CITY OF GRANDE PRAIRIE
FIRE MASTER PLAN

Prepared by:

MORRISON HERSHFIELD




Final Copy

January 24, 2008

CITY OF GRANDE PRAIRIE

FIRE MASTER PLAN

Prepared by:

MORRISON HERSHFIELD

Bus: (403) 259-5031 Ext. 2911
Cell: (403) 999-9211

Email: icomandante@morrisonhershfield.com
Online: www.morrisonhershfield.com

ACKNOWLEDGMENTS

This report would not be possible without the valuable contributions of the following individuals and groups.

The Mayor and Council for The City of Grande Prairie

The Protective Services Committee

Bill Walker

Dan Lemieux, Senior Deputy Fire Chief, City of Grande Prairie Fire Department

Steve Larsen and the IAFF Local 2770

Harvey Pearson, Deputy Fire Chief for his insights into the training and operational aspects of the department.

Dennis Biggs (Platoon Captain) for his leadership on the Emergency Services Location Study and to other members of that committee.

The following stakeholders for providing feedback and identifying issues:

- Grande Prairie and District Chamber of Commerce
- Weyerhaeuser
- Talisman Energy
- Grande Prairie Airport
- County of Grande Prairie
- Peace Country Health

Morrison Hershfield Team

Al Kennedy, Team Lead

Isaac Comandante, Project Manager

Laird Burton, Project Advisor

EXECUTIVE SUMMARY

The Grande Prairie Fire Department is a well managed and effective organization that is under considerable strain from a number of sources. Rapid growth in and around the city is increasing the complexity and volume of calls, and creating new risks. This situation is exacerbated by a very tight labour market and an aging workforce, both of which will create recruitment and retention challenges for the Department. In combination these factors will require the Department to explore new relationships with other stakeholders, in particular other governments in the region and industry. The need to implement and sustain these relationships will also create short to medium term strains on the Department, with significant long term benefits in the longer term.

There are many factors increasing the level of risk now faced by the department, but several are especially important:

- Increasing stock of residential infrastructure that includes larger more complex buildings.
- Significant increase in the amount, complexity and variety of commercial structures.
- Location of rail lines, and the volume and nature of the traffic carried by those lines.
- Increased volume and variety of air traffic, leading to increased risk associated with the airport.
- Increasing volume and importance of medical related calls.
- Capacity to compete in a strained labour market, including capacity to train and retain qualified staff.

Given risk realities, there are several aspects of the resources available to the department that need continuing attention, but several are especially important.

- Capacity of the Department to successfully compete in a very tight labour market, and the need to create and implement training and development strategies that will enhance long term retention.
- The need to ensure that the communications system, the heart of effective emergency response, continues to be staffed with highly qualified people, and that the system as a whole responds effectively to rapid technological change.
- The need to ensure that policies, standard operating procedures and guidelines are kept up to date and relevant, and that operating principles in key areas like dangerous goods and technical rescue also remain current and relevant.
- A growing requirement for a fire hall in the west quadrant, recognizing the increasing risk associated with the airport.

Several specific initiatives are recommended:

- Seek an operational partnership with regional service providers to form a Regional Response Model involving, but not limited to, the County of Grande Prairie, Peace County Health, the Municipal District of Greenview, the Municipalities of Sexsmith, Beaverlodge, Hythe, Wembley, and others in the surrounding area, plus the area industries and the Grande Prairie Airport.
- That an Accord and Charter be developed for the proposed Partnership
- That the City of Grande Prairie constructs the third hall in the west quadrant.
- That Partnership reviews the service levels for emergency operations and look at opportunities to share services or form teams.
- That the apparatus and equipment requirements for the third hall be acquired.
- That regional training forms a potential part of the proposed Partnership.
- That City of Grande Prairie Fire Department restructures its training division to ensure its own internal training and succession planning needs are met.
- That the City of Grande Prairie Fire Department take a support role with the County of Grande Prairie in the formation of a “Community Awareness and Emergency Response” CAER group to work with industrial partners on issues for the region.
- That the proposed Partnership supported by the City, County and other Partners require a business plan to deal with the potential migration of radio systems throughout the Province to UHF (Ultra High Frequency) and how that will impact all users including Mutual Aid Partners, the Health Region and area Industries.
- That the City of Grande Prairie Fire Department provide a RIT (Rapid Intervention team) protocol with appropriate equipment and policy support to meet the intent of NFPA 1561 and the Workplace Health & Safety (WH&S) Code of Practice for Firefighters.
- That the City of Grande Prairie Fire Department continues in a leadership role in fire prevention delivery by reviewing all fire prevention and public education programs to look for opportunities.
- That the City of Grande Prairie Fire Department reviews the impact/risk associated with no longer routinely inspecting F-2 occupancies (medium hazard Industrial occupancies). Recommend a review of the existing inspectional data for all F-2 occupancies with the goal of looking at personal injuries and property losses and their association to any known code deficiencies.
- Adopt a quality control framework for the Grande Prairie Fire Department with involvement of Partners to measure effectiveness and efficiency of service delivery and to promote firefighter safety through a CIP (Continuous Improvement Process).

- City of Grande Prairie Fire Department review and adopt the appropriate sections of NFPA 1500 and NFPA 1561 to promote firefighter safety and wellness over the span of their careers.

- That the City of Grande Prairie promote joint land use planning with the County of Grande Prairie using tools such as MIACC (Major Industrial Accidents Council of Canada), CAN 2-731 (CSA standard on emergency planning), Directive 71 (AEUB standard for the Petroleum Industry), and others as appropriate to limit risk to the public and Industry.

There is also a growing need to take a fresh look at mechanisms that might be used to deliver a multi-stakeholder approach to resource allocation and utilization. Because of the overarching need to maintain a highly reliable service in the face of increasing risk the Department should consider structuring partnership arrangements using a 'best practises' approach where services are designed and delivered based on a collaborative risk assessment and commonality of vision, not limited by current boundaries and organizations.

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

1.1. Introduction

This report is designed to provide a comprehensive assessment of the City of Grande Prairie Fire Department. It does so by identifying and assessing the nature and sources of risk faced by the Department, calibrating the resources available to address these risks, and then idenfying the nature of the gap between these risk driven needs and available resources. This is followed by a suite of detailed recommendations regarding how to best address various aspects of the identified gap. This approach also includes addressing the governance and relationship management implications and opportunities associated with effective management of the most significant risks.

This approach is designed to ensure that the nature and allocation of resources, and the relationships between key participants, are aligned with real risk, in particular the need to ensure the most significant risks are addressed first.

We begin by identifying the sources and attributes of key sources of risk..

SECTION 2 RISK

2.1 Operational Risks and Realities

Emergency response activity: the Grande Prairie fire department is a very efficient and competent team of dedicated firefighters and officers who are proud of their community and the role they play in protecting its citizens. During all the stakeholder consultations this was recognized and reinforced by all participants both within and external to the department. The Grande Prairie department does rank within the top five percent of departments in the Province of Alberta based on their fire rate, loss control and strong commitment to injury control and reduction and acting as a beacon to other municipalities in helping them to set up programs that have worked so well in Grande Prairie where they were often first used.

Trying to maintain this leadership position while dealing with unprecedented growth and climbing incident volumes has put a strain on the department. This report will analyze some of the root causes and best solutions to deal with the issues. It is important to understand that many of these issues and themes are not totally unique to the City of Grande Prairie, to the region or indeed to the Province of Alberta.

2.1.1 Nature of the Service

- Rate of growth in the City and the region;
- Evolution of that growth to many new services which address new risks;
- Pressure this has put on the relationship between the City, the County and the other partners in the region;
- Growing challenge of recruiting and retaining firefighters in an environment where competition with other services and the private sector is a continuing issue;
- Aging of the existing workforce and the probability that over 30% of the officer core will retire in the next 5 years;
- The great opportunities presented by new large industries who may play a role in emergency response;
- The improved transportation network, both air and road, which makes getting to Grande Prairie so much easier but also adds to the incident volume;
- The region becoming the nexus for product shipment to British Columbia ports with the strong potential for some level of product upgrading (i.e. Ethane stripping from natural gas or side stream products from bitumen) due to its ideal location;
- Lack of a regional planning framework to deal with possible industrial risk poses a threat to residents and to firefighters;

- Growing realization that cooperation (came up as the number one stake holder theme) between municipalities, the private sector and other important stake holders such as the Health Authority and the Airport is essential to long term risk identification and management.

An important source of risk data is the nature and volume of department activities. Our methodology included not only a detailed review of the excellent data stream supplied by the department, but to also direct observation and feedback from service providers. This was done to confirm the accuracy of the data stream (it was very accurate) and also to look for trends and parameters which are not captured or clearly evident in the data (very few since the data collection system is robust).

The main statistical observation is that the call volumes are on a sharp rise and this trend will continue. With the predicted economic growth in the region this pattern may even accelerate. These increases have coincided with the department's growth strategy of moving to a quadrant hall (supported by this report) concept with the north and south halls being established first. This strategic move has avoided a potential crisis as it would be difficult to see how the department could manage the existing volume out of the old downtown hall from both a capacity and a location standpoint. The addition of the western hall will cover the high potential risk in this quadrant and add needed resources to the system with the understanding that the final east hall is still required.

The volume of calls has increased but equally important is the level of call complexity and the time spent on each call. There is a combination of factors involved in this extension of incidents but the single biggest factor is the legal and regulatory requirements for responders to discharge their duty of care in a common law setting and to ensure from a regulatory standpoint that all the statutory law requirements are fulfilled. This alone has resulted in up to a 50% time on task increase to ensure that things such as rekindles do not occur or that traffic is adequately controlled during a motor vehicle rescue, just to give two examples of many. The length of time to respond to, set up for and recover from incidents is increasing. This is the case for both the City of Grande Prairie and its regional partners.

These factors result in numerous overlapping or simultaneous calls, a reality common to this and many other similar systems. If call volumes could be evenly spread throughout the day as single events the system would be manageable, but that is an exception as calls in this system cluster and overlap for a variety of predictable reasons. This department has already entered the risk envelope of having two or more calls occurring an the same time and many of the recommendations in this report are structured to deal with this growing reality. Our recommendations will provide some guidance in looking at" best practices" in dealing with this pressing issue, but ultimately this is a service level issue. It will require the department and its partners to build on the already excellent policy approach of the Grande Prairie Fire Department rooted in what is a shared understanding of what is an acceptable risk in terms of capacity, and how many calls of what complexity the system can realistically be expected to manage. While at a high level this is a straight forward concept the number of variables involved in dealing

with emergency incidents demands a more rigorous approach than just someone's gut feeling. Following is a section containing a proposed approach that uses probabilistic modeling commonly used in determining service levels is included in the Appendices. It represents an important aspect of determining effective emergency response levels.

Please see Appendices for supporting statistics. Probabilistic models of fire station availability and dispatching in analyzing multiple call risks.

2.2 Demographic and Geographic Risk

General comments around unique niche in respect to both population (age, mobility,transient and first nation influences but a very old and still stable community with a strong cultural core. The blend of true prairie in close proximity to the mountains and extensive FPA's(forest protection areas) plus an appreciation of the County of Grande Prairie's close association in both these aspects with the City and Municipal District of Greenwood. The relative isolation of Grande Prairie from other major urban areas makes partnership a necessity as working together is the only reasonable option.

2.3 Residential Risk

- The City of Grande Prairie has a very typical and well planned mix of residential occupancies ranging from low density country residential through to an excellent stock of single family dwellings and a large number of high density walk ups and condominiums to accommodate a growing highly mobile workforce. From a fire and emergency services perspective there are several issues arising from this reality.
- The sheer increase in the volume of housing increases the overall risk.
- The size of an average single family dwelling has almost doubled while the common construction methods have lowered the tenability in terms of rescue and firefighting. Lightweight engineered wood construction products and other code compliant but potentially hazardous materials (i.e. the vinyl siding as a potential fire spread issue) have also affected levels of risk. This imposes a new duty on incident commanders to accurately assess attack modes on these newer houses which may, depending on their construction, pose a real threat to responding crews in terms of early floor separation and collapse. Many departments are identifying this type of construction as a risk in their pre-fire planning systems.
- While the City of Grande Prairie has done an excellent job of maintaining adequate separation distances between dwellings there must be constant vigilance to maintain those important spaces so the dwellings do not start to form one contiguous fire area which can wipe out a whole neighborhood, as has occurred several times over the past year in Edmonton and other communities. It is also important for the City of Grande Prairie to work with its neighbours to encourage safe and viable residential growth. This is both a building code and a planning issue where all developments should continue to be assessed for their potential to contribute to a conflagration or large loss fire.

- With the very variable (low vacancy to high) housing issues in the entire Grande Prairie region it is important to track the existing housing stock in terms of suites so the risk to residents and firefighters can be assessed. Any policy framework on secondary suites should include a fire assessment in relation to the area or zone not just on the individual dwelling unit.
- The high number of mult-family and apartment units impose a firefighting, rescue and recovery risk on the community a number of reasons:
  - Fires in these occupancies require a lot of resources to fight.
  - Even if confined to the unit of origin these incidents can displace a large number of people, where will those who are displace be able to go?
  - Given the current economy, how quickly will units be rebuilt, particularly at the lower end of the scale where other social issues (such as a displaced single mother on assistance) add additional complexities to the recovery process.

2.4 Commercial Risk

The growth of the commercial sector in the City of Grande Prairie and the surrounding areas of the County can only be described as phenomenal. Nothing probably better illustrates Grande Prairie's central role in the catchment area than the number and variety of commercial occupancies.

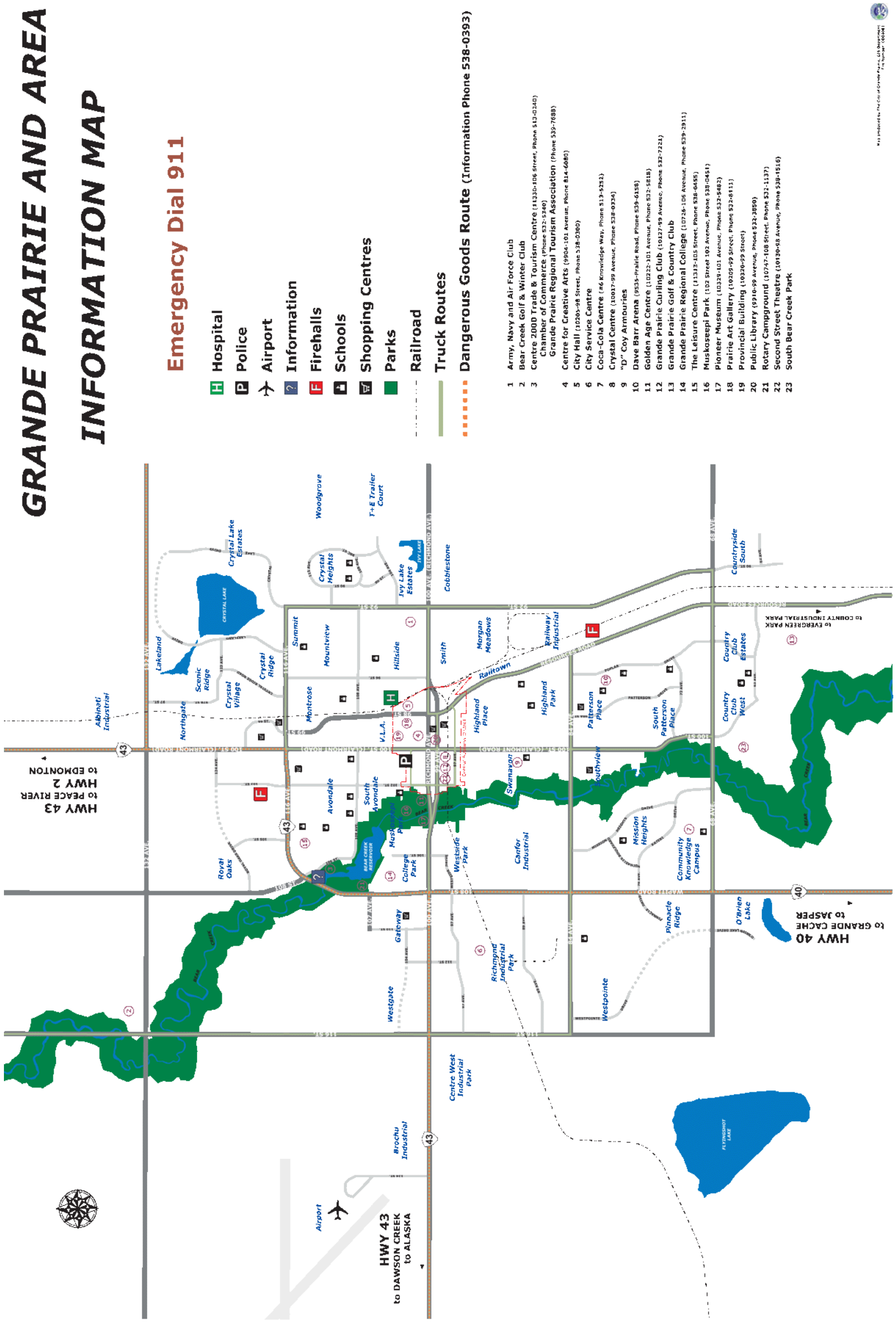
- The majority of new commercial occupancies appear to fall into three broad categories, big box mercantile, service occupancies and a boom in restaurants and hotel facilities.
- The big box stores represent potential large loss fires but they are usually confined to a single occupancy or as in the case of the ones observed in Grande Prairie, they meet the code requirements for rated fire separations. The existing and new commercial developments in the northern quadrant are well served by the existing north station but the high value western developments pose a response challenge for the two existing halls as this area continues to expand and cannot be adequately serviced by the two existing halls.
- The service industry facilities and occupancies appear to be rationally located and given their highly changeable uses the City of Grande Prairie has done a good job of controlling their use, but in a very active economy this takes constant attention to ensure zoning and code compliance (see Fire Prevention section of this report).
- The restaurant and hotel sector is a risk based on volume: despite growth in facilities there is still no capacity and that also factors in the Counties new additions.
- There is an apparent inflow of commercial/mercantile activity into the existing downtown core based on a revitalization strategy which is clearly working. Fewer transient and less recognizable businesses are occupying the old economic core including even fewer vacancies. This is mitigating a possible risk because routine building maintenance and standard loss prevention increase.
- Much of the construction in this sector is new and low maintenance now, but much of this construction has a relatively short life cycle and must be monitored to ensure

fire and life safety risks are not exceeding the original design criteria. To illustrate this, an example would be where a ‘stick built’ non 3.2.6.(ABC) hotel occupancy was proposed in another jurisdiction for conversion to an extended care facility and another as a health hotel to accommodate patients recovering from surgery.

2.5 Road and Rail Risk

- Roads were not brought up as a concern during the consultation process except for some comments on snow clearing but that was in reference to a record snowfall year. The road network is excellent with high capacity road widths and no obvious issues other than the number and location of rail crossings (addressed in respect of rail risk). This also extends to the county interface with the city as there are smooth transitions with no obvious changes in engineering standards on the main feeder routes.
- Rail is an issue as there are a high number of rail interfaces in the City which increase the overall risk in terms of emergency services. Active rail lines run past or through many critical facilities including:
  - directly behind the main fire hall;
  - in front of the hospital, and
  - parallel and in close proximity to downtown. Each situation is a level crossing.
- Rail is an important factor in the communities development and the railways need to be a partner in controlling incidents and improving access for responders.
- As this area grows importance and industrial complexity it may be time to encourage a TUC(transportation utility corridor in cooperation with the County and to include the future of Rail in that approach).

See map on next page.


GRANDE PRAIRIE AND AREA
INFORMATION MAP
Emergency Dial 911
Hospital
Police
Airport
Information
Firehalls
Schools
Shopping Centres
Parks
Railroad
Truck Routes
Dangerous Goods Route (Information Phone 538-0393)
1 Army, Navy and Air Force Club
2 Bear Creek Golf & Winter Club
3 Centre 2000 Trade & Tourism Centre
Chamber of Commerce
Grande Prairie Regional Tourism Association
4 Centre for Creative Arts
5 City Hall
6 City Service Centre
7 Coca-Cola Centre
8 Crystal Centre
9 "D" Coy Armouries
10 Dave Barr Arena
11 Golden Age Centre
12 Grande Prairie Curling Club
13 Grande Prairie Golf & Country Club
14 Grande Prairie Regional College
15 The Leisure Centre
16 Muskoseepi Park
17 Pioneer Museum
18 Prairie Art Gallery
19 Provincial Building
20 Public Library
21 Rotary Campground
22 Second Street Theatre
23 South Bear Creek Park
HWY 43 to PEACE RIVER
HWY 2 to EDMONTON
HWY 40 to GRANDE CACHE to JASPER
HWY 43 to DAWSON CREEK to ALASKA

2.6 Water Risk

The issue of water has created some of the most threatening incidents in Grande Prairie's history. Both flooding and the loss of potable water supplies have posed significant threats to the city and its regional partners. While much has been done to address these issues and Grande Prairie is seen as a leader on water issues the risk still remains that water imposes many variables in dealing with emergencies like when or where should the fire department revert to using gray water for firefighting during a supply crisis, what does a demand A or B scenario really look like and who should get potable water? The whole issue of water and its direct effects on the atmosphere and weather imposes a risk on the community. Record snow and rain falls potentially produce much more violent weather including tornadoes and other severe weather incidents which appear to be increasing in this region. While it is outside the scope of this report to deal with all the possible implications of the water and weather issues the Grande Prairie Regional Emergency Partnership report being worked on concurrently will include guidance on responses specific to water emergencies as this is so vital to public safety and well being.

2.7 Industry Risk

- The City has a mix of light medium industrial occupancies serving a number of industries including forestry, oil and gas exploration and pipeline servicing, along with ongoing support to agriculture, all of which are mirrored in the County at some level.

- The importance of Grande Prairie as a hub of the energy industry is just starting to be realized, with its ideal location for product gathering, upgrading and redistribution to northwestern ports. Planning and responding to this specialized growth will be the greatest challenge for emergency responders in the region.

- There needs to be a high degree of harmonization in terms of land use planning to maintain safe distances between residents and industry so responders can focus on the incident and not be absorbed by evacuations or health issues because people have been allowed in close proximity to industry

- While the City of Grande Prairie has no technical heavy industrial zoned risks there are existing risks which would be deemed equivalent including the log storage issue which requires continuous management and aggressive responses to mitigate the impact. While there is no technical measure to analyze this risk a worst case scenario in a very dry year with the right wind conditions could cause localized spot fires to spread over a narrow but significant portion of the community. In addition to direct damage there are significant air quality issues with this type of fire necessitating medical responses for those people who suffer from respiratory conditions. While these incidents have been managed well by responders in the past the threat remains a constant and it is the equivalent of having a large Wild Land

interface risk in the community, the only difference being that the fuel load is horizontal and tightly packed .

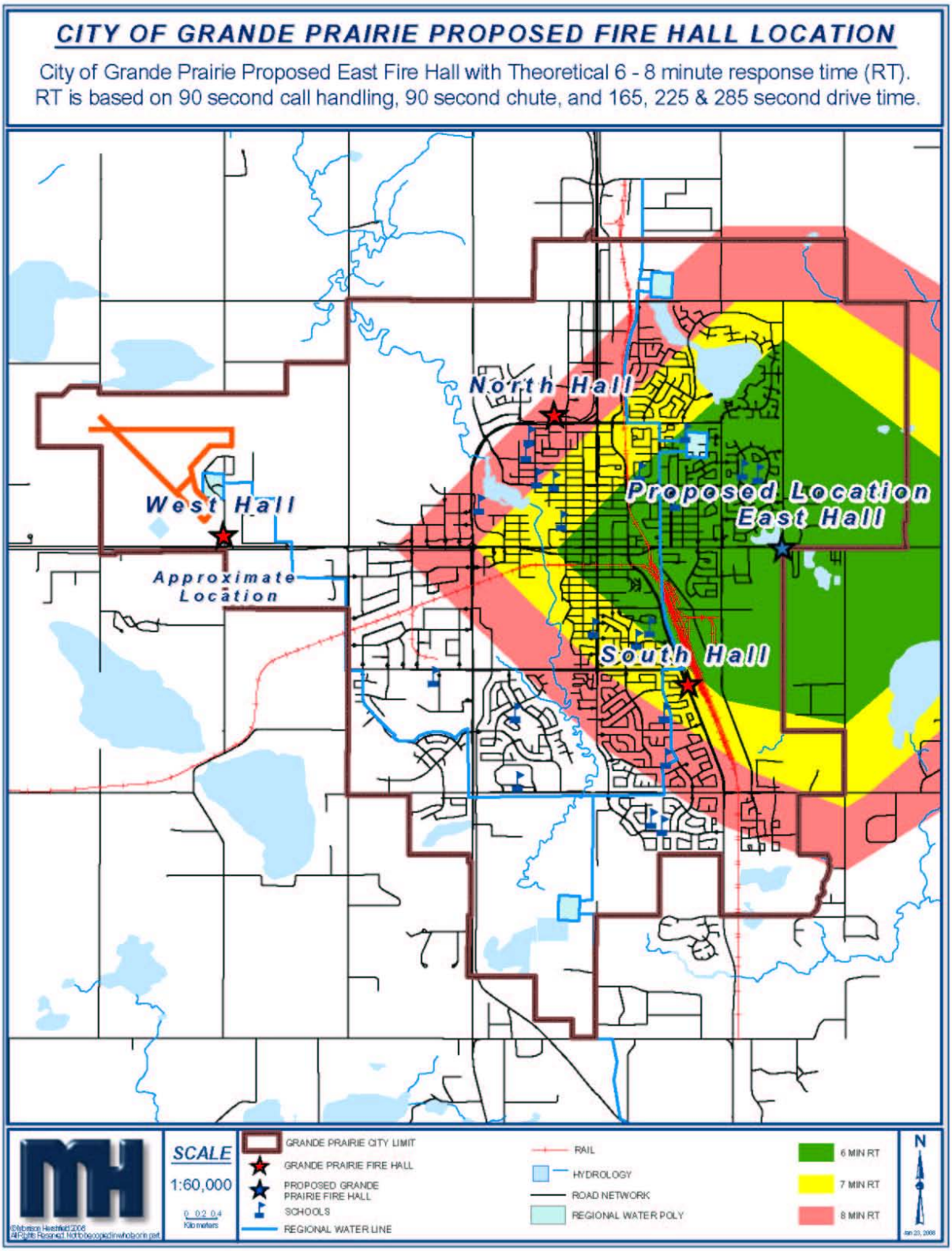
See Appendices for Land Use Planning approach.

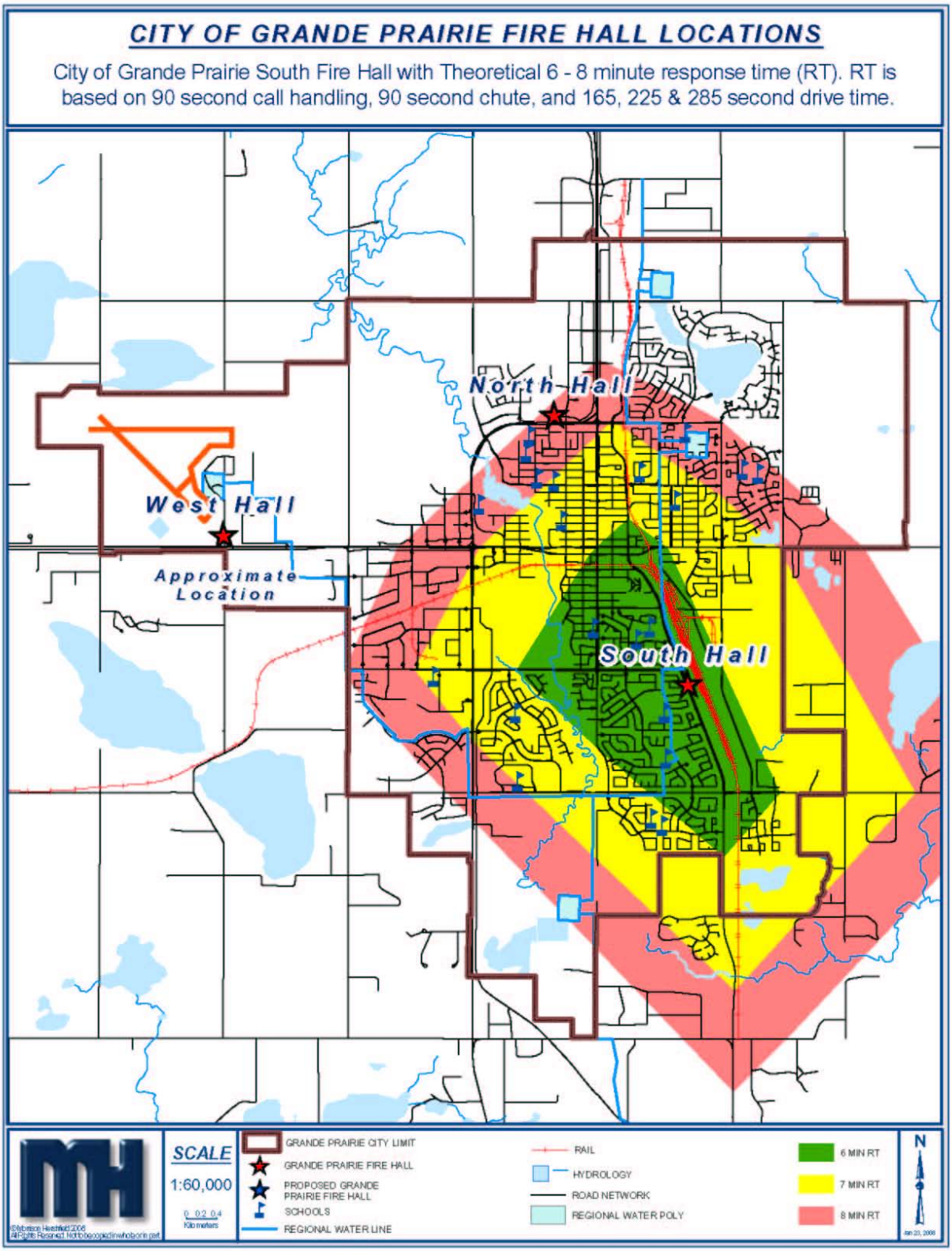
2.8 Air Risk

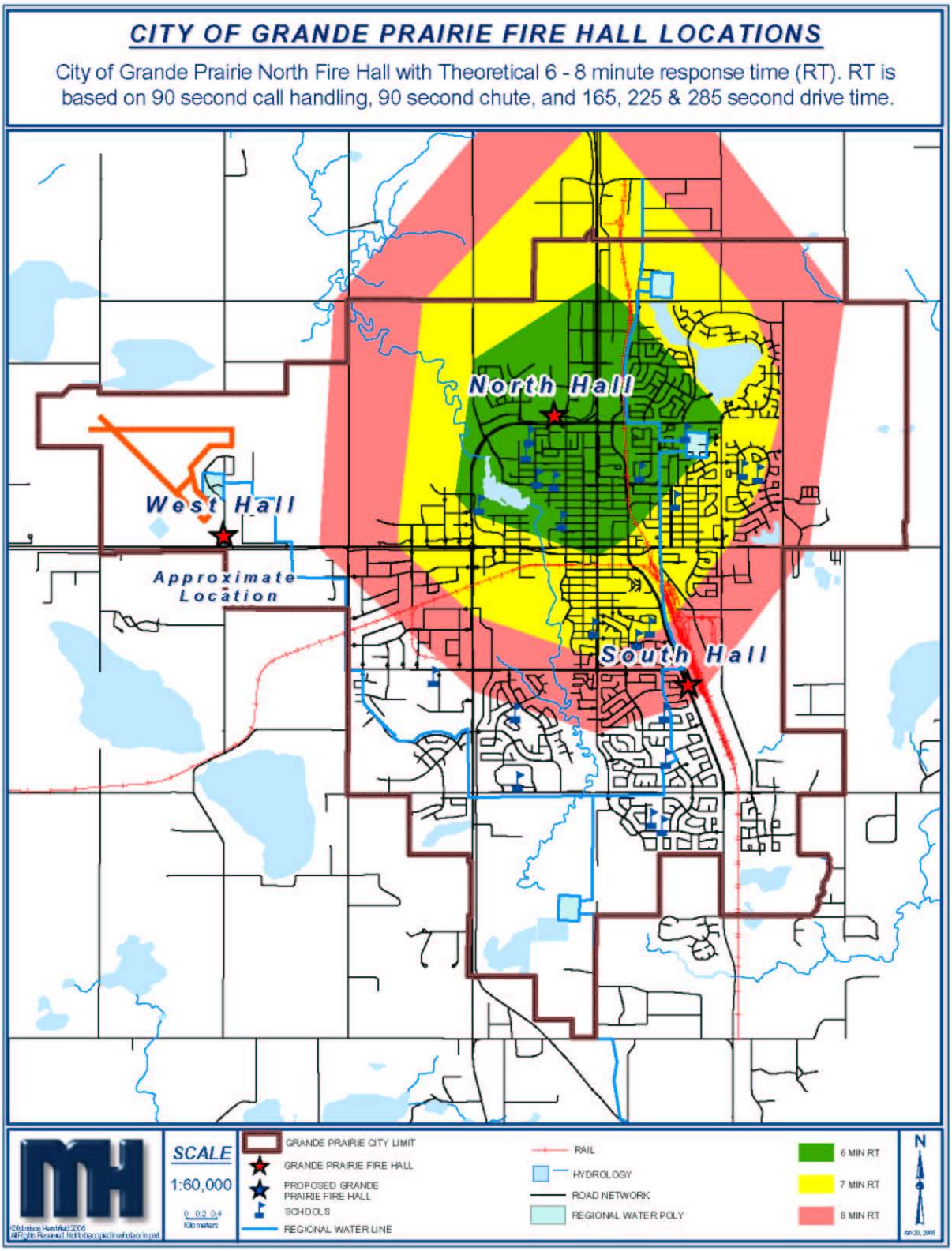
- The importance of the airport and air service was repeatedly pointed out by most stakeholders.
- The volume of passenger traffic at the airport will result in a change of airport category which will require a dedicated response capability for scheduled flights. The airport expansion also includes modifications to existing runways and other extensive airside improvements.
- The non airside light medium industrial area is continuing to grow at a rapid pace and it requires fire protection due to high asset value and the requirement to quickly deal with incidents to avoid interfering with the airside of the operation. The proposed western hall will be critical in mitigating this high value risk.
- Given the relative remoteness of Grande Prairie maintaining the air link is vital. The airport should be a pivotal partner in all emergency and disaster management up to and including the recommendation in this report to construct and staff a fire hall to handle both air and non airside incidents in this rapidly growing area of the region.
- The airport also plays a vital role in dealing with emergencies which may impact the city and the region including acting as the air attack base for combating wildland or other forestry related fires, supporting medical evacuations or other health related prerogatives' plus acting as the link for resources both human and material in an emergency. The management of the airport and their staff are well trained and highly competent at dealing with crisis situations and they are an asset in aligning the airports role in risk management as the air service grows.
- As the industry in the Grande Prairie region continues to intensify with an emphasis on becoming a major transmission and gathering point for oil and gas the airport will see a large increase in high value freight to serve the industry. The Port Alberta project (over 3000 hectares) at the Edmonton International Airport will have large spin off impacts on regional airports such as Grande Prairie.

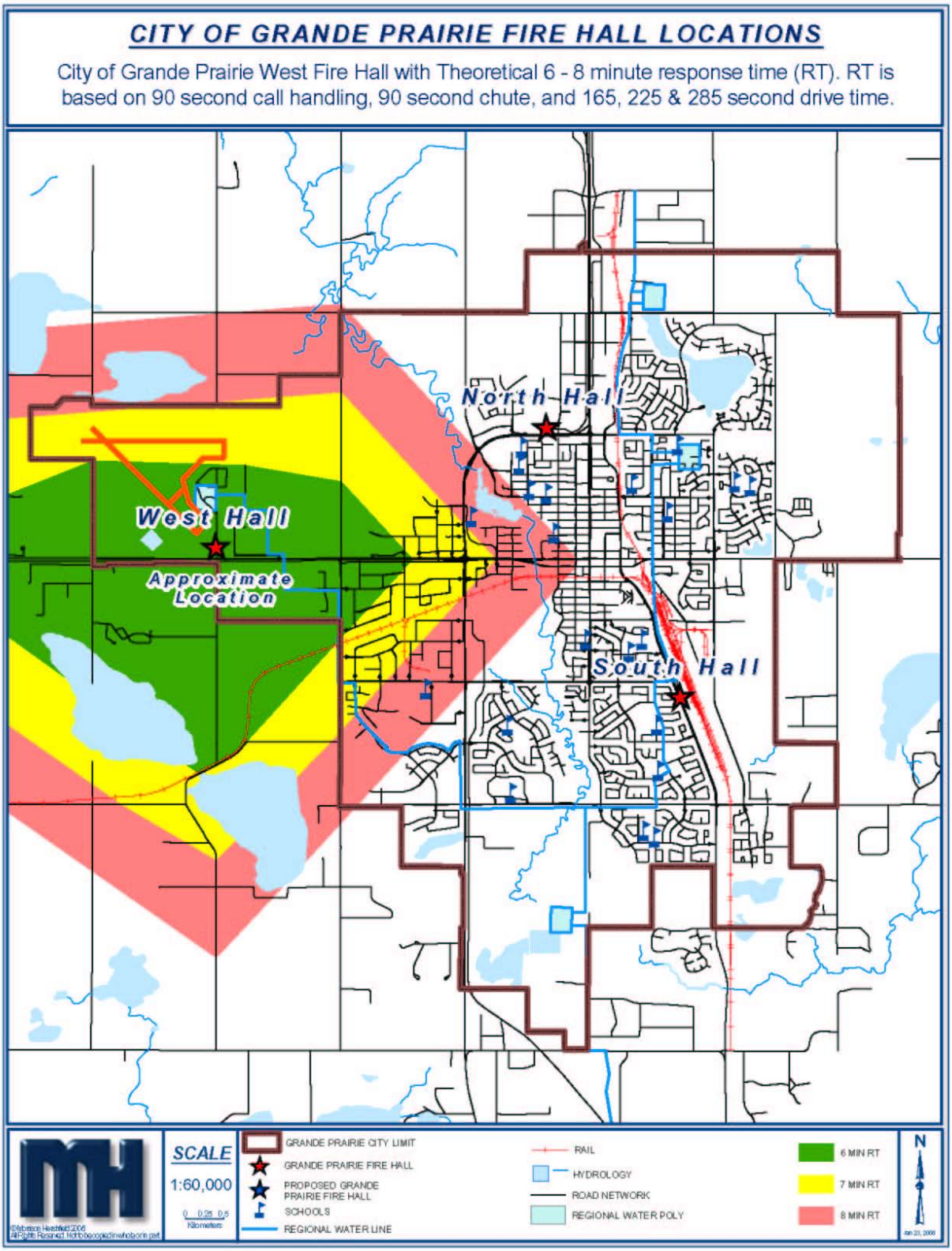
2.9 Additional Maps

From Bruce McBride


CITY OF GRANDE PRAIRIE PROPOSED FIRE HALL LOCATION
City of Grande Prairie Proposed East Fire Hall with Theoretical 6 - 8 minute response time (RT).
RT is based on 90 second call handling, 90 second chute, and 165, 225 & 285 second drive time.
North Hall
West Hall
Approximate Location
Proposed Location East Hall
South Hall
SCALE
1:60,000
GRANDE PRAIRIE CITY LIMIT
GRANDE PRAIRIE FIRE HALL
PROPOSED GRANDE PRAIRIE FIRE HALL
SCHOOLS
REGIONAL WATER LINE
RAIL
HYDROLOGY
ROAD NETWORK
REGIONAL WATER POLY
6 MIN RT
7 MIN RT
8 MIN RT
N


CITY OF GRANDE PRAIRIE FIRE HALL LOCATIONS
City of Grande Prairie South Fire Hall with Theoretical 6 - 8 minute response time (RT). RT is based on 90 second call handling, 90 second chute, and 165, 225 & 285 second drive time.
North Hall
West Hall
Approximate Location
South Hall
SCALE
1:60,000
GRANDE PRAIRIE CITY LIMIT
GRANDE PRAIRIE FIRE HALL
PROPOSED GRANDE PRAIRIE FIRE HALL
SCHOOLS
REGIONAL WATER LINE
RAIL
HYDROLOGY
ROAD NETWORK
REGIONAL WATER POLY
6 MIN RT
7 MIN RT
8 MIN RT
N


CITY OF GRANDE PRAIRIE FIRE HALL LOCATIONS
City of Grande Prairie North Fire Hall with Theoretical 6 - 8 minute response time (RT). RT is based on 90 second call handling, 90 second chute, and 165, 225 & 285 second drive time.
North Hall
West Hall
Approximate Location
South Hall
SCALE
1:60,000
GRANDE PRAIRIE CITY LIMIT
GRANDE PRAIRIE FIRE HALL
PROPOSED GRANDE PRAIRIE FIRE HALL
SCHOOLS
REGIONAL WATER LINE
RAIL
HYDROLOGY
ROAD NETWORK
REGIONAL WATER POLY
6 MIN RT
7 MIN RT
8 MIN RT
N


CITY OF GRANDE PRAIRIE FIRE HALL LOCATIONS
City of Grande Prairie West Fire Hall with Theoretical 6 - 8 minute response time (RT). RT is based on 90 second call handling, 90 second chute, and 165, 225 & 285 second drive time.
North Hall
West Hall
Approximate Location
South Hall
SCALE
1:60,000
GRANDE PRAIRIE CITY LIMIT
GRANDE PRAIRIE FIRE HALL
PROPOSED GRANDE PRAIRIE FIRE HALL
SCHOOLS
REGIONAL WATER LINE
RAIL
HYDROLOGY
ROAD NETWORK
REGIONAL WATER POLY
6 MIN RT
7 MIN RT
8 MIN RT
N

SECTION 3 RESOURCES

3.1 Human Resources

- The Grand Prairie Fire Department has a highly motivated well trained complement of professional firefighters and fire officers. The issues faced by the Department are similar to many others in that increasing call volumes and incident complexity are putting a strain on members to manage what is becoming a very busy system. Many of the recommendations in this report deal with the staffing issues facing the Grande Prairie Fire Department. Many demographic and career issues remain outside the strict realm of business planning as they involve significant personal choices by individual members. This can involve when staff choose to retire or if they stay on what incentives exist for their continued participation or where they see themselves in terms of possible promotion in the department. While the Grande Prairie Fire Department currently exhibits a high degree of career stability there are many possible changes which could impact recruitment and retention of people in the next 1 to 5 years with the greatest potential being in the officer ranks and the management team. It would be valuable for the department to set up a Succession Planning Team which, while respecting individuals right to choose their own future, would help to ensure their choices could be integrated into the overall direction for the department and potentially to the City as a whole.

- While staffing is a potentially serious issue at the in-scope officer level it could also become critical at the senior command and management team levels as candidates are very difficult to find even when engaging in full national and international searches. The earlier suitable candidates can commence their journey down this path the better, but it requires cooperation from the union and the membership as a whole to avoid this being perceived, accurately or not, as jumping ahead. A technique to avoid conflict in this area is to ensure that regular officer training and selection are not impacted in the process and that the career enrichment (such as acquiring a degree in business administration) remains external to the normal promotional system. As the Grande Prairie Fire Department already has a top of class training and development program this should be another component in the development process with the goal being a number of qualified diverse people ready to join the senior ranks of the department. One necessary qualification here is not to produce too large a pool or have the individuals peak too early, or they may leave to pursue their careers elsewhere. One outstanding advantage of a potential partnership in terms of a regional fire service is that it may allow for the building of an experiential base without candidates having to leave the region and still being able to apply their skills in the region. The bottom line is that members of the Grande Prairie Fire Department need to see this internal development as a positive approach by the department to minimize roadblocks presented to individuals taking this risk as there are no guarantees for them.

- One of the first issues the potential regional partnership will need to deal with is recruitment and retention in the broader service to avoid competing for scarce firefighter resources at all levels. If such cooperation does not exist it could have a negative impact on the Grande Prairie Fire Department's ability to recruit and retain staff in an already tight labour market. Given the demand for firefighters due to retirements and new full time services being implemented there will be a predicted short fall of over 250 qualified positions for the next two years provincially.

3.2 Apparatus

- The Grande Prairie Fire Department has a well equipped and maintained fleet of response apparatus.
- The replacement and reserve policies for the Grande Prairie Fire Department are amongst the best in the Province and no recommendations were made in this report to change them but rather to maintain and strengthen the current direction.
- As regional partnerships emerge there will be a need to harmonize and rationalize apparatus specifications to avoid incompatibility and potential non risk driven duplication. Because much harmonization already exists due to contractual arrangements, it is more a question of moving ongoing practice into the more collaborative shared risk partnership realm.

3.3 Equipment

- Our observations regarding the equipping of the Grande Prairie Fire Department parallel the comments on the apparatus; from PPE to appliances the level and condition of equipment appears to be excellent. On all station visits the overall level of care and maintenance was top of class and reflected the pride and professionalism of the members in maintaining their stations and their equipment. This is a constant battle in a busy department and more formal quality assurance measures will be required as the system and the number of stations grows. A particular concern will be the introduction of new or different equipment and how that is managed in the department or in the broader partnership as it appears new appliances and tools are showing up on a weekly basis.

3.4 Communications

The Grande Prairie Fire Department offers one of the highest performing E-911 call answer/dispatch centers in the province. This assessment is based on direct experience as the Grande Prairie Fire Department was the contractual backup for the Department which a member of the consulting team managed in Strathcona County. The performance of this dispatch center was flawless in terms of dealing with clients when Strathcona County would go off line either in planned outages or emergency situations.

- E-911 and Dispatch remain one of the most important elements in the entire emergency response system: it's where it all begins and ends in terms of productivity. This role within the Grande Prairie Fire Department is well supported at all levels within the department and understood by the highly competent staff who

operate the centre. The continued pursuit of high performers in this service will be very important for the Department and its potential partners as good dispatchers are if anything more difficult to find than good firefighters.

- Continued pursuit of quality management systems and compliance with relevant standards (NFPA 1221 and 1061) remains a challenge for all dispatch centers
- Perhaps no area is more impacted by technological change than dispatch: 15 years ago 95% of 911calls came from dedicated landlines. This has now dropped below 50% and that is just one of a myriad of fast paced fundamental technical changes and heightened public expectations affecting delivery of the service. Other major areas include:
- Data logging and legal transcription services;
- Possible shifts in radio frequency allocations (shift from vhf to uhf);
- New public alerting opportunities for reverse 911 as proposed by the CRTC (Candian Radio and Telecommunications Committee);
- Computerized fire and disaster management programs with dispatch as the process hub;
- Changing medical protocols ;
- New security and critical infrastructure requirements;
- Possibility of a new CAER partnership forming and working directly with industry in a dispatch and CNS(community notification system) role;
- More advanced GIS applications including AVLs (automatic vehicle locators) which are normally monitored by dispatch to determine closest available units, and
- Managing new potential satellite uplink technology and communications.

These are just a few of the challenges and opportunities facing dispatch, but in the Grande Prairie Fire Department given the level of the existing service, transitions will be far easier than for most . Indeed many smaller or less prepared operations are on the brink of going out of service as they cannot keep up with the pace of change. That creates an opportunity for larger more stable services such as Grande Prairie Fire Department to seek out new business and partnership opportunities which will arise over the next 5 years.

3.5 Mission and Core Services

The Grande Prairie Fire Department is one of the most advanced services in terms of setting service levels. In fact their policy framework(GPFD City Policy 80 – see

Appendices) was used as the model by the Fire Service Advisory Council (FSAC) in assisting with recommendations to the Minister of Municipal Affairs.

- This approach to high level policy setting assists council in setting realistic service levels without becoming involved in the actual operation of the department.
- The policy framework is open and flexible enough to deal with emerging issues and or changes in core services
- The relevant documents are simple and easy to use, avoiding the kind of confusion which can invite council to participate at an operational level causing potential issues.
- While the service level document is totally appropriate for use at the level intended it is clearly designed to be used in conjunction with a set of firm and definitive Standard Operating Procedures (SOPs) and Standard Operating Guidelines (SOGs).
- Work on this important component is already proceeding and is included within the recommendations section as the Firefighters and officers need a more structured approach to what services they provide and which ones they do not.
- The ongoing SOP, SOG review will deal with the safety issues in setting clear procedures and guidelines for firefighters and fire officers to keep them safe in the field and to avoid freelancing which is very dangerous for all responders. This does not mean that firefighters will not continue to take reasonable risks to save people and preserve property: it means that it must always occur in a clearly understood policy framework based on safety.
- The other protection afforded by the ongoing SOP/SOG review is that exposure to legal liability is greatly reduced. While it can never be eliminated, the City's commitment to this policy review is a wise and prudent investment. Certainly the City of Grande Prairie and the Grande Prairie Fire Department are acutely aware of the potentially damaging effects of legal action and how that can have far reaching impacts on relationships including in the case of the sawmill fire whose impact is still being felt today by both the City and the County of Grande Prairie
- In terms of this review the number and scope of core services delivered by the Grande Prairie Fire Department were all deemed to be appropriate and none are being targeted for elimination or addition as part of this report but that should not limit the requirement to scan services for their future applicability particularly as Partnerships grown in the region.

3.6 Operating Principles

This section will review the operating principles and procedures of the Grande Prairie Fire Department in the context of the business plan commitment to follow the recommendation to complete a review of all SOP's and SOG's used in the Grande Prairie Fire Department and with its immediate mutual aid partners.

The Grande Prairie Fire Department operating principles as reflected in the SOP's and SOG's are better than most departments in the Province but as with most they have grown through time and are in need of a systematic review to ensure consistent application for firefighter and Public safety. Only general comments and observations

will be made in this section as a separate review of this important component is already underway.

- Without clear operating principles it would be difficult to adopt any form of valid quality management program as recommended in this report so the SOP-SOG review is critical to engaging staff in a culture of continuous improvement and learning. The approach already being taken by the Grande Prairie Fire Department, to have this review done at the working level, is important so that members of the Department see this process as their means to directly deal with safety and quality issues before they get out of control and cause avoidable injuries and loss.
- Using the approach Grande Prairie Fire Department has adopted will allow the Department to share this process with other response partners including the County of Grande Prairie, the regional Health Authority, area industry and other external partners who are using the same or similar process's (City of St. Albert, AB; Strathcona County, AB, City of Yellowknife, NWT).
- The primary focus of the SOP/ SOG review will be to establish a performance based quality management system which will promote firefighter safety and improve public fire protection for the community and Grande Prairie Fire Department partners.
- The SOP/SOG project goal is to establish a process for ensuring that operational procedures are owned and revised at the provider firefighter level and that the system continues to change to meet current needs and conform to the Alberta Code of Practice for Firefighters (Fire and Explosion Occupational Health and Safety Regulations – FEX 003)

Several aspects of individual service delivery areas/programs are important to note.

- **Fire Fighting - Structural –** the Grande Prairie Fire Department continues to demonstrate excellent firefighting capability although as noted in this report and the recommendations the ability to mount a consistent attack is becoming problematic due to multiple call and personnel pressures. Although the raw fire rate continues to decline that trend is predicted to swing back upwards over the next 10-15 years as the housing stock ages and commercial properties undergo changes in use. As this volume increases Grande Prairie Fire Department will need to look at a formal call triage system to formally allow command to reassign resources based on risk. This will be of real importance when dealing with the multiple demands of serving both internal and external partner clients.
- **Firefighting - Industrial**- where ever possible this should remain the primary responsibility of the industry creating the risk. It is still important that the Grande Prairie Fire Department play a support role for industry to ensure that their residents are being adequately protected. As recommended in this report, a formal mechanism such as a Community Awareness Emergency Response (CAER) group should be formed to deal with industrial risk both for the city and its partners with a special emphasis on full cooperation with the County of Grande Prairie, right from land use

planning through to response protocols. Given the industrial growth potential in this region this may pose the single greatest risk element for the Grande Prairie Fire Department and its partners

- **Firefighting - Aircraft**- this report deals with this expanding role as a critical link to Grande Prairies future and the opportunities to work directly with the Airport in providing service to this vital commercial sector of the community, including all the rapidly growing areas around the Airport.

- **Firefighting - Wildland and Urban Interface**- this remains a concern on the Western and south-eastern reaches of the City, recognizing the horizontal forest in the light industrial zone. The Grande Prairie Fire Department has an excellent reputation in dealing with these incidents but maintaining liaison with SRD and partners is vital as these fires are characterized by their length and the number of firefighter's required to control them

- **Dangerous Goods Response**- the city and surrounding area have and will continue to experience DG incidents due to the expanding nature of linear risk in the region including roads, rail, pipelines, and power transmission. These incidents are difficult to quantify from a risk management standpoint as the event can occur anywhere along the line. It would be of assistance to the Grande Prairie Fire Department to look at where such incidents would have an impact and working with the proposed Community Awareness Emergency Response (CAER) group partnership assemble a linear risk register with response protocols. As industry in the region grows this may be an opportunity to form a joint partnership for DG response. The goal of such a partnership remains firefighter and public safety, not revenue generation or allowing industry to transfer the risk to the municipality which most responsible industries will not do. The Grande Prairie Fire Department should also create a policy frame work to review the service delivery around DG responses to delineate which activities are within the scope of the department and which are not and how to manage the risk gaps. This approach will also act as a catalyst for the department to determine its role in regional, provincially-funded CBRNE (chemical, biological, radiological, nuclear, and explosive) as these elements are potentially part of any full DG program. It is further recommended that the Grande Prairie Fire Department and its partners use NFPA 472 Professional Competence of Responders to Hazardous Materials Incidents as a minimum standard to negotiate service levels with the Province. This program area should be self funding in terms of equipment, training and direct response team allocations. If this does not occur a budget adjustment may be required. As part of the Provincial/Federal CBRNE initiative the Grande Prairie Fire Department role within the larger Grande Prairie REP proposal should be clarified in terms of joint command responsibilities and liaison with the RCMP and other orders of government to deal with security implications

- **Technical Rescue**- the department does a commendable job of providing technical rescue for a number of incidents and along with medical aid calls these services

account for the largest segments of call volume growth within the Grande Prairie Fire Department. This is also one of the fastest growing areas in terms of new techniques and standards for performing rescue. Given this growth and the complexity of this operational area the Grande Prairie Fire Department will need to review its current approach to training and staffing rescue teams as attempting to train everyone in all skills sets is no longer realistic given the technical requirements and the growth of the department. It is recommended that Grande Prairie Fire Department review its technical rescue program and team development on NFPA 1670 Operations and Training for Technical Rescue Incidents including awareness, operations and technician levels for each of the following service level approved categories.

- Structural collapse including heavy rescue
- Rope rescue (excluding high angle) and slope
- Confined space
- Vehicle and machinery
- Water
- Trench and excavation

- The technical rescue service also provides an ideal opportunity to work with partners including the County of Grande Prairie and industry to work together on rescue teams. As noted this is a growth area with many training and recertification requirements since no single team or department can handle all aspects of technical rescue. In addition many incidents will require multiple teams (a high angle with a person trapped in a vessel process tray will usually require two teams to ensure firefighter safety and proper victim packaging). There is also an issue of safety in training all members of what is becoming a larger multi-station department. As the frequency of many of these rescue incidents is low, any attempt to split the response experience between too many members will produce a very low experiential base, and training demands will then have to increase to ensure skills maintenance which is not occurring through applied experience.

- Given the complexity and diversity in this rescue field, plus existing or potential partnership opportunities, the major decisions on teams and service levels should be grown over the next two years for inclusion in the next business planning cycle. The two notable exceptions to this recommendation are the continued support for all Grande Prairie Fire Department firefighter's to remain at the highest practical skill levels for dealing with vehicle extrication and rescue, and continuing to fulfill the Grande Prairie Fire Department commitment to water rescue as a service level imperative.

- **Medical Aid -** this forms part of the reality for every department as they all deal first and foremost with saving people in extremis which means all departments are involved in care of people. There are many debates in the primary care community

about when patient care begins. This report does not deal with the debate on this issue but rather the practical outcome of ensuring proper care for victims until they can enter into the next higher or more appropriate level of care. While the level of cooperation with the medical community, particularly the QEII, is outstanding an even more formal team approach is recommended to deal with the impending changes coming from Alberta Health and Wellness particularly in terms of the about to be released Ambulance report which will have an impact on all the partners. The Grande Prairie Fire Department requires a policy framework to be developed with the Health Authority and the QEII hospital to clarify the next steps in primary care.

3.7 Community Service Considerations

Grande Prairie Fire Department has demonstrated a real commitment to overall community well being and these initiatives in health and safety are an important way to ensure the department remains an effective agent for improving the quality of life for both the City and the region. There is always a danger of overextending secondary services to the point where they impact on core service delivery, but if the SOPs /SOGs are built on a firm policy framework this should not create undue pressure on the system or the firefighter's who ultimately deliver the service.

- There are many exciting new approaches being taken in pre-hospital care and having the Grande Prairie Fire Department engaged in this process is important as the Department will continue to play a meaningful role as they are often the first and many times the only responders able to provide initial care. This will become even more evident as the region continues to industrialize where only properly equipped and trained (full fire resistant PPE with SCBA) responders can enter hazardous areas. This should be done in partnership with the Health Authority and industry to comply with safety standards for all responders and provide the best possible outcome for the patient. Using this approach could assist the Grande Prairie Fire Department in determining its service level in politically mandated CBRNE as the primary goal is to limit exposure for both potential victims and responders. All decontamination and other activities are predicated on health effects and this is a strong argument for fire departments to work with their health authorities to establish operational protocols. The training requirements for this important element needs to be considered particularly where joint team training could strengthen the bond between EMS personnel and First Responders in dealing with all incidents

- Other operating areas are covered separately in this section including Communications and Fire Prevention/ Public Education Activities.

3.8 Facilities

- As noted earlier in this report Grande Prairie Fire Department is to be commended for taking the bold and productive approach of pursuing a quadrant approach to station location. The two new stations covering the north and south quadrants are state of the art signature buildings which reflect the commitment the community has

to its Fire Service and the partners they serve. Given the growth and the activity level of the Grande Prairie Fire Department the remaining stations should be brought on line as soon as practical as the system is incomplete in terms of protection until the west and east halls are operational.

- This report clearly identifies the need for the west hall to be the priority given the values at risk (VARs) in this sector and the critical partnership with the airport in terms of moving up category, which requires an on duty firefighting commitment during scheduled flight activities. The level of commercial, industrial and public occupancies in this zone requires protection now and as the highest potential growth node for high value medium to high risk developments. What appears to be on the periphery now is predicted to look much like the growth in the Clairmont area of the County of Grande Prairie which ten years ago was a four way stop and now is a booming economic zone. While the Airport may limit some types of growth based on TC (Transport Canada) regulations such as limiting building height it also presents great growth opportunities including industrial and service occupancies that require quick travel or freight services. Many of the light/ medium ABC(Alberta Building Code) F2 occupancies, VARs(Values at Risk) have limited fire defense capabilities and require rapid intervention by fire crews to limit property damage or potential fire spread to exposures. This differs from high buildings and assembly occupancies in the downtown core where compliance with the provisions of the ABC under section 3.2.6(high buildings) provide for these buildings to defend against fire by both compartimilization and fire separations with active suppression systems which require FD support. A sub recommendation of this report is that the Grande Prairie Fire Department adopt a risk management approach to deal with the various occupancies following a best practice system such as the UK " Fire Service Emergency Cover -- Description of the Risk Assessment Process" as published by the Office of the Deputy Prime Minister, Fire health and Safety Directorate, Fire Research Division. The strength of this work is that it provides both a quantitative and qualitative approach to the process of assessing risk from fire in "other buildings" which are those buildings such as offices, ,commercial shops ,and hotels, where there is the potential for significant loss of life (societal risk) or significant financial loss (property, heritage or environmental risk). Also this approach includes properties such as Houses in Multiple Occupation (HMOs), where blocks of apartments and tenement buildings are deemed to be potential societal risks even though they are clearly dwellings.

3.9 Societal Life Risk

- Societal Life Risk is the risk that a number of persons will be killed in the same fire incident. In the UK planning process six or more fatalities constitute a Societal Risk incident. The probability of such an incident depends, in part, on the number of occupants at risk in the building. Three ranges of numbers of occupants at risk are considered: 20 to 99, 100 to 999 and 1000+. It is assumed that 85% of the

occupants will evacuate safely, so only the remaining 15% are considered to require FD assistance to evacuate.

- The assessment process consists of estimating the Societal Risk in a sample of the buildings in an area from the results of building site assessments. This is done for six four hour time periods to take account of the variations in the number of occupants.

- For each four hour time period, the analysis adds together the societal risk posed by all the target buildings and occupancy types in the surveyed risk group. The resulting societal life risk in the risk area is then compared with the UK national risk criteria. These criteria determine whether the risk meets or exceeds the “action level”, where a suitable level of fire coverage must be provided to keep risk to tolerable levels.

- Determination of tolerability of risk is based on the societal risk criteria. Where the risk is above the action level a response time of five minutes is specified for resources to arrive and commence rescues. Determination of resources required takes into account the associated firefighter, property, environmental, business continuity and heritage risks.

- Where the societal risk level is not above the action level, no specific response time is set. Response to these risks is based on the basis of cost effectiveness-apparatus is sited according to the Departments service level commitment this includes Hall location.

- The toolkit considers property loss, heritage loss and business continuity in terms of potential financial loss. The maximum property loss is predicted using the maximum probable loss in terms of floor area, combined with UK wide costs per unit area for each type of building and the assessment of the building risk to other buildings of that occupancy type. In Strathcona County for example, used this model to determine planning parameters based on HSE (Health and Safety Executive in the UK) to establish permitted and discretionary land uses based on EPH (Equivalent Persons per Hectare).The effects of heritage hazards and business continuity are also included by scaling up the cost per unit area. Property risk is not assessed relative to tolerability criterion. The appropriate response for a property fire must be solely on cost benefit grounds and shall not endanger firefighters lives or health

- The process takes account of these critical elements by drawing them to the attention of the cover(age) planner(s), so that appropriate provision can be made, to ensure that the response is adequate for firefighter safety as well as providing resources for firefighting and environmental protection

- In order to determine the resource requirements, all of the site assessments in each area need to be considered. Several hundred may be made by a Department so a spreadsheet has been developed for each area and for each type of occupancy. This identifies those sites which account for 80% of the societal and property risk loss

- For all these sites an estimate is made of the major firefighting resources likely to be required for each target hazard. This estimate is based on general assumptions about the relationship between fire size, the number of predicted rescues, the number of storey's and the number of adequately staffed apparatus including aerials, and required PPE. As a final step there is a calculation which determines the maximum number of these resources required to cover all of the sites of that occupancy type in that area for societal risk day (8 am to 8 pm), societal risk night (8 pm to 8 am) and for property risk.

- These estimates of resources are then used as the basis for creating WCPSs (worst case planning scenarios) for each building occupancy in each response zone.

- The UK Coverage Risk approach should where practical be considered for adoption by the Grande Prairie Fire Department and its partners as it is a full cycle risk program from planning through response and back to planning. There are separate tool kits for every emergency response activity from dwellings, Dangerous Goods through Technical Rescue and Disaster Management.

- This risk based approach is supportive of the quadrant approach to fire hall placement as it does not over focus resources in city core areas which have far lower fire rates based on higher levels of built in protection. In the UK for all buildings in this class the net fire rate for occupancies with 20- 99 occupants was 0.0206 or 1 criteria fire every 49 years per occupancy where for buildings with from 100-999 occupants the rate drops to 0.000233 or 1 fire every 4300 years at 1000+ the rate drops even further to 0.000144 or 1 fire every 6950 years averaged for all occupancies. Many Departments over protect their low risk cores while providing marginal services to their fast growing and higher value risk growth areas. The Grande Prairie model is a bold far sighted approach which should avoid many of the mistakes made by other more traditional department who deal with long responses from centralized stations in clogged cores trying to respond to high frequency and high risk occupancies in their growth areas. The Grande Prairie Fire Department was also designed to encourage regional shared service with critical partners in the County of Grande Prairie .This only works up to potential if the services are within meaningful intervention times for response into the County of Grande Prairie and vice versa when the City requires assistance from the County.

- To support the recommendations in the report regarding these pivotal partnership opportunities the County and its partners should be engaged in the facility design process to avoid duplication and maximize synergies between the Departments.

SECTION 4 GAP ANALYSIS

4.1 Governance

An important gap in the current situation is the absence among decision makers and stakeholders of a shared understanding of the factors that influence choices regarding governance of emergency services, and also with a common starting point for discussions regarding how best to govern delivery of these services in the Grande Prairie region. There are four sections to this discussion.

- Nature of the Service – key attributes of emergency services, and the implications of these attributes for governance design and change initiation and management.
- Key Dimensions of Current Reality – those aspects of current reality that are particularly relevant to governance.
- Governance Alternatives and Structures – identification of specific alternative approaches to governance in an emergency services environment.
- Recommendations – specific recommendations regarding the way ahead, for consideration by decision makers and stakeholders.

4.1.1 Nature of the Service

Several aspects of emergency service delivery are especially relevant to consideration of governance options.

4.1.1.1 The Service Delivery Screen

The fundamental reality of service delivery in this environment is that those in need of emergency services assume, quite reasonably, that the most senior decision makers, using advice from trained professionals, have put in place the arrangements needed to ensure ongoing service delivery. As shown in figure one, service recipients expect to see and receive fire, police, ambulance and related services. They are indifferent to the arrangements made behind the screen to provide these services, as long as effective services are there when needed in a manner that does not create an unreasonably large economic burden.

4.1.1.2 Influences on Service Delivery

There are a number of important influences on the design and delivery of these kinds of services:

- **Physical Reality –** the physical realities of service delivery (distances, access issues, natural and man made barriers), including location and nature of high risk facilities (plants, large elderly care facilities etc), major attributes of topography (rivers, natural barriers, relevant distances from resource locations and sources of risk) and future development plans, both 'on the books' or speculative.

- **Resource Reality –** the realities of currently available resources (quantity, quality, deployment) including location and profile (people, equipment, buildings and related facilities' such as training facilities).
- **Other Participants –** the status and capacities of others involved in or able to affect service delivery (resources, responsibilities, key policies and practices) including key participants (health region for EMS for example) and details of current relationships and arrangements (such as mutual aid service agreements). Who is responsible for what, and who can do what?
- **Policy and Practice –** current policy and practice of service providers (service standards, delivery policies and practices) as reflected in relevant policy documents (such as bylaws, statements or commitments made regarding nature and levels of service, standard operating procedures, and development practices). Also includes any relevant studies or other activities that collected data or produced recommendations in respect of emergency or related services
- **Activities and Experience –** attributes of current service delivery (call volumes and types, experience trends, significant incidents) and nature and level of activity over the last number of years, as well as any analysis done or conclusions reached in respect of recent experience (trends, anomalies, surprises) for all elements of emergency response.

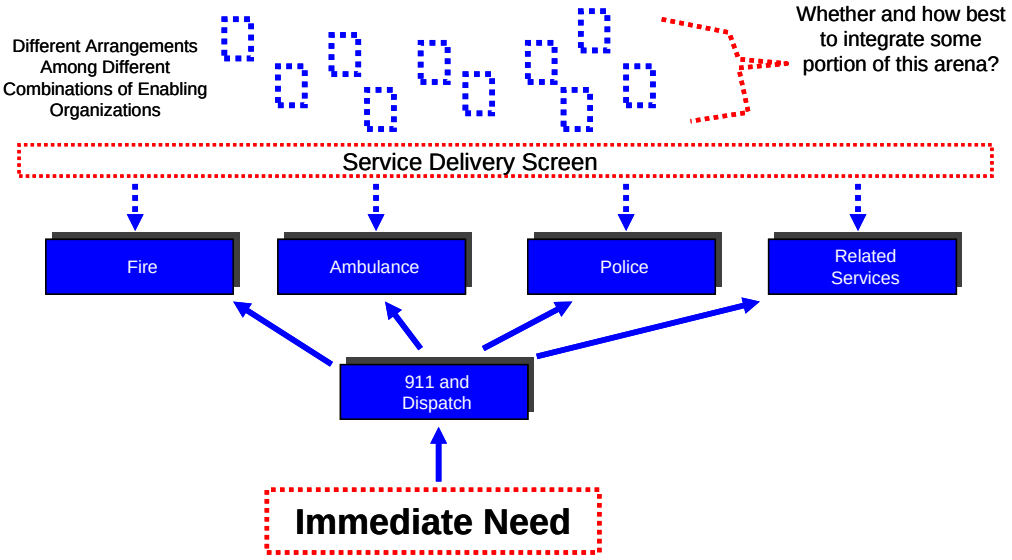


Figure 1 – The Service Delivery Screen

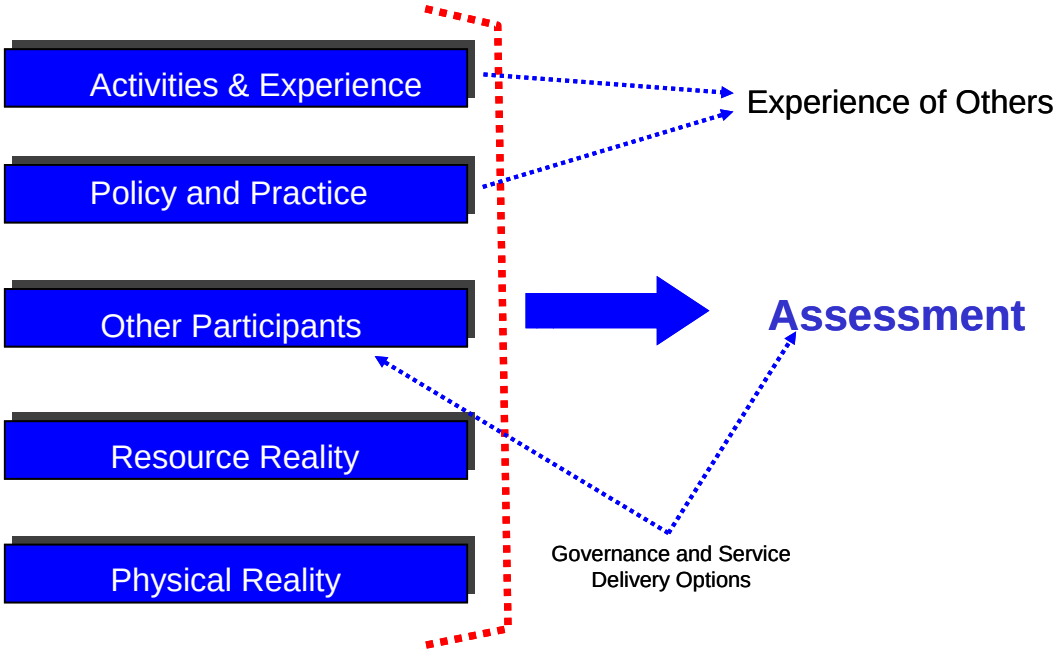


Figure 2 -- Elements of Service Delivery

When looking at the overall effectiveness of service delivery, including optimization of governance arrangements, it is important to consider all of these factors. They vary significantly from one situation to the next, and therefore limit the extent to which a solution used in one area can be replicated in another.

The scope of discretion regarding risk management also varies significantly across these dimensions of service delivery. In each case there are practical targets that are likely achievable, manageable risks that can be addressed with informed allocation of appropriate resources, and risks that are simply unavoidable. For example, much of the risk arising from physical realities is not manageable in any meaningful or cost effective way, and thus must be considered unavoidable. On the other hand most if not all of the risks arising from inadequate or inappropriate policies can be addressed by changes or refinements to those policies. The challenge is to ensure that efforts are directed at those areas where impacts and risk management payoffs are likely to be the greatest.

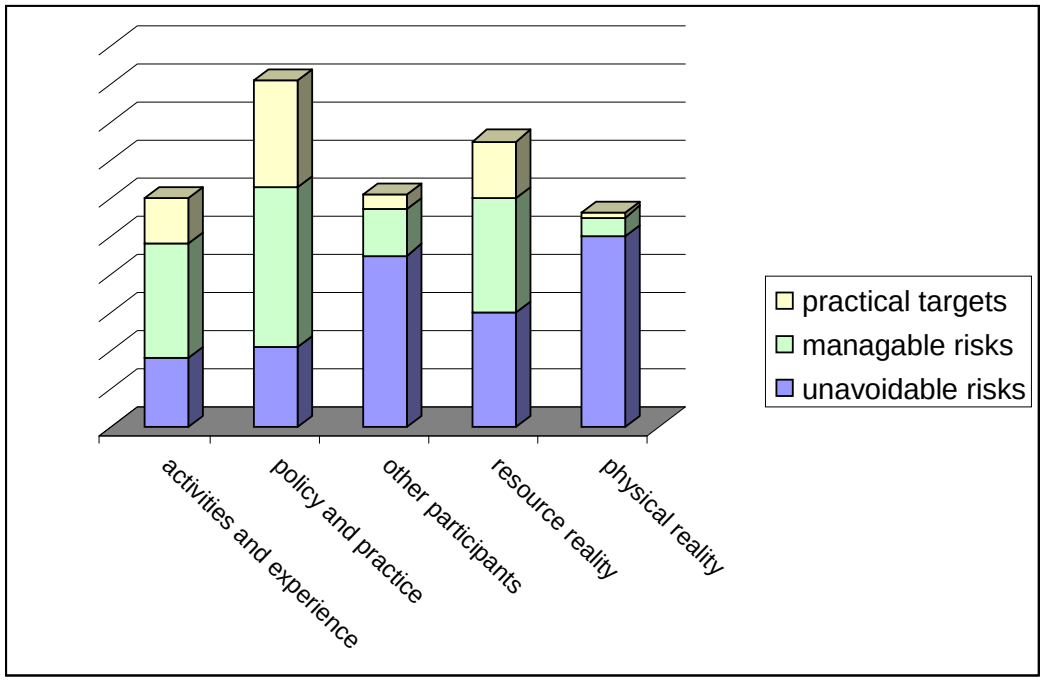


Figure 3 - Scope of Manageable Risk

4.1.1.3 Effective Risk Management

Although on-site emergency response is the most visible aspect of service delivery it is important to remember that effective delivery of the whole risk management cycle is the key to overall service delivery. As illustrated in figure three those responsible for service delivery must carry out several interconnected functions to ensure effective service delivery.

- **Identify Risks** – the process of specifically identifying hazards and the risks arising from those hazards. Answering the question "What risks do we face?"
- **Assess and Rank Risks –** assessing the nature and magnitude of identified risks. Answering the question "What is the relative importance of the risks we face – and which can or must we try to manage?"
- **Develop Risk Management Strategy –** identification of feasible risk management strategies for addressing priority risks. Answering the question "How will we manage these risks and what tools and strategies will we use to do so?"
- **Allocate Resources and Implement –** identification and allocation of the resources needed to carry out the agreed risk management strategy. Answering the question "Exactly how will we deploy the resources associated with our chosen risk management strategy?"

- **Measure Results –** the process of measuring the effectiveness of the chosen strategy using measurement tools and data agreed in advance. Answering the question "Did our chosen strategy work, and if not why not?"

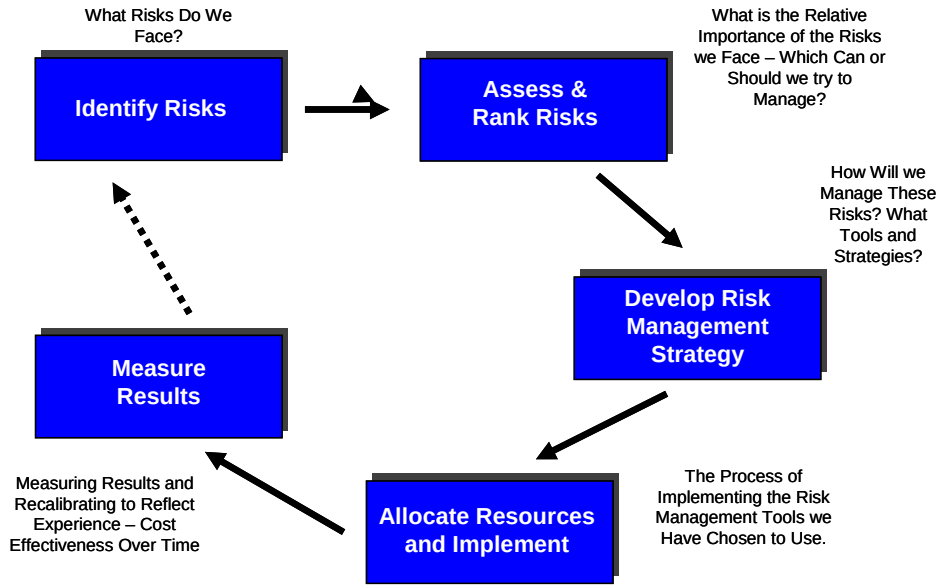


Figure 4 - The Risk Management Process

4.1.1.4 The Response Sequence

The process through which service is actually provided is a tightly knit interdependent sequence of events that must operate as a unified whole if effective service is to be provided. It is very much a chain, and one weak link can severely undermine overall effectiveness. Figure five illustrates that different aspects of overall service delivery are especially important at different stages in the process.

- **Alarm Time and Dispatch Time –** at this point the reliability and sophistication of the communications technology being used is especially important. This includes not just technology being used in the call centre or equivalent, but also by both service providers and service recipients.
- **Turnout Time and Response Time –** at this point the nature and location of buildings and related structures is very important. A well layed out and organized facility, in the right location, can have on huge impact on how long it takes to deploy a response.
- **Intervention Time and Intervention –** the appropriateness and operating condition of equipment will have a huge impact on the timeliness and effectiveness

of the on site Intervention. Arriving in a timely fashion with the wrong or poorly maintained equipment will achieve little.

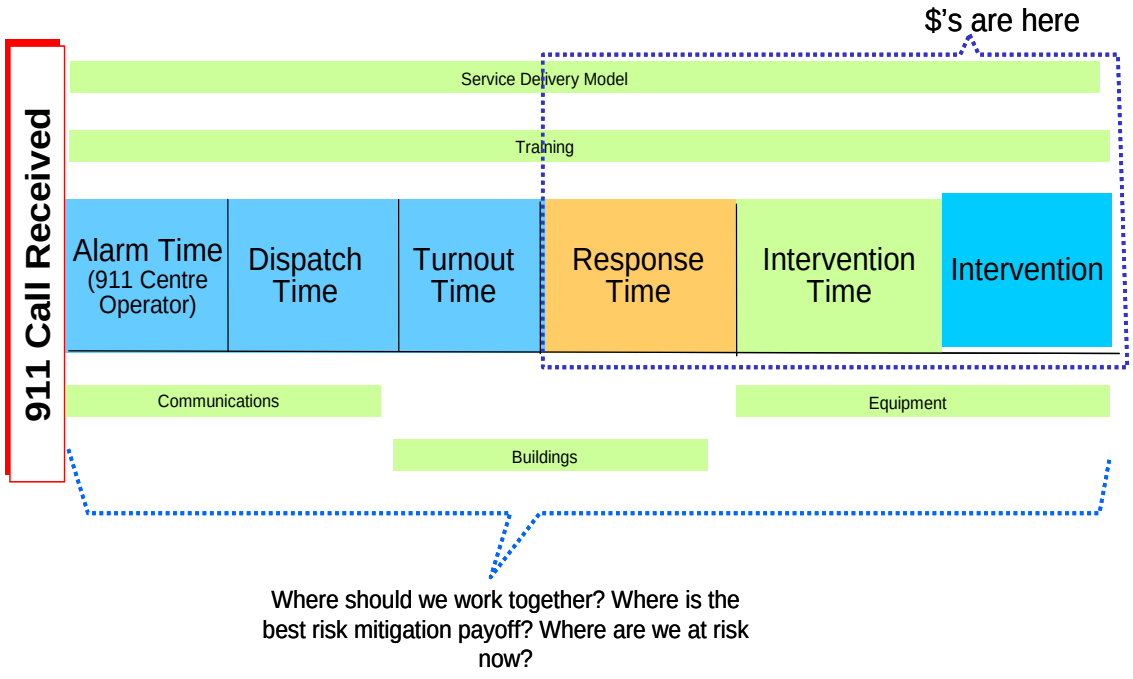


Figure 5 -- The Response Sequence

In addition to these element specific factors, there are two factors whose influence spans the whole response sequence.

- **Service Delivery Model –** the service delivery and governance model will determine the extent to which the overall response sequence is viewed and governed as an integrated process. At one extreme, elements of the process can be governed and managed as discreet entities, (such as dispatch) while at the other there can be a 'whole process' approach that recognizes the integrated nature of the process by managing it as a single whole.
- **Training –** training is the overall 'glue' that holds the process together, for the effectiveness of the whole sequence depends on there being fully qualified people in place to carry out the functions necessary at each stage. A state-of-the-art call centre is useless if staff is not properly trained. State-of-the-art on site equipment is useless, and even dangerous, in untrained hands.

It is also important to recognize that level of investment, operating costs and system flexibility all vary significantly across the sequence. For example, once a particular building is located and equipped it will be expensive and time consuming to make changes. On the other hand technology continues to evolve, with increased flexibility and cost effectiveness.

4.1.1.5 High Reliability

Organizations that must operate successfully in environments where management systems and supporting technologies and processes, the service environment, and the interactions between them are very complex, and the consequences of failure are very significant, are called 'high reliability' organizations. Nuclear and other power stations, hospitals, and emergency response organizations are prototypical examples of this kind of organization. It is important to understand the major characteristics of these kinds of organizations, for they affect available options and optimum choices in respect governance and change management strategies. Figures six and seven illustrate these key characteristics.

- **They Do Not Simplify Reality –** these kinds of organizations do not, and cannot afford to, simplify the realities they face. In particular they take these approaches on an ongoing basis.
    - Recognize and accept complex chains of events.
    - Acknowledge reality is messy – accept and embrace complexity.
    - Recognize they are working with tightly coupled systems, and that interactive complexity creates interdependencies (like the response sequence discussed earlier).
    - Recognize that coupling of systems produces hard to foresee or prevent events, and a potential 'cascade effect' once an event begins.
    - Recognize that systems are complex because they involve;
        - Processes and individual components;
        - People and culture; and
        - Organization command and accountability structures.
    - Recognize it is possible to have safe components that do not add up to a safe system.
    - Recognize reliability does not equal safety; an inherently unsafe system can operate very reliably.

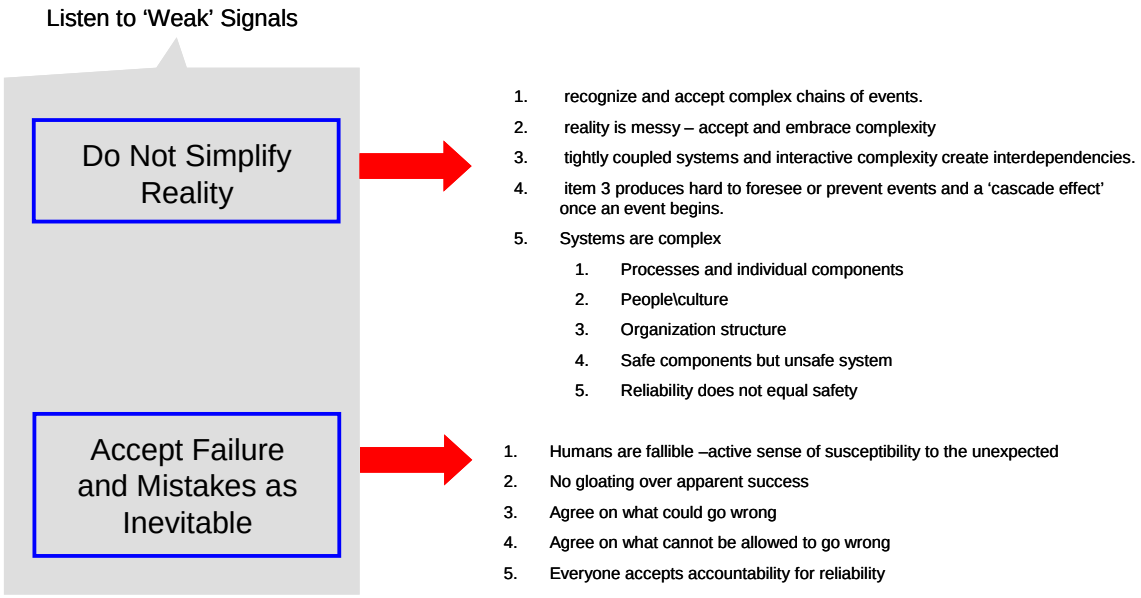


Figure 6 - High Reliability Attributes

They Accept the Inevitability of Failure and Mistakes – highly reliable organizations are not naïve about the likelihood of failure and mistakes. While they work extremely hard to avoid failure and mistakes, they accept this fact as they do the reality of complexity, since the two are inextricably linked. In particular they accept that:

- Humans are fallible and must maintain an active sense of susceptibility to the unexpected;
- There is no room for gloating over apparent success;
- There needs to be agreement on what could go wrong;
- There needs to be agreement on what cannot be allowed to go wrong; and that
- Ultimately, everyone in the organization must accept responsibility for reliability.

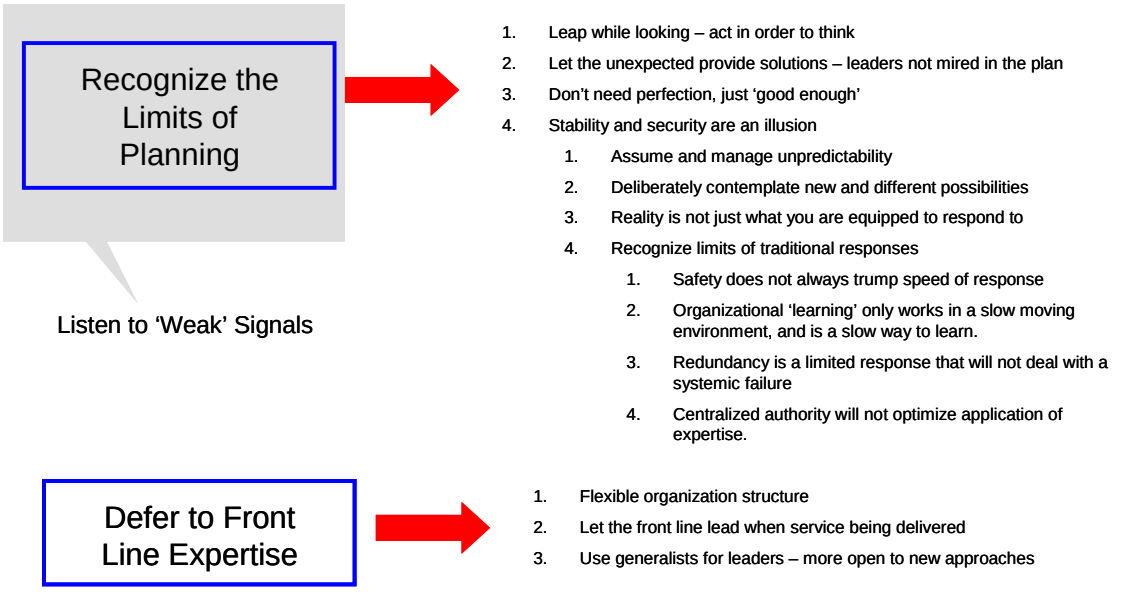


Figure 7 - High Reliability Attributes

- **They Recognize the Limits of Planning –** planning for high reliability organizations is tempered by the need to recognize the limits of planning in this kind of environment. These kinds of organizations approach planning with a particular mindset.
  - Leap while looking: because of the risks of inaction, one must occasionally 'act in order to think' with or without a plan.
  - It is not unusual to let the unexpected provide solutions; leaders should not get mired in the plan if reality provides different feedback.
  - Perfection is not necessary (given the time and effort needed to achieve it). Often it is fine to be just 'good enough'.
  - Stability and security are an illusion, as is planning to achieve them. Assume unpredictability and constant change and manage and plan accordingly.
  - Deliberately contemplate new and very different possibilities.
  - Reality cannot be defined as just what you happen to be equipped to respond to.
  - Always recognize the limits of traditional responses, by accepting that:
    - Safety does not always trump speed of response;
    - Organizational 'learning' only works in a slow moving environment, and is a slow way to learn;

- Redundancy is a limited response that will not deal with a systemic failure; and
- Centralized authority will not optimize application of expertise.

- They Defer to Front Line Expertise – high reliability organizations recognize and nurture front line expertise.
  - Organization structures are flexible, and designed to ensure front line expertise is a direct part of decision-making processes.
  - When actual service delivery is underway, those with the front line and\or technical expertise are encouraged to provide leadership.
  - The importance of front line and technical expertise is balanced with recognition of the need for generalists at key leadership positions, in order to ensure openness to new approaches and environmental realities.

If there are key messages or themes embedded in the realities of this kind of organization it is (1) their need to listen to 'weak signals', those small variances within processes and the unanticipated trends in performance or service needs that might be the precursor to much more significant changes and needs, and (2) the limits of planning and the perils of managing change in an environment of complex and not always clearly understood processes and linkages.

4.1.1.6 Layered Change

A significant consequence of operating in a high reliability environment is a very measured approach to change. The overriding need to continue to provide high quality service in a high reliability situation means that change must be carefully planned, and even more carefully carried out. As figure eight illustrates, there are three categories of change to be considered.

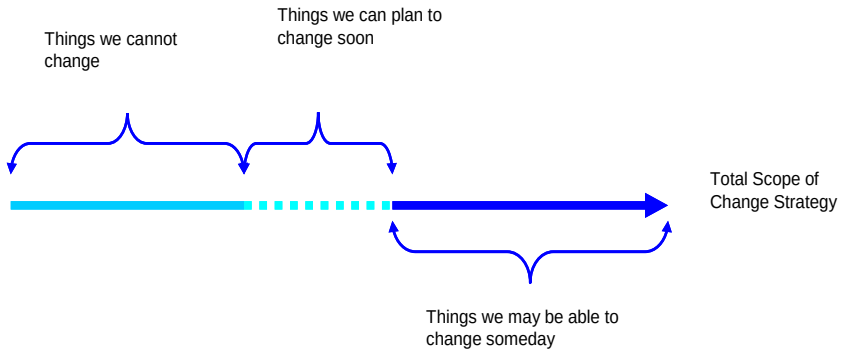


Figure 8 - Elements of Change

- **Things We Cannot Change –** some dimensions of service delivery are simply beyond the scope of change. For example, the fact that service requires an integrated and specific sequence of events to be carried out by competent individuals is not subject to change, unless one is prepared to live with poor or nonexistent service.
- **Things We Can Plan to Change Soon –** some things can be changed rather quickly. For example, a need for specific training or equipment can be addressed directly and likely quite quickly if there are resources available to do so.
- **Things We May be Able to Change Some Day –** some things can be changed, but it will take time to do so. For example, changing the overall governance model for service can be done, but will take time and the direct involvement of stakeholders and decision makers.

4.1.1.7 Opportunities and Capacity to Collaborate

Opportunities to collaborate with others in service delivery are heavily influenced by the amount of standardization and commonality inherent in the service itself. Where the degree of commonality is significant (agreed overall objectives, priorities and standards, common technology and technical language, standardized training, and agreed performance metrics supported by reliable data) there is a significant opportunity to create and work within collaborative structures: the underlying service delivery platform is shared. As illustrated in figure nine, the emergency services environment is supported by such a platform, and therefore represents a significant collaboration opportunity.

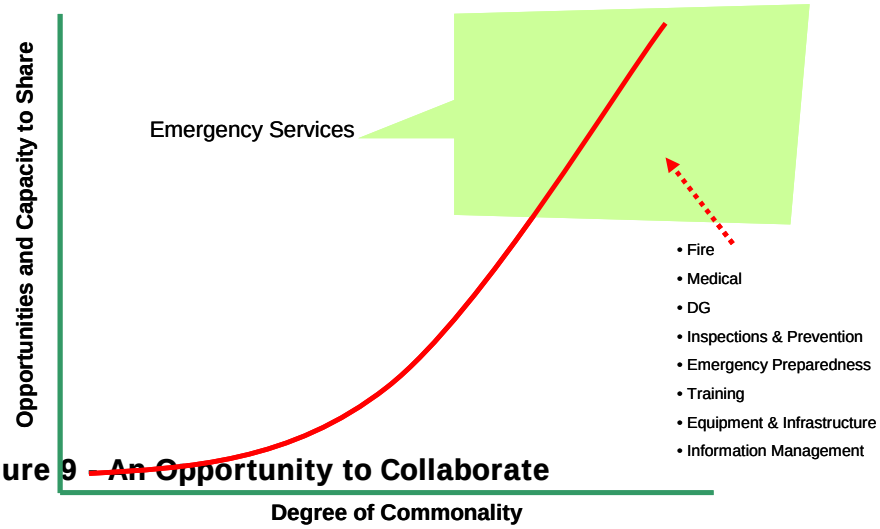


Figure 9 – An Opportunity to Collaborate

4.1.1.8 Themes and Implications – Nature of the Service

A number of governance related themes and influences emerge from the key service attributes we have identified.

- **Complexity –** the governance mechanism must effectively address complexity, for this service delivery arena is complex from a number of perspectives.
  - A wide range of arrangements and relationships can be used to deliver service: end users do not care about such arrangements, only delivery of cost effective and reliable service.
  - There are wide range of influences on service delivery, from geography to equipment and training to policy and practice.
  - Service is delivered in a high reliability environment, which while complex, must also 'deliver' all the time.
- **Scope –** the governance mechanism must be capable of addressing a broad scope.
  - It should address all aspects of two critical processes, risk management and response.
  - Because this line of service is based on a shared platform (objectives, priorities and standards, common technology and technical language etc) it represents a significant opportunity for broadly collaborative approaches to decision making and governance. The governance mechanism should build on this reality.
- **Change –** the governance mechanism must be capable of reliably identifying the need for change, and ensuring change is carried out in recognition of the particular realities of this line of service.
  - Service is delivered through an integrated process: change in one part affects all parts, and some parts can be changed more quickly and easily than others.
  - Because the arena is high reliability, change cannot affect the integrity of day-to-day operations.
  - Identification of the need for change must be driven from a 'constant learning and monitoring' environment.
  - Plans, and plans for change, must be tempered by the recognition that this arena can be greatly affected by the unexpected.
- **Communication –** the governance mechanism must operate such that communications channels are efficient and effective, including ongoing links to 'front line' service providers, who in a high reliability environment are always keepers of key knowledge and experience.

4.1.2 Key Dimensions of Current Reality

It is important to identify and understand the key aspects of the current technical reality of service delivery.

- Grande Prairie continues to perform in the top 5% of Alberta Departments in terms of aggressive fire prevention and mitigation.
- With growth pressures this performance is becoming hard to sustain in the face of increased call volumes and complexity of calls.
- The well thought out approach to design and location of the two new stations is working well provided they continue to provide service to the County, and the growing industrial area.
- A third collaborative station to serve the airport and district should be considered: current resources will not handle the upgrades to the airport's status.
- The City remains a leader in prevention activities from inspections to injury reduction but call volume is impacting the delivery of these programs: alternate delivery mechanisms will be recommended.
- The valuable service of medical aid calls is impacting availability of personnel.
- Staffing and related resource levels can only be established once the scope and nature of collaboration with other partners has been clarified (County, Health Authority and Industry).
- Dispatch remains pivotal to public and responder safety and the role should be strengthened.
- The service can manage one to two minor calls but struggles with multiple or serious calls where dependence on paging in help is unreliable.
- The level of training and expertise is excellent but due to demographics officer and other key positions need accelerated training for candidates.
- The entire area of recruitment and retention is an issue for the Department particularly if the County sets up a competing system.
- Bottom line an excellent state of the art department which creates the challenge of how to stay at that level.

Discussions with stakeholders also revealed some important themes.

- Stakeholders want to see:
  - a collaborative approach to service design and delivery, and
  - a creative and inclusive approach to governance that involves all key stakeholders including industry.
- Efforts should respond to real risk: those involved should understand the nature and implications of growth.

- Service providers should distinguish between core and peripheral activities and set risk driven priorities.

A number of important strategic drivers emerge from this current reality.

- Risk now overlaps jurisdictional boundaries, and since this will continue, some form of integrated response is needed. Service levels need to be appropriate to actual risk exposures.
- There is no reason to think there will be enhanced municipal support or implementation of new revenue sources.
- Since risk evolution is indifferent to boundaries, tax bases, and 'border based' response, lack of a collaborative response will ensure capacities become increasingly out of sync with risk realities.
- Future development will continue to increase pressure in emergency and other services.
- Time is not an ally – options decrease and implementation cost and complexity increase with risk.
- There will continue to be mandatory compliance service requirements at the airport. This facility is very relevant to the risk profile in this region.

Several overall aspects of current reality are especially important in terms of governance.

- High service standards have become the norm and service recipients expect these standards to be maintained: the governance mechanism is expected to do so.
- Scarcity linked to growth and demographics, particularly in terms if human resources, will remain a continuing challenge. An effective governance mechanism will have to ensure access to as wide a range of resources as possible, and that these resources are efficiently directed at real, significant risk. This means effectively governing the whole risk management process through an inclusive structure.
- Large scale long term commitments of the kind needed to address growing needs like the airport will soon be needed. The pattern and nature of these investments will be heavily influenced by the scope of collaboration enabled through governance.

4.1.3 Governance Alternatives

As illustrated in figure ten, there are four potential levels of collaboration or integration that might be considered for implementation in an emergency services context. There is no 'right' or 'wrong' approach, only that which best aligns with the risk management and service delivery challenges and opportunities of affected stakeholders and decision makers. It is also possible to 'migrate' between levels as required to carry out effective risk management.

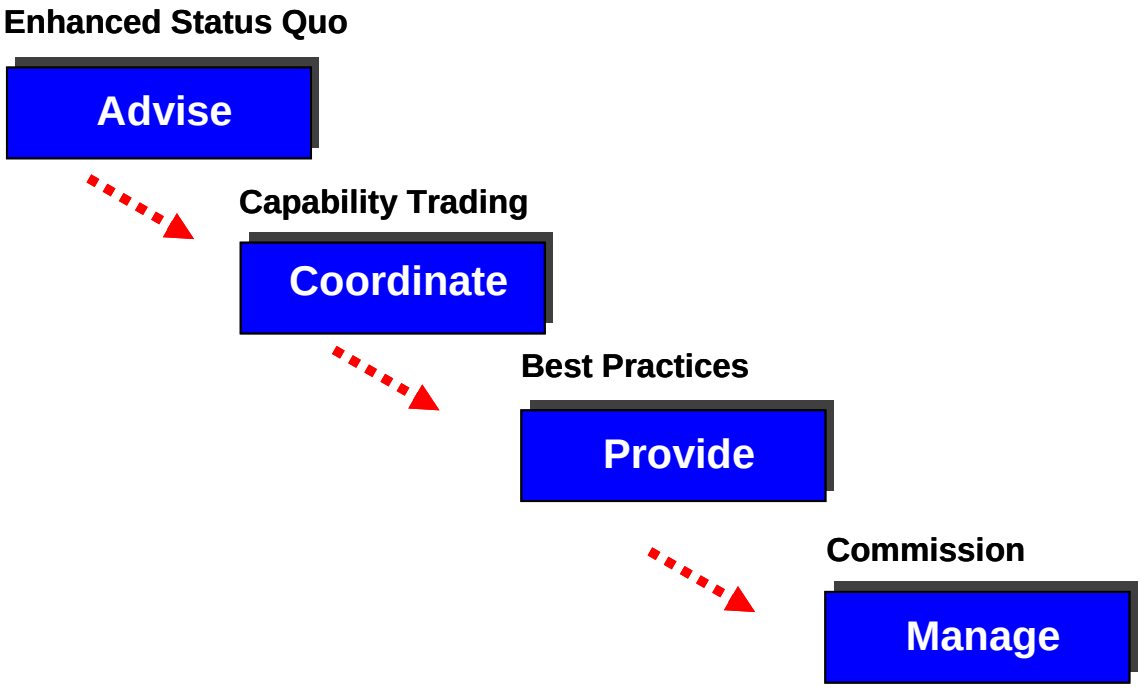


Figure 10 - Levels of Integration

- **Advise – Enhanced Status Quo** -- No changes are made to existing governance mechanisms. Attempts are made to better manage risk within existing administrative frameworks.
    - Supports rapid implementation and retained autonomy.
    - Cost and value for money are hard to demonstrate to the public.
    - Cost allocation and revenue streams are likely to lag risk evolution.
    - Does not create a shared forum for managing the risk cycle and its consequences.
    - Equitability issues are sure to arise.
    - If improvements occur in some services these enhancements might lead to capability trading.
- **Coordinate -- Capability Trading** -- Services are bought, sold and traded between entities so each can improve on what it does best. Others benefit from, and help pay for, improvements in efficiency and risk mitigation.
    - Quick start possible, but progress toward increased collaboration likely slower.
    - There would be increased efficiencies through specialization with associated long run cost effectiveness.
    - No clear mechanism for managing overall risk or service default.
    - No clear mechanism for monitoring overall costs and making spending adjustments.
    - Allows for significant improvement but unlikely to generate best practice.
    - Contracting mechanism may lag risk evolution.
    - As trading evolves a need for joint management will emerge.
- **Best Practices – Provide** -- Services are designed and delivered based on a collaborative risk assessment and commonality, not limited by current boundaries and organizations.
    - Maximizes risk mitigation and cost effectiveness.
    - Many local structures and practices would change over time.
    - Requires risk driven financial transactions.
    - Very:

- strong in terms of risk management since it synchronizes risks and resource allocation, and
- flexible over time.
- Leverages extensive commonalities.
- Implementation would be controlled locally.

- **Commission – Manage** -- A political institution is set up to manage services previously managed by local municipalities.
  - Provides procedural certainty and reallocates local responsibility.
  - Local autonomy and identity are reduced with long term inclusion of other local governments likely.
  - Cost and revenue streams would be transferred to the new entity.
  - There is a risk of administrative issues overtaking risk management.
  - Very slow to start and to change because of third party control by the Government of Alberta.
  - If done well, could form base for expanded regional services.

4.1.4 Recommendations

The "Best Practices – Provide" approach will most likely fully align with current realities and the nature of the service for a number of reasons.

- Reflects clear stakeholder bias toward enhanced and sustained collaboration.
- Allows participants to address the complexity challenges we have identified, creating an opportunity to involve a wide range of stakeholders in collaborative risk identification and resource allocation.
- It would allow stakeholders to build on the shared platform we have identified, and to address all aspects of the risk management and response processes.
- Change can be managed locally, with local stakeholders directly involved and accountable for results, and communications channels and structures designed to align with local realities.
- Allows for one, or several, organizational\institutional arrangements to be put in place, reflecting the potential complexity of realities behind the service delivery screen (such as health authority role in EMS).

- Facilitates optimization of limited resources in response to the scarcity challenges we have identified.
- Allows for rapid implementation where circumstances warrant, such as in the case of the airport.

SECTION 5 RECOMMENDATIONS

5.1 Operations Recommendation One

Seek an operational partnership with regional service providers to form a Regional Response Model involving, but not limited to, the County of Grande Prairie, Peace County Health, the Municipal District of Greenview, the Municipalities of Sexsmith, Beaverlodge, Hythe , Wembley, and others in the surrounding area, plus the area industries and the Grande Prairie Airport.

- At this operational level, the partnership would be characterized by “high trust” involvement through agreements and accords which will emphasize a practical operational approach. This proposed Partnership would be made up of operational/technical providers who are aware of the critical issues and opportunities, and the Partnership would provide direction based on working towards a seamless co-response with protective services agencies. The Partnership is proposed to consist of one Senior City Fire Department manager, one County Senior Fire Department manager, one Senior Industry Fire / Emergency Response Partner (assigned by the proposed Community Awareness Emergency Response (CAER) Group including the Airport), and one Senior Health region representative with an applied emergency/disaster background.

Budget Implication

City of Grande Prairie budget implication $10,000.00/per year, over 3 years = Total $30,000.00 to provide support and members for the Partnership Team.

5.2 Operations Recommendation Two

That an Accord and Charter be developed for the proposed Partnership and that Accord include:

- A document which lays out the proposed partnership framework in operational terms which act as a guide for the Partnership and that it be empowered to deal with issues and maintain strong relationships between the Partners.

- And a Charter for the Partnership will include access to advanced team work models, and coaching to ensure success and be shared with the wider response community.

- That the Partners adopt an Issues Management Format where problems are identified and dealt with on a daily basis and the Partnership is committed to continuous improvement.

Budget Implication

(Included in Recommendation 1)

5.3 Operations Recommendation Three

As identified in the preliminary findings presented to the committee in June 2007. “That adequate resource be provided to meet the needs of a growing community”. The recommendation is that the City of Grande Prairie constructs the third hall as identified in this Master Plan. This recommendation supports the highly innovative approach taken in the “Emergency Services Location Study” (April 1997), which recommended a regional quadrant approach running from strategic boundary halls to serve both core residents and new outlying developments. This third station is vital to continuing that vision by supplying enough Firefighters to keep up with the demand while continuing to cover the critical geographic and economic risks.

It is recommended that this Hall be located to service the Western region and that it be built in conjunction with the Grande Prairie Airport and other potential partners (Peace Country Health EMS, RCMP, etc.).

This Hall is recommended to be in full operation by 2010. To accomplish this the following sub-recommendations are made:

- Final location to be determined by Q1 2008
- Decision Team with the Partnership involvement by Q2 2008
- Architectural design completed by Q4 2008
- Project to be tendered Q1 2009
- Additional Firefighters need to be acquired in stages to meet current demand and to man the third station. A mass hire is not recommended as demand will exceed supply and quality of the overall system will suffer. To avoid this, the following hiring pattern is recommended:
    - Hire eight additional firefighters in Q1 of 2008
    - Hire eight additional firefighters in Q2 of 2009
    - Hire eight additional firefighters in Q3 of 2010
- The rationale for twenty-four (24) firefighters at this station includes the commitment to meeting the Transport Canada Civil Aviation requirements where this Hall will require staffing during all scheduled flight hours and cannot be totally utilized for non-airside responses.
- Have the proposed Partnership (with full participation of the Grande Prairie Airport) review apparatus specifications based on current “Best Practices” within the industry and recommend a final delivery model complete with apparatus and equipment specifications to the City Council. This recommendation will also include input from

Transport Canada to ensure the regulatory requirements for the Grande Prairie Airport are met for the appropriate response category.

- The Partnership to share this unique approach with other response partners where similar issues are impacting on response systems (Wood Buffalo, Red Deer, etc.)
- The City of Grande Prairie to track the process and ensure continuous improvement up to and including the fourth hall where the planning should be commencing in Q4 of 2010 to maintain the Team with final upswing to be adjusted for growth, but not to exceed 2015 as the system is based on a quadrant approach and missing one station degrades the response of the other three by having them routinely committed outside their response zone and stressing firefighters by running too many simultaneous or overlapping calls.

Budget Implication

With consultation included in base budget.

5.4 Operations Recommendation Four

That the proposed Partnership review the service levels for emergency operations and that using this Master Plan as a basis, look at opportunities to share services or form teams in the following critical areas:

Fire (all categories including wildfire and industrial), Dangerous Goods, Aircraft Crash Rescue, Medical (first responder and beyond), Rescue (MVC's through to technical rope rescue or confined space, etc.), prior to final design of Halls and acquisition of staff to identify shortfalls and areas to avoid duplication.

Budget Implications

Net savings with safe, high quality service delivery would be a goal for the Partnership.

5.5 Operations Recommendation Five

That the apparatus and equipment requirements for the third hall be acquired, including but not limited to:

- One new triple combination pumper for Hall 3;
- One tanker (with Airport and County input) for Hall 3;
- One light rescue for Hall 3;
- One auxiliary vehicle for Hall 3.

All other equipment needs to be reviewed by the proposed Partnership to ensure continued compatibility and inter-operability.

5.6 Operations Recommendation Six

- Recommended that regional training form a potential part of the proposed Partnership with the City of Grande Prairie, playing a role, but also being a benefactor in the following proposed areas:
- Fire Officer training and succession programs including Leadership Training stream with practical application and internship programs shared amongst the proposed Partnership;
- Firefighter skills acquisition programs including:
  - NFPA – 1001, 1002 - toward Municipal Firefighters;
  - NFPA – 1003 – targeted at Airside Firefighting;
  - NFPA – 600, 1081 – targeted at Industry and other special risk applications
  - NFPA – 1221 for E-911 and Professional Dispatchers;
  - NFPA – 471/472 – for Dangerous Goods Responders;
  - NFPA – 1031 and 1033 – for Inspectors and Investigators;
  - NFPA – 1021 – for Fire Officers;
  - NFPA – 1041 – for Instructors;
  - NFPA – 1035 – for Public Fire Educators.
- Regional Training Proposal to include primary skills acquisition, through to skills maintenance with a heavy emphasis on practical elements which will involve a proposed live fire training site(s) to be shared by the proposed Partnership.
  - It is recommended that the proposed Partnership undertake a feasibility study and prepare a business case for a shared Training Centre.
  - This recommendation proposes that the Industrial/Business portion of the Partnership would play a major role in driving and funding this recommendation based on their ability to use the capacity of the training partnership.

Budget Implications

To be based on feasibility study and subsequent business case.

5.7 Operations Recommendation Seven

The City of Grande Prairie Fire Department needs to restructure its training division to ensure its own internal training and succession planning needs are met including the following:

- Develop a leadership based succession/job rotation and mentorship program(s) to ensure adequate bench strength at all officer levels;

- Develop a competency based skills maintenance program that is valued by the members and wherever possible involve the members in its decision and implementation;
- Participate in the ongoing SOP/SOG review and construct training to ensure consistent application;
- Revise the recruit training program;
- Participate in and assist with the overall direction towards quality management within the department;
- Always look for the regional opportunities including forging a real and lasting relationship with Grande Prairie College, there will never be a better time for this initiative;
- Use of technology to enhance learning within the department and the Partnership.

Training Budget Implications

- Temporary position to assist with the completion of SOP/SOG project to conform with OH&S Code of Practice for Firefighters, eight month internal project at $40,000.00 total;
- Recruit training program and modifications $10,000.00 (additional);
- Distance learning and teleconference to support internal training (SOG/SOP quality control issues) + external training programs (Leadership, Local Government Certificate etc.) $14,000.00.

5.8 Operations Recommendation Eight

- That the City of Grande Prairie Fire Department take a support role with the County of Grande Prairie in the formation of a "Community Awareness and Emergency Response" CAER group to work with industrial partners on issues for the region including:
  - Working together on emergency response planning, exercises and protocols;
  - Providing coordinated emergency response resources to industrial incidents
  - Ensuring proper public communications and actions are undertaken during an emergency (eg. In Place Sheltering and evacuation, etc.).
- Once the CAER group is established, it continues to be supported by the municipalities through their participation but industry will provide the actual Organization. This is also an opportunity for Grande Prairie College to play a leadership role with industry and the municipalities in terms of providing an ideal learning venue for the proposed Partnership.

5.9 Operations Recommendation Nine

- The proposed Partnership supported by the City, County and other Partners require a business plan to deal with the potential migration of radio systems throughout the Province to UHF (Ultra High Frequency) and how that will impact all users including Mutual Aid Partners, the Health Region and area Industries.

Budget Implications

Unknown at this time, but a separate study in the range of $5,000.00 may be required.

5.10 Operations Recommendation Ten

- To provide a RIT (Rapid Intervention team) protocol with appropriate equipment and policy support to meet the intent of NFPA 1561 and the Workplace Health & Safety (WH&S) Code of Practice for Firefighters.

Budget Implications

Additional tally lines and rescue equipment at $3,000.00 per team, including each technical rescue specialty.

5.11 Operations Recommendation Eleven

- To continue in a leadership role in fire prevention delivery by reviewing all fire prevention and public education programs to look for opportunities including:
  - Updating procedures and training to move to the new performance based codes;
  - Automating the inspection process and ensuring the data is available for pre-fire planning at an operational level;
  - Revise QMP to align with performance based codes;
  - Review the opportunity for a joint QMP with the County of Grande Prairie and the sharing of inspectional services based on joint capacity and risk with SCOs (Safety Code Officers) being able to assist in each jurisdiction;
  - Expand public education programs to include new partners and the proposed CAER group. With quality control and performance measures included;
  - Have the proposed Partnership review investigation procedures as a regional initiative.
- These Fire Prevention Public Education tools may lead the Partnership to propose a functioning governance body such as a commission or a Part 9 Company.

5.12 Operations Recommendation Twelve

- Review the impact/risk associated with no longer routinely inspecting F-2 occupancies (medium hazard Industrial occupancies). Recommend a review of the existing inspectional data for all F-2 occupancies with the goal of looking at personal injuries and property losses and their association to any known code deficiencies. This review to be completed by an independent third party.

Budget Implications

$10,000.00 for external consultant review and provide a final report.

5.13 Operations Recommendation Thirteen

- Recommend adopting a quality control framework for the Grande Prairie Fire Department with involvement of Partners to measure effectiveness and efficiency of service delivery and to promote firefighter safety through a CIP (Continuous Improvement Process) including:
  - Adoption of a formal quality management program (ISO 9001/9002, Six Sigma, etc.);
  - Implementation staged for each operational element based on risk, i.e. E-911/ Dispatch first, Fire (structural/industrial) second, Technical Rescue third, Dangerous Goods fourth, etc.;
  - Share quality management tools through the proposed Partnership;
  - Provide quality impact studies and reports which can be shared with Council(s), the CAER group and the public.

Budget Implications

$10,000.00 to set up quality system + $3,000.00 per year maintenance.

5.14 Operations Recommendation Fourteen

- Recommend that the Grande Prairie Fire Department review and adopt the appropriate sections of NFPA 1500 and NFPA 1561 to promote firefighter safety and wellness over the span of their careers.

Budget Implications

Using IAFF/IAFC as a guideline $10,000.00 to set up the program with $3,000.00 per year to maintain.

5.15 Operations Recommendation Fifteen

- That the City of Grande Prairie promote joint land use planning with the County of Grande Prairie using tools such as MIACC (Major Industrial Accidents Council of

Canada), CAN 2-731 (CSA standard on emergency planning), Directive 71 (AEUB standard for the Petroleum Industry), and others as appropriate to limit risk to the public and Industry. That from a Fire Department perspective, the MDP(s) (Municipal Development Plans) are harmonized so risks are similar in both jurisdictions which improves firefighter safety when responding to mutual aid calls.

Budget Implications

$2,000.00 for document research and updates.

SECTION 6 SUMMARY & CONCLUSIONS

AI to Provide.

REFERENCE MATERIALS

INDEX OF ACRONYMS

AOHS	Alberta Occupational Health and Safety
AFCA	Alberta Fire Chiefs Association
CAER	Community Awareness Emergency Response
CEPA	Canadian Environmental Protection Act
CCPA	Canadian Chemical Protection Association
CBRNE	Chemical, Biological, Radiological, Nuclear and Explosive
CIC	Coordination and Information Centre
CSA	Canadian Standards Council
DDS	Director of Disaster Services
DSS	Disaster Social Services
AEMA	Alberta Emergency Management Agency
EMS	Emergency Medical Services
ESPC	Emergency Services Planning Committee
EOC	Emergency Operations Centre
EUB	Energy and Utilities Board
EPWS	Early Public Warning System
ERCC	Emergency Response Communications Centre
FCO	Fire Commissioner's Office
FF	Firefighter(s)
FUS	Fire Underwriters Survey
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
MCI	Mass Casualty Incident
MCR	Medical Co-Respondent
MEP	Municipal Emergency Plan
MOH	Medical Officer of Health
MVC	Motor Vehicle Collision
NGO	Non-Governmental Organization
NFPA	National Fire Protection Association
OH&S	Occupational Health and Safety
PIO	Public Information Officer
PSEPC	Public Safety and Emergency Preparedness Canada
QMP	Quality Management Plan
RCMP	Royal Canadian Mounted Police

REOC	Regional Emergency Operations Centre
SOG	Standard Operating Guidelines
SRD	Sustainable Resources Department (Forestry)
TO	Training Officer

GLOSSARY OF TERMS

Acceptable Risk	That level of risk to be deemed acceptable. The global consensus today is that an annual individual risk of one chance in a million ($1 X 10^{-6}$) of a fatality is acceptable for involuntary risks involving an industrial activity. In some countries this is acceptable for existing operations, but for a new facility, the risk needs to be one chance in 100 million ($1 X 10^{-8}$). The determination by public authorities through a process involving industry and the public of levels of risk which are considered acceptable if all reasonably practical measures have been taken to reduce risks. Acceptability depends on the trade-offs between risks, costs, and benefits and may vary from one community to another.
Accident	An undesired and unplanned event that results in harm to a person, damage to property, and/or harm to the environment.
Buffer Zones, Transition Zones & Separation Distances	An area of land established around an industrial activity to separate other adjacent land uses, particularly residential areas, from the potential effects of an industrial accident are called separation distances. These distances should be determined based on Risk. Buffer zones represent the land in the separation distance, which belongs to the industry. That is within their fence line. This distances is determined to be at a risk level of $1 X 10^{-4}$ as per the MIACC guidelines, or is set by the municipalities as a minimum "setback" in conjunction with the industry, which ever is greater. Transition zones represent the land regulated by the County where land uses are determined using the MIACC guidelines for risks from $1 X 10$ to $1 X 10^{-6}$.
Alert	Is a phase of emergency response in which there is a possibility of an emergency situation occurring within the near future. During the 'Alert' phase of the response, selected Emergency Operations Centre personnel monitor the situation and provide informational and instructional bulletins to department, agencies, and the general public, as appropriate.

Controlled Buildings	Controlled building is a building designed for ease of evacuation, access by emergency services, and mechanical systems to provide protection to occupants in case of a significant industrial accident.
Dangerous Dose	As defined by the UK Health and Safety Executive. "A dose of toxic gas, or heat, or explosion overpressure which gives all the following effects: severe stress to almost everyone, a substantial fraction requires medical attention, some people are seriously injured requiring prolonged treatment, any highly susceptible people might be killed".
Declaration of a State of Local Emergency	A resolution of the Disaster Services Committee to create a Temporary legal state in which extraordinary action may be taken to address a major emergency or disaster.
Director of Disaster Services	The Director of Disaster Services, as designated by the Partnership, assumes the position of EOC Director upon activation.
Disaster	An occurrence of a natural catastrophe, technological accident, or human caused event that has resulted in severe property damage, deaths, and/or multiple injuries. Beyond the capability of the Partners to handle with its resources.
Dispersion	The process of dilution of a hazardous substance by the surrounding fluid.
Emergency Operations Centre (EOC)	The protected site from which civil officials coordinate, monitor, and direct emergency response activities during an emergency or disaster.
Emergency	Any occasion or instance that warrants action to save lives and to protect property, public health and safety. A situation is larger in scope and more severe in terms of actual or potential effects.
Environmental Assessment and Review (Municipal)	Means processes and activities designed to contribute pertinent environmental information, to land use decision-making. In doing so, it attempts to predict and measure the environmental effects of specific human activities and identify means of mitigating those effects.
EPA-RMP	The US Environmental Agency Risk Management Plan. A

	requirement of industry who have hazardous chemicals that may have an impact on surrounding communities to communicate these hazards to the communities.
ERPG	Emergency Response Planning Guidelines taken from the American Industrial Hygiene Association. These values are used to describe human exposure levels for emergency planning needs.
ERPG-1	The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odour.
ERPG-2	The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.
ERPG-3	The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.
Evacuation	Organized, phased, and supervised dispersal of people from dangerous or potentially dangerous areas.
Evacuees	All people removed or moving from areas threatened or struck by a disaster.
Event Risk	The event risk is a measure of the likelihood and severity of an adverse effect to health, property or the environment from a single release event, i.e., a catastrophic release, a pipe break, etc.).
Facility Risk	The facility risk is estimated by summing together the event risks for all possible release events in a hazardous facility.
Frequency	The number of occurrences per unit of time, usually one year.
Gas Cloud	The mass of gas and air mixture within a particular envelope of concentration limit.
Hazard Analysis	A document included in the Option Plan, that identifies the

	local hazards that have caused, or possess the potential to adversely affect public health and safety, public and private property, or the environment.
Hazard	A potential threat to the health or life of individuals, to property and/or to the ability of individuals to maintain their livelihoods and regular daily activities. Hazards could include natural forces (such as wind, drought, earthquakes etc.) or technologically induced threats (such as aircraft and highway mishaps, industrial accidents, explosions etc.)
Hazard Area	The area defined as "unsafe" by the risk criteria. Hazard areas are also called areas of concern.
Hazardous Facility	My site at which hazardous substances are produced, processed, handled, stored, used or disposed of in such a form and quantity that there is a risk of a major industrial accident that could cause serious harm to human health, property, or the environment.
Hazard Identification*	The recognition that a hazard exists and the determination of its characteristics and possible consequences.
Hazardous Substance	Any substance contained in the MIACC lists of hazardous substances. They have the potential to cause injury or death. They are also known as dangerous goods or hazardous materials.
Heavy Industrial Policy Area	is intended to accommodate heavy industrial and supportive uses, which may have offsite impacts regarding safety, use, amenity or enjoyment of adjacent or nearby sites. The degree to which a heavy industrial use has a detrimental effect on adjacent or nearby sites and requires mitigation shall be determined through safety, risk and environmental assessment and review processes which are to be completed to the satisfaction of the municipalities, provincial and federal authorities.
HSE	The Health and Safety Executive. The arm of the United Kingdom government
IDLH	Immediately Dangerous to Life or Health. Data taken from NIOSH (National Institute of Occupational Safety and Health) Pocket Guide to Chemical Hazards – 1994.

Impact	The effect that each hazard will have on people such as injury and loss, adverse effects on health, property, the environment and the economy.
Incident	An undesired event which, under slightly different circumstances, could have resulted in harm to people, damage to property, damage to the environment or loss of business.
Incident Commander (IC)	The individual responsible for making operational decisions to manage an incident.
Incident Command Post (ICP)	A location from which the Incident Commander directs the site response to the emergency. Incident objectives, strategies and tactics for the site are formulated and directed from the ICP
Incident Command System (ICS)	A standardized organizational structure used to command control, and coordinate the use of resources and personnel that have responded to the scene of an emergency.
Individual Risk	The annual frequency at which an individual may be expected to sustain a given level of harm from the realization of specified hazards. The unit of this risk measure is "chance of an individual (exposed to a risk source) to become a fatality in a year".
Interface Fire	A fire in an area where combustible wildland fuels are found adjacent to houses and other structures.
Local Authority	Councils of the Regional Partnership including the Board of the Edmonton International Airport.
Mass Care	The actions that are taken to protect evacuees and other disaster victims from the effects of the disaster. Activities include providing temporary shelter, food, medical care, and other essential life support needs to those people that have been displaced from their homes because of a disaster or threatened disaster.
MIACC	Major Industrial Accident Council of Canada (1987 – 1999), was an uniquely Canadian, not-for-profit organization. Standards, guidelines and interactive forums developed

	through a voluntary network of Canadian experts in Process Safety Management and Emergency Response were their results.
Minimum Reciprocal Separation Distance	Refers to the minimum separation distance to be maintained between specified incompatible land uses.
Minimum Separation Distance	A distance to be maintained between different land uses or constructions. The separation distance determines the width of a buffer zone.
Nuisance	Anything injurious or obnoxious to the community or member of it and for which legal remedy exists. Includes noise, odour, light, visual effects, etc. which impact the community in a negative way.
Noise	Any sound loud or harsh or undesired.
Odour	Property of a substance which has a pleasant or unpleasant or any effect on the nasal sense of smell.
OSHA-PSM	Occupational Safety and Health Administration – Process Safety Management. The arm of the US government which is responsible for regulating safety in the workplace.
Performance zoning	Zoning based on standards to be met concerning various enumerated nuisances or levels of risk. An industry that can operate in a fashion that meets such standards can locate in an industrial zone.
Plume	The gas cloud resulting from a continuous release.
Probability	A number in a scale from 0 to 1, which expresses the likelihood that one event will succeed another.
Regional Partnership	An initiative undertaken to further enhance the ability to provide safe and effective emergency services for the potential Partners.
Release	The discharge of energy or a hazardous substance from its containment system.
Response	Those measures undertaken immediately after an emergency has occurred, primarily to save human life, treat the injured, and prevent further injury and losses. They include response plan activation, opening and

	staffing the EOC, mobilization of resources, issuance of warnings and direction, provision of aid, and may include the declaration of a State of Local Emergency.
Risk	The chance or likelihood of an occurrence based on the vulnerability and known circumstances of a community.
Risk Analysis	The use of available information to estimate the risk to individuals or populations, property or the environment, from hazards. Risk analysis generally contains the following steps: scope definition, hazard identification, and risk estimation.
Risk Assessment*	The process of risk analysis and risk evaluation.
Risk Assessment (Quantitative)	The evaluation (in numerical terms) of the likelihood of undesired events and the likelihood of harm or damage being caused together with the significance of the results.
Risk Management	The optimization of exposure to known and assessed risks. Risk management concerns five different objectives: risk reduction at the source (modifications to facilities or processes, technical changes, training, etc.), risk reduction through better land use planning around industrial sites, pipeline and dangerous goods corridors, emergency preparedness, emergency response, and risk communication and public participation.
Risk Measurement	1 X 1e or $1E^{-6}$/yr.: - One chance in one million per year. $1 X 10^{-5}$ or 1E-5/yr.: - One chance in one hundred thousand per year. $1 X 10^{-4}$ or 1E-4/yr.: - One chance in ten thousand per year. $1 X 10^{-3}$ or 1E-3/yr.: - One chance in one thousand per year.
Setback	Means the distance that a development must be set back from a property line or any other features of a site specified by the Bylaw. A setback is not a yard.
Shelter in Place	An emergency response approach to protecting people by having them take refuge from on coming toxic gas clouds. By staying indoors with windows, doors and vents closed the toxic cloud will take at least an hour to infiltrate the building and cause dangerous exposures.

Standard Operating Guidelines	A set of instructions constituting a directive, covering those SOG features of operations which lend themselves to a definite, step-by-step process of accomplishment.
Standard Operation Procedures	A set of instructions constituting a directive and differs from an SOG as it is not deemed to be a guideline and has less room for interpretation.
Wildland Fire	A wildfire, also known as a wildland fire, forest fire, vegetation fire, grass fire, peat fire, bushfire, or hill fire, is an uncontrolled fire often occurring in wildland areas, but which can also consume houses or agricultural resources.

REFERENCE DOCUMENTS

Major Industrial Accidents Council of Canada (MIACC), “Risk Based Land Use Planning Guidelines”, Ottawa, June 22, 1995

Major Industrial Accidents Council of Canada (MIACC), “Hazardous Substances Risk Assessment: a Mini-guide for Municipalities and Industry” Ottawa, 1994

MIACC Alberta, “Alberta Working Group, Land-Use Planning and Control – February 1993” , Ottawa, 1993

Major Industrial Accidents Council of Canada (MIACC), “Risk Assessment – Recommended Practices for Municipalities and Industry – Final Draft”, Ottawa, August 1999

Dutch Guide, “ Guide to Hazardous Industrial Activities – Ministry of Home Affairs”, The Hague, 1988

Health and Safety Executive, “Risk criteria for land-use planning in the vicinity of major industrial hazards” London, 1989

IPS Consulting Inc., “Land Uses in The Transition Zone Between Heavy Industry and Residential Development in Strathcona County, Safety and Nuisance Land Use Criteria”, Edmonton, December 22, 1992

Stantec Consulting, “Strathcona County Land Use Bylaw Review and Update –An Interim report”, Edmonton, April 2000

Strathcona District Mutual Assistance Program, Strathcona County, June 2000.

National Institute for Occupational Safety and Health, “Pocket Guide to Chemical Hazards”, Washington June 1994 and July 2000

Westinghouse Safety Management Solutions LLC, “ERPG’s and TEEL’s for Chemicals of Concern: rev. 17m”, South Carolina, January 10, 2001

Environmental Protection Agency, EPA-RMP Rule, “Determining Worst Case Scenarios”, Washington, April 15, 1999

Alberta Energy and Utilities Board, “EUB Statistical Series 57: Field Surveillance Provincial Summaries 1999/2000”, Calgary

The Royal Borough of Kensington and Chelsea, “Model Partnership Charter”, June, 2004

Wild Rose Foundation, “Working in Partnership”, 2007, Alberta