other Electrical Equipment	11	5%	$339,719	4%
Miscellaneous	13	6%	$447,805	5%
Exposure	20	9%	$377,926	4%
General	2	1%	$73,656	1%
Unknown	114	52%	$5,868,946	61%
Total	**221**	**100**	**$9,625,222**	**100**

Key Finding: The most common known sources of ignition for fires within the City is due to Smoker's Material & 'Open' Flame at 12% and Exposure at 9%.

Key Finding: The ignition source for 52% of the City's fires was determined as "unknown".

7.1.5 Smoke Alarm Status

At the time of preparing this C.R.A. there was no historical data available from the L.F.D. related to the status of smoke alarms following a fire. The presence of working smoke alarms and carbon monoxide detectors in all residential occupancies are core elements of a community fire safety plan.

According to a 2011-2012 Alberta Fire Commissioner's Statistical Report, in 2011 and 2012, there were 3,179 fires in the province where a smoke alarm was not installed (totalling 69% of fires in 2011 and 58% in 2012). In the instances where a smoke alarm was present, the smoke alarm was activated 38% of the time, did not activated 28% of the time, and it is was undetermined if it activated 34% of the time.

Although limited, this report indicates that over this period 62% of the smoke alarms present either did not activate or it was undetermined if the smoke alarm activated. The importance of working smoke alarms and carbon monoxide detectors has resulted in many provinces passing mandatory regulations for the installation and maintenance of these devices.

Key Finding: Historical provincial data indicates that a high percentage of smoke alarms were found to have not activated, or it was undetermined if they activated.

8.0 Response

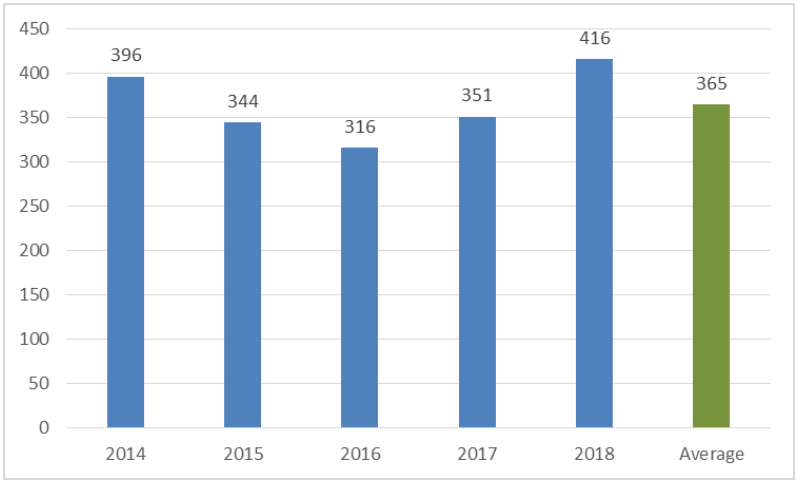
As described in N.F.P.A. 1730, the Response Profile describes and presents an analysis of the types of emergencies to which the Lloydminster Fire Department responds. The profile assesses the historical emergency response capabilities of the L.F.D. based on data collected by the department for the period from January 2014 to December 2018. This includes an analysis of annual call volume, call volume by month, day of the week, time of day and response type.

The response profile seeks to apply the historic call data to develop an understanding of community risks. The analysis provided within this profile is based on all historical calls responded to by the L.F.D. for the years 2014-2018. It also provides detailed breakdowns of calls by type and corresponding volumes. The volume and frequency of historic calls informs the understanding of response probability.

8.1 Annual Call Volume – All Incidents

A summary of the total number of calls within the City from 2014-2018 is shown in **Figure 2**. The annual call volume provides an understanding of the probability of incidents occurring within Lloydminster. Overall, the number of calls responded to by the L.F.D. has increased by 5% from 2014 to 2018, with the lowest number of calls received in 2016. The most dramatic increase in call volume occurred between 2016 and 2018 over this five year period with an increase in 100 calls.

Figure 2: Annual Call Volume – All Incidents (2014-2018)

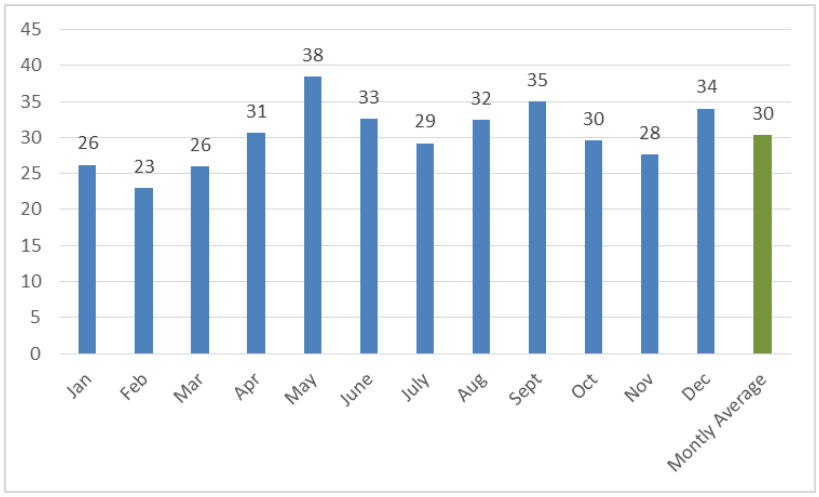


Key Finding: The call volume in 2018 exceeded the 5-year annual call volume average of 365 calls by 12%.

8.2 Average Call Volume by Month – All Incidents

As shown in **Figure 3**, call volume by month is for all incidents is fairly consistent across all months. On average, the highest call volume occurs in May while the lowest call volume occurs in February. The difference between the highest average call volume and lowest average call volume by month is 15 calls.

Figure 3: Average Call Volume by Month – All Incidents (2014-2018)

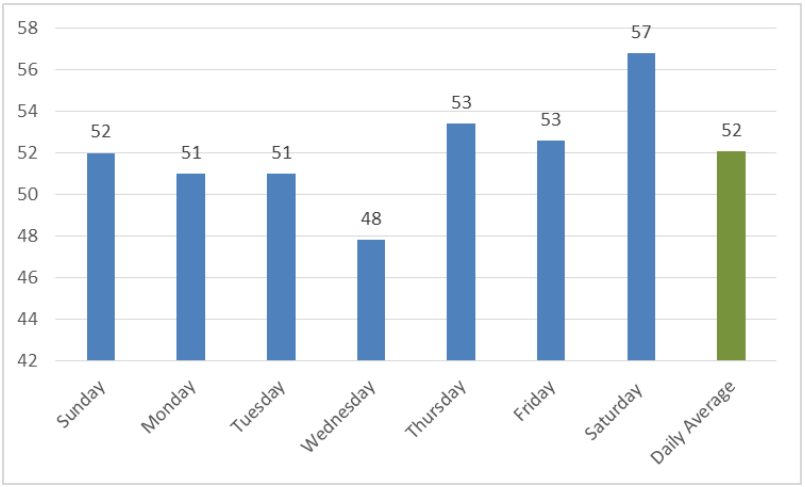


Key Finding: Analysis of call volume by month for the period 2014-2018 indicates that the highest average call volume occurs in the month of May, exceeding the 5 year monthly average of 30 calls per month.

8.3 Average Call Volume by Day of Week – All Incidents

Similar to call volume by month, call volume is fairly consistent across all days of the week, as **Figure 4** below illustrates. On average, highest call volume occurs on Saturdays, while the lowest call volume occurs on Wednesdays. The difference between the highest and lowest call volumes is 9 calls.

Figure 4: Average Call Volume by Day of Week – All Incidents (2014-2018)

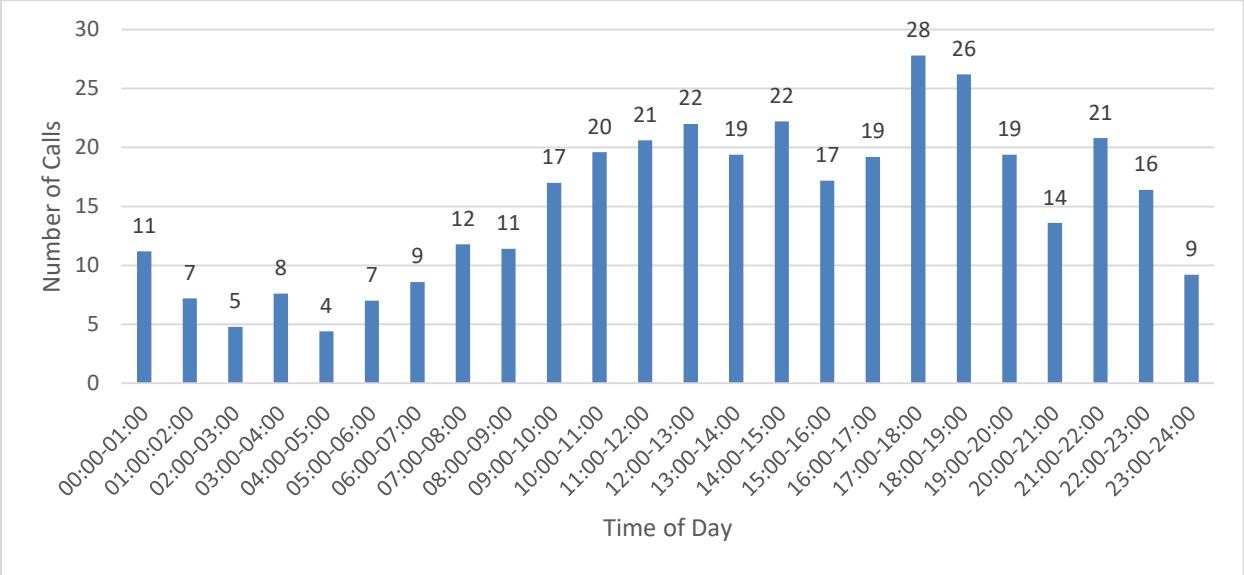


Key Finding: Analysis of call volume by day of week for the period of 2014-2018 indicates that the highest average call volume occurs on Saturdays, exceeding the 5 year daily average of 52 calls per day.

8.4 Average Call Volume by Time of Day - All Incidents

Figure 5 indicates that on average, there is a higher occurrence of calls between 5pm and 7pm. The lowest average call volume takes place between the hours of 11pm and 9am. This trend of high call volume between 5pm and 7pm coincides with daily times of higher commuter traffic and the lowest average call volume between 11pm and 9am occurs when the majority of the population is typically asleep.

Figure 5: Average Call Volume by Time of Day – All Incidents (2014-2018)



Key Finding: Analysis of average call volume by time of day for the period of 2014-2018 indicates that the highest average call volume occurs between 5pm and 7pm when the majority of individuals are travelling from work to home.

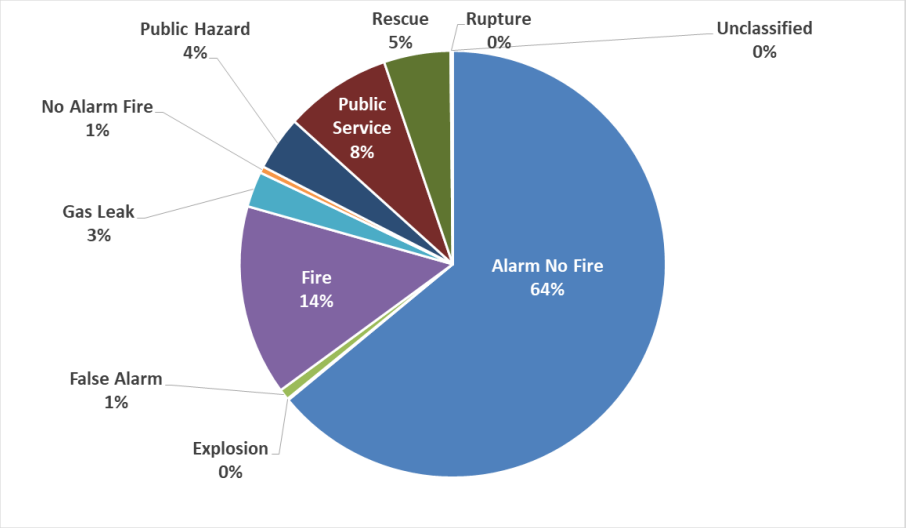
8.4.1 Calls by Response Type

Figure 6 shows the percentage of calls responded to by the L.F.D. by response type. Alarm, No Fire calls are the most common response type accounting for 64% of all calls. Alarm, No Fire calls include unknown odours investigated, fumigation, smoke or steam mistaken, sprinkler surge or discharge, detector activated, miscellaneous and accidental miscellaneous[12]. This indicates that alarm, no fire calls

[12] Source: Fire Statistics Reporting Manual, Alberta Office of the Fire Commissioner website, last revised March 2006, https://www.alberta.ca/fire-reporting.aspx

result in a significant demand on the current resources of the L.F.D. In our experience, these findings support further consideration of a more comprehensive strategy that includes an enhanced and targeted public education campaign, and increased fire inspections of properties where repeat false alarms occur. Additionally, fire calls include fire calls, no loss rubbish or grass fires, and 'no alarm fire – not responded to by fire department'. Fire calls account for 14% of calls responded to and public service calls account for 8%.

Figure 6: Call Volume by Response Type (2014-2018)



Key Finding: Alarm, No Fire calls are the most common response type accounting for 64% of all calls.

9.0 Applying Risk Outcomes

The Community Risk Assessment and Fire Services Master Plan are complementary documents. The findings of the C.R.A. help to define local needs and circumstances and ultimately inform the service levels provided by the fire department. This section of the C.R.A. brings together all of the risk assessment outcomes and frames how they will be used to inform the F.S.M.P. This includes an overview of the overall approach (**Section 9.1**) as well as the application of that approach (**Section 9.2 and 9.3**).

9.1 Overall Approach

To apply the risk outcomes, this C.R.A. considers the 5 "E's" of Community Risk Reduction and the application of a risk matrix in order to assign risk levels to the major occupancy types.

9.1.1 The 5 "E's" of Community Risk Reduction

According to N.F.P.A. 1300 (2020 edition), identifying and prioritizing community risk is the first step in developing a Community Risk Reduction Plan (C.R.R.P.). A C.R.R.P. establishes the foundation for reducing the occurrence and impact of local fire and life safety risks, integrating fire suppression and prevention strategies. Although emergency response may be needed in some instances, there are other approaches that can be applied to reduce the need for emergency response and optimize public safety within the community.

Together, these risk reduction strategies form the ***five "E's"***, a framework outlined in N.F.P.A. 1300, and the Institution of Fire Engineers' *Vision 20/20 National Strategy for Fire Loss Prevention*. The five "E's" are summarized in **Table 24**. These strategies include increasing awareness (**E**ducation), changes to the physical environment (**E**ngineering), influencing change through economic incentives (**E**conomic Incentives), enforcing legislation through inspection programs (**E**nforcement) and mitigating injury, illness and saving lives (**E**mergency Response). For some risks, only one strategy may apply and others may require multiple strategies. Incorporating all "E's" into the risk reduction process will enable the fire department to provide the highest level of fire protection.

Table 24: Overview of the N.F.P.A. 1300 Five "E's"

Five E's	Description
Education	Education influences audiences to refrain from risky or unhealthy behavior or take positive action to reduce risk.
Enforcement	Enforcement reduces risks through enforcing legislation through inspections and fines for noncompliance.
Engineering	Engineering includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths.
Economic Incentives	Economic incentives are typically offered to encourage better choices and changes in behaviour.
Emergency Response	Effective emergency response can mitigate the effects of unintentional injuries and save lives.

Source: Community Risk Reduction: Doing More with More, the N.F.P.A. Urban Fire and Life Safety Task Force, June 2016.

This C.R.A. is designed to incorporate the framework of the five "E's" into the fire master planning process which results in a strategic document. It is important to note that N.F.P.A. 1300 discusses the application of the 5 E's to develop very specific goals and objectives to reduce risk. It also acknowledges that some strategies may require policy advocacy or legislative work. These are important considerations for a department but are beyond the purview of the recommendations found within a Fire Services Master Plan document. As a result, the recommendations of the F.S.M.P will focus on ways to reduce risk from the perspective of the typical operations of a department. This includes a focus on a proactive reduction of risk through education, prevention, and enforcement with fire suppression as the fail-safe. The manner in which this will be accomplished for the F.S.M.P. can be found in **Section 9.2**.

9.1.2 Risk Assignment

The risk assignment methodology used as part of this C.R.A. is informed by N.F.P.A. 1730, Dillon's historical experience in applying the Ontario Office of the Fire Marshal's Fire Risk Sub-model, and risk management industry best practices.

At a high level, there are three steps included in the risk assignment exercise used for this C.R.A.:

1. Determine a probability level to assign to each event
2. Determine a consequence level to assign to each event
3. Establish the risk level (e.g., numerical value / location on the matrix) and risk category (e.g., low, moderate or high) for each based on the identified probability and consequence for each event.

9.1.2.1 Probability Levels

The probability of a fire or emergency event occurring can be estimated in part based on historical experience of the community and that of the province as a whole. The application of broader risk management industry best practices is also a key element in assigning probability levels as shown in **Table 25**.

Table 25: Probability Levels

Likelihood Category	Value	Description
Rare	1	• May occur in exceptional circumstances • No incidents in past 25 years
Unlikely	10	• Could occur at some time, especially if circumstances change • At least one incident in past 10 years
Possible	100	• Might occur under current circumstances • More than one incident in the past 10 years
Likely	1,000	• Will probably occur at some time under current circumstances • More than one incident in the past 5 years
Almost Certain	10,000	• Expected to occur in most circumstances unless circumstances change • One or more incidents per year

9.1.2.2 Consequence Levels

The consequences as a result of an emergency event relates to the potential losses or negative outcomes associated with the incident. There are four components that should be evaluated in terms of assessing consequence. These include:

1. ***Life Safety:*** Injuries or loss of life due to occupant and firefighter exposure to life threatening fire or other situations.
2. ***Property Loss:*** Monetary losses relating to private and public buildings, property content, irreplaceable assets, significant historic/symbolic landmarks and critical infrastructure due to fire.
3. ***Economic Impact:*** Monetary losses associated with property income, business closures, downturn in tourism, tax assessment value and employment layoffs due to fire.
4. ***Environmental Impact:*** Harm to human and non-human (e.g., wildlife, fish and vegetation) species of life and general decline in quality of life within the community due to air/water/soil contamination as a result of fire or fire suppression activities.

Table 26 presents the consequence levels.

Table 26: Consequence Levels

Consequence Category	Value	Description
Insignificant	1	• No life safety issue • Limited valued or no property loss • No impact to local economy and/or • No effect on general living conditions
Minor	10	• Potential risk to life safety of occupants • Minor property loss • Minimal disruption to business activity and/or • Minimal impact on general living conditions
Moderate	100	• Threat to life safety of occupants • Moderate property loss • Poses threat to small local businesses and/or • Could pose threat to quality of the environment
Major	1,000	• Potential for large loss of life • Would result in significant property damage • Significant threat to businesses, local economy, and tourism and/or • Impact to environment would result in a short term, partial evacuation of local residents and businesses
Catastrophic	10,000	• Significant loss of life • Multiple property damage to significant portion of the municipality • Long term disruption of businesses, local employment, and tourism and/or • Environmental damage that would result in long-term evacuation of local residents and businesses

9.1.2.3 Risk Level

Once probability and consequence are determined the level of risk is calculated by multiplying the numerical values for probability and consequence. The relationship between probability and consequence as it pertains to risk levels can be illustrated in a risk matrix. In a risk matrix, probability and consequence are defined on separate scales with varying descriptors providing direction on how to assign the probability and consequence of an event. While these descriptors will vary, probability and consequence must use the same logarithmic numeric scale to reflect the fact that they are equally important. It is human tendency to place a higher weight on consequence than on probability, but robust risk analysis methods value probability and consequence equally.

This study makes use of the risk categories identified in N.F.P.A. 1730 and the descriptions for each risk category provided in the O.F.M.E.M. Fire Risk Sub-Model. **Table 27** shows the risk matrix for this C.R.A.

Table 27: Risk Matrix

Probability \ Consequence		Insignificant	Minor	Moderate	Major	Catastrophic
		1	*10*	*100*	*1,000*	*10,000*
Almost Certain	*10,000*	10,000	100,000	1,000,000	10,000,000	100,000,000
Likely	*1,000*	1,000	10,000	100,000	1,000,000	10,000,000
Possible	*100*	100	1,000	10,000	100,000	1,000,000
Unlikely	*10*	10	100	1,000	10,000	100,000
Rare	*1*	1	10	100	1,000	10,000

Risk Category	Definition
Low Risk	• Manage by routine programs and procedures • Maintain risk monitoring
Moderate Risk	• Requires specific allocation of management responsibility including monitoring and response procedures
High Risk*	• Community threat, senior management attention needed • Serious threat, detailed research and management planning required at senior levels

9.2 Categorization of Key Findings

When it comes to aligning service levels with risks that define local needs and circumstances, it is important to recognize that not all risk analysis outcomes align with the services provided by a fire department in the same way. For this reason, the risk outcomes - Key Findings - are categorized based on how they can be used to inform the activities, strategies, and services provided by the L.F.D. This categorization is then directly used within the Fire Services Master Plan.

As referenced above, the categories used for this process are based on the five "E's" of community risk reduction planning: Education, Enforcement, Engineering, Economic Incentive and Emergency Response as shown in **Table 28**.

Table 28: Risk Analysis Outcome Categorization

Five E's	Description	Purpose
Education	Education influences audiences to refrain from risky or unhealthy behavior or take positive action to reduce risk.	For consideration within the proposed Public Education Program
Enforcement	Enforcement reduces risks through enforcing legislation through inspections and fines for noncompliance.	For consideration within the proposed Fire Inspection/Enforcement Program
Engineering	Engineering includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths.	For consideration within the proposed Fire Inspection/Enforcement Program
Economic Incentives	Economic incentives are typically offered to encourage better choices and changes in behaviour.	For consideration within the proposed Fire Inspection/Enforcement Program
Emergency Response	Effective emergency response can mitigate the effects of unintentional injuries and save lives.	For consideration within the proposed Emergency Response Deployment Options

The risk outcomes from each profile that inform local needs and circumstances are aligned with one or more of the five "E's". **Table 29** presents the Key Findings in a matrix format to indicate the ways in which the risks can be addressed by the fire service and ultimately considered within the Fire Services Master Plan analysis and recommendations.

Table 29: Categorization of Key Findings

Profile	C.R.A. Analysis Outcome: Key Finding	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Fire Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic	Major road disruptions along Highway 16 which runs East/West through the City centre, could result in heavy traffic congestion and the rerouting of commercial trucks through the City leading to longer fire department response times both on the highway and within the City.					✓
	Rail lines within the City have been identified as hazardous material routes that may present a higher risk to the community.					✓
	The at-grade railway crossing on 50th Avenue located just north of Fire Station No. 1 creates a potential delay in emergency response times from this station to areas north of this at-grade rail crossing.					✓
	The City has a potential risk of wildland fire due to the wildland-urban interface primarily located outside of the urban settlement area.	✓	✓		✓	✓
Building Stock	According to Statistics Canada, 90.5% of the City's existing building stock is comprised of Group C-Residential Occupancies.	✓				✓
	The 2016 Census data indicates that 24% of the City's residential building stock is comprised of attached dwellings representing a higher risk of fire exposure.	✓	✓	✓		✓
	The building stock within the downtown core includes a number of buildings with minimal separations between them presenting a greater fire risk to occupants and first responders.	✓	✓	✓		✓
	The L.F.D. has not identified any building height concerns as part of the data collection process for this C.R.A. The L.F.D. may wish to consider tracking these types of occupancies to further assess fire risk with respect to building height within the community.		✓	✓	✓	✓
	The L.F.D. has not identified any potential high fire risk occupancies as part of the data collection process for this C.R.A. The L.F.D. may wish to consider tracking these types of occupancies to further assess high fire risk within the community.	✓	✓	✓	✓	
	There are 14 buildings that present an increased fire risk due to their large floor areas.			✓		✓
	Research identified seven High Life-Safety Risk Occupancies within the City of Lloydminster.	✓	✓	✓	✓	✓
Demographics	The 2016 Census data indicates that the percentage of persons aged 0 to 14 represent 23% of the City's total population in comparison to that of the both the Province of Saskatchewan and the Province of Alberta.	✓				
	The 2016 Census data indicates that the percentage of seniors (those 65 or older) represent 11% of the City's total population. Based on historical provincial data seniors have been identified as a high fire risk group.	✓				
	The 2016 Census data indicates that people between the ages of 45 and 64 represent 21% of the City's total population.	✓				
	From 2006 to 2016 the City experienced an increase of 11% in the number of immigrants living within the City.	✓				

Profile	C.R.A. Analysis Outcome: Key Finding	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Fire Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Hazard	The City of Lloydminster Hazard Risk and Vulnerability Assessment identifies the top hazards within the City as hazardous materials spills, industrial fire, non-emergency events, overland flooding, rail Incident, urban fire, and wind event related to summer storms.					✓
Economic	The City's top employers represent a potential high economic impact should a fire impact production, operations or services.					✓
Fire	Residential occupancies account for 73% of property fires within the City when analyzing the proportion of fires that occurred within a National Building Code major occupancy classification.		✓	✓		✓
	Mercantile occupancies account for 11% of property fires within the City when analyzing the proportion of fires that occurred within a National Building Code Major Occupancy major occupancy classification.	✓	✓	✓	✓	✓
	Properties that are not a part of a National Building Code major occupancy classification (e.g., storage properties, special property and transportation equipment, etc.) account for 59% of the 221 fires occurring over the ten year period.	✓				✓
	For the period 2007 to 2016, four injuries occurred within Group C – Residential occupancies.		✓	✓		✓
	For the period 2007-2018, three fire fatalities have occurred.		✓	✓		✓
	Of the fires occurring in the City between 2007 and 2016, the leading known causes of unintentionally set fires was due to Mechanical/Electrical Failure/Malfunction at 22% of fires.	✓	✓			
	Of the fires occurring in the City between 2007 and 2016, miscellaneous acts or omissions was the most prevalent cause of fires (44%).					✓
	Of the fires occurring in the City between 2007 and 2016, 25% of fires were intentionally caused and classified as Arson or 'Set Fires'.	✓	✓			✓
	The most common known sources of ignition for fires within the City is due to Smoker's Material & 'Open' Flame at 12% and Exposure at 9%.	✓	✓	✓	✓	✓
	The ignition source for 52% of the City's fires was determined as "unknown".					✓
	Historical provincial data indicates that a high percentage of smoke alarms were found to have not activated, or it was undetermined if they activated.	✓	✓	✓	✓	✓
Response	The call volume in 2018 exceeded the 5-year annual call volume average of 365 calls by 12%.		✓		✓	✓
	Analysis of call volume by month for the period 2014-2018 indicates that the highest average call volume occurs in the month of May, exceeding the 5 year monthly average of 30 calls per month.					✓
	Analysis of call volume by day of week for the period of 2014-2018 indicates that the highest average call volume occurs on Saturdays, exceeding the 5 year daily average of 52 calls per day.					✓
	Analysis of average call volume by time of day for the period of 2014-2018 indicates that the highest average call volume occurs between 5pm and 7pm when the majority of individuals are travelling from work to home.					✓

Profile	C.R.A. Analysis Outcome: Key Finding	Education	Enforcement	Engineering	Economic Incentive	Emergency Response
		For consideration within the proposed Public Education Program	For consideration within the proposed Inspection and Enforcement Program	For consideration within the proposed Inspection and Enforcement Program	For consideration within the proposed Fire Inspection and Enforcement Program	For consideration within the proposed Emergency Response Program
	Alarm, No Fire calls are the most common response type accounting for 64% of all calls	✓	✓	✓	✓	✓

9.3 Risk Assignment by N.B.C. Occupancy Type

To support the application of the risk outcomes to the proposed Public Education programs, Inspection and Enforcement and Suppression, risk levels are assigned to the N.B.C. occupancy types based on the findings of the C.R.A. This approach is supported by N.F.P.A. 1730 which, for example, recommends establishing inspection cycles based on occupancy type risk levels.

Table 30 outlines the assignment of risk levels to the N.B.C. occupancy types with consideration to the findings of the profile assessments. The probability level is informed quantitatively by the average annual events from fire loss as well as the breakdown by property stock in building stock profile as described under the rationale. Consequence is informed qualitatively by property stock, demographic, fire loss, geography, and economic profile considerations as described under the rationale.

Our review of the historical emergency response data for the City of Lloydminster in preparing this C.R.A. indicates that there have been no incidents in a Group B – Care or Detention Occupancy in the last 10 years. In our experience, this is an exceptional record that may be related to the minimal number of these occupancies types within the community, the relative age of the current occupancies or a high degree of maintenance and commitment to existing fire and life safety systems and procedures. Our research of the probability of a fire related incident in other comparable municipalities indicates a higher degree of probability of an incident in a Group B – Care or Detention Occupancy. As a result, we have adjusted the probability likelihood of Group B – Care or Detention Occupancy to “likely” to recognize broader municipal historical experience.

Although Group B occupancies within Lloydminster have a rare history of fires and loss of life, these occupancies contain vulnerable individuals who typically require some assistance due to cognitive or physical limitations, disabilities, drug or alcohol use and others that may require assistance to evacuate in the event of a fire. In our view, industry standards also support the classification of Group B occupancies as high-risk due to the high dependency of occupants on built-in fire protection features or staff to assist in their evacuation during a fire.[13]

[13] N.F.P.A. 1730 (2019 Edition).

Table 30: Risk Assignment based on N.B.C. Occupancy Type

ABC Major Occupancy Classification		Probability		Consequence							Risk Level
				Level	Rationale						
		Level	Rationale		Building Stock	Demographic	Fire Loss	Response	Geographic	Economic	
Group A	Assembly	Possible	Might occur under certain circumstances. The City's historical fire loss data recorded by the Province is available only for a ten year period, this data indicates that there has been a historical average of less than one incident per year, however there may have been one or more incidents in the past five years. Currently there are six Group A occupancies within the City.	Moderate	Presence and maintenance of fire protection equipment; Large floor area risks. Currently no defined annual fire inspection and evacuation program provided.	Potential for the assembly of large groups of vulnerable individuals; consumption of alcohol/cannabis may impair judgement of occupants; conditions including lack of familiarity with room/building may impede evacuation in the event of an emergency.	Potential for moderate property loss and threat to life safety of occupants.			Group A occupancies typically play a key role in the economic wellbeing of the municipality.	Moderate
Group B	Care or Detention	Likely	Will probably occur at some time under current circumstances. City's historical fire loss data indicates that there have been no incidents over the past ten-year period. However, the City currently only has one Group B occupancy.	Major	Presence and maintenance of fire protection equipment; use of oxygen; Impeded egress in detention facilities; Large floor area risks. Currently no defined annual fire inspection and evacuation program provided.	Potential for large groups of vulnerable individuals with cognitive and/or physical limitations and/or combative behaviours who require assistance to evacuate; facility staff; visitors;	Potential for large loss of life and significant property damage.			Group B occupancies can play a key role in the economic well-being of the municipality.	High
Group C	Residential	Likely	Will probably occur at some time under certain circumstances. Based on the City's historical fire loss data, there has been an average of seven events per year over a ten year period. Of the total property stock in the City, 90.5% is Group C.	Moderate	Exposure risk within some buildings as well as risk due to building age; Presence and maintenance of fire protection equipment.	Potential for vulnerable residents including elderly and young;	For the period 2007 to 2016, the two fatalities and one injury all occurred within Group C.			Within mixed-use occupancies, a residential fire could have an economic impact. In addition, economic impact could occur in the downtown where there is greater exposure risk and older buildings.	Moderate
Group D/E	Business/Mercantile	Possible	Might occur under current circumstances. Based on the City's historical fire loss data, there have been a total of 13 events in the past 10 years. Of the total property stock in the City, 7.5% is Group D and Group E combined.	Moderate	Presence and maintenance of fire protection equipment. Large floor area risks. Currently no defined annual fire inspection and evacuation program provided.	Patrons may be unfamiliar with exit facilities;	Potential for moderate property loss and threat to life safety of occupants.			Some Group D and E occupancies play a key role in the economic wellbeing of the municipality.	Moderate
Group F	Industrial	Possible	Might occur under current circumstances. City's historical fire loss data indicates that there have been two incidents over the past ten-year period.	Major	All Group F - Industrial occupancies could have building area, building height and/or exposure related risks.			Potential for hazardous materials impact on occupants and firefighters;		Some Group F occupancies play a key role in the economic well-being of the municipality; the	Moderate

ABC Major Occupancy Classification		Probability		Consequence							Risk Level
					Rationale						
		Level	Rationale	Level	Building Stock	Demographic	Fire Loss	Response	Geographic	Economic	
			However there may have been one or more incidents in the past five years. Of the total property stock in the City, 2% is Group F.		Presence and maintenance of fire protection equipment (e.g. fire alarm system, sprinklers, etc.). It was identified that some of the Group F - Industrial occupancies with large floor area risks are not in compliance with the N.B.C. Currently no defined annual fire inspection and evacuation program provided.			preplanning opportunity;		environmental impact of a fire in a Group F occupancy is a consideration.	

Appendix B

Council Workshop Presentation

Community Risk Assessment & Fire Master Plan

Council Workshop
Steve Thurlow
Dillon Consulting Limited

August 15th, 2019

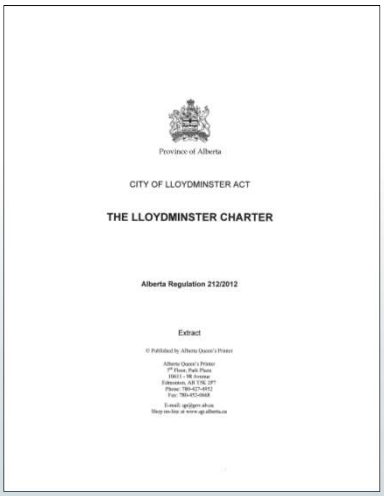
Municipal Responsibilities

- Local government defined by **Lloydminster Charter;**
  - *Empowered by Alberta and Saskatchewan;*
  - *Unique interests & challenges associated with geographic location;*
- In consultation with **Alberta Municipal Affairs** and the **Safety Codes Council** develop and **provide relevant** information to:
  - *Fire service industry;*
  - *Building Owners; and*
  - *Authorities having jurisdiction.*
- **Comply** with the **Safety Codes Act** of the **Alberta Fire Code**;

3

Municipal Responsibilities

- **Fire Bylaw No. 25-2015**
  - *Authorized by the **Lloydminster Charter;***
  - ***Control, regulate** and provide for **fire services** and to provide **fire protection services** within the City of Lloydminster;*
  - *Lloydminster Fire Department, a public organization that provides **predominantly emergency firefighting** and **vehicle extrication** services;*
  - *Adopts the **National Fire Code** (2010); and*
  - *Minimal reference to **fire prevention** and **public education**.*


Province of Alberta

CITY OF LLOYDMINSTER ACT

THE LLOYDMINSTER CHARTER

Alberta Regulation 212/2012

Extract

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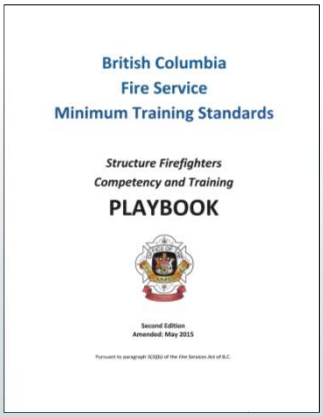
Industry Standards & Best Practices

Utilized to inform the **analysis** and **methodology** applied to the **Community Risk Assessment** and **Fire Master Plan** including:

- *National Fire Protection Association (NFPA);*
- *Commission on Fire Accreditation International (CFAI);*
- *National Institute of Standards and Technology (NIST);*

Current **industry best practices** including:

- *Province of British Columbia - B.C. Playbook;*
- *Province of Ontario – Comprehensive Fire Protection Model; and*
- *Province of Alberta – High Intensity Residential Fires*


British Columbia
Fire Service
Minimum Training Standards

Structure Firefighters
Competency and Training
PLAYBOOK

Second Edition
Amended: May 2015

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Community Risk Assessment (CRA)

- The analysis of existing **fire related risks** within a community;
- Representing **current industry best practices** to inform **all decisions** related to the delivery of **fire protection services**;
- Informed by **National Fire Protection Association** methodology including the recently released **NFPA 1730 and 1300** standards;
- Concludes in the identification of **"key findings"** that identify existing fire risks within the community.

Fire Risk Profiles

- ✓ Building Stock
- ✓ Demographics
- ✓ Geographic
- ✓ Fire Loss
- ✓ Response
- ✓ Hazard
- ✓ Economic

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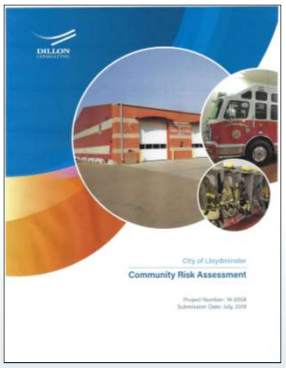
CRA Key Finding Examples



- ❖ 90.5% of the City's existing building stock is comprised of **Group C-Residential Occupancies;**
- ❖ The 2016 Census data indicates that **48%** of the City's residential building stock was **built prior to adoption** of the 1992 Alberta Fire Code;
- ❖ The 2016 Census data indicates that the **percentage of seniors** (those 65 or older) represent **11% of the City's** total population in comparison to that of the **province of 9%.** Based on historical provincial data seniors have been identified as a high fire risk group;
- ❖ The 2016 Census data indicates that people between the ages of **45 and 64** represent 21% of the **City's total population**.

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CRA Risk Reduction

- **NFPA 1300** (2020 edition) identifies the importance of developing **risk reduction strategies;**
- Highlights the importance of **fire prevention** and **public education** in reducing existing fire risk;
- Introduces utilization of the **five "E's"** framework for **fire risk reduction.**

Five E's	Description
Education	Education influences audiences to refrain from risky or unhealthy behavior or take positive action to reduce risk.
Enforcement	Enforcement reduces risks through enforcing legislation through inspections and fines for noncompliance.
Engineering	Engineering includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths.
Economic Incentives	Economic incentives are typically offered to encourage better choices and changes in behaviour.
Emergency Response	Effective emergency response can mitigate the effects of unintentional injuries and save lives.

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Fire Master Plan (FMP)

Comprehensive evaluation of a fire department's current operations, staffing and service delivery.

Assessment of current services in relation to legislated standards and municipal best practices.

Creation of a strategic plan to deliver services based on the "**needs and circumstances**" of the community.

10-year strategic planning document to assist Council & staff in guiding the delivery of fire protection services.

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Benefits of Fire Master Plan

- ✓ Assess a **community's compliance** with applicable **legislation** and **municipal best practices**;
- ✓ Further inform **Council** and the **community** with respect to the **programs** and **services** provided by the fire department;
- ✓ Provide **Council and staff** with an **evidence-based** strategic framework for delivering **fire protection services** in response to identified community **fire risks**;
- ✓ The identification of **strategic priorities** in the form of **goals and objectives** to inform ongoing **performance benchmarks**.

10

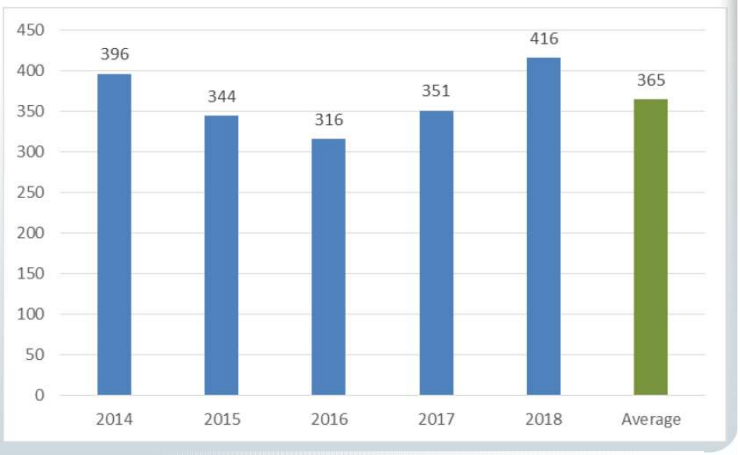
Key Issues/Challenges

- Absence of regular fire inspection & public education programs
- Limited capabilities of existing fire suppression services
- Sustainability of an effective firefighting training program
- Records management and performance benchmarks
- Fire Station No.1 condition and location
- Sustainability of an effective & efficient composite fire service model

11

Annual Call Volume

- Analysis of all emergency calls for the period from **January 1st 2014** to **December 31st 2018**;
- Over this period the **total number** of emergency calls **increased by 5%;**
- From **2016 to 2018** the total number of emergency calls **increased by 32%.**



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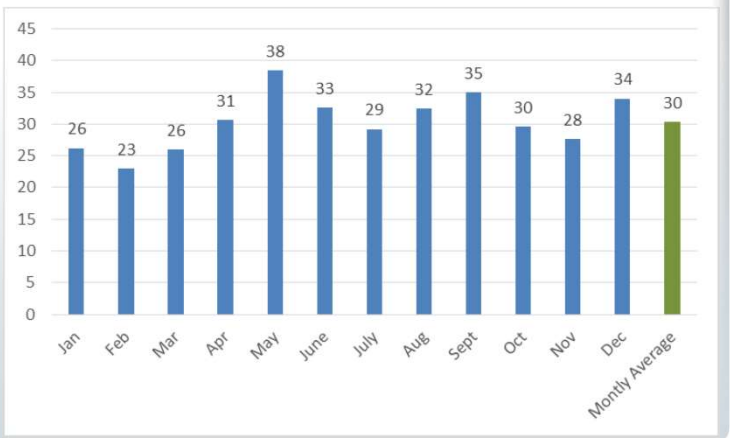
Call Volume by Month of the Year

- **5-year** analysis of emergency calls by **month of the year;**
- Average of **30 emergency calls** per month;
- Relatively **consistent distribution** of calls of approximately **1 per day;**



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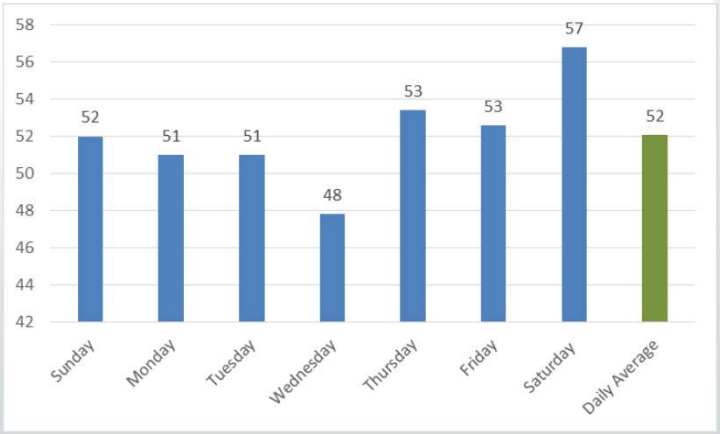
Call Volume by Day of the Week

- **5-year** analysis of emergency calls by **day of the week;**
- **Similar** distribution to that of the calls by month;
- Highest average on **Saturday** and lowest on **Wednesday.**



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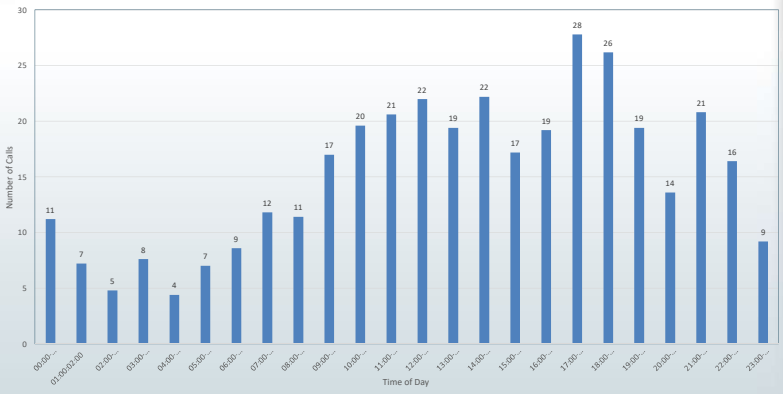
Call Volume by Time of the Day

- **5-year** analysis of emergency calls by the **time of day;**
- **Higher occurrence** of calls between **5pm** and **7pm;**
- **Lowest average** call volume between **11pm** and **9am;**



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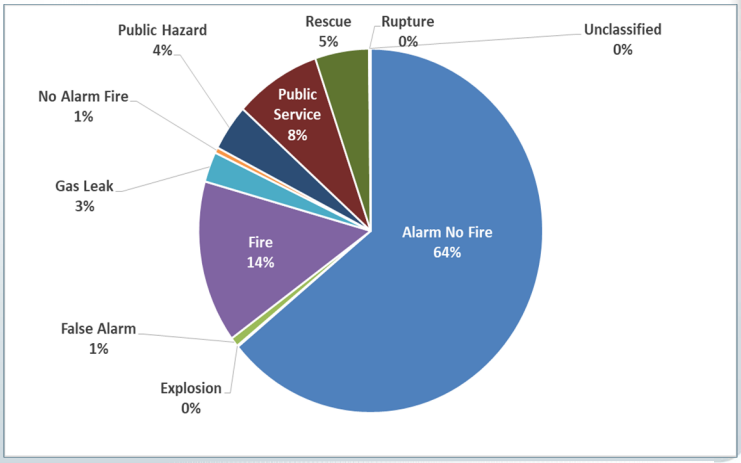
Calls by Response Type

- **5-year** analysis (2014 to 2018) of emergency calls by the **type of response** (Alberta Response Codes);
- **Fire related calls** accounted for **14%** of the total calls;
- **Alarm no fire** incidents represented **64%** of the total calls including:
  - Odor investigation;
  - Smoke or steam mistaken for fire;
  - Detector activated.



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Administration - Overview

- Department is in the midst of a **significant evolution** from its historical roots as a **"volunteer"** operating model;
- There is an **absence of "vision"** for how the department is going to operate in the future;
- The **interim operating model** appears to be driven by the **movement to unionization** versus clear goals and objectives related to the **fire protection services** to be provided;
- Decentralization of **senior staff** not conducive to **effective and efficient Management Team** practices;
- Absence of defined **goals and objectives.**

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Administration - Considerations

- Recommendations of proposed **Fire Master Plan** to provide the following:
  - Clear Council direction to inform fire protection services to be provided;
  - Establishment of Council approved performance benchmarks;
  - Recommendations to form Fire Chief's work plan.
- Need for **Fire Chief** to develop a comprehensive **Implementation Plan** including:
  - Prioritization of recommendations;
  - Financial implementation strategy;
  - Process for reporting to Council on progress.

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Prevention/Education - Overview

- The current **"Fire Bylaw"** does not reflect the **value of fire inspections** and **public education** in creating a safer community;
- The Voluntary Home Fire Safety Inspection Outline is currently the **only defined inspection/education** program;
- Fire Chief conducts a **limited number of fire inspections** annually based only upon receipt of a complaint or a specific request;
- Department is **active within the community** in attending public events, but there are **no defined goals and objectives** for this effort;
- Department is **not consistent** with **municipal best practices** in this area.

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Prevention/Education - Considerations

- Seek **Council's support** to update the existing **Fire Bylaw** to include and **prioritize fire inspections** and **public education programs**;
- Utilize the **CRA "key findings"** to develop **defined fire inspection** and **public education programs**;
- Focus the department on **shifting its historical priority** of **"fire suppression"** to the primary objective of **fire prevention/public education**;
- Will require the **leadership of Council** and senior staff (Chief & Assistant Chief) to **change the culture** of the **department** and the **community**.

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Prevention/Education - Strategies

- Develop a defined **Fire Prevention Policy** for consideration by **Council** and inclusion in an updated **Fire Bylaw** including;
  - Annual fire inspection program including fire inspection cycles for major building occupancies as identified by the CRA;
  - Targeted public education programs for "at risk" demographics including seniors and children as identified by the CRA;
- **Broaden** training requirements for all **full-time firefighters** to include applicable **NFPA qualifications** for the delivery of **fire inspections** and **public education** programs;
- Consider a **new full-time dedicated Fire Inspector/Public Education** position.

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Training - Overview

- **Current training program** described by the department as being in its **"infancy"** and in its **"early stages";**
- Staff resource includes one **Training Officer/Captain** with **limitations** and **time constraints** compounded by need for **flexible hours** to accommodate **POC training**;
- **Supporting documentation** limited to **high-level** descriptions of **training syllabus** and **terms of reference**;
- **Competency** based training documentation references **applicable NFPA training** qualifications;
- One **Standard Operating Procedure** for driver/operators provided.

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Training – Overview cont'd

- Identified by **full-time** and **paid on call firefighters** as a major area of concern;
- Examples include:
  - Paid On Call responding without having completed basic Firefighter 1001 training;
  - Incidents where there was no "Officer" available to respond with the Paid On Call on secondary apparatus;
  - No qualified driver/pump operator available to drive secondary apparatus;
- **Current practices link** to and **support** the **evidence** of potential presence of **occupational health and safety** issues.

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Training – Considerations

- **Reassess current fire suppression services** based on **existing training** competencies (B.C. Playbook);
- Prioritize **short-term training priorities** to achieve **standardization of basic firefighting** including:
  - Required supervision, OHSA supervisory roles and responsibilities, span of control;
  - Driver/pump operator qualifications, and sufficient personnel;
  - Defensive attack only;
- Develop **longer term plan** to **enhance skills** and competencies to achieve **interior attack** capabilities.

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Training – Strategies

- Develop comprehensive **Annual Training Program** for all staff;
- **Consideration** of on duty **Shift Training Instructors** comprised of full-time firefighters to support **Training Officer;**
- **Proposed Shift Training Instructors** responsible for **direct delivery** of the **Annual Training Program** on their respective platoon (full-time & Paid on Call firefighters);
- **Prioritization** of immediate/short-term training priorities;
- Implementation of **Training Committee** chaired by Training Officer;
- Implementation of **Standard Operating Guideline Committee** chaired by Training Officer;

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Fire Suppression - Overview

- The current **"Fire Bylaw"** references ***"provide predominantly emergency firefighting and vehicle extrication"***
  - *Does not include any definition of the level of these services*;
- **Interim staffing model** implemented (January 2019) including minimum response of **2 full-time** and **1 Paid on Call** reflecting an **initial response** capability of **3 firefighters at all times**;
- Monday through Friday during **normal business hours** the initial response capability **increases** as a result of **other full-time staff** (e.g. Chief and Assistant Chief availability);
- Depth of response supported by groups of **3 Paid on Call** scheduled at each station;

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Fire Suppression - Considerations

- **Short-term** – reassess current **fire suppression capability** - limited to exterior attack only (B.C. Playbook);
- **Immediate priorities** related to fire suppression services;
  - Identify and seek Council approved fire suppression service levels (performance benchmarks);
  - Based on findings of Community Risk Assessment & current municipal best practices;
  - Informed by current industry standards (NFPA);
  - Develop clearly defined Standard Operating Guideline (provide direction to firefighting expectations);
  - Develop & implement Comprehensive Annual Training Program.

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Fire Suppression - Strategies

- Increase capability of **initial response** capabilities to include a **minimum of 4 firefighters** responding on the **1st apparatus at all times** (limited rescue or limited firefighting);
- Increase capability of **depth of response** capabilities to a minimum of **10 firefighters** scheduled to be **available and responding** (with supporting supervision);
- Develop **scheduled on call** process for **Chief and Assistant Chief** (minimum of one available at all times);
- **Develop** and implement **defined deployment policies** based on type of call (fire risk present) with an approved **Standard Operating Guideline**

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Stations & Equipment

- **Identified need** to consider the future of **Fire Station No. 1** including **condition & location**;
- All **major apparatus** (large vehicles) in **good condition** with reserve capacity;
- **Equipment** (bunker gear, breathing apparatus etc.) in **good condition** and consistent with **needs of the department**;
- Need to further review **life cycle replacement planning** and **financing** for all apparatus and equipment.

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Questions / Next Steps