2016-2030 Kelowna Fire Department Strategic Plan

An evidence based, flexible & dynamic approach for the City of Kelowna's Fire Service

Table of Contents

EXECUTIVE SUMMARY

OVERVIEW

The purpose of this report is to establish a strategic plan that will guide the Kelowna Fire Department (KFD), the City Executives, and the Mayor and Council over the next 14 years in the delivery of valued protective services to the citizens of Kelowna. The scope of this report includes a comprehensive analysis on all programs and services delivered by the KFD.

This Executive Summary focuses on the current and future emergency response system with an emphasis on the collection of data, scientific analysis and evidence based decisions. All services including fire suppression, training, fire prevention and education and Regional Services including Dispatch, Emergency Management and technical rescue are highlighted. The conclusions and recommended options for consideration are outlined in section 6.6 Resource Deployment Model & Staffing Options.

The development of this plan followed a typical strategic planning system of evaluating the current state, determining where KFD should be and how to get there, followed by implementation that includes an accountability and reassessment process.

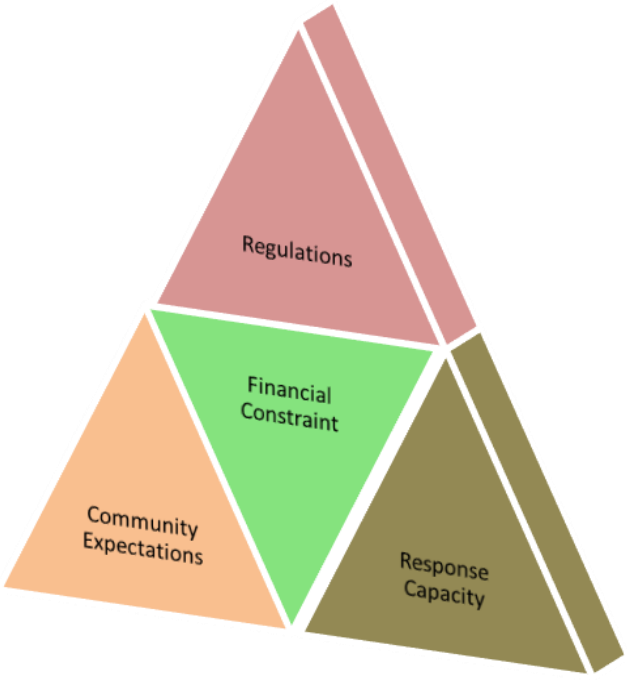
The strategic outcomes are a key aspect of this plan in that they establish the criteria to evaluate the options and recommendations contained in this report. The following applies:

- Risk based levels of service for all areas of the City of Kelowna
- Realistic and achievable performance targets
- Alignment with Corporate goals and objectives
- Establishes accountability measures
- Optional implementation based upon priorities

A peer review was conducted by 3 contemporary Fire Chiefs as part of the feedback and validation process. Their feedback and comments have been considered and integrated into this report.

METHODOLOGY

The 2016-2030 KFD Strategic Plan provides a framework for the cost-effective and efficient delivery of service to the City, its partners and other stakeholders. The illustration below provides a visual representation of the strategic framework considered in the development of this plan:



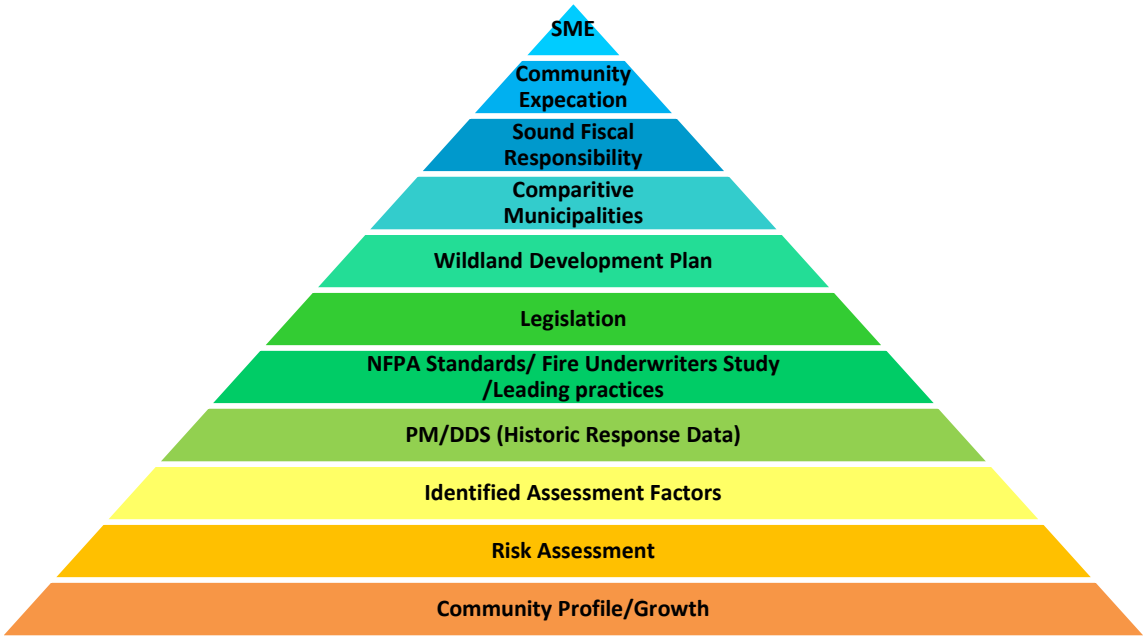
This plan strives to meet current and future demands for KFD service delivery requirements over the next 14 years. Further it establishes a foundation for service delivery beyond this time period.

The 2016-2030 KFD Strategic Plan is built on risk analysis, the use of predictive modeling including historical data analysis, industry leading practices, community comparative, and Subject Matter Expert (SME) input that lead to improved service delivery targets and realistic performance measures.

In order to achieve this, the 2016-2030 KFD Strategic Plan will:

- Ensure service levels are balanced with community expectations with defined risks
- Utilize evidence based data to support decisions
- Ensure costs are sustainable and economically feasible for the City
- Satisfy all legislative and regulatory requirements
- Align with corporate direction including the Strategic Plan, Official Community Plan (OCP)and other related decisions and plans
- Be dynamic, flexible and adaptable to change
- Engage stakeholders, expand partnerships and build relationships
- Compare services to other similar communities

This plan is based on the thorough collection of data and analyses that lead to evidence based recommended service level options. The illustration below provides a visual representation of this process:



Of particular note is the Predictive Modelling and Dynamic Deployment System (PM/DDS). Across North America leading fire services are using PM/DDS to improve the overall efficiency and effectiveness of the emergency response system. In 2014, City Council approved the procurement of PM/DDS for the KFD from Deccan International Inc. This computer based system located in Fire Dispatch employs risk

tolerance decisions based upon historical data and other related factors to determine the optimum deployment system for the concentration and distribution of emergency response resources.

Two modules of the software are currently in use. The first uses historical data to inform "what is" and maps call volumes, response times and coverage, identifying gaps. The second module shows "what if" and allows multiple operational deployment models to be measured for effectiveness, efficiency and how best to address current gaps in service delivery.

Historically, fire departments have employed a 'geographic response' model. This is where stations, staff and equipment are strategically placed throughout the community to effectively respond to any type of emergency within an established response area. Progressive departments are now moving beyond the simple geographical response model and are considering both dynamic deployment and risk based response. PM/DDS allows for the balance of future considerations to be based on all 3 types of deployment models: geographic, dynamic deployment and risk based response to assess and determine the most effective coverage to meet Kelowna's needs.

The 3 types of deployment models are described below:

> **Geographical Response:** is the establishment of response zones based on the community's geography. This is the traditional use of natural and human made boundaries, transportation system and distances to determine the station location and response area.
>
> **Dynamic Deployment:** is the strategic positioning and deployment of staffing and related resources based on peak call volume times, and known risk factors. An example of this is deploying resources to a specific area for peak call volume times only.
>
> **Risk Based Response:** is identifying what resources and related training are required for a specific response to identified risks. An example is deploying smaller response units such as a bush truck to medical response instead of a fully staffed Engine company.

The full implementation of PM/DDS will ensure future operational and strategic decisions are based on using modern analytics in conjunction with local experience to create effective and efficient deployment of units. This allows for the maintenance of service level standards in a growing community within reasonable fiscal constraints. This tool supports the development of relevant key performance indicators that will measure the success of future innovations in the deployment models.

SUMMARY OF ASSESSMENT FACTORS

Throughout the report several Assessment Factors have been highlighted as having a direct impact on the development of performance targets. The following is a summary of these factors:

1. Emergency response performance targets will be evidence based data with consideration for the City footprint; residential construction types; interface risks (wildland/forest fire risks), rate of growth and demographics; Industrial/commercial activities; transportation systems, growth in traffic volumes and available water flows for firefighting.

2. Emergency response performance target options will be developed by applying geographic coverage, dynamic deployment and risk based responses as efficiency and operational effectiveness measures.

3. PM/DDS will provide the evidence based data to develop emergency response targets.

4. Emergency response performance targets will ensure compliance with provincial safety and training standards legislation.

5. To enhance operational effectiveness and efficiency, life cycle replacement Engines will be tendered as multi-purpose Engine/Rescues. The existing fleet will be examined to determine if a retrofit is possible to create the multi-purpose capability.

6. In comparison to similar sized cities, KFD has the highest call volume, the second lowest ratio of career Firefighters per capita and the third highest population.

7. Distribution and concentration of KFD resources will be based upon mitigating fire related death, injury and dollar loss trends

8. Emergency response performance targets will be realistically related to effective response time for initial assignment (first vehicle on emergency scene).

9. Emergency response performance target options will include:

    - Minimum staffing of Engines to remain at 4 Firefighters
    - Role and limitations of the Paid On Call (POC) system
    - KFD current Effective Response Force (ERF) is limited to mitigating a single event low to moderate risk situations.
    - High & Maximum risk events will require additional resources above the ERF and may include external agencies and/or mutual aid from neighboring communities.

SUMMARY OF OPTIONS

The analysis contained in this report indicates there are two underserved areas within the City (Glenmore/UBC/YLW and KLO/Gordon/Pandosy). The assessed risk tolerance requires the increase of career stations from 4 to 5 as soon as possible. This will address the service gap in the Glenmore/UBC/YLW area. The KLO/Gordon/Pandosy area will be served through the use of dynamic deployment and risk based responses until such time as a 6th station is required. This assertion is based upon the City risk and Assessment Factors and other relevant considerations identified in this report. This analysis is consistent with the previous four studies (Section 1.5) conducted on KFD and the service delivery gaps within the PGB for the initial response in the Glenmore/UBCO/YLW and KLO/Gordon/Pandosy areas. The PM/DDS evidence based analysis serves to substantiate these previous studies through leading technology.

The preferred implementation would be to renovate Station 8 in Glenmore as an interim facility until the new Station 5 is completed and hire 20 firefighters in 2017. Understanding the need for financial constraint incremental staffing has been identified as follows:

Table 23 Incremental staffing options

Staffing Options	2017	2018	2019	2020	Comments
Option A	12		8	New Station 5 completed	Addresses geographic and risk coverage in Glenmore/UBC/YLW area. The ability of Station 1 to mobilize the 2 Firefighter Rescue unit for risk and dynamic deployments particularly in the KLO/Gordon/Pandosy areas is delayed until 2019
Option B	8	4	8	New Station 5 completed	Provides partial geographic coverage and risk in Glenmore/UBC/YLW area. May require increased overtime or reduced service levels depending upon available staffing. The ability of Station 1 to mobilize the 2 Firefighter Rescue unit for risk and dynamic deployments particularly in the KLO/Gordon/Pandosy areas is delayed until 2019

It is important to note that KFD, as part of the annual business plan and budget process will review the response system performance utilizing PM/DDS. This is not

only to monitor performance target progress but to look for further opportunities to increase efficiencies and operational effectiveness.

The following section provides a more in-depth comparison of the current traditional centralized support model with the recommended Station 5 – Glenmore/UBCO/YLW Area - Convergent Support Model

Recommended: Station 5 – Glenmore/UBCO/YLW Area - Convergent Support Model

Response Capacity: 5 career stations, 5 Engine companies, Rescue unit of 2 Firefighters and 3 POC Stations.

The need for Station 5, as a replacement for the current Station 8, has been identified previously in 4 studies and has been most recently confirmed through the use of PM/DDS Analytics. As the area continues to develop, Engine companies from Stations 1 and 2 are facing increasing travel times, reducing effective response while also removing critical assets from some of the City's busiest areas, particularly Station 2's downtown coverage area.

Station 5 will require the addition of 20 new Firefighters, resulting in a fifth career Engine company within the City. This Engine company will continue to be supported by the other career stations and the POCs in the Glenmore and McKinley areas, but will considerably reduce response times for incidents in those areas.

It is understood that construction of Station 5 will not be complete by 2017; therefore, the units will be temporarily based out of Station 8 until the new Station 5 is complete. In reviewing the analytics and the need to address an underserved area (Glenmore/UBCO/YLW), the Engine company will be committed to geographic coverage the majority of the time during the day time period where the call volume is historically higher.

The MDS will increase to 23. The addition of another Engine company will aid in convergent support to Station 1. In addition, OT and call backs will be reduced significantly by an estimated $125,000 with the increased response capacity to support the City during larger incidents or incidents that commit resources for extended periods such as Marine Rescue and the majority of single family residential fires.

With the additional staffing, a more dynamic deployment approach to resource deployment will be achieved.

As part of this model, the Rescue unit would be available for dynamic deployment and risk based responses. The primary focus will be coverage for the KLO/Pandosy area and response to lower risk calls as identified by PM/DDS.

The operational costs including incremental staffing options is in the range of $3.1 million per year over the next 14 years. Staffing option B is on average $38,000 less per year than option A over the same 14-year period.

Advantages:

- Incremental implementation that reduces overall interim costs as compared to full staffing and addresses existing service gap without delay.
- Allows for much of the flexibility with deferred costs through incremental staffing.
- Demonstrates efficiencies and effectiveness on an ongoing basis.
- Risk model can be adjusted and is based upon, and validated by scientific data.
- Does not result in a degradation of current service levels and will improve overall efficiencies by redistributing/redeployment of existing resources.
- Deletion/revision of DLC contracted fire suppression service resulting in a potential savings of approximately $280,000 in 2017.
- Enhances response service level for McKinley area.
- Fire Engines at the outer perimeter of all quadrants of the response zones allowing a convergent response from the perimeter.
- Delays the need for Station 6 through risk based responses and dynamic deployments once full implementation has occurred.

Disadvantages:

- Until full implementation of the new Station 5 is completed utilization of dynamic deployment and risk based responses is not possible. This may result in extended response time for the KLO/Pandosy area. Once the Rescue unit is re-established at Station 1, the dynamic deployment coverage for this area will be possible.
- Rescue/Engine is deployed beyond the core area for an interim period.

Current Traditional Centralized Support Model

Response Capacity: 4 career Stations, 4 Engine Companies, and Rescue Unit of 2 Firefighters and 3 POC Stations. The current MDS is 19. POC staffing is 45.

The current traditional model utilizes Station 1 staff to provide support to each of the other Engine Companies located at Stations 2, 3 and 4 along with responses in the 3 POC Stations 7, 8 and 9. Station 1 is staffed with a 4 firefighter Engine Company and a 2 Firefighter Rescue unit.

The Rescue unit provides all FMR responses within Station 1, 7, 8 & 9 areas. POC Stations 7 and 9 co-respond when available for FMRs in their respective areas.

Advantages:

- Cost containment is achieved as there is no increase in service, staff, Stations or equipment.
- Increased use of dynamic deployment with the Rescue unit to support other stations, including potential to use smaller more mobile vehicles in responding to medical calls.
- POCs remain a viable and critical support resource.

Disadvantages:

- Does not address identified risks in growing areas, most notably Glenmore/UBCO/YLW and the KLO/Pandosy area.
- Maintains the traditional service delivery system that is based upon geographic coverage only and considered to be inefficient.
- Degradation in service delivery is inevitable due to population and construction growth.
- Requires callback of off duty staff for Marine Rescue calls and single family structure fires.
- POC attendance cannot be relied upon depending upon the time of day etc.
- Response times do not align with risk assessment, preferred performance target, or comparative communities.

Below is a comparison table that evaluates the current traditional centralized support model with the recommended Station 5 – Glenmore/UBCO/YLW Area - Convergent Support Model:

Strategic Goals: Criteria	Current traditional centralized support model	Recommended 5 – Glenmore/UBCO/YLW Area - Convergent Support Model
Risk based levels of service for all areas of the City	No: 2 areas with identified service gaps KLO/Pandosy and Glenmore/UBCO/YLW areas	Yes: addresses identified service gaps with full implementation. Service gap in KLO/Pandosy area not addressed until full staffing of station 5 and then dynamic deployment will be utilized until Station 6 is required.
Innovative and Non-traditional	Traditional geographic coverage deployment model	Non-traditional, innovative convergent model. Using PM/DDS technology dynamic and risk based responses integrated with geographic coverage
Realistic and achievable performance targets	None formally established. Current response system is 9:31 minutes inside PGB, 14:30 minutes outside PGB. Well beyond comparative communities, industry guidelines and leading practices. Increase risks for public, firefighters and property loss	Yes: based upon PM/DDS analytics response system targets will be: 7:40 minutes in 90% inside PGB, 11:40 minutes outside PGB

Alignment with Corporate goals and objectives	No: Shortfall in Corporate Framework &Plan • A well run City • A safe City	Yes: achieves performance excellence through continuous improvement Provides rapid fire emergency response throughout the City
Establishes accountability measures	No: Performance targets not monitored corporately at this time. Current system capacity if adopted can be monitored.	Yes: Performance target objectives will be continuously monitored for achievement or adjustment
Optional implementation based upon priorities	Not applicable	Yes: part of Corporate annual budget approval process

SUMMARY OF RECOMMENDATIONS

RECOMMENDATION 1

That the City identifies an appropriately zoned parcel of land for the construction and career staffing of a new Station (#5) in North Glenmore at or near the intersection of Glenmore Rd and John Hindle Dr (near or inside the #3 Area Structure Plan).

RECOMMENDATION 2

KFD will set a performance target to achieve an average turnout time of 1:40 minutes for fire responses and 1:20 minutes for medical responses. Ongoing system reviews will be conducted for continuous improvement of turnout times.

RECOMMENDATION 3

KFD will base the preferred PM/DDS analysis on geographic coverage along with incident volume (risk based response).

RECOMMENDATION 4

KFD will establish performance targets for response times within the PGB to have the first fire truck arriving (dispatch to on scene time) within 7:40 minutes 90% of the time of being dispatched for all emergency types. For areas outside of the PGB, the deployment is the same with the first fire truck arriving within 11:40 minutes 90% of the time of being dispatched to arriving on scene.

RECOMMENDATION 5

The City will increase the KFD resource deployment capacity to 5 career stations. This will require the construction of a new station in the Glenmore/UBC/YLW area, the addition of 20 firefighters and a replacement Engine and Bush truck.

RECOMMENDATION 6

That KFD and the City conduct a complete review and audit of the contracted area fire suppression service with the view to establish performance measures for District of Lake Country (DLC) or alternatively determine if KFD can provide an equivalent level of service within the current or proposed performance targets recommendations contained in this report.

RECOMMENDATION 7

KFD will monitor the need for 1 additional Fire Inspector. This position would be dedicated to the public education and pre fire planning functions.

RECOMMENDATION 8

That the opportunity to incorporate a dedicated training center as a potential source of revenue to be included in the planning and funding of the future Station 5.

RECOMMENDATION 9

That KFD continue to further market dispatch services to both traditional and non-traditional clients, with a focus on managing current costs to the City, while maintaining or enhancing critical service levels.

SUMMARY OF COSTS

A summary of the costs associated with this Strategic Plan is located at Section: 6.12 Costs & Budgeting Summary. A complete cost estimate schedule of this Strategic Plan up to 2030 is attached as Appendix D.

The operational costs including incremental staffing options is in the range of $3.1 million per year over the next 14 years. Staffing option B is on average $38,000 less per year than option A over the same 14-year period. The final capital costing of a new station, apparatus, equipment and land acquisition has been estimated in a rough order of magnitude to be $9.1 million. More accurate estimates will be determined within the City Infrastructure and Community Planning Departments along with KFD input.

CONCLUSION

In Canada, all orders of government are facing strong demands for cost management and increased value in the delivery of services to citizens. Elected officials and government administrators are constantly searching for ways to balance public expectations within financial constraints. It is challenging to deliver valuable services and programs, while maintaining fiscal restraint amidst global, international, national and local economic realities. It is this fiscal restraint that has stimulated the need for

today's Fire Chiefs to undertake a more businesslike approach to leading/managing their respective departments. They must be proactive and in line with corporate priorities, and examine all aspects of the service delivery to find efficiencies.

The 2016-2030 KFD Strategic Plan has utilized leading technology along with multiple layers of data, evidence analyses and relevant information to develop an innovative and efficient service delivery system that balances risk, firefighter and public safety with the fiscal realities that the City faces today and into the next 14 years.

ACKNOWLEDGEMENTS

This report required significant effort from a number of the City and KFD staff. By enlarge it was a total team project and the support from all those involved is greatly appreciated;

Deputy City Manager, **Paul Macklem**

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Deputy Chief Operations **Larry Hollier**

Deputy Chief Communications & Emergency Programs **Travis Whiting**

Finance and Administration Supervisor **Sandy Scott**

Platoon Captain **Tim Light**

KFD Secretary **Candace Friesen**

IAFF Executive Team**: Dennis Miller, Mike Hill, Jason Picklyk & Troy Mamchur**

1. SECTION 1 INTRODUCTION

1.1 PREFACE

The scope of this report is focused on operational outputs for KFD. This includes analysis on all programs and services delivered by the Department with an emphasis on the emergency response system. Options and recommendations are included based upon the risk assessment and other relevant factors contained throughout the report. The intent is to provide a plan for the future that will guide the Department, the City Executives Leadership Teams, the Mayor and Council in the delivery of valued essential services to the citizens of Kelowna.

The use of a modern Predictive Modeling and Dynamic Deployment System (PM/DDS) software program was instrumental in determining the most efficient and effective use of resources to balance risks, firefighter and public safety with financial sustainability.

The strategic outcomes are a key aspect of this plan in that they establish the criteria to evaluate the options and recommendations. The following applies:

- Risk based levels of service for all areas of the City
- Realistic and achievable performance targets
- Alignment with Corporate goals and objectives
- Establishes accountability measures
- Optional implementation based upon priorities

2. SECTION 2 CITY OF KELOWNA OVERVIEW

The City is the 7th largest city in the province with 124,000 residents and the 43rd largest city in Canada. On any given day of the year on average, an additional 4500 people visit Kelowna and an unknown number of commuters come to Kelowna for work or to reside.

The percentage of seniors (*age 65+*) will continue to increase over the coming years. As the rate of natural population increase is expected to continue to decline, population growth in Kelowna will continue to rely on migration, particularly those moving here from other parts of BC. The City is focused on creating vibrant urban centers with a diverse range of housing options to help meet the changing demographics. Changes in anticipated population growth and composition will also be incorporated into broader strategies as part of the next OCP update, scheduled to begin in 2018.

Nearly 96% of Kelowna residents feel they have a 'good' or 'very good' quality of life, while listing transportation and growth management among the top issues facing the City. As a contributor to quality of life, the crime rate and crime severity are

declining. Recognizing safety is a priority for residents, a new police services building is being constructed downtown to give the RCMP the support system and efficiencies they need to keep Kelowna neighbourhoods, business areas and downtown safe well into the future.

The overall picture of the local economy appears to be positive, with economic measures showing modest improvements in performance, evidence of recovery from the economic downturn. However, meeting the labour market requirements of local employers will need to be addressed to sustain economic growth in the long term. In 2014, Council approved a new Innovation Centre that will play a key role in fostering innovation and growth in the region, driving the creation of new jobs and helping to build economic prosperity and diversity.

Kelowna's ownership housing market has remained relatively steady and is forecast to return to moderate growth over the next 2 years in a balanced market. The rental market, however, is constrained with a decreased vacancy rate and increased rental costs. The City continues to pursue partnership opportunities with both private and public sectors, and to offer financial incentives to encourage the development of rental housing.

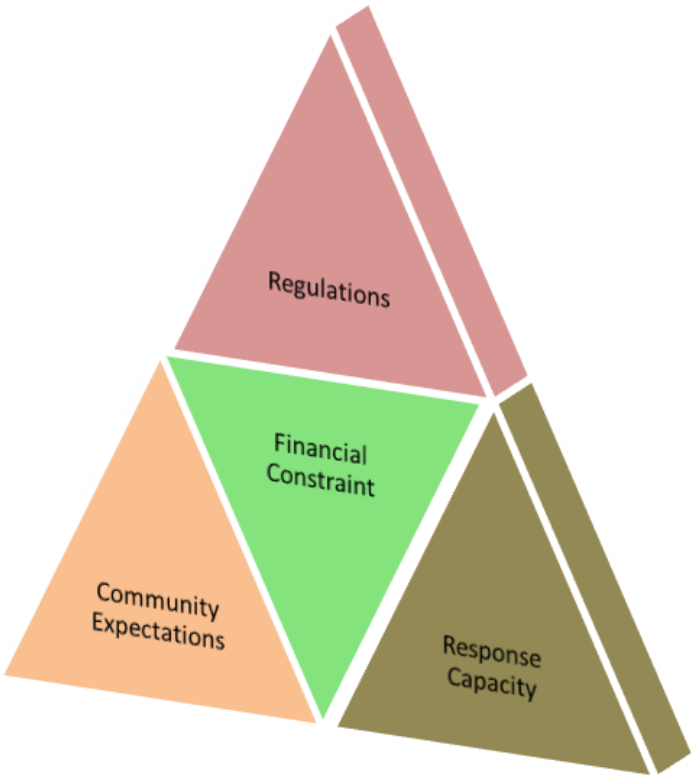
While early in the measurement process, data suggests that Kelowna residents are making changes for the betterment of the environment. Over the past few years, Kelowna has experienced reductions in Green House Gas (GHG) emissions, energy and water consumption and increases in more sustainable transportation choices. The expansion of the transit and active transportation networks, and the development of a Pedestrian and Cycling Master Plan (*currently underway*), will provide opportunities for residents to reduce automobile dependency and GHG's.

The OCP details how the City is configured with 5 de-centralized urban cores within the identified PGB where lands may be considered for urban uses within the 20 year planning horizon ending in 2030. This creates an urban/ suburban/ rural mosaic for KFD to deliver service within as opposed to a traditional center urban core surrounded by a suburban zone melding into rural. According to the City Planning Department, there is nearly 8,700 hectares of agricultural land reserve inside the City boundary, 674 hectares of which are inside the PGB. Essentially, this means that for many moderate and high risk responses, fire resources are responding from an urban area through suburban and rural zones to support operations in another urban zone.

2.1 PURPOSE

The 2016-2030 KFD Strategic Plan provides a goal orientated framework for cost-effective and efficient provisions for service delivery to the City, including partners, residents, customers and clients.

The illustration below provides a visual representation of the strategic framework considered in the development of this plan:



This plan strives to meet current and emerging emergency response, fire prevention, training, fire dispatch and emergency program requirements over the 14-year period and establishes a foundation for service delivery beyond this time period. The 2016-2030 KFD Strategic Plan is largely built on risk, predictive modelling based upon historical data, industry leading practices, comparative community analysis, SME input, and establishing performance measures as service delivery targets.

In order to achieve this, the 2016-2030 KFD Strategic Plan must:

- Balance community expectations with defined risks while ensuring costs are sustainable and economically feasible for the City.
- Utilize evidence based data to support decisions to the highest extent.
- Meet current legislative and regulatory requirements.
- Align with the corporate strategies and priorities and other related decisions.
- Be dynamic and adaptable to change.
- Involve stakeholders input and recognize relationships.
- Consider fire services provided in comparable communities.

2.2 STANDARDS AND REFERENCES

This review considered the following references and standards:

- Basic Guide for Fire Prevention & Control Master Planning (United States Fire Administration)
- British Columbia Fire Services Act
- British Columbia Health Act
- British Columbia Emergency Response Management System (BCERMS)
- British Columbia Community Charter
- British Columbia Wildfire Act and Regulation
- Clarks Fire Fighting Principles and Practices
- Code of Practices for the Fire Service
- Compensation and Disaster Financial Assistance Regulation
- Emergency Program Act
- Health Emergency Act (BC)
- International Association of Fire Chiefs (IAFC) 10 Rules of Structural Engagement
- Fire Underwriters Survey (FUS)
- Commission on Fire Accreditation International (CFAI)
- National Fire Protection Association's (NFPA) Standards and Guidelines
- WorkSafe BC (WCB) Act and Regulations

2.3 STUDY METHODOLOGY

In order to develop the 2016-2030 KFD Strategic Plan, an extensive process was utilized to analyze the numerous studies that have been completed since 2006. In addition, it considered other factors that would substantiate KFD's preferred direction while providing alternative strategies. This process included a review of the following:

- Strategic planning cycle framework (*methodology*)
- 2007 Consultant's report on "Assumptions About Demand" by Process Four (*Jim Sumi*)
- 2010-2019 KFD Strategic Plan, Results Management Services Inc.
- 2012-2022 KFD Draft Strategic Plan, KFD
- 2006 IAFF Geographic Information System (GIS) Study (*staffing and response based*)
- the City 2012 FUS (identified effective firefighting forces, RFFs and assigned FUS grading to specific response zones)
- NFPA industry standards
- Risk Assessment Matrix (probability/consequence)
- Review of the City OCP
- Community Wildfire Protection Plan

- Consultant's Report on 2012-2022 KFD Draft Strategic Plan Draft by Nelson-Welch Consulting Inc. (confidential)
- Financial Impact Analysis
- 2012 City Council feedback
- Core Service Review/Corporate Alignment
- Historical emergency response data from the Fire Department Management System (FDM) data base

In order to assess and provide recommendations that have the greatest impact on service delivery for KFD and the City, the following key factors were examined:

- Total geographical area of review
- Population and Demographics
- Future growth
- Financial resources
- Economics
    - Tourism
    - Agriculture
    - Construction
    - Industrial activity
    - Manufacturing
    - Utilities
    - Transportation system (including dangerous goods routes)
    - Retail businesses and other services
- Multi-jurisdictional requirements and cooperation
- Impact of Government legislation
- Support services – dispatch, maintenance
- Public education and prevention
- Service delivery methods
- Leading practices and fire service technology
- Current and future development impact on risk and response
- Benchmarking with comparative communities

3. SECTION 3 RISK ASSESSMENT

3.1 COMMUNITY GROWTH AND RISK ASSESSMENT

Risk Assessment is a process used to identify the community's inherent risks coupled with fire protection and other emergency service needs. KFD's FDM provides the basic source of data and information in order to logically and rationally define the fire department's mission. The overall purpose of using a risk assessment process is to establish a long-range general strategy for the operation of the fire department.

Two main areas must be considered to evaluate risk. The first is the existing risk based on calculable criteria or statistics. The second is identifying possible future

risks and a means of evaluating to ensure that a situation can be mitigated to an acceptable level.

Conducting a risk assessment is the first step towards establishing an effective strategic plan. It is intended to collect the information required by a municipality in order to make informed decisions about levels of protection, fire prevention and other activities necessary to effectively manage community risk based upon local needs and circumstances.

Every municipality has both common and unique challenges when it comes to ensuring the safety of its citizens. It is the unique challenges and the community's identified risk tolerances that requires the fire department to modify their structure and equipment to best serve the citizens. Municipalities have a fundamental and legislative responsibility to conduct community risk assessments in order to provide effective public safety and private property protection. In general terms, needs and circumstances relate to a municipality's economic situation, geography, population, demographics, community and building/infrastructure profiles, and service delivery system.

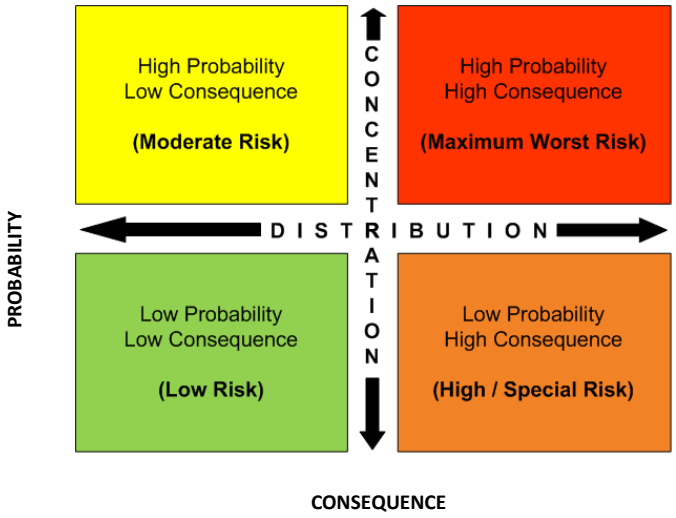
3.2 RISK ANALYSIS

The evaluation of fire risks must take into account the frequency and severity of fires and other significant human or nature caused incidents. Determining risk by analyzing past statistical information and projected growth is essential to the development of an appropriate level of service, staffing model, and performance matrix. The risk assessment can be divided into 4 quadrants, which pose different requirements for commitment of resources in each area *(See Figure 1 page 24 3.2.1)*.

The challenge for the City will be to ensure the proper balance of resources between prevention and response services that will provide suitable distribution and concentration of resources to meet current and future needs. Throughout this report "**Assessment Factors**" will be highlighted. These factors will be collated in Section 5 as part of the Gap Analysis. The Assessment Factors form the foundation for the development of recommendations and service delivery options.

3.2.1 Risk Evaluation Matrix

Figure 1: Risk Evaluation Matrix



Different quadrants of the risk matrix require different response requirements. The 4 possible relationships between structures or conditions and the distribution of resources can be defined as follows:

Decision makers and fire service management must understand the relationships between probability and consequence and the community's adopted service level goals to determine the needed concentration and distribution of both emergency prevention and response resources.

Distribution: The location and deployment of apparatus and staff designed to provide the initial response to any type of emergency call. For KFD, current distribution is based on a minimum of 1 Engine at every station, capable of providing an initial (first-in) response to any type of incident.

Concentration: The deployment of additional and specialized apparatus and staff designed to meet specific demands and risks. Increased risk requires increased concentration of resources. For KFD, stations with high call volumes or other specific risks present are served by additional resources such as second Engines and specialized apparatus, equipment, and personnel suited to the area's risks, (for example the marine rescue boat at Station 2 and the rescue unit operating out of Station1). Other units include hazardous materials (HAZMAT) equipment, and technical rescue resources. Optimal concentration of resources provides the entire Effective Response Force (ERF) required for any type of incident, beyond the initial apparatus that arrives first on scene.

Probability: The likelihood that a particular event will occur within a given time period. An event that occurs daily is highly probable. An event that occurs only once a century is very unlikely.

Consequence: There are 3 primary components when considering possible consequences:

1. **Life Safety:** (*including incidents that risk the lives of occupants, and the lives of responding personnel, and the amount of personnel and equipment required to rescue or protect the lives of occupants from life-threatening situations which include: fire, hazmat, medical, motor vehicle incidents, extreme weather, flooding and all types of rescue situations*);
2. **Economic Impact:** (*the losses of properties, income, or irreplaceable assets*), and;
3. **Environmental Impact:** (*consequences include the risk of irreversible or long term damage to the environment*).

Other consequences such as impact to the community (*the loss of historic buildings, recreation facilities, or community infrastructure*) are identified but do not impact resource deployment.

Low Risk = Low Probability and Low Consequence

This category is limited to areas or incidents which are defined as having a low probability of fire risk and low consequence for the potential of economic loss or loss of life.

- Fires in isolated, non-residential structures such as sheds
- Areas with low fire risk such as vacant land and parks without structures

Moderate Risk = High Probability and Low Consequence

The majority of responses fall under this category. This includes miscellaneous explosions, standbys, smoke, odours, garbage fires, detached garages, single detached or multi-unit residential fires, and small non-residential buildings less than 600 square meters.

- Motor Vehicle Collisions
- Spill clean-up
- Midsize residential fires, etc
- Carbon Monoxide detection
- Emergency medical
- Monitoring/local alarms
- Vehicle fires
- Hazmat incidents with small quantities of a known product (*20 litres or less*), outdoor odours (*natural gas or unknown*)
- Water rescue incidents

High Risk = Low Probability and High Consequence

There are very few properties that are considered high probability, high consequence. These properties can be categorized as large properties, over 600 square meters, without adequate built-in fire protection systems, that have large concentrations of people or have a significant impact on the local economy.

- Commercial, industrial warehouse fires or major events
- Elevator or Technical Rescue including trench or high angle
- Hazmat incidents with large quantities of known products (*75 litres or more*), unknown products or large exposure
- Vehicle fires in parkades
- Care facilities and retirement home fires
- Wildland and interface fires
- Ignition sources such as outdoor fire pits and lightning strikes

Maximum Risk = High Probability and High Consequence

This category of risk can be generally categorized as properties over 600 square meters that have high economic value in the form of employment or are not easily replaceable, or natural disasters occurring in highly populated areas, creating high life and property loss potential and strains on department and other agency resources. Damage to properties in this category could result in temporary job loss or permanent closure of the business. Such properties are highly regulated or possess built-in fire protection systems.

- Large interface fires
- Large vehicle accidents, pile-ups
- Quantities of known products (*20 to 75 litres*), indoor natural gas odour
- Confirmed natural gas leak
- Underground pipeline eruption

3.3 COMMUNITY RISK CONSIDERATIONS

Specific challenges that have a correlation with community risks include the following:

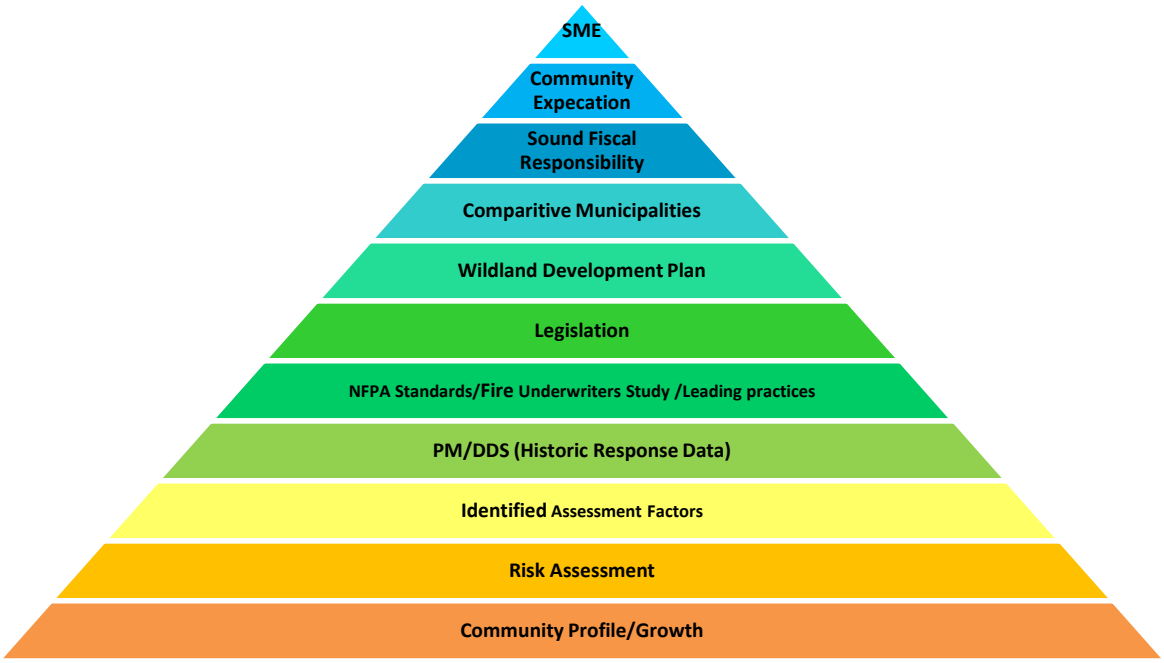
- Industrial
- Economic
- Rate of population growth in the community
- Demographics of the community
- Annexation of lands
- Transportation (*i.e. Road, Rail, etc.*)
- Natural disasters

3.3.1 Risk Management

Risk management is the analysis of the chance of an event occurring and the resulting damage that could occur as a result of the event. In this study KFD used the Risk Evaluation Matrix *(See Figure 1, Section 3.2.1)* to categorize risk using probability and consequence as a method of assigning risk to individual properties. All properties in the City have been be reviewed and assigned to 1 of 4 different risk levels.

The challenge in community risk management does not lie solely in the work necessary to assess the probabilities of an emergency event in a community by SMEs. It is the policymakers who on the basis of recommendations made by SMEs will support the level of service to be delivered to the area being served. The illustration below (*see figure 2 below*) provides a visual representation of the various layers of information, data and evidence that lead to the recommended level of service:

Figure 2 Assessment Pyramid



3.4 RISK ANALYSIS CATEGORIES

Part of the processes to quantify risk within the area would include the categorization of the various low, moderate and high risk structures by utilizing the risk evaluation model. The actual numbers of structures in the different risk categories has been determined and are shown below. The low risk category has not been included as this type of risk does not present an immediate life safety or fire risk. *(Table 1: Typical Distribution of Structure Risk Levels on next page)*

Kelowna has a typical mix of residential, commercial/industrial, and institutional land use for a City with a population around 124,000 people. While the current types and extent of development are well-served by KFD, there are factors related to land use interface and community growth that do present higher than normal risks and should be considered as part of Kelowna's emergency response system. These factors include:

- City Footprint;
- Residential construction types;
- Interface risks (*wildland/forest fire risks*);
- Rate of growth and demographics;
- Industrial/commercial activities; and
- Transportation systems and growth in traffic volumes.
- Water flows for firefighting.

Table 1: Typical Distribution of Structure Risk Levels

Risk	Number of Units	% of Total	Sources
Low	-	-	Vacant Lands (urban and rural park land, residential lots and privately owned agricultural land). Risk level varies on time of year, terrain, fuel density and slope.
Moderate	approx 33,000	86%	Residential Structures/Units
High	approx 5,300	14%	A (assembly), B (institutional), D (business), E (mercantile), F1 (high hazard industrial), F2 (medium hazard industrial), F3 (low hazard industrial) **There are about 40 high risk properties that are considered a "special risk" in that any significant damage or shut down could result in varying impact on infrastructure, employment, sociological and/ or environmental damage to the community. The list includes chemical manufacturing/ storage, private care facilities, sewage and water treatment etc.
Total	38,300		

**Statistics from KFD's FDM Properties and the City Planning Department 2015*

3.4.1 City Foot Print

In 1973, provincial legislation resulted in the amalgamation of the City which brought small neighbourhood "communities" into the City. These neighbourhoods still maintain their own character and identity to some extent in the OCP. The OCP identifies 5 urban centers and 5 village centers, creating multiple core areas where KFD must focus the distribution and concentration of resources.

3.4.2 Residential Construction Types;

Nearly all residential structures in Kelowna are constructed of standard wood frame components. The KFD advocates for residential sprinklers or combustible resistant building materials such as asphalt shingles or tile roofing as opposed to cedar shakes along with cement composite siding or brick/ rock veneer siding rather than wood or vinyl siding. Combustible resistant building materials are an integral part of making a structure FireSmart and more resilient to wildland interface fires.

3.4.3 Interface Risks (wildland/forest fire risks)

It is important to note that during summer months the wildland interface threat to some of Kelowna's residential neighborhoods is higher due to steep terrain, amount of natural fuels (*vegetation*) and limited access and egress for traffic. Due to these factors, what would normally be rated as a moderate risk residential fire could in fact be rated as a higher risk as the threat to neighbouring structures is greatly increased. Response times in some suburban and rural areas are delayed as they are performed by local POC Firefighters. Understandably the response time is greater for career fire crews as they are responding from stations in the core areas.

3.4.4 Rate of Growth and Demographics

The OCP identifies a focus on city core densification within the PGB rather than urban sprawl and predicts the City's population will be 141,689 by 2020 and 161,701 by the year 2030. The forecasted growth in the following areas of the city is of particular interest to KFD:

North Glenmore Valley:

- McKinley Beach (*Shayler Rd*) and Lakeside Communities (*Clifton Rd*):1500-1700 living units and 6-8 commercial.
- McKinley Beach (*Granite*): 132 units in townhouses and 116 units in 4 multi-family buildings.
- Wilden: ongoing development with phase 2 and 3 with 200 living units
- Diamond Mountain on John Hindle Drive: 1000 (*potential*) living units

UBCO/ Quail Ridge:

- Academy Way: 800 living units
- Quail Ridge: 90 additional living units
- 6 story hotel with 116 units across from YLW.
- UBCO student population projections: 8,376 (*2015*), 8,957 (*2017*), 9,424 (*2020*)

Downtown/ Midtown/ South Pandosy

- Core Densification: expected to add 7,000 living units by 2030.
- Westcorp Tower hotel (*Queensway*)
- Central Green(*Richter*) with 1000 living units

Rutland:

- Black Mountain 300 living units
- Tower Ranch 300 living units
- Kirschner Mountain 700 living units

Mission/ South Slopes:

- The Ponds/Thompson Flats 1,000 living units

3.4.5 Industrial/Commercial Activities

Kelowna has a number of low to medium hazard type industries or commercial businesses. KFD has identified over 40 higher risks industrial/ commercial businesses such as fuel and oil distributors and pesticide distributors that could pose a potential environmental risk in the event of fire or accident.

There are also a number of properties/infrastructure that if compromised by fire or accident, could pose a significant sociological and economic hardship on the city and its residents. These would include water treatment/provider facilities, sewage treatment facilities, the landfill and the Kelowna International Airport (YLW).

3.4.6 Transportation Systems and Growth in Traffic Volumes

The great majority of Kelowna's roadways are adequate to handle regular volumes of traffic on the two provincial highways or municipal roads. The significant transportation issues are:

- The lone access and egress to the city from the south over the WR Bennett Bridge. An average of 60,000 vehicles travel the bridge daily so a significant event involving the bridge can have a compounding effect on the local traffic negatively affecting response times.

- Currently there is no roadway link from the Glenmore Valley to the University of British Columbia Okanagan (UBCO). The planned link from Glenmore Road to Academy Way referred to as John Hindle Drive will greatly improve emergency service response in this area.

- With the recent purchase of the 22km rail line, all HAZMAT that were once transported via rail are now being transported by the highway corridor and road system throughout Kelowna.

A great portion of KFD's service area is relatively flat however some neighborhoods have roadways as steep as 13% grade. The Knox and Dilworth Mountains with their steep slopes and wildland interface characteristics creates a fire defence challenge by semi isolating neighborhoods like Clifton Rd, McKinley, Wilden, Dilworth and Quail Ridge. Mission Creek runs 17km from Gallagher's Canyon to Okanagan Lake and divides the community with only 5 crossing points. The southern perimeter of South East Kelowna (SEK) and Mission neighborhoods are a continuous boarder of steep ridges and gullies covered with the challenge of wildland interface issues.

3.4.7 Water Flows for Firefighting

KFD's service area gets its water supply from 5 large water utilities and 13 smaller water service providers. There are 4,300 hydrants in the service area of which 757 are private. In accordance with the municipal bylaw, they are serviced once each year as detailed in the NFPA 25 standard and they are spaced no more than 200 meters in residential area and no more than 100 meters in high density residential/commercial/industrial areas. The rural areas of the Mission and SEK have water systems with more sparsely spaced hydrants requiring water tenders to be included on the resource deployment in these areas.

3.5 PREDICTIVE MODELLING AND DYNAMIC DEPLOYMENT SYSTEM (PM/DDS)

Across Canada and the United States leading fire services have or are implementing PM/DDS to improve overall efficiency and effectiveness of emergency responses. In 2014, the City Council approved the procurement of PM/DDS for the KFD. This computer based system that employs risk tolerance decisions based upon historical incident and response data and other related factors to determine the optimum deployment system for concentration and distribution of resources.

Assessment Factor 1

Emergency response performance targets will be evidence based data with consideration for the City footprint; residential construction types; interface risks (wildland/forest fire risks), rate of growth and demographics; Industrial/commercial activities; transportation systems and growth in traffic volumes and available water flows for firefighting.

With the use of PM/DDS, the KFD has been able to verify previous fire protection areas within the City that expose service delivery gaps.

The computer based system is comprised of 4 separate modules, two of which have been installed by KFD and were key in the development of this strategic plan. These two modules answer two baseline questions needed to assess future operational needs: "what has happened" CAD Analyst and "what if" ADAM?

CAD Analyst: This application filters and processes key data from existing CAD or Records Management System (RMS) and utilizes that historical information to evaluate response performance. This answers the question "what has happened?"

CAD Analyst generates objective data concerning current response performance. This application filters and processes historical data from the existing CAD and RMS. It then utilizes that information to evaluate historical KFD response performance against current (*or new*) response time targets.

ADAM: Working in tandem with CAD Analyst, ADAM calibrates to match actual performance and calculates the impact of changes in workloads. The deployment analysis is displayed as colour coded maps. This addresses the question of "what if?"

ADAM helps answer questions regarding changes by using historical data, Predictive Modeling and Dynamic Deployment System (PMDDS) and mathematical formulas. It is also fed data such as street networks and speed limits to increase prediction accuracy.

ADAM simulates various deployment scenarios to effectively test and evaluate the impact of changes if these scenarios were implemented in the field.

The tool calibrated to match actual performance will:

- Evaluate impact of apparatus deployment changes on response target performance.
- Analyze impact of station/apparatus relocation.
- Compare the performance of alternate/new station locations.
- Demonstrate impact on service/performance due to proposed changes.
- Assess response performance between career and volunteer stations.
- Analyze strengths and weakness of established/proposed staffing levels.
- Calculate and predict average response times, anticipate workloads, identify unit availability and potential number of calls per day for multiple options.

The system based on the two modules above, the historical data analysis and response target options are displayed as color-coded maps allowing consideration of different deployment models and options for service delivery (See Section 6.5.1). With the use of PM/DDS, variable historical comparisons can be produced using travel time, geography and incident formulas.

Having a broadly understood and accepted system for determining deployment helps policy makers at all levels understand the deployment resources needed. Historically, fire departments have employed a 'geographic response' model. This is where stations, staff and equipment are strategically placed throughout the community to effectively respond to any type of emergency within an established response area.

Moving forward, innovations are being found by departments moving beyond simple geographical response and considering both dynamic deployment and risk based response. PM/DDS has allowed this strategic plan to balance future considerations on all 3 types of deployment models: geographic, dynamic deployment and risk based response to assess the most effective coverage based on Kelowna's needs.

The 3 types of deployment models are described below:

Geographical Response: is the establishment of response zones based on the community's geography. This is the traditional use of natural and human made boundaries, transportation system and distances to determine the station location and response area.

Home insurance companies refer to the FUS "Dwelling Protection Grade" system when quoting home fire insurance. The grading system takes into consideration: water supply availability, fire truck size, firefighting staff (career/ volunteer) and distance to a station. This is consistent with the historical geographical response deployment model.

Dwelling Protection Grades vary from:

Grade 1 (*fully protected*) with a water system designed in accordance with FUS standards, response with a fire truck within 8 kilometers with 4 on- duty career staff.

Grade 2 (*semi protected*) with a water system designed in accordance with FUS standards, response with a fire truck within 8 kilometers with 1 career on- duty staff and 15 trained volunteers or recalled career staff.

Grade 3A (*semi protected*) with a water system designed in accordance with FUS standards, response with a fire truck within 8 kilometers with 15 trained and scheduled volunteers.

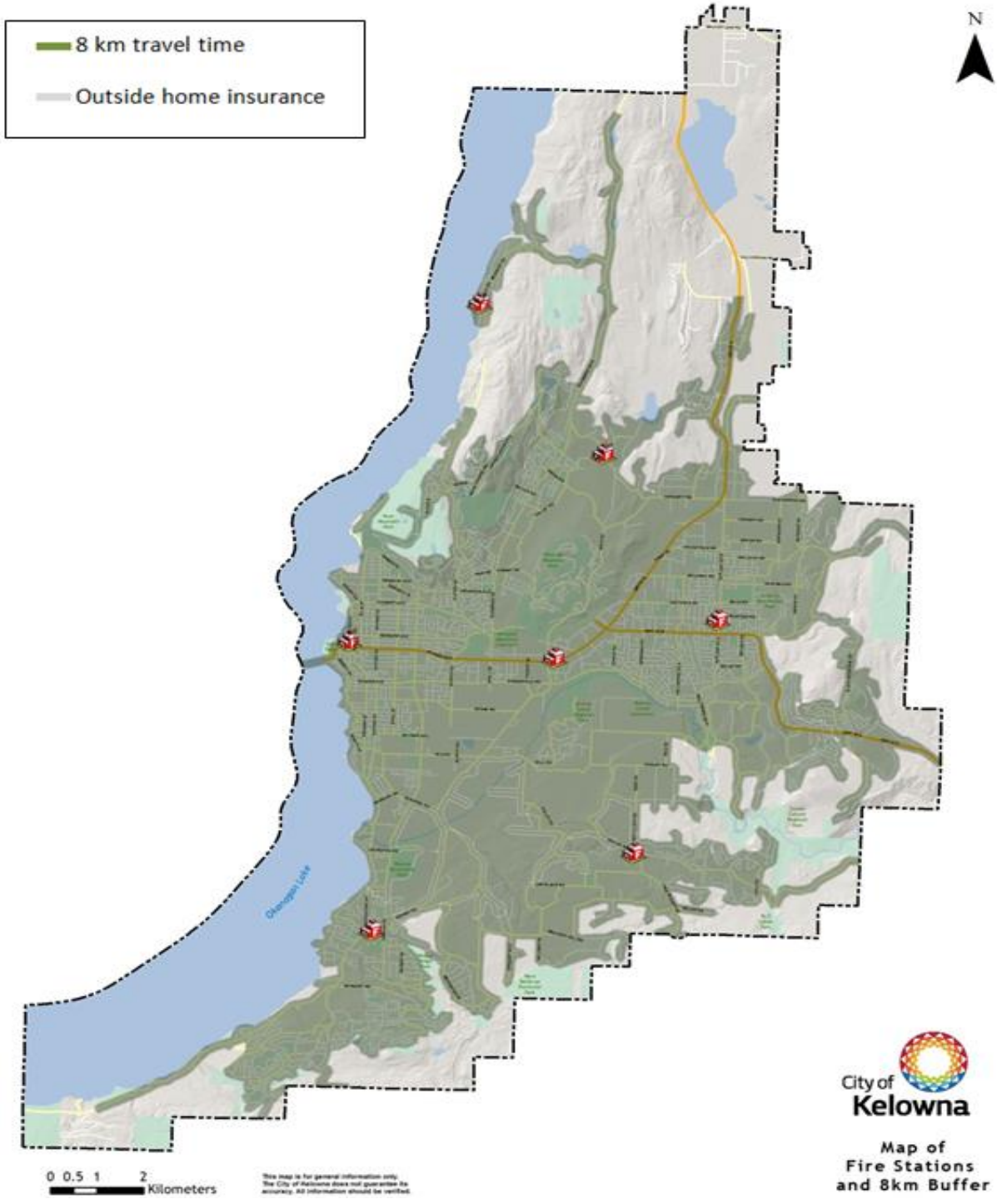
Grade 3B (*semi protected*) no water system required, 15 scheduled and trained volunteers, fire trucks with a minimum of 1500 gallons of water and Station within 8 kilometers.

Grade 4 (*semi protected*) no water system required, 10 scheduled and trained volunteers, 800 gallons of water and a station within 8 kilometers.

Grade 5 (*unprotected*) areas without fire protection meeting grades 1 through 4.

Each insurance provider uses the Dwelling Protection Grades to integrate with their own internal policies in establishing insurance rates depending on a property's location and use (*commercial, industrial or residential*).

The map below illustrates an 8 kilometer travel time from current stations (green shaded areas) which shows the Quail Ridge subdivision and beyond the 5700 block of Lakeshore Road (*grey shaded areas*) being outside of the full coverage home insurance parameters.



Dynamic Deployment: is the strategic positioning and deployment of staffing and related resources based on peak call volume times, and risk factors. An example of this is deploying resources to a specific area for peak call volume times only.

The implementation of a dynamic deployment model which includes apparatus redeployment guidelines will enhance the management of resources based on identified risks, probability of occurrence, reliability of response resources, and service demands. The model applies this systematic approach based on risk rather than blanket (*geographic*) response. It is used for apparatus redistribution and the day-to-day backfilling or repositioning of resources to improve response performance. This system will identify optimum station locations including the identification of gaps in service, redundancies or over resources in certain locations and enhancements, along with the more effective utilization of equipment and staffing levels.

It is apparent that many departments largely driven by economic factors coupled with increasing call-volumes are employing peak time resource redistribution. This is where resources (*equipment and staff*) are shifted from one station to another in order to manage changing risk in the community throughout the day. In some cases, stations might be left vacant or apparatus not staffed during identified quiet times. The City of Toronto is one example of this.

KFD is currently implementing dynamic deployment at a very basic level. As previously indicated, given the Station locations and distance from back up responses the coverage needs to include a geographic element. For example, the 2 person rescue unit from Station 1 is deployed to Station 2 during peak periods on weekends during the summer months. Further implementation of PM/DDS will allow for the matching of resources to the identified risk.

Risk Based Response: is identifying what resources and related training are required for a specific response to identified risks. An example is deploying smaller units to medical responses instead of a fully staffed Engine company. KFD is on the threshold of implementing a risk based approach to responses. The recently procured Engine/rescue vehicle will be assigned as a mobile unit within the City. Having a multi-use capacity, this unit will be used for lower risk calls such as medical responses, needle pickups, etc. In addition, a recent change has been implemented to use the smaller bush truck units for responses to the SEK district in support of POC operations in the rural area and First Medical Responses (FMR) throughout the City. This approach was introduced in July 2015 with ongoing evaluation and complete review early in 2016 for operational effectiveness and efficiencies.

Assessment Factor 2

Emergency response performance target options will be developed by applying geographic coverage and dynamic deployment and risk based responses as efficiency and operational effectiveness measures.

Two additional modules of PM/DDS aid in the operational deployment of resources based on the model selected through the analysis. These two modules are BARB and LiveMUM:

BARB: As part of developing the response logic (*standard apparatus assigned to a call type*) for dispatching, BARB validates the effective and efficient use of resources, by determining the closest most effective resources to send to incidents.

Until now, defining the geographic boundaries between station response areas has been an intuitive process, drawing on the knowledge and experience of Fire Service SME, rudimentary tools such as map books, stopwatches and limited GIS mapping support provided by outside experts.

Using advanced GIS tools and mathematical formulas, combined with KFD's data on streets and speed limits, this tool generates recommendations for response areas using computed running routes to every street address in the city. These recommendations are then validated against historical events to ensure accuracy.

These results are mapped and then uploaded directly into the CAD System to inform the dispatchers of the most appropriate apparatus and routing to a particular address or request for service.

LiveMUM: Connecting with the CAD in real time, LiveMUM identifies gaps in coverage or changes in a unit's status then recommends instantaneously the optimal move-ups for apparatus.

The system employs what is known as 'Bayesian inference to probability calculations' which is a mathematical formula that determines the probability of an event occurring based on historical incidences of similar events. Factors such as location, time of day and day of the week are part of this calculation. As a result, a repositioning of resources to a particular area would be recommended at times/days when the area's call volume is typically high, but not at times/days when it is typically low. This is a non-traditional approach from the standard of providing full standby fire coverage for all areas at all times. Simply put, stations are backfilled even when the chance of a call is minimal.

LiveMUM has been implemented on Vancouver's North Shore for the past 2 years where there has been a demonstrated improvement to service and response time with existing resources. The system has eliminated guesswork on when and which units are repositioned in order to ensure coverage.

The full implementation of PM/DDS will ensure future operational and strategic decisions are based on modern, scientific analytics as opposed to emotionally driven decisions. This approach combined with local experience creates cost effective and efficient deployment of resources to meet service levels in a growing community. This tool will also assist in the development of performance indicators that measure the impact of future innovations in the deployment models.

Assessment Factor 3

PM/DDS will provide the evidence based data to develop emergency response targets.

4. SECTION 4 PROGRAM AND SERVICES

4.1 HUMAN RESOURCES

In 1905, KFD was inaugurated as a volunteer fire department. Career Firefighters began to be hired in the 1950's for the Water Street Station known today as Station 2. At that time the Fire Department also provided Fire Dispatch Service and Ambulance Service to the community. The Provincial Government assumed the Ambulance Service role in the mid 1980's.

In 1973, the City amalgamated the surrounding areas of Glenmore, Rutland, Benvoulin, SEK and the Mission. KFD hired a number of members in the mid 1970's to provide the basics of a career fire service to the newly formed city. From 1954 to 1987, KFD provided the only ambulance service within the Regional District of Central Okanagan (RDCO) as part of its integrated service. The KFD continues to provide pre-hospital care through the First Medical Responder (FMR) Program, Emergency Health Services Commission (EHSC) as assistance to the British Columbia Ambulance Service (BCAS). In 1989, all Firefighters were trained to the FMR level 3 as the BCAS became the primary pre-hospital health care provider.

In 1989, the KFD took the lead on the development of the Regional Rescue Program to provide auto extrication, HAZMAT response and technical rescue to the citizens and visitors of the RDCO. Currently 6 fire departments in the RDCO provide auto extrication and low embankment rescue; 3 provide marine rescue and 2 provide technical rescue.

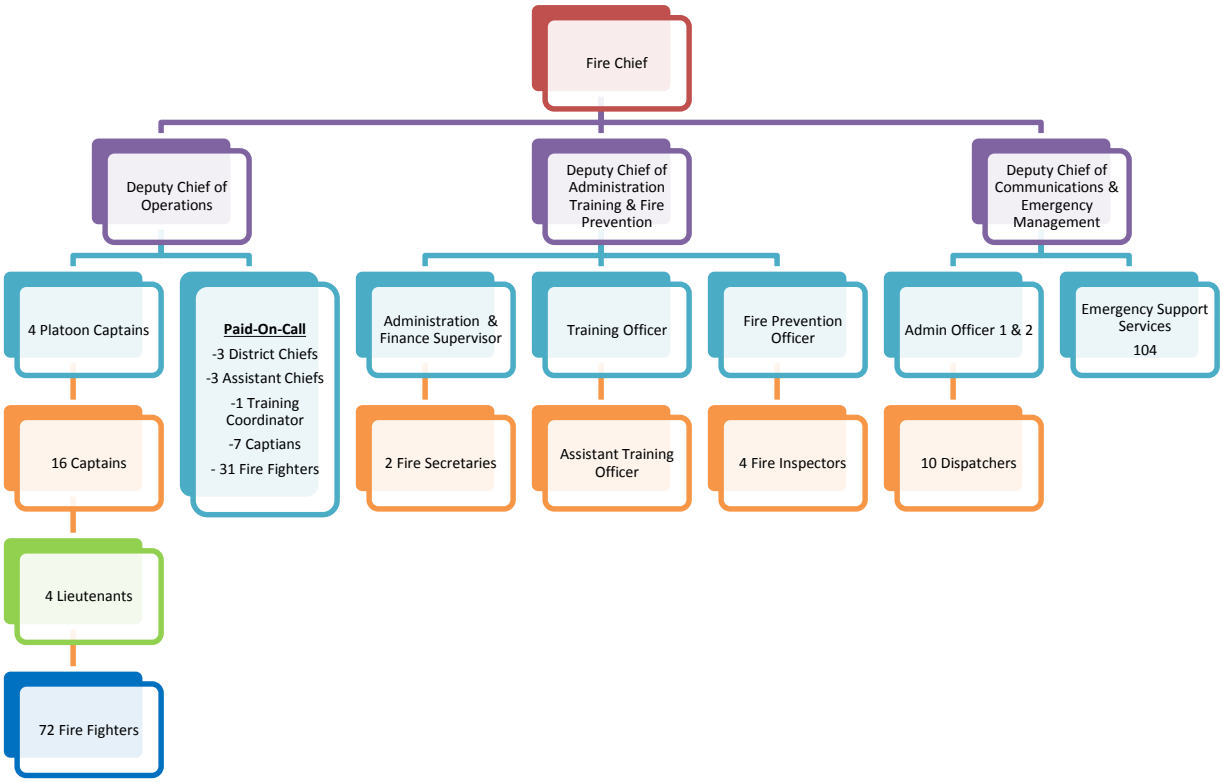
In 1993, the KFD developed the Regional Emergency Management Program which became a RDCO Bylaw in 1995. This program provides regional coordination and training for emergency management under the Provincial Legislation.

Past major regional emergencies, such as wildfires and floods have enabled the Regional Emergency Management Program to become a model emulated by other fire and emergency service providers.

In 2000, to comply with WorkSafe regulations, all career Engines were staffed with 4 Firefighters. This was done in order to enable a first arriving crew to make entry into a burning building complying with the "2 in 2 out" regulation. In 2010, a squad company of 2 Firefighters was implemented to cross staff Rescue 1, Ladder 1, Bush 1 and Tender 1.

Today, the KFD is a composite department comprised of 122 career staff (96 Firefighters) and 45 POC staff based out of 7 stations. Fire Prevention is staffed with 5 fire Inspectors, Training with 2 Training Officers, Department Administration with 3, Communications/Dispatch with 10, Communications Administration Officers with 2, Chief Officers with 4 and Emergency Support Service Volunteers with 104, for a total of 299 people.

Staffing:



4.2 VISION AND VALUES

In 2012, the City launched its vision, values and mission statement in an effort to create a cohesive resilient organization that has the capacity and depth to deliver valued services to its citizens while preparing to meet future challenges. This work provided a strategic direction for the Corporation and is the foundation for how staff will interact with internal and external stakeholders.

Vision:

To be the best mid-sized city in North America.

Values:

The City values are embodied in the acronym **BEST**:

Balance: We balance priorities to ensure environmental, economic, social and cultural sustainability.
Excellence: We pursue excellence and commit to continuous improvement.
Service: We put people first and focus on service.
Teamwork: Teamwork powers our decision making

Mission:

Leading the development of a safe, vibrant and sustainable city.

Community Strategic Plan:

The City is also guided by the Community Strategic Plan, a direction set out by City Council and the citizens of Kelowna. The Corporate Plan builds the corporate capacity necessary to deliver on City Council's directions and the goals of the community.

The Corporate Plan focuses on 6 priorities:

- Performance Excellence
- Passionate Public Service
- Responsive Customer Service
- Engaged Communities
- Pioneering Leadership
- Sustainable City

KFD Alignment:

KFD is directly aligned with the corporate direction, with a vision to be "the best mid-sized Fire Department in North America".

Using innovative approaches such as PM/DDS analytics, KFD will develop Performance Targets, providing measurable outcomes to assess our success in supporting and achieving the corporate vision. The recommendations within this strategic plan are aimed at using innovation to deliver a service response level that meets or exceeds community expectations while working within current financial constraints and realities.

4.3 SERVICES PROVIDED

In Canada, the provision of fire services by municipal governments is discretionary. In BC, there is no legislation mandating the levels or type of fire services that any municipality provides. However, if a Municipality decides to establish a fire service, regardless of whether it is staffed by POC or career Firefighters, there are general safety regulations that do apply. The occupational specific WCB interior firefighting regulations must be met requiring 2 in and 2 outside a structural fire before entry can be made to affect a rescue or interior operations. Along with the 2 in and 2 outside, a Rapid Intervention Team (RIT)/Firefighter Rescue of 2 members must be assembled within 10 minutes of entry or the interior attack team must exit the structure. In addition, the training standards, as identified in the Office of the Fire Commissioner (OFC) Training and Standards Playbook also apply. Other services such as technical rescue, hazardous material response and medical response also have their own standards in terms of training, equipment, and core disciplines; however, the delivery of these services is entirely at the discretion of the municipality. The Fire Service Act in BC does require municipalities to investigate and report fires, as well as to conduct inspections on public buildings/facilities. In the case of inspections, the municipality has the discretion to set the cycle or number of inspections per year.

Assessment Factor 4

Emergency response performance targets will ensure compliance with Provincial safety and training standards legislation.

KFD provides a variety of services, as detailed below. These services are provided by a staffing complement of Career and POC Firefighters.

4.4 FIRE PREVENTION

The Fire Services Act requires Municipalities to provide for a regular system of fire safety inspections carried out by Local Assistant's to the Fire Commissioner (LAFC) under the relevant sections of the Fire Services Act and in accordance to the British Columbia Building Code (BCBC) and British Columbia Fire Code (BCFC).

The BCFC establishes the minimum standard for fire prevention, fire protection and life safety in existing buildings and includes provisions for:

- The ongoing maintenance and use of the life safety and fire protection features incorporated in buildings.
- The conduct of activities that might cause fire hazards in and around buildings.
- The establishment of fire safety plans.
- Fire safety at construction and demolition sites.

In a municipality that maintains a fire department, the Fire Chief and persons authorized in writing by the Fire Chief to exercise the powers of a LAFC have the powers of a peace officer for the purposes of the Fire Services Act.

The KFD Fire Prevention Branch provides a variety of services including Fire Inspections, Fire Investigations, Public Education and Development/Construction Plan Review. The Fire Prevention Branch consists of 1 Fire Prevention Officer, and 4 Fire Inspectors. All Fire Prevention Branch staff are authorized LAFC in accordance to the Fire Services Act. All KFD Fire Inspectors undergo extensive training to meet NFPA standards for Fire Inspectors, Fire Investigators and Fire and Life Safety Educators.

Fire Inspections: Fire Inspectors are responsible for the inspection of over 6,100 properties in Kelowna each year with a total building value over 12.4 billion dollars. There are over 32,000 inspection items inspected each year for compliance.

The fire inspections are completed by Fire Inspectors, Engine companies and the Rescue Squad based on frequency levels established under Council Policy #181 and in accordance to the BCFC, BCBC and the Fire Services Act. To improve corporate effectiveness, fire inspections also include checking for business licenses on behalf of the Bylaw Department. The Bylaw Department is notified for follow up when a business license is out of date or non-existent.

Fire Investigations: The KFD Fire Inspectors are certified Cause & Origin Fire Investigators level 2 and 3, and must investigate all fires occurring in the municipality in accordance with the Fire Services Act. Immediately after a fire investigation, the fire reports must be submitted to the OFC containing all the facts ascertained about the cause, origin and circumstances of the fire.

Public Education: KFD dedicates ¾ of a full time Fire Inspector's hours to coordinate all Public Education events and act as a liaison to School District 23, numerous volunteer groups, strata councils and agencies. School District 23 events range from station tours and pumper visits, Fire Safety House visits for K-3, Fire Chief for the Day during Fire Prevention Week, Middle School extinguisher training for shop and cooking classes as well as career fairs and presentations on opportunities for young people interested in the fire service as a career. KFD has teamed up with the Kelowna Senior's Community

Outreach Center to provide fire safety and fall awareness programs and conducted training on what to do after a fire for strata councils and companies.

Juvenile Firesetters: KFD fire prevention staff is trained on counselling children who have initiated a fire. This program offers opportunity for children and their parents to see the ramifications of lighting fires. The child and parents are invited to the station to learn about what firefighters do and the services they provide and how intentional fires take them away from helping those in need. They also learn about the types of injuries that can result from playing with fire. On average KFD provides this service/counselling to 6-8 juveniles and their parent/ guardian each year.

Development/Construction Plan Review: Plan review is conducted by the Fire Prevention Officer when development and or construction plans are forwarded from the City for review. The plans are reviewed for life safety code compliance, fire and life safety systems, water supply, hydrant location and fire department access. It is important to note that this service is coordinated in close consultation with the City Building Services Branch.

The BCBC and the BCFC both have specific requirements on new construction, alterations, change of use and demolitions. The BCBC covers the fire safety and fire protection features that are required to be incorporated in a building at the time of its original construction. The BCFC covers the fire and life safety systems of the building and the ongoing testing and maintenance after the building is occupied.

Pre-incident Planning: KFD dedicates ½ of a fulltime Fire Inspector's hours to review and conduct pre-incident planning for larger high risk structures. This typically includes medium and high risk industrial and commercial buildings. This Fire Inspector co-ordinates this work with the Platoon Captain responsible for pre-incident planning.

4.5 FIRE TRAINING

The Fire Training branch consists of 1 Career Training Officer (TO) and 1 Career Assistant Training Officer (ATO) based at the main station. The POC stations have Assistant Chiefs. The TO oversees all training for Career and POC members. Both the TO and ATO are certified Justice Institute of British Columbia (JIBC) Instructor/Evaluators. Each platoon has instructors for the following disciplines: FMR, Emergency Vehicle Operations (EVO), RIT, technical rescue and HAZMAT.

All career fire officers are certified to NFPA 1021 for Fire Officer I & II. The department's technical rescue teams are certified to NFPA 1006 Standards in High Angle Rescue, Tower Crane Rescue, Swift Water Rescue and Ice Rescue. The department's HAZMAT Teams are certified to NFPA 472 Standards to the Technician Level. All shift officers' conduct monthly training drills as assigned by the Training Branch through the Web Based Target Solutions Training System and conduct monthly

practical training drills. Crews train an average of 22,000 hours each year, both on and off duty in order to maintain skills and proficiencies in all disciplines provided by the fire department.

4.6 REGIONAL SERVICES

Kelowna Fire Dispatch provides a number of critical services on a regional basis through a strong partnership with the RDCO. This innovative approach allows the Region to benefit from the full time career capacity of a large fire department, while providing support to KFD in relation to core funding for training, equipping and planning for major emergencies and regional communications.

Regional services can be broken into 3 main components:

- Fire Dispatch
- Emergency Management
- Regional Rescue Services

4.6.1 Fire Dispatch

The Regional Fire Dispatch Centre is located in Station 1 and provides service to the municipalities and rural electoral areas within the RDCO. Through contract, service is also provided to the fire departments in the Regional District of Okanagan Similkameen (RDOS). In addition to fire dispatch, KFD continues to look at alternative revenue opportunities in non-traditional service provision. Examples of these services include current service agreements to provide alarm monitoring, lone worker monitoring, and Bylaw dispatch and after hours call-out for local government staff across the Region. Dispatch also plays an important part in the Regional Emergency Management Program, providing the first point of contact for both the public and responders during the initial phase of any major emergency incident.

KFD continues to work on identifying additional revenue opportunities that support ongoing improvements to our existing technology and response systems while potentially offsetting the costs to the current dispatch partners in the region. This initiative will be expanded upon in Section 5 of this report.

4.6.2 Emergency Management

The Regional Emergency Management Program is administered by KFD, supported by an agreement with RDCO and consistent with the Regional Emergency Management Bylaw. KFD is responsible to plan, train, maintain resources and prepare for emergency incidents or disasters that may occur within the RDCO. This includes ensuring the Emergency Operations Centre (EOC) located at KFD Station 1 is ready for activation at all times, and that a broad range of essential staff, from across the region are trained and able to respond.

During an emergency, representatives come together at the EOC to coordinate response and recovery actions and necessary resources that support frontline response

personnel. The EOC is where coordination and management decisions are facilitated, and all official communications regarding the emergency originate. Representation may include local government staff, first responders, and representatives from various stakeholders such as health, utilities, education or provincial ministries such as Ministry of Transportation and Infrastructure (MOTI).

Emergency Management also administers the Emergency Support Services (ESS) program. This program relies heavily on many dedicated trained and experienced volunteers who provide relief for residents displaced from their homes during an emergency. The ESS team is very active, and supports numerous events annually ranging from single house fires (*termed Level 1 activations*) up to and including mass evacuations for events such as wildfires (*Level 3*).

The Regional Emergency Program conforms to the best practices provided by Emergency Management British Columbia (EMBC), such as BC Emergency Management Response System (BCERMS). Direction on program development and training are provided throughout the year. During EOC activations, EMBC will open a Provincial Regional Emergency Operations Centre (PREOC) to coordinate resources and provide financial support, including potential cost recovery for activities taken to respond to or recover from a large emergency event or disaster.

4.6.3 Regional Rescue Services

In 1989 the KFD spearheaded development of the Regional Rescue Program to provide auto extrication (*road rescue*), HAZMAT and technical rescue to all of the citizens of the RDCO. Technical rescue includes marine, ice, swift water, low embankment, confined space and high angle rope rescue.

The service remains under the administration of the KFD, with cost recovery for all equipment, training and operations provided through the RDCO. The training and equipment administered by KFD is deployed to departments within the RDCO based on local response capacities and service levels. For example, most departments take part in Road Rescue and Low Embankment Rescue, but the KFD directly provides the only Hazmat Response Unit in the region.

Operationally, service delivery is organized into 3 areas: (r*oad rescue, technical rescue and Hazmat response*):

> **Road Rescue (Motor Vehicle Incidents (MVI)/Auto Extrication):** Auto extrication is provided by the majority of departments in the region, with the exception of Ellison Fire and Wilson's Landing. In Kelowna, the closest equipped Engine company and/or rescue unit will respond to MVI where extrication is or may be needed in support of medical aid, whether fire suppression is required or not. Training and equipment is standardized within the region and managed through the KFD, with funding provided by RDCO.

Technical Rescue: Includes 6 disciplines of varying complexity and staffing requirements. Technical rescue includes: marine, low embankment, ice, swift water, confined space and technical high angle (*which includes tower crane rescue*).

Ice and Low Embankment Rescue:
As with auto extrication, both ice rescue and low embankment rescue are provided by KFD and 5 other local community fire departments. This allows for quick, consistent response to incidents across the region. Within Kelowna, calls for ice rescue and low embankment rescue are responded to by members at Station 1 on Enterprise Way. Training and equipment is standardized within the region and managed through the KFD, with funding provided by RDCO.

Technical High Angle Rope/Swift Water and Confined Space:
Each of the 4 KFD career platoons has a technical rescue team consisting of 6 designated members. The members are not seconded full time to the team, but are part of the regular on duty compliment and may be located at any one of the KFD stations. In the event of a technical rescue call within the city for swift water, confined space or technical high angle rescue, the closest KFD Engine company responds directly to assess the situation. Outside of Kelowna, but within the RDCO, local community fire departments or other first responding agencies (generally BCAS or RCMP) will provide the initial assessment. Team members from KFD respond to Station 1 to assemble the Technical Rescue Team and equipment and then respond directly to the incident.

In late 2015, West Kelowna Fire Rescue formally began providing technical high angle rope/swift water and confined space rescue under agreement with the RDCO for areas across the lake from Kelowna. The 2 teams will enhance the rescue response time across the region. These teams are working together ensuring a consistent response, providing back up and support to each other as required.

Marine Rescue:
Marine Rescue is provided through 3 regional rescue boats operated by KFD, Peachland and Lake Country. The KFD Marine Rescue Team is based out of Station 2 on Water Street. When needed, staff responds from the Kelowna Yacht Club in a specialized marine rescue vessel. In addition to the regional fire rescue boat program, support for marine search operations may also involve the volunteers and boat from Central Okanagan Search and Rescue (COSAR), which is also moored at the Yacht Club.

Hazardous Material Response: Each of the 4 career platoons have a hazardous material response team consisting of 6 members on each team. Specially trained KFD team members are located at various stations as part of the normal duty rotation. In the event of a HAZMAT incident, the closest Engine company responds directly to assess the situation. On confirmation from the Incident Commander that the event is higher than a Level I response, the team members respond to Station 1 to assemble the Hazmat Team and equipment.

4.7 FIRE OPERATIONS

Fire Operations consists of fire suppression, first medical response, MVIs or auto extrication, technical rescue (l*ow embankment, high angle, tower crane, ice rescue, swift water rescue, confined space rescue, and marine rescue*), Hazmat response, pre-incident planning, fire inspections, and apparatus maintenance functions.

Fire Suppression: Minimum (career) Duty Strength (MDS) per shift is 19 Firefighters. Crews are notified by Fire Dispatch and receive call notification via radio and pager system as well as verified Rip 'n' Run reports which are printed at each responding station at the time the call is committed to the apparatus. Apparatus are now equipped with onboard computers that provide incident details, electronic maps and pre-incident plans. Each Engine company is staffed by 1 Officer and 3 Firefighters with the exception at the Station 1 where an additional Rescue Unit is staffed at a minimum of 2 members (*1 Lieutenant & 1 Firefighter*). Any additional staff above the MDS is assigned to alternate apparatus such as the ladder and rescue units. There are written protocols for a wide variety of emergencies all of which can be adapted to increase or decrease the level of response depending on the incident needs.

First Medical Response: All members are trained to Emergency Medical Assistant First Responder Level III with Automatic External Defibrillator (AED) and Spinal Endorsements. The Department is registered with the EHSC as a provider for FMR and responds to all Level I Medical Calls as indicated by the BCAS Medical Priority Dispatch System (MPDS) system. This program represents on average 65% of the total calls for service (*emergency responses*) for KFD.

5. SECTION 5 RESOURCES AND PERFORMANCE

5.1 CURRENT STATIONS

Stations are community buildings that are frequented by school children, service clubs, and the members of the public. As such, these buildings must be maintained to the City's standards and must serve to promote a professional image and a sense of public confidence and safety. The Deputy Chief of Operations liaises with the Building Services Manager to communicate and prioritize routine and annual maintenance as well as priority refurbishment projects in all stations. The Building Department's 2030 Capital Plan identifies future refurbishment plans.

Station 1

A building condition assessment of Station 1 was conducted in 2007 at which time it was considered to be half way through its "useful life". The assessment identified and categorized issues for Building Services to prioritize and address. Major renovations to Station 1 over the years have included the expansion of the front reception and fire dispatch in 1994, overhead door replacement in 2010 and renovations completed in 2012 to provide additional office space for Fire Prevention, as well as female washrooms and change room.

Station 2

In 2014, a masonry condition assessment was conducted on Station 2 (*built in 1924*) which included a review of seismic aspects. Since 1924, the building has undergone several additions, most notably in 1945, 1951, 1971 and 1990. The exterior of each addition has been constructed with brick pattern similar to the original construction, in an attempt to maintain a consistent look throughout. The station is currently listed on the City Heritage Register. The Building Department's 2030 Capital Plan identifies 2017 for major refurbishments to the station such as the reconditioning of the masonry (this is not included in the financial analysis within this report).

Ninety years ago this Station was in an ideal central location. Today it is situated on the western edge of its 15 square kilometer response zone. In recent years the increased densification of the downtown core, increased traffic flow in front of the Station and the installation of traffic signals at Lawrence and Leon Avenues has resulted in severe traffic congestion in front of the Station. This creates operational challenges for the response vehicles exiting the station and upon return. For example, when the Engine returns to the station a U-turn in the middle of the street is required in order to back into the vehicle bay.

Station 3

In 1998, Station 3 was refurbished to include new updated living quarters and overhead doors. The Building Department's 2030 Capital Plan identifies major refurbishments for this Station in 2022 (this is not included in the financial analysis within this report).

Station 4

In 2014, Station 4 received a significant upgrade to the exterior envelope of the building with new siding, windows and roofing. There are no other refurbishments identified in the Building Department's 2030 Capital Plan.

Stations 7, 8 and 9

There are no major refurbishments identified in the Building Department's 2030 Capital Plan for the POC Stations however, there are condition assessments conducted annually to identify annual maintenance and repairs.

Station 1

Opened in 1975 and located at 2255 Enterprise Way, Station 1 is KFD's headquarters and primary station. It accommodates the Administration staff, Fire Prevention Branch, Dispatch, Training and Management staff. It is also home to multitude of apparatus including a Command unit, Engine, Ladder truck, Rescue unit, Water Tender, Gator (*ATV*), Bush truck, and Reserve pumpers. Station 1 is staffed with 1 Platoon Captain, 1 Captain, 1 Lieutenant and 4 Firefighters. In 2014 there were 2,094 responses in Station 1's response zone.

Station 2

Built in 1924 and located in downtown Kelowna at 1616 Water Street. Station 2 is staffed by a Captain and 3 Firefighters and is KFD's busiest response zone with 3,165 responses in 2014. This Station houses 1 fire Engine and a Ladder truck. The Firefighters from this station also staff the Regional District's Marine Rescue boat located at the Kelowna Yacht Club.

Station 3

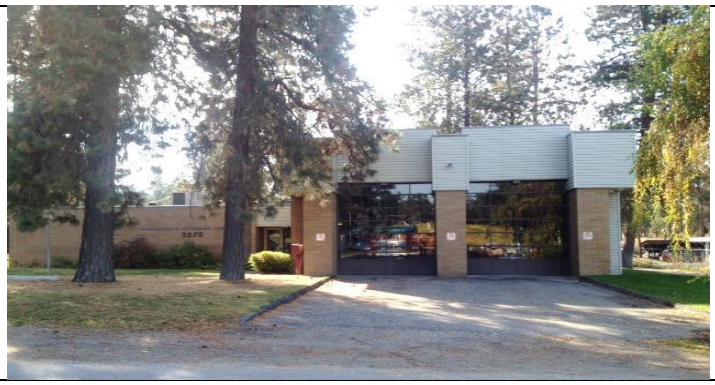
Built in 1966 and located at 310 Rutland Rd N. Station 3 is shared with the RCMP's Rutland Community Policing Office and houses a fire Engine, Bush truck and the RDCO's HAZMAT truck. Station 3 is staffed by a Captain and 3 Firefighters. There were 2,241 responses in Station 3's response zone in 2014.

Station 4

Built in 1974 and located at 619 Dehart Rd. Station 4 is staffed by a Captain and 3 Firefighters and houses a fire Engine, Bush truck and Water Tender. There were 1,454 responses in Station 4's response zone in 2014.

Station 7

Built in 1974 and located at 3275 Gulley Rd. Station 7 is the busiest of the POC Stations with 186 responses in 2014. There are 22 POCs based out of this Station staffing a fire Engine and a Bush truck.



Station 8

Built as a twin to Station 7 in 1974 and located at 550 Valley Rd N. The 19 POCs based out of this Station staff a fire Engine and responded 130 times in 2014. Station 8 also serves as a back-up location for fire dispatch.

Station 9

Built in 1993 and located at 2160 Bennett Rd. The 6 POC members based out of this Station staff a fire Engine and responded 18 times in 2014. The POC members are an integral part of promoting FireSmart wildfire prevention program in this isolated neighbourhood.

5.2 DISPATCH CENTRE

KFD Fire Dispatch is located in the main station on Enterprise Way. Within the Dispatch Centre are 3 complete workstations, of which two are staffed 24/7. During peak times or emergent events the third position will be staffed as well.

An additional two workstations are set up in the administration offices at Station1 to allow support by one or both of the KFD Administrative Officers within that division. Currently, the centre is in the midst of an upgrade of its dispatch consoles, expected to be completed in early 2016. As part of this upgrade, the current consoles will be

relocated to the Station in Glenmore as a backup location to our main Dispatch Centre.

5.3 TRAINING AREAS

Besides daily theoretical training that takes place at each station, KFD has a training ground at Station 1 on Enterprise Way where firefighters can train on a multitude of disciplines from pumping water, high rise firefighting evolutions, and confined space rescue to high angle rope rescue. At Station 7 in SEK, KFD maintains a "smoke house" for practical fire training. In 2015, KFD constructed a burn building at the landfill where live fire training can be conducted while on duty. KFD also has a flashover simulator training prop at the landfill for demonstrating the pending conditions of a flashover and the science behind fire growth.

Flashover Simulator

Burn Building

SEK Smoke House

5.4 APPARATUS AND EQUIPMENT AND OTHER MAJOR EQUIPMENT

The following represents the current equipment and apparatus complement of the KFD:

Unit #	Description	
Station 1 – Enterprise Way This Station houses 7 front line apparatus.		
PC 1	2005 Dodge 4X4 pick up. This vehicle is assigned to the Platoon Captain who manages the on duty firefighting staff. The vehicle also serves as the command post to coordinate resources during emergency incidents.	
ENGINE 1	2010 Spartan/ Rosenbauer 1500 gpm with 500-gallon water tank 50’ aerial ladder This is the primary firefighting vehicle based at Station 1 that backs up all areas of the city during fires. This unit is staffed with a Captain and 3 Firefighters.	
LADDER 1	2014 Spartan/ Smeal 100 Foot Tower Ladder 1800 gpm with 300-gallon water tank This unit is cross staffed with a firefighter.	

RESCUE 1	2002 Freightliner/Hub Rescue Truck. This truck carries equipment for fires, auto extrication, rope rescue and swift water rescue. This unit is cross staffed with a Lieutenant and 1 Firefighter.	
BUSH 1	2013 Ford 4X4 for wildland firefighting 100 gpm with 250-gallon water tank This unit is cross staffed with a Lieutenant and 1 Firefighter.	
TENDER 1	1999 Western Star water tender 250 gpm with 2500-gallon water tank This unit is cross staffed with a Lieutenant and 1 Firefighter.	
QUAD 1	2015 John Deere Gator. This All-Terrain Vehicle (ATV serves 3 primary purposes: • Wildland firefighting with a skid pack that carries 50-gallons of water and a small pump. • Wilderness Rescue with a skid pack for carrying equipment & transporting a patient over rough terrain. • This unit can be equipped with a plough blade for clearing snow. • This unit is cross staffed with a Firefighter.	

Station 2 – Water Street This station is staffed with 1 Captain and 3 Firefighters who cross staff the 3 units.		
ENGINE 2	2002 Spartan/Superior 1500 gpm with 500-gallon water tank This is one of the busiest units in the province averaging over 3100 responses each year.	
LADDER 2	2002 Spartan/Smeal 100 aerial ladder 1750 gpm with 400-gallon water tank	
MARINE RESCUE 2	2000 Boston Whaler Hurricane This unit is owned by the RDCO and operated by KFD. Besides marine rescue, this unit is capable of pumping 490 us gpm for firefighting.	

Station 3 – Rutland Rd. This station is staffed with a Captain and 3 Firefighters that cross staff the 3 units.		
ENGINE 3	2009 Spartan/ Rosenbauer 1500 gpm pump with 500-gallon water tank	
BUSH 3	2007 Ford 4X4 for wildland firefighting 125 gpm with 200-gallon water tank	
HAZMAT 3	1998 Freightliner HAZMAT unit This unit is owned by RDCO and operated by KFD. KFD owns an accompanying 16' cargo trailer that carries additional equipment for the Regional HAZMAT Team.	

Station 4 – Dehart Rd. This station is staffed with 1 Captain and 3 Firefighters that cross staff 3 units.		
ENGINE 4	2004 Spartan/Superior 4X4 1500 gpm with 500-gallon water tank	

BUSH 4	1999 Ford 4X4 for wildland firefighting 125 gpm with 200-gallon water tank	
TENDER 4	1993 International Water Tender 250 gpm with 2500-gallon water tank	

Station 7 – Gulley Rd. This station is staffed with 22 POC Firefighters that train weekly and respond via pager when required.		
ENGINE 7	1999 Freightliner/ Hub 4X4 1500 gpm with 1000-gallon water tank	

BUSH 7	1996 Ford 4X4 for wildland firefighting 250 gpm with 250-gallon water tank	

Station 8 – Dry Valley Rd. This station is staffed with 17 POC Firefighters that train weekly and respond via pager when required.		
ENGINE 8	2006 Freightliner/ Hub 1500 gpm with 500-gallon water tank	

Station 9 – Paley Rd. This station is staffed with 6 POC Firefighters that train weekly and respond via pager when required.		
ENGINE 9	2014 Freightliner. Pierce 4X4 1250 gpm with 750-gallon water tank	

Reserve Apparatus
These units are housed at Station 1 to replace frontline units during repairs. These units are also backfilled when necessary during major events where frontline units are committed for an extended period of time.

PUMPER 10	1994 Spartan/ Superior Originally was Engine 3 that was moved to reserve status in 2009 after 15 years of front line service. This unit is due to be decommissioned after 21 years of service.	
PUMPER 11	1996 Spartan/ Superior Originally was Engine 1 that was moved to reserve status in 2011 after 15 years of front line service. This unit is due to be decommissioned after 19 years of service.	
BACK UP RESCUE	1991 Mack/ Superior The former Engine 2 was converted to a backup Rescue Truck to be used when the front line Rescue is out of service. This unit is due to be decommissioned in 2016 after 25 years of service.	

Fire Prevention/ Public Education/ Fire Investigation		
Fire Prevention Branch	The Fire Prevention Branch is based out of Station 1 with a Fire Prevention Officer and 4 Fire Inspectors whose primary duties include: • Fire Inspections • Public Education • Fire Investigation Vehicles include: Ford Focus, Chevy Aveo, VW Beetle (donated), Ford Transit, Mazda Tribute	

Fire Training/ Safety Officers		
Training Branch	The Training Branch is staffed with a TO and ATO whose primary duties include: • Co-ordinate and deliver instruction to Career and POC staff. • Perform as Safety Officers at emergency incidents assisting the incident commander. • Vehicle: Ford F250	

5.5 EMERGENCY VEHICLE EFFCIENCIES

KFD continually monitors its fleet for adjustments to meet the needs for the City based on services provided. As the city has expanded over the years, variations in apparatus types and response capability has been evaluated and altered to best fit the needs of the community while creating efficiencies.

A new multi-purpose Rescue truck with pumping capability is under construction and is expected to be in service in 2016. The multi-purpose capability establishes a dynamic deployment and risk based response function for KFD which will be deployed to areas for peak periods, respond to lower risk calls and can initiate exterior operations in the event of a structural fire. This will be the first Rescue truck with pumping capabilities to enter KFD's fleet. The current Rescue 1 will remain central to provide additional

rescue activities within the City as well as a reserve apparatus for mechanical downtime.

All future Engine procurements will include the basic extrication equipment allowing further dynamic deployment of all apparatus.

Currently KFD (depending upon the specifics of the incident) dispatches an Engine and Rescue 1 for MVIs. The reason for this is to provide the required tools for extrication purposes.

Assessment Factor 5

To enhance operational effectiveness and efficiency, life cycle replacement Engines will be tendered as multi-purpose Engine/Rescues. The existing fleet will be examined to determine if a retrofit is possible to create the multi-purpose capability.

A trial utilizing a smaller vehicle of FMR deployments in Stations 1 and 7 response areas is underway. Previously, the Rescue unit was the responding apparatus to all medicals within Station 1 and Station 7 fire protection areas. This trial has switched the response to a smaller and more manoeuvrable Bush truck allowing Rescue 1 to remain central within the city. In addition, a smaller unit is now the responding FMR unit in the Station 7 area. This pilot project also has an impact on reducing fuel consumption, repair costs, and reducing unnecessary wear and tear on large more expensive replacement apparatus.

After a 6-month trial, all results will be analyzed and staff feedback received to extend the deployment or look for another alternative model. If the results are as expected, a new dynamic deployment model may be initiated for FMRs in all career stations.

The 2002 100' Ladder truck is currently assigned to Station 2 and scheduled for replacement in 2022 at an estimated $1.2 million. Prior to the scheduled replacement date, KFD is prepared to enter into talks with neighbouring municipalities on a formal ladder agreement. If an agreement can be reached, the current ladder would not be replaced allowing nearly $1.2 million in replacement costs to be avoided.

With the amount of forested area around and within the City, interface fire threat continues to be a high probability risk with further development within the interface areas. Additional smaller apparatus need to be looked at closely in the event of any further station openings. Larger fire Engines that once were the multi-use vehicles have been phased out in actual attack of a wildfire and replaced by smaller Bush trucks equipped with pump and water capabilities. In 2015, the first Utility Transport Vehicle (UTV) unit was added to the fleet of emergency response vehicles. This addition has proven to be highly successful for wildland fires and rescue operations in limited access conditions this past year.

Since 1997, the City has contracted fire suppression services (including FMR) to the District of Lake Country (DLC) for the northern area of the City Limits. The primary response for emergencies occurring in the contracted area is the Lake Country Volunteer Fire Department (LCVFD). Response statistics indicate an average response time of 12:37 minutes. The City pays the DLC approximately $280,000 to provide fire protection and FMR services to this area of the City. This is discussed in more detail in Section 6.8 of this report with a view to fully examine the need for this contract.

5.6 COMMUNITY COMPARABLE ANALYSIS

KFD, like the entire fire service, is challenged to provide excellent customer service for a variety of emergencies in a timely manner while being cost efficient. Below is a comparison of fire departments in like sized communities with information supplied by the respective Fire Chief. The response time standards of the fire departments surveyed strive to respond as quickly and effectively as possible but are unable to meet the NFPA standard of a 4-minute travel time for the first unit on scene 90% of the time. Like KFD, many of these communities have set a local standard that are more obtainable ranging from 4 to 8-minutes travel time in urban areas.

Not all of the surveyed communities utilize POCs as part of their operations. KFD's call volume consists of on average 66% first medical responses. This is consistent amongst the surveyed departments which ranged from 42% to 70%. Of note is that KFD performs more FMRs than 5 of the other 7 departments total call volume (see table below). Engine 2 based at the Water Street Station responded 3,165 times in 2014. In comparison to even larger cities, Vancouver's busiest fire Engine had 2,382 responses and Surrey's busiest fire Engine had 2,489 responses in 2014.

Table 2: Community Comparative Analysis

City	Population	Area (sq.km.)	Career FF/ population	Call Volume	Stations Career/ POC	Firefighters Career/ POCs	Busiest Response Zone
Kelowna	124,000	214	1:1292	9560	4/3	96/45	3165
Delta	100,000	184	1:621	6027	6/0	161/0	1819
Kamloops	99,000	311	1:952	7349	5/2	104/40	2820
Prince George	78,000	318	1:750	5495	4/0	104/0	2907
Saanich	111,000	103	1:1133	4171	3/0	98/0	1612
Nanaimo	100,500	88	1:1241	7067	4/1	81/51	1828
Abbottsford	138,000	370	1:1683	6227	4/4	82/106	2080
Coquitlam	140,000	140	1:864	6169	4/0	162/12	2664

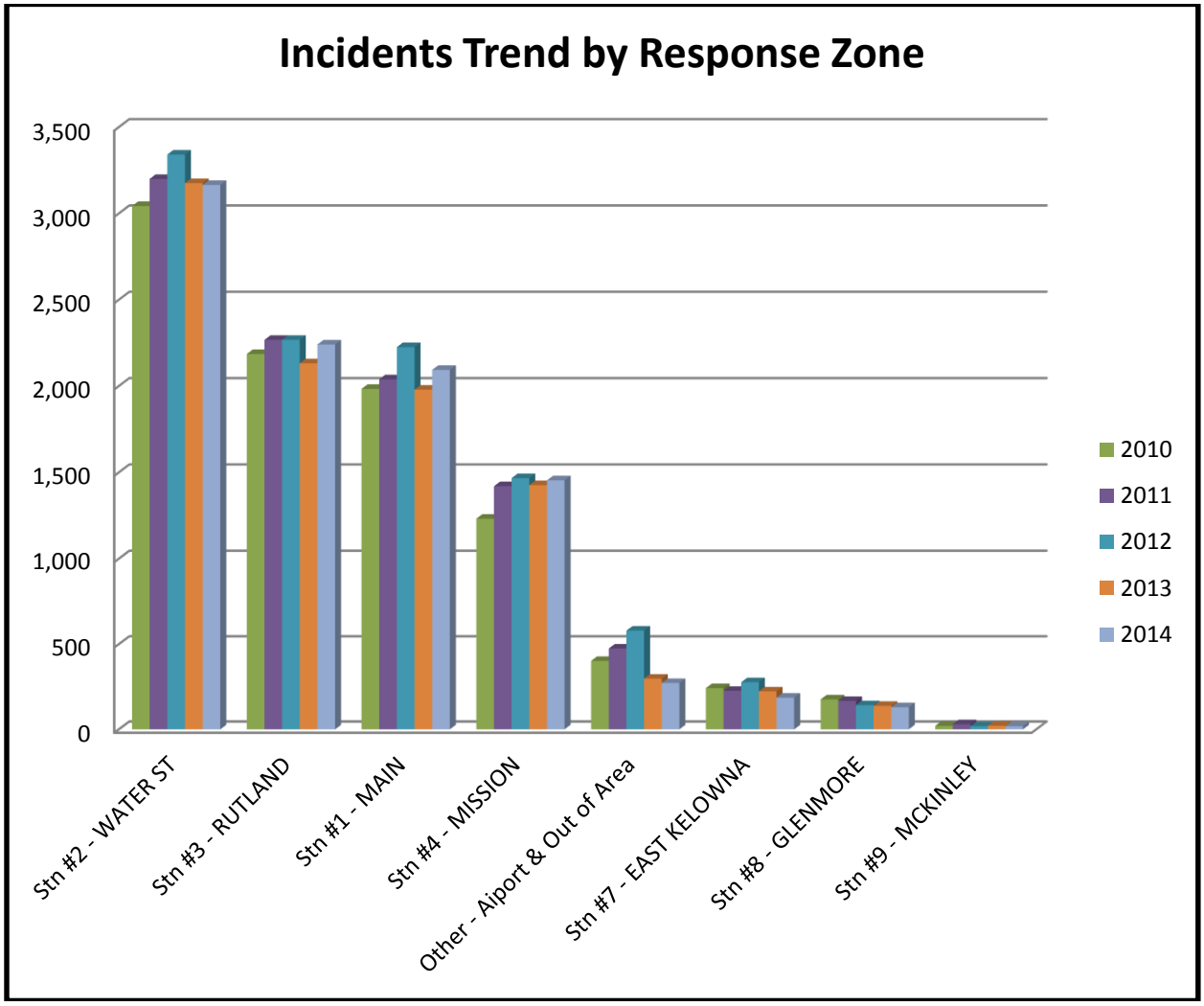
Assessment Factor 6

In comparison to similar sized cities, KFD has the highest call volume, the second lowest ratio of career Firefighters per capita and the third highest population.

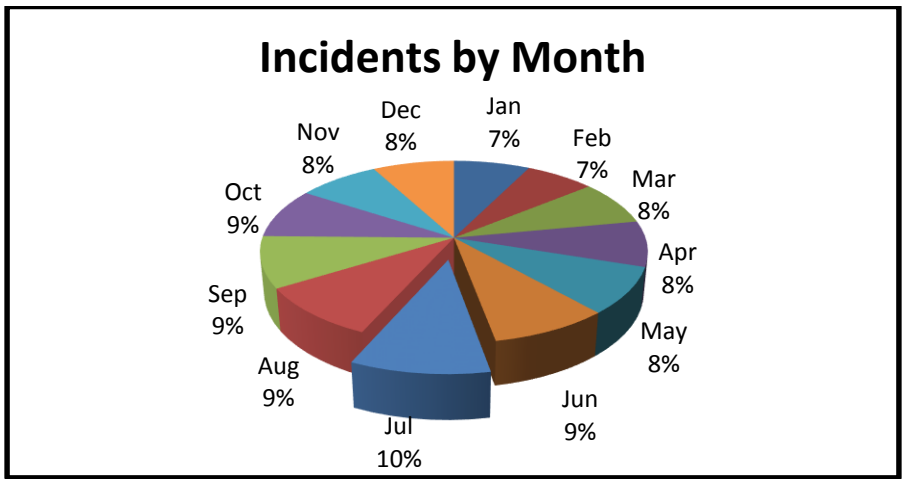
5.7 RESPONSE STATISTICS

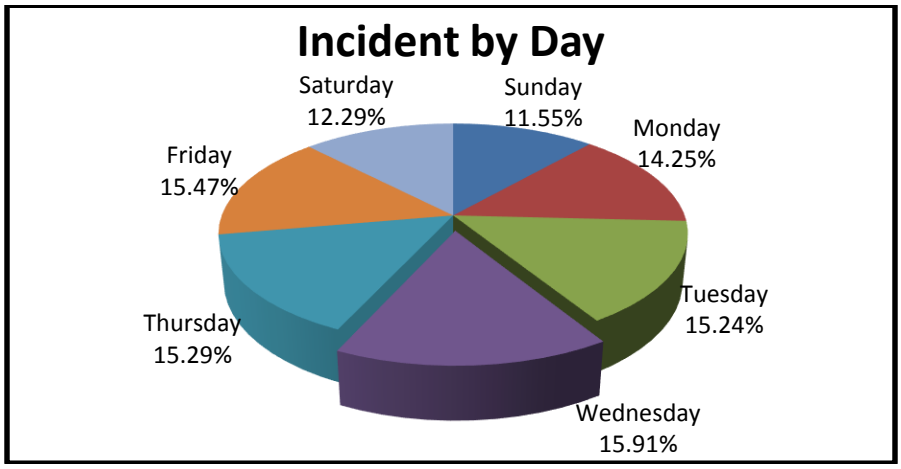
The requests for services have been consistent over the past 5 years with a peak volume occurring in 2012 at just over 10,300 calls resulting in an average of 9,676 incidents per year. It is anticipated that request for service calls will increase as the population and development increases.

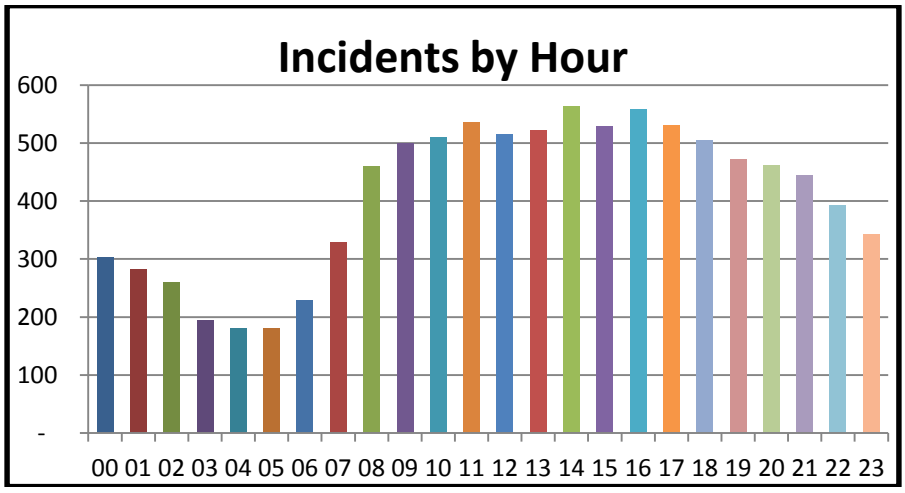
The chart below shows how busy each station has been over the last 5 years. Station 2 is the busiest station with a 5-year average of 3,185 responses annually. The next busiest Station is station 3 with a 5-year average of 2,200 annual responses, ranking above 3 other cities in the comparison above.



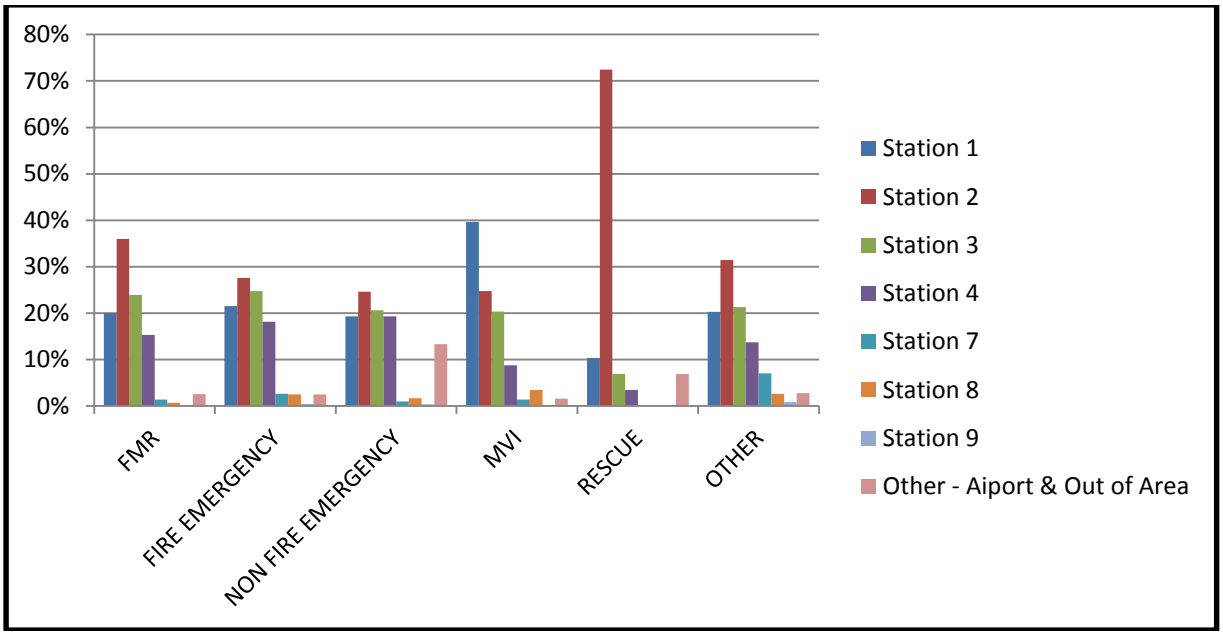
The 3 charts below provide an analysis of the response volumes; by month, by day and by hours in a day:



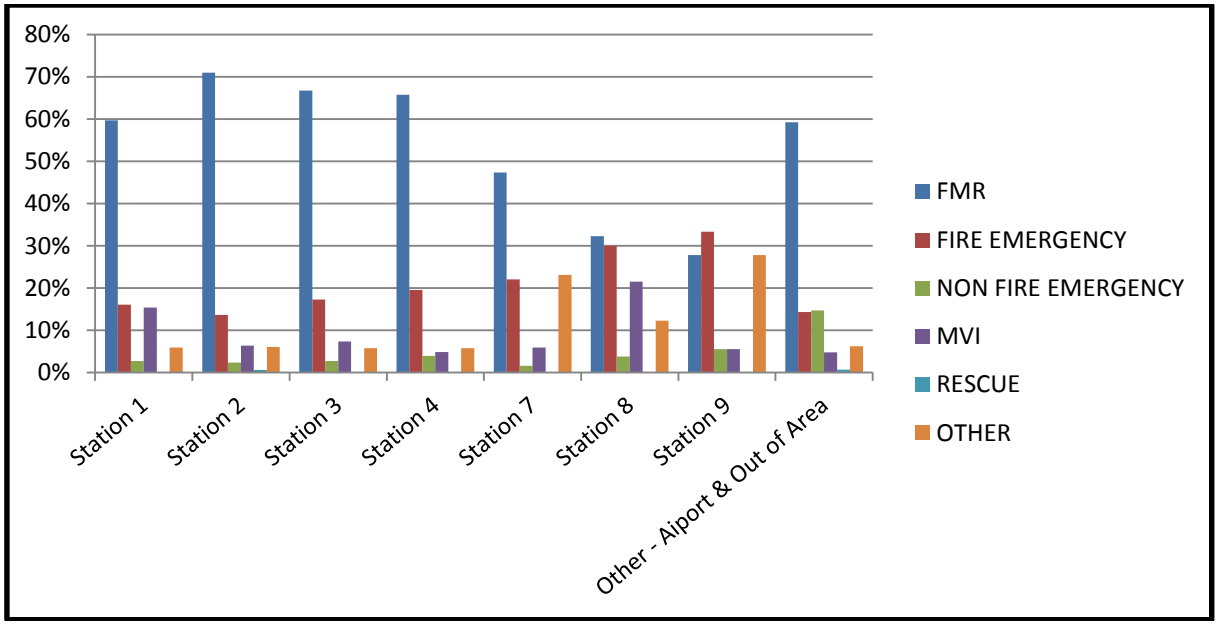




The chart below illustrates how 6 basic incident types are dispersed throughout KFDs service area for a typical year such as 2014. The chart gives a percentage for the incident type in each basic response zone. For example, over 72% of rescues take place in area 2 (downtown) as most are marine rescues. These statistics also help confirm resource assignments in terms of distribution and concentration. For example, this data confirms the necessity to locate the Rescue truck at Station 1 as approximately 40% of the MVIs occur in area 1 (Enterprise).



The chart below illustrates how each station's call volume was represented within the 6 basic incident types in 2014.



Over the past 5 years, KFD has experienced an average dollar loss of $11.9 million the highest categories being $5.76 million loss in multi-family residential occupancies and $2.39 million loss in single family homes, vehicles and outdoor fires (non-inspectable). This data coupled with the previous graph helps KFD identify fire loss trends and areas of concentration to focus fire prevention initiatives, public education and emergency response target options for deployment of firefighting resources.

The 5-year dollar loss by occupancy type city wide is detailed below.

Table 3: 5 Year Dollar Loss by Occupancy

Dollar Loss YTD	2010	%	2011	%	2012	%	2013	%	2014	%
Total Dollar Loss	$12,400,000	100.00%	$17,800,000	100.00%	$5,900,000	100.00%	$19,100,000	100.00%	$4,300,000	100.00%
Assembly	$16,250	0.13%	$38,800	0.22%	$338,200	5.78%	$66,860	0.35%	$0	0.00%
Institutional	$200	0.00%	$3,100	0.02%	$4,200	0.07%	$1,000	0.01%	$0	0.00%
Multi - Residential	$840,250	6.77%	$11,279,740	63.40%	$1,045,150	17.85%	$15,225,200	79.32%	$437,550	10.18%
Single Family Residential*	$1,046,820	8.43%	$2,214,680	12.45%	$3,920,120	66.97%	$3,034,420	15.81%	$1,713,900	39.86%
Commercial	$399,000	3.21%	$1,816,100	10.21%	$5,000	0.09%	$15,000	0.08%	$500	0.01%
Mercantile	$44,500	0.36%	$2,139,500	12.03%	$157,550	2.69%	$3,600	0.02%	$0	0.00%
Industry (High Hazard)	$5,000,000	40.26%	$0	0.00%	$0	0.00%	$704,000	3.67%	$5,000	0.12%
Industry (Medium Hazard)	$5,073,200	40.85%	$291,500	1.64%	$383,700	6.55%	$69,220	0.36%	$2,132,000	49.58%
Industry (Low Hazard)	$0	0.00%	$8,000	0.04%	$0	0.00%	$75,000	0.39%	$0	0.00%

**Includes Vehicle & Outdoor Fires*

Assessment Factor 7

Distribution and concentration of KFD resources will be based upon mitigating fire related death, injury and dollar loss trends.

5.8 SERVICE EFFECTIVENESS

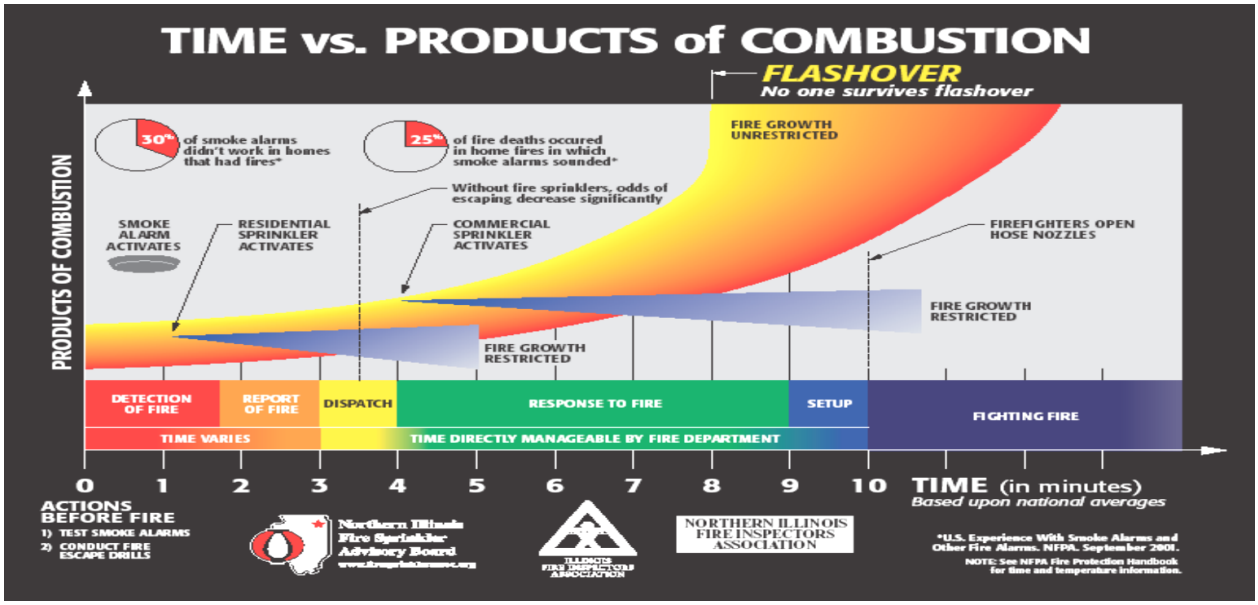
The components of service effectiveness are comprised of response time sequence, the ERF, industry standards, staffing of emergency response vehicles, MDS and critical tasks. For clarity the ERF is the minimum number of personnel that are required to manage an event and is necessary to minimize the loss of life and property as well as maintaining firefighter safety. The MDS is the total career staff on duty. For example, the ERF for a residential house fire is 16 Firefighters whereas the MDS is 19 Firefighters on duty. The following section will discuss these components.

To effectively respond to an identified risk, it is necessary to have an understanding of what types of equipment and numbers of properly trained personnel are needed to mitigate each risk category for each service provided. This is accomplished through a critical task analysis process.

Firefighter safety is the first priority at any incident or when delivering any type of service. The deployment of the appropriate number of firefighters increases the

effectiveness of those firefighters in completing tasks and will maximize the safety of all responding personnel. The responsibilities of the 'first-in' apparatus and those of the initial deployment apparatus identified in the critical tasking analysis are defined as the ERF.

Response Time Sequence: Effective response time with adequate resources is necessary to limit threat to life, property and the environment. The intent of an effective and timely response is to act on the fire prior to flashover where the all the room's contents have heated to their ignition point where the fire grows exponentially as illustrated below.



In a fire's timeline, KFD has influence on the amount of time it takes to receive and process a response and, on the amount time it takes to receive and process a call from the public reporting a fire and, the time necessary to alert firefighters. The NFPA 1221 standard time to process the emergency call is 95% of calls are answered in 15 seconds and 90% of calls are processed in 60 seconds. KFD Dispatch Centre is able to meet these standards.

The next component that KFD has influence over is the amount of time it takes firefighters to get ready and respond to the alarm. This is referred to as "turn out time". The NFPA 1710 industry benchmark for turn out time is 60 seconds for medical responses and 80 seconds for fire responses. While the NPFA turnout time standard is recognized throughout the fire service industry it is a standard that is not readily met due to several factors such as:

- Station layout
- Personnel location in Station
- Personal Protective Equipment (PPE) Requirements
- Length of dispatch message

- Time of day
- Speed of Rip and Run
- Activity at time of call
- Apparatus deployment

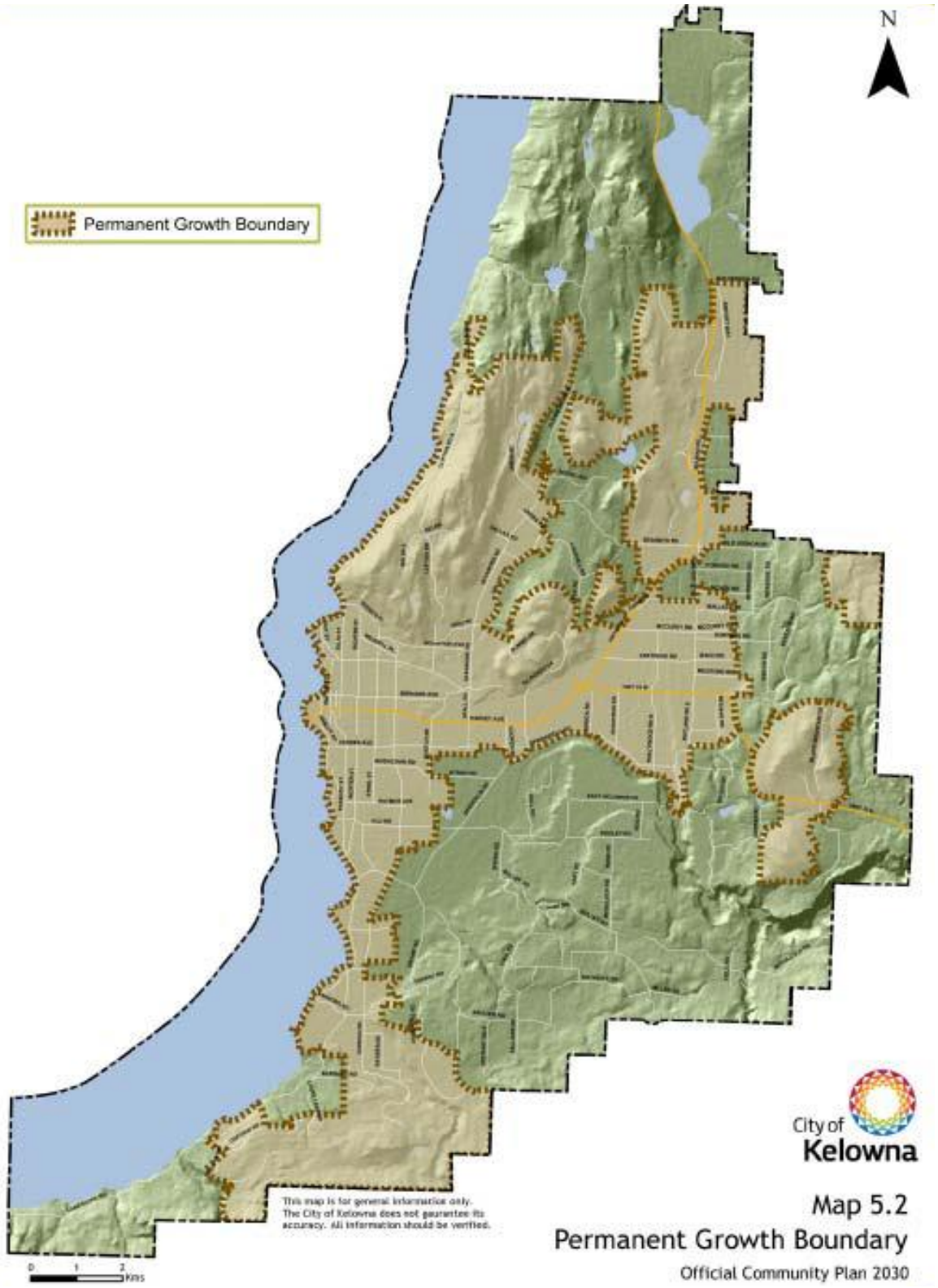
In 2014, KFD conducted several time trials to determine if it was possible to lower the turn out times for both medical and fire responses. Variables tested were Station wear (uniforms); as well as a pre alert system to 911 emergency calls. The Pre Alert system is an audible alert over the existing intercom system that notifies firefighters that a call is being created for their station. After considerable live trials, it was determined that station wear made a marginal difference compared to a pre alert system. The pre alert system was disclosed to the Information Services (IS) department to see if it could further build on the program for all Stations.

Additionally, emergency intervention for medical incidents is just as imperative. The sooner Cardio Pulmonary Resuscitation (CPR) and defibrillator protocol begins, the better the patient's chance of survival. A victim's chance of surviving cardiac arrest is highest when CPR is initiated within 5 minutes of the heart stopping and defibrillation within 10 minutes. KFD's participation in the FMR program is done so without the requirement for additional staff or response vehicles. FMR is provided within the fire suppression response system's existing capacity.

Travel Time: Travel time to emergency calls is directly related to the concentration and distribution of resources of Stations, staff and equipment, and geographic coverage. The NFPA 1710 standard for a single family dwelling fire is 4 minutes 90% of the time for the first unit to be on scene. Travel time is based on departure from the Station to arrival on scene of the incident. Response time is travel time plus the turnout time. This report will focus on response times as the performance targets measurement.

While NFPA standards provide timelines, apparatus deployment and staffing on various emergency types, the KFD has administratively adopted local specific goals for response time and resource allocation depending upon the type and severity of the event. Within the PGB the goal is to have the first truck response time arriving within 7:40 minutes 90% of the time of being dispatched for all emergency types. For areas outside of the PGB, the deployment is the same with the first truck arriving within 11:40 minutes 90% of the time of being dispatched.

The map on the next page depicts the City boundaries for the PGB. It is important to note that the 5-year average indicates that 93% of all calls for service that KFD receives are within the PGB.


N
Permanent Growth Boundary
This map is for general information only.
The City of Kelowna does not guarantee its
accuracy. All information should be verified.
0 1 2
Kms
City of
Kelowna
Map 5.2
Permanent Growth Boundary
Official Community Plan 2030

Assessment Factor 8

Emergency response performance target options will be realistically related to effective response time for initial assignment (first emergency vehicle on scene).

5.9 FIRE COMPANY SIZE

A fire company is defined as the team of firefighters assigned to a fire apparatus. An April 2010 report issued by the National Institute of Standards and Technology identifies 5 as the optimum number of firefighters for an Engine for most effective operations over 22 critical fire ground tasks at a typical single 2000 square foot family residential fire.

As previously indicated, the WBC[1] regulations stipulate that if firefighters enter a structure fire's hazardous atmosphere, a minimum of 2 Firefighters must be together and there must be at least one firefighter outside to run communications during the event. This does not include the operator of the fire pump who is integral to ensuring that the interior attack team has water to combat the fire and protect themselves. Essentially, this means that the first arriving Engine is not legally able to perform entry into any structure fire to attack the fire or perform a rescue until 4 Firefighters are on the scene. The standard goes on to state that within 10 minutes of entry, an additional 2 member RIT must be available standing by outside to perform a firefighter rescue or the 2-member interior team must exit and abandon interior operations. It should also be noted that no specific tasks that would interfere or delay RIT deployment can be assigned to the RIT team members. Their sole purpose on scene is for firefighter safety and rescue if required.

In 2000, the City Council made the decision to establish 4 firefighter Engine companies based upon the WCB Legislation. This required an increase in staffing of 16 Firefighters. In 2013 the City Council reviewed the 4 firefighter Engine company as part of the 2012-2022 KFD Draft Strategic Plan review. At that time Council supported the continuation of the 4 firefighter Engine company.

The KFD Standard Operational Guideline (SOG) for resource deployment to a fire in a single family residence is based on the WorkSafe legislation and fire industry guideline for residential fires. These identify a minimum ERF of 16 Firefighters is required to perform critical tasks at this type of emergency incident. The composition of the ERF of 16 includes a Safety Officer that is one of the KFD TOs. During normal dayshift work hours, they respond to fire responses. After day shift hours' responses requires the recall of an off duty TO and they may or may not be available.

[1] WorkSafe BC 31.23 Entry Into Buildings

These tasks include:

- Command and Control
- Scene Safety
- Search and Rescue
- RIT
- Fire Attack
- Water Supply
- Pump Operations
- Ventilation

The following section provides basic information on the department's emergency response services, the general resource capability, and the KFD staff resources for that service.

5.10 EMERGENCY RESPONSE SERVICES SUMMARY

The current KFD deployment system has been analysed to determine the 90 percentile and table 4 below indicates the average performance response time inside and outside the PGB:

Table 4: Average Performance Inside & Outside the PGB

Inside PGB 90 Percentile	Outside PGB 90 Percentile	Service Gaps
9:31	14:30	**Inside PGB:** Glenmore/UBCO/YLW area and Lakeshore/Pandosy/Gordon for call volume or risk **Outside PGB:** McKinley, and north Glenmore and contracted area

The following tables depict the MDS, resource assignments and staffing configuration;

Table 5: MDS and Resource Table

Service	General Resource/ Asset Capability	Basic Staffing Capability/ Shift
Fire Suppression	4- 4 member staffed Engines 1- 2 member staffed Squad *(cross staffed Ladder/ Rescue/Tender/Bush/Gator)* 1 Platoon Captain 1 Safety Officer *(day shift or recalled off duty)* **Additional cross staffed equipment:** 1 Ladder Truck 2 Bush Trucks 2 Water Tenders 1 Fire Boat 1 UTV Gator POC Units 3 POC Engines 2 Back up Pumpers 1 Back up Rescue 1 Bush Truck	19 MDS Suppression minimum staffing (24/7) Call back Career staff 45 POC members

Staffing Distribution:
The table below depicts the staffing configuration/ranks and MDS:

Table 6: Staffing Configuration/Ranks & MDS

Career Suppression Staff:	Number	Minimum on Duty	POC Suppression Staff:
Platoon Captains	4	1	All ranks are on call 24/7 and utilized on as required basis in accordance within the Alarm Assignment Guideline. Current staffing levels as indicated below:
Captains	16	4	
Lieutenants	4	1	
Firefighters	72	13	
TOTAL	**96**	**19**	
Station 7 (SEK)			22
Station 8 (Glenmore)			17
Station 9 (McKinley)			6
July 2015 TOTAL			**45**

5.11 CURRENT STAFFING AND CRITICAL TASKING

The KFD service area has a wide variety of challenges from the densely populated urban areas with risks associated with high rise residential and commercial/industrial buildings to the unique challenges of the rural areas in wildland interface fires and back country type rescues. By evaluating the risk potential to firefighters, people, the environment and basic infrastructure, KFD has developed a standard operating procedure for all types of incidents. This guideline enables a systematic method to elevate the resource deployment and call back staff (*off duty career and POC*) to assist at large events or to provide geographic coverage for the City.

At the beginning of 2015, a time based assessment on the call back of off duty career staff took place. The purpose was to determine the average time for a fire Engine to be fully staffed to the operation requirement from call back. For entry into a building in the event a second fire incident occurring while on duty staff were initiating suppression activities at the original emergency, the required number of Firefighters is 4. On average from the call back logs analyzed, the average time to assemble a complete fire suppression crew was 20.05 minutes per occurrence at Station 1.

It must be emphasized that KFD's current on duty staffing has the critical task capability to handle one single family residential fire provided it has not extended beyond the structure of origin. Any larger event such as multiple structures, commercial or industrial fires, wildland fires, HAZMAT or technical rescue requirements would overwhelm the on-duty contingent requiring the back filling of reserve apparatus with off duty staff on OT and POCs.

Fire service critical tasks are those tasks that are essential to perform at fire and emergency scenes in order to provide an efficient and effective response to any kind of incident in an appropriate time. A critical task analysis of the various common types of responses including time line and specific operational tasks is provided at Appendix B.

The following tables overviews the alarms assignment guideline and staffing for the common types of responses:

Alarm Incidents:

Table 7: Wildland Fire minor (1st alarm)

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	For example: a fire in short grass/low angle terrain/manageable area
Bush truck	1	1-2	
POC in 7,8,9	1		
ERF	3	6+ POCs	

Table 8: Wildland Fire (2nd alarm)

Unit Type	Number of units	Total Personnel	Notes
Engines	2	8	Heavy wildland fuel areas/steeper slope/structure proximity
Bush truck	1	1	POC in 1,7,8,9
Water Tender	1	1	DC notified
Safety Officer	1	1	Career call backs to re-staff Station(s)
Dispatcher		1	Dispatcher called back
Incident Commander	1	1	
ERF	6	13+ POCs	Career call back to incident

Table 9: Wildland Fire major (3rd alarm)

Unit Type	Number of units	Total Personnel	Notes
Engines	2	8	Heavy wildland fuel areas/steeper slope/structure proximity
Bush Truck	4	4	POC in 7,8,9
Water Tender	1 or 2	2	
Safety Officer	1	1	Career call backs to re-staff Station(s) and incident
Dispatcher		1	Dispatcher called back
Incident Commander	1	1	Deputy Chief notification
Station 1 POCs			
Deputy Chief	1	1	
ERF	11	18+ POCs	

Table 10: Single Family Residential

Unit Type	Number of units	Total Personnel	Notes
Engines	3	12	Career call backs to re-staff Station(s)
Squad	1	2	
Safety Officer	1	1	
Incident Commander	1	1	Deputy Chief notification
POC in 7,8,9	1		
ERF	7	16	

Table 11: Multi Family Residential/ Commercial/ Industrial Fire

Unit Type	Number of units	Total Personnel	Notes
Engines	4	16	Career call backs
Squad (Ladder)	1 or 2	2	To re-staff station(s) and incident
Safety Officer	1	1	POC
Incident Commander	1	1	Career call backs
Deputy Chief	1	1	Deputy Chief respond to scene
Firefighter call back		As required	
ERF	9+	21+	

Table 12: HAZMAT minor (1st alarm)

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	For example: small fuel spill from vehicle
ERF	1	4	

Table 13: HAZMAT (2nd alarm)

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	Career call backs to re-staff Station(s)
HazMat truck	2	1	
Safety Officer	1	1	POC in 7,8,9
Incident Commander	1	1	Deputy Chief notification
HazMat Team		6	On duty Hazmat team assembles
ERF	5	13	

Table 14: HAZMAT (3rd alarm)

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	Career call backs
HazMat truck	2	1	To re-staff station(s)
Safety Officer	1	1	POC in 7,8,9
Incident Commander	1	1	
HazMat Team		6	On duty Hazmat team assembles
HazMat technicians called back	0	As required by Incident Command	

Dispatcher		1	Dispatcher called back
Deputy Chief	1	1	Deputy Chief responds to scene
ERF	6	15+	Assembles

Table 15: Motor Vehicle Accident with Extrication

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	
Rescue truck	1	2	
POC in 7,8,9	1		
ERF	3	6+ POCs	

Table 16: Alarm activation by automatic system

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	
POC in 7,8,9	1		
Add: 2nd Engine and Command unit for high life occupancies	1	5	Additional units respond to places such as schools and rest homes.
ERF	1+	4+ POCs	

Table 17: First Medical Response

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	Stn 2,3,4
Squad in area 1,7,8,9	1	2	Stn 1,7,8,9
POC in 7,9	1		
ERF	2	4+ POCs	

Table 18: Technical Rescue

Unit Type	Number of units	Total Personnel	Notes
Engines	1	4	Patient contact/medical aid
Technical Rescue Team	1 or 2	6	TRT assembles
			Career call backs to re-staff station(s) and to the incident
ERF	2/3	10	Deputy Chief notification

Table 19: Aircraft Incident (2nd alarm)

Unit Type	Number of units	Total Personnel	Notes
KFD Engines	2	8	
KFD Rescue truck	1	2	
KFD Incident Commander	1	1	
KFD Deputy Chief	1	1	
KFD Safety Officer	1	1	ERF = 13 KFD staff
YLW Airport Crash Trucks	2	4	
YLW Duty Manager		1	
YLW Fire Chief and Asst. Chief		2	ERF = 7 YLW staff
Effective Response Force			

**Other agencies such as RCMP and BCAS also respond as per their internal protocols.*

Table 20: Aircraft Incident (3rd alarm)

Unit Type	Number of units	Total Personnel	Notes
KFD Engines	2	8	
KFD Rescue truck	1	2	
KFD Incident Commander	1	1	
KFD Deputy Chief	1	1	Responds to scene
KFD Safety Officer	1	1	
KFD Water Tender	1	1	ERF = 14KFD staff
YLW Airport Crash Trucks	2	4	
YLW Duty Manager		1	
YLW Fire Chief and Asst. Chief		2	ERF = 6 YLW staff
Mutual Aid Engines	2	4+	
Mutual Aid Water Tenders	1	2+	ERF = 6+ Mutual Aid staff

**Other agencies such as RCMP and BCAS also respond as per their internal protocols*

5.12 ALARM ASSIGNMENT SYSTEM

The minimum staff on scene must be 4 Firefighters to make entry into a burning structure and to carry out suppression, search and rescue, and overhaul. These initial 4 Firefighters are committed to the following critical tasks:

- 2 are designated as an attack team
- 1 is designated as a Pump Operator
- 1 is designated to outside communications

While Fire Departments across North America utilize NFPA 1710 as a staffing model, it is based on response times, firefighting personnel, apparatus staffing and several

other factors. KFD utilizes an alarm assignment guideline to best meet these operational and regulatory requirements.

To summarize, for a typical single family residential fire, the alarm assignment utilizes 16 of the available 19 career staff on duty. All 16, which includes the Training Officer assembled at the scene play a significant role in rescue and suppression and would be classified as a second alarm. A call back system is in place to staff an additional fire Engine with 4 Firefighters leaving a total of 8 Firefighters to cover the remaining city areas.

For a general alarm assignment, all 19 on duty Firefighters would respond to the incident and call back of all off duty career would be initiated to respond to the scene. The POC Firefighters would then be called to report to their respective stations for geographic coverage or if necessary respond to major events and support the career operation.

5.13 PAID ON CALL FIREFIGHTERS

The POC system is complicated with defined limitations in mid-sized cities such as Kelowna. There must be a balance between training hours and responses otherwise POC members become overwhelmed and do not stay. They need to be assigned to a station that is close to their respective residence or place of work. Even though some employers may grant time away from work, others do not. While some of the POCs have the goal to secure a career position; others simply just want to give back to their community.

KFD's challenges with recruitment and retention of POCs are not unique. Volunteer services across Canada are experiencing similar issues. The 44% turnover rate in 7 years is typical amongst the 5 departments surveyed. The fact is, approximately 40% of POCs are seeking career opportunities either with Kelowna, neighbouring communities and/or other cities. The continued turnover of POC's resulting in additional budgetary pressures for KFD is further exacerbated by the new training standards (*OFC Playbook*). The recurring costs include basic recruit training with costs for the trainer, recruitment, and PPE as well as certification costs.

Notwithstanding the above, it must be emphasized that the POC contingent is a valued component of the emergency response system in Kelowna and are a cost efficient support service for KFD.

In 2015, the KFD completed city wide recruitment for POC members for all 3 POC Stations. In an effort to staff Station 7 with a higher number due to call volume and the inability to staff a fire truck completely for fire calls and medical calls, the recruitment only yielded 4 candidates. Station 8 yielded 5 candidates and Station 9 yielded zero applicants. While overall the city received over 60 applicants, many did not live within the catchment area required to be effective in the delivery of service in the response areas.

It should be noted that while the POC members are dedicated and highly regarded members of the KFD, there is no way of being able to predict the number of members that are available to respond to an emergency. In some occurrences there has been no POC response to calls within the City. POC members are an integral part of the KFD resource deployment however depending upon the time of day, weekday, month, etc., there is no guarantee of responder attendance.

The role of the POC members based out of the McKinley, SEK and Glenmore Stations are as part of the initial response to all incidents in the rural area due to the greater response time and to support career operations in the PGB. All POC response areas are responded to by career staffed Stations.

To date, there is a shortfall of POC Firefighters stationed in McKinley with 6 members currently active.

Assessment Factor 9

Emergency response performance target options will include:

- Minimum staffing of Engines to remain at 4 Firefighters
- Role and limitations of the POC system
- KFD current ERF is limited to mitigating a single event low to moderate risk situations.
- High and Maximum risk events will require additional resources above the ERF and may include external agencies and/or mutual aid from neighboring communities.

6. SECTION 6 GAP ANALYSIS AND OPTIONS

Across Canada, all levels of government are facing strong demands for cost reduction and increased value in the delivery of services. Politicians and government executives are relentlessly looking for strategies that balance public expectations, and deliver valued services/programs, while maintaining fiscal restraint amidst global, international, national and local economic realities. This environment has resulted in the need for Fire Chiefs to adopt a more private sector businesslike approach to leading/managing their respective fire service. They must be proactive and along with the Chief Administration Officer (CAO) examine all aspects of the service delivery systems to look for innovative efficiencies and effectiveness. In essence run the fire service as a business. This requires a shift from the typical caretaker approach of maintaining the current systems to a predominate focus on creating the future that is responsive to change, and is sustainable and efficient.

This section will discuss service delivery gaps and/or additional assessment factors as a result of the data and analysis previously introduced in this report. The development of options or recommendations will be supported by evidence based

considerations with the overarching goals to position KFD as an innovative, efficient and effective fire service.

6.1 SUMMARY OF ASSESSMENT FACTOR

Throughout the report several Assessment Factors have been identified that will have direct impact on the development of meaningful performance targets. The following is a summary of the key assessment factors:

1. Emergency response performance targets will be evidence based data with consideration for the City footprint; residential construction types; Interface risks (wild-land/forest fire risks), rate of growth and demographics; Industrial/commercial activities; transportation systems and growth in traffic volumes and available water flows for firefighting.

2. Emergency response performance target options will be developed by applying geographic coverage and dynamic deployment and risk based responses as efficiency and operational effectiveness measures.

3. PM/DDS will provide the evidence based data to develop emergency response targets.

4. Emergency response performance targets will ensure compliance with Provincial safety and training standards legislation.

5. To enhance operational effectiveness and efficiency, life cycle replacement Engines will be tendered as multi-purpose Engine Rescues. The existing fleet will be examined to determine if a retrofit is possible to create the multi-purpose capability.

6. In comparison to similar sized cities, KFD has the highest call volume, the second lowest ratio of career firefighters per capita and the third highest population.

7. Distribution and concentration of KFD resources will be based upon mitigating fire related death, injury and dollar loss trends.

8. Emergency response performance targets must be realistically related to effective response time for initial assignment (first emergency vehicle on scene.

9. Emergency response performance target options will include:

    - Minimum staffing of Engines to remain at 4 Firefighters
    - Role and limitations of the POC system
    - KFD current ERF is limited to mitigating a single event low to moderate risk situations.
    - High and Maximum risk events will require additional resources above the ERF and may include external agencies and/or mutual aid from neighboring communities.

6.2 FIRE UNDERWRITERS SURVEY 2012

In 2012, the KFD contracted the services of SCM Risk Management Services Inc. to evaluate the community's fire protection programs referred to as a Fire Underwriters Survey (FUS). The purpose of the assessment was to determine whether the community's current fire insurance grading classifications are representative of the fire protection programs and fire protection resources that are currently in place within the community. The report used over 34,000 points of Required Fire Flow (RFF) data to grade the community by KFD response zones. RFF may be described as the amount and rate of water application and fire company response, required in firefighting to confine and control the fires possible in a building.

The FUS credits are another layer of data that KFD used to evaluate current distribution and concentration of resources and identify gaps in service by response zone. The results of the 2012 FUS grading for the "Distribution of Fire Companies" is detailed below. This is a highly weighted portion of the FUS grading as it identifies the actual response available to each building in the community. RFF calculation is completed for each building and the resultant response is read from the FUS Table of Effective Response (See Appendix 'C'). The actual response to the building is then measured against what is actually available using GIS analysis and a percentage credit is applied to the response area. This means that the higher the credit received for a response area, the more KFD is theoretically prepared to combat a fire in the response area (note: this grading does not consider wildland fire threat).

Table 21: FUS Distribution of Fire Companies

Urban Centers (OCP)	KFD Response Zone(s)	FUS Credit Received
City Center	(2-1-4)	78.5%
Midtown (West)	(1-2-3)	53%
Midtown (East)	(1-3-2)	97.5%
South Pandosy	(2-4-1)	25.5%
Capri/ Landmark Center	(2-1-4)	78.5%
Rutland	(3-1-2)	38.5%
Village Centers (OCP)	KFD Response Zone(s)	FUS Credit Received
South Gordon	(4-1-2)	6.5%
University South	(3-1-2)	38.5%
Glenmore (suburban)	(1-8-2)	32%
Guisachan	(2-1-4)	78.5%
Black Mountain	(3-1-2)	38.5%

Other Areas	KFD Response Zone(s)	FUS Credit Received
SEK	(7-1-4) (7-1-3)	45.75%
McKinley	(9-1-2)	65%
Industrial area bordering Lake Country	(71-1-3)	0%
Airport(aviation/non-aviation)	ARFF + (3-1-2)	0%

NOTE: KFD response zones are correlated as near as possible to identified OCP urban and village centers.

The results of the FUS indicated that the Glenmore/UBCO/YLW and South Pandosy/Gordon response zones received the lower FUS credits. To reduce KFD's gap in emergency service delivery a number of data sources was reviewed including:

- Historical response data
- FUS credit ratings
- FUS RFF value weightings
- Home insurance coverage rankings
- Wildland interface risk assessment
- Impending land development and population growth

Addition of Station 5

The FUS report consultants were requested to include a hypothetical score for the Glenmore/ UBCO area with the completion of John Hindle Drive, extension of Curtis Road and the addition of Station 5 located at the intersection of John Hindle Drive and Glenmore Road. The results improved from a credit rating from the mid 30% to as high as 74%. In addition, the RCMP as part of their Community Crime Reduction Strategy and Police Zone response concept are looking for a facility in the Glenmore area. Construction of the new Station 5 should consider future opportunities to share space with other city services such as the RCMP Community Policing, similar to Station 3.

It must be noted that utilization of the existing Station 8 in Glenmore and Curtis road as a primary response route was considered in this plan. In light of the City's and Agricultural Land Commission decision dated 22 November 2011 (appendix F) that the current Station 8 site would be reclaimed as Agricultural Land Reserve (ALR) and that Curtis Road is a private road, this option is not deemed feasible to address the service gap.

From this analysis, it is recommended:

RECOMMENDATION 1

That the City identifies an appropriately zoned parcel of land for the construction and career staffing of a new Station (#5) in North Glenmore at or near the intersection of Glenmore Rd and John Hindle Dr. (near or inside the #3 Area Structure Plan).

Addition of Station 6

The FUS report consultants where also requested to include a hypothetical score for the South Pandosy/Gordon/ Benvoulin area. The addition of Station 6 near the intersection of Gordon Drive and KLO Road would improve the credit rating from 6.5% to as high as 61.5%. It is important to note that this additional station is not anticipated until after 2025. Building Services has included the construction of Station 6 in the 2030 Capital Infrastructure Plan. In the interim, the preferred option identified in this report includes a dynamic deployment and risk based response system in this area until such time as the additional station is required. This is discussed in more detail in Section 6.6 of this report.

6.3 TURN OUT TIME ANALYSIS

As discussed in Section 45.2, turn out time is a segment of the response sequence where firefighters are alerted, don their PPE and move to the response units. This segment ends when the response unit moves out of the station. The NFPA 1710 industry benchmark for turn out time is 1 minute for medical responses and 1:20 minutes for fire responses. In 2014, KFD conducted several time trials to determine if KFD could lower the times that were identified on both medical and fire responses with no significant improvement. Given this, and that the comparative fire departments surveyed as part of this study also could not meet the NFPA standard, KFD will establish a turnout time performance target that can be realistically achieved. The monthly dashboard report that measures this segment indicates that for both fire and medical responses the turnout times are consistently exceeded by approximately 50 seconds (medical = 1:39 minute, fire = 1:56 minutes).

RECOMMENDATION 2

KFD will set a performance target to achieve an average turnout time of 1:40 minutes for fire responses and 1:20 minutes for medical responses. Ongoing system reviews will be conducted for continuous improvement of turnout times.

6.4 STATION ANALYSIS

The location of Stations in any community is a long term decision that involves a significant number of factors. This includes the changing role of the fire service, the risk assessment factors identified in Section 6.1 of this report and the level of service the City can afford. These factors all apply to the City. Seven of the current KFD stations have remained in their original location, though in many cases they have

been modernized since their original commissioning. In the forty years since the last career station was built, the population of Kelowna has increased by 250%, going from 50,000 in 1975 to an estimated 124,000 in 2015.

The question becomes at what point are additional stations added due to growth and development, and increased risks? Growth in population may be a starting point in determining the requirement for additional stations. Density is one of several factors that need to be considered.
The City amalgamated the surrounding areas of Cedar Creek, Glenmore, Rutland, Benvoulin, SEK and Mission in 1973 which brought small neighbourhood "communities" into the city. Each of these smaller communities had already established fire services with the stations located within their respective boundaries. With the exception of Benvoulin and Cedar Creek the existing stations are used today as the KFD distribution infrastructure. It must be noted that the station locations are not optimum and result in response time challenges. This factor has been identified in the previous KFD strategic plan studies. For this reason, the emergency response time target options will include geographical coverage as a key factor. Using PM/DDS there are geographic service gaps currently in the northern the City limits. The PM/DDSS computer generated maps number 1; (Section 6.5.1) illustrates where KFD is currently achieving the 7:20 minute goal by the highlighted green area and where the gaps are identified in red. Map number 2; (Section 6.5.1) depicts the performance target enhancement if a Station 5 was to be constructed and staffed with career Firefighters.

It is important to note that the data is compared to the response times predicted by PM/DDS and there is a significant congruence with all the previous studies. This serves to validate the previous studies completed on KFD's capabilities.

6.5 PM/DDS AND STATISTICAL ANALYSIS

As previously discussed the two PM/DDS modules currently in use at KFD have provided actual response data to address two basic questions to assess future operational needs for KFD;

1. What has been happening in terms of call volumes, types of emergencies and response system performance?

2. What if the distribution and concentration of resources was enhanced to meet gaps in service coverage?

The analytics provided by PM/DDS result in a plethora of options in the development of performance targets. The concentration and distribution of KFD resources will apply, geographic, dynamic deployment and risk based responses. Several proportions of risk and geographic coverage percentages were analyzed along with various response time targets. Given the City risk factors identified in Section 6.1 of this report the analysis in this report will focus on geographic and incident volume.

RECOMMENDATION 3

KFD will base the preferred PM/DDS analysis on geographic coverage along with incident volume (risk based responses).

Additionally, PM/DDS provides the opportunity to apply various response time increments ranging from the NFPA recommended 5:20 minutes and the current KFD 90th percentile of 9:31 for PGB and 14:30 for the rural area (note these include the turnout time increment).

While somewhat subjective, the cumulative consideration of the Assessment Factors identified in this report, comparison with similar sized communities, industry standards and legislation, previous KFD studies and KFD's current capabilities were applied in the development of a preferred travel time performance target. The overarching goal is to provide the optimum level of service that result in a cost efficient and operationally effective travel time target.

RECOMMENDATION 4

KFD will establish performance targets for response times within the PGB to have the first fire truck arriving (dispatch to on scene time) within 7:40 minutes 90% of the time of being dispatched for all emergency types. For areas outside of the PGB, the deployment is the same with the first fire truck arriving within 11:40 minutes 90% of the time of being dispatched to arriving on scene.

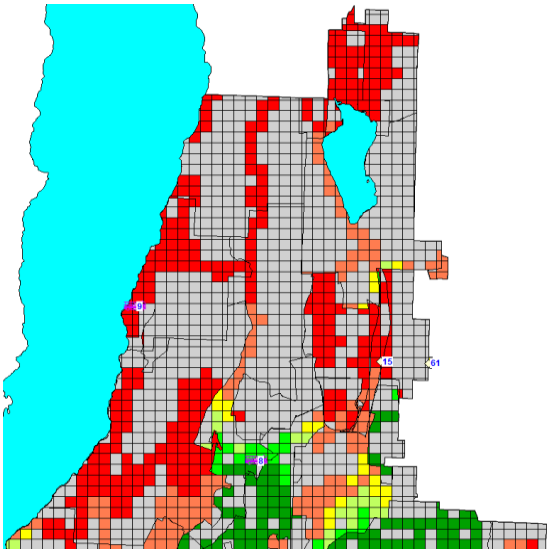
It must be noted that PM/DDS can apply any coverage/risk proportions or time increments in the development of performance target criteria. In general terms, shorter response time equates to more stations/firefighters, long response times creates service delivery and safety challenges for the public and firefighters, higher percentages in call volumes equate to geographic coverage gaps and vice versa.

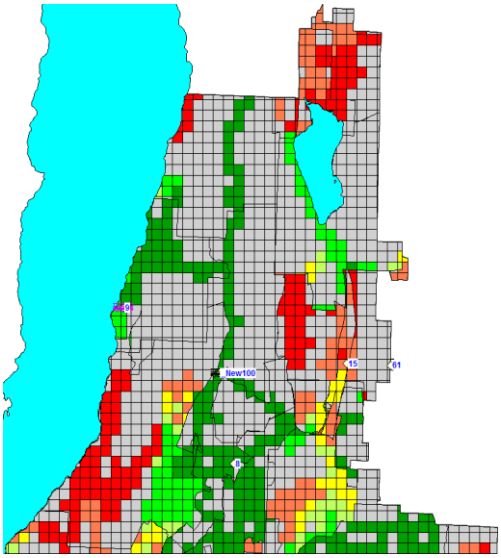
Using PM/DDS analytics the illustrations below have been recreated from using actual historical response data. The first illustration shows our current coverage within the City and the second illustration shows how the addition of Station 5 in the Glenmore area would enhance fire response within the City. It must be noted that a single station not only services the response zone it is located in but also responds to all areas within the City for additional resources due to the nature of the call.

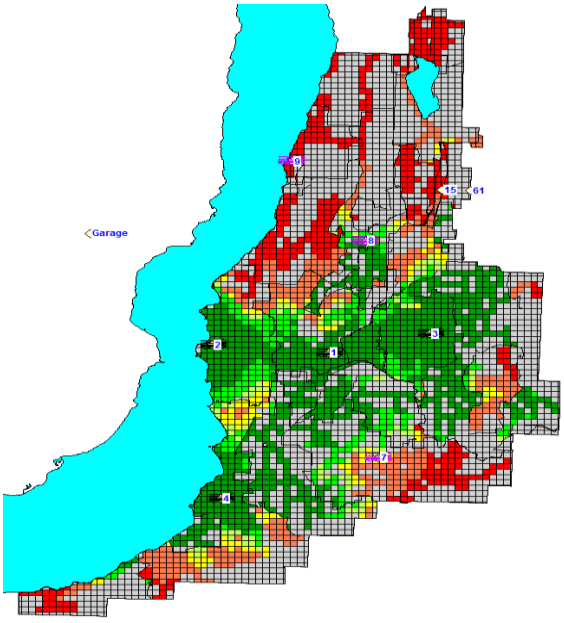
In addition, the recommended performance targets have been developed by SMEs considering all the relevant factors identified in this report. The 7:20 response target within the PGB places Kelowna in the middle of the fire departments surveyed for this report which ranged from 6 to 8 minutes.

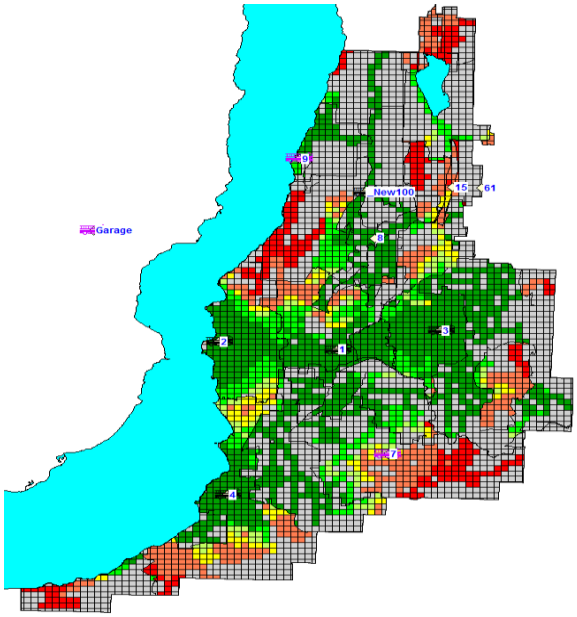
6.5.1 PM/DDS Response System Maps

The maps on page 85, illustrate the current geographic coverage (Map 1) and the 7:40 response time based on geography and incidents after the new adding Station 5 (Map 2).









Map 1 Current System

Map 2 Addition of Station 5

First Career Engine Dispatch to Onscene Average Performance

- Inside Over 10:10, Outside Over 14:10
- Inside 08:10 To 10:10, Outside 12:10 To 14:10
- Inside 07:40 To 08:10, Outside 11:40 To 12:10
- Inside 07:10 To 07:40, Outside 11:10 To 11:40
- Inside 06:10 To 07:10, Outside 10:10 To 11:10
- Inside Under 06:10, Outside Under 10:10
- No Access

6.6 RESOURCE DEPLOYMENT MODEL & STAFFING OPTIONS

The analysis contained in this report indicates there are two underserved areas within the City (Glenmore/UBC/YLW and KLO/Gordon/Pandosy). The assessed risk tolerance requires the increase of career stations from 4 to 5 as soon as possible. This will address the service gap in the Glenmore/UBC/YLW area. The KLO/Gordon/Pandosy area will be served through the use of dynamic deployment and risk based responses until such time as a 6th station is required. This assertion is based upon the City risk and Assessment Factors and other relevant considerations identified in this report. This analysis is consistent with the previous four studies (Section 1.5) conducted on KFD and the service delivery gaps within the PGB for the initial response in the Glenmore/UBCO/YLW and KLO/Gordon/Pandosy areas. The PM/DDS evidence based analysis serves to substantiate these previous studies through leading technology.

RECOMMENDATION 5

The City will increase the KFD resource deployment capacity to 5 career stations. This will require the construction of a new station in the Glenmore/UBC/YLW area, the addition of 20 firefighters and a replacement Engine and bush truck.

The preferred implementation would be to renovate Station 8 in Glenmore as an interim facility until the new Station 5 is completed and hire 20 firefighters in 2017. Understanding the need for financial constraint incremental staffing has been identified as follows:

Table 22 Incremental staffing options

Staffing Options	2017	2018	2019	2020	Comments
Option A	12		8	New Station 5 completed	Addresses geographic and risk coverage in Glenmore/UBC/YLW area. The ability of Station 1 to mobilize the 2 Firefighter Rescue units for risk and dynamic deployments particularly in the KLO/Gordon/Pandosy areas is delayed until 2019.
Option B	8	4	8	New Station 5 completed	Provides partial geographic coverage and risk in Glenmore/UBC/YLW area. May require increased overtime or reduced service levels depending upon available staffing. The ability of Station 1 to mobilize the 2 Firefighter Rescue unit for risk and dynamic deployments particularly in the KLO/Gordon/Pandosy areas is delayed until 2019.

It is important to note that KFD, as part of the annual business plan and budget process will review the response system performance utilizing PM/DDS. This is not only to monitor performance target progress but to look for further opportunities to increase efficiencies and operational effectiveness.

6.6.1 Comparison: Status Quo – Recommended Station 5

The following section provides a more in-depth comparison of the recommended Station 5 – Glenmore/UBCO/YLW Area - Convergent Support Model with the current traditional centralized support model.

Recommended: Station 5 – Glenmore/UBCO/YLW Area - Convergent Support Model

Response Capacity: 5 career stations, 5 Engine companies, Rescue unit of 2 Firefighters and 3 POC Stations.

The need for Station 5, as a replacement for the current Station 8, has been identified previously in 4 studies and has been most recently confirmed through the use of PM/DDS Analytics. As the area continues to develop, Engine companies from Stations 1 and 2 are facing increasing travel times, reducing effective response while also removing critical assets from some of the City's busiest areas, particularly Station 2's downtown coverage area.

Station 5 will require the addition of 20 new Firefighters, resulting in a fifth career Engine company within the City. This Engine company will continue to be supported by the other career stations and the POCs in the Glenmore and McKinley areas, but will considerably reduce response times for incidents in those areas.

It is understood that construction of Station 5 will not be complete by 2017; therefore the units will be temporarily based out of Station 8 until the new Station 5 is complete. In reviewing the analytics and the need to address an underserved area (Glenmore/UBCO/YLW), the Engine company will be committed to geographic coverage the majority of the time during the day time period where the call volume is historically higher.

The MDS will increase to 23. The addition of another Engine company will aid in convergent support to Station 1. In addition, OT and call backs will be reduced significantly by an estimated $125,000 with the increased response capacity to support the City during larger incidents or incidents that commit resources for extended periods such as Marine Rescue and the majority of single family residential fires.

With the additional staffing, a more dynamic deployment approach to resource deployment will be achieved.

As part of this model, the Rescue unit would be available for dynamic deployment and risk based responses. The primary focus will be coverage for the KLO/Pandosy area and response to lower risk calls as identified by PM/DDS.

The operational costs including incremental staffing options is in the range of $3.1 million per year over the next 14 years. Staffing option B is on average $38,000 less per year than option A over the same 14-year period.

Advantages:

- Incremental implementation that reduces overall interim costs as compared to full staffing and addresses existing service gap without delay.
- Allows for much of the flexibility with deferred costs through incremental staffing.
- Demonstrates efficiencies and effectiveness on an ongoing basis.
- Risk model can be adjusted and is based upon, and validated by scientific data.
- Does not result in a degradation of current service levels and will improve overall efficiencies by redistributing/redeployment of existing resources.
- Deletion/revision of DLC contracted fire suppression service resulting in a potential savings of approximately $280,000 in 2017.
- Enhances response service level for McKinley area.
- Fire Engines at the outer perimeter of all quadrants of the response zones allowing a convergent response from the perimeter.
- Delays the need for Station 6 through risk based responses and dynamic deployments once full implementation has occurred.

Disadvantages:

- Until full implementation of the new Station 5 is completed utilization of dynamic deployment and risk based responses is not possible. This may result in extended response time for the KLO/Pandosy area. Once the Rescue unit is re-established at Station 1, the dynamic deployment coverage for this area will be possible.
- Rescue/Engine is deployed beyond the core area for an interim period.

Current Traditional Centralized Support Model

Response Capacity: 4 career Stations, 4 Engine Companies, and Rescue Unit of 2 Firefighters and 3 POC Stations. The current MDS is 19. POC staffing is 45.

The current traditional model utilizes Station 1 staff to provide support to each of the other Engine Companies located at Stations 2, 3 and 4 along with responses in the 3 POC Stations 7, 8 and 9. Station 1 is staffed with a 4 firefighter Engine Company and a 2 Firefighter Rescue unit.

The Rescue unit provides all FMR responses within Station 1, 7, 8 & 9 areas. POC Stations 7 and 9 co-respond when available for FMRs in their respective areas.

Advantages:

- Cost containment is achieved as there is no increase in service, staff, Stations or equipment.
- Increased use of dynamic deployment with the Rescue unit to support other stations, including potential to use smaller more mobile vehicles in responding to medical calls.
- POCs remain a viable and critical support resource.

Disadvantages:

- Does not address identified risks in growing areas, most notably Glenmore/UBCO/YLW and the KLO/Pandosy area.
- Maintains the traditional service delivery system that is based upon geographic coverage only and considered to be inefficient.
- Degradation in service delivery is inevitable due to population and construction growth.
- Requires callback of off duty staff for Marine Rescue calls and single family structure fires.
- POC attendance cannot be relied upon depending upon the time of day etc.
- Response times do not align with risk assessment, preferred performance target, or comparative communities.

Below is a comparison table that evaluates the current traditional centralized support model with the recommended Station 5 – Glenmore/UBCO/YLW Area - Convergent Support Model:

Table 23: Strategic Goals Comparison Table

Strategic Goals: Criteria	Current traditional centralized support model	Recommended 5 – Glenmore/UBCO/YLW Area - Convergent Support Model
Risk based levels of service for all areas of the City	No: 2 areas with identified service gaps KLO/Pandosy and Glenmore/UBCO/YLW areas	Yes: addresses identified service gaps with full implementation. Service gap in KLO/Pandosy area not addressed until full staffing of station 5 and then dynamic deployment will be utilized until Station 6 is required.
Innovative and Non-traditional	Traditional geographic coverage deployment model	Non-traditional, innovative convergent model. Using PM/DDS technology dynamic and risk based responses integrated with geographic coverage

Realistic and achievable performance targets	None formally established. Current response system is 9:31 minutes inside PGB, 14:30 minutes outside PGB. Well beyond comparative communities, industry guidelines and leading practices. Increase risks for public, firefighters and property loss	Yes: based upon PM/DDS analytics response system targets will be: 7:40 minutes in 90% inside PGB, 11:40 minutes outside PGB
Alignment with Corporate goals and objectives	No: Shortfall in Corporate Framework & Plan • A well run City • A safe City	Yes: achieves performance excellence through continuous improvement Provides rapid fire emergency response throughout the City
Establishes accountability measures	No: Performance targets not monitored corporately at this time. Current system capacity if adopted can be monitored.	Yes: Performance target objectives will be continuously monitored for achievement or adjustment
Optional implementation based upon priorities	Not applicable	Yes: part of Corporate annual budget approval process

Summary

Station 5 is critical given the growth and densification in the Glenmore/UBCO/YLW area and the increase in size of the University. The construction of the new station, which will replace the current Station 8 has been the focus of numerous reports and now has been also supported through the use of PM/DDS analytics. Although growth is occurring in many areas, KFD is committed to maintaining service levels through efficient use of resources, utilizing dynamic deployment and risk based responses within a new convergent support model.

The Station 5 incremental staffing approach provides a way of deferring a portion of the ongoing operational costs for 2 years, which will closely coincide with the construction of the new Station by 2020. While full staffing of the existing Station 8 (as an interim) until the completion of the new Station 5 is preferred, KFD recognizes the need for constraint and is recommending an incremental approach. KFD supported by modern analytics, the repositioning of the new station and the addition of a staffed Engine/Rescue company will allow the department to enhance the current service levels towards the achievement of recommended performance targets. The use of PM/DDS provides an evidence based approach to address the KLO/Gordon/Pandosy call volume risk by utilizing alternative deployment methods and delaying a new Station 6 until risk and call volume indicates otherwise.

The department will also continue to recognize the value of community driven POC members to support the rural areas. KFD continues to be committed to considering ways of reducing or constraining costs. Additional efforts are being made to move

towards smaller, fuel efficient vehicles for calls such as medical or non-emergency public service.

The projected response time system performance based upon PM/DDS analytics will be as follows:

Glenmore/UBCO/YLW

Inside PGB 90 Percentile	Outside PGB 90 Percentile	Service Gaps	Challenges
7:40 minutes	11:40 minutes	Until 2019 service gaps will remain in the Glenmore area, and the KLO/Gordon/Pandosy area.	Planned growth in the Glenmore area will increase the risk over the interim period when Station 5 is operational.

KLO/Gordon/Pandosy

Inside PGB 90 Percentile	Outside PGB 90 Percentile	Service Gaps	Challenges
7:40 minutes	11:40 minutes	KLO/Gordon/Pandosy area will be managed by dynamic deployment from Station 1	While not a recommended option for station construction or staffing at this time, the KLO Pandosy Corridor should be monitored for increasing incidents and service gap shortfalls as the number of incidents rise utilizing PM/DDS

6.7 FIRST MEDICAL RESPONSE/EMERGENCY MEDICAL RESPONSE

The primary objective of the FMR program is to improve the continuity of patient care provided throughout the Province for pre-hospital emergencies. By recognizing that police and fire.

The KFD has provided the FMR service since 1989 and today makes up about 66% of the total response call volume. As previously indicated the FMR service is delivered within KFD's basic fire and rescue response capacity requiring no additional staff or emergency vehicles. The costs for the City to participate in the FMR program are incremental for items such as medical supplies, vehicle maintenance, fuel, and occasional OT when responses extend beyond shift change. In 2014 the incremental costs were approximately $72,300 and ongoing participation in the program was

approved by the City Council in 2011 as a low cost, high valued service for the citizens of Kelowna. An analysis conducted in 2014 identified the lives of 10 citizens saved by the KFD and the FMR program.
The revision of the BCAS Resource Allocation Plan (RAP) in 2013 that downgraded a number of code 3 responses (lights and sirens on immediate responses) has resulted in delayed responses. These occurrences have been well documented throughout BC including the City. Several BC fire departments (including KFD) have continued to respond to the RAP downgraded code 3 calls in an effort to provide the best possible care for their citizens. In Delta, the Fire Department has enhanced their service level to EMR as a method to enhance pre-hospital care and resolve a perceived service deficiency within BCAS. This move has prompted legal action by BCAS and an ongoing political debate amongst many BC Municipalities. KFD will continue to monitor the trends throughout the Province regarding the FMR program or other related service enhancements.

6.8 CONTRACTED AREA LAKE COUNTRY

Since 1997, the City has contracted fire suppression services (including FMR) to the DLC for the northern area of the City Limits. The area covered under this contract includes commercial, industrial and includes approximately 900 living units in modular homes and recreational vehicles on the Okanagan Indian Band (OKIB) Reserve and entirely outside the PGB. The primary response for emergencies occurring in the contracted area is the Lake Country Volunteer Fire Department (LCVFD). Response statistics indicate an average response time of 12:37 minutes. Over the last 3 years the total call volume was 412 responses of which 312 were FMR calls to the OKIB Reserve. In this same period of time there were 5 structure fires. Due to the dated contract/agreement not including any performance measures or service levels, a complete review and audit is required to determine if this arrangement is the most efficient and effective way to deliver fire suppression services. The City pays the DLC approximately $280,000 to provide fire protection and FMR services to this area of the City. In addition, KFD will conduct an analysis utilizing PM/DDS to determine if a KFD response from the existing Station 3 or from the proposed new Station 5 in Glenmore would be operationally adequate rather than contracting LCVFD.

RECOMMENDATION 6

That KFD and the City conduct a complete review and audit of the contracted area fire suppression service with the view to establish performance measures for DLC or alternatively determine if KFD can provide an equivalent level of service within the current or proposed performance targets recommendations contained in this report.

6.9 FIRE PREVENTION STAFFING

As mentioned earlier in this report, KFD dedicates ¾ of a fire inspector's hours to public education, leaving ¼ of his/her time to conduct fire inspections. This member coordinates KFD public education events and liaises with numerous public service and community groups to deliver fire safety. KFD has made great headway in the area of

public education by partially dedicating a staff member to coordinate and deliver this task. The department has seen the demand and opportunity for public fire education grow each year. Another fire inspector dedicates half of their time to conducting pre-fire planning of critical buildings and facilities. In order to keep pace with the demand and opportunity to deliver public education and the increase workload of fire inspections and pre-fire planning, an additional fire inspector will be requested in 2018. This will enable the Fire Prevention Branch to reorganize and dedicate 1 Full Time Employee (FTE) to public education and pre-fire planning.

RECOMMENDATION 7

KFD will monitor the need for 1 additional Fire Inspector. This position would be dedicated to the public education and pre fire planning functions.

6.10 TRAINING & FACILITY

The flashover simulator (built in 2008) and burn building (built 2014) training props located at the landfill have proven to be invaluable tools in training firefighters. These facilities provide safe, controlled hands-on fire attack that would cost KFD $65,000 annually on facility rental and wages since training can be conducted on duty rather than sending staff to the North Okanagan Regional District's burn facility in Vernon.

KFD currently conducts this live fire training within the day to day operations of the landfill and although it is a good location and is well accommodated by the landfill staff and management, the surrounding area in not an ideal environment since it is close to the public with limited access and uneven ground surface that puts extra wear and tear on equipment. When the burn props were constructed at the landfill, it was understood between KFD and the Landfill staff that the props were portable and able to be moved as required. The challenge, however is that these props are located in close proximity to one of the few hydrants on the site. As operations increase at the Landfill the burn building and flashover simulated will need to be moved. There are several similar sized fire departments in BC that have training centers. They include cities such as Abbotsford, Kamloops, Nanaimo, Salmon Arm and Vernon (RDNO).

There are 2 options for the future of the burn props at the landfill:

Option 1 (Status Quo): Continue to train on the props as they are currently and move them as operations at the landfill dictate. KFD's day to day operations would continue as normal and fire companies relocated if necessary to cover the city while staff are at the training ground.

Option 2 (Permanent Training Facility): Ideally, KFD would have a permanent designated area of 2-3 acres of the property that was fenced for safety and where training props could be located on asphalt and have a fire hydrant close by. It is advantageous to have the training facility in close proximity to a future station to

enable staff to train but remain in the heart of their response zone and continue to be available for service if needed. The future fire training center would have classroom and shower/ locker room facilities for staff. With a training facility as described, there is opportunity to recover some of the operational costs by renting out the training facilities and contracting out the training. Before any recommendation from staff, a separate viability study on contracting out the facility and services and to evaluate the opportunity to increase the Training Branch staff by producing income from renting out the training facility to local agencies.

RECOMMENDATION 8

That the opportunity to incorporate a dedicated training center as a potential source of revenue to be included in the planning and funding of the future Station 5.

6.11 FIRE DISPATCH SERVICES

In 2011, the City capitalized on an opportunity to expand fire dispatch service to the RDOS, creating a new revenue stream and demonstrating the ability for dispatch to successfully expand its business model. This expansion, combined with an innovative approach to new business that now includes bylaw, law enforcement, alarm monitoring and after hour call outs. In addition, dispatchers also support additional duties such as:

- Response map updating
- Hydrant database maintenance
- Fire alarm monitoring database maintenance
- EOC activation requests and ESS notification

The result of these expansions has been an increase in marketable skills and proven capacity, with dispatch providing high levels of customer support in a manner that meets each customer's unique needs.

Currently, the dispatch centre is managed by KFD, with all assets owned by the City. RDCO provides core funding based on a quarterly remittance. This funding covers dispatcher staff time, training and equipment. The City contributes support to the centre as "in-kind" in regards to human resources, IS, management oversight (*KFD Deputy Chief*) and location (*no costs are associated with housing the centre*).

In February of 2014, staff were directed to work with RDCO on a partnership model to better reflect the relationship of the centre to the region overall. It is well recognised the value the centre provides to local responders. This has been demonstrated numerous times, especially during EOC activations to support our local communities in response to wildland interface fires, where communication between site and the EOC is helped during the critical initial phase of activation.

Under a new partnership model, the centre will realize a number of benefits most important of which is the longer term stability of a regional model, equally cost shared by all partners. This will need to recognise all costs of the dispatch centre, including those currently provided "in-kind" by the City. Further, the process of evaluating the partnership model and the financial needs of the service have identified a lack of capital planning, and under the new model, it would be proposed that an appropriate Capital and Operational Reserve be established to ensure the centre maintains reasonable technology and equipment needed to provide the agreed upon service levels.

Although independent dispatch centres may not initially be the lowest cost service delivery model, there are two important considerations to make. First is the functional and operational value of a local dispatch centre, especially given the nature and risks of wildland interface fires and a growing community. Second, the professional standards, high level of customer service and experienced staff will allow the centre to be marketed to new customers, all of which will serve to begin offsetting the costs to each partner, while allowing for potential improvements to staffing levels and equipment. Our current contracts for fire dispatch with RDOS and other specialized services such as alarm monitoring, after hours contact and law enforcement are already set to reduce costs to the partners.

Moving forward the goal will be to market the centre to other areas of the province and other potential customers of a 24/7 dispatch centre, including non-fire related agencies. The costs of these services will need to be established within a competitive environment that reflects our actual costs of service provision, but are based on developing a volume of business that allows the partnership to benefit financially.

The immediate short term goal for the centre will be the formalization of the partnership model through a formal agreement with the RDCO, including a transparent financial model that reflects true costs and includes an appropriate Capital and Operational Reserve Program.

Moving forward, it is recommended that the centre aggressively look for new business opportunities, with a lens for innovation that looks beyond traditional fire dispatch. This growth will need to be methodical and considered to allow for stable levels of service provision, accurate staffing levels and managed financial accountability.

RECOMMENDATION 9

That KFD continue to further market dispatch services to both traditional and non-traditional clients, with a focus on managing current costs to the City, while maintaining or enhancing critical service levels.

6.12 COSTS AND BUDGETING SUMMARY

Life Cycle Capital Program and Vehicle Equipment Reserve

KFD has been working closely with Financial Services in addressing Fire Equipment Replacement Reserve financing requirements. In the 2016 regular budget supplement process, KFD will be requesting an increase in the Fire Equipment Capital Reserve appropriation by $100,000 per year up until the year 2019. The current base appropriation to reserve is $400,000 annually. This will increase the reserve appropriation to an annual amount of $800,000 per year thereafter. Based on this amount KFD will have sufficient capital reserves to meet the long-term life cycle requirements for the fleet.

On an annual basis, KFD will conduct a review of Fire Equipment Capital Reserve by working with Financial Services and Fleet Services to ensure the contributions are adequate and that the replacement planning is meeting operational requirements. Condition surveys on all KFD units will determine if the life cycle can be altered to create cost efficiencies with the Fire Equipment Capital Reserve Plan.

Below are a summary of costs and savings that will occur by implementing the recommendations as presented in this report. A Fire Equipment Capital Reserve Plan showing the replacement schedule for apparatus is shown in Appendix D along with a complete cost estimate schedule of this Strategic Plan up to 2030 for option A and B.

Cost Comparison – Incremental Staffing Options A and B

The cost of implementing option B based on a 14-year average is $3,070,000 per year. Furthermore, the first year cost of option B is $108,124; taking into account any offsetting reductions that will occur. If option A was to be implemented instead of option B, it would cost $38,000 more per year over the same 14-year period.

Station 5 Building Costs

The final capital costing of a new station, apparatus and equipment, and land acquisition has been estimated in a rough order of magnitude to be $9.1 million. More precise estimates will be determined within the City Infrastructure and Community Planning Departments along with KFD input.

Station 5 Apparatus

An increase in responding apparatus will be required for the newly constructed Station 5. This will include a replacement Engine and new Bush truck with applicable equipment costing approximately $1,148,000:

Engine 5	$828,000
Bush 5	$150,000
Equipment - Engine 5 & Bush 5	$170,000
Total	$1,148,000

Station 8 Renovation Costs

In order to accommodate career staff in the interim and before Station 5 is completed, Station 8 would need to undergo some renovations in the range of $40,000. In addition, additional space will be required and the preferred option is a temporary trailer. The lease of this trailer is estimated to be $27,000 for 4 years. The total interim costs are estimated to be $67,000:

Station 8 Renovations	$40,000
Temporary Trailer Rental Fees (4 Years)	$27,000
Station 8 Costs	$67,000

Potential Cost Reductions

KFD has analyzed its current processes and has been able to identify a potential for some annual cost savings. By eliminating the DLC contract, reducing staff call backs and implementing some POC cost saving measures, KFD would be able to save a total of $420,000 annually.

Reduction of DLC Contract Area	$280,000
Reduction of Call Backs	$125,000
POC Deployment	$15,000
Total Cost Savings	$420,000

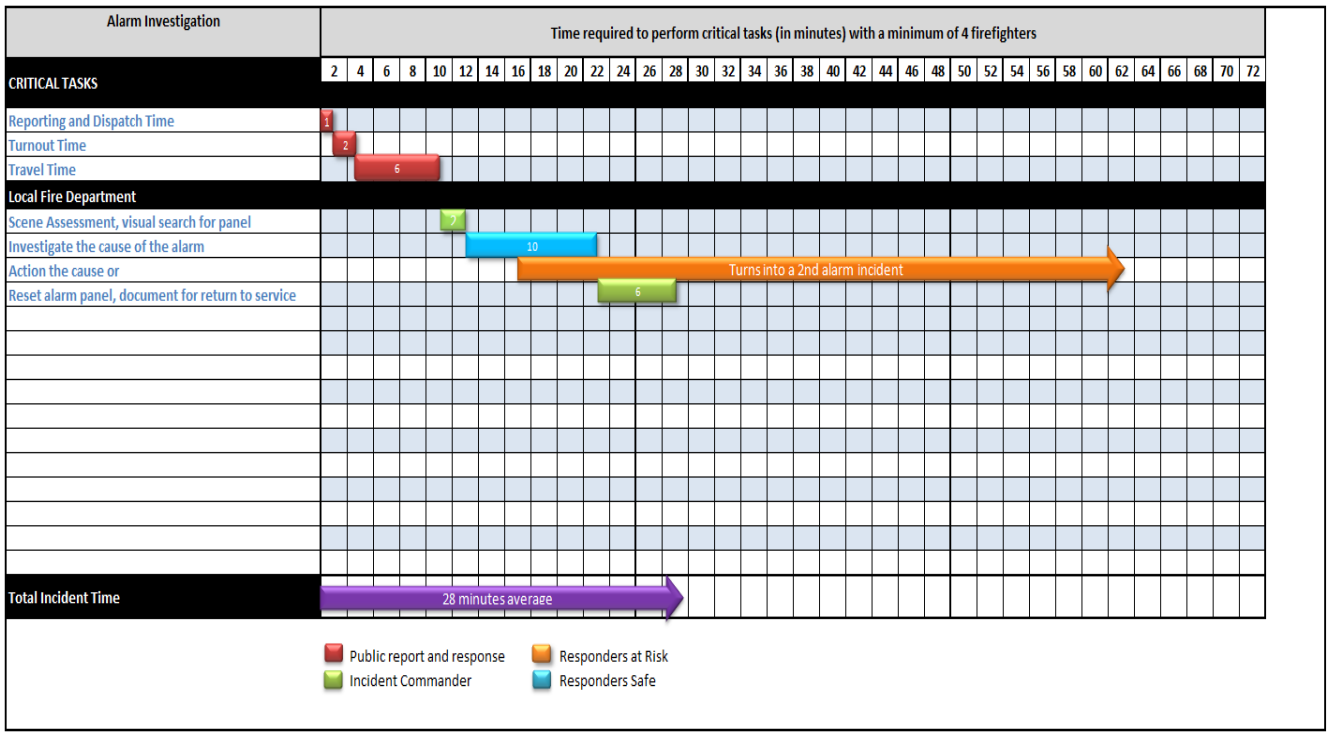
7. SECTION 7 SUMMARY

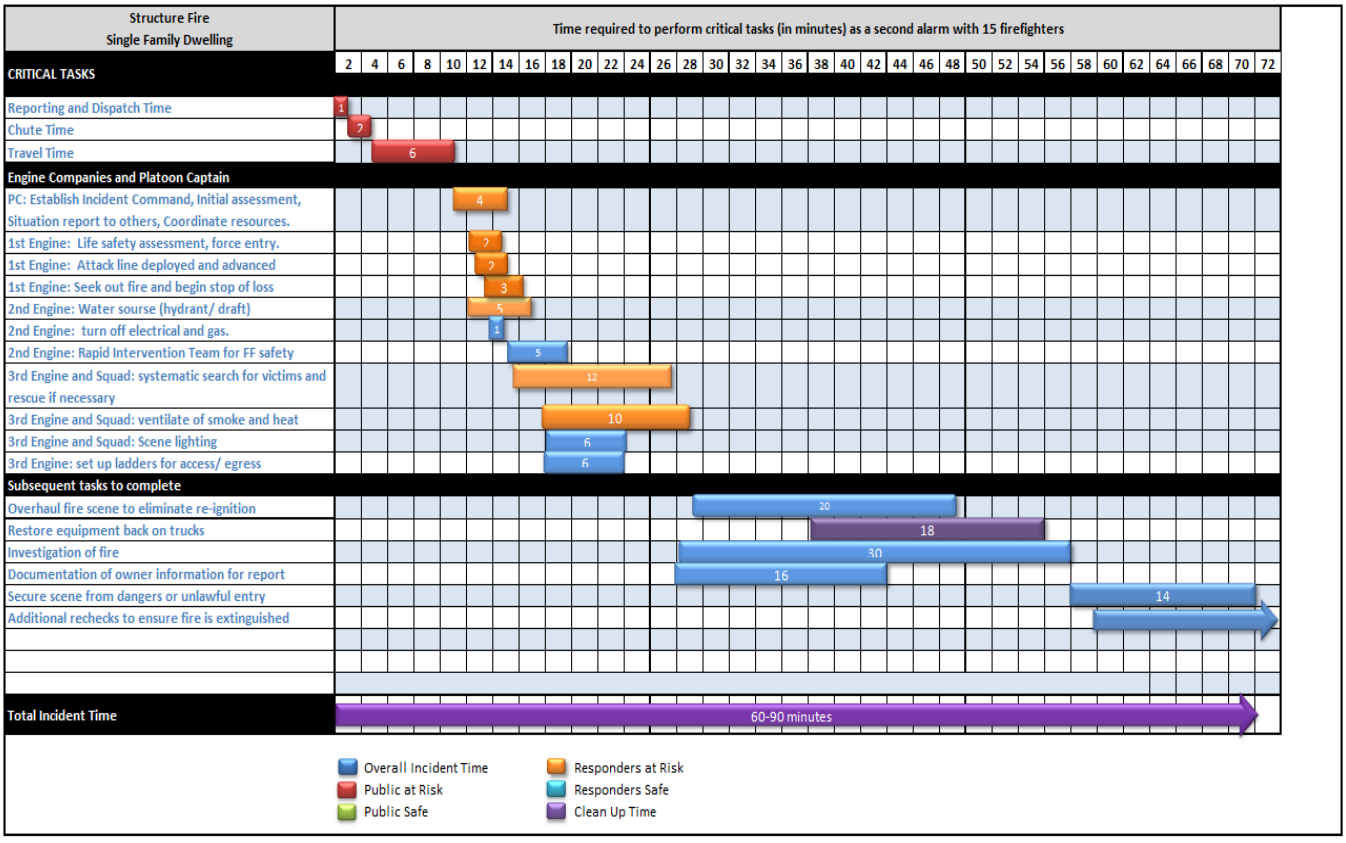
7.1 APPENDIX 'A' ACRONYMS

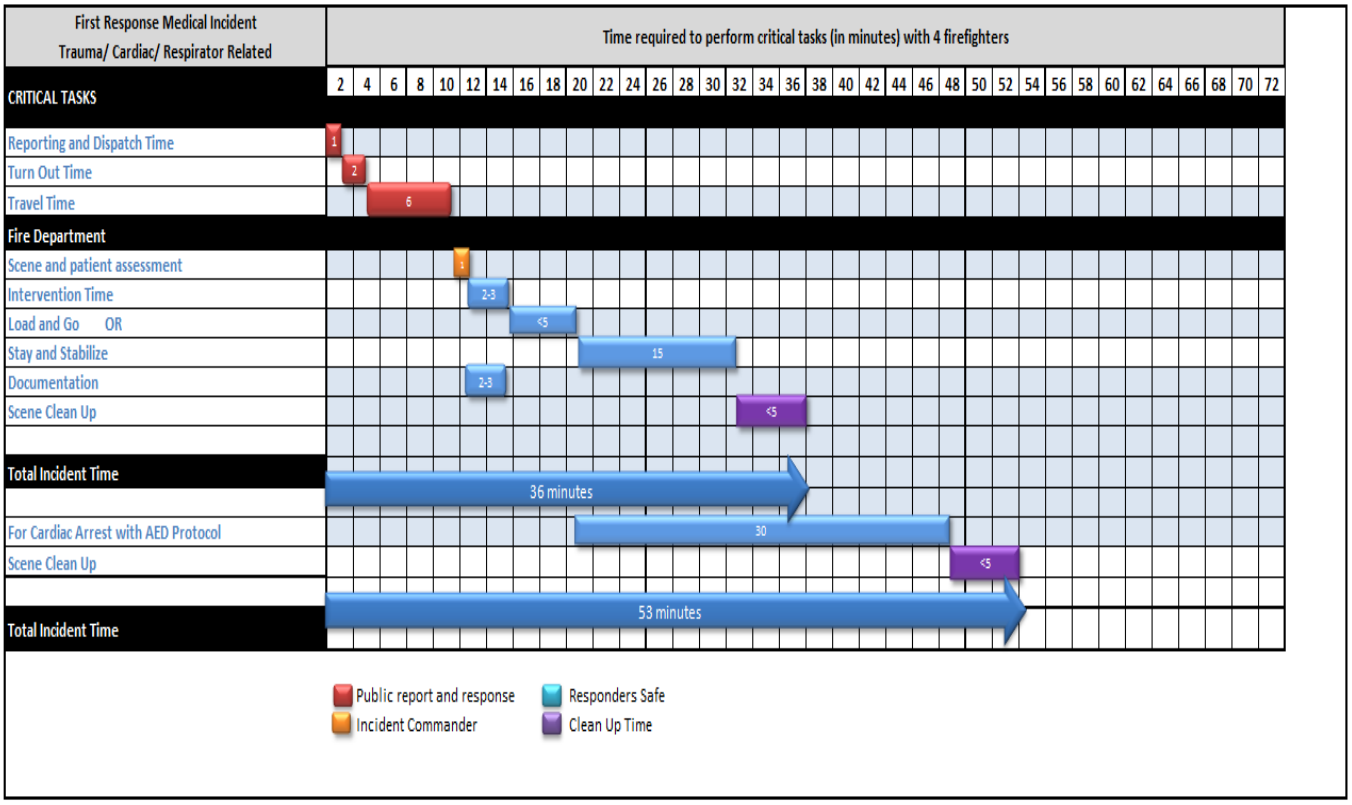
ADAM	Apparatus Deployment Analysis Module (PMDDS)
AED	Automated External Defibrillator
ATO	Assistant Training Officer
BCAS	British Columbia Ambulance Service
BCBC	British Columbia Building Code
BCERMS	British Columbia Emergency Response System
BCFC	British Columbia Fire Code
BARB	Box Area Run Card (PMDDS)
CAD	Computer Aided Dispatch
CAO	Chief Administration Officer
CFAI	Commission on Fire Accreditation International
the City	City of Kelowna
COSAR	Central Okanagan Search and Rescue
CPR	Cardio Pulmonary Resuscitation
DLC	District of Lake Country
EHSC	Emergency Health Services Commission
EMBC	Emergency Management British Columbia
EOC	Emergency Operations Center(RDCO)
ERF	Effective Response Force
ESS	Emergency Support Services
EVO	Emergency Vehicle Operations
FDM	Fire Department Management System
FMR	First Medical Responder
FTE	Full Time Employee
FUS	Fire Underwriters Survey
GHG	Green House Gas
GIS	Geographic Information System
HAZMAT	Hazardous Materials
IAFC	International Association of Fire Chiefs
IAFF	International Association of Fire fighters
IS	Information Services

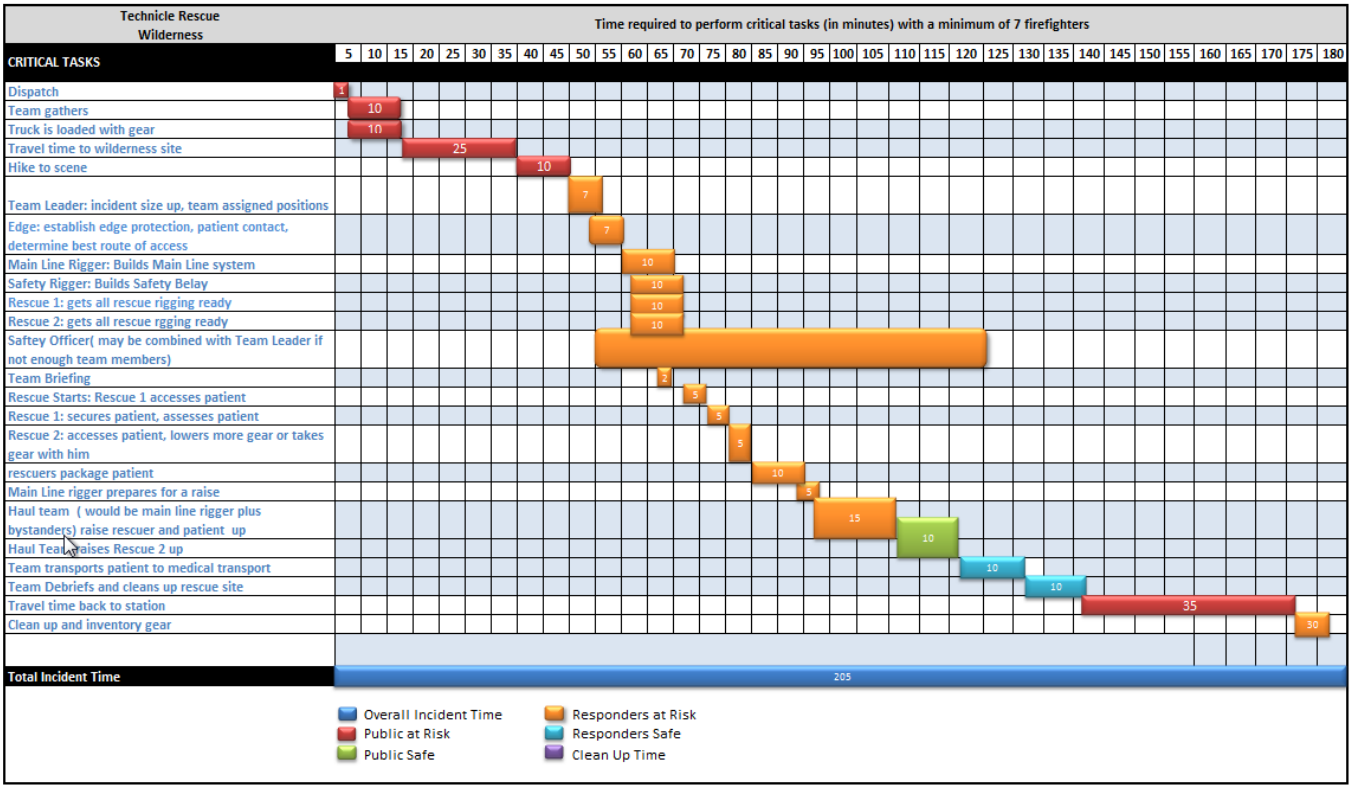
JIBC	Justice Institute of British Columbia
KFD	Kelowna Fire Department
LAFC	Local Assistant to the Fire Commissioner
Live MUM	Live Move Up Module (PMDDS)
MPDS	Medical Priority Dispatch System
MDS	Minimum Duty Strength
MOTI	Ministry of Transportation and Infrastructure
MVI	Motor Vehicle Incident
NFPA	National Fire Protection Association
OCP	Official Community Plan
OFC	Office of the Fire Commissioner
OKIB	Okanagan Indian Band
OT	Overtime
PGB	Permanent Growth Boundary
PMDDS	Predictive Modeling and Dynamic Deployment System
PPE	Personal Protective Equipment
PREOC	Provincial Regional Emergency Operations Center
POC	Paid on Call (Firefighter)
RAP	Resource Allocation Plan
RFF	Required Fire Flow
SEK	South East Kelowna
SME	Subject Matter Expert (Fire Service)
SOG	Standard Operational Guideline
TO	Training Officer
RDCO	Regional District of the Central Okanagan
RDOS	Regional District of Okanagan Similkameen
RIT	Rapid Intervention Team
RMS	Records Management System
UBCO	University of British Columbia Okanagan
UTV	Utility Transport Vehicle
WCB	WorkSafe BC

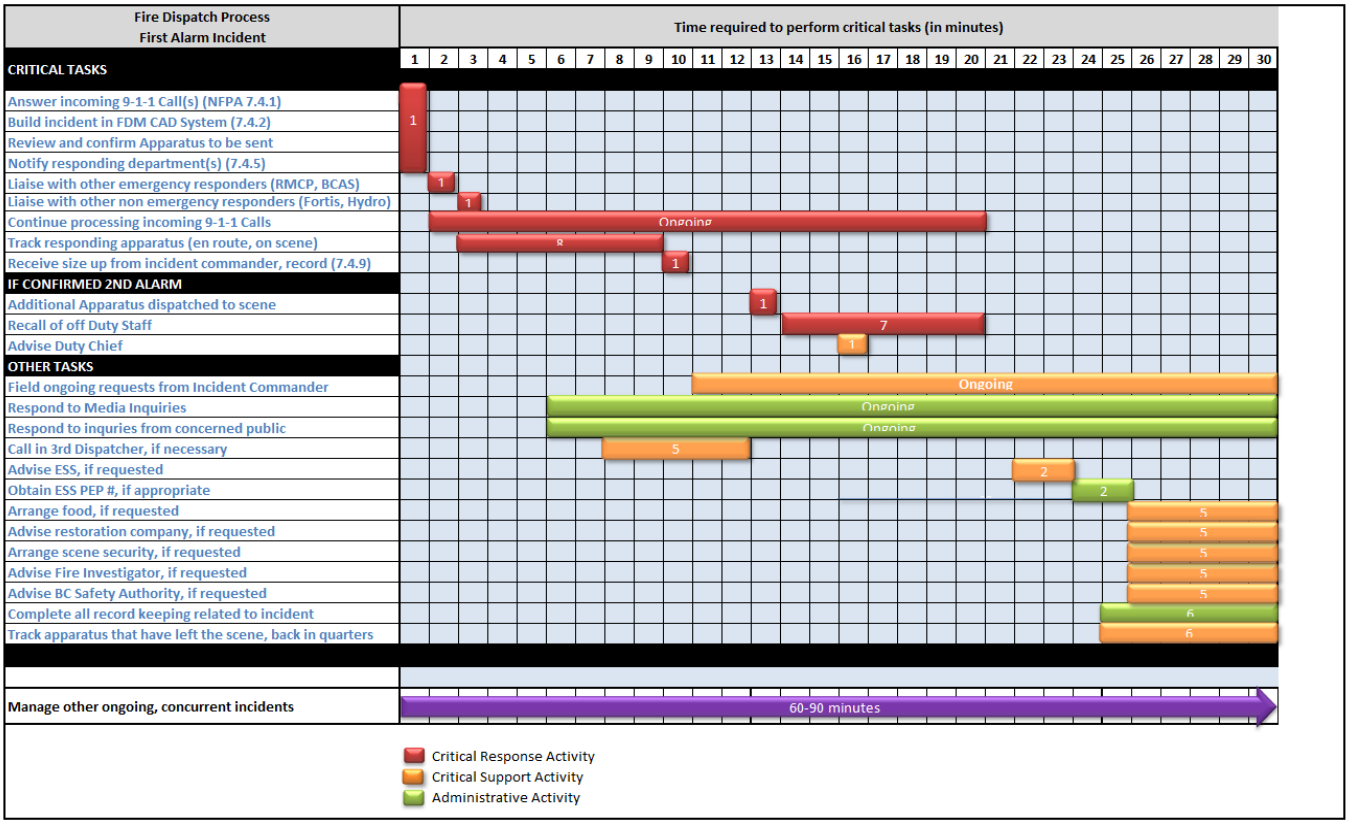
7.2 APPENDIX 'B' CRITICAL TASK TIME CHARTS

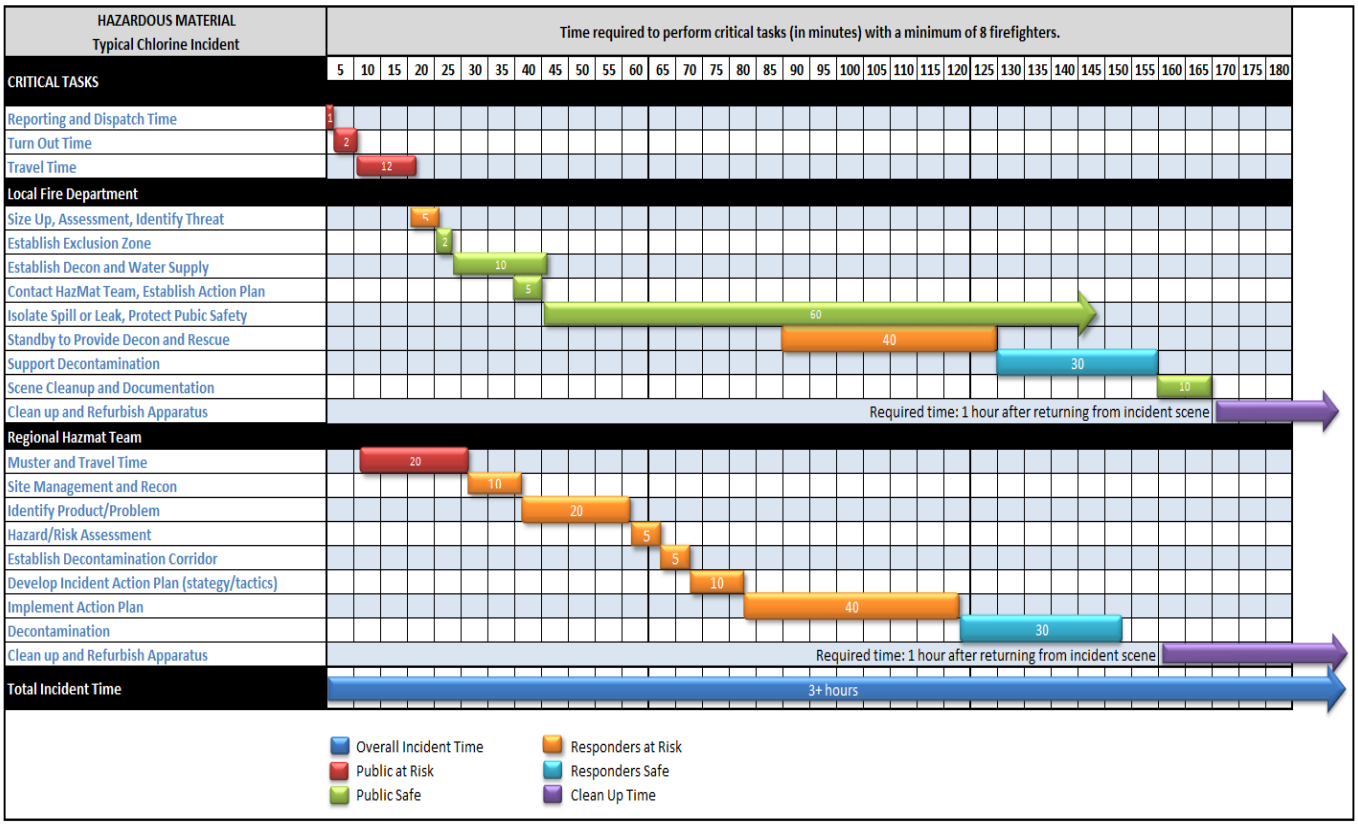


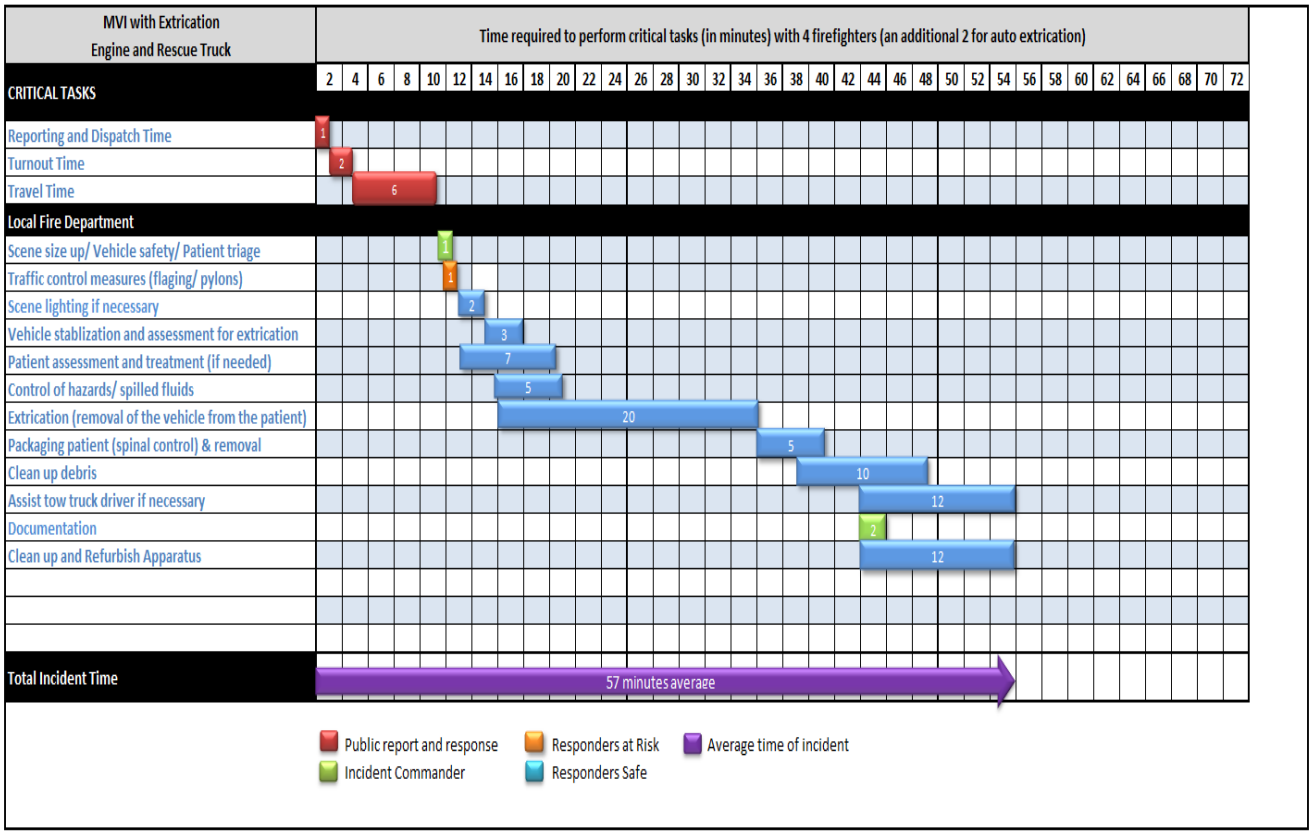


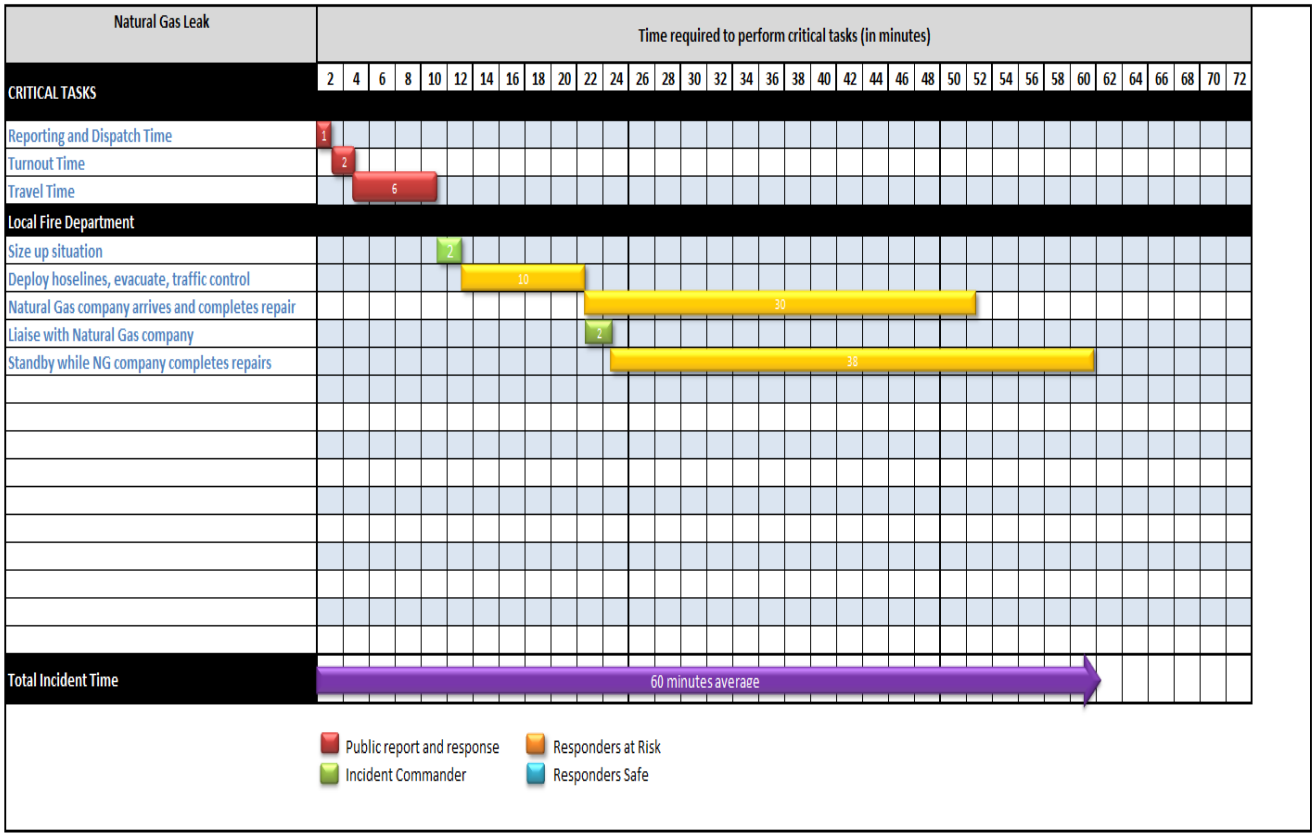

First Response Medical Incident
Trauma/ Cardiac/ Respirator Related
Time required to perform critical tasks (in minutes) with 4 firefighters
CRITICAL TASKS
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72
Reporting and Dispatch Time
Turn Out Time
Travel Time
Fire Department
Scene and patient assessment
Intervention Time
Load and Go OR
Stay and Stabilize
Documentation
Scene Clean Up
Total Incident Time
36 minutes
For Cardiac Arrest with AED Protocol
Scene Clean Up
53 minutes
Total Incident Time
Public report and response
Incident Commander
Responders Safe
Clean Up Time


Technicle Rescue
Wilderness
Time required to perform critical tasks (in minutes) with a minimum of 7 firefighters
CRITICAL TASKS
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180
Dispatch
Team gathers
Truck is loaded with gear
Travel time to wilderness site
Hike to scene
Team Leader: incident size up, team assigned positions
Edge: establish edge protection, patient contact, determine best route of access
Main Line Rigger: Builds Main Line system
Safety Rigger: Builds Safety Belay
Rescue 1: gets all rescue rigging ready
Rescue 2: gets all rescue rgging ready
Saftey Officer(may be combined with Team Leader if not enough team members)
Team Briefing
Rescue Starts: Rescue 1 accesses patient
Rescue 1: secures patient, assesses patient
Rescue 2: accesses patient, lowers more gear or takes gear with him
rescuers package patient
Main Line rigger prepares for a raise
Haul team (would be main line rigger plus bystanders) raise rescuer and patient up
Haul Team raises Rescue 2 up
Team transports patient to medical transport
Team Debriefs and cleans up rescue site
Travel time back to station
Clean up and inventory gear
Total Incident Time
205
Overall Incident Time
Public at Risk
Public Safe
Responders at Risk
Responders Safe
Clean Up Time


Fire Dispatch Process
First Alarm Incident
Time required to perform critical tasks (in minutes)
CRITICAL TASKS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Answer incoming 9-1-1 Call(s) (NFPA 7.4.1)
Build incident in FDM CAD System (7.4.2)
Review and confirm Apparatus to be sent
Notify responding department(s) (7.4.5)
Liaise with other emergency responders (RMCP, BCAS)
Liaise with other non emergency responders (Fortis, Hydro)
Continue processing incoming 9-1-1 Calls
Track responding apparatus (en route, on scene)
Receive size up from incident commander, record (7.4.9)
IF CONFIRMED 2ND ALARM
Additional Apparatus dispatched to scene
Recall of off Duty Staff
Advise Duty Chief
OTHER TASKS
Field ongoing requests from Incident Commander
Respond to Media Inquiries
Respond to inquries from concerned public
Call in 3rd Dispatcher, if necessary
Advise ESS, if requested
Obtain ESS PEP #, if appropriate
Arrange food, if requested
Advise restoration company, if requested
Arrange scene security, if requested
Advise Fire Investigator, if requested
Advise BC Safety Authority, if requested
Complete all record keeping related to incident
Track apparatus that have left the scene, back in quarters
Manage other ongoing, concurrent incidents
60-90 minutes
Critical Response Activity
Critical Support Activity
Administrative Activity


HAZARDOUS MATERIAL
Typical Chlorine Incident
Time required to perform critical tasks (in minutes) with a minimum of 8 firefighters.
CRITICAL TASKS
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180
Reporting and Dispatch Time
Turn Out Time
Travel Time
Local Fire Department
Size Up, Assessment, Identify Threat
Establish Exclusion Zone
Establish Decon and Water Supply
Contact HazMat Team, Establish Action Plan
Isolate Spill or Leak, Protect Pubic Safety
Standby to Provide Decon and Rescue
Support Decontamination
Scene Cleanup and Documentation
Clean up and Refurbish Apparatus
Required time: 1 hour after returning from incident scene
Regional Hazmat Team
Muster and Travel Time
Site Management and Recon
Identify Product/Problem
Hazard/Risk Assessment
Establish Decontamination Corridor
Develop Incident Action Plan (stategy/tactics)
Implement Action Plan
Decontamination
Clean up and Refurbish Apparatus
Required time: 1 hour after returning from incident scene
Total Incident Time
3+ hours
Overall Incident Time
Public at Risk
Public Safe
Responders at Risk
Responders Safe
Clean Up Time


MVI with Extrication
Engine and Rescue Truck
Time required to perform critical tasks (in minutes) with 4 firefighters (an additional 2 for auto extrication)
CRITICAL TASKS
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72
Reporting and Dispatch Time
Turnout Time
Travel Time
Local Fire Department
Scene size up/ Vehicle safety/ Patient triage
Traffic control measures (flaging/ pylons)
Scene lighting if necessary
Vehicle stablization and assessment for extrication
Patient assessment and treatment (if needed)
Control of hazards/ spilled fluids
Extrication (removal of the vehicle from the patient)
Packaging patient (spinal control) & removal
Clean up debris
Assist tow truck driver if necessary
Documentation
Clean up and Refurbish Apparatus
1
2
6
1
1
2
3
7
5
20
5
10
12
2
12
Total Incident Time
57 minutes average
Public report and response
Incident Commander
Responders at Risk
Responders Safe
Average time of incident


Natural Gas Leak
Time required to perform critical tasks (in minutes)
CRITICAL TASKS
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72
Reporting and Dispatch Time
Turnout Time
Travel Time
Local Fire Department
Size up situation
Deploy hoselines, evacuate, traffic control
Natural Gas company arrives and completes repair
Liaise with Natural Gas company
Standby while NG company completes repairs
1
2
6
2
10
30
2
38
Total Incident Time
60 minutes average
Public report and response
Incident Commander
Responders at Risk
Responders Safe

7.3 APPENDIX 'C' FUS TABLE OF EFFECTIVE RESPONSE

Appendix C FUS Table of Effective Response

Table 2 Fire Underwriters Survey - Table of Effective Response

The following Table aids in the determination of Pumper and Ladder Company distribution and total members needed. It is based on availability within specified response travel times in accordance with the fire potential as determined by calculation of required fire flows, but requiring increases in availability for severe life hazard.

RISK RATING	BUILDING DISTRICT EXAMPLES	FIRE FLOW L/min X1000	FIRE FLOW Approx. Igpm Range	INITIAL RESPONSE TO ALARMS Pumper Companies	INITIAL RESPONSE TO ALARMS Ladder Companies	1st DUE Engine Company, Minutes	2nd DUE Pumper Company, Minutes	1st DUE Ladder Company, Minutes	TOTAL Pumper Companies. No.	TOTAL Pumper Companies. Min.	TOTAL Ladder Companies No.	TOTAL Ladder Companies Min.
1 (a)	Very small buildings, widely detached buildings.	2	400	1	0	7.5	-	*9	1	7.5	*1	9
(b)	Scattered development (except where wood roof coverings).	3	600	1	0	6	-	*7.5	1	6	*1	7.5
2	Typical modern, 1 - 2 storey residential subdivision 3 - 6 m 10 - 20 ft. detached).	4-5	800-1,000	2	0	4	6	*6	2	6	*1	6
3 (a)	Close 3 - 4 storey residential and row housing, small mercantile and industrial.	6-9 10-13	1,200-2,000 2,200-2,800	2 2	1 (if required by Hazards)	3.5 3.5	5 5	*4 *4	2 3	5 6	*1 *1	4 4
3 (b)	Seriously exposed tenements. Institutional. Shopping Centres Fairly large areas, fire loads, and exposures.	14-16 17-19	3,000-3,600 3,800-4,200	2 2	1 1	3.5 3.5	5 5	4 4	4 5	7 7	1 **1	4 4
4 (a)	Large combustible institutions, commercial buildings, multi-storey and with exposures.	20-23 24-27	4,400-5,000 5,200-60.00	2	1	2.5 2.5	4 4	3.5 3.5	6 7	7.5 7.5	2 2	5 5
4 (b)	High fire load warehouses and buildings like 4(a).	28-31 32-35	6200-6800 7000-7600	3	1	2.5 2.5	3.5 3.5	3.5 3.5	8 9	8 8	3 3	7 7
5	Severe hazards in large area buildings usually with major exposures. Large congested frame districts.	36-38 39-42 43-46	7,800-8,400 86,00-9,200 9,400-10,000	3	3	2 2 2	3.5 3.5 3.5	2.5 2.5 2.5	10 12 14	8 9 9	4 5 6	7.5 8 9

City of Kelowna

7.4 APPENDIX 'D' OPTION A COSTS & CAPITAL REQUIREMENTS

KELOWNA FIRE DEPARTMENT
Option A Costs
Fiscal Years 2016 - 2030

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Facilities				New Stn 5 Construction	Open Stn 5										
Station 8 Renovations		$40,000													
Britco Trailer Rental		$6,750	$6,750	$6,750	$6,750										
Station 5 - Debt Payments w/Interest				$180,000	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889
Station 5 - Maintenance & Utilities Costs					$25,000	$25,500	$26,010	$26,530	$27,061	$27,602	$28,154	$28,717	$29,291	$29,877	$30,475
Station 5 - Misc. - Cleaning & Office Supplies					$2,500	$2,550	$2,601	$2,653	$2,706	$2,760	$2,815	$2,872	$2,929	$2,988	$3,047
Apparatus Costs															
Fuel					$1,000	$1,020	$1,040	$1,061	$1,082	$1,104	$1,126	$1,149	$1,172	$1,195	$1,219
Repair Parts					$4,500	$9,000	$9,180	$9,364	$9,551	$9,742	$9,937	$10,135	$10,338	$10,545	$10,756
Insurance					$1,750	$1,785	$1,821	$1,857	$1,894	$1,932	$1,971	$2,010	$2,050	$2,091	$2,133
Labour					$2,500	$5,000	$5,100	$5,202	$5,306	$5,412	$5,520	$5,631	$5,743	$5,858	$5,975
Reduction of DLC Contract Area		-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000
Reduction of Call Backs		-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000
Reduction in POC Deployment		-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000
Total	**$0**	**-$373,250**	**-$413,250**	**-$233,250**	**$266,889**	**$267,744**	**$268,641**	**$269,556**	**$270,489**	**$271,441**	**$272,413**	**$273,403**	**$274,413**	**$275,444**	**$276,495**
Staffing		12 Career Fire Fighters		8 Career Fire Fighters											
Suppression - Salaries,		$634,326	$1,230,948	$1,821,306	$2,424,016	$2,630,077	$2,800,055	$2,912,461	$2,985,272	$3,059,904	$3,136,401	$3,214,811	$3,295,182	$3,377,561	$3,462,000
Fire Inspector			$69,779	$135,313	$138,512	$141,791	$145,151	$148,596	$152,127	$155,746	$159,455	$163,258	$167,155	$171,150	$175,244
Assistant Training Officer				$85,794	$168,145	$172,164	$176,284	$180,507	$184,836	$189,273	$193,821	$198,482	$203,260	$208,157	$213,177
Materials, Supplies, etc.		$81,790	$16,730	$63,378	$26,387	$26,436	$26,487	$26,539	$27,189	$27,733	$28,287	$28,853	$29,430	$30,019	$30,619
Total	**$0**	**$716,116**	**$1,317,457**	**$2,105,791**	**$2,757,059**	**$2,970,468**	**$3,147,978**	**$3,268,103**	**$3,349,424**	**$3,432,655**	**$3,517,965**	**$3,605,404**	**$3,695,027**	**$3,786,887**	**$3,881,041**
Grand Total	**$0**	**$342,866**	**$904,207**	**$1,872,541**	**$3,023,948**	**$3,238,212**	**$3,416,619**	**$3,537,659**	**$3,619,913**	**$3,704,097**	**$3,790,377**	**$3,878,807**	**$3,969,440**	**$4,062,331**	**$4,157,536**

Total Yearly Tax % Increase^	0.00%	0.29%	0.45%	0.73%	0.86%	0.14%	0.12%	0.08%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%

* Based on estimation only

^Tax % Increase - calculated based on each year's incremental change divided by the previous years increases plus the five year tax demand from the Financial Plan, using the 2019 Tax Demand with a 3% increase thereafter.

KELOWNA FIRE DEPARTMENT
Capital Requirements (excluding interst)
Fiscal Years 2016 - 2030

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Facilities				New Stn 5 Construction	Open Stn 5										
Building*				$7,000,000											
Land*				$1,000,000											
Total	**$0**	**$0**	**$0**	**$8,000,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Equipment															
Engine 5				$828,000											
Bush 5				$150,000											
Equipment - Engine 5 & Bush 5				$170,000											
Total	**$0**	**$0**	**$0**	**$1,148,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Cumulative Total	**$0**	**$0**	**$0**	**$9,148,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

7.4 APPENDIX 'D' OPTION B COSTS & CAPITAL REQUIREMENTS CONT.

KELOWNA FIRE DEPARTMENT
Option B Costs
Fiscal Years 2016 - 2030

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Facilities				New Stn 5 Construction	Open Stn 5										
Station 8 Renovations		$40,000													
Britco Trailer Rental		$6,750	$6,750	$6,750	$6,750										
Station 5 - Debt Payments w/Interest				$180,000	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889	$642,889
Station 5 - Maintenance & Utilities Costs					$25,000	$25,500	$26,010	$26,530	$27,061	$27,602	$28,154	$28,717	$29,291	$29,877	$30,475
Station 5 - Misc. - Cleaning & Office Supplies					$2,500	$2,550	$2,601	$2,653	$2,706	$2,760	$2,815	$2,872	$2,929	$2,988	$3,047
Apparatus Costs															
Fuel					$1,000	$1,020	$1,040	$1,061	$1,082	$1,104	$1,126	$1,149	$1,172	$1,195	$1,219
Repair Parts					$4,500	$9,000	$9,180	$9,364	$9,551	$9,742	$9,937	$10,135	$10,338	$10,545	$10,756
Insurance					$1,750	$1,785	$1,821	$1,857	$1,894	$1,932	$1,971	$2,010	$2,050	$2,091	$2,133
Labour					$2,500	$5,000	$5,100	$5,202	$5,306	$5,412	$5,520	$5,631	$5,743	$5,858	$5,975
Reduction of DLC Contract Area		-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000	-$280,000
Reduction of Call Backs		-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000	-$125,000
Reduction in POC Deployment		-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000	-$15,000
Total	**$0**	**-$373,250**	**-$413,250**	**-$233,250**	**$266,889**	**$267,744**	**$268,641**	**$269,556**	**$270,489**	**$271,441**	**$272,413**	**$273,403**	**$274,413**	**$275,444**	**$276,495**
Staffing		8 Career Fire Fighters	4 Career Fire Fighters	8 Career Fire Fighters											
Suppression - Salaries,		$422,884	$1,034,955	$1,777,466	$2,372,661	$2,608,144	$2,800,055	$2,912,461	$2,985,272	$3,059,904	$3,136,401	$3,214,811	$3,295,182	$3,377,561	$3,462,000
Fire Inspector			$69,779	$135,313	$138,512	$141,791	$145,151	$148,596	$152,127	$155,746	$159,455	$163,258	$167,155	$171,150	$175,244
Assistant Training Officer				$85,794	$168,145	$172,164	$176,284	$180,507	$184,836	$189,273	$193,821	$198,482	$203,260	$208,157	$213,177
Materials, Supplies, etc.		$58,490	$35,250	$63,378	$26,387	$26,436	$26,487	$26,539	$27,189	$27,733	$28,287	$28,853	$29,430	$30,019	$30,619
Total	**$0**	**$481,374**	**$1,139,984**	**$2,061,952**	**$2,705,705**	**$2,948,535**	**$3,147,978**	**$3,268,103**	**$3,349,424**	**$3,432,655**	**$3,517,965**	**$3,605,404**	**$3,695,027**	**$3,786,887**	**$3,881,041**
Grand Total	**$0**	**$108,124**	**$726,734**	**$1,828,702**	**$2,972,594**	**$3,216,279**	**$3,416,619**	**$3,537,659**	**$3,619,913**	**$3,704,097**	**$3,790,377**	**$3,878,807**	**$3,969,440**	**$4,062,331**	**$4,157,536**

Total Yearly Tax % Increase^	0.00%	0.09%	0.49%	0.84%	0.85%	0.16%	0.13%	0.08%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%

* Based on estimation only

^Tax % Increase - calculated based on each year's incremental change divided by the previous years increases plus the five year tax demand from the Financial Plan, using the 2019 Tax Demand with a 3% increase thereafter.

KELOWNA FIRE DEPARTMENT
Capital Requirements (excluding interst)
Fiscal Years 2016 - 2030

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Facilities				New Stn 5 Construction	Open Stn 5										
Building*				$7,000,000											
Land*				$1,000,000											
Total	**$0**	**$0**	**$0**	**$8,000,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Equipment															
Engine 5				$828,000											
Bush 5				$150,000											
Equipment - Engine 5 & Bush 5				$170,000											
Total	**$0**	**$0**	**$0**	**$1,148,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Cumulative Total	**$0**	**$0**	**$0**	**$9,148,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

KELOWNA FIRE DEPARTMENT
Fire Equipment Capital Reserve Plan 2014-2035
As of October 27, 2015

		Replacement Cost (w/ inflation factor)	Appropriation from Reserve (Payment Year)	Contribution to Reserve	Interest	Reserve Balance
						$1,507,116
2014	Rescue 1	$706,000				
2015	Engine 2	$780,000		$400,000	$45,213	$1,952,329
	ATV w/trailer	Taxation+				
2016	Bush Truck 4	$140,454	-$1,766,908	$500,000	$58,570	$743,991
	Bush Truck 7	$140,454				
	Engine 4	$810,000				
	Engine 7	$530,604				
2017	Tender 4	$324,730	-$1,340,604	$600,000	$22,320	$25,707
2018	No Purchase	$0	-$324,730	$700,000	$771	$401,748
2019	Tender 1	$337,849	$0	$800,000	$12,052	$1,213,801
2020	Engine 3	$804,080	-$337,849	$800,000	$36,414	$1,712,366
2021	Engine 8 ~	$585,830	-$804,080	$800,000	$51,371	$1,759,657
2022	Bush Truck 3	$158,174	-$744,004	$800,000	$52,790	$1,868,443
	Engine 1	$896,319				
	Ladder 2	$1,075,583				
2023	No Purchase	$0	-$1,971,903	$800,000	$56,053	$752,593
2024	No Purchase	$0	$0	$800,000	$22,578	$1,575,171
2025	No Purchase	$0	$0	$800,000	$47,255	$2,422,426
2026	No Purchase	$0	$0	$800,000	$72,673	$3,295,099
2027	Rescue 1	$931,552	$0	$800,000	$98,853	$4,193,952
	Engine 2	$923,635				
	Engine 4	$923,635				
2028	Bush Truck 1	$178,130	-$2,956,952	$800,000	$125,819	$2,162,819
2029	Engine 5	$1,029,589		$800,000	$64,885	$3,027,703
	Engine 9	$686,393				
2030	ATV	$30,201	-$1,746,183	$800,000	$90,831	$2,172,351
2031	Bush Truck 4	$189,033	-$378,065	$800,000	$65,171	$2,659,457
	Bush Truck 7	$189,033				
2032	Bush Truck 5	$192,813	-$192,813	$800,000	$79,784	$3,346,427
	Engine 3	$1,019,768				
2033	Engine 7	$742,974	-$1,019,768	$800,000	$100,393	$3,227,052
2034	Engine 7	$1,136,750	-$742,974	$800,000	$96,812	$3,380,889
	Ladder 1	$1,818,800				
2035	No Purchase	$0	-$2,955,550	$800,000	$101,427	$1,326,766

*** Actual purchase of apparatus (excluding bush truck) occurs 1 year after RFP.**
+ Based on City of Kelowna policies any new equipment purchased comes from taxation.
~ May not be needed.
Included in the value of the apparatus is a 2% Inflation rate compounded annually.
Costs may flucuate based on US exchage rates.

7.5 APPENDIX 'E' COMPARATIVE COMMUNITY RESPONSE TIME ANALYSIS

Municipality or City	90th Percentile Travel Time Only	90th Percentile Travel Time and Turnout (Response Time)	Average Travel Time: Wheels Turning to Wheels Stopping on Scene	Average Travel and Turnout Time (Response Time)	Formally Approved/Supported by Council (Yes or No)
Surrey (Medical)	6:25 mins	7:53 mins	4:05 mins	5.23 mins	No
Surrey (Fire)	6:08 mins	7:35 mins	3:50 mins	5:10 mins	No
Vancouver (Fire)	4:24 mins	6:22 mins	2:46 mins	4:34 mins	No
Vancouver (Medical)	4:26 mins	6:16 mins	2:53 mins	4:28 mins	No
Cranbrook	7 mins	9 mins			
Kitmat	6 mins	9 mins			
Nelson	Not measuring at this time				
Port Alberni	5:15 mins	6:07 mins	3:01 mins	3.90 mins	Support not approved
Pitt Meadows			12 mins Rural 9 mins Urban		
Chilliwack			12 mins		

Municipality or City	90th Percentile Travel Time Only	90th Percentile Travel Time and Turnout (Response Time)	Average Travel Time: Wheels Turning to Wheels Stopping on Scene	Average Travel and Turnout Time (Response Time)	Formally Approved/Supported by Council (Yes or No)
Langley		8 mins			
Poco	5 mins	6 mins			
Saanich		8 mins 80%			
Nanaimo	4 mins	5 mins			83%
Campbell River		5 mins/8mins			
New Westminster	4 mins	5 mins	90%	90%	
Abbotsford	4 mins 11mins 80% POC	5 mins			
Abbotsford (12 staff)	9 mins	10 mins			
Richmond	4 mins	5mins	7:28mins 90%	9:21 mins 90%	
Mission	7 mins	9 mins			
Kelowna	7:30mins	9:30 mins	5:22 mins	7:11 mins	No
Kamloops (Urban)	1st Engine in 7 minutes 90% 1st alarm (14 staff) in 12 minutes 90%				

Municipality or City	90th Percentile Travel Time Only	90th Percentile Travel Time and Turnout (Response Time)	Average Travel Time: Wheels Turning to Wheels Stopping on Scene	Average Travel and Turnout Time (Response Time)	Formally Approved/Supported by Council (Yes or No)
Kamloops (Rural)	1st Engine in 14 min. 1st alarm (10 staff) in 14 minutes 80%				
Coquitlam	1st unit in 6 minutes 90%				
Prince Geo.	Plan to have a standard at end of 2015				
Delta	Objective is to meet NFPA 1710				

7.6 APPENDIX 'F' AGRICULTURAL LAND COMMISSION DECISION

Agricultural Land Commission
133–4940 Canada Way
Burnaby, British Columbia V5G 4K6
Tel: 604 660-7000
Fax: 604 660-7033
www.alc.gov.bc.ca

November 22, 2011

Reply to the attention of Martin Collins
ALC File: 52452

Terry Barton
Manager, Parks and Public Spaces
City of Kelowna
1435 Water St
Kelowna, B.C.
V1Y 1J4

Dear Sir:

Re: Application for Exclusion of land from the Agricultural Land Reserve

The Agricultural Land Commission has now had an opportunity to review the City of Kelowna exclusion application for Glenmore Valley Recreation fields. The Commission would like to thank you and Greg Sauer for attending the October 25th, 2011 meeting and for the excellent, comprehensive presentation that provided a rationale for the recreation fields, and outlined potential mitigation measures to limit the negative impacts of the facility on the agricultural resource.

As a general comment, the Commission would like to commend the City for its long term, planning based approach to this project. The Commission is also encouraged by the City's strong commitment to agriculture and the ALR, and its pro-active, and creative response to mitigation. The Commission believes the mitigation measures proposed for the project are appropriate and it encourages the City to follow through on its commitments.

Please find attached the Minutes of Resolution #352/2011 and two sketch plans outlining the Commission's decision as it relates to the above noted application. The Commission refused the exclusion application as proposed, but has conditionally approved the use of the 10.5 ha area within the ALR for recreational facilities (as per the submitted development plan). The conditions of approval are recognized as being complex and may only be achieved in the long term. As such the Commission emphasizes that it does not expect all of the conditions of approval to be completed prior to beginning construction on the recreation facilities.

Furthermore, the Commission notes that the application materials reference that the City of Kelowna is proposing bylaw amendments to increase the minimum parcel size in the "agriculture" zone, and to establish size and siting regulations for the residential home plate on farm parcels. These are very important initiatives that will go a long way to strengthening the ALR in Kelowna. Without referencing these initiatives in its decision, the Commission strongly encourages the City to continue to move ahead to adopt the bylaws.

If you have any questions about the attached minutes, please contact Martin Collins at 604-660-7021.

...2

Yours truly,

PROVINCIAL AGRICULTURAL LAND COMMISSION

Brian Underhill, Executive Director

Enclosure

PROVINCIAL AGRICULTURAL LAND COMMISSION

A meeting was held by the Provincial Agricultural Land Commission on October 25th, 2011 at the offices of the Commission located at #133 – 4940 Canada Way, Burnaby, B.C.

COMMISSION MEMBERS PRESENT:

Richard Bullock	Chair
Jennifer Dyson	Vice-Chair
Gordon Gillette	Vice-Chair
Sylvia Pranger	Vice-Chair
Bert Miles	Commissioner
Jim Johnson	Commissioner
Jerry Thibeault	Commissioner
Lucille Dempsey	Commissioner
Denise Dowswell	Commissioner
Jim Collins	Commissioner

COMMISSION STAFF PRESENT:

Martin Collins	Regional Planner
Ron Wallace	Land Use Planner
Brian Underhill	Executive Director
Colin Fry	Executive Director

APPLICATION ID: #52452
PROPOSAL: To exclude 10.5 ha from the ALR for community park and playing field uses. Five (5) ALR parcels are affected. One is a 0.4 ha residential parcel. The remaining four parcels range in size from 5 – 6 ha. The City intends to subdivide and exclude the lower (westerly) ~2.5 ha portions of the four larger parcels to develop the park playing fields, and retain the hillside portions of each parcel in the ALR.

The park development plan shows a spray park, a skateboard park, a future recreational facility building, four large baseball diamonds, community garden space, and single large open play field.

The application is submitted pursuant to section 29(1) of the *Agricultural Land Commission Act*

1) **PROPERTY INFORMATION:**

Parcel ID:	012-019-810
Legal Description:	Lot 12, Block 9, Section 4, Township 23, and of Section 33, Township 26, ODYD (Osoyoos Division Yale District) Plan 896
Civic Address:	219 Valley Road, Kelowna
Size:	6.1 ha
Area in ALR:	6.1 ha
Current Land Use:	Residence with field

...2

Farm Classification: Yes
(BC Assessment)

2) PROPERTY INFORMATION:

Parcel ID: 003-243-303
Legal Description: Lot 11, Block 9, Sections 23 and 33, Township 26, ODYD (Osoyoos Division Yale District) Plan 896
Civic Address: 229 Valley Road
Size: 5.6 ha
Area in ALR: 5.6 ha
Current Land Use: Residence with field
Farm Classification: Yes
(BC Assessment)

3) PROPERTY INFORMATION:

Parcel ID: 007-705-301
Legal Description: Lot 10, Block 9, Sections 23 and 33, Township 26, ODYD (Osoyoos Division Yale District) Plan 896
Civic Address: 253 and 259 Valley Road
Size: 5.7 ha
Area in ALR: 5.7 ha
Current Land Use: Two residences, hayfield
Farm Classification: Yes
(BC Assessment)

4) PROPERTY INFORMATION:

Parcel ID: 012-019-801
Legal Description: Lot 9, Block 9, Section 33, Township 26, ODYD (Osoyoos Division Yale District) Plan 896
Civic Address: 279 Valley Road
Size: 4.9 ha
Area in ALR: 4.9 ha
Current Land Use: Residence, hayfield
Farm Classification: Yes
(BC Assessment)

5) PROPERTY INFORMATION:

Parcel ID: 002-089-777
Legal Description: Lot A, Section 33, Township 26, ODYD (Osoyoos Division Yale District) Plan 30721
Civic Address: 289 Valley Road
Size: 0.4 ha
Area in ALR: 0.4 ha
Current Land Use: Residence

...3

Farm Classification: No
(BC Assessment)

PROPERTY OWNER INFORMATION/Date acquired:

1. Hendrikus Roelofs, Mary Carr – Nov. 2009
2. Cornelia Issler – Dec. 1997
3. Barbara Kwiatkowski, 25/100's interest Dieter Tripke 75/100's interest – Nov. 1989
4. Adolph and Olga Kaplun – Feb. 1980
5. Suresh Khurana 1/3 interest, Sunita Sood 1/3 interest, Surinder Khurana 1/3 interest – Jan 2008

SITE INSPECTION MEETING:

A site inspection meeting was conducted on September 22, 2011 following which a report was prepared. The site inspection meeting report was approved by Commissioner Bullock.

Section 14(2) of the *Agricultural Land Commission Act* provides that a member of the Commission who was not present at a meeting to determine an application or other matter may vote on the application or matter only if a summary of the meeting is given to the member before the vote. The site inspection meeting report, approved by Commissioner Bullock October 6, 2011 constitutes a written record of the site inspection meeting and has been provided to all Commission members recorded above.

PUBLIC HEARING:

For applications made by a local government pursuant to section 29(1) of the *Agricultural Land Commission Act* a public hearing must be held in the form provided for in the BC Regulation #171/2002. It was confirmed that the notification requirements of Sections 13 and 14 of BC Regulation 171/2002 were followed by the City of Kelowna.

The City of Kelowna held a public hearing on August 9, 2011. Various citizens spoke in support of the proposal at the hearing. Two letters of opposition were noted, as well as one letter of support.

Representatives of the City of Kelowna were afforded the opportunity to meet with the Commission on October 25th, 2011 at Burnaby, B.C. Those in attendance at the meeting were:

- Terry Barton, Kelowna Manager Parks and Public Spaces
- Greg Sauer, Kelowna Planner/AAC liaison
- The Commissioners and staff noted above

...4

A presentation provided by Terry Barton outlined the rationale for the project, how the application had been initiated, and what criteria was used in the site selection. Five ALR sites had been reviewed in the Glenmore area. The Glenmore area does not have a large scale centralized recreation facility like other parts of the City. The reason is because the City was unable to secure a large enough site when Glenmore Valley land was excluded from the ALR in the 1980's. The application site was chosen because significant portions were believed to be of low agricultural capability and debilitated by fill, and because it is adjacent to existing high density residential development.

Mitigation options suggested by the City consist of the following:

- the reclamation and long term agricultural lease of a small park and contiguous firehall site (3.5 ha) in the Glenmore area (Scenic and Valley Roads),
- the consolidation of an undeveloped highway right of way in the Roberts Lake area with adjoining parcels
- development of community gardens on the park site
- heritage interpretation structure that will help interpret the Glenmore Valley's agriculture past
- Improved City of Kelowna enforcement in the ALR
- Bylaw amendments which enhance agriculture: for example increasing minimum parcel size in the agriculture zone, and residential size and siting regulations for agricultural parcels

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COMMISSION CONSIDERATION:

Section 6 of the *Agricultural Land Commission Act* identifies the purposes of the Commission are (1) to preserve agricultural land; (2) to encourage farming on agricultural land in collaboration with other communities of interest; and (3) to encourage local governments, first nations, the government and its agents to enable and accommodate farm use of agricultural land and uses compatible with agriculture in their plans, bylaws and policies.

Agricultural Capability

The application included a June 24th, 2011 "*Agricultural Assessment Proposed Glenmore Recreation Park*" by Golder and Associates. The Report assessed 11.1 ha (slightly more than the applications area), and concluded that 5.9 ha was contaminated with fill and had no capability for improvement. The remaining area could be improved to Class 3 (1.5 ha); Class 4 (3.2 ha); and Class (0.5 ha). The above ratings roughly corroborate and slightly downgrade the information provided in the BC Land Inventory (BCLI), 'Land Capability Classification for Agriculture in B.C.' system.

The BCLI agricultural capability of the soil of the subject properties is complex, with the land being improvable to;

....5

50% Class 3 – Land in this class has limitations that require moderately intensive management practices or moderately restrict the range of crops, or both.
50% Class 4 – Land in this class has limitations that require special management practices or severely restrict the range of crops, or both.

The limiting subclasses are: N - salinity; D - undesirable soil structure; W - excess water

As noted in the Golder Report, Lots 11 and 12 have had unauthorized fill deposited on their lower portions, abutting Valley Road. However, this land had severe salinity issues prior to filling. On balance the Commission concurred with the assessment that half the subject area has limited potential for agricultural uses because of soil salinity and filling. However, the remaining (5 ha) area has potential for agricultural uses.

Agricultural Suitability

The Commission assessed whether external factors such as encroaching non-farm development have caused or will cause the land to become unsuitable for agriculture. Adjoining land uses to the north, west and south are agricultural. A church and lower density residential uses lie to the west outside the ALR, directly across Valley Road. In view of this, the Commission does not believe there are external factors that render the land unsuitable for agricultural use.

Assessment of Potential Impact on Agriculture

The Commission also assessed the impact of the proposal against the long term goal of preserving agricultural land. The Commission believed that establishing playing fields east of Valley Road had the potential to raise expectations of additional land use change east of Valley Road. The Commission also noted that, if approved, the proposal would reduce the size of the four upland remnant parcels to ~ 2 ha, reducing the likelihood that they will be used for farm purposes in the long term.

Other Factors

The Commission considered the public hearing information and the information (letters) submitted by citizens and groups that were both opposed to and supportive of the application.

The Commission recalled that the City of Kelowna offered the following agricultural mitigation to help balance the potential negative impacts of using 10.5 ha for park purposes. The proposed mitigation that offers the most significant agricultural benefits include;

- Consolidation of undeveloped highway right of way in the Roberts Lake area into adjoining farm parcels, (a total of 4 ha). The land is currently used for non intensive agriculture by the adjoining property owners.
- Reclaiming a contiguous firehall site and small park in the Glenmore area for agricultural uses (3.6 ha).
- Bylaw amendments which strengthen farming; for example increasing the minimum lot size, and residential size and siting regulations for the agricultural zone.

....6

The total area proposed to be enhanced for agricultural uses (7.6 ha – comprising the former park/firehall sites and the undeveloped road right of way), is smaller than the proposed exclusion area, but agriculturally significant. The undeveloped right of way represents potential threat to the agricultural integrity of the parcels through which it passes, if it is proposed for a linear park or road. The consolidation of the right of way with adjoining parcels will eliminate community pressure to utilize the right of way as a road or linear park.

The Commission believes that the rehabilitation of the current park and adjoining firehall site to an agricultural standard, and their lease for agricultural uses, represents a significant benefit to agriculture, provided the land was leased for the long term, at favourable lease rates, to an agricultural operator. In order to enhance the potential for leasing, and to ensure that the maximum amount of land is available for agriculture, the Commission requires that a covenant be registered against the title of the leased parcel prohibiting the construction of a dwelling. Another option is to sell and consolidate the rehabilitated land to the adjoining parcel owner(s). Fencing the perimeter of the former park to deter casual trespass will also enhance lease opportunities.

The Commission was intrigued by the City's proposed bylaw initiatives in support of agriculture (i.e. the proposed increase of the minimum lot size in Agriculture zone; and size and siting provisions for residences on agriculture zone parcels), but appreciated that these could be contentious, and would apply to all City of Kelowna ALR areas, not just the Glenmore Valley. The Commission, though strongly supportive of the initiatives, prefers to focus on agricultural benefits that are immediate and local.

The Commission appreciates that the above mitigation proposals represent a significant commitment on the part of the City of Kelowna, and some time may elapse before they are completed. Therefore, the Commission does not require that the mitigation be completed prior to, or concurrently, with the development of the proposed park site. However, the Commission would like to ensure that proof of offer of the right of way to adjoining landowners be provided prior to commencement of construction, and that the rehabilitation and lease of the existing park site be completed within three (3) years of the date of the decision.

The Commission also recalled that it had considered the issue of the park designation in the recently adopted City of Kelowna Official Community Plan in March 2011. By Resolution # 9N/2011 the Commission resolved to not object to the "Park" designation of ALR land at Valley Road and Longhill Road , provided the designation area was reduced to 10 ha (from 20 ha). It also advised the City that any application would be viewed in the context of agricultural benefits associated with the revision of property boundaries of the hillside remnants to develop larger parcels. Although the current proposal does not address the consolidation of the hillside remainders, the Commission believed the two combined mitigation strategies achieved a similar local benefit for agriculture.

Finally, the development proposal for the park shows a minimal area designated for parking and buildings. In previous discussions with the City, ALC staff had advised Kelowna that certain recreation structures, such as pools, ice rinks, and their attendant large parking lots did not necessarily have to be located in the ALR, because they did not require extensive land areas.

...7

It is the Commission's view that these facilities can be located elsewhere in the City, potentially in underutilized commercial/industrial areas. The Commission was heartened by the lack of buildings proposed for the park site.

CONCLUSIONS:

1. That the land under application has mixed agricultural capability but is appropriately designated as ALR and is suitable for some types of agricultural uses.
2. That the proposal, if mitigated by the agricultural benefits proposed by the City of Kelowna , will not substantively impact agriculture.
3. That the exclusion proposal is inconsistent with the objective of the *Agricultural Land Commission Act* to preserve agricultural land. However, in this particular case, permitting park uses while retaining the land in the ALR will limit the potential to convert the proposed playing fields to other structures, and reflect that playing fields have agricultural potential and can revert to agricultural uses if necessary.

IT WAS
MOVED BY: Commissioner G. Gillette
SECONDED BY: Commissioner J. Johnson

THAT the application to exclude 10.5 ha from the Agricultural Land Reserve be refused as proposed,

However, the Commission allowed the non-farm use of 10.5 ha for parks uses subject to the following conditions:

- Fencing the perimeter of the recreation site with a 1.8 meter high chain link fence with the exception of the Valley Road frontage.
- That the recreation facilities be developed as per the attached Sketch #1 (as submitted with the application)
- The planting of a vegetative buffer (as per the application submission).
- The consolidation of the right of way show in red on the attached Sketch #2 with the adjoining parcels.
- The rehabilitation to an agricultural standard, and long term (20 year) lease of the playing field area shown in yellow (located between Scenic and Valley Roads) to an agricultural operator. A covenant prohibiting the construction of a home must also be registered against the title of the property.
- Upon relocation of the firehall shown in purple on the attached Sketch #2, the land must be rehabilitated to an agricultural standard, consolidated by survey with the rehabilitated playing fields (shown in yellow) and added to the agricultural lease area.
- Fencing the above noted rehabilitated areas with a Schedule D fence to discourage casual trespass and to enhance the lease potential of the parcel.
- the playing fields permitted by this decision must be substatntially commenced within three (3) years from the date of this decision.
- The submission of a subdivision plan showing the 10.5 ha park as a single parcel.

...8

- approval for non-farm use is granted for the sole benefit of the applicant and is non-transferable.

AND THAT the applicant be advised of the provisions of Section 33 of the *Agricultural Land Commission Act* which provides an applicant with the opportunity to submit a request for reconsideration.

S.33 (1) On the written request of a person affected or on the commission's own initiative, the commission may reconsider a decision of the commission under this Act and may confirm, reverse or vary it if the commission determines that
(a) evidence not available at the time of the original decision has become available,
(b) all or part of the original decision was based on evidence that was in error or was false.
(2) The commission must give notice of its intention to reconsider a decision under subsection (1) to any person that the commission considers is affected by the reconsideration.

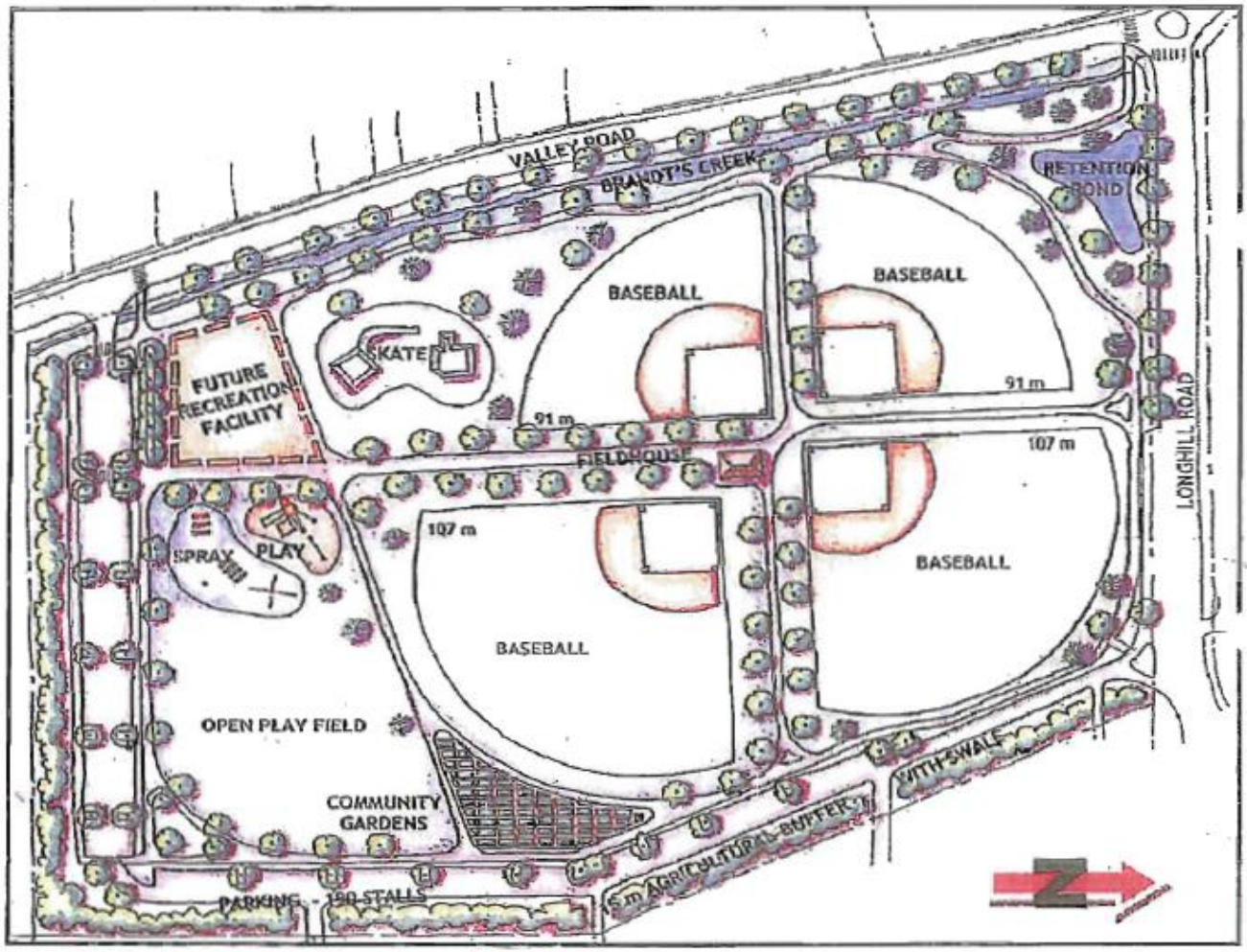
AND THAT the applicant be advised that a revised proposal does not constitute new information and will not be considered as a basis for reconsideration and the time limit for submitting a request for reconsideration is one (1) year from the date of the decision letter.

CARRIED
Resolution # 352/2011

ALC FILE # 52452
RESOLUTION # 352/2011

APPROVED NON FARM USES
SKETCH # 1

Preliminary Concept Plan



Glenmore Firehall - 1.1 ha (2.7 acres)
Glenmore Sportsfield Park - 2.9 ha (7.1 acres)
Highway Right-of-way - 3.8 ha (9.4 acres)

Attachment 7 - Compensation Measures

ALC FILE 52452
RESOLUTION # 352/2011

APPROVED CONDITIONS
SKETCH #2