



Summary of Recommendations

<i>Recommendation 8.5-1 - Decommission and Replace Apparatus in Excess of 20 Years of Age.....</i>	<i>71</i>
<i>Recommendation 8.7-1 – Expand Fire Department to Provide Improved Fire Protection Coverage throughout the Community.....</i>	<i>79</i>
<i>Recommendation 8.9-1 Take steps to ensure that apparatus are professionally maintained by appropriately qualified personnel</i>	<i>83</i>
<i>Recommendation 8.13-1 - Increase Available Fire Force.....</i>	<i>88</i>
<i>Recommendation 8.14-1 - Implement Duty Crew System to Help Improve Response Times.....</i>	<i>89</i>
<i>Recommendation 8.15-1 Improve Pre-Incident Planning Program.....</i>	<i>89</i>
<i>Recommendation 9.1-2 – Maintain the Sprinkler Bylaw.....</i>	<i>99</i>
<i>Recommendation 9.2-1 Improve Fire Prevention Inspection Program.....</i>	<i>100</i>

Recommendation 8.5-1 - Decommission and Replace Apparatus in Excess of 20 Years of Age.

To reduce the risk to the life safety of fire fighters utilizing the apparatus, an apparatus replacement program should be developed. The replacement program should take into consideration the benefits with respect to fire insurance grades as well as the costs associated with owning and maintaining apparatus.

To ensure that apparatus is recognized for fire insurance grading purposes, the replacement program for apparatus within the City of Campbell River should not exceed a 20 year life cycle for apparatus. See Appendix D.

Recommendation 8.7-1 – Expand Fire Department to Provide Improved Fire Protection Coverage throughout the Community

In order to provide the optimum level of fire protection throughout the entire community, additional resources should be acquired. An additional fire station should be constructed and be located so that the industrial mill buildings and surrounding area are within a reasonable response distance from the station.

Option 1

To provide the ideal level of fire protection to the industrial mill area, within the fire insurance grading, it is recommended that a new fire station be built. The new fire station should have all the tools and equipment needed by the fire fighters in addition to 2 pumper companies and 1 ladder company. The location of the fire station should be situated so that the response requirements of the first and second due pumper and ladder companies can be met. Additionally, the number of fire fighters (career or auxiliary) should be sufficient to operate each apparatus safely and effectively.

Providing a fire station that is located within the response requirements of the first and second due pumper and ladder companies, is housed with 2 pumpers and 1 ladder and is staffed with an adequate number of fire fighters will result in attaining the maximum amount of credit within this portion of the fire insurance grading. Additionally, from the perspective of the insurer, these buildings will be considered to be “protected” because they are within 5 road km of a fire station.¹¹



Option 2

To provide a recognized level of coverage, from the perspective of an insurer, it is recommended that a satellite fire station be situated so that no building in the Catalyst area is beyond 5 road km of the satellite fire station. The station should be staffed with a minimum of 15 auxiliary members from Fire Station 1 and be housed with at least one recognized pumper apparatus.

From the perspective of most insurers, the Catalyst buildings are considered to be “unprotected” because they are beyond 5 road km from a fire station. Providing a fire station that has a pumper apparatus with the necessary tools, equipment, staffing and is within 5 road km will change the Catalyst protection status from “unprotected” to “fire hall protected” or “protected” should the hydrant system be recognized.

Recommendation 8.9-1 Take steps to ensure that apparatus are professionally maintained by appropriately qualified personnel

Apparatus used by the fire department is critically important to the life safety of fire fighters as well as to those persons involved in accidents or fires that are responded to. Failure of apparatus (or sub-system) to operate according to specification during an emergency may result in significant increase in risk to life safety and property losses. For this reason, it is important that a high standard of care be utilized in maintaining emergency apparatus and equipment.

The recommended standards for maintaining fire apparatus are:

1. All Manufacturer Specifications
2. NFPA 1911: Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus, 2007 Edition

Maintenance to fire apparatus should be completed by a certified Emergency Vehicle Technician (NFPA 1071: Standard for Emergency Vehicle Technician Professional Qualifications). The Campbell River Fire Department maintenance program manager should be highly familiarized with the Manufacturers’ specifications for maintenance and with NFPA 1911.

Recommendation 8.13-1 - Increase Available Fire Force

To maintain or improve the Public Fire Protection Classification, the available fire force should be improved for the Campbell River Fire Department. Additional credit could be received up to a maximum of 60 fire fighters per shift. Note that the available fire forces can be improved through additional auxiliaries up to 50% of the required fire force. (In the case of Campbell River, the required fire force is 60, so the maximum available fire force that can be provided through auxiliaries and other FFEU sources is 30.)

Should the City of Campbell River opt to provide additional fire fighter positions, the amount of credit in the Available Fire force section will not only improve but, if the day shift Fire Prevention Officer can return to their previous duties, additional credit can be



awarded within the Fire Safety Control portion of the fire insurance grading. It can be assumed that the frequency of inspections will improve to previous levels and the overall level of Fire Prevention Services will improve.

Providing career staffing is a serious matter that requires careful consideration. There are many factors to consider and the fire insurance grading is only one such factor.

Recommendation 8.14-1 - Implement Duty Crew System to Help Improve Response Times

In order to help reduce the response times for apparatus that is staffed by auxiliary members, consideration should be given to implementing a duty crew system for both fire stations as they both operate using auxiliary members. The number of auxiliary members that are part of the duty crew should be sufficient enough to adequately and safely operate the emergency apparatus.

Implementing a duty crew system has the potential to help reduce response times for additional apparatus needed on emergency scenes. Within the fire insurance grading, any member responding as part of the duty crew is graded the same as an auxiliary member.

Recommendation 8.15-1 Improve Pre-Incident Planning Program

In order to improve the pre-incident plan program utilized by the CRFD, it is recommended that all pre-incident plans be updated as required upon completion of any building inspection conducted within the City of Campbell River. Additionally, continuous efforts should be given to increasing the percent of buildings that have pre-incident plans. All of the pre-incident plans should be stored digitally and in hard copy and be made available to the fire fighters and the dispatchers. Upon receipt of an emergency call and dispatch of fire fighters, the dispatcher should have the ability to provide the fire fighters with the pre-incident plan details (i.e. pre-plan number, etc.) or relevant information (hazmat storage, etc.).

Recommendation 9.1-2 – Maintain the Sprinkler Bylaw

To reduce fire risk and improve life safety throughout the community, it is strongly recommended that the Sprinkler Bylaw be maintained. An effective Sprinkler Bylaw reduces the required fire flow for any given building and has the potential to create a “cap” on the Basic Fire Flow, and the associated benchmarks that the community is graded against.

Furthermore, consideration should be given to expanding the scope of the sprinkler bylaw to include retrofitting existing building stock in stages.



Recommendation 9.2-1 Improve Fire Prevention Inspection Program

To improve the level of fire prevention and reduce the overall fire risk in the community, the Fire Prevention Inspection Program should be improved to include a minimum of one inspection per year for all hotels, public buildings and industrial occupancies in the City. Increased inspection frequency should be provided to occupancies with increased fire risk and/or life safety issues.

The City of Campbell River should consider providing an additional full time Fire Prevention Officer (Local Assistant to the Fire Commissioner) to conduct inspections on a reasonable frequency schedule. If the community cannot regularly conduct fire prevention inspections, due to a lack of resources, consideration should be given to outsourcing fire prevention inspection related services.

Reference: FIRE SERVICES ACT [RSBC 1996] CHAPTER 144

Municipal duty to inspect hotels and public buildings

Section 26

(1) A municipal council must provide for a regular system of inspection of hotels and public buildings in the municipality.

(2) A municipal council may authorize persons, in addition to the local assistant, to exercise within the municipality some or all of the powers under sections 21 to 23. The information gathered in the inspection process should be utilized in developing the pre-incident plans for the community as well.

Note: Failure to comply with the Fire Services Act may result in a significant liability exposure for the City if a fire related loss should occur.



January 27th, 2015

Ian Baikie, Fire Chief,
City of Campbell River,
675 13th Avenue,
Campbell River, BC,
V9W 6C1.

Re: Campbell River Fire Protection Area Brief Optimization Analysis.

Dear Mr. Baikie,

As requested by the Campbell River Fire Department Fire Underwriters Survey has conducted a brief optimization analysis in order to provide analytics concerning fire hall coverage to aid in the decision for proposed fire hall locations. The results of this fire hall coverage and optimization analysis are provided in this letter.

1. Project Objectives and Methodology

This fire hall location and optimization analysis looks at optimizing locations for 3 fire halls located in the Campbell River Fire Protection Area (including the contract response area) under various scenarios. The study provides coverage analytics and uses optimization tools to aid in a decision on optimal fire hall locations.

A previous study completed by the Fire Underwriters Survey in 2009 identified a need for better coverage of the Catalyst Mill property in the northern portion of the City of Campbell River. As such it was noted that 3 fire halls within the community would provide better coverage and initial response considering travel distance.

We conducted the following in order to aid with fire hall placement decisions:

- Using address location points, Required Fire Flow values were assigned based on the Fire Flow Demand Zones used in the “Fire Department Operational Study – Fire Underwriters Survey” completed in 2009.
- Specific Required Fire Flow building calculations completed in the 2009 study were added
- A Required Fire Flow value of 1000IGPM was added to the remainder of the address points located within the Fire Protection Area but beyond the Fire Flow Demand Zones.
- The following optimizations and coverage analysis was completed:

Optimization/Coverage Analysis	Scenario
Current Coverage	Provide coverage statistics from the current 2 fire halls at 2.5km, 5km, and 8km.
Optimization 1	Maximize the coverage of points based on the specific first due response distances derived from the Required Fire Flow values, see APPENDIX A - Table of



	Effective Response, with 3 fire halls.
Optimization 2	Maximize the coverage of points at 5km with 3 fire halls.
Optimization 3	Maximize the coverage of points at 8km with 3 fire halls.
Potential 3 Fire Halls	Provide coverage statistics from the proposed 3 fire halls at 2.5km, 5km, and 8km as provided by Campbell River Fire Department.
Potential 2 Fire Halls	Provide coverage statistics from the proposed 2 fire halls at 2.5km, 5km, and 8km as provided by Campbell River Fire Department.

The City of Campbell River also provided GIS maps of the 200 year flood plain for the City; fire hall locations within the area would not be chosen, as requested. All Required Fire Flow points considered for demand in this analysis can be seen in Figure 2.

2. Results

Fire Underwriters Survey recommends that underwriters use the following response distances when applying fire insurance grades and making adjustments.

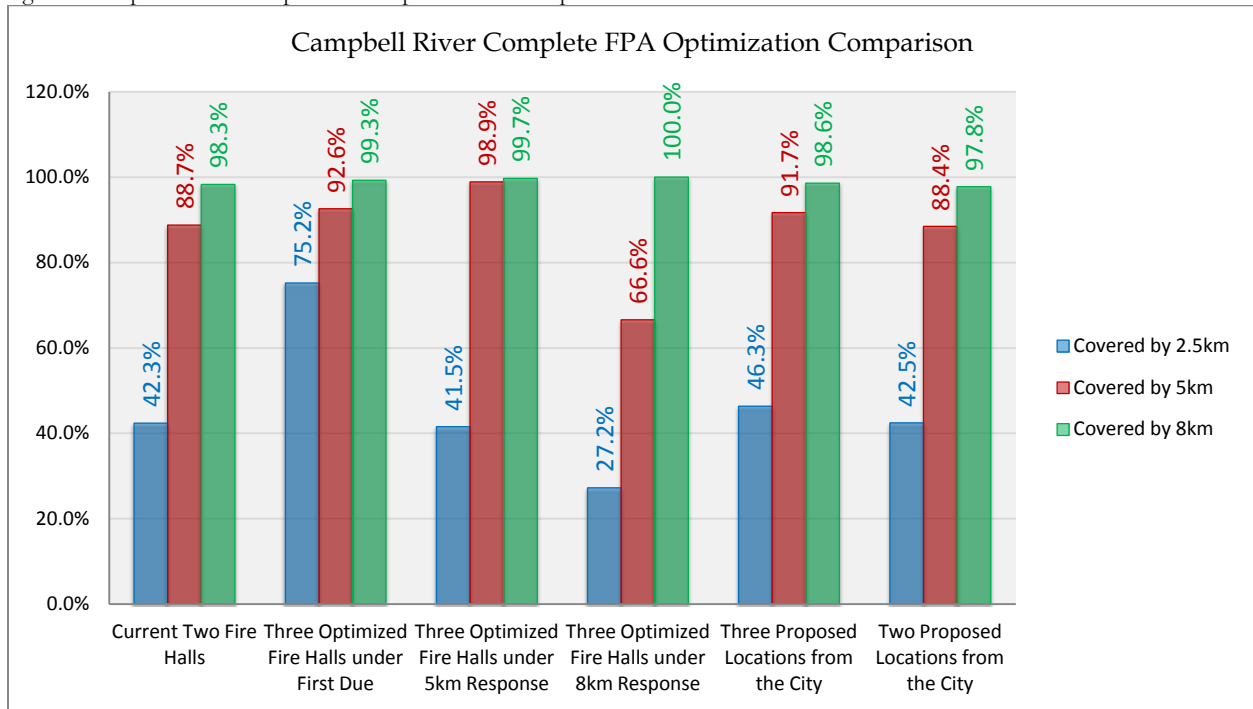
Table 1 Benchmark Distances when Applying Grades

Grouping	Dwelling Protection Grade (DPG)	Public Fire Protection Classification (PFPC)
Ideal		2.5km
Maximum	8km	5km

Coverage statistics are provided for each of these distances. It should be noted that coverage analysis only considers the roads shown and does not consider private driveway access, i.e. the assumption is that the property is at the road. Coverage under each scenario can be seen in Figure 1.



Figure 1 Campbell River Complete FPA Optimization Comparison



2.1. Current Coverage

The current 2.5km, 5km and 8km coverage area is shown in Figure 2. Figure 1 shows that 42.3% of points are covered at 2.5km; 88.7% covered at 5km; and 98.3% covered at 8km. It can be seen that the Catalyst Mill is not covered at 2.5/5km as noted in the report completed in 2009. Additionally, there are some points not covered at 8km road distance in the northern portion of the Fire Protection Area although 98.3% coverage at 8km is already achieved.

2.2. Optimization 1

The current 2.5km, 5km and 8km coverage area is shown in Figure 3. Figure 1 shows that 75.2% of points are covered at 2.5km; 92.6% covered at 5km; and 99.3% covered at 8km. When completing an optimization analysis for maximizing the coverage of properties under respective ideal first due response distances (see APPENDIX A - Table of Effective Response) it can be seen that there is a clustering of fire halls in the central portion of the community where the majority concentration of RFF points are located. This is also due to the assignment of Required Fire Flow values using the Fire Flow Demand Zones calculated in 2009 which results in overly high values being assigned to properties in the core. This solution does however place a larger number of properties closer to fire halls, i.e. 75.2% within 2.5km. This solution does not place the Catalyst Mill site within 2.5/5km of a fire hall.

2.3. Optimization 2

The current 2.5km, 5km and 8km coverage area is shown in Figure 4. Figure 1 shows that 41.5% of points are covered at 2.5km; 98.9% covered at 5km; and 99.7% covered at 8km. When completing an optimization analysis for maximizing the coverage of properties under 5km response distances, it can be seen that a



location closer to the Catalyst is now chosen which places the property within 2.5km of the fire hall. Additionally, properties in the contract response area are now covered within 8km.

2.4. Optimization 3

The current 2.5km, 5km and 8km coverage area is shown in Figure 5. Figure 1 shows that 27.2% of points are covered at 2.5km; 66.6% covered at 5km; and 100% covered at 8km. When completing an optimization analysis for maximizing the coverage of properties under 8km response distances, it can be seen that a location closer to the Catalyst is again chosen which places the property within 2.5km of the fire hall. As 98.3% coverage is currently achieved in the 2 fire hall layout maximizing for 8km coverage places a fire hall further west in order to achieve 100% coverage at 8km.

2.5. Potential 3 Fire Halls

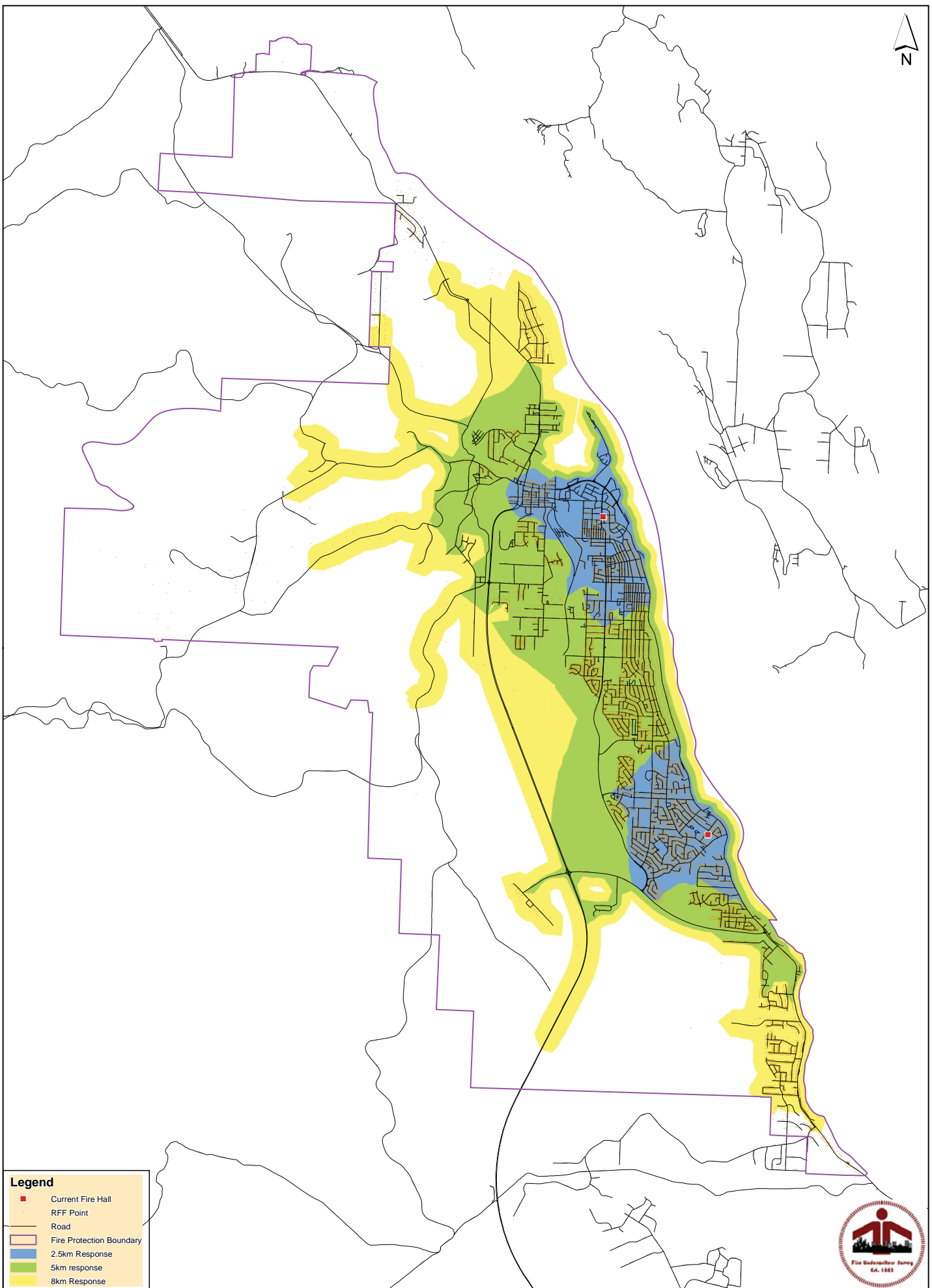
The current 2.5km, 5km and 8km coverage area is shown in Figure 6. Figure 1 shows that 46.3% of points are covered at 2.5km; 91.7% covered at 5km; and 98.6% covered at 8km. Comparing the potential locations provided with the optimization coverage it can be seen that a reasonable level of coverage is provided at 2.5km, i.e. 46.3%. Both the Catalyst Mill and the Campbell River airport are covered at 2.5km and 5km respectively. Some properties in the contract response area are beyond 8km; however, the location of the southern fire hall places the building closer to major road collectors in the community which may result in overall fast response times to large portion of the Fire Protection Area.

2.6. Potential 2 Fire Halls

The current 2.5km, 5km and 8km coverage area is shown in Figure 7. Figure 1 shows that 42.5% of points are covered at 2.5km; 88.4% covered at 5km; and 97.8% covered at 8km. Comparing the 2 potential locations provided with the current coverage it can be seen that an improved level of coverage is provided at 2.5km, i.e. 42.5%. Again the location of the southern fire hall places the building closer to major road collectors in the community which may result in overall fast response times to large portions of the Fire Protection Area.

3. Conclusion

It can be seen that the optimal positioning of fire halls is largely based on the desired outcome, i.e. maximize based on x-distance coverage. Furthermore the level of detail involved in optimization analysis will also affect the desired outcome, e.g. optimizing based on road speeds. Based on this analysis the potential locations provided meet the intent of providing a certain level of coverage to both the Catalyst Mill and the Campbell River airport as discussed with Fire Department staff while also providing a good level of coverage considering the 2.5/5/8km distances.

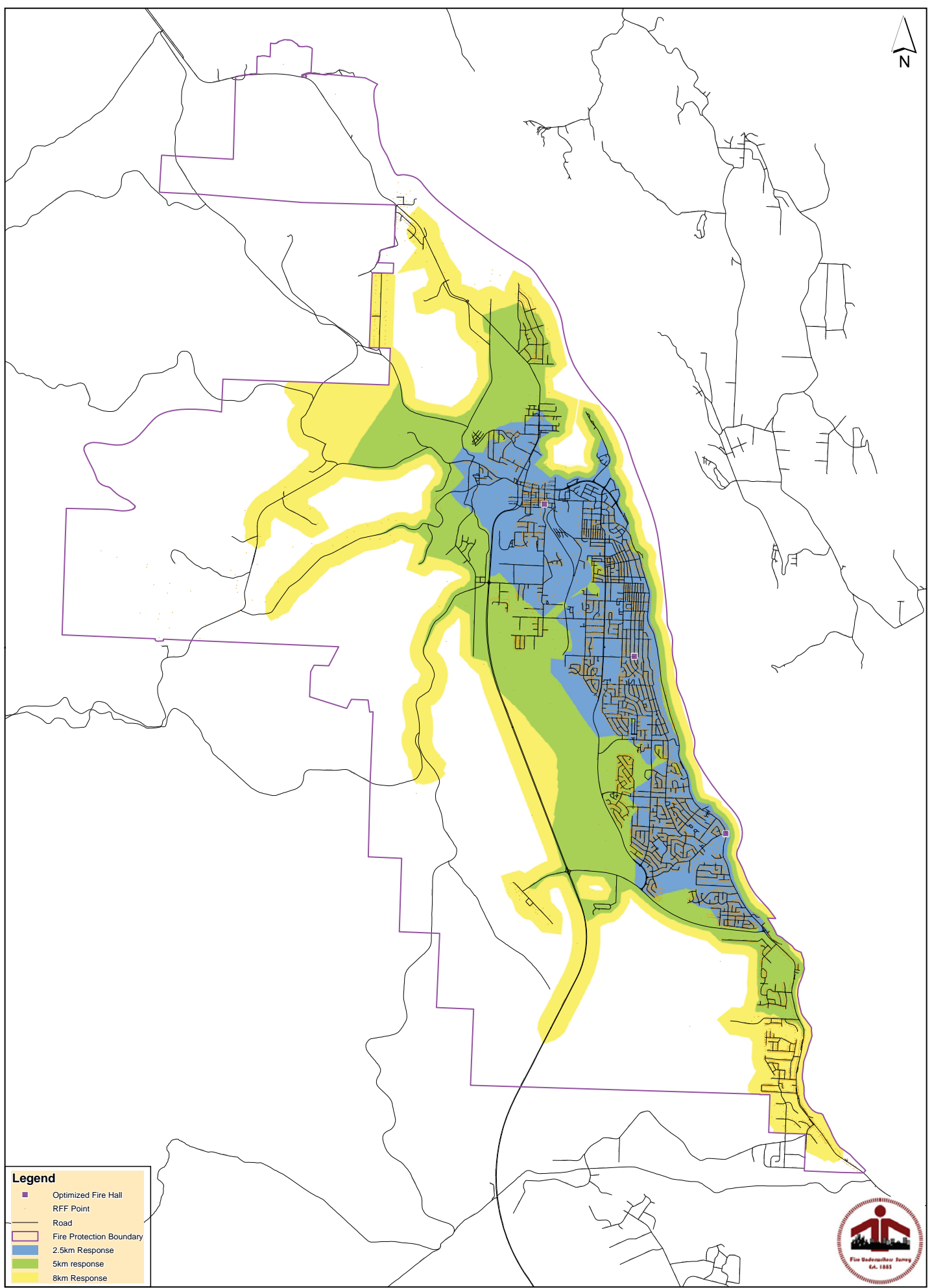


Legend

- Current Fire Hall
- RFF Point
- Road
- ▭ Fire Protection Boundary
- 2.5km Response
- 5km response
- 8km Response



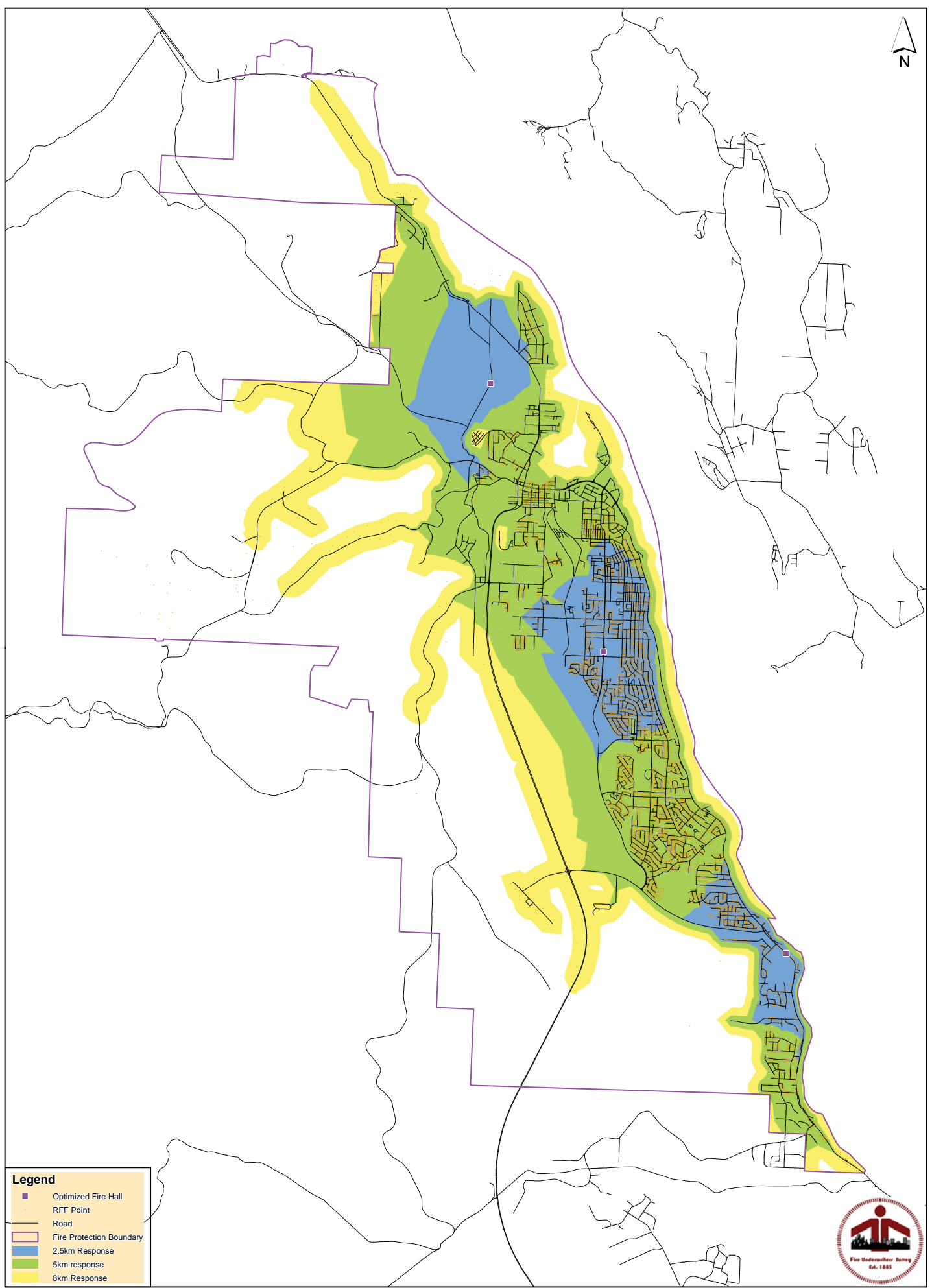
Figure 2 2.5/5/8km Response Map from Current Fire Halls



- Legend**
- Optimized Fire Hall
 - RFF Point
 - Road
 - ▭ Fire Protection Boundary
 - 2.5km Response
 - 5km response
 - 8km Response



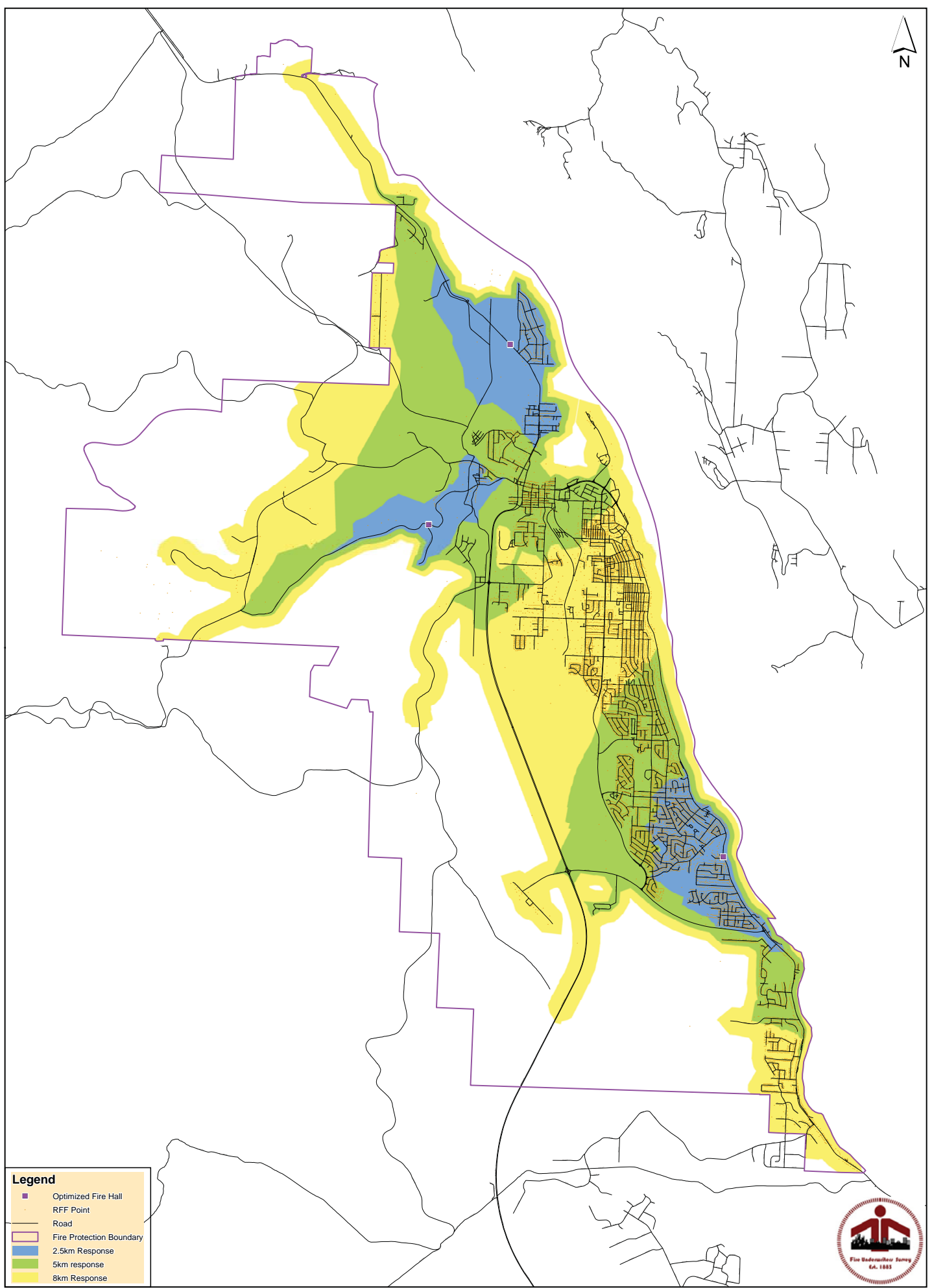
Figure 3 2.5/5/8km Response Map from Optimized Fire Halls under First Due



Legend

- Optimized Fire Hall
- RFF Point
- Road
- ▭ Fire Protection Boundary
- 2.5km Response
- 5km response
- 8km Response



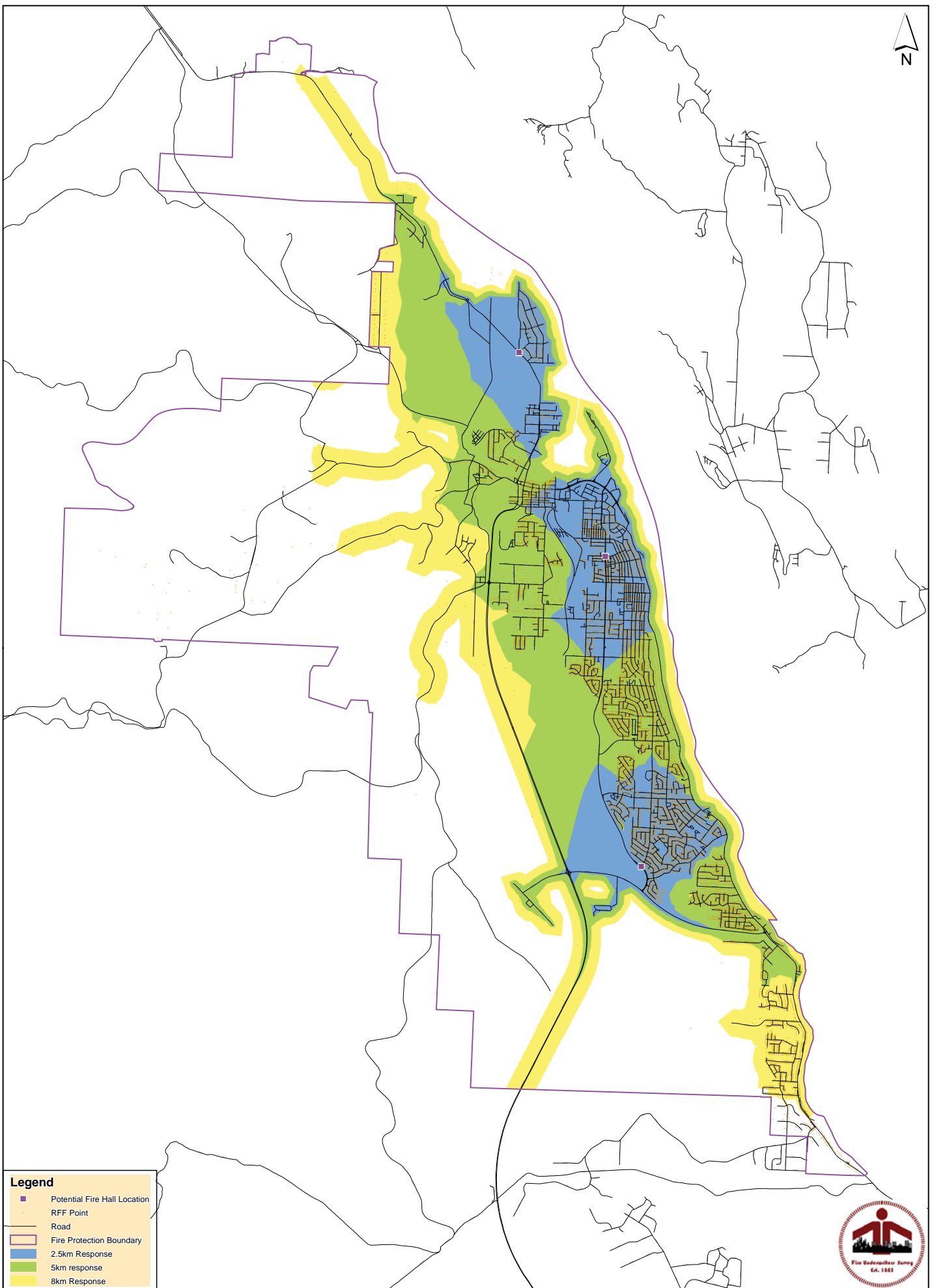


Legend








- Optimized Fire Hall
- RFF Point
- Road
- Fire Protection Boundary
- 2.5km Response
- 5km response
- 8km Response



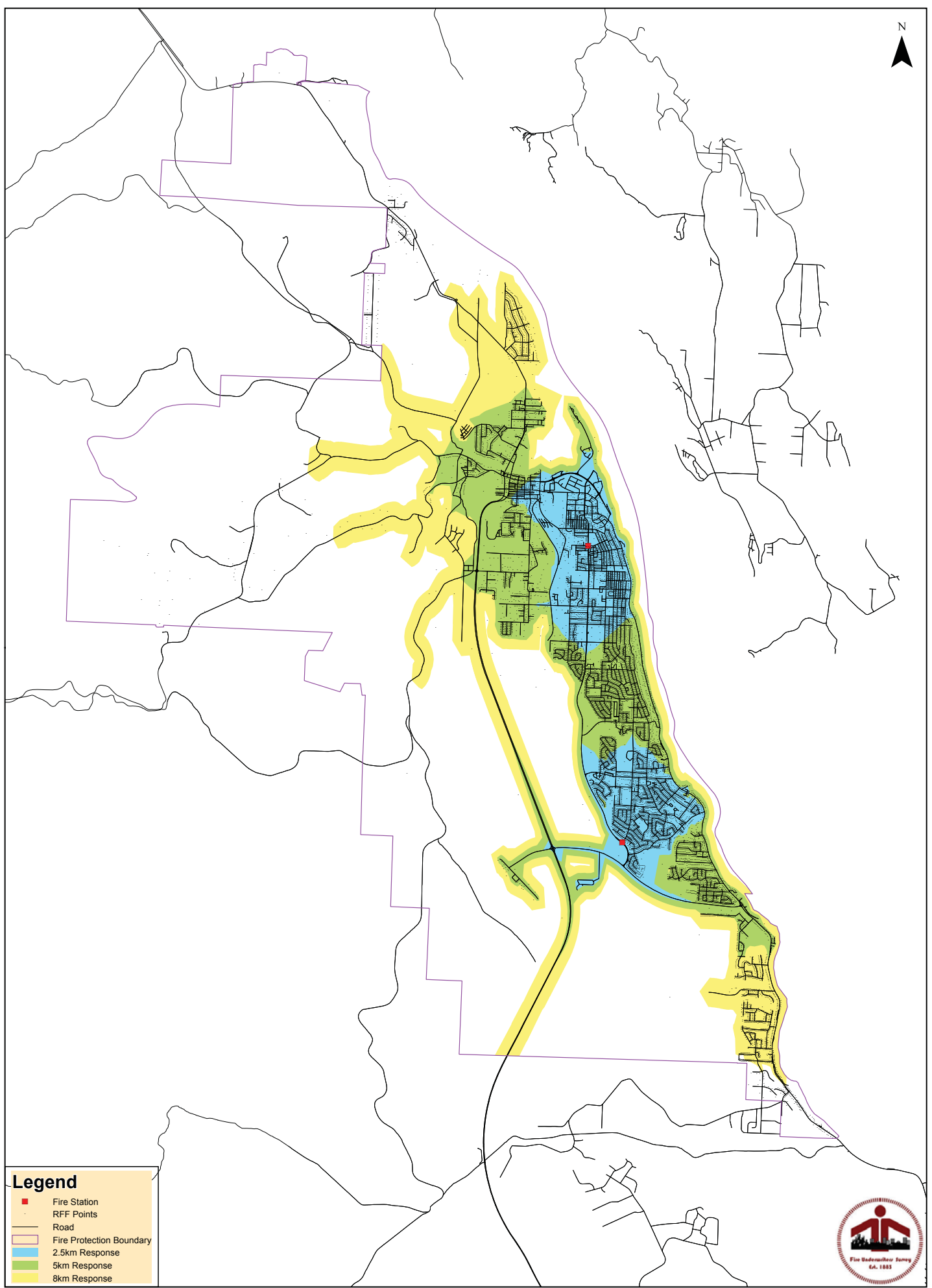
Figure 5 2.5/5/8km Response Map from Optimized Fire Halls under 8km



Legend

-  Potential Fire Hall Location
-  RFF Point
-  Road
-  Fire Protection Boundary
-  2.5km Response
-  5km response
-  8km Response





Legend

- Fire Station
- RFF Points
- Road
- ▭ Fire Protection Boundary
- 2.5km Response
- 5km Response
- 8km Response



Figure 7 2.5/5/8km Response Map from 2 Potential Fire Halls



The final Public Fire Protection Classification of the City is based on a measurement of the protective facilities against a benchmark of risk within the built environment in the community.

The four areas of protective/preventive facilities that are measured each have assigned relative classifications on a scale of 1 to 10 with 1 representing the highest standard of protection and 10 representing no protection.

Area of Grading	Weight within Grading	Relative Classification
Fire Department	40%	6
Water Supplies	30%	2
Fire Safety Control and Prevention	20%	4
Emergency Communications	10%	3

The area where the most significant improvement is needed is in Fire Department. The area protected by the Fire Department has been reviewed and to provide an ideal level of protection, one additional fire station would be required to serve the northern area of the community. Currently, the Campbell River Fire Department provides a career response from one fire station and an auxiliary response from the second fire station. The maximum credit that could be received in this area of the grading would include career response from three fire stations including one in the northern area.

A cost benefit analysis was also completed as part of this study which indicates that the greatest cost benefit for fire protection comes from Personal Lines insurance and occurs when a community fire insurance grade improves to Dwelling Protection Grade 3A. The City of Campbell River substantially exceeds the requirements for this grade, however continues to receive significant cost benefits through reduced insurance premiums on Commercial Lines albeit to a smaller extent.

Reduction in fire protection service levels as well as reduction in other service levels throughout the City may be required due to the economic downturn, however are not recommended. Should the City of Campbell River wish to further decrease the level of fire protection service being provided, it would increase the risk of life and property losses to fire and adversely impact the insurance rates of property owners.



Table 12.1-1 Fire Insurance Grading Classifications - Dwelling Protection Grades

SUB DISTRICT(S) and contract protection areas	DPG 1982	DPG 2009	COMMENTS
City of Campbell River	1	1	Hydrant Protected - detached dwellings within 300 m of a recognized fire hydrant and within 8 road km of Fire Station 1.
City of Campbell River	3A	3A	Hydrant Protected - detached dwellings within 300 m of a recognized fire hydrant and within 8 road km of Fire Station 2
City of Campbell River	3B	3B	Fire Station Protected - detached dwellings within 8 km by road of Campbell River Fire Station 1 but not within 300 m of a recognized fire hydrant.
City of Campbell River	-	4	Fire Station Protected – detached dwellings within 8 km by road of Campbell River Fire Station 2 but not within 300 m of a recognized fire hydrant.
Rest	5	5	Unprotected - detached dwellings further than 8 km by road of the Campbell River Fire Station.



Table 12.1-2 Fire Insurance Grading Classifications - Public Fire Protection Classifications

SUB DISTRICT(S) and contract protection areas	PFPC 1982	PFPC 2009	COMMENTS
City of Campbell River	4	5	Hydrant Protected - commercial properties within 5 road km of Campbell River Fire Station and 150 m of a recognized fire hydrant.
City of Campbell River	8	8	Fire Station Protected - commercial properties within 5 km by road of a Campbell River Fire Station but not within 150m of a recognized fire hydrant.
Rest	10	10	Unprotected - commercial properties further than 5 km by road of a Campbell River Fire Station.



FIRE UNDERWRITERS SURVEY COST BENEFIT OF IMPROVING FIRE INSURANCE GRADING

Fire Underwriters Survey was originally developed after a number of communities across North America had massive conflagration losses. The fire insurance grading system was developed to provide insurers with information related to the levels of fire risk and fire protection within each community in Canada. The system is designed to provide a cost benefit to communities for providing fire protection. Communities that have effective and appropriate levels of fire protection for the level of fire risk within their protection areas, will receive lower fire insurance grades, which in turn will result in lower insurance rates for property owners. This memo gives an overview of the factors that affect a community's fire insurance grading and how these ratings affect insurance premiums.

Fire Underwriters Survey (FUS) is a national organization financed and directed by CGI Insurance Business Services (formerly I.A.O.) and the Insurance Bureau of Canada (IBC). The organization assesses, evaluates and grades the quality of public fire defences maintained in Canadian municipalities and communities. This technical information is conveyed to FUS subscribers for use in their fire insurance statistical, rating and underwriting programs. FUS member companies provide approximately 85 percent of the private general insurance written each year in Canada.

Major features assessed during fire protection surveys include:

- 1) Water supply systems
- 2) Fire department administration and operations
- 3) Fire service communications
- 4) Fire safety control including building and fire prevention codes and their enforcement.

These functions are measured against recognized standards of fire protection.

The grading system has two components, the Dwelling Protection Grade and Public Fire Protection Classification. Both grading systems begin with a community risk assessment.

Dwelling Protection Grades (D.P.G)

The first fire insurance classification we establish and convey to FUS member companies is the Dwelling Protection Grade. The D.P.G. is a numerical system scaled from 1 to 5. One (1) is the highest grading possible and 5 indicates little or no public fire protection. This grading reflects the ability of a community to effectively respond to fires in small buildings (single family dwellings). An effective response requires adequate manpower (with appropriate training and equipment), apparatus, water supply and response time must be reasonably fast.

Public Fire Protection Classification

The P.F.P.C. is a sophisticated grading system scaled from 1 to 10. One (1) represents the ultimate degree of protection and 10 indicates little or no fire protection. This system evaluates the ability of a community's fire defences to prevent and control major fires that may occur in commercial, industrial and institutional buildings. This grading system includes a comprehensive analysis of the community's fire defences and risks.



Most insurance companies across Canada use the fire insurance grades (DPG and PFPC) as a factor in setting the premiums they charge for property insurance; the better the community's fire insurance grade, the lower the premiums the insurance company would charge for property insurance in that community.

How do fire insurance grading results affect insurance premiums? Table 2 shows how the premiums would vary for some typical single family dwellings under several example insurance companies' current rating schedules. It is important to note that every insurance company sets its own rates. While these figures are reasonably representative of how much difference the fire insurance grading can make in an insurance buyer's premiums, the amounts and percentages of the premium credits for the various fire classes will vary among insurance companies.

The first grade that communities are interested in is the Dwelling Protection Grade. The Fire Underwriters Survey method of assessment utilizes a 1-5 grading scale. Many insurers have simplified this scale into a "3 tier" system as shown in Table 1.

Table 1 Simplified 3 Tier System for Single Family Dwellings

Insurance Bureau of Canada Dwelling Protection Grades. Statistical "5 tier" System.	System Used by Many Insurance Companies Underwriting "3 tier" system.	Insurance Companies refer to this grade as :
1 2 3A 3B (S)	Table I	Protected
3B 4	Table II	Semi - Protected
5	Table III	Unprotected

Insurers typically provide a reduction of approximately 60% when communities fire insurance grading DPG is changed from unprotected to semi-protected. Note that different insurers have different policies and rating systems in many areas. Common examples of such differences include but are not limited to:

- Some insurers will treat communities with DPG 4 as Table III – Unprotected
- Some insurers may not accept 3B (S) as Table I - Protected

Insurers typically provide a reduction of approximately 32% when communities fire insurance grading DPG is changed from unprotected to semi-protected.

The following table shows average insurance premiums as they relate to different valued single family dwellings in typical Canadian communities.



Table 2 Example Insurance Premiums for Single Family Dwellings by Fire Insurance Classification¹

Replacement Value \$	Unprotected Rate \$	60± % reduction	Semi Protected Rate \$	32± % reduction	Fully Protected Rate \$
100,000	1165		465		315
125,000	1470		585		400
150,000	1750		700		475
175,000	2040		815		555
200,000	2300		915		625
250,000	2790		1110		755
300,000	3290		1310		890
350,000	3750		1495		1015
400,000	4200		1675		1140
450,000	4655	1855	1260		

The second grade that communities are interested in is the Public Fire Protection Classification. This grade is calculated from a comprehensive evaluation of the community and fire defense capabilities. This grade is a number between 1 and 10 with 1 being superior fire protection and 10 being unprotected. The PFPC grade of a community is a significant factor that most insurance companies use to set insurance premium rates for all buildings that are not single family dwellings. All such buildings are referred to as “commercial”. This includes assembly, institutional, industrial, multi-family residential and all others.

Many factors affect “commercial” property insurance premium rates. The Public Fire Protection Classification is significant, however it is important to note that there are many other significant factors that will affect insurance premiums in commercial properties. Such factors include but are not limited to: construction (combustible, noncombustible, etc.); building size; building value; type of occupancy; type of business; etc.

For information purposes, several insurance companies were contacted and quoted rates for commercial insurance were provided to illustrate the influence the Public Fire Protection Classification System has on insurance premiums.

Table 3 - Example Commercial Insurance Premiums at varying PFPC Classifications¹

Occupancy	FUS grades Insurance Premium per Year			FUS grades Insurance Cost Forecast over 10 years		
	6	5	4	6	5	4
Office \$2.2 million	\$ 2,647.00	\$ 2,455.00	\$ 2,314.00	\$ 26,470	\$ 24,550	\$ 23,140
Manufacturing (Wood) \$5.0 million	\$ 17,868.00	\$ 15,097.00	\$ 12,791.00	\$ 178,680	\$150,970	\$ 127,910
Hotel \$30.0 million	\$ 39,938.00	\$ 35,488.00	\$ 32,205.00	\$ 399,380	\$ 354,880	\$ 322,050
Apartment Complex \$10.0 million	\$ 11,828.00	\$ 11,160.00	\$ 10,667.00	\$ 118,280	\$ 111,600	\$ 106,670

¹ Note that Fire Underwriters Survey does not set rates for insurance. The values shown are based on data collected from a number of insurance companies quoted rates and U-rate insurance quote calculations.



For further information, the following table was developed to forecast what insurance premium savings would be if the community improved its Public Fire Protection Classification from PFPC 6 to PFPC 5 or PFPC 5 to PFPC 4. The cost savings were forecast over a 10 year period and were calculated for \$500 million of each example risk type.

Notably, Campbell River's assessment roll increased from \$2.75 billion last year (2005) to \$3.35 billion this year. This total of \$603 million in growth reflects changing market values for many properties but also includes subdivisions, rezoning and new construction.

Reference: http://www.bcassessment.ca/offices/courtenay/06_2006_Courtenay_Campbell_River_News_Release.pdf

Table 4 Cost Benefit Forecast (10 year) of Varying Improvements to PFPC¹

Occupancy	FUS grades			
	Insurance Cost Forecast over \$500 million of each risk type			Cost Benefit between 5 and 4
	6	5	4	
Office	\$ 6,015,909.09	\$ 5,579,545.45	\$ 5,259,090.91	\$ 320,455
Manufacturing (Wood)	\$ 17,868,000.00	\$ 15,097,000.00	\$ 12,791,000.00	\$ 2,306,000
Hotel	\$ 6,656,333.33	\$ 5,914,666.67	\$ 5,367,500.00	\$ 547,167
Apartment Complex	\$ 5,914,000.00	\$ 5,580,000.00	\$ 5,333,500.00	\$ 246,500
Average				\$ 855,030

As can be seen, the cost benefit of achieving a lower fire insurance grading can be significant. Communities can achieve lower fire insurance grades by providing an improved level of fire protection and reducing their fire risk.

The first and most important reason to provide improved levels of fire protection is to protect lives. However the cost of providing fire protection can be significant and in some cases communities find it is difficult to convince constituents and other stakeholders of the merits of providing an effective and up to date fire protective service program.

Communities that develop their fire protective services effectively can offset the cost of improved levels of fire protection with reduced property insurance rates.

The community of Campbell River has numerous commercial and multi-family residential properties. The total values of these properties would almost certainly exceed \$500 million dollars. The cost benefit of a positive change (or detriment of a negative change) in the Public Fire Protection Classification (FUS grade) is difficult to specifically quantify as the community make up may have more industrial occupancies than office or mercantile occupancies (or vice versa), however, each area of the community (excluding single family residences) may stand to significantly benefit from maintaining a PFPC Class 4 or moving to a PFPC Class 3.

If further analysis of potential cost benefits of fire insurance grade improvements is required, CGI Insurance Business Services offers comprehensive actuarial analysis services.