DILLON CONSULTING

TOWN OF CANMORE

Fire-Rescue Master Plan

Phase 2

February 2017 –15-2720

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The Town of Canmore (referred to as the Town or Canmore) initiated the review of existing staffing levels and services through development of the Fire Rescue Staffing Study, which formed Phase 1 of a two-part process. Phase 2 of the process involved the preparation and development of this 10-year strategic Fire Rescue Master Plan (FRMP) to assess the existing fire protection needs of the community and plan for the future service delivery, community needs and department resources, programs and strategies.

There are three foundational elements to the fire master planning process including: current legislation, industry guidelines and stakeholder consultation. The process to develop this FRMP has engaged and gathered input from Council, senior Town staff, Canmore Fire-Rescue Services (CFRS) staff and community stakeholders. The FRMP will guide Canmore Fire-Rescue Services over the next ten years through a framework of strategic priorities and a recommended action plan.

This FRMP is based on an assessment of community needs and risks and assesses the Town's compliance with the current legislative requirements, supporting the Town's due diligence for the provision of fire protection and prevention. The FRMP provides a review of all operations and divisions of the CFRS and provides recommendations for service level standards, staffing, training, apparatus deployment and implementation strategies. The implementation strategies address the context of the recommendations in terms of the current financial and political realities of the Town.

Industry best practices within the fire service support that proactive fire prevention and public education initiatives provide the most effective means to enhancing community safety, reducing the number of fire related injuries and deaths, and reducing the financial loss associated with fires. As introduced within the Phase 1 Fire-Rescue Staffing Study, the *"Three Lines of Defence"* (identified within the Ontario Comprehensive Fire Safety Effectiveness Model) include:

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

In our view the application of the "Three Lines of Defence" model for the Town of Canmore aligns well with the proposed strategy of matching the Town's needs and circumstances by prioritizing education and prevention. The analyses within this report utilizes the findings of the Community Risk Assessment (included as an Appendix to the FRMP) and the optimization of the first two lines of defence as a strategic priority towards reducing fire risk within the community and providing cost effective and efficient levels of fire protection services to the community.

The analyses within this FRMP recognize four strategic priorities for the delivery of fire protection services within the Town of Canmore including:

- ✓ *The utilization of a Community Fire Risk Assessment in determining the level of existing and projected fire safety risks within the municipality as the basis for developing clear goals and objectives for all fire protection services to be provided by Canmore Fire-Rescue Services;*
- ✓ *The optimization of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement to provide a comprehensive fire protection program within the Town based on the results of the Community Fire Risk Assessment;*
- ✓ *The use of strategies that support the sustainability of a composite fire department including utilization of paid response firefighters as a core component of the departments fire suppression deployment model, and through communication strategies emphasize to employers, including the Town of Canmore, the importance of supporting the emergency response of paid response firefighters; and*
- ✓ *The delivery of a comprehensive fire protection service model that provide the most effective and efficient level of fire protection services resulting in the best value for the community.*

Consideration for Service Level Targets are presented and discussed within this FRMP. Based on the suppression analysis and results, the primary standard (NFPA 1720 Suburban Demand Zone) is considered to be an appropriate service level target within the downtown core (i.e. between the highway and the river) of the Town of Canmore. The service level target aims to achieve the deployment of ten firefighters arriving on scene in ten minutes of response time (turn-out time +travel time). It is not recommended that the service level target include a set performance objective at this time. Instead, the Town should measure, record and monitor emergency response data in order to measure improvement over time. In the rural areas of the Town of Canmore, beyond the downtown core, the service level target more accurately reflects the secondary standard (NFPA 1720 Rural Demand Zone). This service level target aims to achieve the deployment of six firefighters arriving on scene in 14 minutes of response time (turn-out time +travel time). Again, it is not recommended that the service level target include a set performance objective at this time. Instead, the Town should measure, record and monitor emergency response data in order to measure improvement over time.

This FRMP provides an implementation strategy that categorizes the recommendations of this plan by proposed time horizon. All decisions related to budget, policy, or bylaw will be brought back to Council prior to implementation. The implementation plan and related recommendations, proposed time horizons and high-level estimates of the related financial implications are summarized below.

Summary of Recommendations and Implementation Plan:

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
Immediate-Term	-	-	*#1: That Council approve the strategic priorities identified within the proposed Fire-Rescue Master Plan to guide the development and delivery of fire protection services within the Town of Canmore.*
Immediate-Term	-	-	*#2: That Canmore Fire-Rescue Services implement a Senior Officer Shift Schedule that provides senior officer coverage seven days per week.*
Immediate-Term	-	-	*#5: That the Fire Chief meet with the Foothills Regional Emergency Services Commission to request that the current dispatch agreement be updated to include the performance objectives for emergency call taking and dispatching services included within the NFPA 1221 "Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems."*
Review in Immediate-Term / Timing According to the Resource Plan	*$1,000*	-	*#12: That the proposed Fire Inspection Staff Resource Plan be approved and implemented.*
Review in Immediate-Term / Timing According to the Resource Plan	*$10,000* *(inclusive of backfill)*	-	*#13: That the proposed Public Education Staff Resource Plan be approved and implemented.*
Immediate-Term	-	-	*#23: That the 'Standard Operating Guideline 110 – Risk Management' and 'Standard Operating Guideline 218 – Incident Safety Officer' be revised based on the recommendations of the proposed Fire-Rescue Master Plan.*
Review in Immediate-Term / Timing According to the Resource Plan	-	-	*#25: That proposed Training Staff Resource Plan be implemented.*
Immediate-Term	-	-	*#26: That each of the department's portfolio responsibilities be updated to reflect the*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
			changes and seek to balance workload across the Senior Officers.
Immediate-Term	-	-	*#27: That consideration be given to utilizing the recruitment and retention strategies for paid response firefighters included within the Alberta Volunteer Firefighter Recruitment and Retention Strategy as part of enhancing recruitment and retention of paid response firefighters in the Town of Canmore.*
Immediate-Term	$**3,566** (represents a10% increase for the six paid response officers in new organizational structure)	-	*#28: That the new organizational structure for the paid response firefighters be implemented.*
Immediate-Term	-	-	*#29: That as an initial transition from reliance on career casual firefighters the total complement be reduced to 12 career casual firefighters.*
Immediate-Term	Increase of five paid response (5 x $5,944 = **$29,970)**	Equipment for five additional paid response (5 x $2,500) = **$12,500**	*#30: That the total complement of paid response firefighter be increased by five firefighters to a total complement of 41 paid response firefighters to improve the sustainability of the paid response model and improve reliability of turnout.*
Immediate-Term	-	-	*#41: That consideration be given to adopting a Council-approved fleet replacement plan or cycle that reflects best practices for front-line and specialty apparatus to support long-term capital asset planning of Canmore Fire-Rescue Services' major apparatus.*
Immediate-Term	-	(maintenance costs only if department keeps existing Pumper as reserve following replacement in	*#42: That consideration be given to creating a major apparatus reserve capacity, including a minimum of one pumper.*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
		2017)	
Immediate-Term	-	-	*#43: That the Town of Canmore develop and adopt a Council-approved life-cycle plan for all equipment, including firefighters bunker gear and self-contained breathing apparatus based on industry best practices and manufacturers' directions.*
Short-Term	-	-	*#4: That the current Establishing and Regulating Bylaw 2013-08 be updated to reflect the direction of Council in respect to the delivery of fire-rescue services.*
Short-Term	-	-	#6: That *the Fire Chief take the following steps regarding standard operating guidelines:* • *Establish and empower a standard operating guideline committee composed of fire service staff to research, develop, and draft new standard operating guidelines and to update existing standard operating guidelines;* • *Conduct a review of all existing standard operating guidelines and where necessary complete revisions or develop additional standard operating guidelines to reflect all levels of service approved by Council;* • *Prioritize the development of SOGs relating to fire prevention (including public education) and department training; and* • *Ensure that the department continues the on-going process of regularly reviewing and updating department policies, operational procedures and relevant bylaws.*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
Short-Term	-	-	*#7: That the Fire Chief prepare and submit an annual report summarizing the service delivery performance of all divisions and highlighting the department's achievements for Canmore Fire-Rescue Services on an annual basis.*
Short-Term	-	-	*#8: That a detailed Fire Prevention Program or Policy be developed.*
Short-Term	-	-	*#9: That the proposed public education program cycle objectives be included within the proposed Fire Prevention Policy/Program.*
Short-Term	-	-	*#10: That the proposed fire inspection cycle objectives be included within the proposed Fire Prevention Policy/Program.*
Short-Term	-	-	*#11: That the proposed Home Smoke Alarm and Escape Planning Program be included within the proposed Fire Prevention Policy/Program.*
Short-Term	-	-	*#14: That the department develop and implement minimum training requirements for all CFRS firefighters to clearly outline the minimum training attendance requirements for all Canmore Fire-Rescue Services firefighters.*
Short-Term	-	-	*#15: That Canmore Fire-Rescue Services formalize a comprehensive annual training program based on the International Fire Service Training Association firefighter curriculum, and the NFPA Professional Qualifications Standards.*
Short-Term	-	-	*#16: That Canmore Fire-Rescue Services include annual live fire training as a required element within the proposed comprehensive annual training program.*
Short-Term	-	-	*#17: That CFRS investigate opportunities and partnerships with neighbouring fire services and within the local private sector to develop*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
			and within the local private sector to develop a live fire training facility.
Short-Term	-	-	*#18: That CFRS investigate potential revenue sources related to a live fire training facility.*
Short-Term	-	-	*#19: That Canmore Fire-Rescue Services consider the use of an online firefighter training program as a component of delivering the proposed comprehensive annual training program.*
Short-Term	-	-	*#20: That CFRS implement a strategy to track all operating and capital costs associated with the Special Operations Team to enhance Council's and the community's understanding of the total costs associated with delivering technical rescue services.*
Short-Term	-	-	*#21: That the Fire Chief investigate options for developing partnerships, shared services and purchasing contracted services for the delivery of technical rescue services, and specifically water rescue.*
Short-Term	This reflects an estimated financial cost of $25 x 7 days a week = $175 per week per firefighter times eight firefighters = $1,400 x 40 weeks = $56,000 per year, and $25 x 7 days a week = $175 per week per firefighter times six firefighters = $1,050 x 12 weeks = $12,600 per year representing a total of **$68,600** for the proposed paid response scheduled on-call	-	*#31: That the proposed strategy of peak time fire suppression staffing be implemented between June 1st and August 31st providing additional 24 hour fire suppression resources.* [***Note:*** eight paid response firefighters would be scheduled on-call at all times during the period from September 1st to May 31st and that six paid response firefighters would be scheduled on-call from June 1st to August 31st each year]

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
	process.		
Short-Term	Annual wage of a full-time firefighter of $99,000 divided by 52 weeks, divided by 42 hours per week = $45.30 per hour. June 1 to Aug 31st = 92 days. (92x24 hours per day)=2,208 hours over the three months at $45.35 per hour= $100, 090 x two firefighters = **$200,180**.	-	*#32: That a group of paid response casual firefighters be identified to fulfill the staffing resources needs of the proposed peak time fire suppression staffing.* [***Note:*** June 1st to August 31st the financial impact of the two positions filled by casual (either career casual or paid response casual) firefighters]
Short-Term	increase of five paid response (5 x $5,944 = **$29,970)**	Equipment for five additional paid response (5 x $2,500) = **$12,500** Locker Space = **$55,000**	*#33: That the total complement of career casual firefighters be reduced to eight, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 46 paid response firefighters.*
Short-Term	-	**$50,000**	*#40: That consideration be given within the capital planning process to purchasing a crew-transport vehicle for the department.*
Short-Term	-	-	*#44: That Canmore Fire-Rescue Services explore solutions for increasing storage and bay capacity and training (e.g. increase classroom size) facilities both within the fire station and at alternate sites, as required.*
Short-Term	-	-	*#45: That Canmore Fire-Rescue allocate bay capacity for a reserve pumper.*
Short-Term	-	-	*#47: That a formal process for exchanging shift-notes for all levels of staff through a digital platform is developed and implemented by CFRS to improve internal communication.*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
Short-Term	-	-	*#48: That Canmore Fire-Rescue Services consider implementing the green flashing light program for paid response firefighters to improve department turnout time. It is further recommended that the Town support the installation of street signage reflecting the use of paid response firefighter flashing green lights within the Town of Canmore*
Short-Term	-	-	*#49: That CFRS investigate and implement technology-based efficiencies to enhance the alerting process for paid response firefighters and off-duty firefighters on call-back.*
Medium-Term	-	-	*#3: That the Fire Chief and Deputy Chief attain professional certification as presented within the NFPA 1021 – Standard for Fire Officer Professional Qualifications or identified equivalent.*
Medium-Term	-	-	*#22: That Canmore Fire-Rescue Services enhance the training opportunities for Company Officers to achieve the skills and competencies identified within the NFPA 1021 Standard for Company Officers.*
Medium-Term	-	-	*#24: That Canmore Fire-Rescue Services incorporate elements of succession planning for all levels and positions within the department and be incorporated into the proposed Comprehensive Annual Training plan.*
Medium-Term	*Costs dependent upon the existing qualifications of the individuals attaining the certification and the location of available courses / examinations.*		*#39: That both of the mechanics within the Town of Canmore's Fleet Services Department attain the Emergency Vehicle Technician (EVT) certification.*
Medium-Term	**$122,000**	**$8,450**	*#34: That a full-time Fire Prevention position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore.*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
Medium-Term	**$122,000**	**$8,450**	*#35: That a full-time Training/Education position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore.*
Medium-Term	Increase of five paid response (5 x $5,944 = **$29,970)**	Equipment for five additional paid response (5 x $2,500) = **$12,500**	*#36: That the total complement of career casual firefighters be reduced to four, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 51 paid response firefighters.*
Medium-Term Long-Term	- -	- -	*#46: That CFRS investigate the implementation of station notification (e.g. station alarm / announcement) for emergency response calls.* *#37: That at the end of the medium-term horizon (5 year) planning horizon of the proposed Fire-Rescue Master Plan the Town of Canmore update the analyses and actual performance of Canmore Fire-Rescue Services.*
Long-Term	Phase 1(4 full-time firefighter positions – wages & benefits): **$438,000 (replaces costs associated with recommendation 32)** Phase 2(4 full-time firefighter positions – wages & benefits): **$438,000 (replaces costs associated with recommendation 32)**	Phase 1 (4 full-time firefighter positions – uniforms, equipment & orientation): **$33,800** Phase 2(4 full-time firefighter positions – uniforms, equipment & orientation): **$33,800**	*#38: That subject to the findings of the Fire-Rescue Master Plan Update the Town of Canmore further consider the proposed Option 4 contained within the Phase 1 Fire-Rescue Staffing Study and outlined in this FRMP.* [**Note:** Only if warranted following implementation and review of medium-term recommendations]

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
	six paid response firefighters scheduled on-call at all times: $25 x 7 days a week = $175 per week per firefighter times six firefighters = $1,050 x 52 weeks = $54,600 per year (replaces costs associated with recommendation 31)	-	

1.0 Introduction

A Fire-Rescue Master Plan (FRMP) is a strategic blueprint for delivering fire protection services to a community. It is developed through analyses of local needs and circumstances and presents options and recommendations for providing effective and efficient levels of service with the most value to the community.

This FRMP assesses the Town's compliance with the current legislative requirements and supports the Town's due diligence for the provision of fire protection and prevention on behalf of the municipality. It provides a strategic framework and relies on evidence-based analyses to assist Council in making decisions regarding the provision of fire protection services. It considers the fire risks within the Town, both in existing and future conditions, including consideration of the nature and location of community growth and development. This FRMP focuses on a ten-year planning horizon within the framework of the current 20 year vision for the Town.

This FRMP was completed as Phase 2 of a study that initiated with the preparation of a Fire-Rescue Staffing Study, as Phase 1. The staffing study has informed this master plan and the findings and recommendations within the staffing study report have been incorporated within this FRMP and updated as applicable. The Phase 1: Fire-Rescue Staffing Study Final Report is included as **Attachment 1** for reference.

The content of this FRMP includes a review of all divisions and operations within the CFRS with the purpose of developing a comprehensive Fire-Rescue Master Plan for the provision of a full range of fire protection services. The plan also includes a Community Fire Risk Assessment (CFRA) and provides recommendations for service level standards, staffing, training, apparatus deployment and implementation strategies. The implementation strategies address the context of the recommendations in terms of the current financial and political realities of the Town.

The recommendations contained within this FRMP are intended to guide the future strategic planning, business plans, and associated operating and capital infrastructure investment decisions of Canmore Fire-Rescue Services Department.

2.0 Fire-Rescue Master Plan Process

A depth of knowledge, experience, and context informed this Fire-Rescue Master Plan. There are three foundational elements to the fire master planning process including: current legislation, industry guidelines and stakeholder consultation. This section describes these foundational elements to frame this Fire-Rescue Master Plan in defining the needs and circumstances of the Town of Canmore.

2.1 Province of Albert Legislation and Fire Regulations

This study was prepared in consideration of the relevant provincial legislation and related regulations, including the *Municipal Government Act*, the *Environmental Protection and Enhancement Act*, the *Health Discipline Act, Emergency Management Act* and the *Safety Codes Act*. The *Safety Codes Act* governs safety standards and code regulations in Alberta, including the Building and Fire Codes. This report includes references and consideration of the following:

- *Town of Canmore Fire Bylaw;*
- *Alberta Building Code (ABC);*
- *Alberta Fire Code (AFC);*
- *Emergency Health Services Act, 2008;*
- *Emergency Management Act, 2000;*
- *Alberta Emergency Plan, 2000;*
- *Emergency Management Act – Government Emergency Management Regulation;*
- *FireSmart – Provincial Guidebook for Community Protection for Wildland/ Urban Interface;*
- *Occupational Health and Safety Act, 2000;*
- *Municipal Government Act, 2000;*
- *Ministry of Municipal Affairs – Office of the Fire Commissioner, Alberta (OFC);*
- *Ministry of Municipal Affairs – Fire STANDATA;*
- *Safety Codes Act (SCA), 1994; and*
- *Safety Codes Council (SCC).*

Although the Minister of Municipal Affairs has ultimate responsibility for the *Safety Codes Act*, public safety policy, and the safety codes system in Alberta, the public safety codes system depends on a strong partnership between Alberta Municipal Affairs and the Safety Codes Council. The Safety Codes Council, which was established under the *Safety Codes Act*, is responsible to the Minister of Alberta Municipal Affairs. Through this partnership, the safety codes system is administered in an effective, accountable, comprehensive and sustainable manner, which maintains public confidence in the system. The Safety Codes Council and its partners have been managing the safety codes system in Alberta since 1993.

2.1.1 Office of the Fire Commissioner, Alberta

The Office of the Fire Commissioner, Alberta (OFC) is the provincial body responsible for the general oversight of the fire rescue and search and rescue portion of Alberta's public safety system. Activities that are the responsibility of this Office include:

- *providing technical advisory services to Alberta communities and organizations that deliver fire and emergency response and prevention services for citizens;*
- *coordinating high-quality, uniform training and certification standards for Alberta's fire rescue and search and rescue personnel;*
- *providing various public safety education campaigns and materials aimed at encouraging Albertans and visitors to Alberta to act safely; and*
- *collecting, analyzing and publishing fire and emergency response data generated by fire rescue departments and search and rescue teams.*

Other activities within the OFC's mandate include advising municipalities on delivery of their public safety education and providing technical inspection and fire investigation services to ensure compliance with Alberta's building and fire codes. The OFC holds the provincial accreditation by the National Board on Fire Service Professional Qualifications and the International Fire Service Accreditation Congress on behalf of the Government of Alberta. The OFC administers these accreditation and certification programs for the fire rescue and search and rescue services.[1]

2.1.2 Alberta Fire Code STANDATA

Safety Services, as part of the Ministry of Municipal Affairs, and the Safety Codes Council jointly develop the Alberta Fire Code STANDATA[2]. Some are issued under the authority of the Code or the *Safety Codes Act* as province-wide variances or interpretations, while others are information bulletins that provide general advice. New STANDATA are added on a regular basis. The Fire Code STANDATA provides the industry and stakeholders with fire related information such as:

- *Fire Code Variances (e.g., TAQA North Ltd. - Portable Fire Extinguishers [AFC 2.1.5.1.(1)]);*
- *Fire Code Interpretations (e.g., Questions Regarding Flood Impacted Fire Protection, Detection and Notification Equipment [FCI-13-02]);*
- *Fire Code Bulletins (e.g., Inspection, Maintenance & Recharging of Portable Fire Extinguishers [FCB-11-01]);*
- *Approved Guidelines (e.g., Approved Fire Safety Guidelines for Rooming Houses and Converted Buildings - Information Update [97-FCV-006]); and*
- *Previous Codes.*

[1] "Office of the Fire Commissioner." Alberta Municipal Affairs. Web. 06 Jan. 2016. <http://www.ofc.alberta.ca/about-us>.
[2] STANDATA are province-wide variances, interpretations or information bulletins to provide general guidelines developed and issued by Safety Services and the Safety Codes Council.

2.1.3 Alberta Building Code STANDATA

Similarly to the Alberta Fire Code STANDATA the Safety Services and the Safety Codes Council also jointly develop Alberta Building Code STANDATA. The Building Code STANDATA for "Fire Department Response Time" is of specific importance to this FRMP.

In response to addressing high intensity residential fires (HIRF) in Alberta, the Building Code STANDATA for "Fire Department Response Time" is intended to help make homes safer from the spread of fire, and to provide more time for occupants to escape while firefighters are responding.

High-intensity residential fires (HIRF) are defined as:

> ***"Fires involving rapid heat release and fire spread beyond the point of origin that usually involve adjacent buildings. The fires also typically include the early exposure of large amounts of combustible materials. HIRFs can occur in any of the following groupings:***
>
> - ***Occupied residential buildings;***
> - ***Unoccupied residential buildings that are under construction; and***
> - ***A mix of occupied and under-construction residential buildings."***

Amendments to the Alberta Building Code were completed in 2006 to recognize that, where a fire department is unable to respond to a fire within 10 minutes, more than 90% of the time, the design and construction of buildings should include greater protection from exposure fires. These building code amendments are intended to recognize that increasing the physical distance of structures from each other and/or the property line is not necessarily required.

Two important interpretations of this STANDATA with respect to fire department response time and this FRMP include:

> ***"receipt of notification of a fire" - means the point in time that the fire dispatcher (who may or may not also be the 911 call taker) first receives the request for fire suppression assistance. The fire dispatcher is the person who directly notifies fire crews of the need to respond and whose actions are within the control of the fire department through direct employment, a shared services agreement or contract".***
>
> ***"arrives at the building" – means the point in time that a rated fire department engine (i.e. pumper) capable of beginning exterior exposure protection and suppression activities arrives at the scene of the fire staffed with a crew of firefighters in accordance with local municipal policy".***

In our view these interpretations are important to differentiating the application of the Alberta Building Code requirements, and Council's decision with respect to the fire suppression emergency response performance for the community. This STANDATA clearly recognizes that it is Council's role to determine the appropriate level of fire suppression emergency response performance, including the use of standards such as those developed by the National Fire Protection Association as presented within this FRMP, and other industry guidelines and best practices.

2.2 Municipal Governance

Through the legislative authority of the *Municipal Government Act* (MGA), municipal Councils are responsible for creating and evaluating municipal policies and programs. The MGA states that the purposes of a municipality are to provide services, facilities or other things that, in the opinion of council, are necessary or desirable for all of part of the municipality, and to develop and maintain safe and viable communities. The Act also gives municipalities jurisdiction to pass bylaws for municipal purposes for specific purposes including *"the safety, health and welfare of people and the protection of people and property"* and "*services provided by or behalf of the municipality"* (MGA, pg. 36, 2000). Bylaws, such as an establishing and regulating bylaw can therefore be created by Town Council to set fire service standards for their community. The MGA works in concert with the Alberta Safety Codes Act which is the governing statute for all of the Provinces standards and code regulations, including both Building and Fire Codes. The Office of the Fire Commissioner is the provincial body responsible for general oversight of the fire rescue and search portion of Alberta's public safety program.

2.3 Industry Standards and Best Practices

Within Alberta there is currently no specific legislated standard that a community must achieve with regard to the type of firefighter (full-time/paid response/casual/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 best practices within the fire service.

2.3.1 National Fire Protection Association

The National Fire Protection Association (NFPA) 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 NFPA is recognized as one of the world's leading advocates of fire prevention and an authoritative source on public safety.

NFPA 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. NFPA'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 (ANSI).

NFPA standards provide insight into best practices within the fire service industry. Applicable NFPA standards are presented within this FDMP as a resource / reference in presenting benchmarks for the

Town of Canmore to consider in providing the optimal level of fire protection services in response to the community's needs.

2.3.2 National Institute of Standards and Technology

The National Institute of Standards and Technology (NIST) was founded in 1901 as a non-regulatory agency within the United States (U.S.) Department of Commerce. NIST'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 NIST 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 NFPA standards.

2.3.3 Prevention and Education Best Practices

In developing this FRMP consideration was also given to the relevance of fire protection and prevention strategies being utilized by other jurisdictions that would be considered best practices.

2.3.3.1 Comprehensive Fire Safety Effectiveness Model - Ontario

In the Province of Ontario the *Fire Protection and Prevention Act, 1997* (FPPA) reflects the current applicable legislation within that province. Through the leadership of the Office of the Fire Marshal and Emergency Management (OFMEM) municipalities in Ontario are supported in their role of compliance with the FPPA through the issuance of Public Fire Safety Guidelines (PFSG) developed by the fire marshal's office.

The *"Comprehensive Fire Safety Effectiveness Model"* utilized within Ontario has gained recognition within the fire service as a proactive and effective model for the delivery of fire protection services, including portions of the model being incorporated into the risk assessment methodology within *NFPA 1730: Standard on Organization and Deployment of Fire Prevention and Code Enforcement, Plan Review, Investigation, and Public Education Operations*. The model utilizes what is referred to as the *"Three Lines of Defence"* as strategic priorities in developing a comprehensive community fire protection and prevention program. The *"Three Lines of Defence"* identified within the Ontario Comprehensive Fire Safety Effectiveness Model include:

I. Public Education and Prevention

II. Fire Safety Standards and Code Enforcement

III. Emergency Response

The first two lines of defence including Public Education and Prevention, and Fire Safety Standards and Code Enforcement are defined below.

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; and

II. Fire Safety Standards and Code 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."

The Comprehensive Fire Safety Effectiveness Model recognizes the high importance of the first two lines of defence in mitigating the potential of a fire occurring. In the event a fire does occur and emergency response is required the model defines the third line of defence as:

III. Emergency Response (Fire Suppression)

"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."

In our view the three lines of defence represent a proven model for optimizing the benefits of proactive prevention and education programs; appropriate use of standards and code enforcement and, as the model suggests, the provision of emergency response as the 'fail safe' (last line of defence) for when incidents occur despite all efforts towards optimization of the first two lines of defence.

An example of the historical experience within Ontario reported by the OFMEM while utilizing this model during the period from 2008 to 2012 further confirms the positive outcomes. Over this period the number of fires within Ontario decreased by 14%, resulting in less fire damage as a result of fire, and a decrease in the number of fire related fatalities and injuries; this is despite continued growth in the population and housing stock of Ontario.[3]

[3] *Source: Analysis of data from the Ontario Office of the Fire Marshal and Emergency Management*

In our view the application of the "Three Lines of Defence" model for the Town of Canmore aligns well with the proposed strategy of matching the Town's needs and circumstances by prioritizing education and prevention.

The analyses within this report utilizes the findings of the Community Risk Assessment (included in ***Appendix A***) and the optimization of the first two lines of defence as a strategic priority towards reducing fire risk within the community and providing cost effective and efficient levels of fire protection services to the community.

Prioritizing these two lines of defence to address relevant risks identified by the Community Risk Assessment should be considered a strategic priority of this plan. For example, high priority should be given to optimizing the first two lines of defence in areas of the community where vulnerable occupants, such as seniors reside.

2.3.3.2 NFPA 1730: Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations to the Public (2016 Edition)

NFPA has recently finalized a *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations.* The stated purpose of the standard is to "*specify the minimum criteria addressing the effectiveness and efficiency of the fire prevention organization… based on an approved community risk reduction plan"* (pg. 4). The standard establishes its criteria through six chapters:

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

The essence of the standard is to ensure that a fire prevention organization has a Community Risk Reduction Plan (CRRP) in place and is based on the local needs and circumstances established through a Community Risk Assessment (CRA). A CRA involves the assessment of: demographics; geography; building stock; fire experience (fire loss); responses; hazards; and economics.

A Community Risk Reduction Plan is then used to establish resources and programs that are consistent with identified risk. This would include inspection activities, plan review, investigations, and public education programs. For example, the NFPA 1730 standard identified a minimum inspection frequency cycle which could be refined based on the local context. Additional CRRP implementation considerations within the standard are to circulate the risk reduction plan to all stakeholders who help implement it and to establish partnerships to facilitate implementation. This standard further emphasizes the

importance of the application of the first two lines of defence and is consistent with the current industry trend to emphasize prevention and education within the fire service.

2.4 Stakeholder Engagement

Stakeholders have provided valuable input during the preparation of this FRMP. This has included the provision of a range of information regarding the context and background of Canmore Fire-Rescue Department from a variety of different perspectives. This helped to identify issues and needs associated with the fire and rescue service. As well, it provided information for the study's analyses and recommendation phases. Engaging stakeholders helped ensure that multiple perspectives can be brought to the fire-rescue master planning process.

2.4.1 Project Team Meetings

The Town's Project Steering Committee included the following members:

- General Manager of Municipal Services;
- Manager of Protective Services;
- Manager Human Resources;
- Fire Chief; and
- Deputy Fire Chief.

In-person meetings were held with the Project Steering Committee at project initiation; to review the Draft Report; and prior to the presentation of the Final Report to Council. A web-based presentation and conference call was held to present the Preliminary Findings to the Steering Committee. Conference calls were also conducted throughout the study process to address project needs and to provide project status updates to the Town's project team members.

2.4.2 Staff Interviews

As part of the data collection process and review of existing services, interviews were conducted with key staff members from all divisions of the CFRS, as well as senior Town staff in other departments (e.g. Planning, Engineering, Human Resources, etc.).

These key stakeholders provided valuable feedback regarding the strengths, weaknesses, opportunities, and constraints within the day to day operations of delivering fire and rescue services. The feedback collected during this process was an essential element of developing the framework of the plan and resulting recommendations.

2.4.3 Stakeholder Interview with Association Executive

The members of the association executive were interviewed at the outset of the master planning process on April 12th, 2016. The group provided feedback regarding the Phase 1 Fire-Rescue Staffing Study and further discussed the opportunities for needs and considerations within the master plan.

2.4.4 Stakeholder Session with Paid Response Firefighters

A stakeholder session was held on April 13th, 2016 with members of the paid response group. The group provided input on the strengths, weaknesses, opportunities and constraints of the fire-rescue services including the operating model, emergency responses, training programs and communications.

2.4.5 Stakeholder Interview with Career Casual Firefighters

The team conducted interviews with a sample of career casual firefighters, selected by the CRFS management team, to gain insight into the role and provide perspective from this unique category of fire-rescue services personnel.

2.4.6 External Stakeholder Consultation

An external group of business and community stakeholders were identified by CFRS staff at the onset of this project. These external stakeholders were sent an email and were requested to participate in telephone surveys. These telephones surveys were carried out to develop an understanding of the services provided by the CFRS to provide input to the preparation of this FRMP. The stakeholder engagement results helped to guide suggestions and recommendations throughout this plan.

The overall results of the external stakeholder engagement were generally positive. Stakeholders were aware of the roles and general structure of CFRS, with appreciation for the dedication of staff members to the community. Stakeholders also believed that Canmore Fire-Rescues core services aligned with the needs of the Town and its residents. The primary gaps addressed included suggestions to advertise services provided to the community and clearer jurisdiction boundaries. The tourism community also suggested that stronger partnerships should be undertaken to address the tourist populations.

The recommendations within this FRMP are designed to provide continued support in satisfying the identified community and stakeholder needs through short, medium and long-term objectives. A summary of stakeholder consultation is included in **Appendix B.**

2.4.6.1 Bow Valley Builders & Developers Association

The Bow Valley Builders & Developers Association (BOWDA) was identified by Council at the beginning of this project as a key external stakeholder. Correspondence received by Council on May 24th 2016 from BOWDA identified a number of concerns related to the previous Canmore Fire-Rescue Staffing Study. In response to these specific concerns an expanded interview consultation was conducted with members of BOWDA as part of the external stakeholder consultation process.

BOWDA's concerns are directly related to the Towns fire department response time as defined by the Alberta Building Code STANDATA, and specifically:

- *The Town's emergency response deployment model identified and approved by Council in the 2011 Canmore Fire-Rescue Department Strategic Plan;*

- *Revisions to the 2011 emergency response deployment model that were implemented by the department in 2015; and*
- *The analyses and recommendations of this FRMP that may result in revised Council polices for emergency response times resulting in requirements to implement additional building code design and construction to enhance the level of fire protection.*

In response to these specific concerns this FRMP includes information and analysis to address, where possible, BOWDA's concerns.

3.0 Previous Reports and Plans

The purpose of this study is to review all operations of Canmore Fire-Rescue Services (CFRS) for the development of a comprehensive Fire-Rescue Master Plan (FRMP), linking the previous Fire-Rescue Staffing Study (Phase 1) to the strategic direction of the fire-rescue service, with consideration of the Town's future conditions.

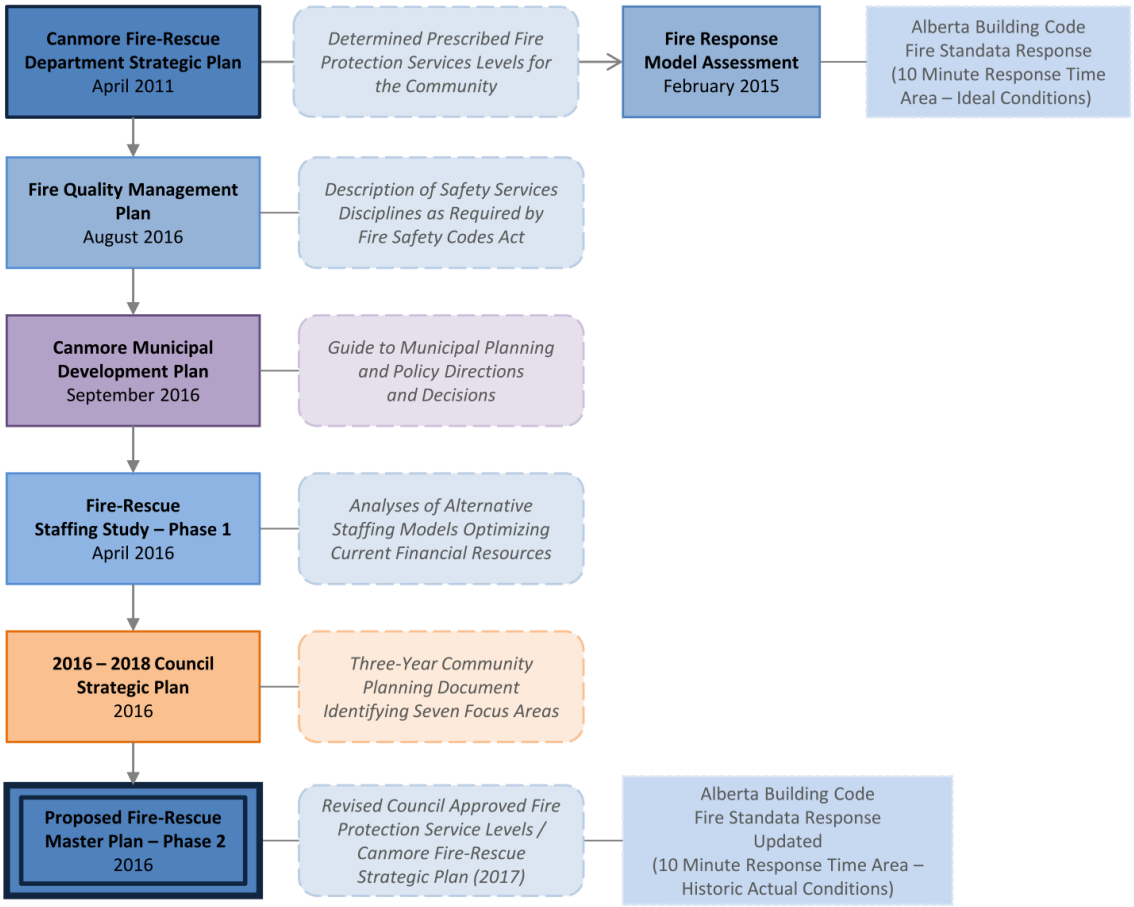
In 2011 Council approved Resolution #146-2011 adopting the Canmore Fire-Rescue Department Strategic Plan (CFRDSP). The purpose of this plan was to provide Council and senior staff with a strategic framework for developing a "stand alone" fire department as it transitioned from the previous fully integrated fire/EMS operating model. This plan was subsequently updated in 2015 through Council Resolution #177-2015 amending the response program details and training requirements.

The Canmore Fire-Rescue Department Strategic Plan has served as the foundation for delivering fire protection services to the community since 2011. As part of its commitment to continuous improvement the Town and Canmore Fire-Rescue Services (CFRS) has commissioned a number of additional studies and planning documents to inform its fire protection service delivery model. These studies and planning documents have included the following:

- *Canmore Fire-Rescue Department Strategic Plan – 2011;*
- *Fire Response Model Assessment – 2015;*
- *Quality Management Plan – 2016;*
- *Canmore Municipal Development Plan – 2016;*
- *Fire-Rescue Staffing Study – Phase 1 (2016); and*
- *Council Strategic Plan (2016).*

Figure 1 provides an overview of the previous reports and plans that have been considered in developing this proposed Fire-Rescue Master Plan.

Figure 1: Previous Reports and Plans Overview



3.1 Canmore Fire-Rescue Department Strategic Plan – 2011

This planning document was prepared by the department in 2011 and approved by Council on April 19, 2011 by resolution #146-2011. The purpose of the plan was to provide Council and senior staff with a strategic framework for developing the "stand alone" fire department as it transitioned from the fully integrated fire/EMS operating model.

The approved strategic plan established the current organizational structure, service levels (including details regarding department programs and activities), and the initial financial requirements to operate Canmore Fire-Rescue Services.

The strategic plan established the current fire response time targets for Canmore Fire-Rescue Services that include the following:

*The time from **receipt of notification of a fire**[(a)] by the fire department until the first fire department vehicle capable of beginning suppression activities **arrives at the building**[(b)] shall be less than 10 minutes in 90% of all calls;*

*Where **(a)**: **"receipt of notification of a fire"** means the point in time that the fire dispatcher first receives the request for fire suppression assistance from the 911 operator; and*

*Where **(b)**: **"arrives at the building"** means the point in time that a rated fire department engine capable of beginning exterior exposure protection and suppression activities arrives at the scene of the fire, staffed with a crew of firefighters in accordance with local municipal policy.*

The fire response time targets listed above are consistent with the High Intensity Residential Fire (HIRF) requirements within the Alberta Building Code. This target was assessed and mapped in the 2015 Fire Response Model Assessment study (see **Section 2.5**). It was discussed with Town staff at the outset of this study that this standard applies within Canmore for development purposes (i.e., building code requirements) rather than for setting fire service delivery targets.

The strategic plan also identified a number of fire prevention and public education programs and activities intended to form a comprehensive fire protection plan for the community. The 2010 strategic plan does not fully represent the practices and operations of CFRS today. Strategic plans are typically updated every five years.

It is the intent of this Fire-Recue Master Plan to provide the strategic direction for the 10 year plan horizon as an update to the department's strategic plan. The recommendations contained within this FRMP are intended to guide the future strategic planning, business plans, and associated operating and capital infrastructure investment decisions of Canmore Fire-Rescue Services.

3.2 Fire Response Model Assessment – 2015

The Fire Response Model Assessment was initiated in response to the Province of Alberta's high intensity residential fire (HIRF) amendments to the building and fire code. The amendments aim to make homes safer from the spread of fires, to provide more time for occupants to escape and for firefighters to respond when there is a fire. The Alberta Building Code requires additional fire protection measures for buildings located outside of a ten minute total emergency response time (dispatch + turnout + travel time = emergency response time).

The response model assessed and visually displayed the area of the community where Canmore Fire-Rescue Services could under "ideal conditions" provide a ten minute emergency response. The response model indicated the area within a ten minute emergency response with and without railway crossing delays.

3.3 Quality Management Plan – 2016

The Safety Codes Council describes a Quality Management Plan (QMP) as follows:

"A Quality Management Plan is a document in which an organization (e.g. municipality, regional services commission, corporation, agency, etc.) describes the disciplines (or parts of disciplines) and extent of safety services it intends to provide when it becomes accredited.

A Quality Management Plan consists of the following:

- *Details of the discipline(s) and the components of the Safety Codes Act the organization seeks to administer*
- *A statement committing senior management to the plan*
- *An organization chart outlining operational structures and reporting responsibilities*
- *An outline of safety policies and standards and the process for ensuring compliance, e.g., the number of inspections and at what stages, plans review (if applicable), verification of compliance, resolution of non-compliance (variances and orders)*
- *A strategy that ensures the ability of a Safety Codes Officer to make decisions without undue influence from management or elected officials*
- *A strategy that prohibits persons from participating in design, construction or installation activities for projects for which they are involved in compliance monitoring."*

The CFRS Quality Management Plan provides a high-level directive to ensure general standards of quality in **staffing, procedures, and training** is being upheld. The plan was recently updated in August 2016. The QMP establishes that the Municipality of the Town of Canmore (overseen by the Chief Administration Officer) is responsible for the effectiveness and compliance with the Plan. The Plan covers the expectations for safety codes officers; safety codes officer training and training implementation; compliance monitoring; documentation; records retention, retrieval, and disposition.

3.4 Alignment with Corporate Plans and Strategies

3.4.1 Alignment with the Municipal Development Plan

The purpose of a Municipal Development Plan (MDP) is to guide municipality's planning and decision making towards greater sustainability of the community. This plan impacts the Town's policy direction with regard to land use decisions, planning documents (e.g., structure plans and land use bylaws), capital project prioritization, strategic planning, and budgeting.

The completion and implementation of this Fire-Rescue Master Plan is designed to contribute to the achievement of the MDP's goals with respect to the fire-rescue and the services it provides. Specifically, the Plan supports providing an appropriate level of public emergency services and providing adequate and assessable municipal services that fit the community's needs.

3.4.2 Alignment with Council Strategic Plan

Canmore Town Council created a Strategic Plan for 2016 - 2018 with the purpose of guiding the Town through the next three years. The vision of the Strategic Plan is consistent with the 2016 Canmore MDP

and it lists several strategic goals for the Town and seven key areas of focus: place, service, safety, economy, affordability, environment and people.

The completion and implementation of this Fire-Rescue Staffing Study is designed to implement these areas of focus, where appropriate, with respect to the fire-rescue and the services it provides. Specifically, the Study supports making Canmore a safe community and delivering effective, innovative, and fiscally responsible services.

CFRS considers the Town's supportive corporate plans and strategies, as well as department-specific supportive plans, to be a foundational element of this Fire Rescue Master Plan (FRMP). **Figure 2** illustrates the plans which support this FRMP.

Figure 2: Town of Canmore Corporate Plans and Strategies

3.5 Fire-Rescue Staffing Study – Phase 1 – 2016

Phase 1 of this Fire-Rescue Master Planning process began with a Fire-Rescue Staffing Study which was completed in March 2016. One of the primary objectives of the Staffing Study was to provide a fresh, innovative look at alternatives for the existing management and staffing models for Canmore Fire Rescue Services, with consideration of existing budgetary constraints. In addition, the findings of the study were intended to serve as the foundation (Phase 1) for this strategic fire –rescue master planning process.

The Fire-Rescue Staffing Study (FRSS) provides valuable insight into industry best practices, innovation and staffing alternatives for consideration in developing the preferred operating model for Canmore Fire-Rescue. The staffing study has been used as a foundation for informing this FRMP in identifying fire protection service levels (performance objectives) for Canmore Fire-Rescue. The staffing study results have been incorporated into this master planning document. The staffing options provided in the FRSS, which remain applicable for the future 10 year horizon, have been revised and carried forward within this master plan.

4.0 Community Risk Assessment Summary

The process of assessing community risk is receiving increased attention within the fire protection industry in North America. A Community Fire Risk Assessment (CFRA) is now considered fundamental to the development of a strategic Fire-Rescue Master Plan. Assessing community risk enables an understanding of local needs and circumstances which can then be applied to align the service levels established by the fire-rescue department. The results of the CFRA, found in **Appendix A,** directly inform the recommendations and are used to identify existing service gaps across divisions, with particular connection to fire prevention, training and emergency response (i.e. suppression).

The risk assessment is based on a methodology founded in part on the NFPA 1730 *"Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations"* (2016 Edition). Per the Standard, the purpose of a Community Fire 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*" (p.6). NFPA 1730 outlines seven profiles that should be assessed and used to understand risk within the community. The exploration of the profiles is the first component of the CFRA methodology for this Fire-Rescue Master Plan. This includes the development of the following seven **profile assessments**:

1. Demographics;
2. Geography;
3. Building Stock;
4. Past Fire Loss;
5. Response;
6. Hazards; and
7. Economics.

The sections that follow summarize the key observations from the complete Community Fire Risk Assessment for the seven profiles and growth considerations. Detailed assessments are located in **Appendix A**.

4.1 Demographic Profile Key Observations

- The 2014 Municipal Census completed by the Town identified a permanent resident population of 13,076 and a non-permanent resident population of 3,687. That is a total of 16,763 people of which 38% of the population is non-permanent;
- Of the permanent residents, the Town Canmore has a slightly older population at 12.0% over 65 years of age compared to 11.1% in the Province of Alberta;
- Canmore is a popular retirement and tourism destination resulting in a non-permanent population that has a higher proportion aged 45 and older than the permanent residents group and that of the Province;

- The Town of Canmore has a more educated population (77%) as compared to the Province (64%);
- The Town of Canmore has 3% (or 155) households that are unsuitable for habitation compared to 5% for the Province as a whole;
- In the Town of Canmore, 26% of households spend 30% or more of the household total income on shelter costs (+2% compared to the Province); and
- The median value of dwellings at $602,080 in the Town of Canmore is $252,396 greater than that of the Province.

4.2 Building Stock Profile Key Observations

- Group C – Residential occupancies are the highest proportion of occupancies;
- The 2011-2012 Alberta Fire Commissioner's Report states that residential fires account for 72% of fire injuries, and 63% of property loss value emphasizing the importance of Group C – Residential occupancies when it comes to fire risk;
- The Town of Canmore has a higher proportion of higher-density types of residential development including semi-detached houses (8.3%), row houses (17.4%) and apartments less than five storeys (21.2%) compared to the Province (+3.1%, +10.4%, and +7% respectively);
- As a result of the Town of Canmore's extensive building design regulations in regards to height and area, the analysis of the building height and area within the Town represent a minimal risk;
- The age and construction of the buildings throughout the downtown area in the Town present the most significant risk for fire spread both internally and to adjacent buildings. In addition, the CFRS has identified several specific occupancies that reflect an exposure risk;
- CFRS has identified six occupancies with fuel load concerns and two vulnerable occupancies; and
- There are four protected properties and seven identified properties of interest, some of which include historic hotels and other lodgings.

4.3 Past Fire Loss Profile Key Observations

- For the Town and the Province, the greatest number of fires and the greatest property loss occurs in Group C – Residential occupancies;
- Group C – Residential occupancies accounted for 88% of fire deaths in Alberta in 2011 and 79% in 2012. There have been no fire fatalities in the Town over this time period;
- The top reason an alarm was not activated, when there was a fire, over the 2011 to 2012 time period was due to not enough smoke (64%) followed by no battery in the smoke alarm (11%);
- For the Province over the period of 2011 and 2012, there were 3,179 fires where a smoke alarm was not installed (totaling 69% of fires in 2011 and 58% in 2012);
- The highest proportion of fires caused in the Town of Canmore (2005 to 2014) was classified as human failing (35%) which can include accidents, asleep with suspected influence of alcohol or drugs, distracted, or ignorance of a hazard; and

- The three most common known causes of fires in the home in the Town of Canmore (2005 to 2014) are electrical distribution equipment (20%), cooking (17%), and smoking (17%).

4.4 Response, Hazard, and Economic Profiles Key Observations

4.4.1 Response Profile

- The majority of all calls from 2011 to 2015 took place in the summer season (30%) in alignment with the tourism/recreation-based population shift;
- Overall, the fire related calls show an increasing trend, which indicates a need to enhance the fire prevention and public education efforts of the CFRS; and
- There is a high proportion of false alarm calls.

4.4.2 Hazard Profile

- The Town is in the process of developing the Mountain Creek Hazard Mitigation program motivated by the 2013 floods that took place in the Town and the surrounding areas of Alberta; and
- There are several potential hazards under all categories (natural, human-caused, technological) but due to the topography and considerations due to weather, natural hazards are more probable.

4.4.3 Economic Profile

- There are several key Town events and key occupancies where if a fire loss were to occur, there would be an economic loss to the Town and its residents:
    - Loss of major industrial facility would impact residents ability to work;
    - Loss of tourist accommodation facilities could impact ability to accommodate tourists and the ability of residents to work resulting in economic loss;
    - Loss of Canmore General Hospital would result in impact of residents ability to work and ability to provide health services; and
    - Loss of municipal offices would result in impact of residents' ability to work and potentially impact the ability of the Town to provide services.

4.5 Fire Risk Model

A Geographic Information System Risk Model was developed based on the results of the profile assessment and utilizing the Ontario OFMEM Fire Risk Sub-model. The probability and consequences was considered based on zoning information to establish base risk levels. More information can be found in **Appendix A**.

4.6 Growth Considerations Key Observations

- According to the 2014 Municipal Census, the population of permanent residents has grown by 24.3% from 2000 to 2014 and the population of non-permanent residents has grown by 88.6%; and
- According to the 2016 Canmore Municipal Development plan, Canmore is expected to continue to grow over the next 30 years as shown and further described in **Appendix A**.

5.0 Strategic Priorities

The purpose of this FRMP is to provide Council and senior staff with a strategic framework to assist in making decisions regarding the provision of fire protection services. This FRMP has been prepared with regard for the Towns legislated and regulatory responsibilities including emphasis on current industry standards and best practices.

The analyses within this FRMP recognize four strategic priorities for the delivery of fire protection services within the Town of Canmore including:

- ✓ *The utilization of a Community Fire Risk Assessment in determining the level of existing and projected fire safety risks within the municipality as the basis for developing clear goals and objectives for all fire protection services to be provided by Canmore Fire-Rescue Services;*
- ✓ *The optimization of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement to provide a comprehensive fire protection program within the Town based on the results of the Community Fire Risk Assessment;*
- ✓ *The use of strategies that support the sustainability of a composite fire department including utilization of paid response firefighters as a core component of the departments fire suppression deployment model, and through communication strategies emphasize to employers, including the Town of Canmore, the importance of supporting the emergency response of paid response firefighters; and*
- ✓ *The delivery of a comprehensive fire protection service model that provide the most effective and efficient level of fire protection services resulting in the best value for the community.*

5.1 Recommendations

The recommendation regarding Strategic Priorities is:

1) **That Council approve the strategic priorities identified within the proposed Fire-Rescue Master Plan to guide the development and delivery of fire protection services within the Town of Canmore.**

6.0 Department Overview

6.1 Canmore Fire-Rescue Services

Prior to April 1st, 2012 Canmore Fire-Rescue Services operated as a fully integrated Fire/EMS operating model including the delivery of both fire protection and emergency medical services. The emergency medical services portion of this operating model was funded through a contractual agreement with the Alberta Health Services (AHS) that expired on March 31st 2012.

The previous fully integrated Fire/EMS operating model included the provision of advanced life support (Paramedics) and emergency medical transport (Ambulances) within the Town of Canmore. Following the decision of the AHS to assume direct responsibility for these services in 2012 the CFRS and the AHS initiated a pilot project to assess the impacts of the CFRS continuing to provide a higher degree of medical care than typically provided by a non-integrated, or standalone fire department.

From April 2012 to April 2015 a team, including representatives from Alberta Health Services, Town of Canmore, and Medical Directors for Canmore Fire-Rescue Services and Alberta Health Services, led the pilot project.

Results of the pilot project indicated that the "vast majority" of medical calls occurring during the period 2012 to 2015 required only the basic life support (BLS) level of service. The report also showed that the CFRS was able to provide an advanced life support (ALS) "Capable" level of service 82% of the time during this pilot period.

On June 16th, 2015 Council approved (through resolution #176-2015) their support to continue the CFRS as an ALS "Capable" fire service. Within its current operations the CRFS is able to provide this ALS "Capable" level of service only when full-time firefighters are on duty who have the required skills and competencies to provide this level of medical response. This means that there will be occasions when ALS "Capable" services are not available. This FRMP includes further analyses of the factors impacting the sustainability of this service in the future.

The CFRS operates out of one fire station centrally located at 1021 Railway Avenue in the core of the Town of Canmore. In addition to the ALS "Capable" services the CFRS provides a range of fire protection services including public education, fire prevention and fire suppression within the urban boundary of the Town and to neighbouring communities through contractual agreements. The CFRS also provides several specialized services, including response to hazardous materials (HAZMAT), ice rescue, water rescue, rope rescue, trench rescue, and heavy rescue.

6.2 Department Mission & Vision

The current Mission Statement of the CFRS is stated as:

"Serving the Community to Preserve and Enhance Our Quality of Life by Providing Life and Property Protection to the Residents in Our Community"

Industry best practices reflect that fire service mission statements are intended to be short, 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. The current mission statement of the CFRS reflects these industry best practices and has been recently reviewed and revised by the Town.

In contrast vision statements, although also defining an organization's purpose, are intended to express the future goals and objectives of the department. Mission statements can often remain the same while vision statements can evolve as the organization moves forward. The department's current vision statement is:

"CFRS will have a highly effective prevention, educations and inspection program while continually enhancing training."

6.3 Organizational Model – Phase 1: Fire-Rescue Staffing Study

The organizational model of the CFRS in place during the Phase 1: Fire-Rescue Staffing Study is referred to as a composite fire service, including both full-time and paid response firefighters. The current complement of CFRS includes a full-time Fire Chief, full-time Deputy Fire Chief (formerly titled Assistant Chief), three full-time Captains (formerly Lieutenants), four full-time firefighters, 36 paid response firefighters, 16 career casual firefighters, and a part-time administrative support position. The CFRS is supported by a Manager of Protective Services and a General Manager of Municipal Services.

Since transitioning from the previous integrated Fire/EMS deployment model in 2012 the CFRS has been utilizing a combination of full-time, career casual and paid response firefighters. These three categories of firefighters reflect a range in employment categories, roles, expectations, and training levels. The three full-time Captains, four full-time firefighters and 16 casual firefighters are all members of Local 4705 of the International Association of Fire Fighters (IAFF or Association). All other members of the department are not affiliated with the Association. Staffing levels of CFRS during Phase 1 of the study are illustrated in **Table 1**.

Table 1: Phase 1: Fire-Rescue Staffing Study

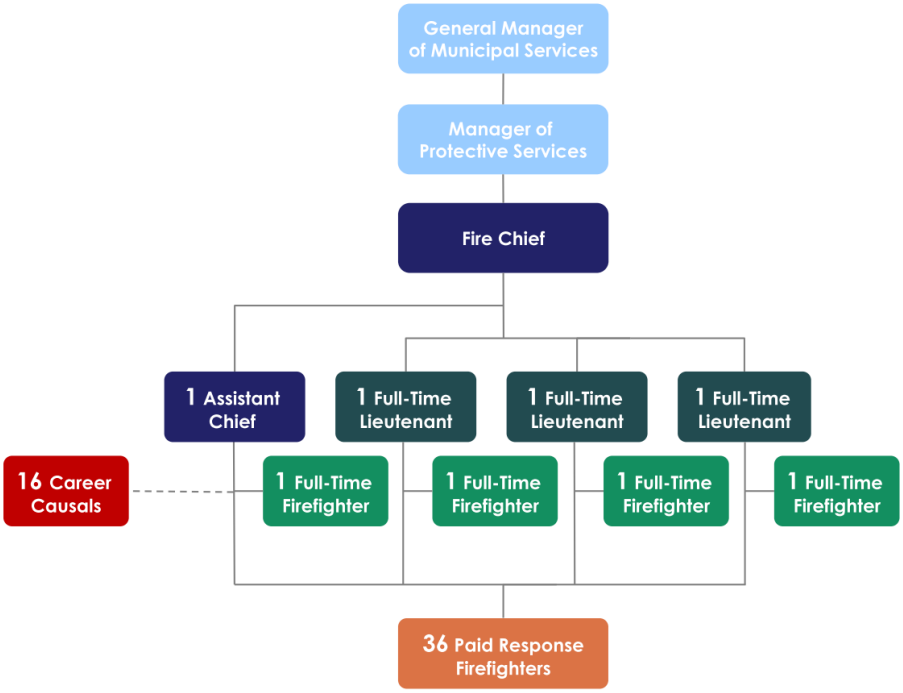
Role/ Division	Full-Time	Paid Response	Career Casual
Fire Chief	1	-	-
Assistant Chief (Deputy Fire Chief)	1	-	-
Lieutenants	3	-	-

Role/ Division	Full-Time	Paid Response	Career Casual
Full-Time Firefighters	4	-	-
Paid Response	-	36	-
Career Casual	-	-	16
Administrative Assistant	0.5	-	-
Total Staffing:	9.5	36	16

The organizational structure in place during the Phase 1: Fire-Rescue Staffing Study included the management team of the General Manager of Municipal Services, the Manager of Protective Services and the Fire Chief, supported by an Assistant Chief (now titled Deputy Chief), who filled a senior firefighter position within the emergency response platoons.

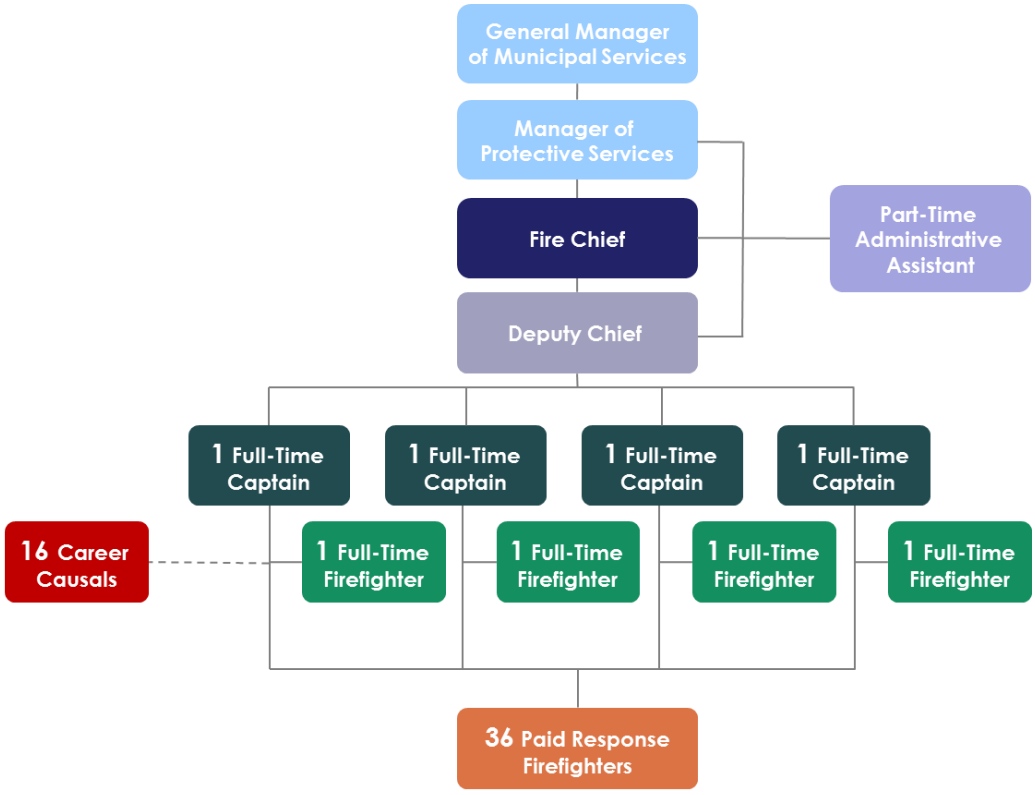
The organizational structure at the time of the FRSS included a four platoon system, with each platoon comprised of two full-time firefighters including one senior firefighter (e.g., Assistant Chief, now Deputy Chief or Lieutenant now Captain) and one full-time firefighter. Each platoon shift consisted of two ten-hour day shifts and two fourteen-hour night shifts, followed by four days off. Full-time firefighter shift coverage was provided by one of the career casual members. In this model emergency response (e.g. suppression) services were supplemented with paid response firefighters as needed. No formalized administrative support position existed within the CFRS during Phase 1 of the study. The organizational structure in place during the Phase 1: Fire-Rescue Staffing Study is shown in **Figure 3** below.

Figure 3: Organizational Chart (Phase 1: Fire-Rescue Staffing Study)



Since the completion of the Phase 1: Fire-Rescue Staffing Study the CFRS management team gained approval to revise the department's organizational structure. This revised structure removed the Assistant Chief from the emergency response platoon and revised the position to Deputy Chief, to provide for additional department management and administration capacity. Following the collective bargaining process in fall of 2016 the title of Lieutenant was revised to Captain. A part-time Administrative Assistant was also added to the department following the Phase 1 FRSS. The current organizational structure approved is shown in **Figure 4**.

Figure 4: 2017 Organizational Chart



Further analyses and recommendations relating to the CFRS organizational model are presented within the following sections of this FRMP.

7.0 Administration Division

The Fire Chief is directly responsible for overseeing the administrative functions of the CFRS. Working with a team of staff including the Deputy Chief and part-time administrative assistant the Fire Chief also receives support from the Manager of Protective Services in overseeing the administration of the CFRS.

This administrative team oversees the following administrative functions including:

- *Preparing the departmental budget and control of budgets;*
- *Preparing payroll data of the department;*
- *Initiating requisitions for materials and services;*
- *Maintaining personnel records in accordance with the Town's policy;*
- *Overseeing the application of the Collective Agreement with Local 4705;*
- *Providing liaison with the paid response complement;*
- *Preparing Council reports and status updates regarding the department;*
- *Carrying out the general administrative duties of the department; and*
- *Assisting the Manager of Protective Services in the preparation of the Municipal Emergency Management Plan.*

This section outlines and reviews the fire-rescue service's primary administration practices, management team roles and responsibilities, applicable service agreements and departmental standard operating guidelines.

7.1 Fire Chief

Reporting directly to the Manager of Protective Services, the Fire Chief is responsible for ensuring the delivery of all fire protection services approved by Council and provided by the CFRS. The current Fire Chief was first promoted to Acting Fire Chief in 2007 before being appointed as the full-time Fire Chief in 2008.

Within the current operating model of the CFRS the Fire Chief works a 40 hour work schedule each week that includes a shift schedule of four 10 hour days with hours from 0800 to 1800. In our experience this shift schedule is more consistent with that of a fire suppression crew than that of the senior administrative/management position within the fire department. The consultation conducted as part of this FRMP indicates that this shift schedule has worked well in the past, particularly in supporting the delivery of fire suppression services. However, this shift schedule does limit access to the Fire Chief during the normal municipal Monday through Friday business hours.

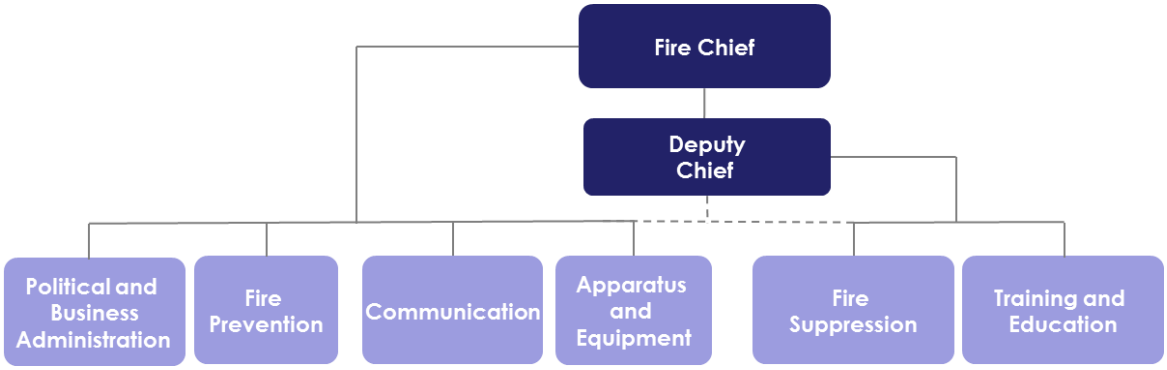
7.2 Deputy Chief

In the summer of 2016 the Deputy Chief position was reorganized and moved out of the shift rotation of the front-line emergency responder role in order to increase the administrative and management capacity of the department to further assist the Fire Chief with day-to-day activities. The Deputy Chief provides department management and leadership and is the senior officer in the absence of the Fire Chief.

7.2.1 Senior Officer Roles and Responsibilities

Figure 5 illustrates the divisional responsibilities of the CFRS senior officers. The distribution aims to balance the workload of the Fire Chief and Deputy Chief, and emphasizes the strategic priorities included within this FRMP.

Figure 5: Senior Officer Roles and Responsibilities



7.2.2 Senior Officer Shift Schedule

One of the unique characteristics of the Town of Canmore, although challenging to the delivery of fire protection services, is its location and destination point for travelers including a growing tourist population and recreational use population. An appropriate shift schedule for the Town's Fire Chief and Deputy Chief should acknowledge both the importance of sustaining access during normal municipal business hours Monday through Friday, and should recognize that the Town of Canmore is an active community seven days a week, from a business perspective. Therefore CFRS should consider and adopt a shift schedule that provides for senior officer coverage, seven days per week.

Recommendation #2: ***That Canmore Fire-Rescue Services implement a Senior Officer Shift Schedule that provides senior officer coverage seven days per week.***

7.2.3 Senior Officer On-Call Schedule

It is considered industry best practice to have a senior officer readily available to respond directly to an emergency incident, or emergency operations centre within an acceptable response time (e.g. 30 to 60 minutes) at all times, 365 days per year. The Fire Chief and Deputy Chief operate within such a senior

officer on-call schedule. This schedule ensures that one of the department's senior non-union management personnel is available at all times, reflecting industry best practices.

7.2.4 Senior Officer Skills and Competencies

The analyses within this FRMP supports further transition to the use of recognized industry certifications and qualifications for all positions within the CFRS. There are three functioning bodies for recruitment training and continued career training for firefighters that apply in Alberta: the National Fire Protection Association (NFPA), the International Fire Service Training Association (IFSTA), and the International Fire Service Accreditation Council (IFSAC).

Ensuring that all CFRS staff resources have the required skills, competencies and certification should also be considered a priority of the FRMP. The NFPA 1021- Standard for Fire Officer Professional Qualifications represents current industry best practices for certification of senior fire officers.

Table 2 summarizes the general prerequisite skills required to achieve the NFPA 1021- Standard for Fire Officer Professional Qualifications.

Table 2: NFPA 1021 – Standard for Fire Officer Professional Qualifications

Fire Officer Designation	NFPA 1021 Standard
Fire Officer I	The ability to effectively communicate in writing utilizing technology provided, write reports, letters, and memos utilizing word processing and spreadsheet programs, operate in an information management system, and effectively operate at all levels in the incident management system.
Fire Officer II	The organization of local government, enabling and regulatory legislation and the law making process at the local, state/provincial, and federal levels, and the functions of other bureaus, divisions, agencies and organizations and their roles and responsibilities that relate to the fire service.
Fire Officer III	Current national and international trends and developments related to the fire service organizations, management and administration principles, as well as public and private organizations that support the fire and emergency services and the functions of each.
Fire Officer IV	Policies and procedures, local state/provincial and federal regulations, community demographics and issues, and formal and informal community leaders.

Recommendation #3: ***That the Fire Chief and Deputy Chief attain professional certification as presented within the NFPA 1021 – Standard for Fire Officer Professional Qualifications or identified equivalent.***

7.3 Full-time Captains

The full-time Captains currently lead portfolios, or areas of specialization. This includes:

- *Training;*
- *Prevention and Public Fire Safety; and*
- *Operations (including apparatus and equipment).*

These portfolios are consistent with the organizational chart in place during the Phase 1 - Fire-Rescue Staffing Study. The Captain positions currently operate at capacity, considering their operational roles responding to incidents in addition to each individual specialized portfolio. As a result there is a need to balance the portfolio-related workloads within the Captain positions. It is expected that the recent addition of a dedicated part-time Administrative Assistant for the department will help off-load some of the workload, as a short-term solution. The analysis within this FRMP recommends a number of strategies for balancing these portfolios and revising the roles and responsibilities of the Captains particularly in the areas of fire prevention, training and public education.

7.4 Administrative Support

An Administrative Assistant position provides administrative support resources to CFRS, the Manager of Protective Services and the Town's Emergency Management Programs. The position will be transitioned from part-time to full-time in 2018 further improving the capacity and efficiency of the department.

7.4.1 Administrative Workspace

The department's administrative workspace, located within the CFRS station, consists of three administrative offices (Fire Chief, proposed Deputy Fire Chief and Manager of Protective Services). The CFRS also has four work stations, which are used for the Administrative Assistant, two for on-duty crews and one spare station. A small meeting space can also accommodate approximately five people.

The current administrative workspace was renovated in 2016 after a small fire within the building. Our analysis indicates that this workspace is currently meeting the needs of the Administration Division and the CFRS in general.

7.5 Bylaws & Agreements

7.5.1 Establishing and Regulating Bylaw

The *Municipal Government Act* and the *Safety Codes Act (SCA)* allow a municipality to pass bylaws to operate their municipality and specifically their fire and/or emergency services department(s). Bylaws provide the community with important information with regard to the level of service that their municipality intends to provide. Bylaws also provide municipal staff with the authorization to provide these services as well as the responsibility to achieve the prescribed service level.

The Town of Canmore Bylaw 2013-08 authorizes the establishment and operation of the Fire-Rescue Department. It establishes the Fire Chief as the appointed head of the department and allows the Fire Chief to appoint other officers to the department and to act on his/her behalf if necessary. The bylaw also outlines the Fire Chief's responsibilities. Bylaw 2013-08 in its current state was adopted in 2013 and came into effect on July 2, 2013.

The Fire Chief has complete responsibility and authority over the Fire-Rescue Department as authorized by Bylaw 2013-08, and is also responsible for other Town of Canmore bylaws relating to fire and rescue services including the False Alarm Bylaw 10-2009. The role and authority of the Deputy Chief, in absence of the Fire Chief, should be revised within the bylaw.

Our review of the existing bylaws approved by the Town of Canmore Council for the Fire-Rescue Services Department indicates that all required bylaws are in place. Our review also indicates that frequent reviews of bylaws should occur to reflect the changing community and revisions to the department itself. Ensuring these documents are regularly reviewed and updated to reflect any changes in service level or changes in authority are important functions.

Following Council's acceptance of the FRMP, the Establishing and Regulating Bylaw should be reviewed and revised to consider the following:

- Service levels for suppression, prevention and public education are clearly defined within the bylaw; and
- The bylaw specifically authorizes the department to deliver fire and rescue services it provides to the Town of Canmore.

Recommendation #4: ***That the current Establishing and Regulating Bylaw 2013-08 be updated to reflect the direction of Council in respect to the delivery of fire-rescue services.***

7.5.2 Collective Agreement – Local 4705 International Association of Firefighters

The Collective Agreement between the Town of Canmore and the Canmore Professional Fire Fighters Association - Local 4705 of the International Association of Fire Fighters (IAFF) defines the scope of work of the full-time firefighters and casual firefighters who are members of Local 4705. The agreement also defines hours of work, wages and benefits and the call back/call out processes for members of Local 4705.

The paid response firefighters are not members of Local 4705; however, the roles and responsibilities of the paid response firefighters are currently limited by the Collective Agreement including:

> ***Article 3.03:*** *Paid Response Fire Fighters may perform the duties of a fire fighter provided the work does not reduce the hours of work or pay of any member and they shall not work a pre-determined shift or call schedule or provide relief shifting for a full time member.*

7.5.3 Mutual Aid Agreements

Mutual aid agreements are predetermined plans that allow a participating fire department to request assistance from a neighbouring fire and/or emergency services department. The Town of Canmore Bylaw 2013-08 authorizes Canmore Fire-Rescue to enter into such agreements. There are two main scenarios when mutual aid agreements are enacted:

1. *When a fire department is on-scene at an emergency, has received information that immediate assistance is required, it may ask for mutual aid assistance from a neighbouring fire department.*
2. *Where distance and/or conditions are such that a neighbouring fire department could provide a more timely response, fire departments may immediately request a simultaneous response from a participating fire department.*[4]

7.5.4 Bow Corridor Emergency Mutual Aid Agreement 1992

The Town of Canmore is an active participant in a mutual aid agreement (Bow Corridor Emergency Mutual Aid Agreement) with various jurisdictions in the Bow Valley Corridor. These include the Town of Banff, the Town of Cochrane, Rocky View County, the Municipal District of Bighorn (Municipal District No. 8), the Summer Village of Ghost Lake, the Summer Village of Waiparous, Kananaskis Country, Banff National Park, the Townsite of Redwood Meadows, the Stoney First Nation, and the Tsuu Tina First Nation. This agreement has been active for over twenty years, and is currently in the process of being updated. Our review of this agreement indicates that the Town of Canmore recognizes the objectives and values of participating in mutual aid agreements.

7.5.5 First Response Agreements

In contrast to mutual aid agreements, first response agreements are programs designed to provide and/or receive assistance from the closest available resource, regardless of municipal boundaries, on a day-to-day basis. The obvious advantage of implementing a first response program or fire protection agreement is that the person experiencing the emergency receives fire services from the closest available provider by supplying seamless service through the elimination of artificial service boundaries. Some of the additional benefits that an automatic aid agreement provides include:

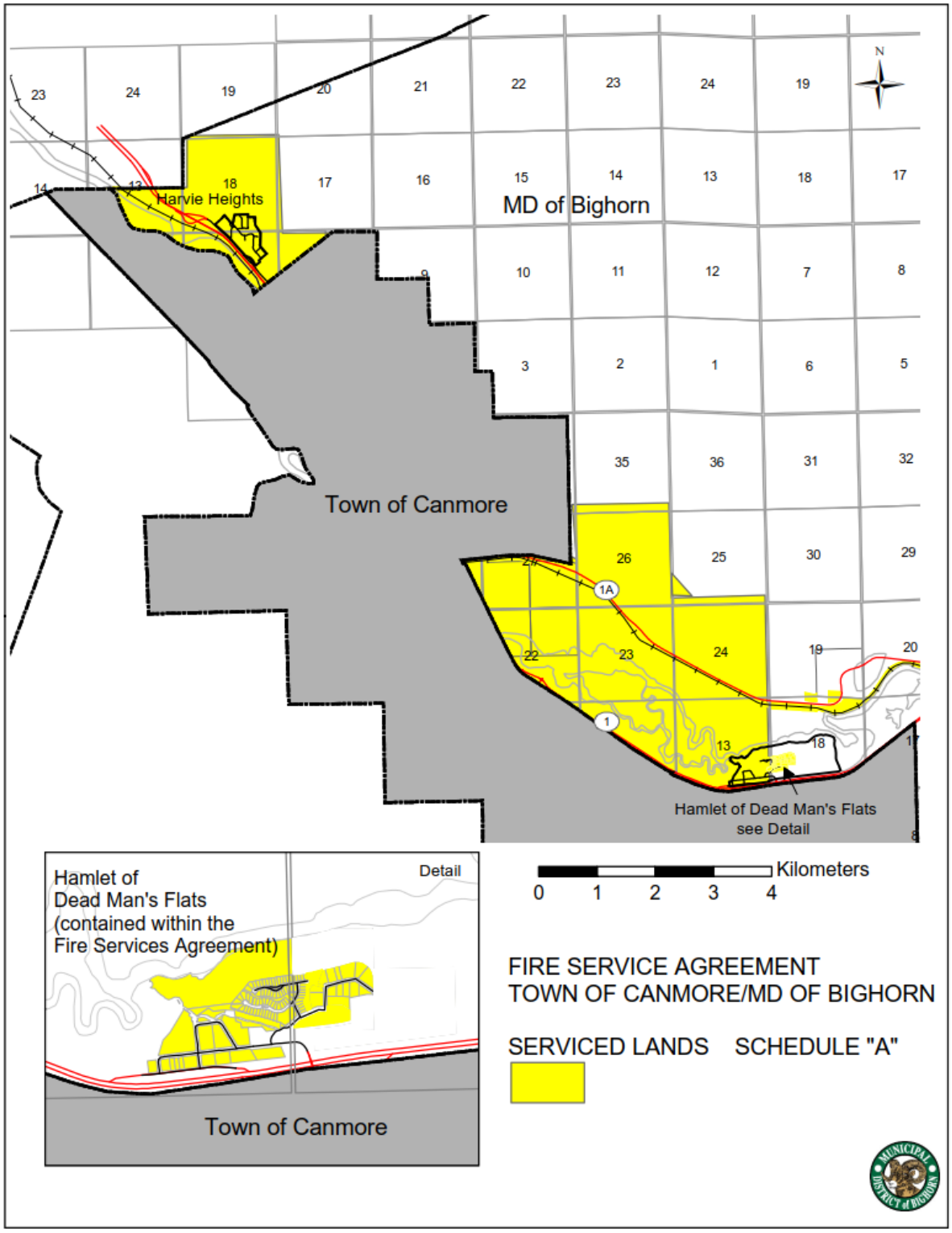
- *an enhancement of the level of public safety;*
- *a reduction of the critical element of time between the commencement of a fire and the application of an extinguishing agent to the fire by dispatching the closest available assistance;*
- *the reduction of life, property and environmental losses; and*
- *the improvement of public and firefighter safety.*

The Town of Canmore is an active participant in, and provides services as part of, the Municipal District of Bighorn (Municipal District No.8) Fire Suppression and Rescue Service Agreement.

[4] Reference: Public Fire Safety Guideline 04-05-12, Office of the Fire Marshal and Emergency Management Ontario

The Municipal District of Bighorn (Municipal District No. 8) borders the eastern town limits of Canmore and covers approximately 2,673 square kilometres. Much of the Municipal District is remote and uninhabited. The boundaries of the service agreement for which CFRS provides emergency response coverage are shown in **Figure 6** which is Schedule "A" of the Agreement.

Figure 6: Municipal District of Bighorn Service Agreement Boundaries



7.5.6 Dispatch Services Agreement

Dispatch services for the Town of Canmore are provided by the Foothills Regional Emergency Services Commission (FRESC). This commission currently provides emergency services for a number of municipalities in Alberta including Okotoks, High River, Turner Valley/ Black Diamond, and the M.D. of Foothills.

The Town of Canmore negotiated an agreement with FRESC on October 9th 2009 which stated that the commission will provide the following services to the Town of Canmore:

a) *Shift tracking;*
b) *Hourly Safety Checks;*
c) *High Risk Situation Times;*
d) *Traffic stop timers as required;*
e) *Monitoring and appropriate response to radio "panic alarms";*
f) *Notification of additional resources when required (RCMP, Tow companies, etc.); and*
g) *Radio repeater network with access to the Foothills Regional Communications Center.*

The Town of Canmore agreed to provide FRESC with *Compatibility of portable and mobile radio equipment for use on the FREMS repeater network or Mike phone capability.* Both the Town of Canmore and the Foothills Regional Emergency Services Commission meet semi-annually to discuss and resolve operational matters.

The Alberta Building Code STANDATA defines emergency response time as a total of ***dispatch time + turnout time + travel time = emergency response time.*** Therefore, the dispatch time is a critical element impacting the CFRS ability to achieve the optimum geographic coverage of the community within the defined STANDATA 10-minute emergency response time frame.

The current dispatch service agreement does not include performance reporting or define performance metrics and reporting requirements. Fire service best practices for the provision of emergency call taking and dispatching reflect the use of the National Fire Protection Association (NFPA) 1221 *"Standard for the Installation, Maintenance, and Use of Emergency Service Communications Systems"* as the guideline for provision of services.

In our view consideration should be given to ensuring that performance goals and objectives be included within the dispatch service agreement in order for the CFRS to regularly assess its emergency response times as defined by the Alberta Building Code STANDATA, and to support due diligence on behalf of the municipality.

Access to the CFRS call data statistics will be required to monitor and measure the department's performance going forward. The revised dispatch services agreement should also include considerations for the provision of call data details, in a database format, to CFRS.

Recommendation #5: ***That the Fire Chief meet with the Foothills Regional Emergency Services Commission to request that the current dispatch agreement be updated to include the performance objectives for emergency call taking and dispatching services included within the NFPA 1221 "Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems".***

7.6 Departmental Standard Operating Guidelines

Standard Operating Guidelines (SOGs) are commonly used within CFRS to direct the performance or behaviour of departmental staff, whether functioning alone or in groups. SOGs differ from policies in that there is more room for interpretation and variance in outcomes. In general, the SOGs are intended to:

- *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.*

CFRS' Standard Operating Guidelines are broad and cover most of the department's business lines, with (71) individual guidelines. The SOGs are divided into the following sections:

1) **Administration** (15)
2) **Safety** (20)
3) **Training** (2)
4) **Maintenance** (6)
5) **Response** (12)
6) **Technical Response** (16)
    a. *Hazardous Materials (11)*
    b. *Ice Rescue (1)*
    c. *Rope Rescue (1)*
    d. *Trench Rescue (1)*
    e. *Water Rescue (2)*

In alignment with the strategic priorities of this FRMP to optimize the use of fire prevention, public education and fire code enforcement, there is a strong need for CFRS to develop SOGs relating to these topics. This should include but not be limited to fire prevention services, fire code inspections, fire investigations, public education services, and occupancy permits.

Given the importance of department training for CFRS, priority should also be given to further development of training SOGs to fully reflect the training programs provided within the department.

Current trends in the fire service suggest that creating and empowering a committee of fire service staff to research, develop, and draft new standard operating guidelines and to update existing ones can be a successful model for administering these core documents. Reviewing and updating SOGs is an ongoing evolution within the fire service. Creating an SOG Committee to conduct regular reviews and updates is considered to be a best practice within the fire service.

Subject to Council consideration and approval of this Fire-Rescue Master Plan, there will be a need to conduct a review of all existing SOGs and complete revisions where necessary including developing additional SOGs to reflect all levels of service approved by Council.

Recommendation #6: ***That the Fire Chief take the following steps regarding standard operating guidelines:***

- ***Establish and empower a standard operating guideline committee composed of fire service staff to research, develop, and draft new standard operating guidelines and to update existing standard operating guidelines;***
- ***Conduct a review of all existing standard operating guidelines and where necessary complete revisions or develop additional standard operating guidelines to reflect all levels of service approved by Council;***
- ***Prioritize the development of SOGs relating to fire prevention (including public education) and department training; and***
- ***Ensure that the department continues the on-going process of regularly reviewing and updating department policies, operational procedures and relevant bylaws.***

7.7 Records Management Procedures

Record keeping is an important part of managing overall the operations of a fire service department, including the provision of training, management of fleet and equipment and the delivery of fire prevention activities (e.g. fire inspections and public education programs). CFRS currently tracks and records information in a number of ways, with a mix of hard copy and digital files. The department is in the process of investigating an integrated software solution for purchase to perform as a standalone records management system, designed for the fire service, to coordinate all records management needs within the department.

7.8 Annual Reporting

Optimizing the delivery of fire prevention and protection services requires ongoing monitoring, evaluation and revisions to the services approved by Council. The municipal fire service industry in Canada utilizes 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 Fire Risk Assessment and fire related bylaws and can provide further value in identifying changes or trends within the community. The Fire Chief currently prepares information and reports to Council on a need basis.

Our review indicates that further documentation of the service delivery performance and overall achievements for Canmore Fire-Rescue Services should be presented to Council on an annual basis. In our view this could be achieved by creating an annual report which presents the previous year's overall department performance, trends analyses, updated risk information and highlighted department successes. This is another task within the department that could be supported by the recommended full-time Administrative Assistant position.

Recommendation #7: ***That the Fire Chief prepare and submit an annual report summarizing the service delivery performance of all divisions and highlighting the department's achievements for Canmore Fire-Rescue Services on an annual basis.***

7.9 Community Emergency Management

Fire services perform an integral role in emergency preparedness. This section reviews the municipal standards for emergency planning; the Town's emergency Plan; the activation of the Emergency Plan and CFRS's role in the Emergency Plan.

Under Alberta's *Emergency Management Act*, the Lieutenant Governor in Council has the authority to make regulations setting standards for the development, implementation and maintenance of emergency management programs required by communities. It is the responsibility of individual departments, boards, commissions or Crown agencies for the preparation or implementation of plans or arrangements to deal with emergencies.

The *Emergency Management Act* sets out the regulation and standards for managing

- Emergency Advisory Committee
- Emergency Management Agency
- Emergency Management Plan & Response

At the provincial level, the Alberta Emergency Management Agency (AEMA) leads the coordination, collaboration and co-operation of all organizations involved in the prevention, preparedness and response to disasters and emergencies.

The Municipal Emergency Management Plan is designed in a generic fashion which allows it to response to situations that are unexpected and require a coordinated response and recovery. The Town of Canmore Municipal Emergency Management Plan was updated in May 2016.

7.9.1 Town of Canmore Municipal Emergency Management Plan

The goal of the Town of Canmore's Municipal Emergency Management Plan is to provide "*best practices for local authorities, provincial and federal governments, and private sector partners to follow during an emergency and guides the operations, organizations, responsibilities, and coordination necessary to provide effective response and recovery from major emergencies or disasters.*"

In order to effectively manage emergency situations, Canmore operates an Emergency Coordination Centre (ECC), alongside an Incident Command Post (ICP). The ECC is only activated if required to support and coordinate all off-site activities.

7.9.2 Fire Branch Coordinator

Under the ECC Operations Section, there are a number of municipal service branches which offer support to the ECC during an emergency situation. The ECC Operations Coordinator is responsible for activating Branch Coordinators, such as the Fire Branch. The Fire Branch Coordinator (i.e. the Fire Chief or Incident Commander), is responsible for:

1. *Arranging and coordinating urban and wildland fire suppression, rescue, and hazardous materials support operations.*
2. *Acquiring mutual-aid resources, as necessary.*
3. *Coordinating the mobilization and transportation of all resources through the ECC logistics section.*
4. *Completing and maintaining branch status reports for major incidents requiring or potentially requiring regional and provincial response support, and maintaining status of unassigned fire and HazMat resources in the area in conjunction with the Resources Unit.*
5. *Implementing the objectives of the ECC action plan assigned to the Fire Branch.*
6. *Liaising with the Fire Branch at the Provincial Operations Centre (POC).*
7. *Overall supervision of the Fire Branch.*

7.9.3 Implementing the Emergency Management Plan

The Emergency Management Plan may be activated by any member of the Emergency Coordination Centre Management Team, any Incident Commander from the Town of Canmore Fire/Rescue or Royal Canadian Mounted Police or the Minister of Municipal Affairs.

Where a threat of an impending emergency exists the ECC will be notified and only those functions/ positions that are needed to effectively handle the emergency should be staffed. The Emergency Coordination Centre Location is The Town of Canmore Civic Center Council Chambers with an alternate location of the Town of Canmore Public Works Building.

ECC priorities and initial actions are:

- *Establish communication with the incident site;*
- *Activate required ECC personnel;*
- *Notify Agency Executive as required;*
- *Setup the ECC;*
- *Begin documentation;*
- *Review individual position roles and responsibilities;*
- *Being ECC Action Plan Development.*

Depending on the size or potential to impact the residents of Canmore, a 'State of Local Emergency' or community evacuation can be undertaken. The mayor, or alternate, is the responsible for declaring a State of Local Emergency. In addition, the Lieutenant Governor in Council may, at any time, make an order for declaration of a State of Emergency relating to all or any part of Alberta. Evacuation Procedures follow the Town of Canmore's Evacuation Plan, written in conjunction to the Municipal Emergency Management Plan to "*establish provisions for a prompt, safe, and coordinated response during an evacuation of residents and publics within the municipality during an emergency or disaster"* (page 1, Town of Canmore Evacuation Plan, 2016).

Following the incident, a post-incident debrief will be conducted with the ECC members who were involved with the incident. The purpose of the meeting is to improve emergency procedures, to review the origination and to provide an opportunity for participants to actively assist in continuous improvement of the ECC team.

7.10 Administration Division Summary and Recommendations

Canmore Fire-Rescue Services is at a pivotal time in its history of transitioning from the previous fully integrated Fire/EMS operating model to a standalone fire department. The strategic priorities presented within this FRMP are intended to assist Council and senior staff with the process of completing this transition.

The analyses and recommendations of the Administration Division provide Council with the opportunity to further enhance the efficiency and effectiveness of this division. This includes revising the roles and responsibilities of the leadership of Canmore Fire-Rescue Services though implementing a revised organizational structure, enhancing current administrative processes and enhancing performance benchmarking.

Recommendations for the Administration Division include the following:

2) ***That Canmore Fire-Rescue Services implement a Senior Officer Shift Schedule that provides senior officer coverage seven days per week.***

3) ***That the Fire Chief and Deputy Chief attain professional certification as presented within the NFPA 1021 – Standard for Fire Officer Professional Qualifications or identified equivalent.***

4) ***That the current Establishing and Regulating Bylaw 2013-08 be updated to reflect the direction of Council in respect to the delivery of fire-rescue services.***

5) ***That the Fire Chief meet with the Foothills Regional Emergency Services Commission to request that the current dispatch agreement be updated to include the performance objectives for emergency call taking and dispatching services included within the NFPA 1221 "Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems".***

6) ***That the Fire Chief take the following steps regarding standard operating guidelines:***

- ***Establish and empower a standard operating guideline committee composed of fire service staff to research, develop, and draft new standard operating guidelines and to update existing standard operating guidelines;***
- ***Conduct a review of all existing standard operating guidelines and where necessary complete revisions or develop additional standard operating guidelines to reflect all levels of service approved by Council;***
- ***Prioritize the development of SOGs relating to fire prevention (including public education) and department training; and***
- ***Ensure that the department continues the on-going process of regularly reviewing and updating department policies, operational procedures and relevant bylaws.***

7) ***That the Fire Chief prepare and submit an annual report summarizing the service delivery performance of all divisions and highlighting the department's achievements for Canmore Fire-Rescue Services on an annual basis.***

8.0 Fire Prevention and Public Education

This section examines the existing fire prevention and public education activities and services provided by Canmore Fire-Rescue Services. It also provides analyses and recommendations that align the proposed services with the identified community fire risk and proposed strategic priorities of this FRMP including:

- ✓ ***The utilization of a Community Fire Risk Assessment in determining the level of existing and projected fire safety risks within the municipality as the basis for developing clear goals and objectives for all fire protection services to be provided by Canmore Fire-Rescue Services; and***
- ✓ ***The optimization of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement to provide a comprehensive fire protection program within the Town based on the results of the Community Fire Risk Assessment.***

Within the Province of Alberta the *Safety Codes Act* (SCA), Alberta Building Code (ABC), and Alberta Fire Code (AFC) are the legislating documents regarding fire safety. The *Safety Codes Act* allows for the Lieutenant Governor and the Safety Codes Council to make regulations governing fire protection and the safe design, manufacture, construction, sale, installation, etc. of buildings, electrical systems, fire protection systems and equipment, among others. The Alberta Fire Code allows for the inspection of various facilities, and outlines specific fire prevention measures required at different facilities such as process plants, child care facilities, distilleries, etc.

In terms of public education, as stated in the *Safety Codes Act*, the Minister or the Safety Codes Council may, in accordance with the regulations, establish and operate safety information and education programs or services"[5]. The previously referenced Canmore Fire-Rescue Quality Management Plan (QMP) outlines the department's approach to fire prevention, public education, and investigation in accordance with the SCA. Throughout this section the QMP is referenced to assist with describing existing conditions within the Town of Canmore in terms of fire prevention.

8.1 Fire Prevention Policy / Program

Industry best practices support the need for a Council approved Fire Prevention Policy or inclusion of fire prevention and public education service levels within the Establishing and Regulating Bylaw of a fire service paired with a detailed fire prevention program. These guiding documents establish policies and authority for fire department personnel for fire prevention, public education programs and activities as

[5] *Source: Safety Codes Act, Section 13(2).*

a primary means of protecting lives and property from fire and can also be used to ensure compliance is maintained with appropriate standards and legislation.

The NFPA 1730: *Standard on Organization and Deployment of Fire Inspection and Code Enforcement, Plan Review, Investigation, and Public Education* includes an outline of fire prevention and fire safety education activities and objectives for:

- Fire inspections;
- Fire code enforcement;
- Fire and life safety education;
- Fire investigation and cause determination;
- Fire loss statistics;
- Plans review; and
- Fire department operational guidelines identifying how, when and where activities will be conducted.

The Town of Canmore's Council-approved 2016 Quality Management Plan addresses many of these best practice components of a Fire Prevention Policy. Based on the review conducted for this FRMP, there is an opportunity to enhance and clarify the objectives and activities to directly align them with risks identified in the Community Fire Risk Assessment as part of the overall community risk reduction plan. Establishing a detailed Fire Prevention Program that directly links with the Quality Management Plan and the Community Risk Reduction Plan would further support the proposed strategic priorities of the FRMP.

Recommendation #8: ***That a detailed Fire Prevention Program or Policy be developed and presented to Council for consideration and approval.***

8.2 Current Public Education Programs

It has been demonstrated in other municipalities 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.

The 2016 QMP states that the CFRS will support and provide at least one of its educational programs annually. While not limited to these programs, the 2016 QMP identifies approximately ten programs that could be provided:

- School curriculum;
- Minority focused programs;
- Community education;
- Risk Watch (injury prevention)
- Getting to Know Fire (fire educator lesson plans);

- Seniors Fire Safety Programs;
- Juvenile Firesetter Intervention Program;
- Fire Smart; and
- Shelter-in-Place.

One annual activity that takes place as part of community education is Fire Prevention Week. This is a focus of the prevention activities provided by the CFRS and occurs annually in early October. The week is focused around a different theme each year. In 2015, the theme was “Hear the Beep Where You Sleep” – promoting smoke detectors in every bedroom. The Canmore Fire-Rescue Strategic Plan estimates that more than 500 students are reached during Fire Prevention Week. These are the only school visits that occur throughout the year. Fire Prevention Week also includes an open house, which provides interactive activities for all age groups and is an opportunity to recruit paid response personnel.

Throughout the staff consultation process there was evidence and discussion of the importance of public education. However, through the FRMP data collection process there was minimal evidence regarding the types of public education programs and activities consistently delivered by the CFRS. In addition, while there is some guidance in the 2016 QMP, there are currently no SOGs in place to describe or outline how, when, and by whom these public education programs will be delivered. As referenced in early sections of this FRMP developing SOG’s for fire prevention and public education should be prioritized.

8.3 Proposed Public Education Programs

As discussed within this Fire-Rescue Master Plan and recognized in the Canmore Fire-Rescue Strategic Plan, a proactive approach to fire prevention and fire safety education can have a significant positive impact on fire protection services delivered within a community. By prioritizing the delivery of fire prevention and public education programs, fire loss can be mitigated and fire call volume reduced.

Implementing goals and objectives for conducting public fire safety education activities and programs is consistent with responding to the strategic priorities identified within this FRMP. This would include developing regularly scheduled programs and activities (cycles) for providing fire safety education to the various occupancies classifications identified by the Community Fire Risk Assessment.

Developing a public education cycle provides the opportunity to prioritize the delivery of fire safety education programs based on the results of the Community Fire Risk Assessment, specifically for vulnerable demographics such as seniors and children as well as unique demographics such as tourists and non-permanent residents. There is also unique need in the Town of Canmore to target employees within the hospitality sector. The large population shifts experienced due to tourism present a target audience that cannot easily be reached. Therefore, reliance is on hospitality staff to ensure appropriate actions and safety precautions are taken in the event of a fire. In addition, non-permanent residents should be a specific demographic that is targeted for public education programs. As discussed in the

Community Fire Risk Assessment, this population has a higher proportion of seniors than the permanent population (14.7% vs. 12.0%). These residents are also only in Canmore for a part of the year which means that the occupancy may be vacant for some time which could have an impact on the level of fire risk.

Dillon's research into developing fire safety program delivery cycles reviewed the relevant NFPA standards, industry best practices, and reasonably available resources within CFRS. **Table 3** reflects the proposed public fire safety education activities and program delivery cycles for Alberta Building Code occupancy classifications.

Table 3: Proposed Public Education Program Cycles

AFC Major Occupancy Classification	Buildings	Proposed Public Education Program Cycle Objectives
Group A – Assembly	Schools, Recreation Centres, Arenas, Theatres	1-2 Years
Group B – Institutional	Licensed Properties, Nursery/Day Care Facilities, Care and Detention Facilities,	1-2 Years
Group C – Residential	Hotels, Inns, Motels, Hostels, Bed & Breakfast Establishments	1-2 Years
	Houses, Townhomes, Apartments, Condominiums	Upon Request
Group D – Business	Business and Personal Services Occupancies	Upon Request
Group E – Mercantile	Mercantile Occupancies	3-4 Years
Group F - Industrial	Low-, Medium-, and High-Hazard Occupancies	4-5 Years

As a minimum, it is recommended that CFRS public education activities include the following formalized programs,

- Media releases and public safety announcements;
- Smoke alarm program;
- Escape planning;
- Public fire and life safety events and displays;
- Awareness and targeted education programs, such as students, seniors, and fire-safe living; and
- Community event activities (such as Fire Prevention Week).

Each program should include corresponding performance measures to define the goals and objectives of each program. In alignment with NFPA 1730, education activities should be carefully tracked and analyzed to assess the effectiveness of programs and procedures. This could include tracking and reporting on the number of activities conducted annually, and the number of people reached for each program delivered.

Recommendation #9: ***That the proposed public education program cycle objectives be included within the proposed Fire Prevention Policy/Program.***

8.4 Current Fire Inspection Services

The current fire inspection services provided by CFRS are outlined in the 2016 Quality Management Plan. The 2016 QMP establishes responsibilities and minimum performance criteria for compliance monitoring as required by the SCA. The current fire inspection services provided by the CFRS include:

- Fire Code advice;
- Permit issuance;
- Plans examinations;
- Site inspections;
- Site investigations;
- Alternative solutions/variances;
- Orders;
- Verification of compliance;
- Identification and follow-up deficient and unsafe conditions;
- Collection and remittance of Safety Codes Council fees;
- Issuance of Permit Services Reports; and
- Maintaining files and records.

8.4.1 Current Fire Inspection Cycle

For existing and occupied dwellings, the current fire inspection cycle is shown in **Table 4** as identified in the 2016 Quality Management Plan. Currently, all major building occupancy classifications are inspected on a request/complaint basis. These fire inspection cycles comply with the Town's minimum legislative requirements. All new construction, alteration, addition, renovation, reconstruction, or removal projects also require a Fire Safety Plan and on-site inspection if potential risk to an occupied residential building(s) is identified.

Table 4: Current Fire Inspection Cycle

AFC Major Building Occupancy Classification	Buildings	Current Fire Inspection Cycle
Group A – Assembly	Schools, Recreation Centres, Arenas, Theatres	Upon Request / Complaint
Group B – Care or Detention	Nursery/Day Care Facilities, Seniors Care Facilities, Hospital, Licensed Properties, Care and Detention Facilities, Churches	Upon Request / Complaint
Group C – Residential	Houses, Townhomes, Apartments, Condominiums, Hotels, Inns, Motels, Hostels, Bed & Breakfast Establishments	Upon Request / Complaint
Group D – Business	Business and Personal Services Occupancies	Upon Request / Complaint
Group E – Mercantile	Mercantile Occupancies	Upon Request / Complaint
Group F - Industrial	High-, Medium-, and Low-Hazard Occupancies	Upon Request / Complaint

(Source: Canmore Fire-Rescue Services)

8.5 Proposed Fire Inspection Cycle

As discussed in *Section 8.4.1*, the current fire inspection cycle meets the minimum legislative requirements of the Town. This FRMP includes proposed strategic priorities to support further optimization of fire prevention and public education programs as a core element of enhancing the Town of Canmore current fire protection services. The proposed fire inspection cycles are targeted to support the application of the strategic priorities.

In comparison to the current fire inspection cycles the proposed cycles are intended to implement a more proactive fire inspection program. In our view the current fire inspection cycle is limited by the available qualified staff resources that rely on a reactive fire prevention inspection program. In our view this strategy is not well aligned with fire risks identified in the Community Fire Risk Assessment or the strategic priority to focus on prevention and education.

The proactive fire inspection cycle as proposed in **Table 5** has been developed based on the minimum recommended fire inspection frequencies stated within the NFPA 1730 standard, and consideration of the findings of the Community Fire Risk Assessment. For example, proactive fire inspections of Group C – Residential occupancies that are hotels, motels, or other tourism-based establishment is identified with an annual inspection cycle due to possible language barriers and lack of ability to educate tourists.

Increasing the inspection cycle frequency will require additional hours and staff resources to be dedicated to conducting the inspections and related reports.

Table 5: Proposed Fire Inspection Cycles

AFC Major Building Occupancy Classification	Buildings	Current Fire Inspection Cycle	Proposed Fire Inspection Cycle
Group A – Assembly	Schools, Recreation Centres, Arenas, Theatres	Upon Request/Complaint	2 Years
Group B – Institutional	Licensed Properties, Churches	Upon Request/Complaint	2 Years
	Nursery/Day Care Facilities, Care and Detention Facilities,	Upon Request/Complaint	Annually
Group C – Residential	Hotels, Inns, Motels, Hostels, Bed & Breakfast Establishments	Upon Request/Complaint	Annually
	Houses, Townhomes, Apartments, Condominiums	Upon Request/Complaint	On Request / Complaint
Group D – Business	Business and Personal Services Occupancies	Upon Request/Complaint	3 Years
Group E – Mercantile	Mercantile Occupancies	Upon Request/Complaint	3 Years
Group F - Industrial	High-Hazard Occupancies	Upon Request/Complaint	Annually
	Medium- Hazard Occupancies		Bi-annually
	Low-Hazard Occupancies		3 Years

Recommendation #10: ***That the proposed fire inspection cycle objectives be included within the proposed Fire Prevention Policy/Program.***

8.5.1 Existing Fire Safety Plans

Fire Safety Plans are required for select occupancy types identified within the Alberta Fire Code. These plans, while approved by qualified personnel within a fire department, are utilized primarily by the occupants. Fire Safety Plans provide an avenue for training in the case of a fire incident; for example, care providers at a long-term care facility would know their role in an evacuation procedure. Per the 2016 QMP, as part of the Alberta Fire Code services provided by the municipality, the Town will support the development and implementation of Fire Safety Plans.

Fire Safety Plans are also considered as part of compliance monitoring with particular "emphasis to addressing the risk to occupied residential buildings". Fire Safety Plans are developed or reviewed in conjunction with one on-site inspection where a risk to occupied residential buildings has been identified, and for all new construction, alteration, addition, renovation, reconstruction, or removal.

Our review indicates that there is currently no SOG, or defined procedures for development, review and approval of Fire Safety Plans.

8.5.2 Pre-Planning

In comparison to a Fire Safety Plan 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 occupancy. Pre-planning is typically conducted by on duty fire suppression staff with information provided from a variety of sources including existing information from the Town, 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 CRFS currently conducts pre-planning for buildings that are considered to have a high density. This FRMP includes a Community Fire Risk Assessment that includes identifying low, moderate and high risk occupancies. Our review indicates that there is currently no SOG or defined procedures for completing or prioritizing pre-planning within the Town. It is recommended that the risk assessment be utilized to inform the priorities of the departments pre-planning process including prioritization of high risk occupancies within a department SOG.

8.6 Fire Investigation Services

The 2016 QMP states that a Fire Safety Codes Officer will conduct an investigation "to determine the cause, origin and circumstance of every fire in which a person dies or suffers injury that required professional medical attention or in which property is damaged or destroyed". The results of the

investigation are reported to the Fire Commissioner in accordance with the Administrative Items Regulation. Where necessary a Safety Codes Officer may need to work with additional law enforcement, agencies, or other resources as required. Presently only one of the Captains and the Deputy Chief are qualified to conduct investigations.

All investigations are to include reporting on the following information:

- file number
- location of fire
- date of fire
- date of investigation
- building / property use
- cause of fire
- origin of fire
- value of loss
- name and designation number of SCO conducting the investigation,
- comments
- date of completion/sign off

There are currently no SOGs in place that outline the procedures and protocols for conducting investigations. Industry best practices indicate that an SOG should be developed for fire investigations and include the following information:

- Who is responsible for investigations;
- What external agencies should be involved and when including contacting and communicating with the Office of the Fire Commissioner;
- Reporting templates and processes;
- Process for evaluating the investigation results and including them within updates to the Community Fire Risk Assessment;
- Required training to be a Safety Codes Officer investigator; and
- Documentation and filing procedure for fire investigations, prosecutions, and litigation.

8.6.1 Home Smoke Alarm and Escape Planning Program

Research indicates that the presence of working smoke alarms within the home will increase the survival rate of occupants during a fire situation. 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 situation.

As a component of a proactive public education program targeting the pre-fire department notification phase of a fire, the provision of a pro-active Smoke Alarm Program is an effective strategy to enhance fire prevention education, and reduce the probability of a fire related injury or death.

Benefits to the provision of a pro-active Smoke Alarm Program include:

- ✓ 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 fire;
- ✓ Provide valuable educational information to home owners about the importance of maintaining working smoke alarms;
- ✓ Inform occupants about the importance of having an effective home fire escape plan, and practicing the plan on a regular basis.

Complimentary to a Smoke Alarm Program, an Escape Planning Program will 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 occupant's fire prevention education and reduce the probability of injuries occurring as a result of a fire. In the event of a fire human behaviour suggests that you exit the room or building in the same manner that you entered. In a fire situation this exit path may not be available as a result of rising heat conditions, 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.

Providing public education including the process and benefits of preparing a home fire escape plan is also a critical component of the pre-fire department notification phase of a fire. Elements of a home fire escape plan should include:

- ✓ The identification of a secondary exit from all rooms;
- ✓ Floor plans of the home that identify alternate exits such as windows;
- ✓ Identify alternate exit paths such as porch or garage roofs;
- ✓ Recognize if there may be individuals with disabilities who may need assistance; and
- ✓ Identify a meeting place outside of the home for all occupants.

Preparing the plan, and taking time on a regular basis to review the plan with all occupants of the home, and practicing using the alternative exits will further reduce the probability of a fire related injury or death.

These types of programs are especially critical in the Town of Canmore where the geography of the Town results in extended response times in certain areas. Historically, CFRS has had versions of this program where they have partnered with a local business (Canadian Tire) who provided free smoke alarm batteries for residents with mobility challenges. Within the current program appointments can be booked with CFRS staff to do a home inspection and change the batteries.

In our view the current Home Smoke Alarm Program/Home Escape Planning could be more effective by involving both the on duty full-time, and paid response firefighters in developing an annual program that could be delivered throughout the summer months on evenings or weekends. The Town could be divided in geographical areas whereby this revised program could target one area on an annual basis. The goal of the program would be to provide this program to the residential occupancies of the entire Town on a five to six year cycle. Subject to the consideration and approval of this recommendation priority should be given to areas of the Town where extended emergency response travel times are present.

Recommendation #11: ***That the proposed Home Smoke Alarm and Escape Planning Program be included within the proposed Fire Prevention Policy/Program.***

8.7 Proposed Fire Inspection/Public Education Staff Resource Plan

The current fire inspection/public education program delivered by the CFRS has served the community well. However, the community continues to grow resulting in an increasing number of buildings and residents. The unique characteristics of the Town including its geography and demographics that shift by season of the year are also stressing the department current fire prevention and public education capabilities.

The analyses within this FRMP highlights current prevention staff resource challenges. In our view this FRMP presents an ideal time to review and consider options for enhancing the department's fire prevention and public education capabilities as well as the staffing resource model to support the delivery of these programs in achieving the proposed strategic priorities of this FRMP.

8.7.1 Safety Codes Officer - Current

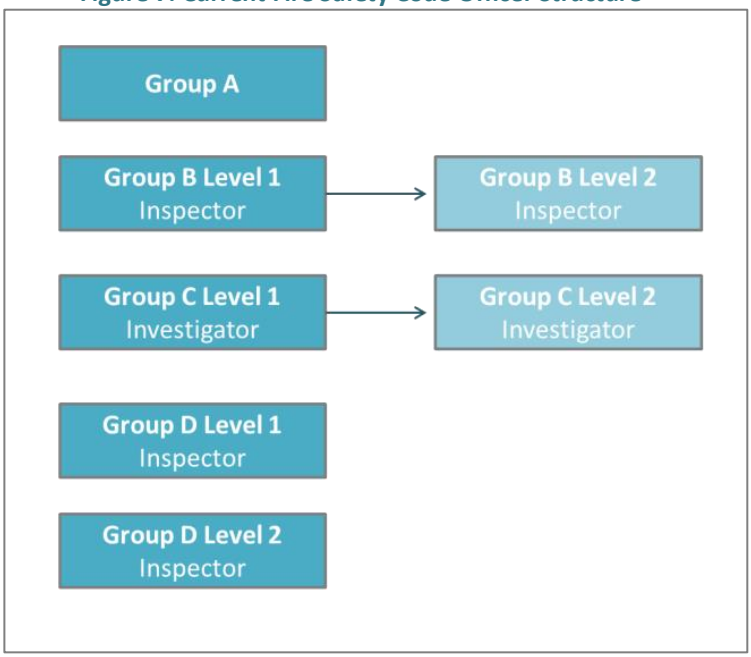
The Safety Codes Act (*Section 31 – Designation*) describes the current role the safety Codes Officer has established under Section 33(2) of the SCA. This designation is required in Alberta to implement the codes and other legislation. Per Section 33(2) of the SCA, a local authority is required to provide SCOs for the purpose of administering the portions of the Act for the services it provides. SCOs can be trained under nine different disciplines:

1. Amusement Rides
2. Buildings
3. Electrical
4. Elevators
5. Fire
6. Gas

7. Passenger Ropeways
8. Plumbing
9. Pressure Equipment[6]

Within the fire service in Alberta there are several training levels provided for the roles of Fire Safety Codes Officers under the role of fire investigator and fire inspector. The current structure of training levels for Fire Safety Codes Officers is shown in **Figure 7**. Group A Fire Safety Code Officer level is stand-alone and allows an individual to conduct both investigations and inspections at a basic level. However, this qualification is currently not required to become a Group B Level 1 Inspector or a Group C Level 1 Investigator. The Safety Codes Council is currently undergoing consultation on a proposed restructure of the Fire Safety Codes Officer certification structure.

Figure 7: Current Fire Safety Code Officer Structure[7]

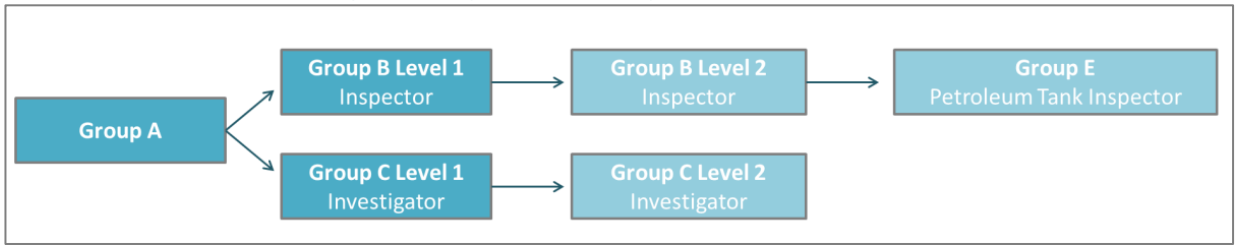


[7] *Source*: Safety Codes Council. (n.d.). Safety Codes Council. Retrieved October 11, 2016, from http://www.safetycodes.ab.ca/SCO/Training/Pages/default.aspx

8.7.2 Safety Codes Officer – Revised Designation

Changes to the Safety Codes Act (Section 31 – Designation) are currently being considered. Under the proposed new structure, Group A certification would be required before obtaining any Group B or Group C certification. This includes proposed changes to remove the Group D Level 1 and Level 2 Inspector Levels. This change is proposed in order to better align the Fire Safety Codes Officer training requirements with the NFPA 1730*: Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education* certification structure and the structures found throughout the rest of Canada. It also introduces a Group F Petroleum Tank Inspector. The proposed Fire Safety Code Officer Structure is presented in **Figure 8**.

Figure 8: Proposed Fire Safety Code Officer Structure[8]



The new proposed Fire Safety Codes Officer training levels for fire inspectors and relevant NFPA Fire Inspector Designation levels is presented in **Table 6**.[9] In addition to Fire SCO – Group B Level 1 and Level 2, there is a Group A designation. Group A SCOs have a limited ability to conduct some inspections and some investigation activities. Group A does not have an NFPA equivalency.

Fire SCO Group B Level 1 is qualified to inspect all buildings other than high-hazard Group F – Industrial occupancies and high-rises as defined by Section 3.2.6.1(1) of the Alberta Building Code. The occupant load limit of Level 1 inspectors is 300 for any occupancy type. Group B Level 2 can issue and enforce orders for those occupancies they can inspect.

Fire SCO Group B Level 2 can inspect any building classification and establish occupant loads for all buildings. Group B Level 2 inspectors can also issue orders, variances, and enforce orders. Investigation roles are the same as in Group A for both Group B levels.

[8] *Ibid.*
[9] Information presented in this table is based on the discussion of the proposed certification levels for Fire Safety Codes Officers found in the "Proposed Certification Structure for Fire Safety Codes Officers" document released by the Safety Codes Council" (pg. 10).

Table 6: Proposed Designation and NFPA 1730 Equivalency[10]

New Proposed Safety Codes Officer Designation	NFPA 1730 Fire Inspector Designation	NFPA 1031 Standard
Group B – Level 1	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 and applies codes and standards.
Group B – Level 2	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.
N/A	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.

***(Source*: "Proposed Certification Structure for Fire Safety Codes Officers", Safety Codes Council, Fall 2016)**

8.7.3 Fire Investigator - Revised Designation

Under the proposed designation structure for Fire Safety Codes Officers, all investigators would need to obtain Group A certification. To become a more qualified investigator, SCOs would then enter the Group C stream. According to the "Proposed Certification Structure for Fire Safety Codes Officers" document released by the Safety Codes Council, a Level 2 investigator can investigate fires in all occupancies and all circumstances. This would be considered equivalent to NFPA 1033 Investigator level. The proposed Group B Level 1 Investigators certification would have some limitations on investigations, namely:

> "*Investigate the origin and cause of fires where fire loss is estimated to be less than $2 million, no death has occurred, and the fire is not suspected to be arson. If, during the investigation, arson becomes a reasonable suspicion or a fire death is discovered, the investigation will be handed over to a Group C Level 2 (Investigator) Fire SCO and the initial SCO shall assist".* (pg. 4)

8.7.4 CFRS Proposed Fire Inspection Staffing Resource Plan

The most recent experience of the CFRS has shown the challenges of having a limited staff resource pool of qualified staff. The recommendations of this FRMP are intended to provide a transitional strategy towards a more sustainable and effective staff resource plan for the delivery of both fire inspections and public education programs. **Table 7** illustrates the proposed fire inspection staffing resource plan**.**

In the immediate future (2017-2018) this strategy includes expanding the current fire prevention portfolio to include two of the full-time Captain positions becoming qualified as Group B – Level 2 Safety Codes Officers (NFPA 1730 Fire Inspector II). This FRMP recommends that a new position be added, subject to available budget funding (2019-2020), with the qualifications of at least Fire Inspector Level II,

[10] *Ibid.*

but Fire Inspector Level III preferred. This new position would be tasked with overseeing all areas of the department's fire prevention/public education program.

Table 7: Proposed Fire Inspection Staffing Resource Plan

New Proposed Safety Codes Officer Designation	NFPA 1730 Fire Inspector Designation	NFPA 1031 Standard	Proposed Fire Inspection Staffing Plan
Group B – Level 1	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 and applies codes and standards.	-----
Group B – Level 2	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.	Designation of two current Captains positions (2017/2018)
N/A	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.	Hire of new position subject to budget approval (2018-2019)

(Source: "Proposed Certification Structure for Fire Safety Codes Officers", Safety Codes Council, Fall 2016)

Subject to the full implementation of this proposed fire inspection staffing plan the proposed new position would be assigned to lead a dedicated Fire Prevention/Public Education Division supported by the two current Captain positions and other staff proposed within this FRMP.

Recommendation #12: ***That the proposed Fire Inspection Staff Resource Plan be approved and implemented.***

8.7.5 CFRS Proposed Public Education Staffing Resource Plan

In order to implement the proposed public education programs and program cycles to achieve the proposed strategic priorities of this FRMP additional emphasis will be required on assigning additional staff resources in this area. In our view this can be effectively achieved by further utilizing the current full-time fire suppression resources.

As referenced in Section 8.8.2, the Province is proposing changes to further align SCO designations with applicable NFPA standards as equivalency for fire inspection and investigation qualifications and certification. For public education, the NFPA 1035 – *Standard for Professional Qualifications for Fire and Life Safety Educator, Public Information Officer, and Juvenile Firesetter Intervention Specialist* represents the current industry best practice for delivering public education programs.

This FRMP recommends that the four current full-time firefighters be trained to the qualifications of the NFPA 1735 – Fire & Life Safety Educator I as illustrated in **Table 8**, and that the proposed new position (Fire Inspector) be required to attain the Fire and Life Safety Educator III designation.

Table 8: Public Education Designations (NFPA 1035 Standard)

Public Education Designation	NFPA 1035 Standard	Proposed Public Education Staffing Plan
Fire & Life Safety Educator I	The individual who has demonstrated the ability to coordinate and deliver existing educational programs and information.	Four Full-time Firefighters (2017-2018)
Fire & Life Safety Educator II	The individual who has demonstrated the ability to prepare educational programs and information to meet identified needs.	-----
Fire & Life Safety Educator III	The individual who has demonstrated the ability to create, administer, and evaluate educational programs and information.	Hire of new position subject to budget approval (2018-2019)

Recommendation #13: ***That the proposed Public Education Staff Resource Plan be approved and implemented.***

8.8 Fire Prevention - Public Education Summary and Recommendations

The analyses and recommendations contained within this section present a significant shift to the historical focus of the CFRS on delivering fire prevention and education programs. Industry best practices within the fire service support that proactive fire prevention and public education initiatives provide the most effective means to enhancing community safety, reducing the number of fire related injuries and deaths, and reducing the financial loss associated with fires.

The analyses and recommendations of this section are intended to support the proposed strategic priorities of this FRMP including:

- ✓ ***The utilization of a Community Fire Risk Assessment in determining the level of existing and projected fire safety risks within the municipality as the basis for developing clear goals and objectives for all fire protection services to be provided by Canmore Fire-Rescue Services; and***
- ✓ ***The optimization of public education and fire prevention programs and activities, and the utilization of fire safety standards and fire code enforcement to provide a comprehensive fire protection program within the Town based on the results of the Community Fire Risk Assessment;***

Recommendations for Fire Prevention and Public Education include the following:

8) ***That a detailed Fire Prevention Program or Policy be developed.***
9) ***That the proposed public education program cycle objectives be included within the proposed Fire Prevention Policy/Program.***
10) ***That the proposed fire inspection cycle objectives be included within the proposed Fire Prevention Policy/Program.***
11) ***That the proposed Home Smoke Alarm and Escape Planning Program be included within the proposed Fire Prevention Policy/Program.***
12) ***That the proposed Fire Inspection Staff Resource Plan be approved and implemented.***
13) ***That the proposed Public Education Staff Resource Plan be approved and implemented.***

9.0 Training Division

Dillon's experience and knowledge of the fire service indicates that firefighter training is an area that has come under a high level of scrutiny over the past decade. The results of numerous inquests and investigations have concluded that firefighter training must be considered a strategic priority for municipalities, in their roles as employers, as fire service leaders, and as supervisors. This division is responsible for ensuring that all CFRS personnel receive the training necessary to meet the Occupational Health and Safety Regulations and the Town of Canmore's Health and Safety Policy.

Composite fire departments such as Canmore Fire-Rescue have an added layer of training complexity as they attempt to balance expectations of full-time, paid response and career casual firefighters. During the stakeholder engagement process with full-time and paid response firefighters, it was evident that there are challenges in the area of training. The paid responders reflected concerns related to the level of training and the amount of training session where the full-time firefighters participate with the department as a whole, as well as the department-level training of the career casual firefighters (who typically do not train with the department).

This section examines the processes and details the programs currently in place. It covers: current training; training facilities; job requirements; and recruiting. Where any gaps are identified in achieving compliance with best practices and legislative requirements further strategies and recommendations are provided for consideration.

9.1 Division Staff Resources

CFRS is committed to ensuring that department staff are well trained in relevant medical and safety procedures, applicable protocols, safety procedures, and patient care.

One of the full-time Captains (Training Lead) is assigned the portfolio to lead training for the department; however, the delivery of training primarily falls to the on-duty full-time Captains. As a result of the organizational structure, one of the main functions of the Training Lead is to provide lessons plans including in-class presentations (theory) and practical (hands-on) training lesson plans for on-duty staff to deliver.

One of the major challenges of firefighter training within the CFRS is consistency between full-time, career casual and paid response firefighters. In the absence of a coordinated delivery program that includes ongoing competency evaluation, variances can occur on a platoon, crew and individual level that are not consistent with the application of the required competencies across the department. In addition to the challenges of coordinating training in a composite model, facilitating and delivering the fire training program is challenging due to the current level of dedicated training staff.

Staffing resources are typically identified within a department's Standard Operating Guideline – 'Training', however, the current CFRS SOG currently only has operating guidelines for live fire training and training areas. Comprehensive training regulations should be documented in a formal SOG in order to improve efficiency and consistency in training across the department. As referenced in early sections of this FRMP developing SOG's for all firefighter training activities should be prioritized.

9.2 Current Training Program

The department follows a training program that aligns with the International Fire Service Training Association (IFSTA) curriculum. IFSTA was established in 1934 with a mission to develop training materials for the fire service. Since this time IFSTA has become a leader in firefighter training modules.

CFRS follows annual cycles for core service training programs. For example, structural firefighting training is completed annually. Other programs (e.g., function capacity / ladders / Self Contained Breathing Apparatus (SCBA), etc.) are completed every two years.

9.2.1 Alberta Code of Practice for Firefighters

Training of firefighters is addressed in Part 1 of the OHS Code under the definition of "competent" and in section 15 of the OHS 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.*

9.2.2 Firefighter Training

Firefighting training begins at the recruit stage and requires commitment to an ongoing process of learning both theoretical and practical job-related tasks of firefighting. Training also includes the development of future officers through the delivery of leadership and supervisory programs. Preparing and administering the promotional process is another important function of department training.

Wednesday nights are the CFRS's training nights. Full-time staff can also conduct on-duty training for certain aspects of the program. Newly hired Paid Response Firefighters receive ten straight days of recruit training and six months of probationary firefighter training on Wednesday nights.

Currently, there is no regular process, or procedure whereby career casual firefighters are scheduled to train with the full-time and paid response firefighters to stay current with CFRS policies and procedures. This presents the potential for career casual firefighters to not be fully aware of and competent in all CFRS policies and procedures when responding to an emergency incident. In our view this also creates potential for a lack of trust between responding firefighters due to uncertainty in this area.

In conjunction with the hiring process, career casual firefighters receive an initial two day training orientation with CFRS. There is also a process in place whereby career casual firefighters are required to provide proof of their firefighting training skills and competencies to the CFRS. These training records are then retained by the CFRS.

9.2.3 Medical Training

In medical emergencies, fire services in many jurisdictions are regularly dispatched to assist emergency medical services (EMS) personnel with critically injured patients, multiple victim incidents and/or heavy lifting situations.

The CFRS's full-time and career casual firefighters are registered with the Alberta College of Paramedics as one of the following practitioners, Emergency Medical Responder (EMR), Primary Care Paramedic (PCP) or Advanced Care Paramedic (ACP) and meet or exceed all standards in the Health Professions Act-Paramedics Profession Regulation.

Paid response firefighters are not required to be registered with the Alberta College of Paramedics. They receive department level training in first aid and Cardio Pulmonary Resuscitation (CPR).

9.3 Training Standards

There are three functioning bodies for recruitment training and continued career training for firefighters that apply in Alberta: the National Fire Protection Association (NFPA), the International Fire Service Training Association (IFSTA), and the International Fire Service Accreditation Council (IFSAC).

This FRMP recommends the development of a comprehensive annual training program based on the NFPA Professional Qualifications Standards (i.e. NFPA 1001). As part of developing this program, consideration should be given to requiring all firefighters to achieve the minimum required training competencies on an annual basis. This would require creating performance objectives for all full-time, career casual and paid response firefighters.

In our view the department's current Standard Operating Guideline – 'Training' requires updating to reflect the recommended annual training cycle for the IFSTA training program developed and delivered.

9.3.1 Training Attendance

On-shift training options for the full-time firefighters is somewhat limited by the on-duty crew size of two full-time firefighters. As an example, there is limited hands-on type practical training that can occur with only two people present. Therefore it is important for the full-time firefighters to participate in the department-wide training sessions held on Wednesday evenings. Paid response firefighters attend training on the Wednesday evenings as their primary method of firefighter training.

Currently, training records are documented within a spreadsheet file to track attendance and subject matter delivered. A sample of training attendance records received from CFRS indicated varying levels of attendance for the three types of firefighters (i.e. full-time, career casual and paid response). Currently, there is no policy or set minimum standard for training attendance within the department.

In addition to developing the skills and competencies required for firefighting, participating in a comprehensive training program has the added benefit of developing trust and respect between all firefighters. This is particularly important in the Town of Canmore that currently relies upon a mix of full-time, career casual and paid response firefighter to respond together in an emergency. From our review there is no evidence of a requirement for career casual firefighters to participate in any ongoing department training sessions.

As part of developing the proposed Comprehensive Annual Firefighter Training Program consideration should be given to requiring all firefighters to achieve a minimum attendance requirement to attend the department-wide training sessions. This will require creating performance objectives for the full-time, career casual and paid response firefighters.

Recommendation #14: ***That the department develop and implement minimum training requirements for all CFRS firefighters to clearly outline the minimum training attendance requirements for all Canmore Fire-Rescue Services firefighters.***

9.4 Proposed Comprehensive Annual Firefighter Training Program

The CFRS currently utilizes the International Fire Service Training Association (IFSTA) curriculum as the foundation for its firefighter training program. In our view the IFSTA curriculum reflects an industry best

practice that aligns with the standards of the NFPA. This review indicates that CFRS has developed a wide range of theoretical and practical training lesson plans that are utilized by the full-time and paid response firefighters.

In our experience the CFRS would benefit from developing a Comprehensive Annual Firefighter Training Program within a department operating guideline that utilizes the current theoretical and practical training lesson plans as the foundation, supplemented by additional IFSTA and NFPA training requirements. The goals and objectives of this process should be targeted at developing the basis of one comprehensive annual training program for all Officers and firefighters within the CFRS.

In addition to responding to the relevant standards, curriculum and health and safety requirements, a comprehensive annual training program should include the follow core functions:

- Identifying training needs in relation to 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.

Recommendation 15: ***That Canmore Fire-Rescue Services formalize a comprehensive annual training program based on the International Fire Service Training Association firefighter curriculum, and the NFPA Professional Qualifications Standards.***

9.5 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”.

Figure 9: Temporary Fire Training Grounds

The CFRS does not have a fully dedicated training centre with the facilities capable of facilitating this type of training. Currently, CFRS perform live fire training in a flashover chamber on training grounds

which are located on the north side of the valley. Canmore Fire-Rescue currently leases the land for this use. The nearest live fire burn tower to the Town of Canmore is located in the City of Calgary.

Based on our research, providing access to live fire training is a challenge facing departments surrounding Canmore, such as the Town of Banff. Investigating opportunities for partnerships with those communities, and/or the private sector, may provide opportunities for collaborating in delivering this type of training. If the Town of Canmore was to champion a project on its own and operate a live fire training facility, it would represent a potential revenue source or cost sharing alternative.

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 Canmore, 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.

Recommendation # 16: ***That Canmore Fire-Rescue Services include annual live fire training as a required element within the proposed comprehensive annual training program.***

Recommendation #17: ***That CFRS investigate opportunities and partnerships with neighbouring fire services and within the local private sector to develop a live fire training facility.***

Recommendations # 18: ***That CFRS investigate potential revenue sources related to a live fire training facility.***

9.6 Online Training

Access to online training programs can provide greater flexibility in delivering the comprehensive training program recommended, particularly for paid response 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.

The Fire Learning Management System (FLMS) is an example of an innovative and cost effective tool for delivering online firefighter training. The learning materials are accessed through the internet at any time of day. FLMS allows each member of the fire rescue department to log on to their account and complete courses created by the department/ training division. These courses can be self-delivered or supervised by a training lead or training officer.

All participating firefighters can access course materials at any time, outside of the regular training schedule, to provide flexibility and convenience. Courses contain learning activities and materials presented in a logical, familiar fashion. Use of this technology would allow the CFRS to build and customize its own training course content and support the proposed comprehensive annual training

program. This particular system also allows courses to be shared with other fire departments. A potential partnership opportunity would be to combine resources and collaborate with the Town of Banff. The FLMS program is available for all firefighter and company officer subjects and has recently been revised to reflect NFPA Professional Qualifications Standards.

Recommendation #19: ***That Canmore Fire-Rescue Services consider the use of an online firefighter training program as a component of delivering the proposed comprehensive annual training program.***

9.7 Specialized Technical Rescue Services

Canmore Fire-Rescue Services provides a number of specialized technical rescue services. 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.

The department provides training for the following rescue operations, according to the CFRS Strategic Plan:

- Hazardous Materials Response;
- Rope Rescue;
- Aquatic (Swift Water) Rescue;
- Ice Rescue;
- Confined Space Rescue; and
- Heavy Rescue (Structural Collapse, Auto/Machinery Extrication, Trench Rescue).

9.7.1 Special Operations Team

A Special Operations Team of twenty department members has been developed to specialize in the technical rescue services. The team is comprised of the Fire Chief, Deputy Chief, full-time Captains, four full-time firefighters and a group of eleven paid response / career casual firefighters. Training for the Special Operations Team occurs on the fourth Wednesday of the month.

9.7.2 Technical Rescue Training

The CFRS has developed a technical rescue training program that follows recognized industry standards and best practices. The skills and competencies to complete technical rescues can be categorized into three levels of training as established in the NPFA 1670: *Standard on Operations and Training for Technical Search and Rescue Incidents*:

- ***Awareness Level*** *– reflecting the minimum capability of organizations*;
- ***Operational 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 Operational Level of services but also to coordinate, perform, and supervise a technical rescue.*

Table 9 presents the current and in-progress technical rescue training levels for the Special Operations Team and the remainder of the Paid Response Firefighters (those who are not on the Special Operations Team)**.** The awareness level and operations level training is delivered in-house by the Technician-Level full-time staff.

Table 9: Current Technical Training Levels of Special Operations Team and Non-Special Operations Team Members

Technical Rescue Type	Special Operations Team		New Recruits & Paid Response Firefighters Not on Special Operations Team
	Fire Chief, Depty Chief, Full-time Captains & Full-time Firefighters	Paid Response & Career Casual Firefighters on Special Operations Team	
Rope (High-Angle) Rescue	Technician Level	Operations Level	Awareness Level
Aquatic (Swift Water) Rescue	Technician Level	Operations Level	Awareness Level
Ice Rescue	Technician Level	Operations Level	Awareness Level
Confined Space Rescue	Technician Level (in-progress)	Operations Level (in-progress)	Awareness Level
Heavy Rescue / Structural Collapse Rescue	Technician Level	Operations Level	Awareness Level
Hazardous Materials Response	Technician Level (in-progress)	Operations Level (in-progress)	Awareness Level

9.7.3 Technical Rescue Frequency

Technical rescues typically represent a small portion of the total emergency call volume of a fire department. Analyses of the historic calls for technical rescues for the period 2011 – 2015 confirms that the highest frequency for specialized rescue calls relate to hazardous materials (including gas leaks, fuel spills, train derailments and specific hazmat coded calls). Heavy rescue/Structural collapse and Aquatic (Swift Water) rescue represent the next highest level of frequency. A summary of the historic calls for specialized technical services, from 2011 to 2015, is presented in **Table 10**.

Table 10: Historic Calls for Technical Rescue Services (2011 – 2015)

Technical Rescue Call Type	2011	2012	2013	2014	2015	Total
Rope (High Angle) Rescue	0	0	0	0	0	0

Technical Rescue Call Type	2011	2012	2013	2014	2015	Total
Aquatic (Swift Water) Rescue	9	4	2	0	5	15
Ice Rescue	2	1	0	0	2	5
Confined Space Rescue	0	0	1	1	1	3
Heavy Rescue/Structural Collapse	0	1	7	1	7	16
Hazardous Materials Response	10	5	8	8	9	40

9.7.4 Technical Rescue Summary

Technical rescues require a high degree of skills and competencies (training) and effective and efficient operating procedures in order to provide a safe working environment for firefighters to complete these types of rescues. The frequencies of technical rescues within the Town of Canmore represent a small portion of the CFRS overall total calls for emergency services. In our view the Special Operations Team represents and effective strategy for coordinating and delivering technical rescues. Based on current information sources within the department it is difficult determine the separated total costs for delivering technical services. This includes the annual operating costs associated with training all members of the Special Operations Team, purchasing and replacement of equipment, and detailed costs of each response.

In our view the Town of Canmore's geographical location in relation to other emergency service providers creates a unique situation whereby opportunities for partnerships, shared service or contracted services are limited, or nonexistent. One exception may be potential overlap in the water rescue services provided by CFRS and the services provided by the Province through the Kananaskis Country Public Safety Section (within the Ministry of the Environment and Parks).

In our view the current technical rescue services provided by the CRFS Special Operations Team are consistent with the potential community risks present. Where possible the Town should investigate opportunities to partner, share or purchase technical rescues from other service providers, such as the Kananaskis Country Public Safety Section. In our view the Town should also track and report separately on all operating and capital costs associated with staffing and operating the Special Operations Team to provide Council and the community with a better understanding of the costs associated with these services.

Recommendation #20:

That CFRS implement a strategy to track all operating and capital costs associated with the Special Operations Team to enhance Council's and the community's understanding of the total costs associated with delivering technical rescue services.

Recommendation #21:

That the Fire Chief investigate options for developing partnerships, shared services and purchasing contracted services for the delivery of technical rescue services, and specifically water rescue.

9.8 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 operation services it delivers. This structure needs to include an appropriate span of control in order to be efficient and effective.

A sufficient number of officers are also required to ensure 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 engager 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 Town of Canmore is legislated by this section of the Occupational Health and Safety Act to ensure that all supervisors, which includes the role of incident commander, be competent.

The Occupational Health and Safety Regulation defines a "competent person" to mean a person who: Section 1, Definitions, subsection (g): *"'competent' in relation to a worker, means adequately qualified, suitably trained and with sufficient experience to safely perform work without supervision or with only a minimal degree of supervision;*
(h) "'direct supervision' means under the supervision of a competent work who is
(i) personally and visually supervising the other worker, and
(ii) able to communicate readily and clearly with the other worker.

Currently within CFRS there is a Health and Safety SOG which underscores the responsibility of competent supervisors: Health and Safety Program SOG #219 – Health and Safety Policy 1.04 – *Department officers are responsible for ensuring that the Fire-Rescue staff and other employees are properly instructed to perform their duties in a safe manner and are to know the safe working procedures for all activities.*

There is currently no defined Company Officer Training program within the CFRS. The CRFS has identified a need to develop the skills and competencies for a Company Officer Program, with the ultimate goal of having Company Officers deliver department training and operate as supervisors on emergency scenes.

It is equally important to maintain a compatible rank structure for all firefighters to ensure an appropriate ratio of supervisors (Officers) to firefighters is maintained at all times). This FRMP includes revision to the current organizational model of the CFRS, specifically with respect to the paid response firefighters, and the Towns OHSA requirements for maintaining adequate qualified supervisor at all times.

Including the proposed Company Officer Training program within the proposed Comprehensive Annual Training Program is intended to ensure that the CFRS complies with the Occupational Health and Safety Regulations.

Recommendation #22: ***That Canmore Fire-Rescue Services enhance the training opportunities for Company Officers to achieve the skills and competencies identified within the NFPA 1021 Standard for Company Officers.***

9.9 Incident Command Training

Incident command training should be considered a core element of the proposed Company Officer Training. Industry best practices reference the importance of having an Incident Command System.

Incident Command Systems are designed to positively affect 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.

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. In his book, titled "*Fire Command"* (second edition), he includes the following statement:

> *"To provide continuous command, the first fire department unit or officer arriving at the scene should assume command, until relieved by a ranking officer, or until command is passed (transferred) or terminated. The initial assumption of command is mandatory."*

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 the duty to:

- Establish immediate priorities, especially the safety of responders, other emergency works, 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 strategy to achieve the objectives.
- Establish and monitor incident organizations.
- Approve the implementation of the written or oral Incident Action Plan
- Ensure adequate health and safety measures are in place.

The department's current SOG #110 – Risk Management (2014), and SOG #218 – Incident Safety Officer (2012), details the procedures for implementing an incident command system. It provides a standardized framework for undertaking risk management at emergency operations, and has a goal to meet the requirements of NFPA 1561 *Standard on Emergency Services Incident Management System.*

In our view, this SOG is limited in its scope and direction with respect to defining the roles and expectations of the Incident Commander, and the determination of the tactical priorities and mitigation strategy required at an emergency incident.

Recommendation #23: ***That the 'Standard Operating Guideline 110 – Risk Management' and 'Standard Operating Guideline 218 – Incident Safety Officer' be revised based on the recommendations of the proposed Fire-Rescue Master Plan.***

9.10 Succession Planning

Fire services and municipalities are recognizing the importance and value that succession planning has within the municipal fire service. Succession planning has not traditionally been an area of concern or consideration within the fire service in Alberta. An effective succession plan requires the implementation of strategies to ensure that opportunities, encouragement and additional training are available for those staff that may be considering further advancement within an organization. A comprehensive succession plan also supports the concepts of coaching and mentoring in support of staff considering future career opportunities.

Within CFRS, there is no formal succession planning process in place within the department. Succession plans can provide a framework of skills and experience that are required for each position in the department. For candidates seeking promotion or further responsibilities, the succession plan can provide a career path to the position of their choosing. Succession planning can also provide Council with the knowledge that there are trained and skilled candidates available in the event vacancies occur within the department.

The CFRS should consider integrating the elements of succession planning within many of the recommendations of this FRMP. This includes the proposed comprehensive annual training program.

Recommendation #24: ***That Canmore Fire-Rescue Services incorporate elements of succession planning for all levels and positions within the department and be incorporated into the proposed Comprehensive Annual Training plan.***

9.11 Proposed Training Staff Resource Plan

As referenced within this FRMP the CFRS currently assigns one of the full-time Captains (Training Lead) with the portfolio to lead training for the department; however, the delivery of training primarily falls onto the on-duty full-time Captains.

This FRMP has confirmed an identified gap in the consistency of firefighter training between the full-time, career casual and paid response firefighters. This FRMP includes proposed recommendations to increase the total complement of firefighters within the CFRS that in the absence of the implementing proposed Comprehensive Training Program will further expand this gap.

In our view, implementation of the proposed comprehensive training program and training initiatives included within this FRMP will require consideration of the current staff resource plan within this area. As indicated consistently within this FRMP this should include a review of the skills and competencies, and certification of the staff resources assigned to this area.

Ensuring the staff resources delivering the proposed comprehensive training program and training initiatives have the required skill, competencies and certification should be considered a priority of this FRMP. **Table 11** summarizes the different instructor levels included within the NFPA 1041: Standard for Fire Service Instructor Professional Qualifications.

Table 11: NFPA 1041 Professional Qualifications

Training Officer	NFPA 1041 Standard
Instructor I	A fire service instructor who has demonstrated the knowledge and ability to deliver instruction and effectively from a prepared lesson plan, including instructional aids and evaluations instruments; adapt lesion 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

Training Officer	NFPA 1041 Standard
	keeping and scheduling systems; and develop training goals and implementation strategies.

Our observations indicate that the full-time Captain currently assigned as the Training Lead has reached a workload capacity that is not sustainable. As indicated within the fire prevention and public education section of this FRMP the assignment of portfolios such as prevention and training has worked well for the CFRS in the past. Increasing demand on the individuals responsible for these portfolios, and the need for expanded services in these areas provides evidence for implementing a revised staff resource strategy.

Similar to the recommendations of the fire prevention and public education section of this FRMP we are recommending a transition process to a dedicated full-time Training Officer. It is recommended that this transition process include in the short-term expanding responsibility for coordinating the department training requirements to two of the full-time Captains. Subject to Council's consideration and approval of this FRMP we are recommending that a full-time Training Officer be hired within the next three to five years.

Table 12 summarizes the proposed staff resource plan to achieve the proposed firefighter training performance levels presented within this FRMP.

Table 12: NFPA 1041 Professional Qualifications

Staff Resource	Proposed Training Staff Resource Plan
Instructor I	It is recommended that all staff resources assigned to deliver firefighting training be required to have NFPA 1041 – Instructor Level I accreditation.
Instructor II	It is recommended that two full-time Captains be required to have the NFPA 1041 – Instructor Level II accreditation.
Instructor III	It is recommended that consideration be given to hiring a full-time Training Officer with the skills and competencies identified in the NFPA 1041 – Instructor Level III accreditation.

Recommendation #25: ***That the proposed Training Staff Resource Plan be implemented.***

9.12 Training Division Summary and Recommendations

The ultimate goal of this FRMP is to reduce the probability and consequence of a fire and enhance community and firefighter safety through the implementation of recommendations that enhance the overall effectiveness and efficiency of the CFRS. Reducing the number of fires and achieving this goal will result in even further demands on the firefighter training program that has existing gaps in both operational needs, and legislative compliance.

The analyses and recommendations of this division highlight the need to formalize and expand many of the department's current training initiatives. This includes implementing a Comprehensive Annual Training Program supported by new operating guidelines and additional training programs in several areas. Implementing the proposed recommendations will require consideration of transitioning to the proposed staff resource plan in order to sustain the proposed levels of performance.

Recommendations for the Training Division include the following:

14) ***That the department develop and implement minimum training requirements for all CFRS firefighters to clearly outline the minimum training attendance requirements for all Canmore Fire-Rescue Services firefighters.***

15) ***That Canmore Fire-Rescue Services formalize a comprehensive annual training program based on the International Fire Service Training Association firefighter curriculum, and the NFPA Professional Qualifications Standards.***

16) ***That Canmore Fire-Rescue Services include annual live fire training as a required element within the proposed comprehensive annual training program.***

17) ***That CFRS investigate opportunities and partnerships with neighbouring fire services and within the local private sector to develop a live fire training facility.***

18) ***That CFRS investigate potential revenue sources related to a live fire training facility.***

19) ***That Canmore Fire-Rescue Services consider the use of an online firefighter training program as a component of delivering the proposed comprehensive annual training program.***

20) ***That CFRS implement a strategy to track all operating and capital costs associated with the Special Operations Team to enhance Council's and the community's understanding of the total costs associated with delivering technical rescue services.***

21) ***That the Fire Chief investigate options for developing partnerships, shared services and purchasing contracted services for the delivery of technical rescue services, and specifically water rescue.***

22) ***That Canmore Fire-Rescue Services enhance the training opportunities for Company Officers to achieve the skills and competencies identified within the NFPA 1021 Standard for Company Officers.***

23) ***That the 'Standard Operating Guideline 110 – Risk Management' and 'Standard Operating Guideline 218 – Incident Safety Officer' be revised based on the recommendations of the proposed Fire-Rescue Master Plan.***

24) ***That Canmore Fire-Rescue Services incorporate elements of succession planning for all levels and positions within the department and be incorporated into the proposed Comprehensive Annual Training plan.***

25) ***That the proposed Training Staff Resource Plan be implemented.***

10.0 Fire Suppression Division

The Town of Canmore shares characteristics of many mountain towns throughout Alberta and British Columbia which includes relatively dense population centres surrounded by large uninhabited landscapes, forests and mountains. These Towns also become regional service centres for travelling public and tourists who are drawn to the area, resulting in fluctuating population totals. While CFRS firefighter staffing remains consistent, the Town of Canmore can experience large population changes depending on the season and tourism. Effectively mitigating a fire in a timely manner can be difficult and challenging. Travel distances and water supply are two factors that can impact the ability to provide fire suppression services within an established time frame.

The primary service provided by Canmore Fire-Rescue is fire suppression response. The department provides community coverage to its residents 24 hours a day and 365 days a year through a composite department composed of full-time, paid response and career casual firefighters.

Canmore Fire-Rescue Services currently has a Fire Chief who oversees the entire department and is supported by the Deputy Chief as well as full-time Captains who each are responsible for a division of the department. Fire suppression and rescue services are currently housed in the Operations portfolio.

The master fire planning process places a strong focus on assessing the municipality's responsibilities dictated by the *Fire Safety Act, Alberta Emergency Management Act* and Alberta's *Occupational Health and Safety Act*. This strategy is appropriate and included within this FRMP; however, Canmore Fire-Rescue Services is also recognized within the community and by Council for their dedication and commitment in providing many other non-fire related services.

This section will analyze the CFRS fire suppression division staffing, response times, and call volume. It will also model the current deployment to illustrate existing fire suppression coverage within the Town of Canmore. The suppression and emergency response operations of the department are reviewed in detail in the following sections.

10.1 Staff Resources

Fire suppression and rescue services are currently housed in the Operations portfolio which includes overseeing the department's mechanical, equipment and fleet needs. It ensures the quality of service for delivery of fire and rescue services, manages supplies, and addresses regular issues and challenges from front-line staff. Full-time firefighters, career casuals and paid responders all support the operations functions of the department.

Currently, the Captain assigned to Operations is also overseeing Prevention, on an interim basis. The workload for both of these roles is too great for one person. A workload rebalance is required to provide

sufficient resources to these two portfolio areas. As previously recommended in this report, further clarity on the roles and responsibilities of the full-time Senior Officer's roles and responsibilities is required to balance workload.

Recommendation #26: ***That each of the department's portfolio responsibilities be updated to reflect the changes and seek to balance workload across the Senior Officers.***

10.1.1 Full-time Firefighters

The full-time firefighters operate as front-line emergency response when on-duty. They also support the portfolios led by the full-time Captains. There is an expectation for full-time firefighters to attend department-wide training and events. Currently, the full-time firefighters do not carry radios or pagers when they are off-duty and are not considered a part of the depth of response model, such as the paid response firefighters are.

10.1.2 Career Casual Firefighters

The Career Casual Firefighters cover full-time firefighter shifts on a call-in basis. Historically the Career Casual staff were hired for medical qualifications (i.e. paramedic or EMT qualifications). There is no requirement for the Career Casuals to be local to Canmore and they are not available to support depth of response when not on-duty. It is recommended within this plan that Career Casuals be required to attend department training.

10.1.3 Paid Response Firefighters

The paid response firefighters carry pagers and are called in to support initial and depth of response operations as required. There is a requirement for paid response to live locally and to attend department training sessions. Historically the paid response firefighters have assisted the department with public education efforts within the community. Currently, there is a Letter of Understanding with the Local Firefighters Association that allows Paid Response Fighters to cover on-duty shifts, when required.

10.1.4 Paid Response Casual Firefighter

Paid Response Casual Firefighters represent CFRS staff who live locally, attend department training and are available by pager to respond to calls as Paid Response Firefighters. In addition they have the additional role of covering on-duty shifts as casual employees. This FRMP proposes a transition from the use Career Casual Firefighters, who are not required to live locally, to an increased reliance on Paid Response Casuals to cover on-duty shifts. There are a number of members within the department who have historically filled a dual role as a Career Casual Firefighter as well as a Paid Response Firefighter. In the proposed model, they would define the category of Paid Response Casual, as a Paid Response Casual Firefighter is a combination of these two roles and is a member of the bargaining unit.

10.2 Emergency Response Analysis

The 'three lines of defence' model recognizes the high importance of the first two lines of defence in mitigating the potential of a fire occurring. In the event a fire does occur and emergency response is required, the model defines the third line of defence as:

III. Emergency Response (Suppression):

"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."

The three lines of defence represent a proven model for: optimizing the benefits of proactive prevention and education programs; the appropriate use of standards and code enforcement; and, as the model suggests, the provision of emergency response as the 'fail safe'. The fail-safe is in place for when incidents occur despite all efforts towards optimization of the first two lines of defence.

A core component of evaluating the overall effectiveness of providing fire suppression services includes considering a measurement-supported set of performance targets (i.e., service standards) and setting clear goals and objectives. Within Alberta, there is no specific legislated standard that a municipality must achieve with regard to the type of firefighter (full-time/ part-time/ volunteer) or the number of firefighters required to respond to any given incident. Best practices require a municipal Council to assess the level of resources based on determining its local needs and circumstances.

This FRMP contains options for Council's consideration directly related to the department's ability to assemble and deploy a sufficient number of firefighters to achieve the initial response and depth of response firefighter staffing levels to provide emergency response services based upon the local needs and circumstances of the community as defined by this FRMP.

To assist with evaluating the level of fire suppression staff resources required by the Town of Canmore, this study identifies the different guidelines and standards that are currently relevant within Alberta. Through comparison of each guideline or standard with a typical fire scenario, this analysis presents insight into the industry best practices based on a risk-based approach.

10.3 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. Research conducted by the OFMEM and 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.

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 (MW) fire. This is roughly equivalent to an upholstered chair burning at its peak. A two MW fire is approximately equal to a large upholstered sofa burning at its peak.

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

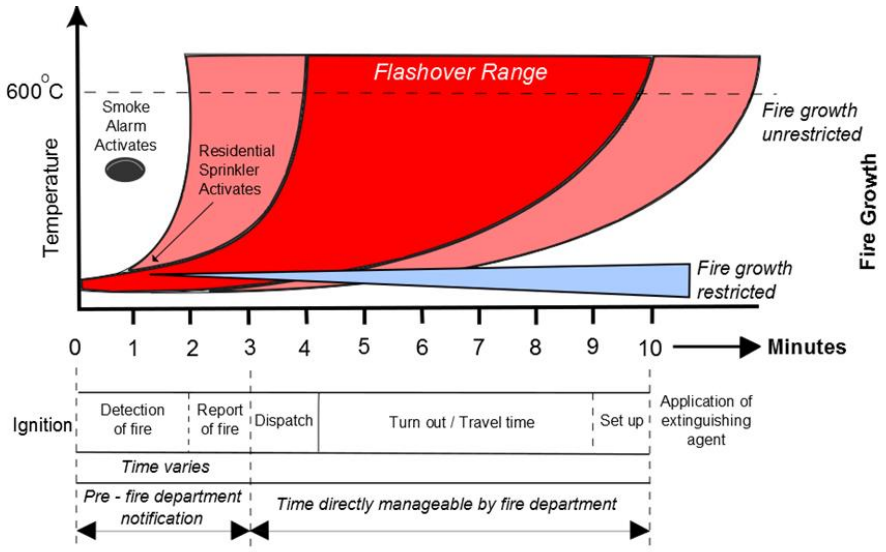
Time to Reach 1 MW and 2 MW Fire Growth Rates in the Absence of Fire Suppression

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 10** 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 10: Example Fire Propagation Curve



Reference*: *Fire Underwriters Survey "Alternative Water Supplies for Public Fire Protection: An Informative Reference Guide for Use in Fire Insurance Grading" (May 2009) and NFPA "Fire Protection Handbook" (2001)

The fire propagation curve reflects the importance of time during the *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 suppression 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 suppression 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, priority 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.

10.4 Fire Suppression Industry Best Practices

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

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.

10.4.1 National Fire Protection Association (NFPA)

The National Fire Protection Association (NFPA) is an international non-profit organization that was established in 1896. The organization'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, NFPA is recognized as one of the world's leading advocates of fire prevention and an authoritative source on public safety.

NFPA is responsible for 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. Its more than 200 technical code and standard development committees are comprised of over 6,000 volunteer seats. Volunteers vote on proposals and revisions in a process that is accredited by the American National Standards Institute (ANSI).

10.4.1.1 Critical Fire Ground Tasks – Initial Response

Initial response is consistently defined in the fire service as the number of firefighters initially deployed to respond 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 fire suppression operations. The NFPA 1720 standard further supports the minimum initial response staffing to include four firefighters: "*Initial firefighting operations shall be organized to ensure that at least four firefighters 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.

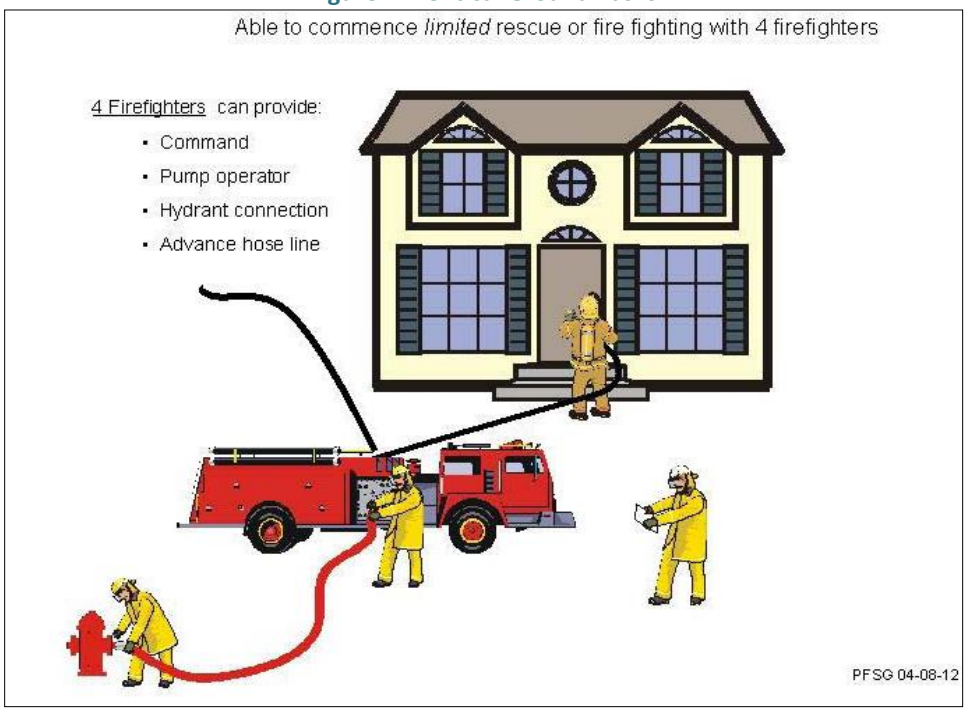
The assembly of four fire fighters on the fire scene provides sufficient resources to safely initiate some limited fire suppression operations. This first crew of four firefighters is also able to conduct the critical fire ground priority of "size-up" whereby the officer in charge can evaluate the incident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

For example, once an initial response of four firefighters is assembled on-scene it is typically assigned the following operational functions:

- The officer in charge shall assume the role of incident command
- One firefighter shall be designated as the pump operator
- One firefighter shall complete the critical fire ground task of making the fire hydrant connection
- The fourth firefighter shall prepare an initial fire attack line for operation.

The critical fire ground task responsibilities of an initial response are highlighted in **Figure 11.**

Figure 11: Critical Ground Tasks



The NFPA 1720 standard identifies an initial response deployment of four firefighters to effectively, efficiently and safely conduct initial fire suppression operations. The critical tasks with four firefighter's on-scene include incident command, pumper operator, hydrant connection and advancing a hose line. This relates to a low-risk call response or an initial response for all calls.

10.4.1.2 Depth of Response

In comparison to the Initial Response, the depth of response relates to the "total" number of firefighters initially assigned to an incident, depending on the risk associated. Depth of response is also commonly referred to as "First Alarm" or "Full Response". For example, NFPA 1720 defines "*Initial Full Alarm Assignment"* as *"Those personnel, equipment, and resources ordinarily dispatched upon notification of a structure fire".*

The NFPA 1720 standard identifies a depth of response deployment range of 4 to 15 firefighters depending on the risks associated with fire demand zones to effectively, efficiently and safely conduct initial fire suppression operations.

It is important to recognize that depth of response is referring to the "total" number of firefighters .

10.4.1.3 NFPA 1720 – Deployment Standard

NFPA 1720 "*Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments"* provides a

standard primarily for use by composite fire departments (combination of full-time, volunteer, temporary, paid response, auxiliary) for determining and evaluating the number of firefighters required based upon recognized industry best practices.

The NFPA 1720 standard further supports the minimum initial response staffing to include four firefighters: "*Initial firefighting operations shall be organized to ensure that at least four firefighters 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 NFPA 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 recommended for each of these categories. **Table 14** presents the NFPA 1720 minimum staffing levels by category.

Table 14: NFPA 1720

Demand Zones	Demographics	Minimum # of Firefighters Responding	Response Time (Turnout + Travel) in Minutes	Meets 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 Fire Department	To be determined by Fire Department	To be determined by Fire Department	90%

The NFPA 1720 Standard utilizes population density as the primary factor in evaluating the minimum number of firefighters recommended to achieve an integrated initial response and depth of response. As a standard primarily for use by composite fire departments, it recognizes lower population densities are typically found in smaller towns and communities in comparison to higher population densities found in cities and larger urban centres.

10.4.1.4 CFRS Minimum Firefighter Deployment Practices

The NFPA 1720 standard identifies that at least four firefighters must be assembled before **interior** fire suppression operations are initiated, although these four firefighters may not arrive on the same apparatus. The previous Canmore Fire Rescue Strategic Plan approved by Council on April 19th, 2011

indicated that two firefighters could initially respond to begin putting water on the fire from a defensive mode (i.e. **exterior** attack). When two additional firefighters arrived at the scene the crew would then be able to commence **interior** attack as necessary.

In our view this previous deployment practice met the intent of the NFPA 1720 standard as it required a minimum of four firefighters to be on scene before commencing **interior** attack. Research conducted as part of this FRMP process could not identify a relevant NFPA standard, guideline or best practice for the deployment of sufficient firefighters to initiate an **exterior** attack. Our research did identify that, at the recommendation of the Fire Chief, the Town of Canmore revised its deployment practice in 2015 to require a minimum deployment of four firefighters at all times on the initial apparatus.

Additional research was also completed as part of the FRMP process to assess the safety of deploying Paid Response Firefighters directly to an emergency incident in their personal vehicles. Our research identified a wide range of this type of deployment practice across Canada. This research identified fire departments that both allow this practice, and others that do not. In our view a decision to allow this practice must consider balancing the safety and liability of the paid response firefighters responding in their personal vehicles with that of the potential benefit to public safety when they arrive on-scene. There are minimal tasks that one firefighter can conduct safely on their own if they are the first to arrive on-scene. An individual firefighter arriving on-scene would still need to wait for a minimum of four firefighters to assemble on-scene prior to conducting an interior attack.

In considering the balance between the actual risks to the paid response firefighter responding and the perceived benefit that his/her arrival may benefit public safety, based on our experience and knowledge of the fire service, we would not recommend the practice of firefighters responding directly to emergency scenes.

10.4.1.5 Population

The 2014 Municipal Census for the Town of Canmore identifies the 2014 permanent population of the Town of Canmore as 13,077 people. The 2014 Municipal Census also identifies a non-permanent population of 3,890 people representing a total population of 16,967 people.

The current area of the Town of Canmore, according to the 2011 Statistics Canada Census is 68.9 square kilometres (26.6 square miles). To determine the Town's 2014 permanent and combined permanent and non-permanent population densities the following calculations were completed:

Permanent Population: 13,077 people / 26.6 square miles = population density of 492 people per square mile

Permanent + Non-Permanent: 16,967 people /26.6 square miles = population density of 638 people per square mile

Based on the Town's 2014 **permanent** population density (492 people per square mile), and composite fire suppression operating model the NFPA 1720 Rural Area Demand Zone would be the applicable standard for assessing the CFRS current deployment model for firefighters. This is obviously very close to the threshold of 500 people per square mile and the Town's population is expected to have increased since the 2014 census. The rural response includes an integrated response of initial response and depth of response in deploying six firefighters arriving on the scene of a fire related incident in a response time (turnout time + travel time) of 14 minutes for 80% of the fire related incidents.

Alternatively, when considering the increased population of the non-permanent population (density of 638 people per square mile) and additional fluctuating population related to tourism and recreational activities the NFPA 1720 Suburban Demand Zone is more applicable to the Town. This is further supported by the predicted population and density increase in the permanent population since the 2014 census, which may find the Town above the rural threshold. The suburban standard includes an integrated response of initial response and depth of response in deploying ten firefighters arriving on the scene of a fire related incident in a response time (turnout time + travel time) of ten minutes for 80% of the fire related incidents.

For comparison purposes within this FRMP the **NFPA 1720 Suburban Demand Zone** is applied as the **primary standard** for assessing the current and future options for delivering fire suppression services. Within this FRMP the **NFPA 1720 Rural Area Demand Zone** is applied as the **secondary standard** for assessing the current and future options for delivering **fire suppression service delivery**.

10.4.2 Province of British Columbia – Structure 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).* 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 B.C. Playbook indicate that it is the direct responsibility of the *"authority having jurisdiction"* (AHJ) to declare its firefighting service level. The declared fire suppression service level must then be established as a formal policy (bylaw, policy or contract) and be fully reflected in operating guidelines within the fire department.

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 Alberta. In further support of NFPA standards, the B.C. Playbook identifies three specific fire suppression levels for Council consideration when developing fire suppression service levels. The Playbook identifies the following service levels from which an AHJ may choose:

10.4.2.1 Exterior Operations Service Level

Exterior Operations Level fire service firefighters shall not enter any building, vehicle dumpster or other object if an immediately dangerous to health (IDHL) 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.

On occasion where the department responds to a simple incident and an IDLH atmosphere does not yet exist, it is reasonable to address the issue from inside the structure. However, if an IDLH 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 IDLH 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 IDLH atmosphere developing, or risk from smoke or particulate matter when conducting external operations (including overhaul), Self-Contained Breathing Apparatus (SCBA) must be worn in accordance with WorkSafe BC requirements.

10.4.2.2 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 AHJ 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 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 BC (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 (RIT) with trained firefighters following the WorkSafe BC requirements.

10.4.2.3 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 Fire Officer Standards.

Full service fire departments will have Operational 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.

10.4.3 Province of Ontario – Public Fire Safety Guidelines

Within the Province of Ontario the Office of the Fire Marshal and Emergency Management (OFMEM) is required by the *Fire Prevention and Protection Act*, 1997 (FPPA) to assist municipalities in the interpretation of the FPPA and to develop training and evaluation systems and enforcement of the Act. The OFMEM has developed Public Fire Safety Guidelines (PFSGs) to assist municipalities in making informed decisions with regard to determining local *"needs and circumstances"* and achieving compliance with the FPPA.

10.4.3.1 PFSG 04-08-10 Operational Planning: An Official Guide to Matching Resource Deployment and Risk

PFSG 04-08-10 was released by the OFMEM in January 2011 and includes a "Critical Task Matrix" to assist municipalities in determining the level of fire ground staffing capabilities based upon low, moderate, high and extreme risks. The Critical Task Matrix is defined by the OFMEM as:

> *"The Critical Task Matrix is based on the Incident Management System (IMS). It will assist in identifying fire ground staffing capabilities based upon low, moderate, high and extreme risk levels within your community. The Office of the Fire Marshal (OFMEM) has identified the critical tasks from the Incident Management System that are used during fire ground operations. These tasks are consistent with applicable legislation, industry best practices and the Ontario Fire College Curriculum."*

The matrix further recognizes that within the IMS 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;
- Some tasks will never be assigned based on the tactical approach chosen by the incident commander (offensive versus defensive).

The Critical Task Matrix provides a lower and upper range of the number of firefighters required to respond for each of the four risk levels (low, moderate, high and extreme). The actual number of firefighters within each range is based upon analysis of actual fires, the Province of Ontario *Occupational Health and Safety Act* Section 21 Guidance Notes regarding firefighters, and industry best practices. **Table 15** reflects the PFSG 04-08-10 Critical Task Matrix.

The OFMEM Critical Task Matrix indicates that the lower and upper level incident response range to effectively, efficiently and safely conduct fire suppression operations to safely complete the tasks associated with a fire in moderate risk (single family dwelling) would be 16 to 43.

In comparison, the matrix indicates that the lower and upper level incident response range to effectively, efficiently and safely conduct fire suppression operations tasks associated with high risk occupancy (care facility) would be 36 to 83.

Table 15: PFSG 04-08-10 Critical Task Matrix

	Fire Ground 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 & 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 & 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

	Fire Ground Critical Task	Low Risk		Moderate Risk		High Risk		Extreme Risk	
	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 Considerations	Logistics Officer								
	Administrative and/or Finance Officer								
	Planning Officer								
	Evacuations (large scale)								
	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:

- LERL = Lower Effective Response Level
- UERL = 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 fire ground 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: Office of the Fire Marshal and Emergency Management, Ontario (2011), Operational Planning: An official Guide to Matching Resource Deployment and Risk)

10.5 Summary of Fire Suppression Industry Standards and Best Practices

The analyses of fire suppression guidelines, standards, and best practices within this FRMP identifies a range of strategies for considering the appropriate level of firefighter deployment, and fire suppression service level for the Town of Canmore. In our view there are a number of consistent factors that should be considered in determining the targeted level of fire suppression services that the Town of Canmore should be striving to achieve. These include:

- ✓ **Optimization of the Three Lines of Defence:** Implementing strategies to optimize the delivery of public education programs and fire prevention activities to reduce the probability and consequences of a fire.

- ✓ **Response Time:** The total time element from receipt of the alarm notification by the CFRS until the arrival of the first responding personnel on-scene including turnout time + travel time = response time. (The exception is that the total response time measured within the HIRF requirements includes dispatch time in addition to turnout time and travel time.)
- ✓ **Integrated Response Deployment:** The total number of firefighters initially deployed to a fire related incident.
- ✓ **Operational Capabilities:** The expected critical fire ground tasks to be accomplished by the initial response and depth of response deployment in defining the level of fire suppression services (e.g., Exterior, Interior or Full Service).

To achieve these targets this FRMP applies the following criteria to assess the current fire suppression capabilities of the CRFS and the proposed options for delivery of fire suppression services presented in the FRMP:

- Ability to achieve the proposed **Suburban Standard** representing the NFPA 1720 Suburban Demand Zone performance objective of deploying ten firefighters arriving on scene in ten minutes of (turn-out time +travel time) 80% of the time (Primary Standard).
- Ability to achieve the proposed **Rural Standard** representing the NFPA 1720 Rural Demand Zone performance objective of deploying six firefighters arriving on scene in 14 minutes of (turn-out time +travel time) 80% of the time (Secondary Standard).
- Ability to achieve the Exterior Operation Service Level identified within the B.C. Playbook.
- Ability to achieve the Interior Operations Service Level identified within the B.C. Playbook.
- Ability to achieve the Full Service Level identified within the B.C. Playbook.
- Comparison of the financial impacts including operating and capital financing requirements.

10.6 Historical Emergency Response Capabilities

This section presents analysis of historical emergency response capabilities of the CFRS. The information within this section was provided by the CFRS and represents the actual data collected by the department for the period from January 1st 2011 to December 31st 2015.

Throughout this section emergency calls are referred to and categorized by response type. These call response types are defined by the Dispatch Determinant Assignments for Foothills 911. Dillon has grouped the response types for more concise discussion in this report. **Table 16** illustrates the relationship between the Dillon detailed and general response types used in this report and the Foothills 911 defined response types. **Appendix C** provides definitions of the Foothills 911 response types.

Table 16: Response Types

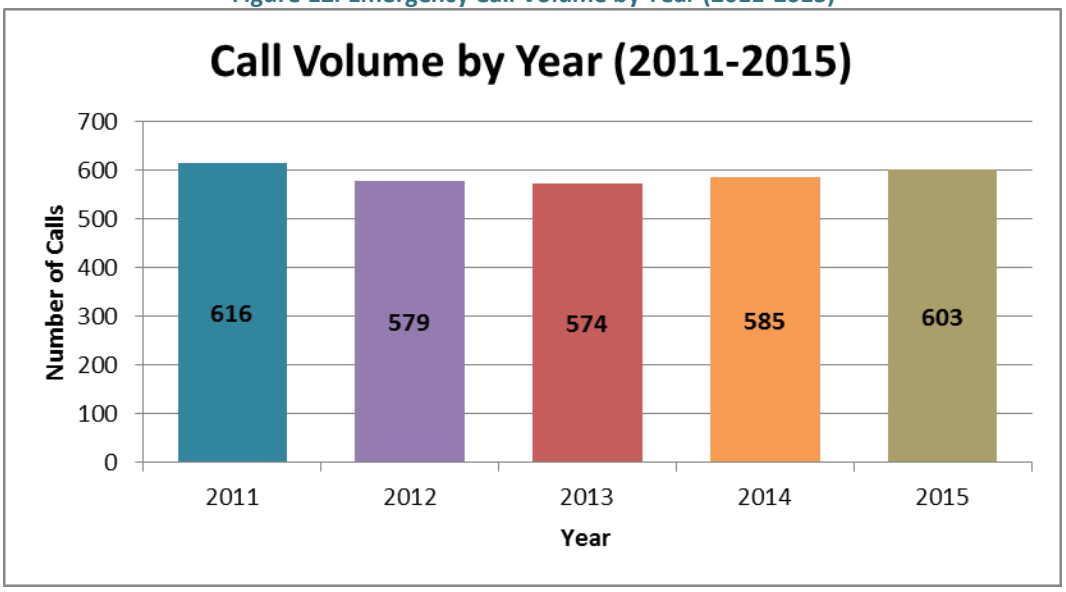
Dillon General Response Type	Dillon Detailed Response Type	Foothills 911 Dispatch Determinant Assignments
Fire	Fire	Structure Fires
		Explosions
		Outside Fires
		Vehicle Fires
Medical	Medical Delta or Echo	Allergic Reaction
		Breathing Difficulty
		Cardiac Arrest
		Chest Pain
		Choking
		Heart Problem
		Stroke
	Medical Other	Abdominal Pain
		Animal Bite
		Assault
		Back Pain
		Burn Subject
		Hazardous Exposure
		Seizures
		Diabetic Problem
		Drowning
		Electrocution
		Eye Problem
		Falls
		Headache
		Environmental Exposure
		Hemorrhage
		Industrial Accidents
		Overdose
		Pregnancy
		Psychiatric Problem
		Sick Call
		Stab/Gunshot/Penetrating Trauma

Dillon General Response Type	Dillon Detailed Response Type	Foothills 911 Dispatch Determinant Assignments
		Traffic Collision
		Traumatic Injury
		Subject Unconscious
		Medical Nature Unknown
		Transfer
Other	Alarm	Alarms
		Smoke Investigation
		Confined Space/Structure Collapse
		Elevator/Escalator Rescue
	Rescue	Extrication/Entrapped
		Fuel Spill
		Gas Leak/Gas Odour
		Hazmat
		Motor Vehicle Collision
		Water Rescue/Sinking Vehicle/Vehicle in Floodwater
		Watercraft in Distress/Collision
	Other	Aircraft Emergency
		Cancelled
		Citizen Assist/Service Call
		Electrical Hazard
		Lightning Strike
		Mutual Aid/Assist Outside Agency
		Odour
		Suspicious Package/Bomb Threat
		Train and Rail Collision/Derailment

10.6.1 Emergency Call Volume

A summary of the total number of emergency calls within the Town is presented in **Figure 12.** Over the five year period, the number of emergency calls responded to by the CFRS has remained relatively stable. There was an average of 591 emergency calls per year.

Figure 12: Emergency Call Volume by Year (2011-2015)



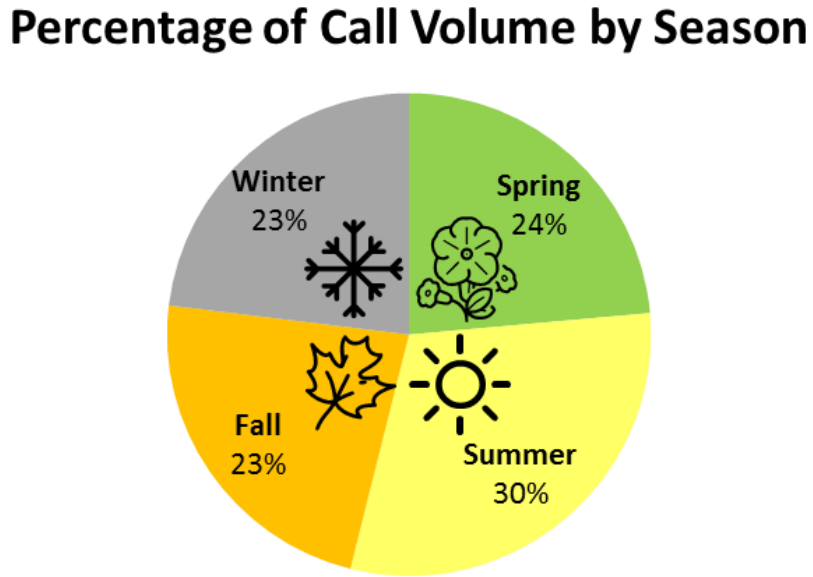
10.6.2 Emergency Call Volume by Season

The Merriam-Webster dictionary defines seasons in the northern hemisphere as the following months:

- Spring: March, April, and May
- Summer: June, July, and August
- Fall: September, October, and November
- Winter: December, January, and February

Historic Call Volumes from 2011-2015 are organized by season and shown in **Figure 13**.

Figure 13: Percentage of Call Volume by Season

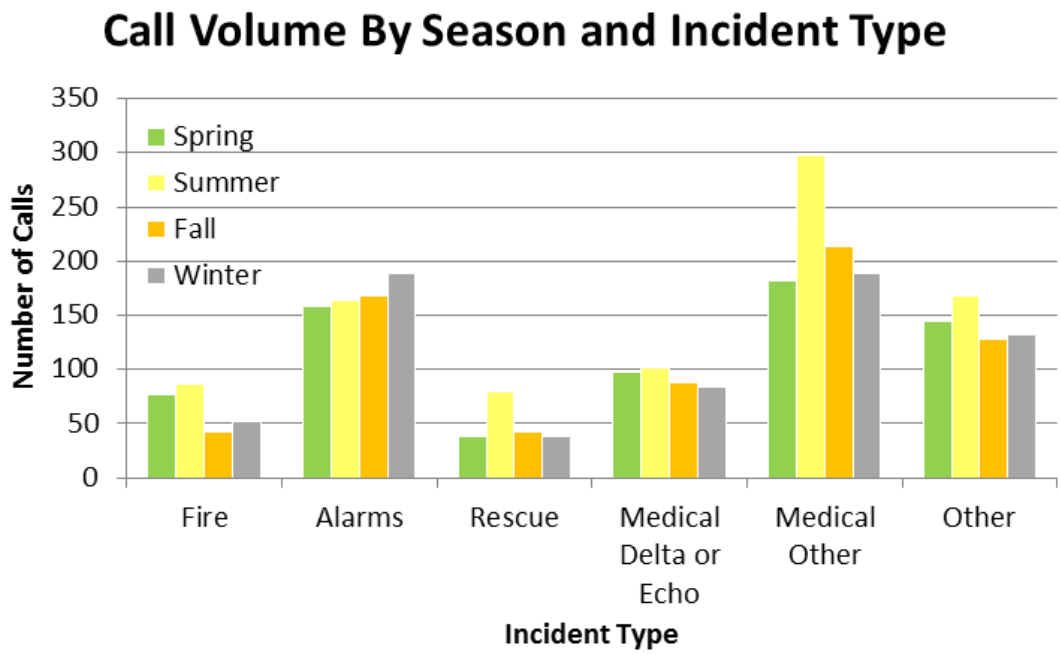


The seasonal call volume analysis highlights the increase in emergency call volume during the summer months. This is consistent with the Town's increase population driven by tourism and recreation during the summer months.

10.6.3 Emergency Call Volume by Type and Season

Figure 14 presents the percentage of emergency calls and incident types over the period 2011 to 2015 associated with each of the seasons. Medical, fire, rescue, and other calls peak during the summer months with the majority of the increase in calls arising from medical responses. Alarm calls have the highest volume during the winter months.

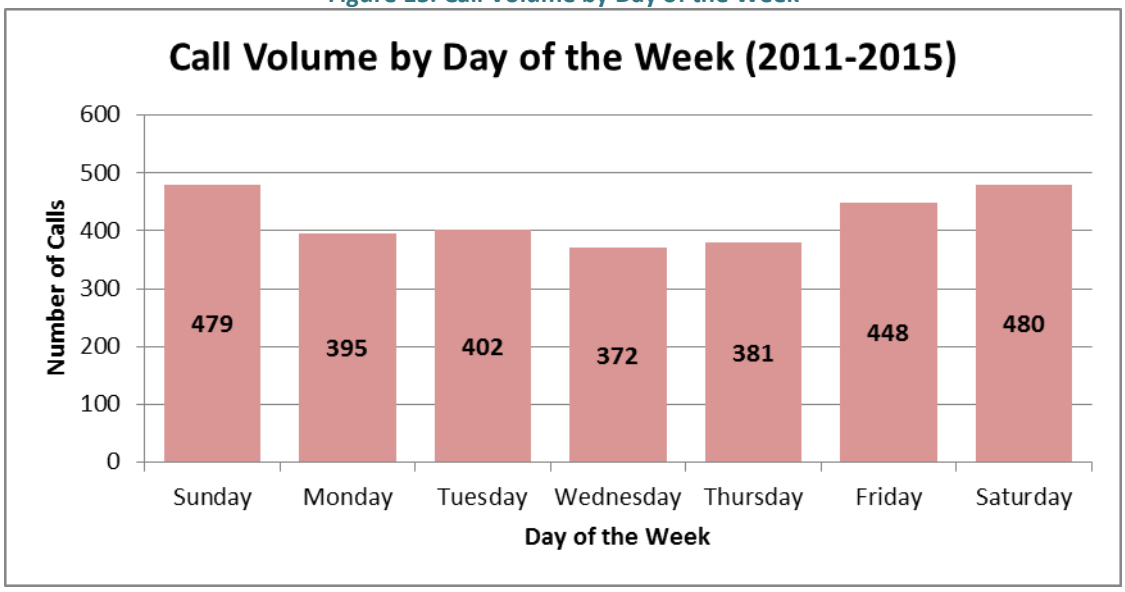
Figure 14: Call Volume by Season and Incident Type



10.6.4 Call Volume by Day of the Week

Historic Call Volumes by day of the week for the period 2011 to 2015 are illustrated in **Figure 15**. The analysis indicates that Friday through Sunday tends to have more calls than Monday through Thursday with Sunday having the highest volume of calls. This reflects the increase in population experienced on weekends as non-permanent residents and tourists/visitors come to town.

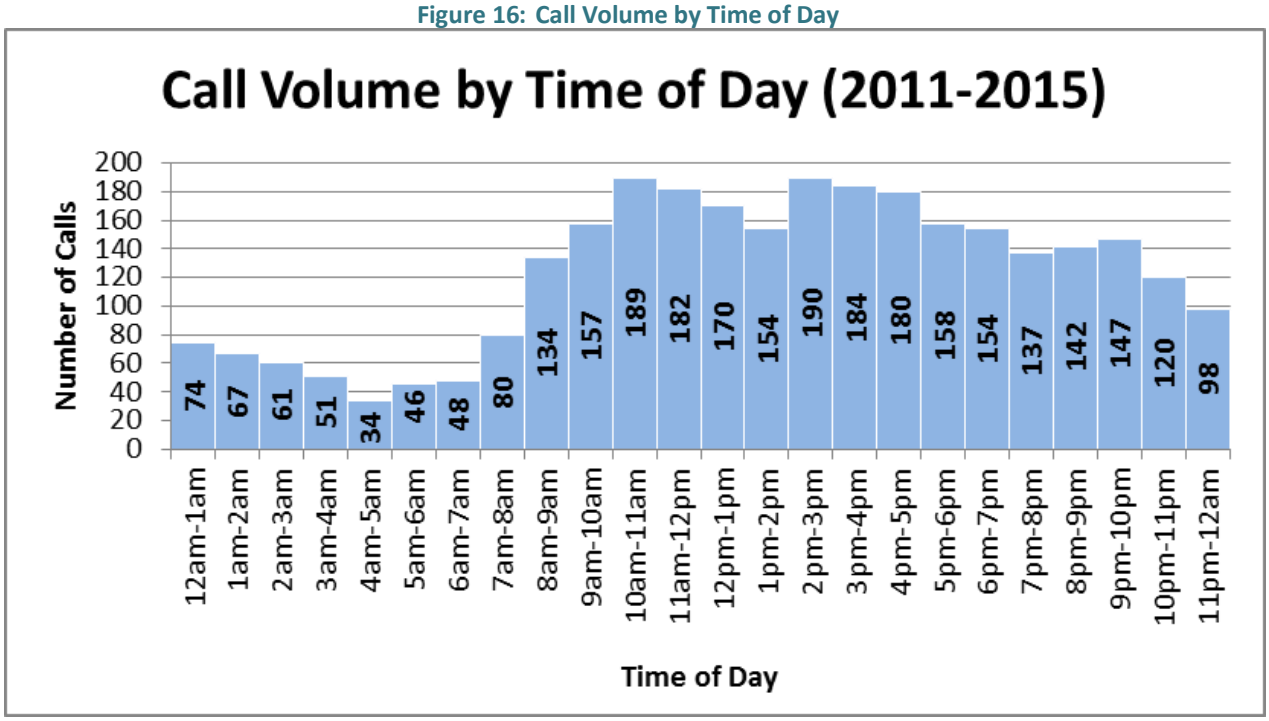
Figure 15: Call Volume by Day of the Week



10.6.5 Call Volume by Time of Day

Figure 16 illustrates historic call volume by time of day trends. This analysis indicates that there is a morning and afternoon call volume peak. The morning peak in call volume is between 10 AM and 12 PM and the afternoon peak is between 2 PM and 5 PM. During the time period 3 AM and 7 AM the CFRS experiences the lowest call volume.

Figure 16: Call Volume by Time of Day



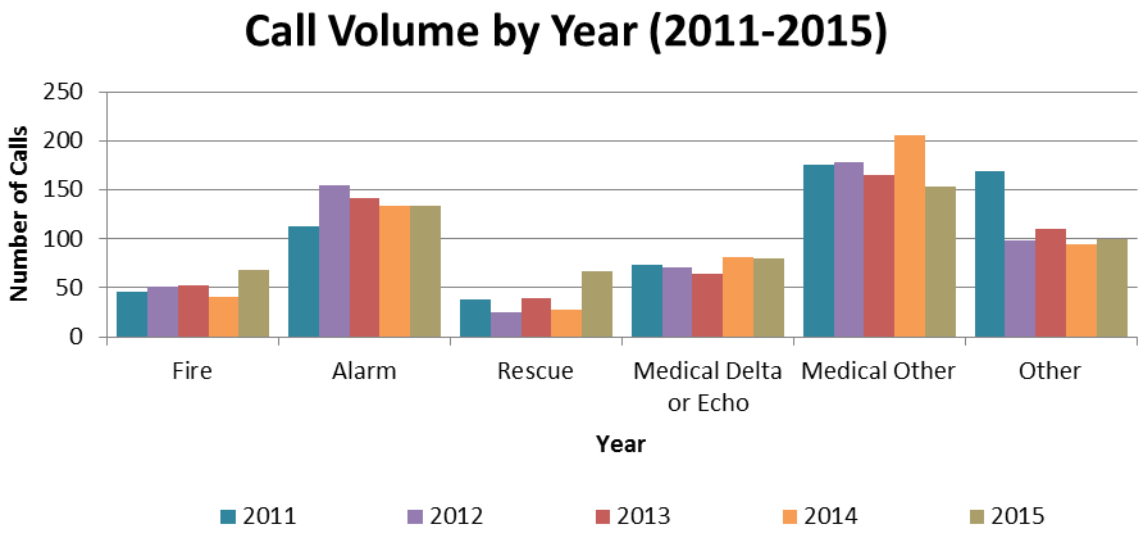
10.6.6 Emergency Incident Types

Throughout the following sections emergency calls are referred to and categorized by emergency incident types. The detailed analysis of emergency calls by type for the period 2011-2015 is presented in **Table 17** and **Figure 17**.

Table 17: Canmore Fire-Rescue Calls by Type

Call Type	2011	2012	2013	2014	2015
Fire	46	51	52	41	68
Alarm	113	155	142	134	134
Rescue	38	25	39	28	67
Medical Delta or Echo	74	71	65	81	80
Medical Other	176	179	166	206	154
Other	169	98	110	95	100

Figure 17: Canmore Fire-Rescue Calls by Type



As shown in **Figure 17**, the number of fire-related calls has fluctuated throughout the past five years. Fire-related calls dropped to its lowest of the five years in 2014 but increased to its highest in 2015. Overall the fire related calls show an increasing trend, which indicates a need to enhance the fire prevention and public education efforts of the CFRS. Even with an increasing population, it is possible to maintain or even reduce fire-related calls volumes by optimizing the 'first two lines of defence'.

The number of alarm calls increase from 2011 however they have decreased since the peak in 2012. Alarm calls represent a significant portion of the total call volume. The Town implemented a False Alarm Bylaw in 2009, which issues warnings and fines for false fire alarms or calls.

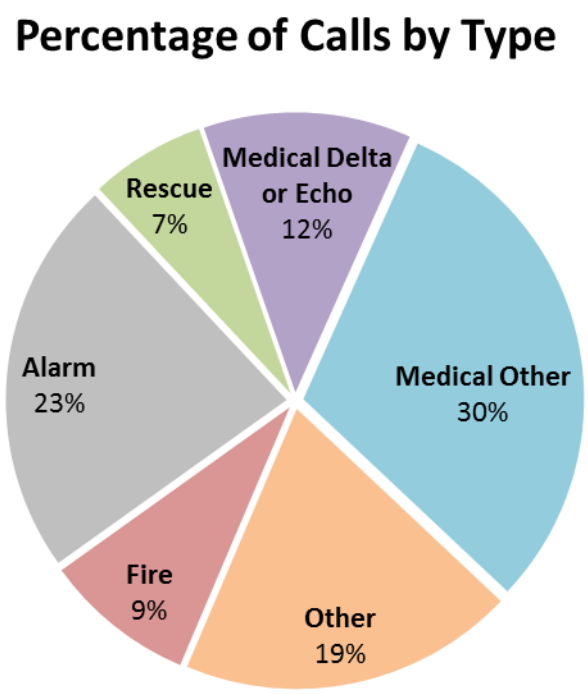
The increase in rescue calls is attributed to a change in the recording process that occurred in 2015 whereby motor vehicle collisions which were previously reported within the medical category are now included within the rescue category. There is a corresponding shift shown in the reduction in medical other calls in 2015.

10.6.7 Percentage of Incident Types

Historic percentages of incident types from 2011 to 2015 are displayed in **Figure 18**. Fire -related calls make up 9% of the CFRS total calls from 2011 to 2015, which is consistent with our findings in other similar sized communities. Medical calls are the most frequent type of emergency response conducted by the CFRS comprising 42% of all calls.

Medical calls can be broken into two categories: life threatening (delta and echo medical calls) and non-life threatening (all other medical calls). Delta and echo medical calls represent 12% of total calls and all other medical calls account for 30% of calls experienced by Canmore Fire-Rescue Services from 2011 to 2015. The majority of medical calls are non-life threatening medical calls.

Figure 18: Percentage of Calls by Incident Type



10.6.8 Dispatch Time

Dispatch time is defined by the NFPA in a standard called "NFPA 1221[11]– Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems", as follows:

> "*Emergency Alarm Processing / Dispatching*: *A process by which an alarm answered at the communications centre is transmitted to emergency response facilities (ERFs) or the emergency response units (ERUs) in the field.*"

As discussed in **Section 7.6.7** the Town of Canmore has a Letter of Understanding with the Foothills Regional Emergency Services Commission (FRESC). However, the letter does not include any performance objectives for emergency call taking and dispatching services.

NFPA 1221 is an industry best practice for 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 the 95 out of 100 calls must be dispatched within 106 seconds. There are some exceptions that have been identified. For the following call types, emergency alarm processing shall be completed within 90 seconds 90% of the time and within 120 seconds 99% of the time:

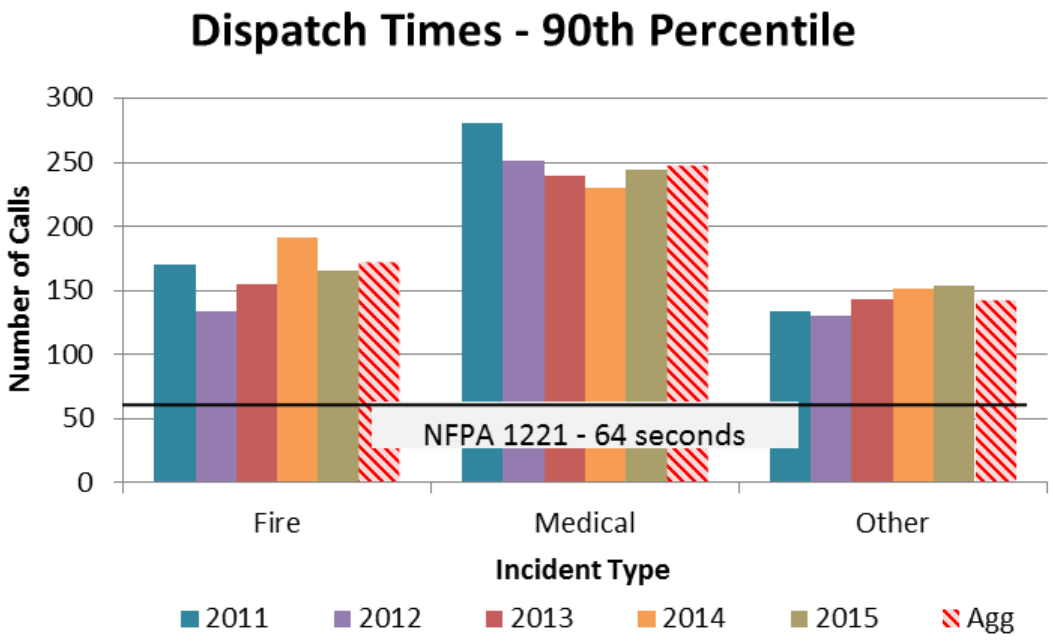
- *Calls requiring emergency medical dispatch questioning and pre-arrival medical instructions*
- *Calls requiring language translation*
- *Calls requiring the use of a TTY/TDD device or audio/video relay services*
- *Calls of criminal activity that require information vital to emergency responder safety prior to dispatching units*
- *Hazardous material incidents*
- *Technical Rescue*
- *Calls that require determining the location of the alarm due to insufficient information*
- *Calls received by text message*

The standard does not make a distinction between fire and emergency calls types other than those listed above but viewing these call types separately can help identify important differences in the historic performance of the CFRS. For example, EMS calls generally have a shorter dispatch time, if the percentage of EMS calls increases over time, then the combined overall dispatch time will decrease. It may be interpreted as an improvement in dispatch time but in reality it is just a shift in the volume of call types received by the department. **Figure 19** presents a summary of the 90th percentile historical dispatch times for emergency type calls from 2011 to 2015.

[11] NFPA 1221 2016 Edition was referenced within this report

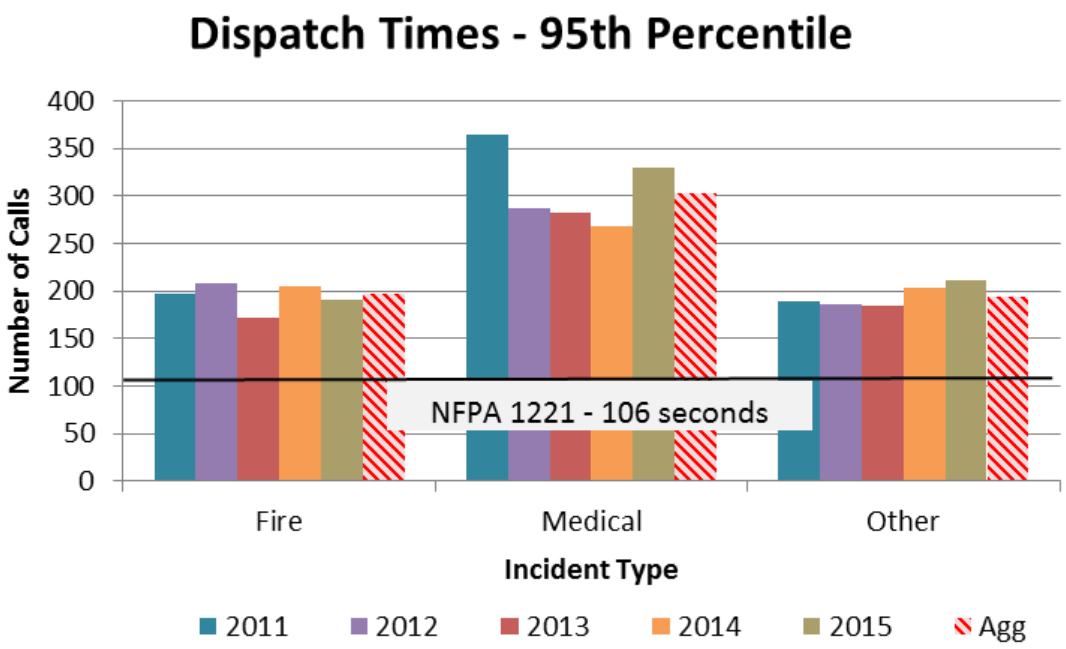
Based on the NFPA standard the 90th percentile aggregate dispatch times for CFRS for period 2011 – 2015 is 172 seconds (or approx. 2.9 minutes) for fire calls which is 108 seconds longer than the standard. The 90th percentile aggregate for medical calls is 247 seconds (or approx. 4.1 minutes), which is 183 seconds longer than the standard. The 90th percentile aggregate for other calls is 143 seconds (or approx. 2.4 minutes), which is 79 seconds longer than the standard. During the same time period the CFRS dispatching was completed (by FRESC) within 64 seconds for 40% of fire calls, 36% of medical calls, and 57% of other calls.

Figure 19: 90th Percentile Dispatch Time



Based on the new NFPA standard, the 95th percentile aggregate dispatch times for CFRS for period 2011 – 2015 is 197 seconds (or approx. 3.28 minutes) for fire calls, 303 seconds (or approx. 5.05 minutes) for medical calls, and 195 seconds (or approx. 3.25 minutes) for other calls. The CFRS completed emergency alarm processing within 106 seconds for 71% of fire calls, 46% of medical calls, and 81% of other calls. The overall trend for this performance measure is illustrated in **Figure20.** Canmore Fire-Rescue Services is not the 90th percentile or the 95th percentile for emergency alarm processing.

Figure 20: 95th Percentile Dispatch Time



10.6.9 Turnout Times Summary

Turnout Time within the fire service is defined as: "*the time interval that begins from when the emergency response staff receives the required dispatch notification, and ends at the beginning point of travel time.*"

Turnout times can vary significantly based on the use of either full-time or volunteer (paid response) firefighters. Full- time firefighters have the benefit of being located within the fire station and are able to receive the call and safely staff the apparatus ready for response in a very short time frame. Best practices reflect a 60 to 80 second turnout time for full-time firefighters depending on the nature of the call.

In comparison, paid response firefighters must first receive the call to respond (via pager or other device) travel to the fire station, or the emergency scene. Paid response firefighter turnout times can vary significantly depending on the location and availability of the individual when the call is received. This variable can have a significant impact on a fire department's response time (turnout time + travel time).

The response standards applied to the modelling analysis of this FRMP, taken from NFPA 1720, assess a response time that is comprised of turnout time plus travel time. In order to calculate existing turnout times for the modelling analysis, historic call data was assessed. Urgent calls between December 2014 and December 2015 were assessed to determine the turnout time of CFRS firefighters; this remains consistent with the 2016 Fire Rescue Staffing Study. The results are summarized in **Table 18**. The existing

80th percentile time is based on CRFS data and the time taken to assemble 4, 6, 8 and 10 firefighters to respond to a call. These staffing numbers were assumed to always include the two on-duty full-time firefighters (Captain and firefighter). The corresponding number of paid response firefighters is also summarized.

Table 18: Summary of Turnout Times (Actual)

Total Number of Firefighters	Number of Paid Response	80th Percentile Turnout Time (Existing*)
4	2	444 seconds (7.4 minutes)
6	4	669 seconds (11.1 minutes)
8	6	825 seconds (13.7 minutes)
10	8	853 seconds (14.2 minutes)
12	10	1037 seconds (17.3 minutes)

*Based on urgent calls December 2014 – December 2015

10.7 Current Fire Suppression Deployment

10.7.1 Historic Fire Call Locations

The locations of historic urgent calls (December 2014 to December 2015), with a specific address location information contained within the call data (e.g., call to a structure fire at a residential property), are shown in **Figure 21**. The calls are indicated as black dots within the map of the Town's geography. This figure also presents the location of the CFRS Fire Station within the Town.

10.7.2 Existing Emergency Response Deployment Guideline

The existing emergency response guidelines of the CFRS are described in the Standard Operating Guideline (SOG) No.501 *"Running Orders."* **Table 19** provides a summary of the existing emergency response deployment for the following responses: outdoor response, alarm bells ringing, hazardous materials, medical, indoor response, vehicle fire, technical rescue, and motor vehicle collision.

Table 19: Existing Emergency Response Deployment Model

Procedure	Initial Response		Depth of Response			
	On Scene		Level 1		Level 2	
	Total Deployment	Alarm Response	Total Deployment	Alarm Response	Total Deployment	Alarm Response
Outdoor Response	2 Firefighters 1 Vehicle	2 Full-Time 1 Rescue Vehicle	4 Firefighters 2 Vehicles	2 Full-Time 2 Paid Response 1 Rescue Vehicle 1 Fast-Attack Vehicle	12 Firefighters 4 Vehicles	2 Full-Time 10 Paid Response 1 Rescue Vehicle 1 Fast-Attack Vehicle 1 Pumper Truck 1 Tanker Truck
Alarm Bells Ringing	2 Full-Time Firefighters 2 Paid Response* 1 Vehicle	4 Full-Time* 1 Rescue Vehicle	6 Firefighters 2 Vehicles	2 Full-Time 4 Paid Response 1 Rescue Vehicle 1 Fast Attack- Vehicle	14 Firefighters 4 Vehicles	2 Full-Time 12 Paid Response 1 Rescue Vehicle 1 Fast-Attack Vehicle 1 Pumper Truck 1 Tanker Truck
Hazardous Materials	2 Firefighters 1 Vehicle	2 Full-Time 1 Rescue Vehicle	6 Firefighters 2 Vehicles	2 Full-Time 4 Paid Response 1 Rescue Vehicle 1 Special-Ops Vehicle	14 Firefighters 4 Vehicles	2 Full-Time 12 Paid Response 1 Rescue Vehicle 1 Special-Ops Vehicle 1 Pumper Truck 1 Tanker Truck
Medical	2 Firefighters 1 Vehicle	2 Full-Time 1 Rescue Vehicle	Resource TBD by Incident Commander			
Indoor Response**	6 Firefighters*** 2 Vehicles	2 Full-Time 4 Paid Response 1 Rescue Vehicle 1 Fast-Attack Vehicle	10 Firefighters 3 Vehicles	4 Full-Time 6 Paid Response 1 Rescue Vehicle 1 Fast-Attack Vehicle 1 Tanker Truck	14 Firefighters 4 Vehicles	4 Full-Time 10 Paid Response 1 Rescue Vehicle 1 Fast-Attack Vehicle 1 Pumper Truck 1 Tanker Truck

Procedure	Initial Response		Depth of Response			
	On Scene		Level 1		Level 2	
	Total Deployment	Alarm Response	Total Deployment	Alarm Response	Total Deployment	Alarm Response
Vehicle Fire**	2 Firefighters 1 Vehicle	2 Full-Time 1 Rescue Vehicle	6 Firefighters 2 Vehicles	2 Full-Time 4 Paid Response 1 Rescue Vehicle 1 Pumper Truck	12 Firefighters 4 Vehicles	2 Full-Time 10 Paid Response 1 Rescue Vehicle 1 Fast-Attack Vehicle 1 Pumper Truck 1 Tanker Truck
Technical Rescue****	6 Firefighters 2 Vehicles	2 Full-Time 4 Paid Response 1 Fast-Attack Vehicle 1 Squad Vehicle	10 Firefighters 3 Vehicles	2 Full-Time 8 Paid Response 1 Fast-Attack Vehicle 1 Squad Vehicle 1 Rescue Vehicle	14 Firefighters 4 Vehicles	2 Full-Time 12 Paid Response 1 Fast-Attack Vehicle 1 Squad Vehicle 1 Rescue Vehicle 1 Pumper Truck
Motor Vehicle Collision**	6 Firefighters 2 Vehicles	6 Paid Response 1 Rescue Vehicle 1 Utility Vehicle	-	-	12 Firefighters 5 Vehicles	12 Paid Response 1 Rescue Vehicle 1 Utility Vehicle 1 Squad Vehicle 1 Pumper Truck 1 Tanker Truck

* Paid Response page

** Incident Commander will request and direct incoming units

*** One additional Paid Response and one Utility Vehicle with Command Trailer upon request from Incident Commander

****Incident Commander will request a specific unit

10.8 Paid Response Retention

Historically paid response (volunteer) firefighters represented a portion of the community that lived and worked in close proximity to the fire station and individuals were allowed to leave work and respond to emergency calls. Financial compensation, although warranted, was not high on the list of those seeking

to become a paid response firefighter. Performance expectations including sustaining training standards and attendance at training sessions, and sustaining minimum response attendance to emergency calls continue to increase the demands municipalities place on being a paid response firefighter.

Municipalities must begin to develop recruitment and retention strategies for paid response firefighters that recognize this evolution. Recruitment and retention of paid response is not just a local Canmore, municipal or provincial challenge. Volunteer firefighters represent approximately 80% of all firefighters in Canada. In May 2010, Volunteer Alberta released the "*Volunteer Firefighter Recruitment and Retention Strategy"* which was developed for the Alberta Fire Chiefs' Association.[12]

Recently, the Canadian Association of Fire Chiefs signed an agreement with the Alberta Fire Chiefs Association to expand this paid response (volunteer) firefighter recruitment strategy across Canada. The *"Volunteer Firefighter Recruitment and Retention Strategy"* includes a range of strategies that should be considered to enhance the recruitment and retention of paid response (volunteer) firefighters within the Town of Canmore, examples of these include:

- *Involving current paid response (volunteer) firefighters in planning formal recruitment drives;*
- *Raising awareness through traditional and new media activities;*
- *Engaging in regular and ongoing outreach with local employers;*
- *Engaging community groups;*
- *Bolstering firefighter psychological support services;*
- *Developing a spousal support network;*
- *Establishing child care services; and*
- *Creating firefighter service recognition awards.*

Recommendation #27: ***That consideration be given to utilizing the recruitment and retention strategies for paid response firefighters included within the Alberta Volunteer Firefighter Recruitment and Retention Strategy as part of enhancing recruitment and retention of paid response firefighters in the Town of Canmore.***

10.9 Emergency Response Modelling

The following section details the assessment of emergency response coverage within the Town of Canmore. The analysis was carried out using Geographic Information Systems (GIS) with ESRI's Network Analyst extension, a tool developed specifically for the purpose of assessing networks, such as roads.

[12] The Volunteer Alberta "*Volunteer Firefighter Recruitment and Retention Strategy"* released May 2010 is currently available on the Alberta Fire Chiefs Association website at: http://www.afca.ab.ca/images/stories/PDFs/volunteer%20alberta%20r%20%20r%20tool%20kit.pdf.

The GIS program was used to assess the fire-rescue services' response coverage. Digital copies of GIS layers were provided by the Town of Canmore and the Municipal District of Bighorn for the existing road network. Relevant base road information such as road length and speed was applied from the GIS data.

The historic call locations for 2012 to 2015 were then added to the network and coded based on travel time to reach the call. An iterative process was used to adjust the speeds throughout the network and calibrate the model to accurately reflect historic travel times of first responding units for all 'urgent' emergency calls. Posted speed limits were reduced to reflect the actual travelling speeds experienced by the CFRS and account for delays, such as traffic signals and traffic congestion.

Primary calibration speeds were chosen based on past experience in reasonably similar municipalities and an iterative process was applied to match the model speeds to correspond with CFRS travel times to historic locations. Topography and slope were considered when calibrating the model. Areas with steep slopes, such as Silver Tip Road, were reduced to reflect slower travel speeds experienced by the fire-rescue service. A calibration table, as shown in **Table 20**, represents the modelled speed by road classification that was applied in the GIS Model.

Table 20: Model Calibration Table

Road Class	Modelled Speed (km/h)
Highway	80
Arterial	42
Collector	30
Local	23

The calibrated road network, combined with the station location, was used to build graphical response polygons" around the station. These polygons represent the total response coverage the station can provide in the specified amount of time.

For the response modelling analysis the response time is measured as **turnout time + travel time = response time.**

10.9.1 Existing Centralized Station Model

The location and number of stations within the Town of Canmore was discussed during the staff and stakeholder consultations. From our review, we understand that the Town temporarily operated from a second facility - a satellite station in the Three Sisters area. From our review of previous studies and feedback from stakeholders, this model did not prove to be a successful solution to the Town's emergency response coverage.

Operating a second station would require staffing of some type, whether it was dedicated full-time resources or a group of paid responders who are able to turnout to the second station in a shorter amount of time than to the primary station. There would be significant cost implications to staffing a second station full-time and from the recent closure of the station it did not seem that a paid response force was available in the outlying areas of the Town to operate a satellite station. As a result, this option was not taken forward for further assessment within the Phase 1 Fire-Rescue Staffing Study (FRSS).

10.9.2 Existing Emergency Response Deployment Modelling with Growth Considerations

The two deployment standards utilized in the Phase 1 FRSS (NFPA 1720 Suburban Demand Zone as the primary standard, and the NFPA 1720 Rural Area Demand Zone as the secondary standard) are carried forward into this Phase 2 Fire-Rescue Master Plan. The master planning process includes considerations for future growth. Therefore the existing suppression analysis was revised to incorporate five and ten-year future growth and development estimates, overlaid onto the response mapping.

10.9.2.1 Primary Deployment Standard

The NFPA 1720 Suburban Demand Zone is applied as the primary deployment standard for assessing the current and future options for delivering fire suppression services. This includes an integrated response of initial response and depth of response in deploying ten firefighters arriving on the scene of a fire-related incident in a response time **(turnout time + travel time)** of ten minutes for 80% of the fire related incidents. Our analysis indicates this to be the most applicable standard for the type of department and density of the Town of Canmore, considering the permanent and non-permanent residents.

In order to model the current primary deployment standard a statistical analysis was also performed to determine the 80th percentile turnout time of the first ten firefighters. This analysis indicates for the period from December 2014 to December 2015, the 80th percentile turnout time of the first ten firefighters was 853 seconds (14.2 minutes).

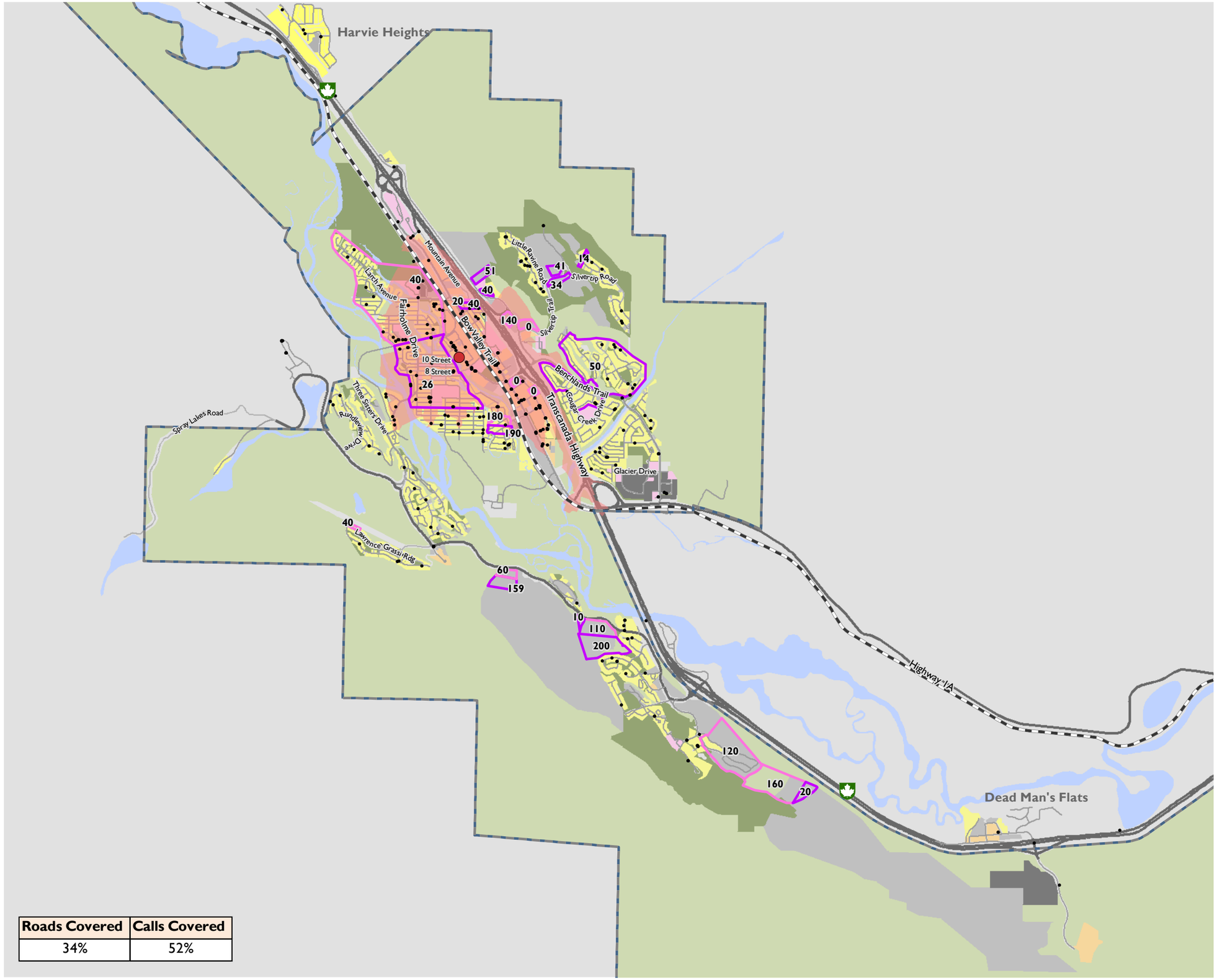
The 80th percentile turnout time of 853 seconds (14.2 minutes) exceeds the combined 10 minute **turnout time + travel time = response time** of the primary deployment standard. The CFRS is currently not able to achieve the primary deployment standard within any area of the Town.

10.9.2.2 Secondary Deployment Standard

The NFPA 1720 Rural Area Demand Zone is applied as the secondary deployment standard for assessing the current and future options for delivering fire suppression services. This includes an integrated response of initial and depth of response in deploying six firefighters arriving on the scene of a fire related incident in a response time **(turnout time + travel time)** of 14 minutes for 80% of the fire related incidents.

In order to model the current NFPA 1720 Rural deployment standard a statistical analysis was performed to determine the 80th percentile turnout time of the first six firefighters. This analysis indicates for the period from December 2014 to December 2015 the 80th percentile turnout time of the first six firefighters was 669 seconds (11.1 minutes). This turnout time was then applied to determine the percentage of Town road coverage, and the location of historical emergency calls the CFRS has been able to respond to in 14 minutes or less of **turnout time + travel time = response time.**

Results of the NFPA 1720 Rural standard under existing conditions with future growth parcels incorporated, presented in **Figure 21,** indicate that the CFRS would be able to achieve a deployment of six or more firefighters to 34% of roads within the Town and 52% of historic emergency call locations within a total response time of 14 minutes or less. As shown in the figure, some of the five and ten-year estimated growth parcels are covered within this response area, but others are outside of the existing response zone.



Roads Covered	Calls Covered
34%	52%

TOWN OF CANMORE
FIRE RESCUE SERVICES

EXISTING SECONDARY RESPONSE (NFPA 1720 - RURAL DEMAND ZONE)
FIGURE 21

- Fire Station
- Fire Call (2012-2015)
- Municipal Boundary
- Railway

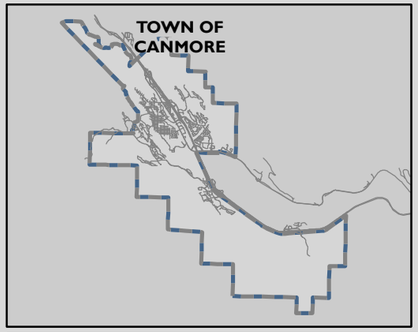
Population Growth Areas (Number of Units are Labelled)
- 5 Year Horizon
- 10 Year Horizon

NFPA 1720 Response Coverage
- ≥ 6 Firefighters with 14 Minutes (Turnout and Travel)

Land Use
- Commercial
- Environmental Reserve/Open Space
- Industrial
- Institutional
- Recreational
- Residential
- Vacant

Total Response Time	Turnout Time	Travel Time
14 Minutes	11.14 Minutes	2.86 Minutes

Footnote: Historic 80th percentile turnout times from December 2014 - December 2015 were used for this model.
Assumed improved turnout time for 4 paid responders = 11.14 minutes.



1:45,000
0 0.5 1 2 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY TOWN OF CANMORE, M.D. OF BIGHORN

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 3TM 114

DILLON CONSULTING

PROJECT: 152720
STATUS: FINAL
DATE: 9/12/2016

FILE LOCATION: I:\GIS\152720 Canmore Fire Staffing Study\mxd\Figure 2 NFPA 1720 - Rural Demand Zone.mxd

10.10 Suppression Response Analysis

The delivery of fire protection services, specifically the level of fire suppression services to be provided by the Town of Canmore has been the focus of several reports and reviews conducted both internally and by professionals within the industry. These reports provide valuable insight into the history of how the delivery of fire suppression services has evolved into its current model. The analysis within these reports consistently identify the depth of response, (total number of firefighters available) and turnout time as core deficiencies within the existing CFRS operating model.

The relevant past reports have included the 2010 Canmore Fire Services Staffing Study, the 2011 Canmore Fire-Rescue Department Strategic Plan (Updated with Addendum 1 in June 2015), the 2015 Fire Response Model Assessment and, most recently, the Phase 1 Fire-Rescue Staffing Study. The options discussed below were presented in the Phase 1 Fire-Rescue Staffing Study, included as **Attachment 1** for reference.

10.10.1 Summary of Suppression Analysis and Options in Phase 1 Fire-Rescue Staffing Study

The analysis within the Fire-Rescue Staffing Study (FRSS) considered fire suppression guidelines, standards, and industry best practices to provide Council with four fire suppression deployment options for consideration within the Town of Canmore. The staffing study was completed as Phase 1 of a process to moves towards the fire-rescue master planning process and determine the fire protection service levels (performance objectives) for the CFRS as a standalone fire department.

10.11 Phase 1 Staffing Study Deployment Options Summary

The CFRS provides a wide range of fire and rescue services through the deployment of a mix of full-time, career casual and paid response firefighters. The fire suppression deployment options presented within the FRSS were designed to enhance services in comparison to recognized industry best practices, guidelines and standards. The staffing study applied comparison framework of industry best practices, standards and guidelines within the evaluation process. The comparison framework applied in the FRSS is presented in **Table 21**.

Table 21: Deployment Option Comparison Framework

Comparison Framework
Ability to achieve the proposed **Suburban Standard** representing the NFPA 1720 Suburban Demand Zone performance objective of deploying ten firefighters arriving on scene in ten minutes of (turn-out time +travel time) 80% of the time (**Primary Standard**).
Ability to achieve the proposed **Rural Standard** representing the NFPA 1720 Rural Demand Zone performance objective of deploying six firefighters arriving on scene in 14 minutes of (turn-out time +travel time) 80% of the time (**Secondary Standard**).
Ability to achieve the Exterior Operation Service Level identified within the B.C. Playbook.
Ability to achieve the Interior Operations Service Level identified within the B.C. Playbook.

Comparison Framework
Ability to achieve the Full Service Level identified within the B.C. Playbook.
Comparison of the financial impacts including operating and capital financing requirements.

10.11.1 Phase 1 Fire-Rescue Staffing Study Options

The following introduces and summarizes the four options resulting from the Fire-Rescue Staffing study (FRSS), considered as Phase 1 (with this Fire-Rescue Master Plan representing Phase 2). The FRSS is included as **Attachment 1** for reference.

10.11.1.1 Option 1 – Enhancing CFRS Current Organizational Operating Model

The focus of Option 1 was targeted to improve the efficiency and effectiveness of the current fire suppression organizational model by identifying strategies that focus on improving the effectiveness of the paid response firefighters. This included enhancing their roles and responsibilities, training level and turnout time in responding to the two core deficiencies identified within the existing deployment model. Option 1 introduced the need for an organizational (i.e. rank) structure within the paid response group, introduced strategies for recruitment and retention, recommended training the paid response firefighters to NFPA 1001 standard and proposed improving turnout times of the paid response firefighters through a scheduling strategy. Option 1 also recommended the use of technology to assist in improving paid response turnout times. The strategies to improve the paid response turnout times, including scheduling, recruitment, organizational change and use of technology are described in further detail within the *Phase 1 Fire-Rescue Staffing Study Section 10.2*.

Findings of Option 1:

Subject to the development of a supportive scheduling process to reduce paid response turnout times Option 1 presents an improvement in the Primary (Suburban) Standard that the CFRS is currently **not achieving** to attain a deployment performance of ten firefighters arriving on scene to 8% of roads and 16% of historic calls within a response time (turnout time + travel time) of ten minutes or less.

Option 1 also represents an improvement in the Secondary (Rural) Standard measured from the current deployment model of six firefighters arriving on scene to 95% of Town roads, and 96% of historic emergency calls within a total response time of 14 minutes or less, to 95% of the road coverage within the Town, and 96% of the historical emergency call locations.

The FRSS noted that Option 1 could be implemented in the immediate term, with relatively low cost-implications to the Town. The cost options can be found in **Section 14.2**. Many of the cultural challenges identified during the stakeholder consultations of the FRSS are targeted for improvement in Option 1. The FRSS recommended this option as a first step towards improving emergency response performance within the Town of Canmore to better reflect the population density of the community.

10.11.1.2 Option 2 – Seasonal Temporary Staffing

The analysis of historical emergency calls within this FRSS indicates that there is an increase in rescue calls, followed by fire and medical incidents during the summer season defined as June, July and August. This finding is consistent with the peak tourism and recreational activities associated with the Town. Option 2 of the FRSS presented a strategy to increase fire suppression staffing on a temporary basis to align with the summer season and peak emergency call volumes.

The proposed organizational design of Option 2 reflected a temporary increase in staffing of two firefighters during the period from June 1st to August 31st representing the summer season. This would increase the scheduled on-duty staffing from two full-time firefighters to four firefighters. In addition to responding to the peak time emergency call volume this temporary staffing also responds to one of the most challenging seasons for maintaining a paid response firefighter deployment.

This option would require utilizing Paid Response Casual Firefighters / Career Casual Firefighters to increase the number of scheduled on duty firefighters from the current two firefighters to four firefighters at all times during the summer season.

Within this option it is proposed that the number of scheduled paid response firefighters could be reduced in consideration of the increased number of firefighters on duty. This option reduces the number of scheduled paid response firefighters, targeting the Secondary Standard, to two paid response firefighters, and for the Primary Standard to six paid response firefighters.

Findings of Option 2:

Option 2 of the FRSS presented a strategy to increase the number of firefighters on duty during the peak time (Summer Season). During the summer season the CFRS is predicted to achieve a Primary Standard performance of the firefighters arriving on scene within ten minutes to 13% of the road coverage within the Town, and 24% of the historical emergency call locations. This option results in a Secondary Standard performance of six firefighters arriving on scene within 14 minutes to 99% of the road coverage within the Town, and 99% of the historical emergency call locations.

For all other times of the year, this option could be supported by the implementation of the proposed Option 1.

Option 2 could be implemented in the immediate to short-term horizon, if budgets allowed. The cost options can be found in **Section 14.2**. CFRS and the Town have practiced the process of 'pilot projects' to test operational changes. This option would be an excellent candidate to test as a pilot project. It would allow for time to collect actual response data to test the real-world results of the staffing and response time performance. The modelled results indicate this option provides the highest achievement of the primary response standard (NFPA 1720 Suburban).

10.11.2 Option 3 – Only Paid Response Fire Suppression Model

Option 3 was considered within the FRSS to identify the impacts of revising the current fire suppression model to utilize **only paid response firefighters,** supported by dedicated full-time positions in the areas of training, fire prevention and public education.

Option 3 included increasing the number of paid response firefighters, further expanding the organizational design (rank structure) and further enhancing the proposed scheduling process for paid response firefighters. The FRSS noted that Option 3 would require changes to the current Collective Agreement with Local 4705.

Findings of Option 3:

Option 3 presented a strategy to revise the delivery of fire suppression services to include only paid response firefighters. As in existing conditions, this option does not meet the Primary Standard.

Subject to the development of a supportive on-call scheduling process to reduce paid response turnout times, this option represents an improvement in the Secondary Standard. The results are that six firefighters could arrive on scene to 83% of Town roads, and 80% of historic emergency calls within a total response time of 14 minutes or less.

From a response performance perspective, Option 3, utilizing only paid response suppression staff, was not recommended within the FRSS. Council provided further direction during the presentation of the Phase 1 - Fire Rescue Staffing Study report which confirmed that Canmore Fire-Rescue Services will remain as a composite fire department, which eliminated Option 3 (proposing a paid response department) from further consideration as a suppression deployment option.

10.11.3 Option 4 – Increasing On Duty Full-time Firefighters

The fourth option that was considered within the FRSS assessed the impacts of deploying four full-time firefighters at all times. Based on Option 2 that proposed a temporary peak season (Summer Season) deployment model of four firefighters on duty, Option 4 applies the same strategy year round by increasing the complement of full-time firefighters from the current seven to 15, representing an increase of eight full-time firefighters. Option 4 also includes dedicated full-time positions in the areas of training, fire prevention and public education, as introduced in Option 3.

The proposed organizational design of Option 4 reflects an increase in staffing of two full-time firefighters per shift. This would increase the scheduled on duty staffing from two full-time firefighters to four firefighters. As in Option 3 this option also includes the addition of one full-time Training / Public Education Officer and one full-time Fire Prevention Inspector. As in Option 2 this option proposes that the number of scheduled paid response firefighters could be reduced in consideration of the increased number of firefighters on duty. This option reduces the number of scheduled paid response firefighters,

targeting the Secondary Standard, to two paid response firefighters, and for the Primary Standard to six paid response firefighters.

Findings of Option 4:

Option 4 provides the same improvement to the emergency response performance measured against the primary and secondary standards as Option 2, but provides the improvement all year long as opposed to seasonally. As such, the cost implications are the highest of all four options presented. It is not recommended that the Town move forward on this option before first considering strategies in line with Option 1 and Option 2 to determine the efficiencies in the immediate and short term. Prior to considering Option 4 in the future, it is recommended that the Town consider the following:

- Consideration of the growth and community risk assessments within this FRMP;
- Determine fire prevention and protection programs to support community needs appropriate for the suppression model selected;
- Conduct public and stakeholder consultation on level of service expectations;
- Consult with Council on level of service impacts and associated risks; and
- Seek legal advice regarding labour relations impacts.

10.11.4 Summary of Phase 1 Fire-Rescue Staffing Study Options

The Phase 1- Staffing Study Options have been utilized to inform the recommendations for the delivery of fire suppression services included within this FRMP. Where applicable the strategies within each option have been updated including:

- *Feedback from Council and Senior Staff following the presentation of the Phase 1 Fire-Rescue Staffing Study including Councils commitment to sustaining a composite fire service; and*
- *Application of the future community growth analyses based on the current 10-year community planning horizon.*

The strategies contained with Option 3 of the Phase 1 Fire-Rescue Staffing Study have not been considered as part of this FRMP.

10.12 Fire Suppression Division Recommendations

Recommendations for the Suppression Division include the following:

26) That each of the department's portfolio responsibilities be updated to reflect the changes and seek to balance workload across the Senior Officers.

27) That consideration be given to utilizing the recruitment and retention strategies for paid response firefighters included within the Alberta Volunteer Firefighter Recruitment and Retention Strategy as part of enhancing recruitment and retention of paid response firefighters in the Town of Canmore.

11.0 Fire Suppression Service Delivery Recommendations

The objective of this Fire-Rescue Master Plan is to provide Council and senior staff with a strategic blueprint for delivering fire protection services to the community. The recommendations for fire suppression consider the fire risks within the Town, both in existing and future conditions, including consideration of the nature and location of community growth and development. The recommendations for fire protection and suppression focus on a ten-year community planning horizon recognizing short-term (0 to 3 year), medium-term (3 to 5 year) and long-term (6 to 10 year) time frames.

This FRMP has assessed the Town's compliance with the current legislative requirements and supports due diligence for the provision of fire protection and prevention on behalf of the municipality. Through analyses of local needs and circumstances the fire suppression recommendations are intended to provide the most effective and efficient level of services resulting in the most value to the community.

11.1 Staff Resources

The future staffing recommendations include the continued use of full-time senior officers (i.e. Captains) and full-time on-duty suppression staff. The staffing recommendations also focus on strategies to sustain, improve and enhance the roles of the paid response firefighters. The current model of a Career Casual Firefighter is transitioned out within the staffing recommendations. Under the current model, the Career Casual group does not add to the capacity of the department beyond individual shift coverage, and consistent training of the Career Casual group was noted as an issue in the Phase 1 FRSS. The future staffing recommendations introduce the position of Paid Response Casuals to provide on-duty shift coverage. This will provide the opportunity to engage the Paid Response Casual role to be available for depth of response coverage, department-wide training, department-wide initiatives (e.g. prevention and education efforts) in addition to shift coverage. Duty crews are also introduced within the staffing recommendations. This refers to Paid Response Staff who are scheduled to be available for response in order to improve turnout times and improve the certainty of a minimum initial response.

11.2 Fire Protection Service Delivery Comparison Framework

As presented within the Phase 1 Fire-Rescue Staffing Study this FRMP utilizes a comparison framework to assess each recommendation in relation to the applicable industry best practice performance benchmarks identified for the Town of Canmore.

For consistency the comparison framework for the proposed fire suppression recommendations follow the comparison framework presented in the Phase 1 Fire-Rescue Staffing Study outlined in **Table 22** below.

Table 22: Fire Suppression Recommendation Comparison Framework

Comparison Framework
Ability to achieve the proposed **Suburban Standard** representing the NFPA 1720 Suburban Demand Zone performance objective of deploying ten firefighters arriving on scene in ten minutes of (turn-out time +travel time) 80% of the time (**Primary Standard**).
Ability to achieve the proposed **Rural Standard** representing the NFPA 1720 Rural Demand Zone performance objective of deploying six firefighters arriving on scene in 14 minutes of (turn-out time +travel time) 80% of the time (**Secondary Standard**).
Ability to achieve the Exterior Operation Service Level identified within the B.C. Playbook.
Ability to achieve the Interior Operations Service Level identified within the B.C. Playbook.
Ability to achieve the Full Service Level identified within the B.C. Playbook.

In addition to the comparison framework the recommendations for the fire suppression division include a number of strategies that support Council's desire to sustain a composite "stand-alone" fire department including:

- *Commitment to sustaining a composite model stand-alone fire department including full-time and paid response firefighters;*
- *Recognition of the importance of the current roles and responsibilities of the paid response firefighters as part of the current deployment model;*
- *Commitment to sustaining an ALS Capable medical response utilizing qualified personnel including paid response firefighters; and*
- *A transition from the use of career casual firefighters to increasing the roles and responsibilities of paid response firefighters.*

11.3 Consideration for Service Level Targets

Based on the suppression analysis and results, the primary standard (NFPA 1720 Suburban Demand Zone) is considered to be an appropriate service level target within the downtown core (i.e. between the highway and the river) of the Town of Canmore. The service level target aims to achieve the deployment of ten firefighters arriving on scene in ten minutes of response time (turn-out time +travel time). It is not recommended that the service level target include a set performance objective at this time. Instead, the Town should measure, record and monitor emergency response data in order to measure improvement over time.

In the rural areas of the Town of Canmore, beyond the downtown core, the service level target more accurately reflects the secondary standard (NFPA 1720 Rural Demand Zone). This service level target aims to achieve the deployment of six firefighters arriving on scene in 14 minutes of response time (turn-out time +travel time). Again, it is not recommended that the service level target include a set performance objective at this time. Instead, the Town should measure, record and monitor emergency response data in order to measure improvement over time.

11.4 Immediate Term Recommendations (6 to 12 months)

The following immediate-term recommendations are intended to be implemented within the first 6 to 12 months from Council's consideration and approval of this proposed FRMP.

Recommendations:

#28. That the new organizational structure for the paid response firefighters be implemented;

#29. That as an initial transition from reliance on career casual firefighters the total complement be reduced to 12 career casual firefighters; and

#30. That the total complement of paid response firefighter be increased by five firefighters to a total complement of 41 paid response firefighters to improve the sustainability of the paid response model and improve reliability of turnout.

11.4.1 Proposed Organizational Design – Immediate Term (6 to 12 months)

Throughout the process to complete the Phase 1 Fire-Rescue Staffing Study and this FRMP there has been considerable discussion in regards to the overall rank structure within the department (See **Attachment 1** for the Fire-Rescue Staffing Study analysis). The current rank structure has a number of challenges with respect to maintaining command and control utilizing the most qualified staff, and respecting the historical rank structure of the department. Of upmost importance to this FRMP is the implementation of an organizational structure within the paid response firefighters to comply with the Towns OHSA responsibilities to provide qualified supervision at all times.

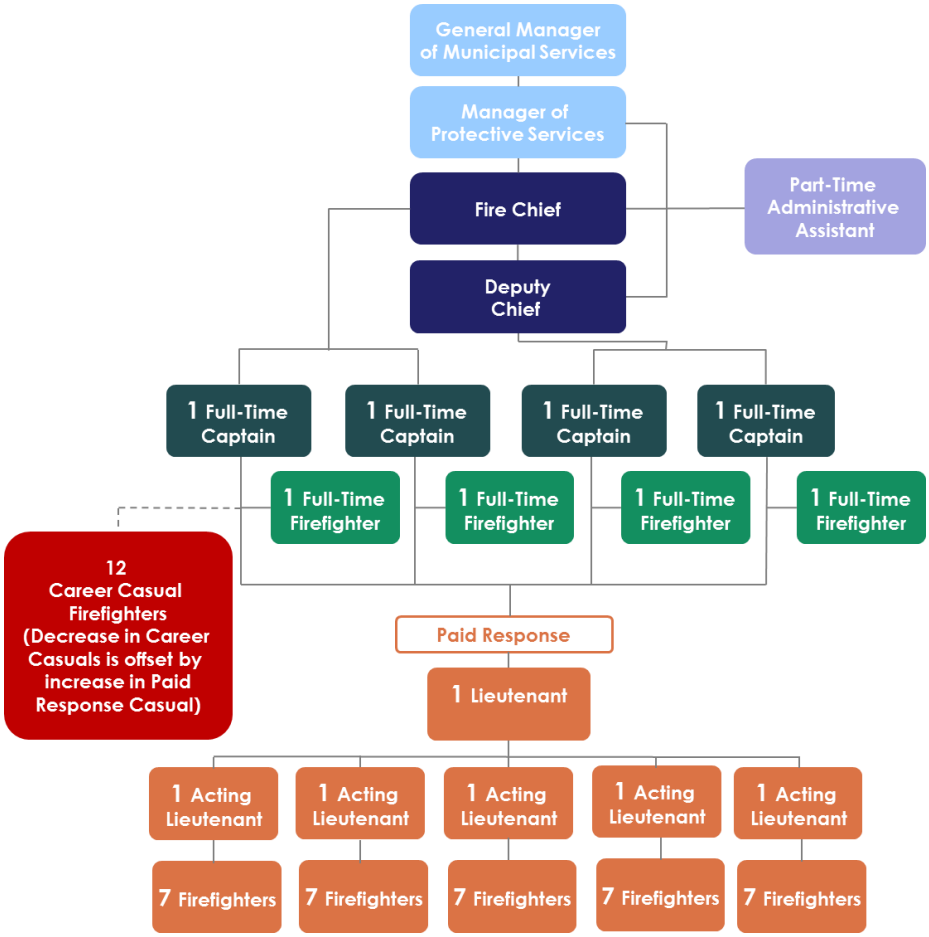
One of the current organizational challenges is the rank of Captain within the paid response firefighters. In comparison to industry best practices the current paid response Captain would be deemed to have the same rank, and thus authority as the full-time Captains. The current paid response Captain is one of the longest serving and dedicated paid response firefighters within the department. However, it must be recognized that the historical rank associated with this individual is not consistent with the current and future operational needs of the department.

Similarly, there is an associated history within the department with respect to the rank of full-time Lieutenant. The proposed organizational structure within this FRMP presents that of industry best practice within a composite fire department. This includes the use of full-time Captains and paid response Lieutenant (current paid response Captain) and a new position of paid response Acting Lieutenant.

The proposed organizational model includes four full-time Captains and four full-time firefighters comprising the four platoons that form the full-time emergency response. It is expected that the Town will continue to use Career Casual firefighters to cover shifts of the full-time emergency responders, however, as a result of the training attendance recommendations within **Section 9.0** of this FRMP, it is recommended that the current complement be reduced to 12 Career Casuals who meet the recommended minimum training standards and department training session attendance targets. These positions will be replaced with the use of Paid Response Casuals.

As presented in the Phase 1 FRSS (Option 1), the proposed immediate-term staffing recommendations include forming an organizational rank structure within the paid response firefighters and improving the turnout times of the paid response firefighters through targeted recruitment strategies, scheduling the paid responders and utilizing enhanced technology. Based on feedback received from the FRSS, the proposed immediate-term recommendations include increasing the total paid response complement by five, for a total of 41. The proposed immediate-term staffing recommendations are depicted in the organizational chart in **Figure 22**.

Figure 22: Immediate Term (6 to 12 months) Organizational Structure



11.4.2 Comparison Framework Analysis – Immediate Term (6 to 12 months) Recommendations

The results of the immediate-term (6 to 12 months) staffing are assessed below. They are comparable to the results of Option 1 (Organizational Structure and Improved Turnout Times of Paid Response Model) in the Phase 1 FRSS (**Attachment 1**). The results within this FRMP have been updated to show the response coverage of the planned five and 10 year growth and development estimates.

11.4.2.1 Immediate Term (6 to 12 months): Ability to Achieve Performance Objectives of NFPA 1720 – Suburban Demand Zone – Primary Standard

Figure 23 presents where the CFRS is predicted to achieve a deployment performance of ten firefighters arriving on scene to 8% of roads and 16% of historic calls within a response time (turnout time + travel time) of 10 minutes or less. This includes the partial coverage of one five year and one ten year estimated growth areas.

11.4.2.2 Immediate Term (6 to 12 months): Ability to Achieve Performance Objectives of NFPA 1720 – Rural Demand Zone – Secondary Standard

With the predicted Secondary Standard turnout time of 6.5 minutes for the first four paid response firefighters applied, **Figure 24** indicates where the CFRS is predicted to achieve a performance of six firefighters arriving on scene within 14 minutes to 95% of the road coverage within the Town, and 96% of the historical emergency call locations. This provides coverage to a significant amount of the predicted five and ten year future growth parcels.

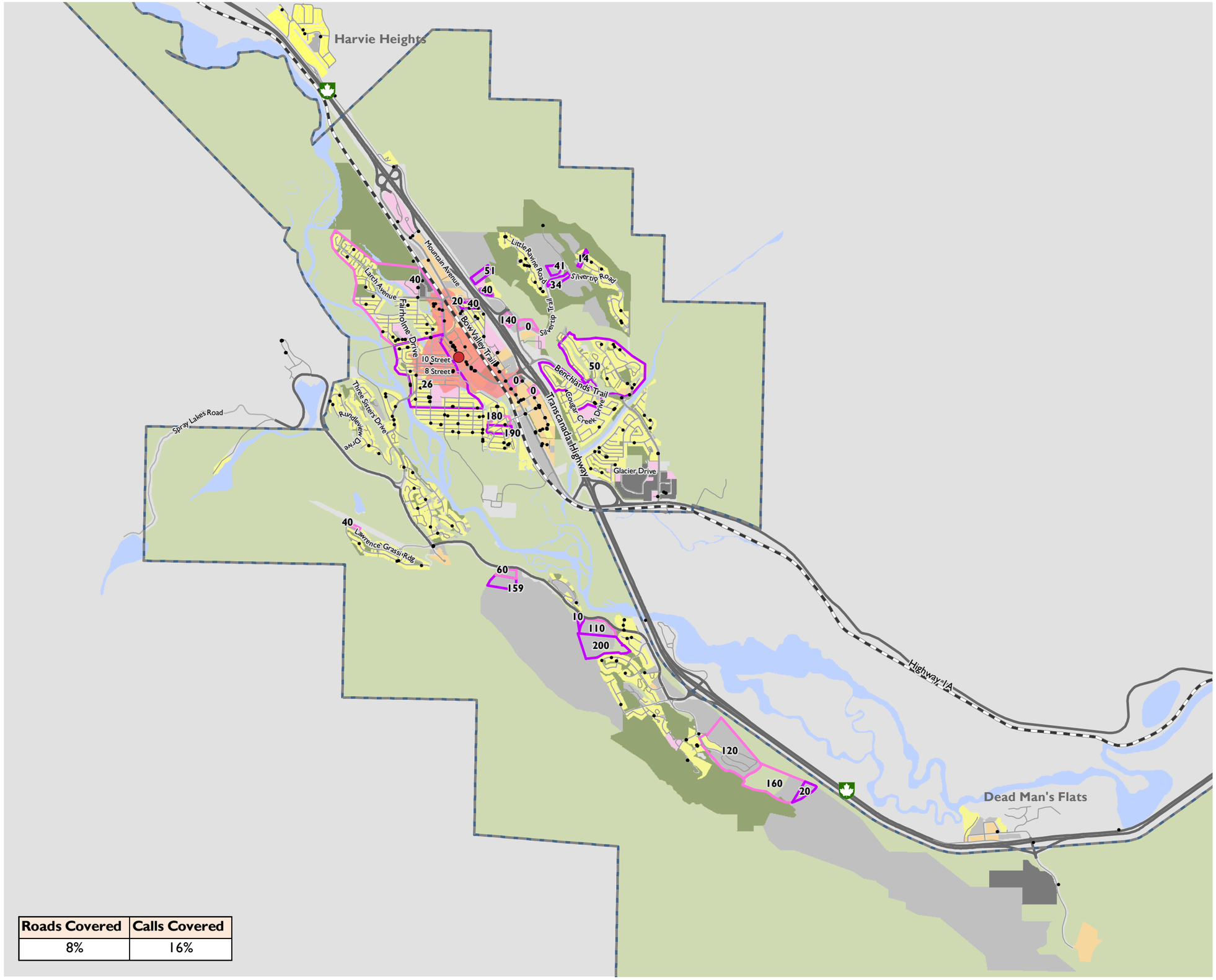
11.4.2.3 Immediate Term (6 to 12 months): Ability to Achieve the Exterior Operations Service Level identified within the B.C. Playbook

The immediate-term (6 to 12 month) staffing model presents a strategy to enhance the current organizational operating model of the CFRS including revising the recruitment and retention process, standardizing training for all firefighters, and implementing a scheduling process for paid response firefighters.

Subject to the full-time, career casual and paid response firefighters achieving, and sustaining the job performance requirements (Exterior Firefighter Competencies) contained within the B.C. Playbook, and the deployment of sufficient qualified firefighters to safely and effectively conduct the firefighting activities associated with this level of fire suppression services, the CFRS would be able to achieve the exterior operations service level contained within the B.C. Playbook.

11.4.2.4 Immediate Term (6 to 12 months): Ability to Achieve the Interior Operations Service Level identified within the B.C. Playbook

Subject to the full-time, career casual and paid response firefighters achieving, and sustaining the job performance requirements (NFPA 1001 – FF1 Competencies) contained within the B.C. Playbook, and the deployment of sufficient qualified firefighters to safely and effectively conduct the firefighting activities associated with this level of fire suppression services, the CFRS would be able to achieve the interior operations service level contained within the B.C. Playbook.



Roads Covered	Calls Covered
8%	16%

TOWN OF CANMORE
FIRE RESCUE SERVICES

SHORT-TERM (6 TO 12 MONTH) STAFFING - NFPA 1720 SUBURBAN
FIGURE 23

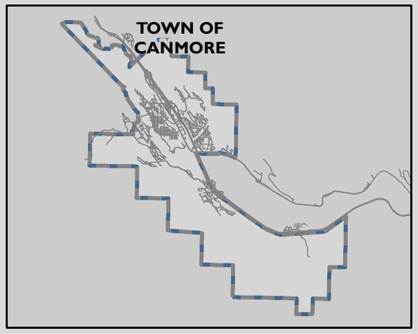
- Fire Station
- Fire Call (2012-2015)
- Municipal Boundary
- Railway

Population Growth Areas (Number of Units are Labelled)
- 5 Year Horizon
- 10 Year Horizon
- ≥ 10 Firefighters within 10 Minutes (Turnuot and Travel)

Land Use
- Commercial
- Environmental Reserve/Open Space
- Industrial
- Institutional
- Recreational
- Residential
- Vacant

Total Response Time	Turnout Time	Travel Time
10 Minutes	8.4 Minutes	1.6 Minutes

Note: Assumed improved turnout time for 8 paid responders = 8.4 minutes.



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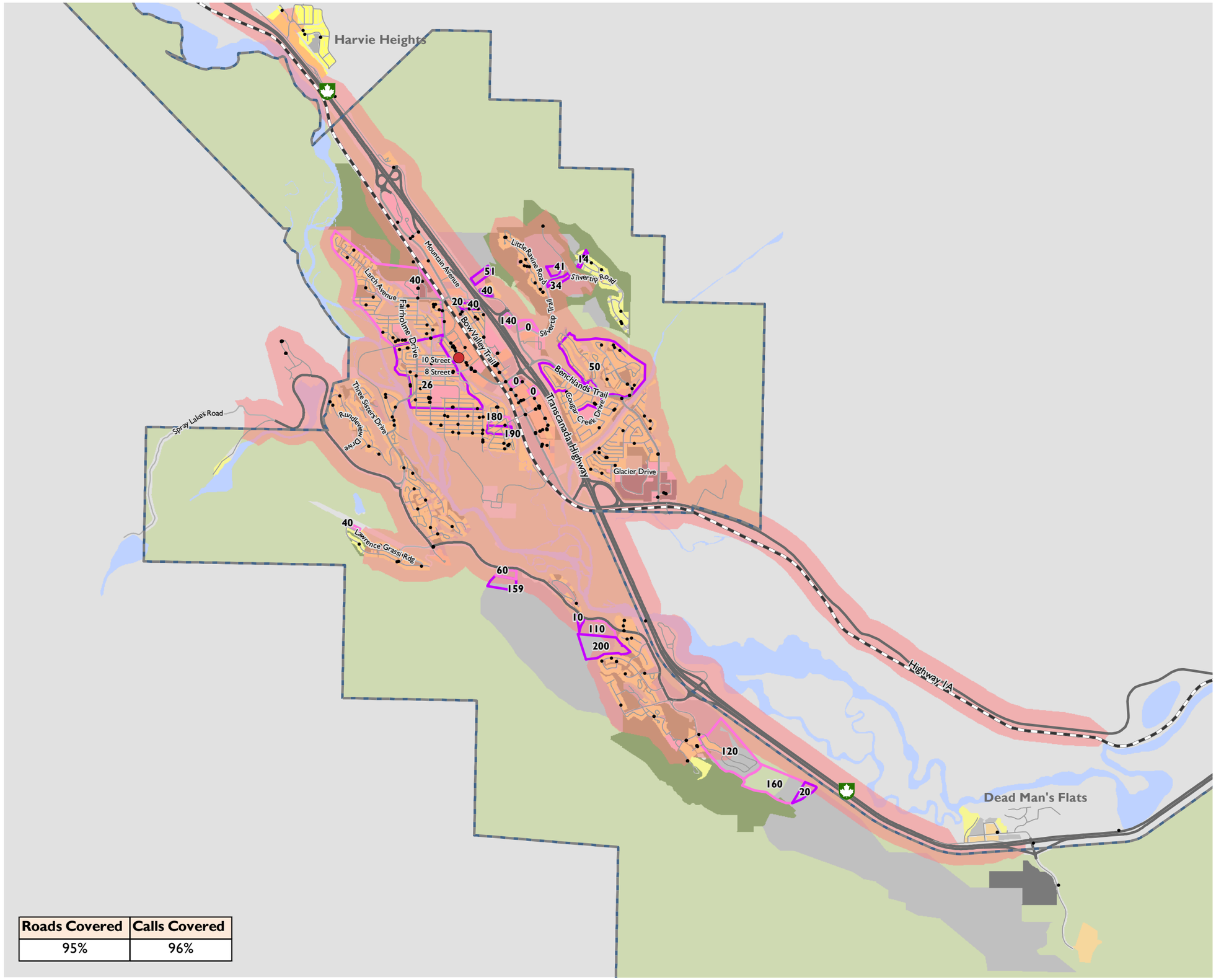


Roads Covered	Calls Covered
95%	96%

TOWN OF CANMORE
FIRE RESCUE SERVICES

SHORT-TERM (6 TO 12 MONTH) STAFFING - NFPA 1720 RURAL

FIGURE 24

- Fire Station
- Fire Call (2012-2015)
- Municipal Boundary
- Railway

Population Growth Areas (Number of Units are Labelled)

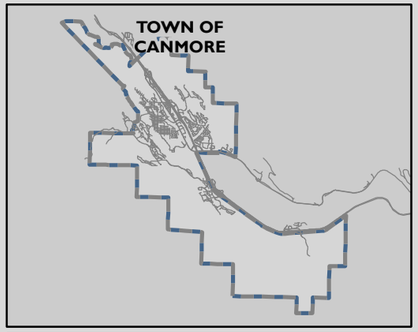
- 5 Year Horizon
- 10 Year Horizon
- ≥ 6 Firefighters within 14 Minutes (Turnout and Travel)

Land Use

- Commercial
- Environmental Reserve/Open Space
- Industrial
- Institutional
- Recreational
- Residential
- Vacant

Total Response Time	Turnout Time	Travel Time
14 Minutes	6.5 Minutes	7.5 Minutes

Note: Assumed improved turnout time for 4 paid responders = 6.5 minutes.



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11.4.2.5 Immediate Term (6 to 12 months): Ability to Achieve the Full Service Level identified within the B.C. Playbook

Subject to the full-time, career casual and paid response firefighters achieving, and sustaining the job performance requirements (NFPA 1001 – FF2 Competencies) contained within the B.C. Playbook, and the deployment of sufficient qualified firefighters to safely and effectively conduct the firefighting activities associated with this level of fire suppression services, the CFRS would be able to achieve the full service level contained within the B.C. Playbook.

11.4.3 Immediate Term (6 to 12 months) Summary

The immediate-term recommendations enhance the current organization of the paid response firefighters in developing a more effective and efficient deployment model. These recommendations help to address many of the cultural challenges identified during the stakeholder consultations. Subject to the development of a supportive scheduling process to reduce paid response turnout times this option presents an improvement in the Primary Standard that the CFRS is currently **not achieving** to a deployment performance of ten firefighters arriving on scene to 8% of roads and 16% of historic calls within a response time (turnout time + travel time) of ten minutes or less.

The immediate-term (6 to 12 month) recommendations also represent an improvement in the Secondary Standard measured from the current deployment model of six firefighters arriving on scene to 95% of Town roads, and 96% of historic emergency calls within a total response time of 14 minutes or less, to 95% of the road coverage within the Town, and 96% of the historical emergency call locations.

11.5 Short-Term Recommendations (2019)

The following short-term recommendations are intended to be implemented within the period from 12 to 36 months (by end of 2019) from Council's consideration and approval of this proposed FRMP.

Recommendations:

#31. That the proposed strategy of peak time fire suppression staffing be implemented between June 1st and August 31st providing additional 24 hour fire suppression resources;

#32. That a group of paid response casual firefighters be identified to fulfill the staffing resources needs of the proposed peak time fire suppression staffing;

#33. That the total complement of career casual firefighters be reduced to eight, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 46 paid response firefighters.

11.5.1 Proposed Organizational Design – Short-Term (2019)

The short-term (2019) proposed organizational design builds upon the changes implemented in the immediate-term and incorporates the fire suppression staffing methods proposed in Option 2 of the FRSS (**Attachment 1**). Option 2 presents a strategy to increase fire suppression staffing on a temporary basis to align with peak emergency call volumes during the summer season (i.e. June 1st through August

31st). This would increase the on-duty staffing from two full-time firefighters to four firefighters, using a combination of full-time firefighters and paid response casual firefighters.

The proposed organizational rank structure and strategies for improving the turnout times of the paid response firefighters are carried forward from the immediate-term. Within this staffing model it is proposed that the number of scheduled paid response firefighters (duty crew) could be reduced in consideration of the increased number of peak time firefighters on duty. This option reduces the number of scheduled paid response firefighters (duty crew), targeting the Secondary Standard, to two paid response firefighters, and for the Primary Standard to six paid response firefighters on the duty crew. In order to improve the sustainability of the increased reliance on the paid responders, the proposed short-term (12 to 36 month) recommendations increases the total paid response complement by five more, for a total of 46 paid response firefighters.

The part-time Administrative Assistant is recommended to be transitioned to a full-time position in the short-term (12 to 36 month), to enhance the support for the administration, prevention, education and training efforts of the department.

It is expected that the Town will continue to use Career Casual firefighters to cover shifts of the full-time emergency responders, however, as a result of the use of Paid Response Casuals it is expected that the total complement of career casual firefighters can be reduced to eight Career Casuals who meet the recommended minimum training standards and department training session attendance targets. The proposed short-term (2019) staffing recommendations are depicted in the organizational chart in **Figure 25**.

Figure 25: Short-term (2019) Staffing Recommendations

11.5.2 Comparison Framework Analysis – Short-Term (12 to 36 month) Staffing

The results of the short-term (12 to 36 month) staffing are assessed below. They are comparable to the results of Option 2 in the Phase 1 FRSS. The results within this FRMP have been updated to show the response coverage of the planned five and ten year growth and development estimates.

11.5.2.1 Short-term (12 to 36 month): Ability to Achieve Performance Objectives of NFPA 1720 – Suburban Demand Zone – Primary Standard

The predicted turnout time for the first six paid response firefighters was applied as 8.1 minutes based on our analysis of improved turnout times. With this predicted Primary Standard turnout time of 8.1 minutes for the first six paid response firefighters applied, **Figure 26** indicates where the CFRS is predicted to achieve a peak time (Summer Season) performance of ten firefighters arriving on scene within ten minutes to 13% of the road coverage within the Town, and 24% of the historical emergency call locations. This includes the partial coverage of one five year and one ten year estimated growth areas and shows improvement from the immediate term coverage.

11.5.2.2 Short-term (12 to 36 month): Ability to Achieve Performance Objectives of NFPA 1720 – Rural Demand Zone – Secondary Standard

The predicted turnout time for the first two paid response firefighters was applied as 4.4 minutes based on our improved turnout time analysis. With this predicted Secondary Standard turnout time of 4.4 minutes for the first two paid response firefighters applied, **Figure 27** indicates where the CFRS is predicted to achieve a peak time (Summer Season) performance of six firefighters arriving on scene within 14 minutes to 99% of the road coverage within the Town, and 99% of the historical emergency call locations. This provides coverage to a significant amount of the predicted five and ten year future growth parcels and shows improvement from the immediate term coverage.

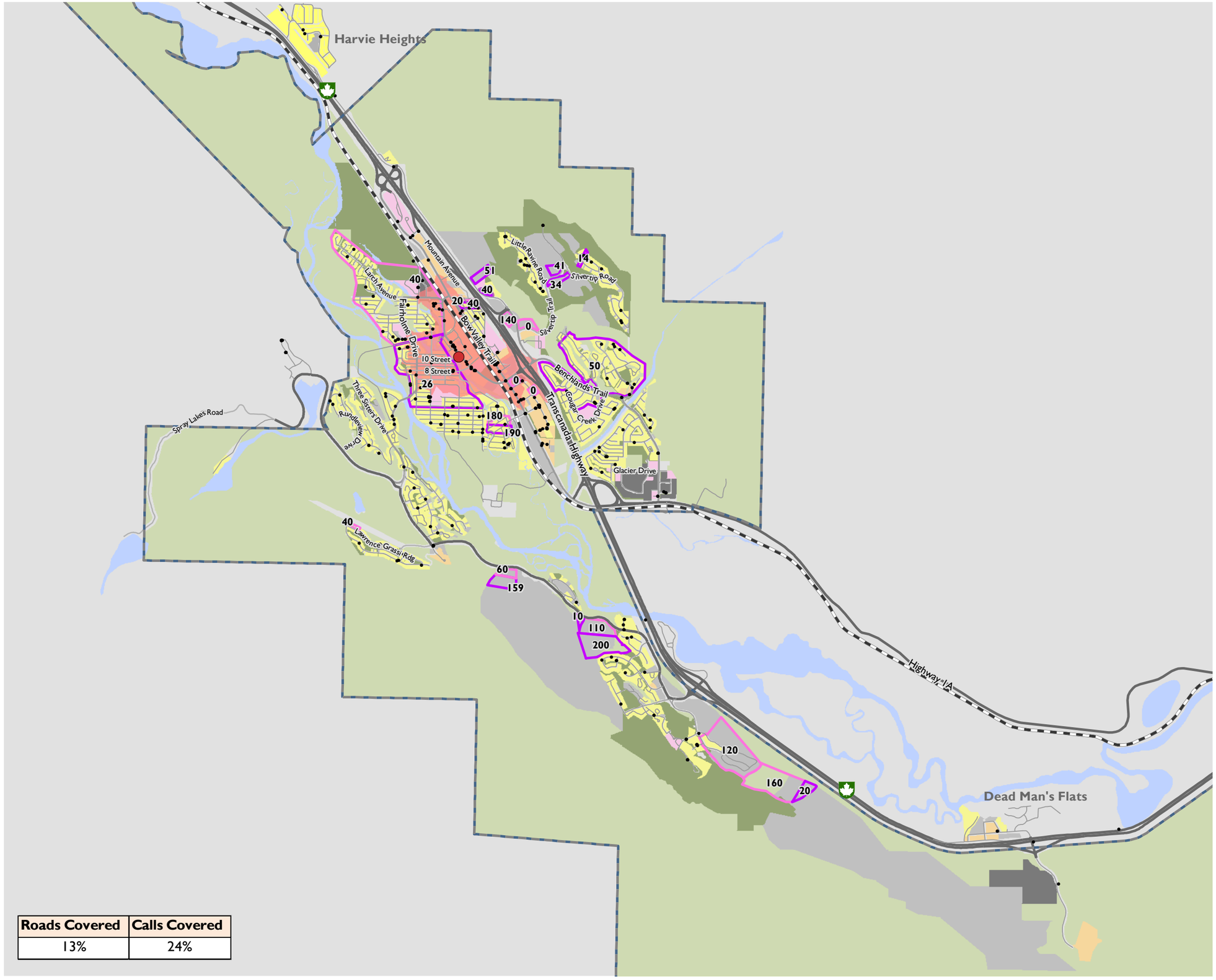
11.5.2.3 Short-term (12 to 36 month): Ability to Achieve the Exterior Operations Service Level identified within the B.C. Playbook

This staffing model presents a strategy to implement a peak time (Summer Season) increase in on duty staffing from the current two full-time firefighters to four firefighters at all times.

Subject to the full-time, career casual and paid response firefighters achieving, and sustaining the job performance requirements (Exterior Firefighter Competencies) contained within the B.C. Playbook, and the deployment of sufficient qualified firefighters to safely and effectively conduct the firefighting activities associated with this level of fire suppression services, the CFRS would be able to achieve the exterior operations service level contained within the B.C. Playbook.

11.5.2.4 Short-term (12 to 36 month): Ability to Achieve the Interior Operations Service Level identified within the B.C. Playbook

In our view, subject to the full-time, career casual and paid response firefighters achieving, and sustaining the job performance requirements (NFPA 1001 – FF1 Competencies) contained within the B.C. Playbook, and the deployment of sufficient qualified firefighters to safely and effectively conduct the firefighting activities associated with this level of fire suppression services, the CFRS would be able to achieve the interior operations service level contained within the B.C. Playbook.



Roads Covered	Calls Covered
13%	24%

TOWN OF CANMORE
FIRE RESCUE SERVICES

SHORT-TERM (12 TO 36 MONTH) - PRIMARY STANDARD, NFPA 1720 SUBURBAN
FIGURE 26

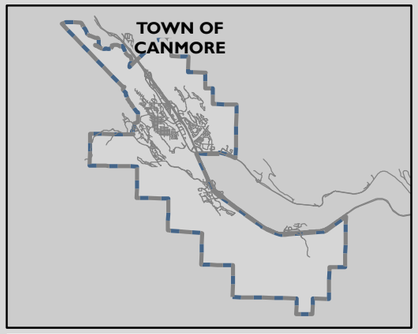
- Fire Station
- Fire Call (2012-2015)
- Municipal Boundary
- Railway

Population Growth Areas (Number of Units are Labelled)
- 5 Year Horizon
- 10 Year Horizon
- ≥ 10 Firefighters within 10 Minutes (Turnout and Travel)

Land Use
- Commercial
- Environmental Reserve/Open Space
- Industrial
- Institutional
- Recreational
- Residential
- Vacant

Total Response Time	Turnout Time	Travel Time
10 Minutes	8.1 Minutes	1.9 Minutes

Note: Assumed improved turnout time for 6 paid responders = 8.1 minutes.



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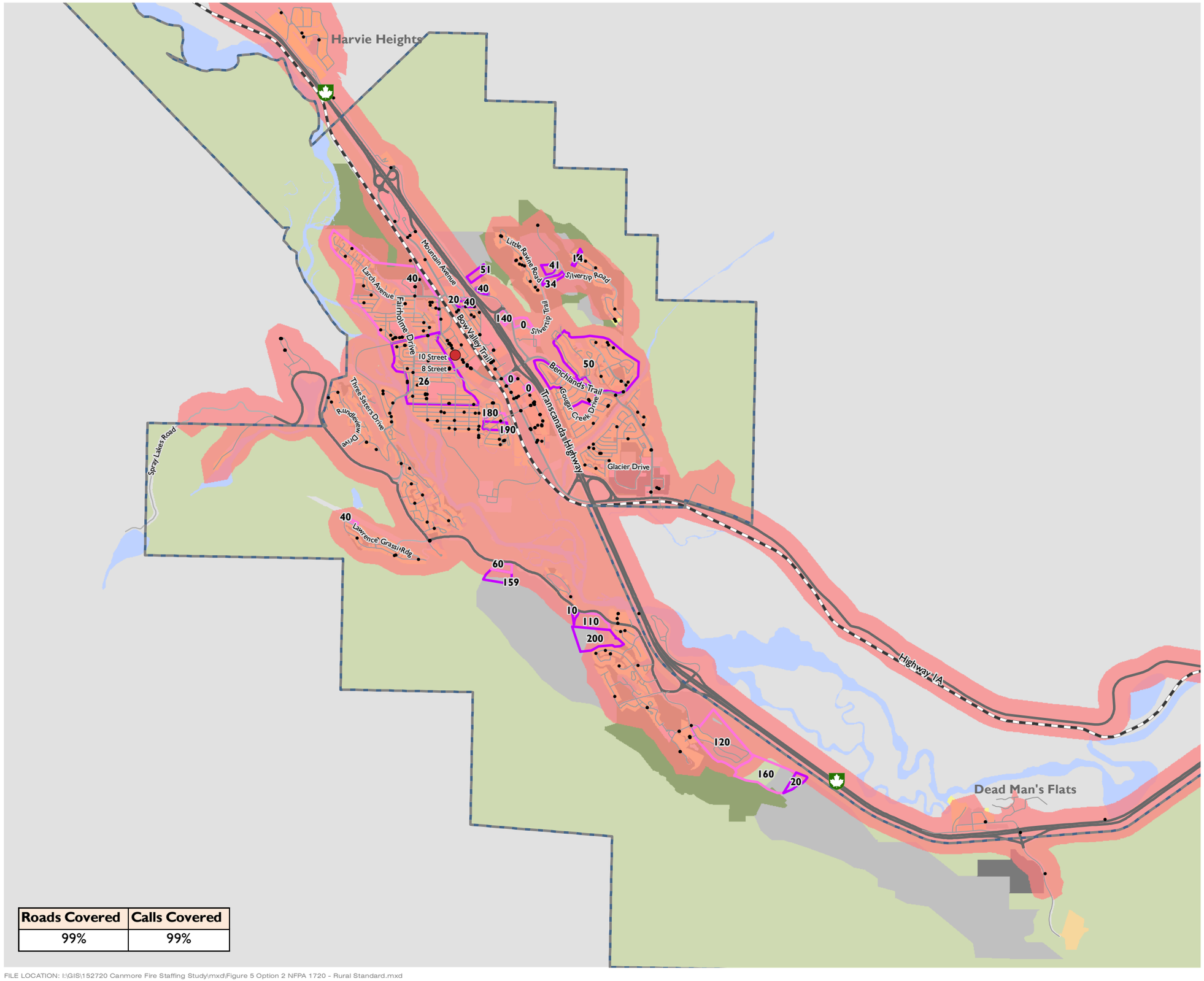


Roads Covered	Calls Covered
99%	99%

TOWN OF CANMORE
FIRE RESCUE SERVICES

SHORT-TERM (12 TO 36 MONTH) - SECONDARY STANDARD, NFPA 1720 RURAL
FIGURE 27

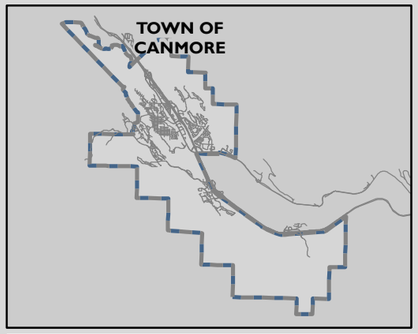
- Fire Station
- Fire Call (2012-2015)
- Municipal Boundary
- Railway

Population Growth Areas (Number of Units are Labelled)
- 5 Year Horizon
- 10 Year Horizon
- ≥ 6 Firefighters within 14 Minutes (Turnout and Travel)

Land Use
- Commercial
- Environmental Reserve/Open Space
- Industrial
- Institutional
- Recreational
- Residential
- Vacant

Total Response Time	Turnout Time	Travel Time
14 Minutes	4.4 Minutes	9.6 Minutes

Note: Assumed improved turnout time for 2 paid responders = 4.4 minutes.



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11.5.2.5 Short-term (12 to 36 month): Ability to Achieve the Full Service Level identified within the B.C. Playbook

In our view, subject to the full-time, career casual and paid response firefighters achieving, and sustaining the job performance requirements (NFPA 1001 – FF2 Competencies) contained within the B.C. Playbook, and the deployment of sufficient qualified firefighters to safely and effectively conduct the firefighting activities associated with this level of fire suppression services, the CFRS would be able to achieve the full service level contained within the B.C. Playbook.

11.5.3 Short-term (12 to 36 month) Summary

The short-term (12 to 36 month) recommendations present a strategy to increase the number of firefighters on duty during the peak time (Summer Season). During the summer season the CFRS is predicted to achieve a Primary Standard performance of the firefighters arriving on scene within ten minutes to 13% of the road coverage within the Town, and 24% of the historical emergency call locations. This option results in a Secondary Standard performance of six firefighters arriving on scene within 14 minutes to 99% of the road coverage within the Town, and 99% of the historical emergency call locations.

Implementation of the peak time staffing strategy would be an excellent candidate to test as a pilot project. It would allow for time to collect actual response data to test the real-world results of the staffing and response time performance. The modelled results indicate this option provides the highest achievement of the primary response standard (NFPA 1720 Suburban).

11.6 Medium-Term Recommendations (3 to 5 years)

The following medium-term recommendations are intended to be implemented within the period from 3 to 5 years from Council's consideration and approval of this proposed FRMP.

Recommendations:

#34. That a full-time Fire Prevention position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore;

#35. That a full-time Training/Education position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore; and

#36. That the total complement of career casual firefighters be reduced to four, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 51 paid response firefighters.

11.6.1 Proposed Organizational Design – Medium-Term (3 to 5 years)

The medium-term (3 to 5 years) staffing builds upon the changes implemented in the proposed short term recommendations. It also incorporates adding non-suppression staffing proposed in Option 4 of the FRSS, including the addition of a full-time Fire Prevention resource and a full-time Training/Education resource.

In the Medium-Term (3 to 5 years) plan it is recommended that the suppression staffing model implemented in the short-term recommendations continue. It is anticipated that the use of Paid Response Casual firefighters will further reduce the reliance on Career Casual firefighters. Alternatively, some of the Career Casual Firefighters can transition into the role of Paid Response Casual Firefighters. In order to sustain the increased demands on the paid response model, it is recommended that an additional five paid response firefighters be added for a total complement of 51.

The proposed medium-term (3 to 5 years) staffing recommendations are depicted in the organizational chart in **Figure 28**.

Figure 28: Medium-Term (3 to 5 years) Staffing Recommendations

11.6.1.1 Medium-Term (3 to 5 years): Analysis

The emergency response performance of the Medium-term (3 to 5 years) staffing model will be the same as those achieved by the short-term (12 to 36 months) model. This includes that the CFRS is predicted to achieve a Primary Standard performance of ten firefighters arriving on scene within ten minutes to 13% of the road coverage within the Town, and 26% of the historical emergency call locations and a Secondary Standard performance of six firefighters arriving on scene within 14 minutes to 99% of the road coverage within the Town, and 99% of the historical emergency call locations.

The primary difference will be the addition of a full-time dedicated fire prevention resource and a full-time dedicated public education / training resource to enhance the first two lines of defence (prevention and education and code enforcement) and improve the training program planning and delivery within the department.

11.6.2 Medium-term (3 to 5 year) Summary

The medium-term (3 to 5 years) recommendations present a strategy to increase the number of firefighters on duty during the peak time (Summer Season). During the summer season the CFRS is predicted to achieve a Primary Standard performance of the firefighters arriving on scene within ten minutes to 13% of the road coverage within the Town, and 24% of the historical emergency call locations. This option results in a Secondary Standard performance of six firefighters arriving on scene within 14 minutes to 99% of the road coverage within the Town, and 99% of the historical emergency call locations.

11.7 Long-Term Recommendations (6 to 10+ years considerations)

The following long-term options are intended to be considered within the period from 6 to 10 years (or beyond) from Council's approval of this proposed FRMP, following the completion of the recommendations within the immediate, short and medium term options.

Prior to considering the long-term (6 to 10+ years) option it is recommended that the FRMP be reviewed and updated to assess the efficiency and effectiveness of the proposed short and medium terms recommendations of this FRMP. This should include an analysis of the results achieved with the improvements implemented in the proposed short and medium-term horizons. Within this update the actual emergency response performance can be assessed using updated turnout time data collected from the emergency calls responded to by CFRS during the first five years of this FRMP. If the Town is satisfied with the service provided following the medium-term implementation, the need may not exist to proceed with the long-term option.

If the results of the short and medium-term analysis suggest that the staffing models recommended are meeting the needs of the community and responding to the growth areas, then the staffing model should be maintained. If the results indicate gaps in services compared with the needs of the community and development parcels then it is recommended that the Town of Canmore further consider the proposed Option 4, with four on-duty full-time suppression staff, contained within the Phase 1 Fire-Rescue Staffing Study (**Attachment 1**).

Recommendations for the long-term (6 to 10+ year) planning horizon include the following:

Recommendations:

#37. ***At the end of the medium-term horizon (5 year) planning horizon of the proposed Fire-Rescue Master Plan that the Town of Canmore update the analyses and actual performance of Canmore Fire-Rescue Services;***

#38. ***Subject to the findings of the Fire-Rescue Master Plan Update that the Town of Canmore further consider the proposed Option 4 contained within the Phase 1 Fire-Rescue Staffing Study and outlined in this FRMP.***

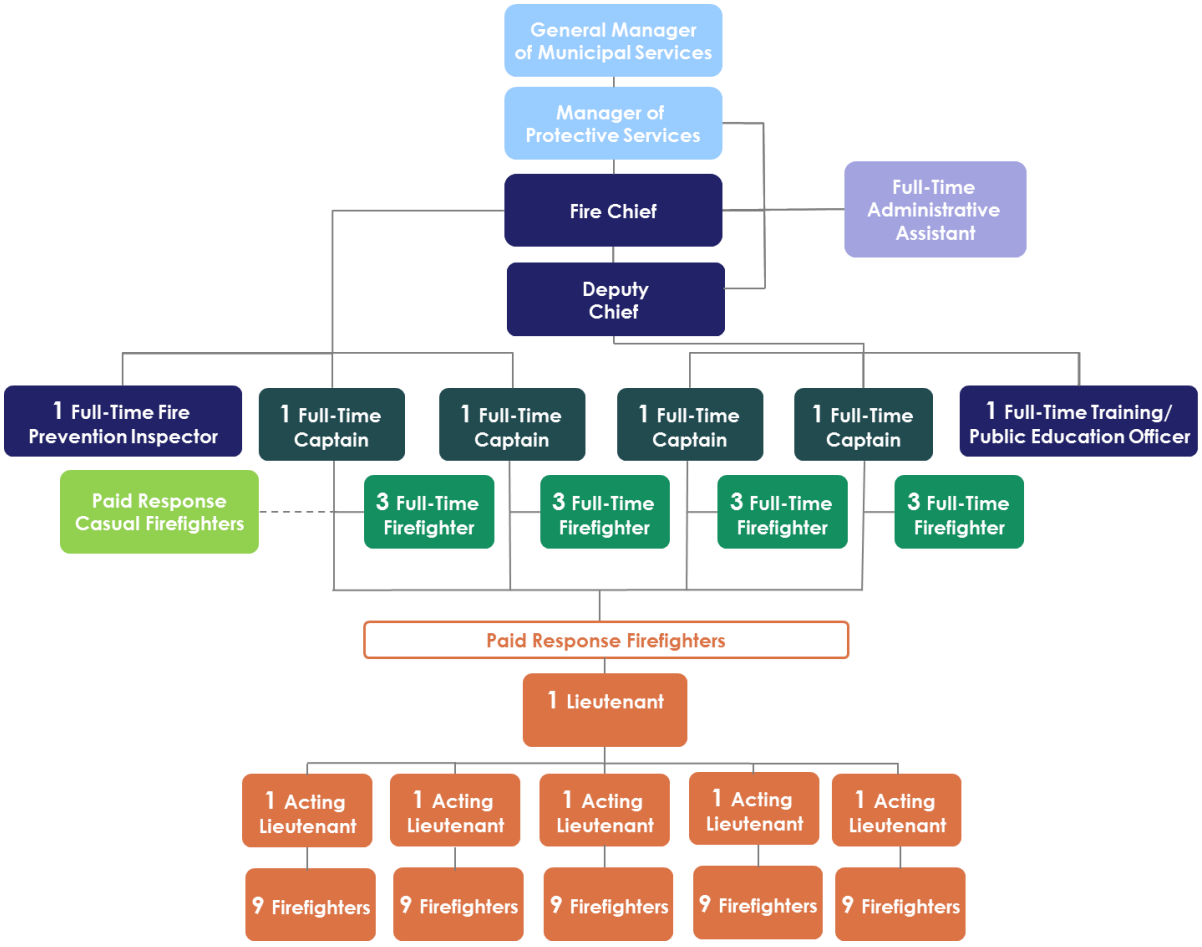
11.7.1.1 Long-term (6 to 10+ year considerations) Proposed Organizational Design

If gaps in service are identified and a need for additional full-time suppression resources is determined(such as is presented in Option 4 with four on-duty full-time suppression staff), then the phased implementation of the long-term staffing model can move forward if approved by Council.

Option 4 from the FRSS reflects an increase in staffing of two full-time firefighters per platoon. This would increase the scheduled on duty suppression staffing from two full-time firefighters to four firefighters. It is anticipated that the long-term staffing model would phase-in over a two-year period, adding four full-time firefighters per year for the two year period to achieve a model of four on-duty suppression staff (one officer and three firefighters). It is expected that the Paid Response Casual Firefighters utilized for the peak season staffing would continue to be available for shift-coverage for the full-time staff to replace the career casual model. It is expected that the long-term model would sustain the complement of 51 paid response firefighters to support the sub-urban response standard and provide depth of response resources to the department, as well as maintaining the Deputy Chief, full-time Administration Assistant, full-time fire prevention resource and full-time training resource proposed within the short and medium term recommendations of this FRMP.

The proposed long-term (6 to 10+ years) staffing considerations are depicted in the organizational chart in **Figure 29**.

Figure 29: Proposed Long-Term (6 to 10+ year) Staffing (Subject to Confirmation at FRMP Mid-term)



11.7.1.2 Long-Term (6 to 10+ year considerations): Analysis

The emergency response performance of the long-term (6 to 10+ year) staffing model will be the same all year long as those achieved by the medium-term (3 to 5 year) model during the peak-season staffing. This includes that the CFRS is predicted to achieve a Primary Standard performance of ten firefighters arriving on scene within ten minutes to 13% of the road coverage within the Town, and 26% of the historical emergency call locations and a Secondary Standard performance of six firefighters arriving on scene within 14 minutes to 99% of the road coverage within the Town, and 99% of the historical emergency call locations.

11.7.2 Long-Term (6 to 10+ year considerations) Summary

This long-term (6 to 10+ year) operating model provides the same improvement to the emergency response performance measured against the primary and secondary standards as the short term(2019) and medium terms, but provides the improvement all year long as opposed to seasonally. As such, the cost implications are the highest of all recommendations presented.

11.8 Fire Suppression Service Delivery Recommendations

Recommendations for Fire Suppression Service Delivery include the following:

Immediate Term Recommendations (6 to 12 months):

28) ***That the new organizational structure for the paid response firefighters be implemented.***

29) ***That as an initial transition from reliance on career casual firefighters the total complement be reduced to 12 career casual firefighters.***

30) ***That the total complement of paid response firefighter be increased by five firefighters to a total complement of 41 paid response firefighters to improve the sustainability of the paid response model and improve reliability of turnout.***

Short-Term Recommendations (2019):

31) ***That the proposed strategy of peak time fire suppression staffing be implemented between June 1st and August 31st providing additional 24 hour fire suppression resources.***

32) ***That a group of paid response casual firefighters be identified to fulfill the staffing resources needs of the proposed peak time fire suppression staffing.***

33) ***That the total complement of career casual firefighters be reduced to eight, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 46 paid response firefighters.***

Medium-Term Recommendations (3 to 5 year):

34) ***That a full-time Fire Prevention position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore.***

35) ***That a full-time Training/Education position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore.***

36) ***That the total complement of career casual firefighters be reduced to four, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 51 paid response firefighters.***

Long-Term Recommendations (6 to 10+ year considerations):

37) ***At the end of the medium-term horizon (5 year) planning horizon of the proposed Fire-Rescue Master Plan that the Town of Canmore update the analyses and actual performance of Canmore Fire-Rescue Services.***

38) ***Subject to the findings of the Fire-Rescue Master Plan Update that the Town of Canmore further consider the proposed Option 4 contained within the Phase 1 Fire-Rescue Staffing Study and outlined in this FRMP.***

12.0 Apparatus, Equipment and Fire Station

This section will review Canmore Fire-Rescue Services existing apparatus, equipment and fire station condition / capacity.

12.1 Staffing Resources

Currently the fleet and equipment is managed by one of the Captain positions, under the Operations Portfolio for the department. This responsibility includes overseeing the department's mechanical needs (i.e. service repairs and maintenance), equipment needs and fleet needs to ensure the delivery of fire and rescue services to the Town of Canmore. This role is responsible for managing supplies, coordinating with the Town's Fleet Services and addressing regular issues and challenges brought forward from the front-line staff.

According to the Fire-Rescue Strategic Plan, the fleet is maintained 90% with the Town of Canmore in house mechanic with the remaining 10% being specialized inspections and certifications.

The Town's Fleet Services currently has two mechanics. One of the two is working towards the Emergency Vehicle Technician (EVT) certification. It is recommended that both of the Town mechanic's achieve this designation, for redundancy and succession planning. The costs associated with attaining EVT certification will depend on the existing qualifications of the individual, as well as the availability and location of courses and examinations.

Recommendation #39: ***That both of the mechanics within the Town of Canmore's Fleet Services Department attain the Emergency Vehicle Technician (EVT) certification.***

12.2 Policies and Procedures

Canmore Fire-Rescue Standard Operating Guideline No 104 – *Fire Department Apparatus and Equipment* (2014) is written to ensure regular maintenance and inspection of apparatus. The primary focus of the SOG is related to firefighter safety and health. The SOG also includes specific details about apparatus acquisition, operation, design, construction, maintenance, inspection and repair. Our review indicates that guidelines around apparatus and equipment maintenance should be reviewed and updated within the process previously identified within this FRMP of reviewing all department SOGs.

12.3 Types of Major Fire Apparatus

NFPA 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. NFPA 1901 provides the following definitions of major fire apparatus:

Pumper: Fire apparatus with a permanently mounted fire pump of at least 750gpm (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): 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 NFPA 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.

12.4 Current Apparatus Fleet

The apparatus and equipment review conducted within this FRMP identified CFRS as a well-equipped fire department with an existing fleet of apparatus that is considered appropriate for the fire risk within the community.

The current major apparatus fleet of the CFRS includes three major types of units including a Rescue #31, Tower (Quint) #31, and Engine/ Pumper #31. The CFRS also has a fast attack vehicle and one utility truck. These are used for moving equipment and staff to emergency incidents and can be used by staff conducting inspections and other department programs. In addition to the major apparatus fleet, CFRS

also has two speciality vehicles including a trail rescue Kubota and a boat for water rescue operations. A detailed table of CFRS existing fleet is included in **Table 23.**

The review of information provided as part of this FRMP indicates that the majority of the major apparatus and equipment operated by the CFRS are currently in good condition and reflect the types of major apparatus that would be expected based on the fire risks present.

The CFRS does not have any service-ready reserve apparatus in the event one of the current front-line apparatus is out of service for maintenance or as a result of a mechanical breakdown. In our view this is a need that should be addressed within a capital reserve apparatus replacement strategy.

With the current fleet, the department experiences challenges in transporting staff to emergency scenes and to training sites. The recommendations within this FRMP propose increasing the size of the paid response complement.

Recommendation #40: ***That consideration be given within the capital planning process to purchasing a crew-transport vehicle for the department.***

Table 23: Canmore Fire-Rescue Existing Fleet

Vehicle		Model/Description	Year	Front-line, Specialty, or Reserve Apparatus
Rescue 31		E-One (Recue/ Pumper)	2000	Front-line
Tower 31		Bronto Skylift – E-One Bronto Quint (Ground Ladders, Fire Pump, Aerial Device, Water Tank, and Fire Hose)	2003	Front-line

Vehicle		Model/Description	Year	Front-line, Specialty, or Reserve Apparatus
Pump 31		E-One Cyclone (Pumper)	1993	Front-line
Fast Attack 31		Ford F-350	1995	Specialty
Utility 31		Dodge Ram 2500	2013	Front-line
Squad 31		Ford Super Duty	2016	Front-line

Vehicle		Model/Description	Year	Front-line, Specialty, or Reserve Apparatus
31 Rover		Trail Rescue/ Fire Suppression Unit	2006	Specialty
Boat		Water-Rescue		Speciality
Bob 31		Bobcat – Miscellaneous		Speciality

12.4.1 Fleet Replacement Plan

Life cycle planning is a core component of the capital planning process for fire departments across Canada. While the CFRS does not currently have a formal asset management plan, CFRS apparatus is included in the department capital plan. 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.

Review of the major apparatus replacement and equipment replacement plans for municipalities with similar types of use and wear reflect a best practice strategy of 15 years of service as front-line apparatus (e.g. Pumps) and a further five years of service in a reserve capacity reflecting a 20 year

overall life cycle for major apparatus such as pumpers and rescues. Specialty apparatus, such as rescues, towers, tankers, etc. reflect a best practice replacement cycle of 20 years as front-line with five additional years in a reserve capacity.

This review indicates that the Town does not currently have a capital replacement plan to replace major apparatus within the presented best practices life cycles. CFRS has accounted for replacement costs of existing apparatus within the capital plan. Presently pumpers are scheduled to be replaced every 20 years, tower every 25 years and smaller vehicles every 10 years. **Table 24** illustrates a proposed replacement schedule based on best practices.

This is not uncommon for smaller municipalities facing challenges in funding their infrastructure replacement needs. As such there are options for a municipality to extend the life cycle of a major apparatus subject to completing an annual acceptance test as defined within NFPA 1701, *Standard for Automotive Fire Apparatus*.

Table 24: Apparatus Replacement Schedule

Front Line Apparatus	Year	Replacement Year	Cost
Rescue 31	2000	2020	$1,000,000
Tower 31	2004	2023	$1,800,000
Pump 31	1992	2017[13]	$500,000
Fast Attack	1995	2017[14]	$850,000

Recommendation #41: ***That consideration be given to adopting a Council-approved fleet replacement plan or cycle that reflects best practices for front-line and specialty apparatus to support long-term capital asset planning of Canmore Fire-Rescue Services' major apparatus.***

12.4.2 Reserve Apparatus

Currently, Canmore Fire-Rescue Services does not have any reserve vehicles. It should be recognized that in the event that any of the front-line apparatus are out of service at any time, the overall firefighting capability of the department is significantly reduced. This includes the department's ability to have firefighters respond as well as the equipment capacity to mitigate the emergency.

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 through the replacement of Pump 31, which was purchased in 1992. This strategy would initiate a cycle of replacing the front-line pumper

[13] Pump 31 will be replaced in 2017. The replacement year for the new apparatus will be 2037.
[14] Fast Attack will be replaced in 2017. The replacement year for the new apparatus will be 2037.

on a 15 year cycle. The replacement pumper is scheduled for delivery to CFRS in the second quarter of 2017.

Recommendation #42: ***That consideration be given to creating a major apparatus reserve capacity, including a minimum of one pumper.***

12.5 Equipment

As previously mentioned, the equipment required for Canmore Fire-Rescue is also managed in the Operations Portfolio. CFRS currently has the necessary equipment to perform fire-rescue operations for the Town of Canmore. In addition, CFRS has specialized equipment which enable rescue operations such as Rope Rescue, Aquatic Rescue, Ice Rescue and Confined Space Rescue. A detailed list of CFRS equipment is located in **Table 25.**

Equipment maintenance is also included in Standard Operating Guideline No 104 – *Fire Department Apparatus and Equipment* (2014).

12.5.1 Equipment Replacement Cycles

Equipment replacement cycles, similar to fleet replacement cycles, should be adopted within the capital planning process for the department. The replacement cycles listed in **Table 25** are reasonably reflective of industry practices for a composite department such as CFRS.

Table 25: Equipment Details

Equipment	Manufacturer	Year Purchased	Current Replacement Cycle
Bunker Gear	Starfield	2014	5
SCBA	Draeger	2009	10
Air Tanks	Draeger	2009	10
Hoses and Nozzles	Miscellaneous	Various	As Needed
Defibrillators	Zoll	2015	10

12.5.2 Equipment Replacement Plans

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.

Industry best practices and manufacturers' directions suggest personal protective equipment, such as firefighters bunker gear, should be replaced based on a ten-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,

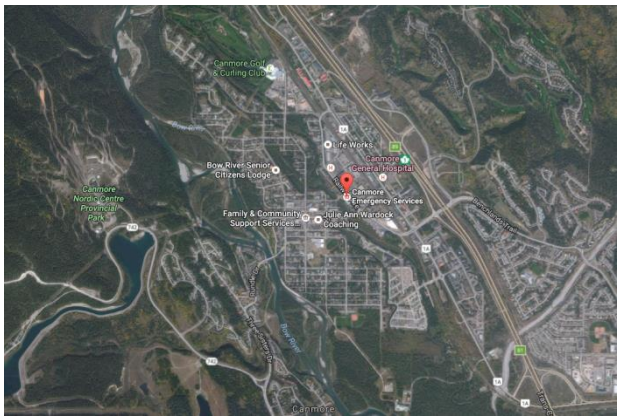
as well as maintain an appropriate life cycle replacement plan. The CFRS indicates that there is sufficient budget for equipment replacement, but there is no formal plan for life cycle replacement.

Recommendation #43*: That the Town of Canmore develop and adopt a Council-approved life-cycle plan for all equipment, including firefighters bunker gear and self-contained breathing apparatus based on industry best practices and manufacturers' directions.*

12.6 Fire Station

Canmore Fire-Rescue Services currently operates from one fire station, which is strategically located within the Town at 1021 Railway Avenue in the core of the Town of Canmore. The station has four drive-through apparatus bays as well as offices, dormitories, weight room, lecture room and a kitchen. The building is approximately 13,325 square feet, total area. Given the size of the department and the complement of speciality rescue apparatus, the station is currently considered to be undersized. From our review it was noted that the classroom training area is small for the current department size and does not allow for planned growth of the department size. The apparatus bays are currently quite full. CFRS has provided functional revisions to address facilities for both genders, but it does not currently reflect a facility with the amenities of a modern fire station.

Figure 30: Canmore Fire-Rescue Station Location



A fire hall spatial needs study completed by *Marshall Tittemore Architects* in 2016, stated that the CFRS fire station has reach its maximum functional capacity. The limited space within the current fire hall impact all aspects of Canmore Fire-Rescue Services including, administration, prevention and public education, training and operations. **Table 28** presents the key findings from the spatial needs study.

Given the recommendations in this FRMP and the need to dedicate a reserve apparatus with the fleet, the fire hall requires increased bay space and storage space to store reserve apparatus, equipment and the command trailer. The spatial needs assessment indicated that expansion of the footprint of the building is not possible, but there is expansion space possible by building an additional storey on each of the wings, to provide more training and administration space.

Further investigation needs to be undertaken to understand the potential to expand fire hall space and storage for CFRS. As the fire hall approaches maximum capacity the station will require consideration for renovation or reconstruction. Alternate options include locating a site for storage of specialty vehicles and equipment which are not considered front-line response units. An alternate site for training should

also be located for use by CFRS, with a permanent status, as opposed to the temporary lease being used presently.

Recommendation # 44: ***That Canmore Fire-Rescue Services explore solutions for increasing storage and bay capacity and training (e.g. increase classroom size) facilities both within the fire station and at alternate sites, as required.***

Recommendation # 45: ***That Canmore Fire-Rescue allocate bay capacity for a reserve pumper.***

12.7 Diesel Emissions

Currently, the diesel emissions are controlled within the fire station apparatus floor through a 'direct connection' system that connects diesel exhaust hose lines to the exhaust pipes of individual vehicles. It is our understanding that CFRS is investigating updating this system to 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.

12.8 Apparatus, Equipment and Fire Station Recommendations

Recommendations for the major apparatus and equipment include the following:

39) ***That both of the mechanics within the Town of Canmore's Fleet Services Department attain the Emergency Vehicle Technician (EVT) certification.***
40) ***That consideration be given within the capital planning process to purchasing a crew-transport vehicle for the department.***
41) ***That consideration be given to adopting a Council-approved fleet replacement plan or cycle that reflects best practices for front-line and specialty apparatus to support long-term capital asset planning of Canmore Fire-Rescue Services' major apparatus.***
42) ***That consideration be given to creating a major apparatus reserve capacity, including a minimum of one pumper.***
43) ***That the Town of Canmore develop and adopt a Council-approved life-cycle plan for all equipment, including firefighters bunker gear and self-contained breathing apparatus based on industry best practices and manufacturers' directions.***
44) ***That Canmore Fire-Rescue Services explore solutions for increasing storage and bay capacity and training (e.g. increase classroom size) facilities both within the fire station and at alternate sites, as required.***
45) ***That Canmore Fire-Rescue allocate bay capacity for a reserve pumper.***

13.0 Communication & Technology Review

This section relates to the internal communications within the CFRS for the distribution of information either face-to-face, through policies and procedures electronically or in printed format. Ensuring that the internal process for communications is a two-way process, both presenting information and seeking feedback is a core element of a successful communications plan. Currently, the Fire Chief is responsible for the communications system and maintenance.

This section also considers the communications systems used by emergency responders including the alerting system for volunteer firefighters and the radio system for managing emergency incidents.

13.1 Emergency Communications & Dispatch

As previously mentioned within this FRMP, Dispatch and Communications for CFRS are provided by Foothills Regional Emergency Services Commission (FRESC), a separate municipal body that is responsible for emergency and non-emergency calls for the department. This report includes the following recommendation with respect to the current fire dispatching agreement:

> *"It is recommended the dispatch agreement be updated to include the performance objectives for emergency call taking and dispatching services included within the NFPA 1221 "Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems".*

Emergency calls are dispatched via radios to on-duty crews and pagers/-radios are used to notify paid response firefighters. Emergency call notification is also regulated by an emergency alerting phone application called Active911. According to their website, *"Active911 is a digital messaging system that delivers alarms, maps and other critical information instantly to first responders. Active911 also allows response efforts to be monitored in real time".* (https://www.active911.com/)

In our experience we have seen that purchasing dispatching services as an effective and efficient strategy for dispatch, however; it must still be recognized that there is an ongoing role to manage and review the performance of the service and the agreement.

13.1.1 Station Notification

Currently CFRS relies on pagers and radios to notify staff in the station of calls for emergency response. No station-wide notification system (e.g. station alarm / alert) is in place. This could improve the communication for the department and may assist in improving turnout times.

Recommendation #46: ***That CFRS investigate the implementation of station notification (e.g. station alarm / announcement) for emergency response calls.***

13.2 Radio Systems

In 2016, Canmore Fire-Rescue Services implemented a new radio system to allow Town departments to communicate with each other via radio networks. The intention of this initiative is to improve operability across departments during community emergency events.

13.3 Internal Communications

Internal communications within a composite fire department is an ongoing challenge. Due to the nature of the model where all firefighters may not be attending every training session, or every emergency incident, the level of internal communications can fluctuate. Consultations with paid response firefighters, full-time firefighters, career casual and CFRS administration, highlighted symptoms of not having the optimal level of internal communications.

Part of the communication challenge relates to the shift structure within CFRS. Currently, there are limited processes whereby shift notes can be transferred between personnel changing shifts. There is an on-duty book for written notes between senior officers on shift however; it is not utilized to the same degree by all staff. In addition, the Deputy Chief and Fire Chief work opposing schedules, therefore opportunities to align communication and address CFRS issues are limited. A daily electronic log book incorporated in the new records management system would provide optimal management of notes and improve communication. The importance of continuous, consistent communication across shifts should also be reiterated to department staff in an effort to improve the cultural compliance to communication procedures.

The FRMP presents options for changing aspects of the organizational structure of the CFRS. The process to consider these changes and implement Council's recommendations will require both an internal and external communication plan so that all stakeholders are fully aware of the changes. Prioritizing both internal and external communications should be considered a priority of implementing the recommendations of this FRMP.

Recommendation #47: ***That a formal process for exchanging shift notes for all levels of staff through a digital platform is developed and implemented by CFRS to improve internal communication.***

13.4 Enhancing Turnout Time with Technology

13.4.1 Flashing Green Lights for Paid Responders

In Alberta the Vehicle Equipment Regulation within Traffic Safety Act, 2000 (TSA, 2000) authorizes volunteer firefighters (paid responder) to display a flashing green light on their personal vehicle while responding to an emergency. The use of these flashing green lights is a strategy to improve turn-out times for volunteer firefighters (paid responders) responding to the fire station.

Public awareness and education with regard to the presence of volunteer firefighters (paid responders) and the use of the flashing green lights within their community is an important consideration. Many communities that adopt the use of these flashing green lights provide street signage to provide awareness to drivers of their presence.

Recommendation #48: ***That Canmore Fire-Rescue Services consider implementing the green flashing light program for paid response firefighters to improve department turnout time. It is further recommended that the Town support the installation of street signage reflecting the use of paid response firefighter flashing green lights within the Town of Canmore.***

13.4.2 Call-Back Technology

The CFRS currently utilize the Active 911 digital messaging system as the alerting system for paid response to respond to an incident. This system can page a wide variety of electronic devices by sending an e-mail from the Dispatch Centre. During the internal stakeholder consultation there were a number of concerns raised with respect to the operation of the Active 911 system. Our understanding is that these concerns relate to inconsistencies in firefighters receiving the alert. In part this may be as a result of the hardware (type of electronic device) being used by the firefighters. These are owned by the individual firefighters and not provided by the Town. The concerns may also be related to the understanding of how to use the system including loading the required technology, updating, and acknowledging a page.

The use of technology to provide the timeliest and most efficient notification of staff, including full-time and paid response firefighters is an important component for consideration by the CFRS as a means to improve turnout times across the department. As an example, the current call-back process for off-duty firefighters requires manual phone calls to the off-duty firefighters in the event of a significant fire / emergency call (e.g., structure fire).

In our experience single purpose pagers, such as the Motorola Minitor VI two tone page, provide an electronic solution designed specifically for emergency services for alerting off-duty firefighters. Implementing a pager system such as the Minitor VII would require the Town to purchase the pagers. Although there is a cost to this process it would eliminate the use of personnel electronic devices and provide a consistent method for alerting all of duty firefighters including the full-time firefighters required for call back. This could improve the response time during moderate to high risk fire calls (such as house fires) and increase the depth of resources responding to these events.

Recommendation 49: ***That CFRS investigate and implement technology-based efficiencies to enhance the alerting process for paid response firefighters and off-duty firefighters on call-back.***

13.4.3 Station Design

Turnout times for crews within the station are affected by the layout and design of the station facility itself. Future renovations or rebuilds of the Town's fire station should take into account the current best practices for improving turnout time through design.

13.5 Communications and Technology Summary and Recommendations

Effective two way communications is an important element of any successful organization. In the fire service, the importance of effective communications can be related to the health and safety of the organization and its members.

This FRMP reflects the potential for significant change within Canmore Fire-Rescue Services subject to the consideration and approval of Council. Communications in every aspect will be a critical element to the success of the plan.

Recommendations for Communications and Technology include the following:

46) ***That CFRS investigate the implementation of station notification (e.g. station alarm / announcement) for emergency response calls.***
47) ***That a formal process for exchanging shift notes for all levels of staff through a digital platform is developed and implemented by CFRS to improve internal communication.***
48) ***That Canmore Fire-Rescue Services consider implementing the green flashing light program for paid response firefighters to improve department turnout time. It is further recommended that the Town support the installation of street signage reflecting the use of paid response firefighter flashing green lights within the Town of Canmore.***
49) ***That CFRS investigate and implement technology-based efficiencies to enhance the alerting process for paid response firefighters and off-duty firefighters on call-back.***

14.0 Recommendations, Implementation and Financial Implications

The recommendations of this FRMP have been developed in consideration of the strategic priorities identified within this plan. This section incorporates the recommendations presented in the Phase 1 Fire-Rescue Staffing Study as well as Phase 2 Fire-Rescue Master Plan. The proposed time lines include the immediate-term representing the first 6 to 12 months following consideration and approval of the proposed FRMP, short-term representing implementation in 2019, medium-term reflecting within the three to five year period, and long-term representing the six to ten or more years horizon.

This section of the FRMP provides an implementation strategy that categorizes the recommendations of this plan by proposed time horizon. All decisions related to budget, policy, or bylaw will be brought back to Council prior to implementation.

14.1 Implementation Strategy

Table 26 summarizes the recommendations by proposed time horizons and presents high-level estimates of the related financial implications.

Table 26: Operational Recommendations

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
Immediate-Term	n/a	n/a	*#1: That Council approve the strategic priorities identified within the proposed Fire-Rescue Master Plan to guide the development and delivery of fire protection services within the Town of Canmore.*
Immediate-Term	-	-	*#2: That Canmore Fire-Rescue Services implement a Senior Officer Shift Schedule that provides senior officer coverage seven days per week.*
Immediate-Term	-	-	*#5: That the Fire Chief meet with the Foothills Regional Emergency Services Commission to request that the current dispatch agreement be updated to include the performance objectives for emergency call taking and dispatching services included within the NFPA 1221 "Standard for the Installation, Maintenance, and Use of Emergency Services Communications*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
			Systems."
Review in Immediate-Term / Timing According to the Resource Plan	*$1,000*	-	*#12: That the proposed Fire Inspection Staff Resource Plan be approved and implemented.*
Review in Immediate-Term / Timing According to the Resource Plan	*$10,000 (inclusive of backfill)*	-	*#13: That the proposed Public Education Staff Resource Plan be approved and implemented.*
Immediate-Term	-	-	*#23: That the 'Standard Operating Guideline 110 – Risk Management' and 'Standard Operating Guideline 218 – Incident Safety Officer' be revised based on the recommendations of the proposed Fire-Rescue Master Plan.*
Review in Immediate-Term / Timing According to the Resource Plan	-	-	*#25: That proposed Training Staff Resource Plan be implemented.*
Immediate-Term	-	-	*#26: That each of the department's portfolio responsibilities be updated to reflect the changes and seek to balance workload across the Senior Officers.*
Immediate-Term	-	-	*#27: That consideration be given to utilizing the recruitment and retention strategies for paid response firefighters included within the Alberta Volunteer Firefighter Recruitment and Retention Strategy as part of enhancing recruitment and retention of paid response firefighters in the Town of Canmore.*
Immediate-Term	$**3,566** (represents a10% increase for the six paid response officers in new organizational structure)	-	*#28: That the new organizational structure for the paid response firefighters be implemented.*
Immediate-Term	-	-	*#29: That as an initial transition from reliance on career casual firefighters the total complement be reduced to 12 career casual firefighters.*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
Immediate-Term	Increase of five paid response (5 x $5,944 = **$29,970)**	Equipment for five additional paid response (5 x $2,500) = **$12,500**	*#30: That the total complement of paid response firefighter be increased by five firefighters to a total complement of 41 paid response firefighters to improve the sustainability of the paid response model and improve reliability of turnout.*
Immediate-Term	-	-	*#41: That consideration be given to adopting a Council-approved fleet replacement plan or cycle that reflects best practices for front-line and specialty apparatus to support long-term capital asset planning of Canmore Fire-Rescue Services' major apparatus.*
Immediate-Term	-	(maintenance costs only if department keeps existing Pumper as reserve following replacement in 2017)	*#42: That consideration be given to creating a major apparatus reserve capacity, including a minimum of one pumper.*
Immediate-Term	-	-	*#43: That the Town of Canmore develop and adopt a Council-approved life-cycle plan for all equipment, including firefighters bunker gear and self-contained breathing apparatus based on industry best practices and manufacturers' directions.*
Short-Term	-	-	*#4: That the current Establishing and Regulating Bylaw 2013-08 be updated to reflect the direction of Council in respect to the delivery of fire-rescue services.*
Short-Term	-	-	#6: That *the Fire Chief take the following steps regarding standard operating guidelines:* • *Establish and empower a standard operating guideline committee composed of fire service staff to research, develop, and draft new*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
			standard operating guidelines and to update existing standard operating guidelines; • *Conduct a review of all existing standard operating guidelines and where necessary complete revisions or develop additional standard operating guidelines to reflect all levels of service approved by Council;* • *Prioritize the development of SOGs relating to fire prevention (including public education) and department training; and* • *Ensure that the department continues the on-going process of regularly reviewing and updating department policies, operational procedures and relevant bylaws.*
Short-Term	-	-	*#7: That the Fire Chief prepare and submit an annual report summarizing the service delivery performance of all divisions and highlighting the department's achievements for Canmore Fire-Rescue Services on an annual basis.*
Short-Term	-	-	*#8: That a detailed Fire Prevention Program or Policy be developed.*
Short-Term	-	-	*#9: That the proposed public education program cycle objectives be included within the proposed Fire Prevention Policy/Program.*
Short-Term	-	-	*#10: That the proposed fire inspection cycle objectives be included within the proposed Fire Prevention Policy/Program.*
Short-Term	-	-	*#11: That the proposed Home Smoke Alarm and Escape Planning Program be included within the proposed Fire Prevention Policy/Program.*
Short-Term	-	-	*#14: That the department develop and implement minimum training requirements for all CFRS firefighters to clearly outline the minimum training attendance requirements for*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
			minimum training attendance requirements for all Canmore Fire-Rescue Services firefighters.
Short-Term	-	-	*#15: That Canmore Fire-Rescue Services formalize a comprehensive annual training program based on the International Fire Service Training Association firefighter curriculum, and the NFPA Professional Qualifications Standards.*
Short-Term	-	-	*#16: That Canmore Fire-Rescue Services include annual live fire training as a required element within the proposed comprehensive annual training program.*
Short-Term	-	-	*#17: That CFRS investigate opportunities and partnerships with neighbouring fire services and within the local private sector to develop a live fire training facility.*
Short-Term	-	-	*#18: That CFRS investigate potential revenue sources related to a live fire training facility.*
Short-Term	-	-	*#19: That Canmore Fire-Rescue Services consider the use of an online firefighter training program as a component of delivering the proposed comprehensive annual training program.*
Short-Term	-	-	*#20: That CFRS implement a strategy to track all operating and capital costs associated with the Special Operations Team to enhance Council's and the community's understanding of the total costs associated with delivering technical rescue services.*
Short-Term	-	-	*#21: That the Fire Chief investigate options for developing partnerships, shared services and purchasing contracted services for the delivery of technical rescue services, and specifically water rescue.*
Short-Term	This reflects an estimated financial cost of $25 x 7 days a week = $175 per week per firefighter times	-	*#31: That the proposed strategy of peak time fire suppression staffing be implemented between June 1st and August 31st providing additional 24 hour fire suppression resources.*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
	eight firefighters = $1,400 x 40 weeks = $56,000 per year, and $25 x 7 days a week = $175 per week per firefighter times six firefighters = $1,050 x 12 weeks = $12,600 per year representing a total of **$68,600** for the proposed paid response scheduled on-call process.		[***Note:*** eight paid response firefighters would be scheduled on-call at all times during the period from September 1st to May 31st and that six paid response firefighters would be scheduled on-call from June 1st to August 31st each year]
Short-Term	Annual wage of a full-time firefighter of $99,000 divided by 52 weeks, divided by 42 hours per week = $45.30 per hour. June 1 to Aug 31st = 92 days. (92x24 hours per day)=2,208 hours over the three months at $45.35 per hour= $100, 090 x two firefighters = **$200,180**.	-	*#32: That a group of paid response casual firefighters be identified to fulfill the staffing resources needs of the proposed peak time fire suppression staffing.* [***Note:*** June 1st to August 31st the financial impact of the two positions filled by casual (either career casual or paid response casual) firefighters]
Short-Term	increase of five paid response (5 x $5,944 = **$29,970)**	Equipment for five additional paid response (5 x $2,500) = **$12,500** Locker Space = **$55,000**	*#33: That the total complement of career casual firefighters be reduced to eight, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 46 paid response firefighters.*
Short-Term	-	**$50,000**	*#40: That consideration be given within the capital planning process to purchasing a crew-transport vehicle for the department.*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
Short-Term	-	-	*#44: That Canmore Fire-Rescue Services explore solutions for increasing storage and bay capacity and training (e.g. increase classroom size) facilities both within the fire station and at alternate sites, as required.*
Short-Term	-	-	*#45: That Canmore Fire-Rescue allocate bay capacity for a reserve pumper.*
Short-Term	-	-	*#47: That a formal process for exchanging shift-notes for all levels of staff through a digital platform is developed and implemented by CFRS to improve internal communication.*
Short-Term	-	-	*#48: That Canmore Fire-Rescue Services consider implementing the green flashing light program for paid response firefighters to improve department turnout time. It is further recommended that the Town support the installation of street signage reflecting the use of paid response firefighter flashing green lights within the Town of Canmore*
Short-Term	-	-	*#49: That CFRS investigate and implement technology-based efficiencies to enhance the alerting process for paid response firefighters and off-duty firefighters on call-back.*
Medium-Term	-	-	*#3: That the Fire Chief and Deputy Chief attain professional certification as presented within the NFPA 1021 – Standard for Fire Officer Professional Qualifications or identified equivalent.*
Medium-Term	-	-	*#22: That Canmore Fire-Rescue Services enhance the training opportunities for Company Officers to achieve the skills and competencies identified within the NFPA 1021 Standard for Company Officers.*
Medium-Term	-	-	*#24: That Canmore Fire-Rescue Services incorporate elements of succession planning for all levels and positions within the department and be incorporated into the proposed*

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
			Comprehensive Annual Training plan.
Medium-Term	*Costs dependent upon the existing qualifications of the individuals attaining the certification and the location of available courses / examinations.*		*#39: That both of the mechanics within the Town of Canmore's Fleet Services Department attain the Emergency Vehicle Technician (EVT) certification.*
Medium-Term	**$122,000**	**$8,450**	*#34: That a full-time Fire Prevention position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore.*
Medium-Term	**$122,000**	**$8,450**	*#35: That a full-time Training/Education position with the skills and competency included within the proposed Fire-Rescue Master Plan be hired by the Town of Canmore.*
Medium-Term	Increase of five paid response (5 x $5,944 = **$29,970)**	Equipment for five additional paid response (5 x $2,500) = **$12,500**	*#36: That the total complement of career casual firefighters be reduced to four, and that the total complement of paid response firefighters be increased by five paid response casual firefighters resulting in a total complement of 51 paid response firefighters.*
Medium-Term	-	-	*#46: That CFRS investigate the implementation of station notification (e.g. station alarm / announcement) for emergency response calls.*
Long-Term	-	-	*#37: That at the end of the medium-term horizon (5 year) planning horizon of the proposed Fire-Rescue Master Plan the Town of Canmore update the analyses and actual performance of Canmore Fire-Rescue Services.*
Long-Term	Phase 1(4 full-time firefighter positions – wages & benefits): **$438,000 (replaces costs associated with recommendation 32)**	Phase 1 (4 full-time firefighter positions – uniforms, equipment & orientation): **$33,800**	*#38: That subject to the findings of the Fire-Rescue Master Plan Update the Town of Canmore further consider the proposed Option 4 contained within the Phase 1 Fire-Rescue Staffing Study and outlined in this FRMP.* [**Note:** Only if warranted following

Proposed Horizon	Estimated Operating Cost	Estimated Capital Cost	Recommendations
	Phase 2(4 full-time firefighter positions – wages & benefits): **$438,000 (replaces costs associated with recommendation 32)**	Phase 2(4 full-time firefighter positions – uniforms, equipment & orientation): **$33,800**	implementation and review of medium-term recommendations]
	six paid response firefighters scheduled on-call at all times: $25 x 7 days a week = $175 per week per firefighter times six firefighters = $1,050 x 52 weeks = $54,600 per year (replaces costs associated with recommendation 31)	-	

Appendix A

Community Fire Risk Assessment

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1.0 Introduction

The process of assessing community risk is receiving increased focus within the fire protection industry in North America. As such, a Community Fire Risk Assessment (CFRA) is fundamental to the development of a strategic Fire-Rescue Master Plan. Assessing community risk enables an understanding of local needs and circumstances which can then be applied to align the service levels established by the fire-rescue department. The results of a CFRA directly inform the recommendations and are used to identify existing service gaps across divisions, with particular connections to fire prevention, training and emergency response (e.g. suppression).

This appendix to the Fire-Rescue Master Plan outlines the methodology and sources used to assess community risk in the Town of Canmore. The analysis and results of the assessment are described based on three primary sections: profile assessments; future growth considerations; and Geographic Information System (GIS) risk model.

2.0 Methodology

The following risk assessment is based on a methodology founded in part on the National Fire Protection Association (NFPA) 1730 *"Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations* (2016 Edition). Per the Standard, the purpose of a Community Fire 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" (p.6). NFPA 1730 outlines seven profiles that should be assessed and used to understand risk within the community. As identified in NFPA 1730, these profiles incorporate the methodology of the Ontario Office of the Fire Marshal and Emergency Management Public Fire Safety Guideline on Simplified Risk Assessments (04-40A-03).

This exploration of the profiles is the first component of the CFRA methodology for this Fire-Rescue Master Plan. This includes the development of the following seven **profile assessments**:

- Demographics;
- Geography;
- Building Stock;
- Past Fire Loss;
- Response;
- Hazards; and
- Economics.

These profiles are analyzed based on several sources of information including data provided by Canmore Fire-Rescue Department, Statistics Canada, Town of Canmore Municipal Census, and desktop research. To best link the CFRA to the risks unique to specific occupancy types, this study utilizes the major occupancy classifications of the Alberta Building Code (ABC) and the Alberta Fire Code (AFC) to define fire risk scenarios within the Town of Canmore.

In addition to NFPA 1730, this Community Fire Risk Assessment is also based on the Ontario Office of the Fire Marshal's Fire Risk Sub-model which informs a risk model that includes the use of a Geographic Information Systems (GIS). The risk model considers the probability and consequence of a fire incident and how those factors interact to inform risk levels. This information is used as the foundation to develop a GIS-based risk model which spatially displays the low, moderate, or high risks within the Town's geography.

The profile assessments and GIS-based model give consideration to community risks as they exist today. An additional consideration of this Community Fire Risk Assessment is future growth. A future growth scenario is developed based on approved Municipal Development Plans, population and employment projections, and discussions with municipal planners. This future growth scenario, based on a ten year plan horizon, is primarily utilized to inform future suppression needs including station location, staffing, and deployment.

3.0 Profile Assessments

The profile assessments include an analysis of demographics, geography, building stock, past fire loss, response, hazards, and economic considerations for the Town.

3.1 Demographic Profile

Per NFPA 1730, the demographic profile assessment includes analysis of age, gender, educational attainment and socioeconomic make-up, vulnerable individuals/occupancies, ethnic and cultural considerations, and tourism and population shifts. The following sections consider these demographic characteristics within the Town of Canmore.

3.1.1 Age

Canada's aging population has been recognized as one of the most significant demographic trends. Based on preliminary postcensal estimates from Statistics Canada, 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%).[1] Seniors (typically those 65 years and over) are considered to represent one of the highest fire risk groups across the province based on proportion of fire fatalities as shown in **Table 1**. **Table 1** was prepared using information from the Alberta Fire Commissioner's Statistical Report for 2011-2012 and 2011 census data. Seniors account for a much higher percentage of fire fatalities than their percentage of population.

Table 1: Fire Fatalities by Age Group (Alberta, 2011)

Category	Age	% of Provincial Population	% of Fire Fatalities
Children and Youth	17 years and under	23%	4%
Adults	18 to 64 years	66%	65%
Seniors	65 year and older	11%	31%

Identifying a community's population by age category is a core component of developing the Community Fire Risk Assessment and identifying specific measures to mitigate risks associated with a specific age group, such as seniors. **Table 2** provides a comparison of the Town's population by age group based on the Canmore 2014 Municipal Census to that of the Province based on the 2011 Census completed by Statistics Canada.

[1] Source: Statistics Canada, Canada's population estimates: *Age and sex, July 1, 2015* http://www.statcan.gc.ca/daily-quotidien/150929/dq150929b-eng.htm, published September 29, 2015: visited November 26, 2015.

Table 2: Population by Age Group

Age Group	Town of Canmore 2014 Municipal Census[2]				Province of Alberta 2011 Statistics Canada Census	
	Permanent Residents		Non-Permanent Residents			
	Pop.	% Total*	Pop.	% Total*	Pop.	% Total
0 to 4 years	650	5.6%	90	3.3%	244,880	6.7%
5 to 9 years	618	5.3%	131	4.8%	218,995	6.0%
10 to 14 years	578	5.0%	145	5.4%	220,915	6.1%
15 to 19 years	537	4.6%	147	5.4%	238,205	6.5%
20 to 24 years	523	4.5%	153	5.7%	258,475	7.1%
25 to 44 years	3,715	32.0%	493	18.2%	1,081,780	29.7%
45 to 54 years	1,845	15.9%	511	18.9%	560,335	15.4%
55 to 64 years	1,754	15.1%	636	23.5%	415,945	11.4%
65 years and over	1,393	12.0%	397	14.7%	405,730	11.1%
Sub-Total	**11,613**	**100%**	**2,703**	**100%**	**3,645,260**	**100%**
Prefer not to answer / Unknown	1,463	-	**984**	-	**N/A**	-
Grand Total Population	***13,076***	-	***3,687***	-	***3,645,260***	-

**% Total calculated based on known population age. (i.e. does not include those who indicated "prefer not to answer" and "unknown" responses)*
(Source: Canmore 2014 Municipal Census and 2011 Statistics Canada Census)

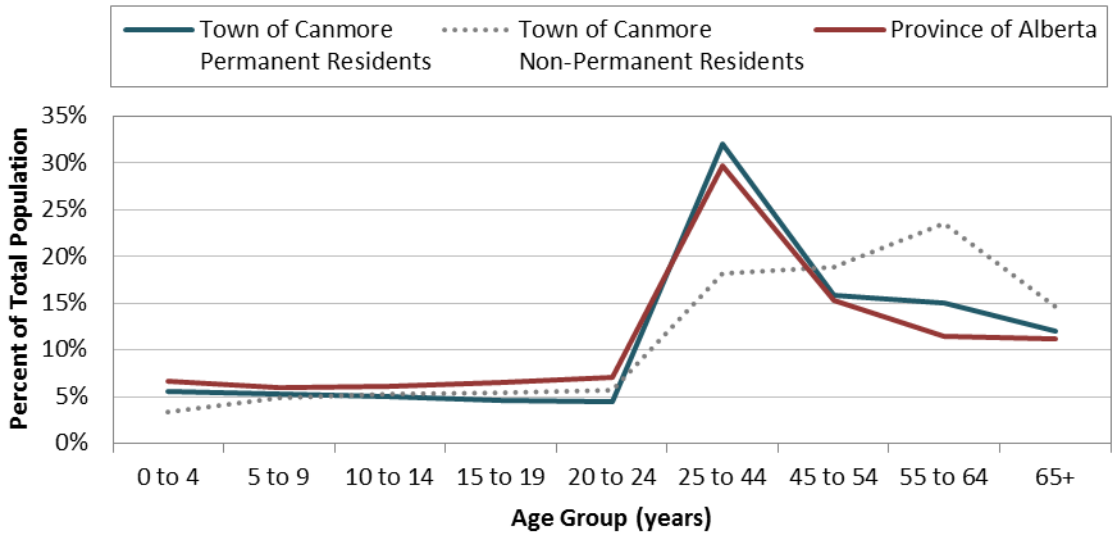
As shown in **Table 2**, the 2014 Municipal Census completed by the Town identified a permanent resident population of 13,076 and a non-permanent resident population of 3,687. That is a total of 16,763 people of which 38% of the population is non-permanent. These populations should be considered when developing targeted public education programs.

Figure 1 illustrates the age distribution of the population of Canmore permanent residents, non-permanent residents, and the population of the Province. The figure illustrates that the age distribution of the Canmore permanent residents and the population of the province follow a similar distribution with the majority of the population within the 25 to 44 years category. The Canmore permanent

[2] *Source:* (Town of Canmore, 2014)

resident and provincial population differs in the older age categories in that Canmore has an older population (12.0% over 65 years of age compared to 11.1% in the Province). The older Canmore population is emphasized when looking at the proportion of seniors and adults aged over 45 in the non-permanent resident population. This is in line with the fact that Canmore is a popular retirement and tourist destination. This is an important factor when considering the level of fire risk for the senior population.

Figure 1: Population Distribution – Town of Canmore vs. Province of Alberta



3.1.2 Gender

NFPA 1730 considers gender breakdown as part of Community Fire Risk Assessments due to the findings that, based on historic data, males are more likely to be injured from a fire or lose their life in a fire.[3,4] **Table 3** shows the gender distribution in the Town of for both permanent and non-permanent residents across age groups. These results are based on the 2014 Town of Canmore municipal census. When looking at the proportion of male versus female overall, they are evenly split at 50% for both permanent and non-permanent residents. When specific age groups are reviewed, there are minor variations within both the permanent and non-permanent populations. One of the greater differences is the proportion of males (58%) compared to females (42%) for the 18 to 19 years age group within Permanent Population.

[3] National Fire Protection Association . (2014, October). Characteristics of Home Fire Victims. Retrieved July 2016, from http://www.nfpa.org/~/media/Files/Research/NFPA%20reports/Victim%20Patterns/oshomevictims.pdf
[4] U.S. Department of Homeland Security . (2015, January). Fire Risk in 2011.. Retrieved July 2016, from U.S. Fire Administration: http://nfa.usfa.dhs.gov/downloads/pdf/statistics/v15i8.pdf

Table 3: Gender distribution by Age Group - Town of Canmore (2014 Municipal Census)*

	Permanent Population					Non-Permanent Population				
Age Group	**Total**	**Female**	*%*	**Male**	*%*	**Total**	**Female**	*%*	**Male**	*%*
0 to 4 years	**648**	310	*48%*	338	*52%*	**86**	47	*55%*	39	*45%*
5 to 9 years	**613**	305	*50%*	308	*50%*	**130**	57	*44%*	73	*56%*
10 to 14 years	**575**	265	*46%*	310	*54%*	**142**	72	*51%*	70	*49%*
15 to 17 years	**324**	164	*51%*	160	*49%*	**76**	34	*45%*	42	*55%*
18 to 19 years	**209**	88	*42%*	121	*58%*	**70**	33	*47%*	37	*53%*
20 to 24 years	**519**	240	*46%*	279	*54%*	**152**	78	*51%*	74	*49%*
25 to 34 years	**1,810**	911	*50%*	899	*50%*	**222**	120	*54%*	102	*46%*
35 to 44 years	**1,884**	948	*50%*	936	*50%*	**264**	133	*50%*	131	*50%*
45 to 54 years	**1,830**	922	*50%*	908	*50%*	**508**	271	*53%*	237	*47%*
55 to 64 years	**1,740**	880	*51%*	860	*49%*	**634**	305	*48%*	329	*52%*
65 to 69 years	**583**	262	*45%*	321	*55%*	**222**	102	*46%*	120	*54%*
70 to 105	**805**	427	*53%*	378	*47%*	**174**	79	*45%*	95	*55%*
TOTAL	**11,540**	5722	*50%*	5818	*50%*	**2,680**	1331	*50%*	1349	*50%*

**Analysis excludes those responses that were 'Prefer not to answer' or 'Unknown'.*

(Source: 2014 Town of Canmore Municipal Census)

3.1.3 Socio-economic Circumstances

Within the fire industry, it has been established through research that fire risk does not impact a community homogenously. Just as communities can be diverse, so too is the potential for fire risk. One of the factors that impact fire risk is the socioeconomic circumstances of a community. Socioeconomic circumstances can be indicated by several factors including educational attainment, income levels, and homeownership. These factors can be analyzed and considered on a number of levels such as neighbourhood, household, and individual as referred to in the report titled "*Socioeconomic Factors and the Incidence of Fire*" completed by the Federal Emergency Management Agency (FEMA) United States Fire Administration (1997). [5]

Socioeconomic factors intersect in a number of ways and have a direct or indirect impact on fire risk. One such example is outlined in the Ontario's Office of the Fire Marshal and Emergency Management's Fire Risk Sub-Model. The Sub-Model makes reference to the relationship between income and fire risk.

[5] *Source: Federal Emergency Management Agency, United States Fire Administration. (1997, June). Socioeconomic Factors and the Incidence of Fires. Retrieved July 2016, from http://www.sustainable-design.ie/fire/socio.pdf*

As one consideration, households with less disposable incomes 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.[6] 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.

For the purposes of this Community Fire Risk Assessment, developed to complement the Fire-Rescue Master Plan, a number of socioeconomic indicators will be reviewed at a high-level for the Town of Canmore in comparison to the Province of Alberta. These factors have been selected based on data available from Statistics Canada (both the Census and National Household Survey). Factors that are highlighted in this section include:

- Immigrant Status
- Educational Attainment
- Labour Force Status
- Family Structure
- Household Tenure
- Household Occupancy
- Household Suitability
- Household Cost

A high proportion of immigrants could demonstrate a higher fire risk due to a large population that has a potential for: lower income bracket; lack of familiarity with local fire life safety practices; and/or experience possible language barriers. **Table 4** presents the overall immigrants status of the population in Canmore. The Town has a similar proportion of immigrants (17%) as Alberta as a whole (18%). In a larger city, there may be neighbourhoods of immigrants that can be educated through targeted public education materials.

Labour force status is another possible indicator of income levels which has a direct impact on fire risk (lower income, higher fire risk). The participation rate (the proportion of residents in the labour force) can also be an indicator of income and can be considered alongside unemployment rates (lower participation rate and higher unemployment could mean lower income, higher fire risk). In terms of labour force status (**Table 5**), the Town has a higher participation rate than the Province (77% versus 73%). The Town of Canmore has an unemployment rate (in 2011) that is the same as the Province at 6%, reflecting a typical amount of risk.

[6] *Source*: Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-model. OFMEM. June 2009, accessed Sept 2015, <http://www.mcscs.jus.gov.on.ca/english/FireMarshal/FireServiceResources/ComprehensiveFireSafetyEffectivenessModel/FireRiskSub-Model/Fire_risk_submodel.html>.

Another indicator of socioeconomic status and level of income is the number of lone-parent families. A higher proportion of lone-parent families could reflect lower household income and therefore a higher fire risk. A higher proportion of lone-parent families also has the possibility of increasing the likelihood of a child being home along unsupervised leading to an increased fire risk. Of the families with children in Canmore, 11% are lone-parent families compared to 14% for the Province as a whole (**Table 6**). This suggests that Canmore has a lower fire risk from the perspective of lone-parent families.

Table 4: Immigrant Status - Canmore and Alberta (2011 NHS)

	Canmore	%	Alberta	%
Non-immigrants	9,645	*80%*	2,864,240	*80%*
Immigrants	2,000	*17%*	644,115	*18%*
Non-permanent residents	345	*3%*	59,620	*2%*
Total	**11,990**	***100%***	**3,567,975**	***100%***
(Source: Statistics Canada, 2011 National Household Survey)				

Table 5: Labour Force Status - Canmore and Alberta (NHS 2011)

	Canmore	%	Alberta	%
In the labour force	7,805	*77%*	2,115,640	*73%*
Employed	*7,310*	*94%*	*1,993,225*	*94%*
Unemployed	*500*	*6%*	*122,415*	*6%*
Not in the labour force	2,335	*23%*	773,095	*27%*
Total	**10,140**	***100%***	**2,888,735**	***100%***
(Source: Statistics Canada, 2011 National Household Survey)				

Table 6: Family Structure - Canmore and Alberta (Census 2011)

	Canmore	%	Alberta	%
Couple Families	3,150	89%	855,015	86%
Lone-Parent Families	380	11%	144,510	14%
Total	**3,530**	**100%**	**999,525**	**100%**
(Source: Statistics Canada, 2011 Census)				

Those with higher education (and therefore higher income) are more likely to invest in fire life safety products such as fire extinguishers and smoke alarms reducing the fire risk. In terms of educational attainment, the Town of Canmore has a more educated population as compared to the Province. As shown in **Table 7**, 77% of Town residents having a post-secondary certificate, diploma or degree (+13% more than the Province). This educational attainment could be linked to the higher median household incomes found in Canmore ($85,579 which is nearly $7,000 higher than the Province). This suggests that

Canmore as a whole as a lower fire risk from the perspective of income using educational attainment as an indicator.

Table 7: Educational Attainment - Canmore and Alberta (NHS 2011)

	Canmore	%	Alberta	%
No Certificate; Diploma or Degree	445	*6%*	250,265	*12%*
High School Diploma or Equivalent	1,320	*17%*	484,725	*24%*
Postsecondary Certificate; Diploma Or Degree	5,935	*77%*	1,300,340	*64%*
Total	**7,700**	***100%***	**2,035,330**	***100%***

(Source: Statistics Canada, 2011 National Household Survey)

Table 8 summarizes household statistics 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 proportions of dwellings that are owned versus rented are almost the same across the Town and the Province (71% owned in Canmore versus 74% in the province). In the Town, 1% of the households have more than one person per room compared to the Province which has 2% of households with more than one person per room. A higher proportion of multiple persons per household can result in an increased fire loss resulting in a higher risk.

Similarly, the National Household Survey reports on housing suitability which, according to Statistics Canada, 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, the Town of Canmore has 3% of (or 155) households that are unsuitable compared to 5% for the Province as a whole (resulting in nearly 70,000 “unsuitable” households across the province). From the perspective of housing suitability, Canmore has a lower fire risk as compared to 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 the Town of Canmore, 26% of households spend 30% or more of the household total income on shelter costs. This is 2% higher than the Province, where 24% of households spend 30% or more of income on shelter costs. This slightly higher cost of living in Canmore in terms of shelter costs is further supported through the median value of dwellings at $602,080 (+$252,396 than the Province). The Town also has higher median monthly shelter costs for both owned and rented dwellings. The median household income in the Town is $85,579 (in 2010) according to the National Household Survey which is higher than the Province at $78,632. The Town has moderately higher shelter costs overall as compared to the province.

Table 8: Household Tenure, Occupancy, Suitability, and Costs - Canmore and Alberta (NHS 2011)

	Canmore	%	Alberta	%
Household Tenure				
Owner	3,665	*71%*	1,022,645	*74%*
Renter	1,510	*29%*	357,945	*26%*
Total	**5,175**	**100%**	**1,380,590**	**100%**
Household Occupancy				
One person or fewer per room	5,105	*99%*	1,364,455	*98%*
More than one person per room	75	*1%*	25,825	*2%*
Total	**5,180**	**100%**	**1,390,280**	**100%**
Housing Suitability				
Suitable	5020	*97%*	1,320,980	*95%*
Not suitable	155	*3%*	69,300	*5%*
Total	**5,175**	**100%**	**1,390,280**	**100%**
Shelter Costs				
Spending less than 30% of household total income on shelter costs	3,815	*74%*	1,025,590	*76%*
Spending 30% or more of household total income on shelter costs	1,340	*26%*	319,230	*24%*
Total	**5,155**	**100%**	**1,344,820**	**100%**
Median value of dwellings ($)	602,080		349,684	
Median monthly shelter costs for owned dwellings ($)	1,389		1,251	
Median monthly shelter costs for rented dwellings ($)	1,211		1,017	
(Source: Statistics Canada, 2011 National Household Survey)				

It is important to keep in mind that all these factors as explored can intersect with one another and have an impact on fire risk. For example, a community may have higher shelter costs resulting in less disposable income, but also have a higher level of educational attainment. **The quantitative impact intersecting factors can have on fire risk is not readily understood at a detailed level within the fire service.** This should be considered when assessing socio-economic factors.

3.1.4 Vulnerable Individuals or Occupancies

A group within a community that faces the highest fire risk is known as vulnerable individuals or vulnerable occupancies. A vulnerable individual can be someone with mobility limitations, cognitive limitations, persons with developmental disabilities, or those generally who are unable to move on their own due to their own physical limitations or due to restraint. This group is a particular focus of a fire-rescue service primarily because they are unable to assist themselves in the event of a fire. From an occupancy perspective, vulnerable occupancies would fall into Group B – Care or Detention occupancies.

(Further information on these occupancies can be found in **Section 3.2.5**.) A vulnerable occupancy would be occupied by vulnerable individuals; however, not all vulnerable individuals reside in a vulnerable occupancy. One way a fire-rescue service can help reduce the risk faced by vulnerable individuals is to provide and advertise a registry for the domiciles of these vulnerable individuals.

3.1.5 Ethnic and Cultural Considerations (Considerations for Public Education)

Cultural diversity and ethnic background can be factors for fire departments 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 of the success of these programs. **Table 9** provides a breakdown of the knowledge of official languages based on the 2011 Statistics Canada census information.

Table 9: Knowledge of Official Languages

Language	Canmore		Alberta	
	Total	% Total	Total	% Total
English only	9,785	80%	3,321,810	92%
French only	25	0%	3,205	0%
English and French	2,425	20%	235,565	7%
Neither English nor French	30	0%	49,600	1%
Total	**12,265**	**100%**	**3,610,180**	**100%**

Source: Statistics Canada, 2011 Census

English is the primary language of the Town's population (80%) with 20% of the population knowing both English and French and less than 1% with knowledge of neither English nor French. Therefore language barriers experienced by permanent residents are expected to be relatively infrequent. However, communications barriers should still be taken into consideration, especially when working with specific groups such as tourists

3.1.6 Tourism and Population Shifts

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 result in an increased risk due to overnight tourism accommodation (sleeping) which can impact the demand for fire protection services. Another impact of population shift is an increase in traffic. The CFRS noted that increased traffic volume in the summer increases the turnout time of paid response firefighters as a result of congestion near the fire station.

The Town of Canmore experiences significant population shift throughout the year. Some of this population shift can be attributed to the large number of seasonal residents in Canmore. According to the Canmore 2014 Municipal Census, the Town has approximately 3,700 non-permanent residents, which represents approximately 22% of the total residents for a total peak population of about 14,000 residents.

Another source of population shift in Canmore is the booming tourism industry. According to the 2010 Fire Staffing Study, less than 75% of residences in Canmore are occupied year round in part due to tourism and recreation.[7] In the winter Canmore is known for ice and alpine climbing, downhill and cross country skiing, and snowshoeing.[8] During the summer, residents and tourists can often be seen hiking and biking on trails in Canmore and the plethora of surrounding provincial/national parks. Some of the most notable nearby parks include:

- Banff National Park;
- Kootenay National Park;
- Yoho National Park
- Peter Lougheed Provincial Park;
- Spray Valley Provincial Park – Kananaskis; and
- Bow Valley Provincial Park – Kananaskis.

Banff National Park in particular is noted for having three to four million annual visitors (approximately 8,000 to 11,000 visitors per day).[9] Other sources of tourist-related population shift are special events, such as festivals and other celebrations. Some of the most notable festivals in Canmore are the:

- Canmore Folk Music Festival (July/August);
- Highland Games (August/September);
- ArtsPeak Arts Festival (September); and
- Festival of Eagles (October).[10]

According to the 2015 Tourist Accommodation Study, the Town of Canmore has 2,791 existing visitor accommodation units. These units include single-owner hotel units (43%), condo hotel units (43%), tourist homes other than primary residences (10%), bed and breakfasts (2%), private dwelling rentals (2%), and hostel rooms (0.4%). The 2011 Canmore Municipal Development Plan (MDP) provides an indication as to how many people these units translate into; according to the MDP 2,750 visitor units can accommodate approximately 8,100 people.

[7] *Source: Canmore Fire Service Staffing Study*, Morrison Hershfield Limited, May 20, 2010.
[8] (Town of Canmore)
[9] Source: http://www.banfflakelouise.com/Media-Relations/Facts-and-Figures-about-Banff-National-Park , accessed July 2016.
[10] Source: http://www.tourismcanmore.com/explore/the-area, accessed July 2016

The Tourist Accommodation Study further analyzed the seasonal and overall occupancy rates of the accommodation units by surveying 25% of the local commercial accommodation market (or 708 of the 2,791 accommodation units). The seasonal occupancy rates show the highest occupancies in the summer for all of the unit types: single-owner hotel, condo hotel, and tourist homes at 92%, 86%, and 66% respectively. The lowest occupancies are in the spring at 54%, 43%, and 30%. However, it is noted in the study that "*this model treats tourist property owners as tourists rather than residents*" and the seasonal occupancy rates reflect only the presence of short-term renters (pg. 33). After adjusting for owner tourists and taking into consideration other data, the annual occupancy rate is 57% for single-owner hotels, 59% for condo hotels, 51% for tourist homes, 45% for bed and breakfasts and hostels, and 28% for private dwelling rentals.

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 this demographic.

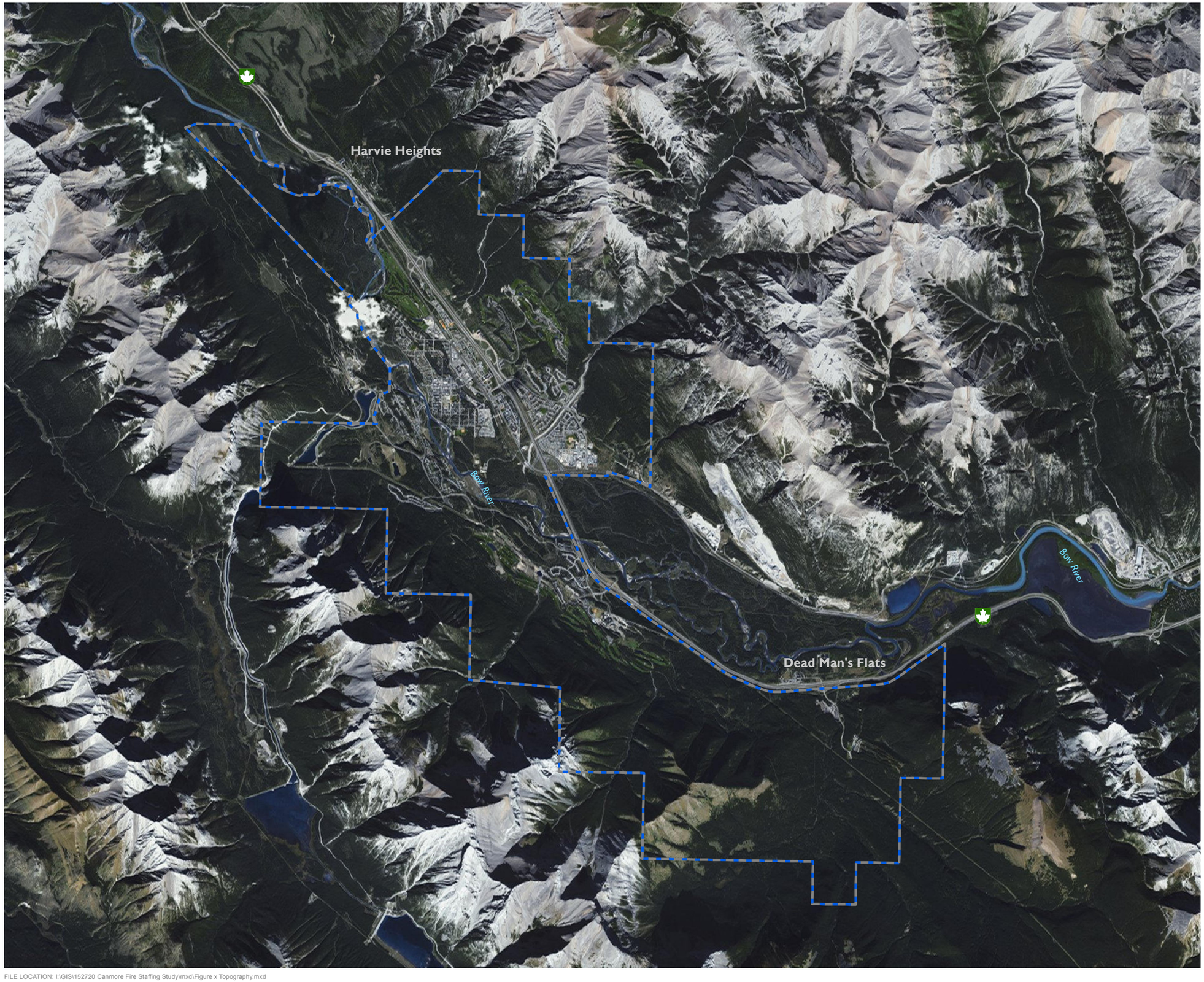
3.1.7 Geographic Profile

The Town of Canmore is located in southwest Alberta, nestled into the eastern edge of the Rocky Mountains in the Bow River Valley. Much of the surrounding area is a mixture of mountainous terrain and ecologically sensitive watersheds, shown in **Figure 2.** The Town is bisected by the Bow River and surrounded by several large mountains, including Mount Fable, Mount Rundle, and Big Sister (in the Three Sisters Chain).

Within the Town limits there are two major river crossings: Bridge Road in the northwest and the Trans-Canada Highway further southeast. There are also several smaller crossings in the downtown area along Spring Creek. In addition to bounding the growth of the Town, this terrain can restrict winter access at Silvertip, which has steep inclines and makes access challenging when roads are icy.

As illustrated in **Figure 3**, Canmore is located along the Trans-Canada Highway. It is also the termination point of Highway 1A (Bow Valley Trail) and Provincial Road 742 (Three Sisters Parkway). Street networks within the Town of Canmore follow a grid pattern near the downtown core and are more curvilinear along waterways and towards the Town limits. Common to many communities, the road network can generate demand for motor vehicle collision responses and automobile extrication support. In addition, the natural features, terrain, and the road network result in an "elongated" form of development with the Trans-Canada Highway acting as a sort of spine.

Canmore is also located along the Canadian Pacific Railway main line, which runs from the northwest to the southeast. Within the Town there are approximately five major rail crossings, four of which are at-grade. The railway transports a variety of goods from food and forest products to coal, fertilizer, and energy supplies. The railway has an associated high risk as it transports potentially flammable and explosive materials through the middle of the Town of Canmore.



TOWN OF CANMORE
FIRE RESCUE SERVICES

CANMORE TOPOGRAPHY

FIGURE 2 (Appendix A)

Municipal Boundary

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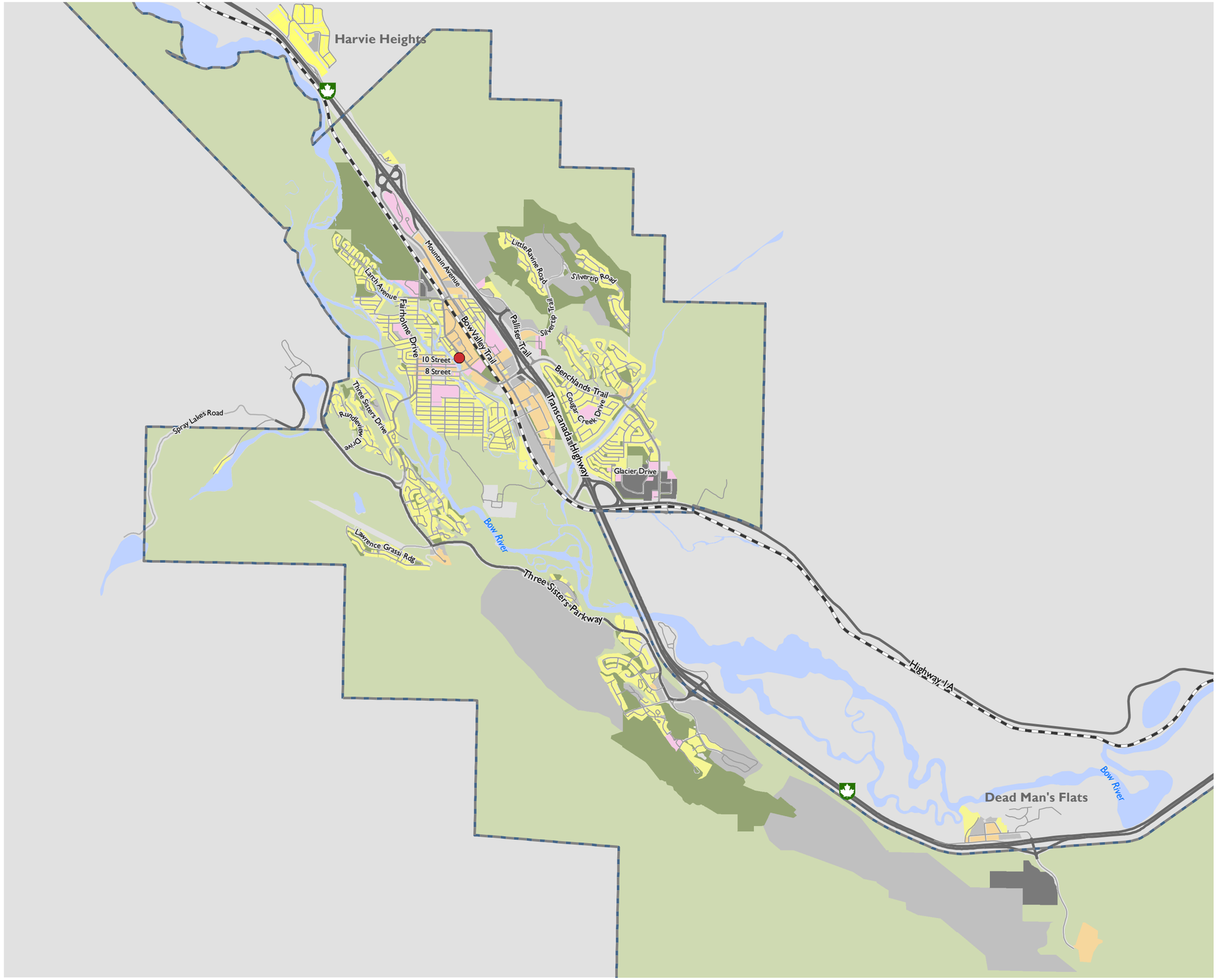
MAP DRAWING INFORMATION:
DATA PROVIDED BY TOWN OF CANMORE, M.D. OF BIGHORN

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 3TM 114

DILLON CONSULTING

PROJECT: 141264
STATUS: FINAL
DATE: 10/20/2016

FILE LOCATION: I:\GIS\152720 Canmore Fire Staffing Study\mxd\Figure x Topography.mxd



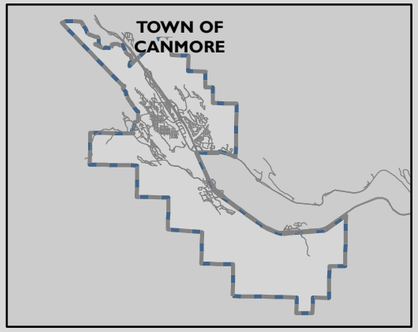
TOWN OF CANMORE
FIRE RESCUE SERVICES

STATION LOCATION
FIGURE 3 (Appendix A)

- Fire Station
- Municipal Boundary
- Railway

Land Use

- Commercial
- Environmental Reserve/Open Space
- Industrial
- Institutional
- Recreational
- Residential
- Vacant



1:45,000

0 0.5 1 2 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY TOWN OF CANMORE, M.D. OF BIGHORN

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 3TM 114

DILLON CONSULTING

PROJECT: 152720
STATUS: FINAL
DATE: 10/21/2016

FILE LOCATION: I:\GIS\152720 Canmore Fire Staffing Study\mxd\Station Location.mxd

Due to the Town's strategic location alongside rail lines and the highway network, Canmore is a gateway between the West Coast and the Canadian Prairies. This role as a goods movement hub for rail and truck traffic has risk implications for the Town. One implication is the impact of the rail traffic on the road network. There are a number of key roads that may become a potential barrier to emergency response if a train is passing through the Town.

The majority of industrial land in Canmore is located along the Trans-Canada Highway and Highway 1A at the east edge of the Town. Further development of the land adjacent to industrial centres is limited by conservation areas to the south and east.

Forest fires are an additional concern in the Canmore area, as the Town is surrounded by thick and extensive forested areas. Wildfires become an increasing hazard when the surrounding area is subjected to long periods of warm, dry weather. In such cases, the Province issues fire bans for prevention and local departments, such as the CFRS, help to enforce them.

3.1.8 Demographic Profile Observations

The following is a summary of key Demographic Profile observations:

- The 2014 Municipal Census completed by the Town identified a permanent resident population of 13,076 and a non-permanent resident population of 3,687. That is a total of 16,763 people of which 38% of the population is non-permanent;
- Of the permanent residents, the Town Canmore has a slightly older population at 12.0% over 65 years of age compared to 11.1% in the Province of Alberta;
- Canmore is a popular retirement and tourism destination resulting in a non-permanent population that has a higher proportion aged 45 and older than the permanent residents group and that of the Province;
- The distribution of males and females in the overall population is evenly split at 50% for both permanent and non-permanent residents;
- The Town of Canmore has a more educated population (77%) as compared to the Province (64%);
- The Town of Canmore has 3% (or 155) households that are unsuitable compared to 5% for the Province as a whole;
- In the Town of Canmore, 26% of households spend 30% or more of the household total income on shelter costs (+2% compared to the Province); and
- The median value of dwellings at $602,080 in the Town of Canmore is $252,396 greater than that of the Province).

3.2 Building Stock Profile

NFPA 1730 highlights a number of characteristics of building stock that should be considered as it pertains to fire risk and that are described in this sections: building stock, building density, building age and construction, potential high-fire risk occupancies, vulnerable occupancies, and historic or culturally significant buildings.

3.2.1 Building Code Occupancy Classifications

The AFC categorizes buildings by their major occupancy classifications. Each classification has inherent definitions that distinguish it from other occupancy classifications. Utilizing the AFC as the source for defining the occupancy classifications provides a recognized definition and baseline for developing the community risk profile.

The AFC major occupancy classifications are divided into six major building occupancy classifications (groups). Within each group the occupancies are furthered defined by division. The AFC major classification groups and divisions are presented in **Table 10.**

Table 10: AFC 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	*Care or detention occupancies in which persons are under restraint or are incapable of self-preservation because of security measures not under their control*
	2	*Care or detention occupancies in which persons having cognitive or physical limitations requ ire special care or treatment*
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: Alberta Fire Code, 2006

This assessment applies the major occupancy group classifications (Group A, B, C, D, E and F) of the Alberta Building Code. The assessment does not use the detailed division classifications provided for the respective occupancy groups.

This strategy provides the ability to assess property stock within a community comparatively by major occupancy group thus providing a consistent and recognized definition for each major occupancy type. Where necessary this strategy provides the opportunity for further analysis of a specific occupancy group. Subject to any site specific hazards or concerns individual occupancies within this group can be assessed individually and then included where required within the scope of the broader community risk profile.

3.2.1.1 Building Stock Analysis

The majority of the building stock profile of most Canadian municipalities are Group C – residential occupancy classifications. While the Town of Canmore does not track and maintain a detailed building stock profile based on the AFC major occupancy classifications, it is similarly comprised of primarily Group C – residential occupancies. According to Statistics Canada 2011 Census, there are 5,170 residences within the Town of Canmore.

As shown in **Table 11**, 48% of the residential buildings are single-detached dwellings. In addition, data provided by the CFRS identifies that there are at least 40 motels/hotels or other lodging accommodation. As most of the community is employed in the hospitality industry, there are very few Group F – Industrial occupancies. There is also a relatively small number of Group A – Assembly and Group B – Care or Detention occupancies. As explored later in this CFRA, Group C – residential occupancies are a notable risk due to the probability of fire occurring in this occupancy and the potential life-loss consequences. This is demonstrated by the proportion of fire loss and injuries or death within this occupancy classification within both Canmore and the Province of Alberta (**Section 3.3**). A key element in mitigating Group C – residential occupancy risks is maximizing the first two lines of defence.

3.2.2 Building Age and Construction

The Alberta Building Code (ABC) was adopted in 1974. The first edition of the Alberta Fire Code (AFC) was adopted in 1984. Together these two documents have provided the foundation for eliminating many of the inconsistencies in building construction and maintenance that were present before their adoption.

The ABC and the AFC were developed to ensure uniform building construction and maintenance standards are applied for all new building construction. The ABC applies to the construction or reconstruction while the AFC applies to the operation and maintenance of the fire-related features of

buildings in use.[11] The codes also provide for specific fire safety measures depending on the use of the building. Examples of the fire safety issues that are addressed include:

- Occupancy;
- exits/means of egress including signs and lighting;
- fire alarm and detection equipment;
- fire department access;
- inspection, testing, and maintenance.

3.2.2.1 Residential Buildings

The priority of addressing the residential fire risk is supported by the historic data provided by the Office of the Fire Commissioner, Alberta. The 2011-2012 Alberta Fire Commissioner's Report states that residential fires account for 39% of total number of fires, 72% of fire injuries, and 63% of property loss value.[12] When the categories that do not directly align with ABC major occupancy classifications are removed from the calculations, (i.e., Special Property-Transportation, Storage Property, Miscellaneous Property, and Unclassified), residential fires account for 83% of all fires.

These facts make understanding the age and construction of a community's residential building stock an important component of developing a Community Fire Risk Assessment. The Town's residential building structural dwelling types are summarized in **Table 11.**

Table 11: Residential Structural Dwelling Type (2011)

Structural Dwelling Type	Town of Canmore	% of Units	Alberta	% of Units
Single-Detached House	2,475	47.8%	883,265	63.5%
Semi-Detached House	430	8.3%	71,845	5.2%
Row House	900	17.4%	97,865	7.0%
Apartment-Duplex	250	4.8%	33,505	2.4%
Apartment-more than 5 Storeys	10	0.2%	58,205	4.2%
Apartment-less than 5 Storeys	1,095	21.2%	197,940	14.2%
Other single-attached House	10	0.2%	1,060	0.1%
Movable Dwelling	0	0.0%	46,590	3.4%
Total	**5,175**	**100%**	**1,390,275**	**100 %**

Source: Statistics Canada - 2011 Census Data

[11] *Source: Alberta Building Code, 2006, p vi*

[12] A preliminary version of the 2013 to 2014 Alberta Fire Commissioner's Report is available; however, it is incomplete and there are data limitations identified where "the data does not represent a complete listing of all fire incidents in the province." Where appropriate throughout this Community Fire Risk Assessment, the most recently available complete reporting from the Office of the Fire Commissioner will be used (2011 to 2012 report).

In comparison to the provincial data, the Town of Canmore percentage of single-detached housing of 47.8% represents a lower component of the residential dwelling types than that of the province at 63.5%. The Town of Canmore has a higher proportion of higher-density types of residential development including semi-detached houses (8.3%), row houses (17.4%) and apartments less than five storeys (21.2%) compared to the Province (+3.1%, +10.4%, and +7%, respectively).

Statistics Canada reports on the age of construction for residential dwellings. The Town of Canmore residential buildings age are summarized in **Table 12** and shown in **Figure 4**. As a community, the current building stock of the Town is representative of a settlement area that has grown substantially as a result of hosting the cross-country skiing and biathlon events in the 1988 Calgary Winter Olympics. Construction of new residential buildings peaked in the decade following the Olympics, as shown in **Figure 4**. An important component of this analysis is the percentage of residential buildings built prior to the adoption of the Alberta Fire Code in 1992. **Table 12** indicates that 38.1% of the Town's residential buildings were built prior to 1991 in comparison to 59.9% of those in Alberta. The Town has a newer housing stock than the provincial average.

Figure 4: Period of Construction for Residential Buildings

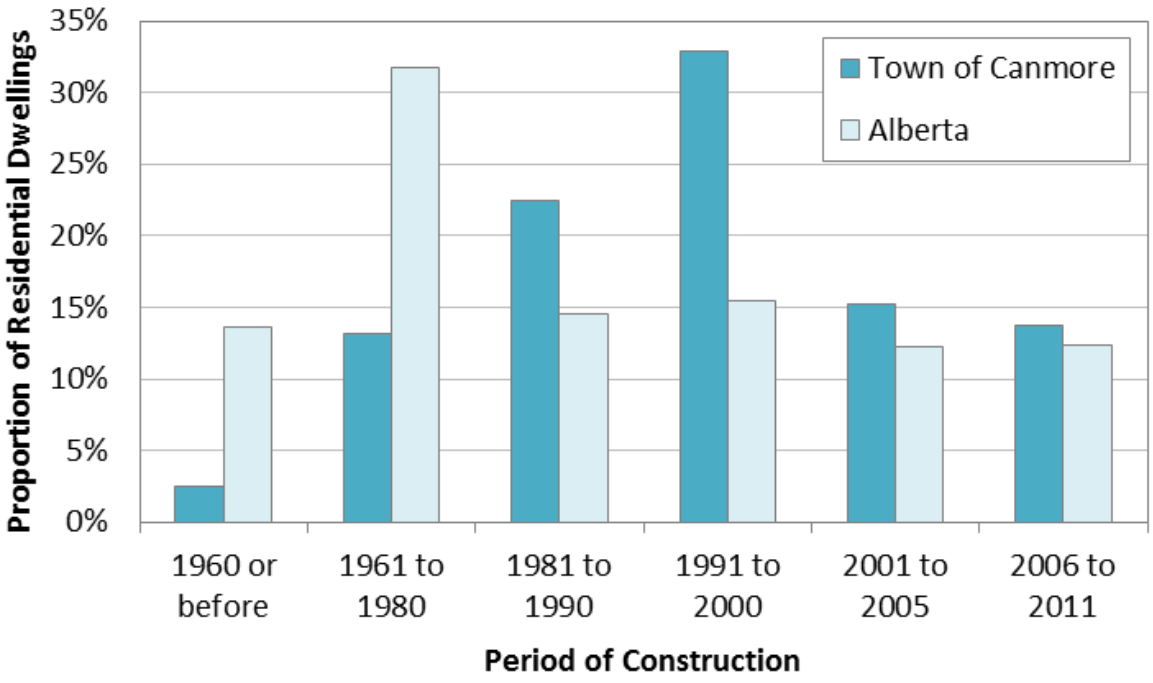


Table 12: Age of Construction of Residential Dwellings (2011)

Period of Construction	Town of Canmore	% of Units	Alberta	% of Units
Prior to 1960	130	*2.5%*	189,745	*13.6%*
1961 to 1980	680	*13.1%*	440,825	*31.7%*
1981 to 1990	1,160	*22.4%*	202,060	*14.5%*
1991 to 2000	1,705	*32.9%*	214,705	*15.4%*
2001 to 2005	790	*15.3%*	170,660	*12.3%*
2006 to 2011	710	*13.7%*	172,290	*12.4%*
Total	**5,175**	***100%***	**1,390,280**	***100%***

Source: Statistics Canada - 2011 Census Data

3.2.2.2 Non-Residential Buildings

During the late 19th century and early 20th century balloon frame construction was a common framing technique used in both residential and small commercial construction. This technique permitted the spread of fire and smoke to move rapidly from the lower floors to upper floors and the roof level. Understanding the age of construction of dwellings can assist in determining if balloon framing may have been utilized.

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.

Specific information, such as the census data, is not available for non-residential buildings; however, the experience of community planning and development provides a relative comparison when assessing the age and construction of a community. The Town of Canmore has identified some heritage resources within Section 13 of its Land Use By-law 22-2010. More information on these resources can be found in **Section 3.2.6** Historic or Culturally Important Buildings/Facilities.

3.2.3 Building Density (Height, Area, and Exposures)

NFPA 1730 lists building density as a key factor for understanding potential fire risk. For the purposes of this analysis, building density is considered to include building height and area as well as exposure risk.

3.2.3.1 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 and knowledge / 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 / suppression response times for firefighters to ascend to the upper levels. Options such as "shelter-in-place" whereby occupants are directed by the fire department to stay within their units can be an effective strategy. However, ensuring internal building communications systems are in place and functioning is critical to the success of this strategy.
Building area can cause comparable challenges as those present in taller buildings. Horizontal travel distances rather than vertical can mean extended response times by firefighters attempting rescue or fire suppression activities.

Large buildings, such as industrial plants and warehouses, department stores, and the new "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 collapse risks.

The Town has some industrial/commercial/mixed-use buildings. Some notable commercial areas include, Safeway, Canadian Tire and Save on Foods (Gateway Avenue). Other examples of buildings with large areas and potential fire loss risk include:

- Institutional uses such as Canmore General Hospital and Canmore Seniors Drop-In Centre. These building have a large footprint, as well as immobile occupants who may be transient and therefore unfamiliar with emergency procedures;
- Downtown Canmore represents a density of buildings that are mixed use, commercial, and institutional uses close together including municipal offices and many businesses.

As a result of the Town of Canmore's extensive building design regulations in regards to height and area, the analysis of the building height and area within the Town represent a minimal risk. This includes all occupancy classifications. There are ten high-rise residential occupancies as defined by Statistics Canada (five storeys or greater). The majority of the high-rise buildings are hotels and resorts located along the Trans-Canada Highway. Large area buildings within Canmore include the Safeway, Canadian Tire,

Canmore General Hospital, and Elevation Place. Priority should be given to a pro-active fire inspection and compliance program.

3.2.3.2 Building Exposures

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 the close proximity. The close proximity of buildings can also impede firefighting operations due to the limited access for firefighters and equipment.

Adoption of the ABC and the AFC has required spatial separations and the use of fire retardant materials and construction methods to reduce the fire risks. In addition to the construction and planning requirements within the respective codes, basic firefighting practices consider the protection of exposures as a primary function and consideration in the event of a response by the fire department.

The age and construction of the buildings throughout the downtown area in the Town present the most significant risk for fire spread both internally and to adjacent buildings due to the close proximity of these buildings to one another. Within the Town of Canmore, many buildings are in close proximity to each other. This includes portions of the downtown core, many residential developments west of the Bow River, residential areas surrounding Elk Run Park and a portion of Peaks of Grassi. The CFRS has identified:

- Seventeen Group C – Residential occupancies that present high exposure risk:
  - Bow Valley Chalets;
  - Stone Ridge Mountain Resort;
  - The Lodges at Canmore;
  - Windtower Mountain Lodge;
  - Canadian Rockies Chalets;
  - Blackstone Mountain Lodge;
  - Grande Rockies Resort;
  - and some Solara buildings.
- Two Group D – Business and Personal occupancies: Bow Valley Business Centre, and Sunset Resorts; and
- The Alpine Heli Hangar and Alpine Heli Office were identified as exposure risks in the Group F – Industrial occupancy.

The risk of exposures as a result of a fire can occur in incidents involving buildings that are in compliance with current ABC and AFC requirements as well as those that may have been constructed prior to these public safety initiatives.

3.2.4 Potential High-Fire Risk Occupancies (Fuel Load)

Potential high-fire risk occupancy consideration is another factor within building stock profile per NFPA 1730. High fire risk can be linked to a combination of factors such as building density (exposures). This section of the Community Fire Risk Assessment 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 results 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 an historic downtown core. As presented previously within this report, 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 such as wood framing rather than newer construction utilizing concrete and steel products.

As shown in **Table 13**, the CFRS has identified six occupancies with fuel load concerns which is to be expected due to the size and role of the Town within its trading area and as a goods movement hub. In addition to ensuring compliance to the requirements of the ABC and the AFC, there are operational strategies that a fire service can implement to address fuel load concerns. These include regular fire inspection cycles and pre-planning of buildings of this nature to provide an operational advantage in the event of fire.

Table 13: Buildings with Site Specific Fuel Load Concerns in the Town of Canmore

Building Name	Address	Concern
Home Hardware	900 Railway Avenue	Fuel Load/Lumber
Home Hardware	11 Industrial Place	Fuel Load/Lumber
OK Tire	107 Elk Run Blvd	Tire Storage
Waste Management Center	102A Bow Valley Trail	Waste Storage
Timbertown Building Center	1456 Railway Avenue	Lumber indoors
Castle Mountain Furnishings	1310 Railway Avenue	Upholstery

(Source: Canmore Fire and Rescue Services)

3.2.5 Vulnerable Occupancies (Potential High-life Safety Risk Occupancies)

Identifying the location and number of vulnerable individuals or occupancies within the community provides insight into the magnitude of this particular demographic within a community. This demographic is typically defined as requiring some type of assistance due to physical/cognitive limitations, disabilities, drug or alcohol use and others that may require assistance to evacuate in the event of a fire and represents a potential high-life safety risk.

Occupancies that should be considered when assessing this demographic include hospitals, seniors' apartments, group homes, rooming houses, residential care facilities, daycare centres and long-term

care facilities. **Table 14** lists these occupancies in Canmore as identified by CFRS and as referenced in the 2016 Evacuation Plan (pg. 3) provided by the Town.

Table 14: Vulnerable Occupancies in Canmore

Facility	Address
Bow River Seniors Lodge	920 - 13th Street
Origin at Spring Creek	808 Spring Creek Drive
Elizabeth Rummel School	1033 Cougar Creek Drive
Canmore General Hospital	1100 Hospital Place
Canmore Community Day Care	606B – 7th Ave
Mountain Munchkins Day Care	20 Grotto Way

(Source: Occupancies identified by CFRS and the Town of Canmore 2016 Evacuation Plan)

3.2.6 Historic or Culturally Important Building or Facilities

In addition to the consideration of building age and construction, understanding the location of historic or cultural important buildings or facilities is important since these features can be keystone features to a community. They provide a sense of heritage, place, and pride and may act as tourism destinations. The CFRS identified designated historic buildings and properties of interest that align with those heritage resources identified within Section 13 of its Land Use By-law 22-2010. These key buildings are presented in **Table 15**. There are four protected properties and seven identified properties of interest, some of which include historic hotels and other lodgings.

Table 15: Town Of Canmore Historic Resources

Historic Resource Name	Location	Level of Designation
Designated Protected Buildings		
North West Mounted Police Barracks	601 – 609 Main Street	Provincial Historic Resource
Ralph Connor Memorial United Church	617 Main Street	Provincial Historic Resource
McNeill Heritage House	500 Three Sisters Drive	Provincial Historic Resource
Ralph Connor Church	617 8 Street	Provincial Historic Resource
Properties of Interest		
Canmore Hotel	738 Main Street	Undesignated
Canmore Mines Lamphouse	S.E. ¼ Sec. 29, Twp. 24, Rng. 10, W5M	Undesignated
The Mine Manager's House	160 Rundle Crescent	Undesignated
Miner's Union Hall	738 Veteran's Way	Undesignated

Historic Resource Name	Location	Level of Designation
St Michael's Church	709 - 713 Veteran's Way	Undesignated
The Settler's Cabin	830 Main Street	Undesignated
O'Canada Soapworks	633 Main Street	Undesignated

(Source: CFRS and Section 13 Land Use Bylaw 22-2010)

3.2.7 Building Stock Profile Observations

The following is a summary of key Building Stock Profile observations:

- Group C – Residential occupancies are the highest proportion of occupancies;
- The 2011-2012 Alberta Fire Commissioner's Report states that residential fires account for 72% of fire injuries, and 63% of property loss value emphasizing the importance of Group C – Residential occupancies when it comes to fire risk;
- The Town of Canmore has a higher proportion of higher-density types of residential development including semi-detached houses (8.3%), row houses (17.4%) and apartments less than five storeys (21.2%) compared to the Province (+3.1%, +10.4%, and +7% respectively);
- As a result of the Town of Canmore's extensive building design regulations in regards to height and area, the analysis of the building height and area within the Town represent a minimal risk;
- The age and construction of the buildings throughout the downtown area in the Town present the most significant risk for fire spread both internally and to adjacent buildings. In addition, the CFRS has identified several specific occupancies that reflect an exposure risk;
- CFRS has identified six occupancies with fuel load concerns and two vulnerable occupancies; and
- There are four protected properties and seven identified properties of interest some of which include historic hotels and other lodgings.

3.3 Past Fire Loss Profile

Past fire loss statistics can be assessed to understand trends within a community and design a community risk reduction plan accordingly. This section reviews overall fire loss, fires loss by occupancy type, death or injury by occupancy type, fire deaths or injuries by age and gender, reported fire cause, smoke alarm status, and fire suppression system status.

3.3.1 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.

In terms of overall property loss as a result of fires, **Table 16** shows the total number of fires, and property loss for the Town of Canmore and the Province of Alberta for the period 2005 to 2014. The

property loss for both the Province and the Town has been quite variable over the ten year period which is not uncommon since the dollar amount of property loss depends on the nature of the property lost. For example, in 2011 Canmore experienced 12 fires with about $570,000 in property loss, where just six fires in 2012 resulted in almost $2.5 million in property loss. Over this period in total, Canmore had $28 million in property loss from 77 fires.

Table 16: Town of Canmore and Province of Alberta Property Loss Fires (2005-2014)

	Town of Canmore		Province of Alberta	
Year	**Fires**	**Property Loss ($)**	**Fires**	**Property Loss**
2005	7	$ 292,576	5,199	$ 450,367,820
2006	3	$ 3,909	5,141	$ 215,894,056
2007	16	$ 3,866,313	5,312	$ 336,369,045
2008	5	$ 815,161	5,710	$ 394,105,439
2009	11	$ 19,411,214	5,273	$ 524,422,775
2010	9	$ 307,974	5,057	$ 395,634,128
2011	12	$ 569,236	7,007	$ 834,283,027
2012	6	$ 2,469,300	5,452	$ 477,282,722
2013	5	$ 86,000	5,193	$ 488,838,169
2014	3	$ 496,00	5,115	$ 417,005,147
Total	77	$ 28,317,638	54,459	$ 4,534,202,328

3.3.2 Fires by Occupancy Type

To assess the fire loss by occupancy type, data accessed through the Office of the Fire Commissioner's Interactive Fire Data Analysis was assessed and categorized into one of the six major occupancy classifications. Based on this analysis, **Table 17** illustrates the fire loss within the Town of Canmore by property classification for the ten year period from 2005 through 2014. There was a total property loss of $28,317,683 from the 77 structure fires that occurred from 2005-2014. The majority of the property loss (91.60%) occurred in Group C – Residential occupancies. The greatest number of fires and the greatest property loss occurs on Group C – Residential occupancies (69%). When the categories that do not directly align with ABC major occupancy classifications are removed from the calculations, (i.e., Special Property-Transportation, Storage Property, Miscellaneous Property, and Unclassified), residential fires account for 91% of all fires (compared to 83% for the Province).

Table 17: Town of Canmore Fire Loss by Property Classification (2005-2014)

Occupancy Classification	Property Classification	Fires	% Fires	Property Loss	% Loss
Group A	Assembly	0	0%	$0	0.0%
Group B	Care or Detention	0	0%	$0	0.0%
Group C	Residential	53	69%	$25,943,871	91.6%

Group D	Business and Personal	5	6%	$308,178	1.1%
Group E	Mercantile	0	0%	$0	0.0%
Group F	Industrial	0	0%	$0	0.0%
	Storage Properties	0	0%	$0	0.0%
	Special Property - Transportation	15	19%	$299,057	1.1%
	Miscellaneous Property	4	5%	$1,766,577	6.2%
	Total	**77**	**100%**	**$28,317,684**	**100.0%**

Table 18 provides the historic fires by property classification for a ten year period within the Town of Canmore (2005-2014) and compares it to the 2012 fires for the Province of Alberta. When considering all property classifications, the number of fires in the Town of Canmore is primarily residential (69%) whereas in the Province of Alberta it is spread between residential (39%) and Special Property – Transportation (38%).

Table 18: Town of Canmore and Province of Alberta Fire Loss by Property Classification

Occupancy Classification	Property Classification	Canmore (2005-2014)		Alberta (2012)		% of Total Property Loss	
		# of Fires	% of Total Fires	# of Fires	% of Total Fires	Canmore* (2005-2014)	Alberta (2012)
Group A	Assembly	0	0%	108	2%	0%	3%
Group B	Care or Detention	0	0%	54	1%	0%	0%
Group C	Residential	53	69%	2,037	39%	92%	63%
Group D	Business and Personal	5	6%	56	1%	1%	2%
Group E	Mercantile	0	0%	131	3%	0%	8%
Group F	Industrial	0	0%	100	2%	0%	4%
	Storage Properties	0	0%	361	7%	0%	6%
	Special Property - Transportation	15	19%	1,977	38%	1%	10%
	Miscellaneous Property	4	5%	363	7%	6%	4%
	Total	**77**	**100%**	**5,187**	**100%**	**$28,317,684**	**$433,989,733**

3.3.3 Fire Deaths or Injuries by Age and Gender of Victims

Reviewing historic fire deaths or injuries by age and gender of victims can help to provide insight for the purposes of targeted community risk reduction programs. While there is no reporting on these statistics for the municipal level, the Alberta Office of the Fire Commissioner does provide statistics overall on these factors. These trends can be used to inform programming for the Town of Canmore with consideration for the Town to track and utilize this information at the local level.

According to the 2011-2012 Alberta Fire Commissioner's Statistical Report, of the fire deaths in 2011, 65% were in the Adult age group (18 to 64 years of age) and 63% in 2012. The next highest proportion was in the senior age category (65 years or older) accounting for 31% of deaths in 2011 and 32% in 2012. In regards to deaths and injuries by gender, as stated in the Commissioners report, "*in 2011 the civilian adult male to female ratio was 3:1 for fire deaths and 2:1 for fire injuries for 2011 while in 2012 the ratio was 2:1 for both fire deaths and injuries*" (pg. 5).

3.3.4 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 as part of the community fire protection plan.

Based on the eleven categories found in the Alberta Fire Commissioner's Statistical Report 2011-2012 for fire losses by major act or omission, analysis was carried out for Town of Canmore data (**Table 19**). The highest proportion of fires causes by act or omission was classified as human failing (35%) which can include accidents, asleep with suspected influence of alcohol or drugs, distracted, or ignorance of a hazard. This category accounted for the highest number of injuries as well (4 of 9). The second highest proportion of fires was also unintentional fires caused by a mechanical, electrical failure or other malfunction (16%).

Arson and 'Set' Fires recognizes the cause of a fire to be started for a specific, intentional reason. These can be related to acts of vandalism, or to achieve personal gain through insurance payment (e.g. insurance fraud). There were 11 arson fires reported for this period totalling 14% of all fires. Misuse of source of ignition also accounted for 14% of all fires.

Table 19: Town of Canmore Fire Loss by Major Acts or Omissions (2005-2014)

Act or Omission	Fires	Injuries	Property Loss ($)
Mechanical, Electrical Failure, Malfunction	12	3	$ 21,181,537
Arson or 'Set' Fires	11	2	$ 3,884,356
Human Failing	27	4	$ 2,188,421
Misuse of Source of Ignition	*11*	0	$ 452,935
Misuse of Material Ignited	1	0	$ 1,000

Act or Omission	Fires	Injuries	Property Loss ($)
Construction, Design, Installation Def.	*3*	0	$ 200,468
Vehicle Accident	1	0	$ 30,213
Misuse of Equipment	0	0	$ -
Not Determined	0	0	$ -
Miscellaneous	2	0	$ 12,600
Act or Omission	9	0	$ 366,153
Total	**77**	9	**$ 28,317,683**

Table 20 compares the percentage of fires by major acts or omissions in Canmore to the Province of Alberta. There are a much higher percentage of "human failing" fires within Canmore compared to the provincial statistics.[13] Most of the property loss in Canmore was due to mechanical, electrical failure or other malfunction (75%) compared to 17% of property loss for the Province.

Table 20: Canmore vs. Alberta Fire Loss by Major Acts or Omissions

Act or Omission	Percentage of Fires		Percentage of Property Loss	
	Canmore (2005-2014)	Alberta (2012)	Canmore* (2005-2014)	Alberta (2012)
Mechanical, Electrical Failure, Malfunction	16%	22%	75%	17%
Arson or 'Set' Fires	14%	17%	14%	17%
Human Failing	35%	13%	8%	11%
Misuse of Source of Ignition	14%	7%	2%	11%
Misuse of Material Ignited	1%	6%	0%	9%
Construction, Design, Installation Def.	4%	2%	1%	4%
Vehicle Accident	1%	1%	0%	0%
Misuse of Equipment	0%	1%	0%	1%
Not Determined	0%	22%	0%	25%
Miscellaneous	3%	5%	0%	2%
Act or Omission	12%	4%	1%	4%
Total	**100%**	**100%**	100%	**100%**

(Source: Analysis of Office of the Fire Commissioner, Interactive Fire Data Analysis for the Town of Canmore, 2005 to 2014 and Province of Alberta data for 2012 per the Statistical Report released by the Fire Commissioner.)

[13] As previously stated, the Town of Canmore statistics are based on an analysis of the Act or Omission data provided from the Office of the Fire Commissioner Interactive Fire Data Analysis. This should be considered when reviewing this data.

The reporting provided by the Office of the Fire Commissioner for the Town of Canmore also specifically provides causes of fires in the home. The results of the home fire causes for the period 2005 to 2014 is found in **Table 21.** The three most common known causes of fires in the home are electrical distribution equipment (20%), cooking (17%), and smoking (17%). In alignment with the overall proportion of property loss shown in Table 22, the highest proportion of property loss in homes is a result of electrical distribution equipment (83% of all loss).

Table 21: Home Fire Causes - Town of Canmore (2005 - 2014)

Home Fire Causes	Fires	% of Fires	Deaths	Injuries	$ Losses
Appliance/Equipment Related	1	*2%*	0	0	$20,000
Arson/Set Fire	3	*7%*	0	1	$1,909,800
Cooking	7	*17%*	0	0	$635,238
Electrical Distribution Equipment	8	*20%*	0	3	$21,329,000
Exposure Fire	2	*5%*	0	0	$290,745
Heating Equipment Related	3	*7%*	0	1	$85,045
Light/Fluorescent Bulb	1	*2%*	0	0	$17,000
Other Causes/Unknown	9	*22%*	0	0	$1,328,264
Smoking	7	*17%*	0	0	$230,065
Total	**41**	***100%***	**0**	**5**	**$25,845,157**

3.3.4.1 Ignition Source

Table 22 illustrates the fire loss by source of ignition based on an analysis of the data provided from 2005 to 2014 from the Office of the Fire Commissioner for the Town of Canmore. The top three most common ignition sources are electrical equipment (19%), undetermined (19%), and open flame tools/smoker's material (14%).

Table 22: Town of Canmore Fire Loss by Major Source of Ignition (2005 - 2014)

Source of Ignition	Fires	% of Fires
Appliances and Equipment - unclassified or unknown	2	*3%*
Cooking Equipment	9	*12%*
Electrical Equipment	15	*19%*
Exposure	4	*5%*
Heating Equipment	9	*12%*
Lighting	2	*3%*
Open Flame Tools/Smoker's Material	11	*14%*
Other	10	*13%*
Igniting Object - cannot be determined	15	*19%*

Source of Ignition	Fires	% of Fires
Total:	**77**	***100%***

(Source: Analysis of Office of the Fire Commissioner, Interactive Fire Data Analysis for the Town of Canmore, 2005 to 2014)

3.3.5 Smoke Alarm Status

Similar to deaths or injuries by age and gender of victims, there is data available at the Provincial level, but not at the municipal level, for the smoke alarm status in the event of a fire. According to the 2011-2012 Alberta Fire Commissioner's Statistical Report, for the period of 2011 and 2012, there were 3,179 fires 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, a smoke alarm was activated 38% of the time. They were not activated in 28% of the time and it is unknown if they were activated 34% of the time.

If an alarm was activated but did not assist, the primary cause was that it was unnecessary to evacuate (at 76%) followed by individuals being under the influence of drugs and alcohol at 10%. The top reason an alarm was not activated over the 2011 to 2012 time period was due to not enough smoke (64%) followed by no battery in the smoke alarm (11%). According to the report, most of the fires originated outside of the home or in structural elements which meant that an adequate amount of smoke did not reach the detector.

These statistics support specific educational programming regarding the importance of having a smoke alarm installed with working batteries.

3.3.6 Fire Suppression System Status

Fire suppression systems are essentially automatic systems that extinguish fires without human intervention, such as fire sprinklers. These systems can detect fires using a variety of methods including heat sensors, wiring, or manual detection. These systems are often required in Group F – Industrial occupancies that may have a high fuel load, result in a large fire loss, or be home to hazardous materials. In some provinces, fire suppression systems are also required in long-term care facilities or other facilities home to vulnerable occupants. These are important systems that prevent the loss of life and property in part due to the fire growth and time for flashover combined with occupants with mobility or cognitive issues. Per the 1990 Alberta Building Code, fire suppression systems (sprinklers) are required in new-build seniors and long-term care facilities (Group B). However, there has been no legislation enacted to retrofit facilities built prior to 1990.[14]

Understanding the status of a fire suppression system in the case of a fire can be used as a check regarding prevention (e.g. inspection) activities. Neither the Town of Canmore nor the Province has data

[14] *Source: http://www.albertafire.com/fire-sprinklers-coming-to-albertas-seniors-lodges/, accessed October 2016.*

available regarding the fire suppression system status in historic fires. The Province does report on the method of fire control and extinguishment where sprinkler systems or some other fixed systems extinguished fires. For 2011 and 2012 combined, about 1% of instances (a total of 90 out of 12,120 fires across the Province) were extinguished through such a system.

3.3.7 Past Fire Loss Profile Observations

The following is a summary of key past fire loss profile observations:

- For the Town and the Province, the greatest number of fires and the greatest property loss occurs in Group C – Residential occupancies;
- Group C – Residential occupancies accounted for 88% of fire deaths in 2011 and 79% in 2012. There have been no fire fatalities in the Town over this time period;
- The top reason an alarm was not activated over the 2011 to 2012 time period was due to not enough smoke (64%) followed by no battery in the smoke alarm (11%);
- For the Province over the period of 2011 and 2012, there were 3,179 fires where a smoke alarm was not installed (totaling 69% of fires in 2011 and 58% in 2012);
- The highest proportion of fires caused in the Town of Canmore (2005 to 2014) was classified as human failing (35%) which can include accidents, asleep with suspected influence of alcohol or drugs, distracted, or ignorance of a hazard; and
- The three most common known causes of fires in the home in the Town of Canmore (2005 to 2014) are electrical distribution equipment (20%), cooking (17%), and smoking (17%).

3.4 Response Profile

The breakdown of calls for emergency response can be used to target education and inspection programs both generally and to specific occupancies. An extensive analysis of the calls for the Town of Canmore can be found in **Section 8.7** of the Fire-Rescue Master Plan. As it pertains to Community Fire Risk Assessment, there are three key observations from a high-level:

- The majority of all calls from 2011 to 2015 took place in the summer season (30%) in alignment with the tourism/recreation-based population shift;
- Overall, the fire related calls show an increasing trend, which indicates a need to enhance the fire prevention and public education efforts of the CFRS; and
- There is a high proportion of false alarm calls;

There is potential for the Town of Canmore to assess these calls spatially and at an individual level to identify trends in geographies or specific occupancies.

3.5 Hazard Profile

Hazards are important to consider from a fire risk, emergency response and overall public safety perspective, whether natural, human-caused, or technological. **Table 23** shows potential hazards by category based on information provided by CFRS and a high-level review of hazards.

While NFPA 1730 highlights the importance of hazard considerations, there are other avenues utilized by municipalities that assess risks at a more detailed level. Within the Town of Canmore there is the Municipal Emergency Management Plan and the Mountain Creek Hazard Mitigation Program.

The Municipal Emergency Management Plan, including the provincial legislation that guides it, is discussed in the Fire-Rescue Master Plan. The Mountain Creek Hazard Mitigation program was motivated by the 2013 floods that took place in the Town and the surrounding areas of Alberta (e.g. Calgary, High River, etc.). This program identified five primary creeks: Cougar Creek, Three Sisters Creek, Stone Creek, Stoneworks Creek, and Pigeon Creek. For each of these creeks, there is a five-stage process: forensic investigation, short-term mitigation, hazard assessment, risk assessment, option analysis, and long-term mitigation. The risk assessments identify coverage of flow depth and impact intensity for the respective creeks. Overall, this process is at various stages for each creek but reflects an initiative that will help both reduce the probability and a consequence of a flooding event.

While there are a number of potential hazards in the Town, due to the topography and considerations due to climate change, natural hazards are more probable.

Table 23: Hazard Risk Assessment Work Sheet

Hazard	Natural	Human-Caused	Technological
Human caused fires		X	
Hazmat spills		X	X
Terrorism		X	
Helicopter CFRAshes		X	X
Mass causality events	X	X	X
Multi vehicle collisions (multi car pile ups on Trans-Canada highway)		X	X
Power/natural gas outages	X	X	X
Internet/communication disruptions		X	X
Overland floods (Bow River)	X		
Creek flooding	X		
Forest fires	X		
Extreme wind	X		
Water supply shortage	X		
Heavy snowfall event	X		

Hazard	Natural	Human-Caused	Technological
Freeze-thaw cycles	X		
Storm water system overwhelmed (Flooding)	X		
Avalanche	X		
Earthquake	X		

The key observations for the hazard profile are:

- The Town is in the process of developing the Mountain Creek Hazard Mitigation program motivated by the 2013 floods that took place in the Town and the surrounding areas of Alberta;
- There are several potential hazards under all categories (natural, human-caused, technological) but due to the topography and considerations due to climate change, natural hazards are more probable.

3.6 Economic Profile

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 profoundly negatively impact on the overall well-being of the Town. The CFRS identified several important events:

- Canada Day;
- Canmore Folk Festival;
- Canmore Highland Games; and
- Uncorked Food Festival.

If a natural hazard were to occur and result in the cancellation of one of these events it could result in significant economic loss for the Town.

According to a Bow Valley College Community and Human Resource Profile on the Town of Canmore (completed August 2010), the two major employers in the Town are Canmore General Hospital and TransAlta. If a fire loss were to occur in one of these facilities, not only would people not be able to work resulting in economic loss but health services would be lost if an incident were to occur at the hospital. The Human Resource Profile also identified that the largest source of employment is the tourism and hospitality industry.[15] If fire loss was to occur among tourist accommodation facilities, this would have a ripple effect on the local economy. Since the accommodations functions at a high capacity in the summer, there could be impacts on the ability of tourists able to come to the Town resulting in

[15] (Bow Valley College, 2010)

economic loss. Further, hospitality workers would not be able to work resulting in further loss. The Town of Canmore itself is a significant employer within the community. A similar economic impact would be experienced if an incident were to occur at municipal facilities with the further effect of the impact on the services provided by the Town. These potentials impacts and mitigation strategy should be considered as part of the Town's Municipal Emergency Management Plan.

The key observations for the Economic Profile are:

- There are several key Town events and key occupancies where if a fire loss were to occur, there would be an economic loss to the Town and its residents
    - Loss of major industrial facilitywould impact residents ability to work;
    - Loss of tourist accommodation facilities could impact ability to accommodate tourists and the ability of residents to work resulting in economic loss;
    - Loss of Canmore General Hospital would result in impact of residents ability to work and ability to provide health services; and
    - Loss of municipal offices would result in impact of residents' ability to work and potentially impact the ability of the Town to provide services.

4.0 Risk Model

As mentioned in the introduction to this Community Fire Risk Assessment, the Ontario Office of the Fire Marshal and Emergency Management (OFMEM) has provided a tool assessing community risk called the Fire Risk Sub-model. This process of Community Fire Risk Assessment, considered a best practice in Canada, can be applied for the Town of Canmore. The OFMEM Fire Risk Sub-model defines risk "*as a measure of the probability and consequence of an adverse effect to health, property, organization, environment, or community as a result of an event, activity or operation. For the purposes of the Fire Risk Sub-model, such an event refers to a fire incident along with the effects of heat, smoke and toxicity threats generated from an incident".*

The OFMEM model develops an overall risk assessment "*by assigning probability and consequence levels to potential adverse events or scenarios due to fire and combining the two to arrive at an overall risk level".* The OFMEM Fire Risk Sub-model provides a matrix as one option in arriving at the level of risk for a range of scenarios. NFPA 1730 also provides a risk assessment matrix that can be used to create a visual representation of risks.[16]

Alternatively the model provides the opportunity "*for analysis purposes, the community being assessed can be defined as the municipality in its entirety or as a particular segment of it that distinguishes it from*

[16] The NFPA 1730 matrix (pg. 1730-13) identifies probability levels (very low, low, moderate, high) and impact levels (no, limited, substantial, high).

other parts". The model further provides that "*it may be convenient to subdivide a municipality based on residential subdivision, downtown sections, industrial park, and a rural area".*

For analytical purposes, the methodology within this study uses the AFC occupancy classifications as the basis for segmenting the community by primary building use. Each major occupancy classification is assigned a probability level based on the AFC definitions. A consequence level also using the AFC definition is then assigned for each major occupancy classification.

The methodology within this report includes a further process of assigning 'weighting factor' to each of the eight risk factor categories identified by the OFMEM Fire Risk Sub-model. Utilizing a range from 1 (lowest) to 3 (highest) each of the factors is assigned a weight factor, to calculated a weighted average. The weight factor assigns more or less priority to each of the given factors. For example, the demographic profile that identifies the number of vulnerable residents has been assigned the highest factor weight of 3. This process results in the most relevant categories having more impact on the risk priority level calculated.

The level of risk (Priority Level) for each major occupancy classification is determined by multiplying ***"probability x consequence = risk level (priority)".*** This provides the ability to determine an overall risk level for each major occupancy classification within the community.

This methodology then coordinates the assigned risk level for each major occupancy classification with the Council approved zoning by-law information and mapping. This process provides the opportunity to create a visual model (map) of the Community Risk Profile. This provides the opportunity to view both the current and projected level of risk within the community based on the Council approved Official Plan.

Creating the Community Risk Profile Model provides the opportunity to evaluate the current level of fire protection services provided. The model can further identify where risk levels may increase or change based on growth and long-term planning of the community.

4.1 Probability Levels

The probability of a fire occurring can be estimated in part based on historical experience of the community. The experience of other similar communities and that of the province as a whole can also provide valuable insight into the probability of a fire occurring. The experience of the evaluator and the local fire service staff in collaborating on determining probability is also a key factor.

The OFMEM Fire Risk Sub-model categorizes the probability of an event occurring into five levels of likelihood. **Table 24** identifies the OFMEM Fire Risk Sub-model categories.

Table 24: OFMEM Fire Risk Sub-model Likelihood Levels (Probability)

Description	Level	Specifics
Rare	L1	- may occur in exceptional circumstances - no incidents in the past 15 years
Unlikely	L2	- could occur at some time, especially if circumstances change - 5 to 15 years since last incident
Possible	L3	- might occur under current circumstances - 1 incident in the past 5 years
Likely	L4	- will probably occur at some time under current circumstances - multiple or reoccurring incidents in the past 5 years
Almost Certain	L5	- expected to occur in most circumstances unless circumstances change - multiple or reoccurring incidents in the past year

4.2 Consequence Levels

The consequences as a result of a fire relate to the potential losses or negative outcomes associated should an incident occur. The Fire Risk Sub-model identifies four components that should be evaluated in terms of assessing consequence. These include:

- ***Life Safety:*** Injuries or loss of life due to occupant and firefighter exposure to life threatening fire or other situations.
- ***Property Loss:*** Monetary losses relating to private and public buildings, property content, irreplaceable assets, significant historic/symbolic landmarks and critical infrastructure due to fire.
- ***Economic Impact:*** Monetary losses associated with property income, business closures, downturn in tourism, tax assessment value and employment layoffs due to fire.
- ***Environmental Impact:*** Harm to human and non-human (i.e. 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.

The OFMEM Fire Risk Sub-model evaluates the consequences of an event based on five levels of severity. **Table 25** identifies the OFMEM Fire Risk Sub-model categories.

Table 25: OFMEM Fire Risk Sub-model Consequence Levels

Description	Level	Specifics
Insignificant	L1	- no life safety issue - limited valued or no property loss - no impact to local economy and/or - no effect on general living conditions
Minor	L2	- potential risk to life safety of occupants - minor property loss - minimal disruption to business activity and/or - minimal impact on general living conditions
Moderate	L3	- 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	L4	- potential for a large loss of life - would result in significant property damage - significant threat to businesses, local economy and tourism and/or - impact to the environment would result in a short term, partial evacuation of local residents and businesses
Catastrophic	L5	- 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

4.3 Risk Levels

Once probability and consequence are determined for each major occupancy classification the level of risk is calculated by multiplying ***"probability x consequence = risk level (priority)".*** **Table 26** identifies the four levels of risk identified within the OFMEM Fire Risk Sub-model including the lower and upper range of each risk classification and the relative definition of each.

Table 26: OFMEM Fire Risk Sub-Model Risk Levels

Risk Level	Priority Level	Definition
Low Risk	L1	- manage by routine programs and procedures, maintain risk monitoring
Moderate Risk	L2	- requires specific allocation of management responsibility including monitoring and response procedures
High Risk	L3	- community threat, senior management attention needed

Table 27 presents the risk level that would be assigned based on the lower to upper range of values (resulting from priority and consequence calculations).

Table 27: Risk and Priority Levels

Risk Level	Priority Level	Lower – Upper Range	Definition
Low Risk	L1	0 to 6.3	- manage by routine programs and procedures, maintain risk monitoring
Moderate Risk	L2	6.4 to 12.5	- requires specific allocation of management responsibility including monitoring and response procedures
High Risk	L3	12.6 to 18.7	- community threat, senior management attention needed

4.4 Town of Canmore GIS Risk Model

This section provides a brief outline of the scope and methodology used in order to provide insight into the modelling procedures adopted to assess town risk. A geographic information system (GIS) model was developed to assess risk based on risk geography, land use, building occupancy, and predicted emergency response travel times to the related risks.

The basis of the GIS risk model is the development of geographic risk zones. These zones represent areas of low, moderate, high, and special risk categories based on land use. The Town's existing Land Use Districts and Bylaw 22-2010 was used as the basis to determine initial building occupancy risk associated with each zone. The base risk zones associated with each land use zoning type are listed in **Table 28**.

Table 28: Base Risk Zone Category by Land Type

Town of Canmore Land Use District	Base Risk Assigned
Commercial	Moderate
Direct Control	Individually Assigned
Industrial (Light)	Low
Industrial (General)	Moderate
Public Use	Low
Residential	Moderate
Urban Reserve	Moderate
Restricted Urban Reserve	Low
Environment District	Low
Wildlands Conservation District	Low
Manufactured Home Family Residential (Mobile Homes)	High

Subsequently, additional risk classification was undertaken to identify areas where a higher risk is present but does not represent an entire land use district.

Buildings located in areas of valley and future development were identified using a buildings shapefile provided by CANVEC (March 2016). A point was assigned to the centroid of each building and a 25 metre buffer was created around the point to approximate the building and its corresponding property. These areas were then assigned moderate risk. Buildings identified as greater than five storeys, a large footprint, a high fuel load, vulnerable occupancies, and historically or culturally important were all identified as high risk areas. These buildings are all identified and discussed in the previous sections.

The active railway lines were identified using a Shapefile provided by the Municipal District of Bighorn. The Shapefile displays the active railways as lines, thus a 20 metre buffer was given on each side to approximate the railway right-of-way. These areas were assigned high risk when traversing through the Town.

Table 29 presents the completed risk evaluation for the Town of Canmore. The evaluation utilizes the methodology described above following the framework of NFPA 1730 and the OFMEM Fire Risk Sub-model. The risk evaluation summary incorporates all community risk factors within the Town of Canmore for each major occupancy classification.

Table 29: Risk Evaluation Summary

Community Risk Profile Factors		Building Stock	Building Height	Building Age	Building Exposures	Demographic Profile	Geography Topography	Past Fire Loss	Fuel Load	Prob. Level	Cons. Level	Priority Level	Risk Level
Weight Factor		1	2	3	2	3	2	3	2				
ABC Major Occupancy Classification		Risk Level Assessment											
Group A	Assembly	3	2	3	2	4	2	1	2	2.4	3	7.2	RL-2
Group B	Care or Detention	3	3	3	3	5	4	3	3	3.4	4	13.8	RL-3
Group C	Residential	4	3	3	4	4	2	4	2	3.3	3	9.8	RL-2
Group D	Business	3	2	3	3	4	2	2	3	2.8	3	8.3	RL-2
Group E	Mercantile	3	2	3	3	4	2	1	3	2.6	3	7.8	RL-2
Group F	Industrial	2	2	2	2	2	2	1	4	2.1	2	4.1	RL-1
Mobile/Manufactured Homes & Trailers		2	1	3	4	5	3	4	2	3.2	4	12.9	RL-3

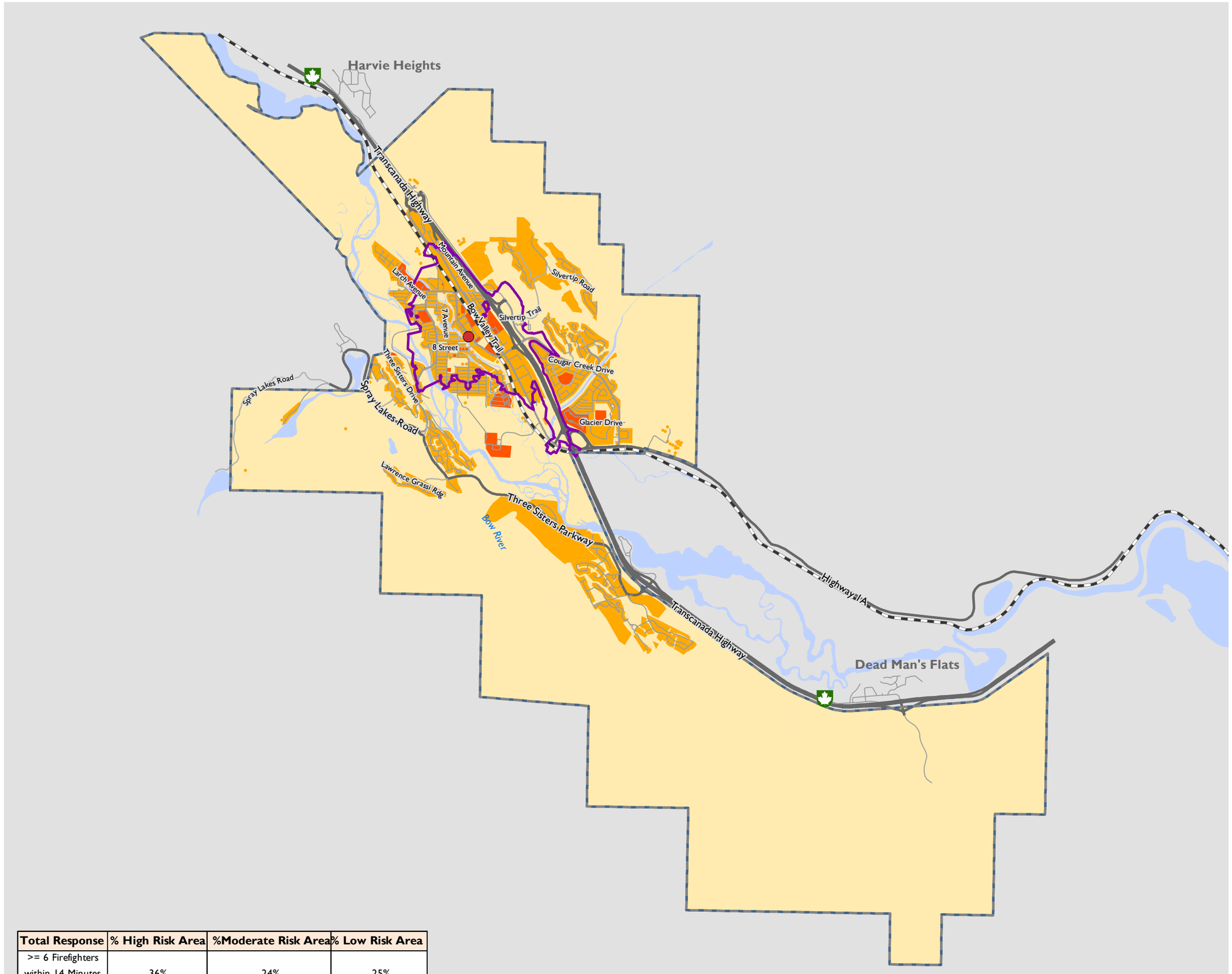
Probability: **1 – Rare** **2 – Unlikely** **3 – Possible** **4 – Likely** **5 – Almost Certain**	**X**	**Consequence Level:** **1 – Insignificant** **2 – Minor** **3 – Moderate** **4 – Major** **5 - Catastrophic**	**=**	**Priority Level** **0 to 6.2 = Low** **6.3 to 12.5 = Moderate** **12.6 to 18.7 = High**	**=** **=** **=**	**Risk Level** **RL-1 – Low Risk** **RL-2 – Moderate Risk** **RL-3 – High Risk**

4.4.1.1 Existing Risk and Response (Municipal Geography)

The GIS NFPA 1720 Rural Demand Zone response model was used to approximate existing geographic coverage of the existing risk zones, shown in **Figure 5**. Total response times were calculated by taking the 80th percentile of turnout times and calibrating the travel time along the road network. The calibrated travel speeds take into account vehicle acceleration and deceleration at stop sign and traffic signals and closely match the actual travel times to historical calls. These calibrated travel speeds were used to calculate total response time buffers that radiate out from the fire stations. Area calculations identify the percentage of each risk zone category that can be responded to by six firefighters within an estimated 14 minute total response time. The calculations indicate that 36% of the high risk geography, 24% of the moderate risk geography and 25% of the low risk geography is covered within a 14 minute total response time throughout the municipality.

4.4.1.2 Existing Risk and Response (Historic Calls 2012-2014)

Figure 6 depicts historic call locations from 2012 to 2014, which have been placed on top of the existing risk zones. Calculations were carried out to determine the number of calls that are located within each risk zone category and the associated total response time. Based on the calculation results, 53% of historic high risk calls, 56% of the historic moderate risk calls and 44% of the historic low risk calls have been responded to within 14 minutes of total response time.



Total Response	% High Risk Area	%Moderate Risk Area	% Low Risk Area
>= 6 Firefighters within 14 Minutes	36%	24%	25%

FILE LOCATION: I:\GIS\152720 Canmore Fire Staffing Study\mxd\Figure x Risk (Geography).mxd

TOWN OF CANMORE
FIRE RESCUE SERVICES

EXISTING FIRE RISK AND GEOGRAPHY
FIGURE 5 (Appendix A)

- Fire Station
- ≥ 6 Firefighters with 14 Minutes (Turnout and Travel)
- Municipal Boundary
- Railway

Risk
- High
- Moderate
- Low

1:60,000
0 0.5 1 2 km

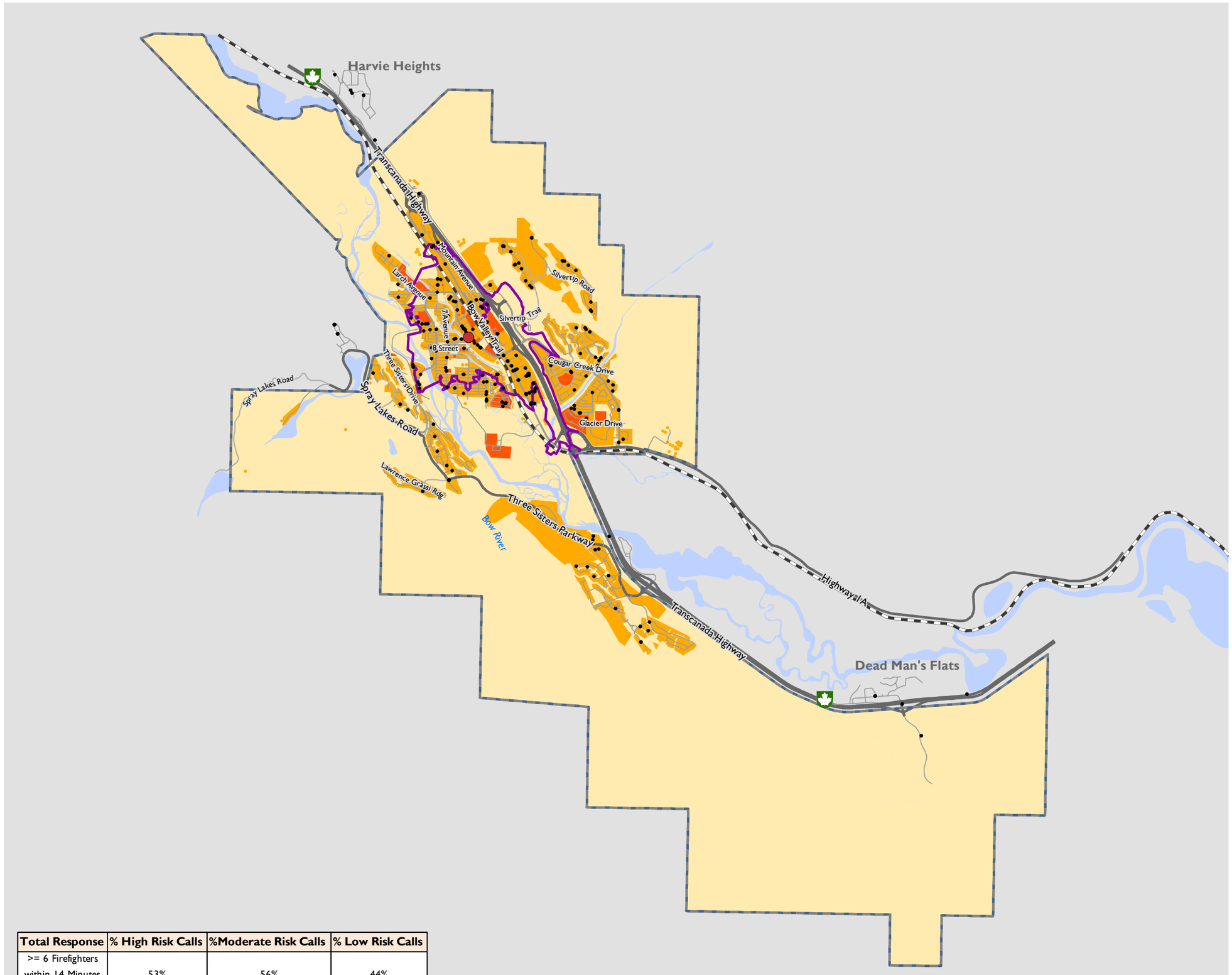
N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY TOWN OF CANMORE, M.D. OF BIGHORN, CANVEC (MARCH 2016)

MAP CREATED BY: SMB
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 3TM 114

DILLON CONSULTING

PROJECT: 141264
STATUS: FINAL
DATE: 10/20/2016



Total Response	% High Risk Calls	%Moderate Risk Calls	% Low Risk Calls
>= 6 Firefighters within 14 Minutes	53%	56%	44%

FILE LOCATION: I:\GIS\152720 Canmore Fire Staffing Study\mxd\Figure x Risk (Calls)2.mxd

TOWN OF CANMORE
FIRE RESCUE SERVICES

EXISTING FIRE RISK AND HISTORIC FIRE CALLS (2012-2014)
FIGURE 6 (Appendix A)

- Fire Station
- Fire Call (2012-2014)
- ≥ 6 Firefighters with 14 Minutes (Turnout and Travel)
- Municipal Boundary
- Railway

Risk
- High
- Moderate
- Low

1:60,000
0 0.5 1 2 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY TOWN OF CANMORE, M.D. OF BIGHORN, CANVEC (MARCH 2016)

MAP CREATED BY: SMB
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DILLON CONSULTING

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STATUS: FINAL
DATE: 10/20/2016

5.0 Growth Considerations

Historic growth provides a sense of trends within the community and planned growth reveals the strategic direction for long-term planning for Canmore Fire-Rescue Services.

5.1 Historic Growth

According to the Canmore 2014 Municipal Census data, the population of permanent residents has grown by 24.3% from 2000 to 2014, reflecting an average annual growth rate of 1.74% from 2000 to 2014. Commensurate with population growth was an increase of 43.5% in the number of households (3.11% annually). Similarly, from 2003 to 2014 the population of non-permanent residents has grown by 88.6% (6.33% annually) and the number of dwellings associated with non-permanent residents has grown by 43.5% (3.96% annually). Combined, this represents a 34.4% increase in total population from 2000 to 2014 (2.46% annually) and 27% increase in the total number of dwellings from 2003 to 2014 (2.45% annually). **Table 30** and **Table 31** summarize the historic growth in both the Permanent and Non-Permanent residences and dwellings from 2000 to 2014.

Table 30: Historic Growth in Permanent Residents and Dwellings for the Town of Canmore

Year	2000	2001	2003	2005	2006	2008	2009	2011	2014
Permanent Population	10,517	10,843	11,458	11,442	11,599	12,005	12,226	12,317	13,077
Average Annual Growth from Previous Count	-	3.1%	2.8%	-0.1%	1.4%	1.8%	1.8%	0.4%	2.1%
Dwellings	3,853	4,067	4,491	4,572	4,704	4,925	5,083	5,215	5,529
Average Annual Growth from Previous Count	-	5.6%	5.2%	0.9%	2.9%	2.3%	3.2%	1.3%	2.0%

(Source: Canmore 2014 Municipal Census)

Table 31: Historic Growth in Non-Permanent Residents and Dwellings for Town of Canmore

Year	2000	2001	2003	2005	2006	2008	2009	2011	2014
Non-Permanent Population	1,955	2,273	2,763	3,790	4,818	5,567	5,744	5,982	3,687
Average Annual Growth from Previous Count	-	16.3%	10.8%	18.6%	27.1%	7.8%	3.2%	2.1%	-12.8%
Dwellings	-	-	1,041	1,599	1,823	2,000	2,070	2,135	1,494
Average Annual Growth from Previous Count	-	-	-	26.8%	14.0%	4.9%	3.5%	1.6%	-10.0%

5.2 Planned Growth

According to the 2016 Canmore Draft Municipal Development plan, Canmore is expected to continue to grow over the next 30 years. As the Town is surrounded by provincial and national parks, future development of the Town is restricted and is approaching build-out as pockets of localized growth are developed. Within the MDP, it is identified that there is an established growth boundary with one specified area where future growth is to be determined (**Figure 7**). The conceptual land use for future growth has been established through the Municipal Development Plan as seen in **Figure 7**.

Dillon worked with Town planning staff to identify key growth areas planned for the next five and ten years. These development areas and the number of projected units are shown in **Figure 8** and includes both greenfield and infill/intensification in existing built up areas. Greenfield growth that is slated to occur in the ten-year horizon is located primarily in the southern area of the Town.

5.3 Growth Consideration Observations

Some key observations based on historic and planned growth are:

- According to the 2014 Municipal Census, the population of permanent residents has grown by 24.3% from 2000 to 2014 and the population of non-permanent residents has grown by 88.6%; and
- According to the 2016 Canmore Draft Municipal Development plan, Canmore is expected to continue to grow over the next 30 years as shown in **Figures 7 and 8**.

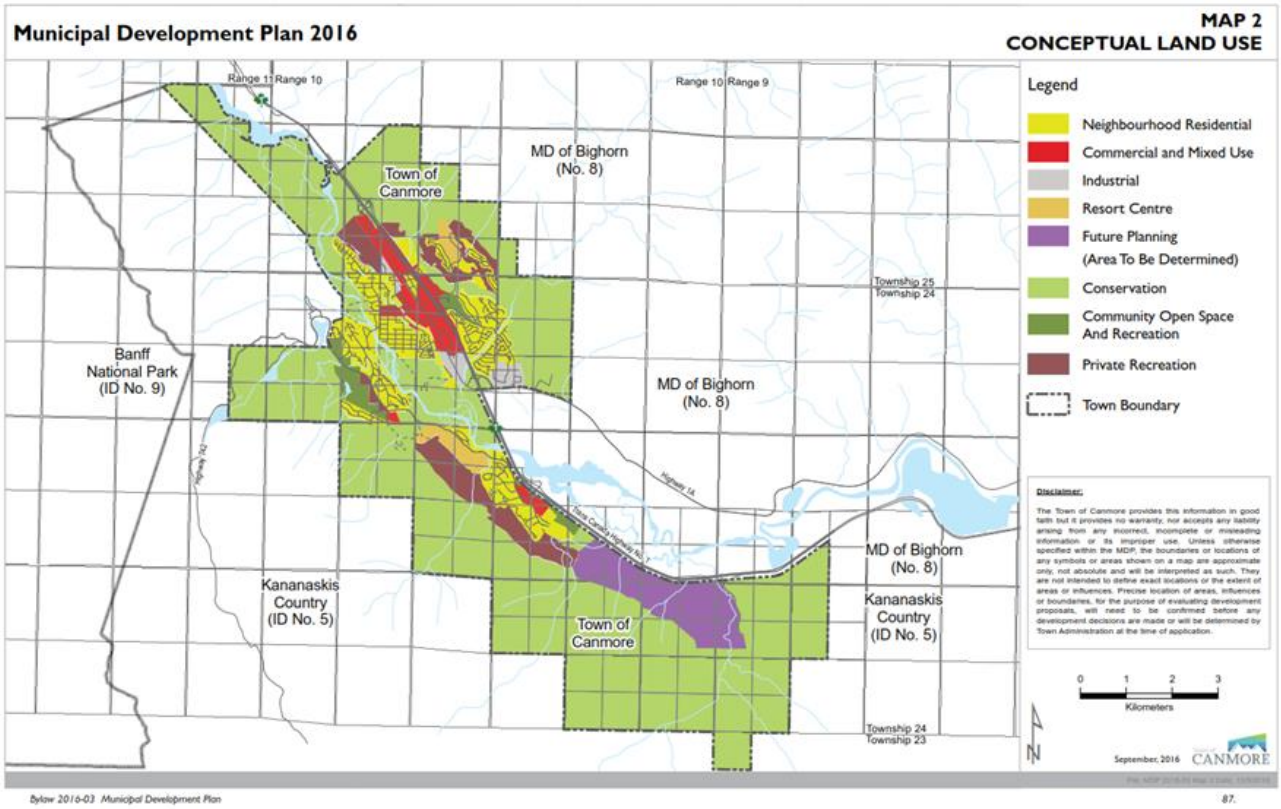
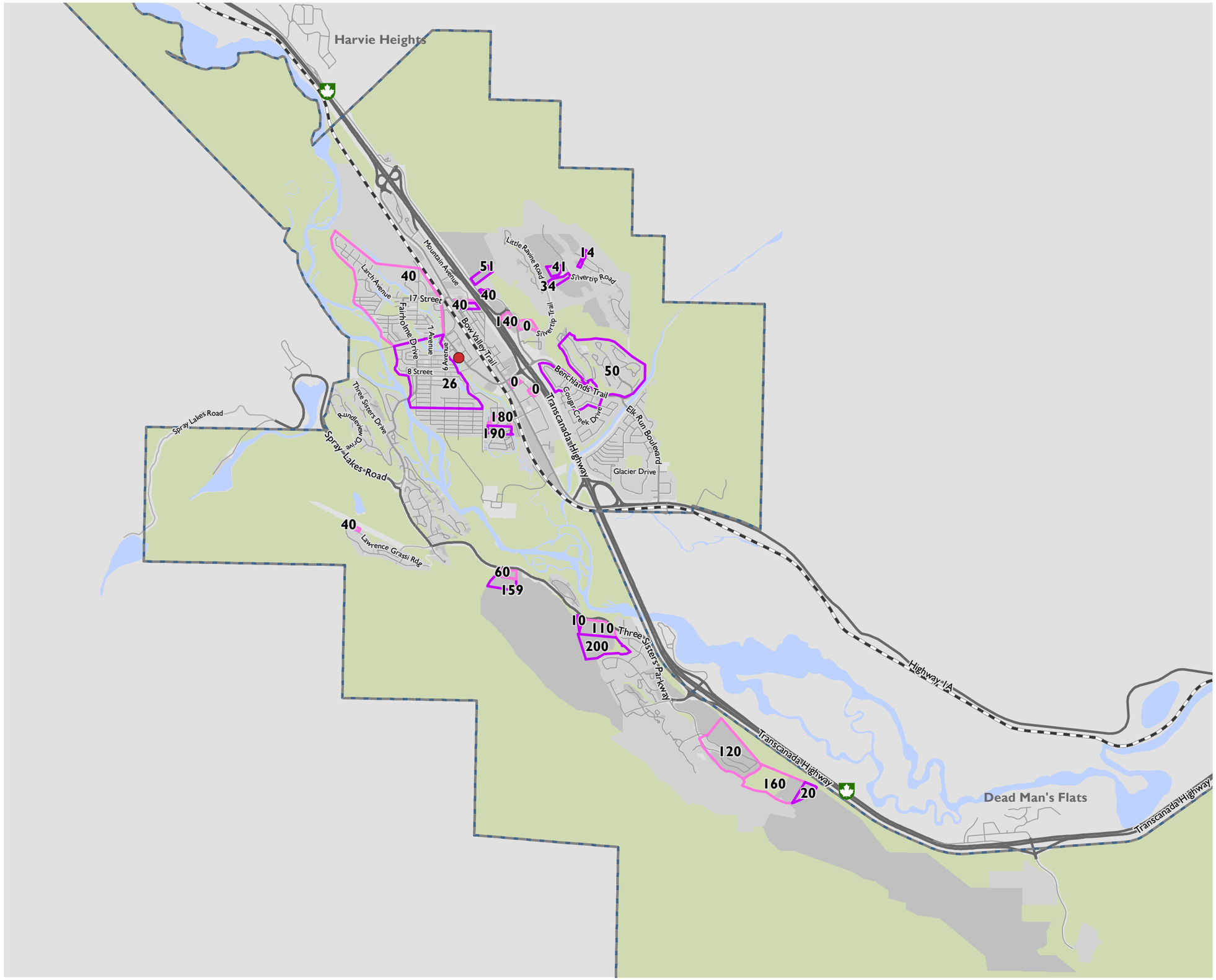


Figure 7: Conceptual Land Use for Future Growth in the Town of Canmore

TOWN OF CANMORE
FIRE RESCUE SERVICES

POPULATION GROWTH AREAS
FIGURE 8 (Appendix A)

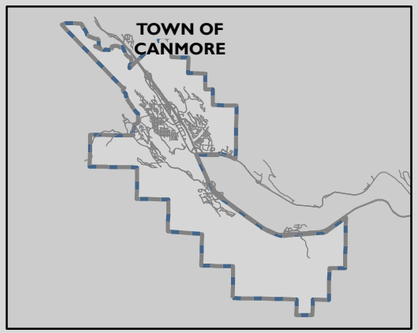


Fire Station
Municipal Boundary

Population Growth Areas (Number of Units are Labelled)

5 Year Horizon
10 Year Horizon
Railway
Developed Land
Environmental Reserve/Open Space
Vacant

2 Person Turnout Times - 198 seconds
4 Person Turnout Times - 420 seconds



1:45,000

0 0.5 1 2 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY TOWN OF CANMORE, M.D. OF BIGHORN

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 3TM 114

DILLON CONSULTING

PROJECT: 152720
STATUS: FINAL
DATE: 10/18/2016

FILE LOCATION: I:\GIS\152720 Canmore Fire Staffing Study\mxd\Population Growth Areas.mxd

6.0 Community Fire Risk Assessment Overview

Through this Community Fire Risk Assessment exercise, key risks have been identified following the NFPA 1730 risk profiles:

- Demographic;
- Building Stock;
- Past Fire Loss;
- Response;
- Hazard; and
- Economic.

Growth considerations including historic and future growth are also considered and a Fire Risk Model was developed based in part of NFPA 1730 and the Ontario Office of the Fire Marshal's Fire Risk Sub-model. The results of this Community Fire Risk Assessment directly inform the Fire-Rescue Master Plan and should be used to inform the development and implementation of public education programs. The CFRA should be reviewed annually and updated every five years per NFPA 1730 or if something significant changes. This can be completed in alignment with the review and update of the Fire-Rescue Master Plan.

Appendix B

Stakeholder Survey Results

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Tables

1.0 Stakeholder Consultation

Stakeholders can provide valuable input at each step of the process, providing information about context and background from different perspectives. This helps to identify issues and needs associated with the fire services. As well, it provides information that is used for study analysis and recommendation phases. Engaging stakeholders helps ensure that multiple perspectives can be brought to the fire department master planning process.

1.1 Key Staff Stakeholder Interviews

As a part of the data collection process and review of existing services, interviews were conducted with key staff members from Canmore Fire-Rescue Services (CFRS). These key stakeholders provide valuable feedback regarding the strengths, weaknesses, opportunities and constraints within the day-to-day operations in fire-rescue services. The feedback collected during this process was an essential element of developing the framework of the plan and the resulting recommendations.

1.2 Targeted Stakeholder Survey

A group of businesses and community organizations were identified by CFRS staff for targeted stakeholder interviews. These stakeholders were contacted and requested to participate in a 30 minute telephone survey. These telephone surveys were carried out to develop input to the Fire-Rescue Master Plan (FRMP). The stakeholder engagement results help to guide suggestions and recommendations throughout the FRMP. The following outlines the survey methodology and results of the survey.

1.2.1 Methodology

The telephone survey was designed in collaboration with Canmore Fire-Rescue Services and Dillon Consulting. The purpose of the engagement was to solicit feedback from key stakeholders regarding their experiences and understanding of the current services CFRS provides.

The key stakeholders contacted included a mix of local business and tourism operators as well as local community organizations. The telephone surveys took place on July 28th, August 2nd, August 4th and August 11th.

The survey was structured into three main sections: (1) general information, (2) core service levels, and (3) general comments. General information gathered included the name of the business or community group and the core services provided or accessed by the group or business. The service level section was composed of multiple questions for each of the service areas:

- Fire suppression
- Rescue
- Emergency Management

- Public Education
- Fire Prevention

The last section of the survey provided opportunity for general comments related to the provision of services provided by CFRS.

1.3 Targeted Stakeholder Survey Results

Using the list of identified stakeholders, eight community representatives were chosen and contacted for telephone surveys. All eight stakeholders were emailed on July 27th and followed up with shortly after to set up telephone interviews. Of these stakeholders five telephone interviews took place.

The individual questions including the possible responses and the frequency with which that option was selected are presented below. The total frequency of responses for each question varies since not every respondent replied to every question and some questions warranted multiple responses.

1.3.1 Results for General Information

Table 1 indicates the most recent occurrence that the respondents have used the emergency response services of the CFRS. All respondents have used CFRS services in the last five years.

Table 1: Has your business, community group or institution used any services as provided by the Canmore Fire-Rescue Department in the past years?

Selected Response	Frequency
Yes	5
No	0
Unsure	0
No Response	0

Table 2 indicates the CFRS services that have been accessed by the respondents in the last five years. The most commonly accessed services were medical response and fire inspections. The least commonly accessed service was training and public education.

Table 2: Which of the services did you or your organization access?

Selected Response	Frequency
Fire Suppression	1
Medical Response	2
Emergency Rescue	1
Training	0
Public Education	0

Selected Response	Frequency
Fire Investigation	0
Fire Inspection	2

Table 3: highlights how familiar the respondents were with the current organization of the CFRS. All respondents indicated that they were aware that the CFRS was a composite department.

Table 3: Did you know that the Canmore Fire-Rescue Department is a composite department, comprised of full-time and paid response firefighters?

Selected Response	Frequency
Yes	5
No	0
Unsure	0
No Response	0

Table 4 identifies organizations which have policies in place to allow their own employees to depart the workplace to respond to emergency calls. Two of the respondents indicated that they were not sure if these policies existed. One respondent stated they had staff members that were paid responders.

Table 4: Does your organization have policies in place to allow paid response firefighters to depart the workplace in order to respond to an emergency call?

Selected Response	Frequency
Yes	1
No	0
Unsure	2
Not Applicable	1

1.3.2 Results for Core Service Levels

1.3.2.1 Fire Suppression

Table 5 illustrates the respondents' perception of the reliability of the Canmore Fire-Rescue Department to respond to fire incidents. Three of five respondents feel that the CFRS response to fire incidents is 'very reliable'.

Table 5: A core service of the fire-rescue department is to respond to fire-related emergencies. How would you rate the reliability of responses to fire incidents from Canmore Fire-Rescue Department?

Selected Response	Frequency
Very reliable	3
Somewhat reliable	0
Unreliable	0
No opinion	2

Table 6 shows the number of respondents that feel that CFRS policies or procedures impede, or otherwise impact, how they do business. Three of five respondents indicated that they are impacted by CFRS policies.

Table 6: Do any current policies or procedures of Canmore Fire-Rescue Department impede or impact how you do business?

Selected Response	Frequency
Yes	3
No	2

Respondents were also free to make comments on how the policies or procedures impede or impact how they do business. Stakeholders said that CFRS's event permitting policies have a negative impact on their business because of staffing limitations and inconsistent hours of operation. Clearer communication protocol at emergency scenes was also suggested.

1.3.2.2 Rescue

Table 7 indicates respondent awareness of specialized rescue services offered by the Canmore Fire-Rescue Department. The majority of respondents were aware of each service. Respondents were least aware of High Angle rescue, swift water rescue and ice rescue and indicated that they were under the impression that these services were provided by Kananaskis Public Safety.

Table 7: The Canmore Fire-Rescue Department provides specialized rescue services. Which rescue services are you aware of?

Selected Response	Aware	Not Aware	No Response
Medical Response (Advanced Life Support Capable)	5	0	0
Vehicle Extrication	5	0	0
High-Angle Rope Rescue	3	2	0
Swift Water Rescue	4	1	0
Ice Rescue	5	0	0
Hazardous Materials Response	5	0	0
Confined Space Rescue	5	0	0

Respondents were able to provide feedback on the specialized rescue services CFRS provides. Some respondents were unaware that CFRS provided High Angle Rescue as well as Swift Water Rescue services because they thought that these services were provided by Kananaskis Public Safety.

Next, respondents were asked to think about their familiarity with the services provided by Canmore Fire-Rescue by answering the following question:

How would you rate the value of the specialized rescue activities delivered by the Canmore Fire-Rescue Department?

Table 8 indicates the respondents' opinions regarding the value of having specialized rescue activities as a service provided by the CFRS. Three of five respondents felt that specialized rescue activities are a valuable component of CFRS.

Table 8: Medical Response (Advanced Life Support Capable)

Selected Response	Frequency
Very Valuable	3
Somewhat Valuable	2
Not Valuable	0
Undecided	1

Tables 9 – 14 provide further breakdown of the perceived value of the specialized rescue services provided by Canmore Fire-Rescue. The majority of responses indicate that each of the individual services is a valuable component of CFRS.

Table 9: Vehicle Extrication

Selected Response	Frequency
Very Valuable	4
Somewhat Valuable	1
Not Valuable	0
Undecided	0

Table 10: High-Angle Rope Rescue

Selected Response	Frequency
Very Valuable	3
Somewhat Valuable	1
Not Valuable	1
Undecided	0

Table 11: Swift Water Rescue

Selected Response	Frequency
Very Valuable	3
Somewhat Valuable	1
Not Valuable	1
Undecided	0

Table 12: Ice Rescue

Selected Response	Frequency
Very Valuable	3
Somewhat Valuable	1
Not Valuable	1
Undecided	0

Table 13: Hazardous Materials Rescue

Selected Response	Frequency
Very Valuable	4
Somewhat Valuable	1
Not Valuable	0
Undecided	0

Table 14: Confined Space Rescue

Selected Response	Frequency
Very Valuable	4
Somewhat Valuable	1
Not Valuable	0
Undecided	0

1.3.2.3 Emergency Management

Respondents were asked about the ability of the Town of Canmore to manage major events under its current emergency plan. The stakeholders expressed a positive response to recent emergency events including the 2013 flood and 2015 explosion. Stakeholders felt that the Town dealt with individuals and the community in a very positive and effective manner.

Respondents also offered comments on how Canmore's response to emergency situations could be improved. General comments included the need for more coordinated practice runs and more

community education. In all, respondents were happy with the Town's ability to manage major events under its emergency plan.

1.3.2.4 Public Education

Public education of fire safety and prevention strategies is the primary defence for reducing occurrences and consequences of fire-related emergencies. **Table 15** illustrates how well the CFRS is meeting stakeholders' needs for fire education services.

Table 15: Public education of fire safety and prevention strategies is the primary defense for reducing occurrences and consequences of fire-related emergencies. Is the Canmore Fire-Rescue Department meeting your group's needs for fire education services?

Selected Response	Frequency
Yes	2
No	1
Unsure	1

Respondents were asked to comment on how stakeholders' needs could be better met in terms of public education. Stakeholders stated that they appreciated the Fire Prevention Week, and pancake breakfast but offered potential improvements including:

- Better communication between businesses and CFRS;
- Public education and newsletters;
- Education from a business point of view.

Table 16 asks respondents' if they would be interested in creating a public education partnership with CFRS in order to effectively communicate fire safety and prevention. Three of five respondents indicated that would be interested in creating a partnership.

Table 16: If not already in place, would your group be interested in creating a public education partnership in order to effectively communicate fire safety and prevention programming needs?

Selected Response	Frequency
Yes	3
No	0
Unsure	2

An open ended question was asked to solicit information on potential partnerships between CFRS and community stakeholders. Suggestions included:

- Create a partnership with Travel Alberta's information centre to educate the travelling public on risks in the area;
- Coordinate school talks with local elementary schools.

1.3.2.5 Fire Prevention

Another strategy to reduce the number of fire-related emergencies is through fire prevention which includes inspections, fire safety plans and investigations. **Table 17** summarizes stakeholder perception to the effectiveness of CFRS's fire prevention strategies. The majority of respondents are 'Undecided/ Not Sure' about the effectiveness of CFRS's fire prevention strategies.

Table 17: Another strategy to reduce the number of fire-related emergencies is through fire prevention which includes inspections, fire protection plans and investigations. How would you rate the fire prevention services of the Canmore Fire-Rescue Department?

Selected Response	Frequency
Very Effective	1
Somewhat Effective	0
Ineffective	0
Undecided/ Not sure	4

Table 18 illustrates the awareness of the role of the CFRS in investigating fires within the Town of Canmore. Three of five respondents were aware of the capability of the CFRS to investigate the cause and determination of fires.

Table 18: Are you aware of the capability of the Canmore Fire-Rescue Department to investigate the cause and determination of fires within the Town of Canmore?

Selected Response	Frequency
Yes	3
No	1
Unsure	1

Table 19 indicates whether or not respondents' businesses or facility have been recently inspected by the CFRS. Only one respondent indicated that they were inspected by CFRS in the last 5 years.

Table 19: Has your business/ institution/ facility been inspected by the Canmore Fire-Rescue Department?

Selected Response	Frequency
Yes, within the past 5 years	1
Yes, within the past 2 years	0
Yes, within the past year	0
Unsure	0
No	3
Not Applicable	1

Table 20 illustrates stakeholders' perception of the ability of the CFRS to investigate fires. The one respondent who was inspected by the CFRS was satisfied with the process.

Table 20: If yes, were you satisfied with the inspection process?

Selected Response	Frequency
Yes	1
No	0
Not Applicable	4

1.4 Results for General Comments

Table 21 summarizes the perception of the alignment of the CFRS services with the needs of the Canmore community. The majority of respondents four of five believe that CFRS services are aligned with the needs of the community.

Table 21: In your experience, are the services as described in this survey aligned with the needs of the Canmore community?

Selected Response	Frequency
Yes	4
No	0
Unsure	1

Within the survey of the key external stakeholders, there were open-ended questions where respondents were invited to describe what they thought the department does well and what could be improved. The issues and concerns highlighted by the respondents included:

- *Fire Department had a fire at their building – not a great PR situation.*
- *Motor vehicle collision – a potential concern is the needs or desire to clear traffic. Competing causes when they (RCMP) need to gather evidence.*
- *Could do a better job a promoting themselves.*

Comments on what stakeholders thought Canmore Fire-Rescue Department does particularly well for their business or community included:

- *Out in the community, they have a presence.*
- *Fire Prevention Week*
- *Really positive crew- willing to come out and do anything they can to help provide assistance.*
- *Fantastic group – glad we have them there. It goes two ways; we can facilitate the discussion with the businesses.*
- *See fire staff doing training – which is positive and reassuring.*
- *Fire suppression is essential and invaluable for the attractiveness of communities generally.*

2.0 Summary

The targeted stakeholder survey was designed to gain detailed information about the Canmore Fire-Rescue Department from important community organizations and businesses. While there were only five respondents to the survey, the detail provided helps shape the direction of the Fire- Rescue Master Plan and identifies both strengths and weaknesses of the department.

The majority of respondents were satisfied with the services provided by the CFRS, but it was identified that enhanced hands-on training and increased public education would be a mutual benefit for the groups and the CFRS. In all, respondents were very positive about the CFRS and valued their protection in the community.