

FIRE DEPARTMENT PLANNING STUDY

City of Bellingham, Washington

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TABLE OF CONTENTS

July 15, 2004

1. INTRODUCTION AND EXECUTIVE SUMMARY	1
2. DESCRIPTIVE PROFILE	6
3. SUMMARY OF THE EMPLOYEE SURVEY	39
4. FIRE DEPARTMENT IN A COMPARATIVE CONTEXT	59
5. ANALYSIS OF EMERGENCY SERVICES DEPLOYMENT AND OPERATIONS	74
6. ANALYSIS OF PERSONNEL POLICIES	115
7. ANALYSIS OF FIRE PREVENTION SERVICES	122
8. ANALYSIS OF ORGANIZATIONAL STRUCTURE AND MANAGEMENT SYSTEMS	132
9. ANALYSIS OF REVENUE GENERATION OPPORTUNITIES	149
APPENDIX: FIRE SYSTEM GIS MAPS	172

Supplemental Materials appended to final report on 12 Aug 2005

Letter addressing Dispatch and Privatization: August 9, 2004	196
Memo from Matrix Consulting Group clarifying August 9 letter: December 3, 2004	211
Additional data analysis by Matrix Consulting Group: June 11, 2005	212

1. INTRODUCTION AND EXECUTIVE SUMMARY

This initial chapter of the report introduces the approaches utilized in this study and summarizes key findings, conclusions and recommendations to be found in this report.

1. INTRODUCTION TO THE REPORT

The Matrix Consulting Group was retained by the City of Bellingham to assist its Fire Department to evaluate current operations and plan for the future. In reaching the concluding point of the study, the project team has assembled this report which summarizes our findings, conclusions and recommendations, where appropriate. This report represents the conclusion of three months of analysis of the organizational structure, staffing, management and operations of the Fire Department.

In this study of the Bellingham Fire Department, the Matrix Consulting Group's project team utilized a wide variety of data collection and analytical techniques. The project team conducted the following data collection and analytical activities:

- The project team began an intensive process of interviewing staff in every Fire Department function and collecting a wide variety of data designed to document workloads, costs and service levels. These interviews included not only managers and supervisors, but also many line staff in group station interviews.
- The project team supplemented this input through the use of confidential employee surveys. Almost two-third of the employees took advantage of this opportunity to provide input to us. Its results were useful to the project team to identify issues and potential solutions.
- The project team developed a descriptive summary, or profile, of the BFD – reflecting organizational structure, staffing, workloads, service levels and programmatic objectives. This profiles was reviewed with managers and staff.
- The project team also compared organizational structure, staffing levels, as well as certain operational and service delivery indices against other fire departments

in the Pacific Northwest. This step, too, served as a way to identify issues in this study.

- Throughout this process, the project team reviewed interim findings and issues with the management of the Fire Department as well as with a project steering committee comprised of municipal elected and appointed officials.

In all instances, the measures of efficiency and effectiveness utilized by the project team in our analyses were selected and adjusted to reflect the unique operating and service conditions in the City of Bellingham and Whatcom County. This process allowed the project team to point to strengths associated with current approaches to delivering fire and emergency medical services as well as potential improvement opportunities.

2. SUMMARY OF RECOMMENDATIONS

The project team has prepared this summary of the findings, conclusions and recommendations contained in this report. While the reader should examine the body of the report for the detailed analyses summarized here, the following table provides each recommendation made in this report, a synopsis of the rationale for each recommendation as well as estimated fiscal impact.

Chapter / Page #	Summary of Recommendations	Estimated Cost / (Savings)
CHAPTER 5 – ANALYSIS OF EMERGENCY SERVICES DEPLOYMENT AND OPERATIONS		
85	Based upon an analysis of hour-by-hour system demand, the current number of dedicated ALS transport units (4) are unable to meet call demands of the system between the hours of 10:00 a.m. and 10:00 p.m. New system design options should include a planned need deployment of at least 5 transport units between the hours of 10:00 a.m and 10:00 p.m. at a minimum. The capacity of the system meets or exceeds the call demand placed on it during the remaining hours of the day. As a result, an additional 3 units would be required.	\$1.668 Million per year

Chapter / Page #	Summary of Recommendations	Estimated Cost / (Savings)
88	The relatively high percentage of Medicare/Medicaid payers makes a reduction of subsidies in the system problematic. Given the elimination or reduction in subsidy, the degree of increases necessary to offset the current costs of the system through fee-for-service billings alone is dramatic. As such, alternative system designs and/or cost structures must be identified to ensure the sustainability of the emergency medical system in both the County and the City.	Covered in later recommendations
92	<p>The City should work collaboratively with public health officials, the community hospital and physician groups to design and designate an alternative pathway to the healthcare system for those who utilize EMS in an inappropriate manner for such purposes.</p> <p>Additionally, the City should acquire and implement a quality assurance audit program for its Priority Medical Dispatch functions to evaluate the efficacy of current and future protocols for telephone and field triaging of patients to the appropriate level of care. Cost avoidance from this measure could exceed \$5 million over the planning period.</p>	<p>\$0</p> <p>\$110,000</p>
98	The City should immediately move to a deployment model that distributes paramedic personnel and resources as described in the first model above. This places personnel in each of the City's stations, enhancing the rapidity of ALS intervention. This will provide the number of transport resources necessary to meet current demand. There are service improvements associated with this change without additional costs.	Covered in later recommendations
113	Move to implement the "squad" approach to deployment. In the near term, this should include Alternative 2. If budgetary constraints arise, the Department can begin to implement other Alternatives which would enable them to reduce minimum staffing and thereby make position reductions as well. There are no new costs associated with the ability to achieve a significant service level enhancement of delivering four or more persons to 100% of calls in the City within 4 minutes or less.	\$0

Chapter / Page #	Summary of Recommendations	Estimated Cost / (Savings)
CHAPTER 6 – ANALYSIS OF PERSONNEL POLICIES		
117	The Fire Department and the City should move to reduce shift Battalion Chief staffing from four to three. This should be accomplished by moving them to the same 50-hour workweek as the line operations. This will have to be negotiated as the current 42-hour workweek is in the contract.	(\$51,000) per year
118	Continue with the current programs which maximize the utilization of line personnel. Consider opportunities to improve pre-fire planning as part of the company inspection efforts already on-going.	\$0
CHAPTER 7 – ANALYSIS OF FIRE PREVENTION SERVICES		
127	The staffing of the Life Safety Division should be reduced by one position (FF / Inspector). Concurrently, the unit should reassign various tasks within the unit as described above. No change should be made in the support staffing for the unit. Implement intensive data collection and reassess staffing needs in 3 to 6 months.	(\$71,000) per year
129	The Life Safety function should continue to be supervised by and assigned to the Fire Department. One of the Life Safety Division staff should maintain some scheduled office hours in the Planning “one-stop” location as a way to enhance services and accessibility for the community.	\$0
131	The Fire Department should re-focus on the delivery of public education and prevention services. One-half of the Inspector’s time should be dedicated to developing, providing and coordinating these services.	\$0
CHAPTER 8 – ANALYSIS OF ORGANIZATIONAL STRUCTURE AND MANAGEMENT SYSTEMS		
136	Implement the organizational alternative with two Assistant Chief positions. This alternative also includes the creation of a Fire Marshal position. This organizational change will allow the Department to focus on key issues, long range planning and allow top staff to utilize their time more appropriately.	\$106,500

Chapter / Page #	Summary of Recommendations	Estimated Cost / (Savings)
137	The Department should continue with automation of the Policies and Procedures. While the Assistant Chief is responsible for policy distribution, this responsibility should be clearly defined and performance standards defined. Organization-wide input and review should be implemented.	\$0
138	Carefully monitor on-going utilization of and participation in the FRITS program. Future consideration should be given to withdrawing from the program if participation continues at these low rates.	\$0
141	The Fire Department should reduce the staffing in the training function by two positions: (1) Division Chief and (1) Captain. Concurrently, all EMS training should be consolidated into a single position and all Fire training consolidated within the other.	(\$201,000) per year
148	During future negotiations over the District 8 and the Emergency Management contract, the City and Department should work to increase the per call payments to the BFD for responding to the airport and should also reduce their payments to the County for emergency management by \$38,000 to offset the cost of the new Assistant Chief.	(\$38,000)
CHAPTER 9 – ANALYSIS OF REVENUE GENERATION OPPORTUNITIES		
170	The City and the Fire Department should consider implementing response-based fees for service.	Additional revenues may range between (\$32,000 and \$161,000) annually. However, the project team's experience with these types of fees is that collections are more likely to be lower.
172	The City and Fire Department should consider other fees including payment in lieu of taxes (PILOT) and compensation for mutual aid response outside the Medic One contract. Impact fees do not appear to be an appropriate revenue option at this time given current response network and growth pattern.	Potential revenues of more than (\$500,000) from PILOT and (\$140,000) from asymmetric mutual aid compensation.

2. DESCRIPTIVE PROFILE

This introductory chapter of the Bellingham Fire Department (BFD) Planning Study includes information regarding the current organization and operation of the BFD – which served as the context for our study. The various types of data and information were developed through interviews of BFD management and line personnel, review of available documents and records, as well as access to computerized records and data sets.

This profile is organized as follows:

- Overview
- Organization and Staffing Levels
- Staff Roles and Responsibilities
- Staff Schedules
- Fire Station and EMS Locations and Apparatus
- Fire and EMS Response Levels
- Fire and EMS Workload
- Operational Revenues and Costs

The first section, which follows, provides a brief introduction and basic overview of the BFD.

1. OVERVIEW

This section gives a brief introduction to the background of the City of Bellingham, as well as for the surrounding area of Whatcom County.

(1) The City of Bellingham and Surrounding Area

The unincorporated and incorporated areas of Whatcom County have experienced a slight growth over the past 5 years, as shown in the following table.

Whatcom County	2000	2001	2002	2003	2004
Unincorporated	74,231	75,682	76,718	77,796	79,022
Bellingham	67,171	68,890	69,260	69,850	70,769
Other Cities	25,424	26,028	26,222	26,854	27,349
Total	166,826	170,600	172,200	174,500	177,141

As shown above, the unincorporated area has increased steadily by an average of 1.6% per year, while the City of Bellingham has increased by 1.3% per year, and the other cities by 1.8% per year, for a total Whatcom County population of 177,141 residents.

In particular, the following table shows the population increase for those residents aged 65 years and older, whose population has an impact on the provision of emergency services in the County.

	2000	2001	2002	2003	2004
Whatcom County	19,400	19,668	20,151	20,693	21,143

As shown above, those residents aged 65 and older in Whatcom County have increased in population, on average, of approximately 2.2% per year for the past 5 years to a current number of 21,143, which represents nearly 12% of the County's total population. Over the same time, the number of housing units has increased in Whatcom County, as shown in the following table.

	2000				2003			
Whatcom County	Total	One-Unit	Two-Unit	Multi/ Trailer	Total	One-Unit	Two-Unit	Multi/ Trailer
Unincorporated	34,390	24,200	2,107	8,083	36,495	25,701	2,222	8,572
Bellingham	29,474	16,099	12,545	830	31,602	16,813	13,963	826
Other Cities	10,033	6,888	2,523	622	10,783	7,403	2,649	731
Total	73,897	47,187	17,175	9,535	78,880	49,917	18,834	10,129

The following points summarize the information above.

- Housing units in the unincorporated area have increased by 6.1% over this 3-year period, from 34,390 to 36,495.
- Housing units in the City of Bellingham have increased by 7.2% over this 3-year period, from 29,474 to 31,602.
- Housing units in the other incorporated cities in Whatcom County have increased by 7.5% over this 3-year period, from 10,033 to 10,783.

Overall, housing units in this area have increased by 6.7%, from 73,897 to 78,880, which includes a 5.8% increase in one-unit housing, a 9.7% increase in two-unit housing, and a 6.2% increase in multi-family / trailer housing.

(2) The Bellingham Fire Department Overview

The BFD provides fire, rescue, and emergency medical services for over 70,500 residents of the City of Bellingham within its 31,600 housing units, and provides advanced life support paramedic and basic life support ambulance transport service to an additional 105,000 residents in Whatcom County covering over 2,120 square miles.

This Emergency Medical Services (EMS) System provides services through an inter-local agreement entered into by the City of Bellingham and the County of Whatcom in 1974. The BFD works with first responders from other county fire departments for fire, rescue, and Basic Life Support (BLS) services in a “tiered response system,” with Advanced Life Support (ALS) services being provided throughout the County through the “Medic 1” Program (administered by the BFD and funded by the City and County) that was formed through the inter-local agreement.

The Medic 1 program is currently undergoing significant re-design efforts. The City and the County are working to mitigate the impacts of the failure of a levy to replace and enhance the general fund contributions of both those agencies to the operations of

the Medic 1 Program. The current proposal would form the Whatcom County EMS Authority and expand membership from the City and the County to include fire districts and the other cities within Whatcom County. Although the hope of the City of Bellingham would be to remain the ALS provider, one primary concept of the Authority is that it would ability to contract with other agencies to provide ALS services and BLS level transports throughout the remainder of the County. The value of the provision of BLS transport services would be considered in future funding models adopted by the Authority Board.

The City of Bellingham is in the position of having to make long-term personnel decisions by July 1, 2004. Therefore, there are significant time constraints on the development and implementation of this proposal. The proposal has significant implications on the operations of the system, including priority dispatch proliferation, clinical quality control, and medical direction.

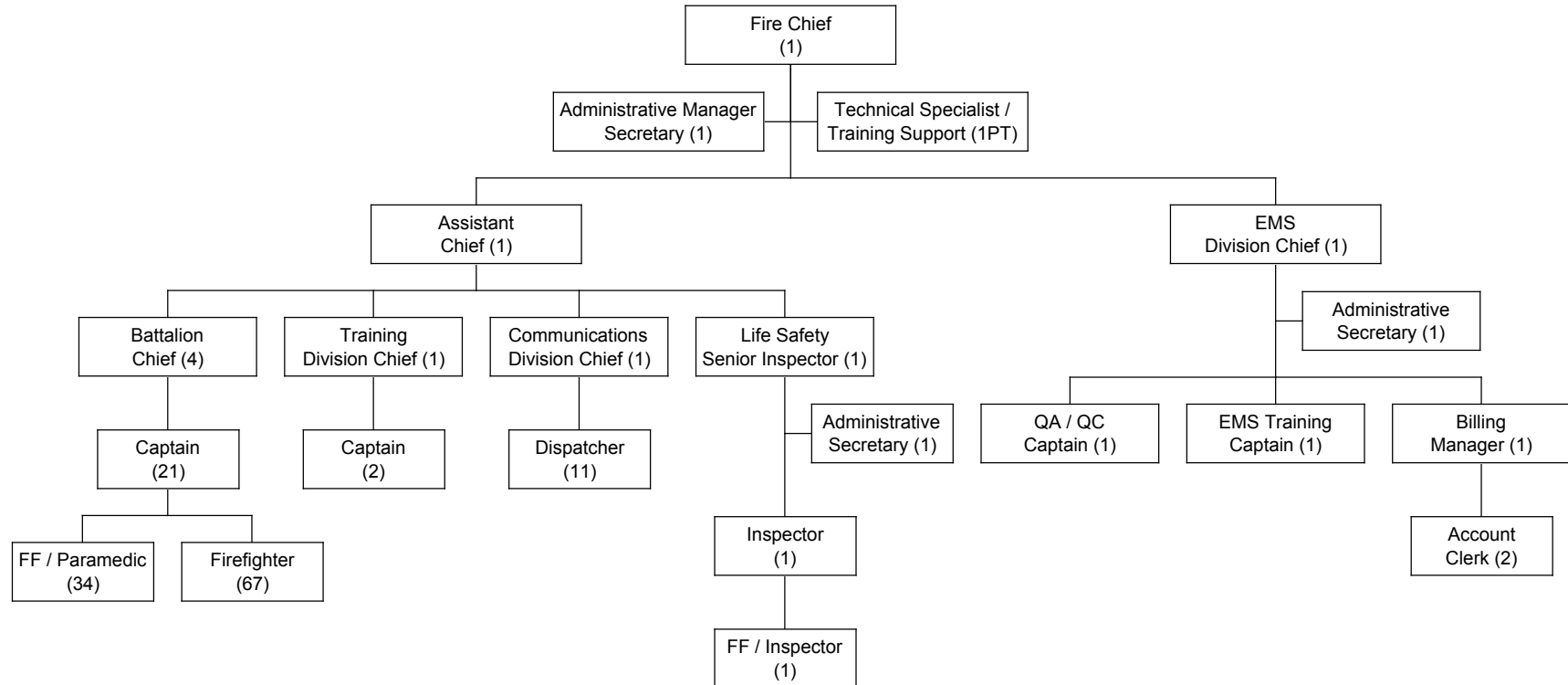
2. ORGANIZATION AND STAFFING LEVELS

In total, the BFD has 156 personnel deployed within 6 Divisions, as shown below.

Division	# of Personnel
Administration	4
Operations	126
Medic One	7
Communications	12
Training	3
Life Safety	4
TOTAL	156

The organization chart, on the following page, provides a graphical summary of current staffing in the BFD, which shows the number of personnel for each division and general classification.

Bellingham Fire Department



3. STAFF ROLES AND RESPONSIBILITIES

The table, below, provides a summary of the primary roles and responsibilities of the various positions in the BFD.

Position	#	Key Roles and Responsibilities
Chief	1	<ul style="list-style-type: none">• Overall manager of the Department.• Responsible for budget development, oversight and management.• Responsible for establishing policies and procedures for overall operations.• Directs administrative functions of the Department on a daily basis.• Appointed by and reports to the Mayor directly.• Primary responsibility for external departmental relations with the community, other fire service agencies, etc.
Assistant Chief	1	<ul style="list-style-type: none">• Functions primarily as the operations chief of the Department, responsible for internal day-to-day activities.• Plans and evaluates changes in operations to reflect needs, changing conditions and resource availability.• Supervises the activities and accountability of Battalion Chiefs in shift oversight as well as administrative responsibilities.• Also supervises Battalion Chiefs assigned to Training, EMS and Fire Prevention, although the Fire Prevention BC position is currently unfilled.
Division Chief (EMS)	1	<ul style="list-style-type: none">• Primarily responsible for the management and leadership of the Medic 1 Program.• Directly supervises 2 EMS Captains, an Accounts Receivable Manager, and a secretary.• Provides support to the EMS Advisory Council• Administers and prepares Medic 1 budgets and financial projections.

Position	#	Key Roles and Responsibilities
Division Chief (Training)	1	<ul style="list-style-type: none"> • This rotating two-year Battalion Chief's position is responsible for the Department's training program. • Key roles of the BC position include training program development, evaluation of training needs, oversight of Captains assigned (in two year rotations) who develop the training schedule, new recruit academy needs and operations. • Evaluates outside training opportunities. • Coordinates the Fire Rescue Incident Training Service (FRITS), a inter-local agreement to improve regional training, especially for neighboring fire districts. • This Battalion Chief also carries administrative assignment, including rescue and wild land responsibilities, firefighter personal equipment, the honor guard and fitness testing.
Battalion Chief (Shifts)	4	<ul style="list-style-type: none"> • Shift commander for each of the three Platoons. Battalion Chief's, however, work a four platoon system. One BC functions on a relief shift basis. • Battalion Chiefs work, essentially, an average 42 hour work week after shift rotations and Kelly days but give back an average of 4 hours per week to handle assigned administrative duties. • Responds as incident commander on all major calls (fire, hazmat, major accidents, etc.). • Also are responsible for the administrative functions of assigned shift (grievances, discipline, etc.). Each Battalion Chief is assigned either 1 – 2 stations for primarily personnel or major facility issues which arise. • Each Battalion Chief also has a set of ancillary responsibilities (fire prevention, arson investigation, public education, training / safety, interaction with the Police Department, communications hardware, vehicle maintenance and other similar administrative duties). • Department policy requires the Operations BC position be filled each shift with either a BC or an Acting BC qualified Captain.
Division Chief (Communications)	1	<ul style="list-style-type: none"> • Responsible for the management of the communications center in the Department. This center provides call taking, pre-arrival instructions and dispatch services to all fire / EMS agencies in the County. This Division Chief handles liaison work as well as serves as project manager on a number of radio related issues and serves on a number of state and regional committees.
Division Chief (Fire Prevention)	0	<ul style="list-style-type: none"> • This position was recently vacated and will be unfunded for the foreseeable future.

Position	#	Key Roles and Responsibilities
Captain	21	<ul style="list-style-type: none">• Coordinates all fire suppression, rescue and emergency activities for a company on an assigned shift.• Serves as station commanding officer and ensures compliance with BFD policies, procedures, and other directives as appropriate.• Oversees and/or participates in extinguishing and preventing fires, emergency medical services, training, public education, inspections and pre-fire plans, etc.• Other duties as directed.
Firefighter	67	<ul style="list-style-type: none">• Responds to fire and medical emergencies and follows instructions of superior officers or standard operating procedures in the laying of hose lines and raising of ladders, performing acts of rescue and ventilation, extinguishing fire, or participating in clean-up operations.• Cleans, maintains, and inspects equipment and fire stations.• Participates in training sessions and drills.• Participates in developing pre-fire plans.• Participates in the inspection of buildings for purposes of enforcing building fire safety regulations and codes.• Handles radio and telephone communications.• Drives rescue and ambulance vehicles when required.• Other duties as directed.

Position	#	Key Roles and Responsibilities
Paramedic	34	<ul style="list-style-type: none"> • Responds to medical emergencies and provides the appropriate level of life support services. • Diagnoses and provides emergency medical treatment in accordance with standard policies and procedures. • Stabilizes victims with life or health threatening problems during incidents. • Cross-trained as firefighters and serves in that capacity for working structure fires. • Other duties as directed.
Fire Inspectors	3	<ul style="list-style-type: none"> • Three positions: Senior Fire Inspector, Fire Inspector and FF / Fire Inspector. • Senior Fire Inspector is now the lead worker in the unit, reporting directly to the Assistant Chief. This position is primarily responsible for conducting all site and building plan reviews (this process is now coordinated by Building Services). • The Inspector position is primarily responsible for conducting new construction inspections and for handling follow-up inspections of issues identified by engine companies. • The FF / Inspector is responsible for conducting a series of dedicated inspections (most typically those which are more complicated or time consuming making them difficult to assign to engine companies) and public education.
Fire Training Captains	2	<ul style="list-style-type: none"> • One Captain is primarily focused on the provision of EMT in-service and continuing education training. This includes the development of on-line training as well as the direct provision of hands-on continuing education and training. • The second Captain is responsible for the provision of quarterly and annual training. This position is also responsible for academy training of new recruits (when there are new hires). • Both of these positions are staffed with Captains who rotate from line positions into Training for two years (the positions are staggered to minimize the impact).

Position	#	Key Roles and Responsibilities
EMS Operations Captain	1	<ul style="list-style-type: none"> • Responsible for specifying and purchasing medical equipment and supplies. • Initial responsibility for handling patient and citizen complaints about EMS related matters. • Reviews all Medical Incident Reports (MIR) and serves as first level of medical review. Forwards targeted charts to Program Medical Director for review and analysis. • Responsible for defining and publishing continuing education opportunities and program development.
EMS Training Captain	1	<ul style="list-style-type: none"> • Responsible for training and coordination of the certification of “new” paramedics through Medic 1’s own training program managed through the BFD. • Responsible for the scheduling of instructors and administrative management of paramedic training program.
Dispatchers	11	<ul style="list-style-type: none"> • The Dispatchers are assigned to work 12-hour shifts which are equal to 42 hours per week (this has been carefully managed). • Staff are responsible for handling all fire and EMS dispatching radio traffic in Whatcom County. In this capacity, they work closely with the Police dispatch center (which is the primary 9-1-1 PSAP for the County).
Account Billing Manager	1	<ul style="list-style-type: none"> • Provides direct supervision of accounting clerks. • Assures proper application of billing codes and updates of Medicare billing procedures. • Provides administrative reports for Medic 1 Administration. • Ensure appropriate level of collection activities and answers consumer questions.

Position	#	Key Roles and Responsibilities
Accounting Clerks	2	<ul style="list-style-type: none"> • Enters medical incident reports and pertinent information into the data system. • Checks for quality control and processes the medical incident reports. • Processes the invoices and distributes as appropriate. • Posts payments and checks bill schedules on accounts with balances. • Take deposits to bank and obtain receipts from Finance. • Reconciles accounts and processes secondary and re-billings.
Administrative Assistant / Secretary	3	<ul style="list-style-type: none"> • The Administrative Assistant reports directly to the Fire Chief and is responsible for a wide range of general support tasks. In addition, this position is responsible for the maintenance of the Department budget, procurement monitoring and payroll monitoring and submission. The part-time position provides assistance to this position as required. • One Secretary reports directly to the Medic One Division Chief and provides support as required. • One Secretary is responsible, primarily, for providing support to the Prevention Bureau. This takes the form of managing appointments, maintaining extensive files and producing correspondence under the direction of inspection staff. In addition, this position is responsible for handling incoming calls (who agency) and for greeting the public.
Technical Support / Training Specialist	1	<ul style="list-style-type: none"> • Provides the BFD technical and logistical assistance to the BFD. • Other duties as appropriate.
Total Full-Time and Part-Time	156	

4. STAFF SCHEDULES

Line personnel in the Bellingham Fire Department work four different shift schedules, as depicted in the table, below:

Assignment	Shift Description	Resulting Average Hours Per Week
Battalion Chief	<ul style="list-style-type: none">• Four “ platoons”• 1-2-1-4 rotation• 24 hour shift• No Kelly day• Owe back 4 hours of administrative time every 2 weeks	42 hours (Shift Workweek) 45.7 hours (w/Owed Time)
Suppression	<ul style="list-style-type: none">• Three platoons• One-on-two-off rotation• 24 hour shift• Kelly day every 6th schedule shift and on 8th schedule shift also (1 platoon of three)	50.3 hours
Medic	<ul style="list-style-type: none">• Three platoons• One-on-two-off rotation• 24 hour shift• Kelly day every 5th shift	46.5 hours
Dispatch	<ul style="list-style-type: none">• Four “ platoons”• 3-on-4-off-4-on-3-off rotation• 12 hour shift• Work week starts mid-shift on T/W (night / day) to keep FLSA time down to 42 hours per week• Paid overtime for 2 hours	42 hours

The following section describes fire stations and EMS locations in the Fire Department’s response network.

5. FIRE STATION AND EMS LOCATIONS AND APPARATUS

The table, below, provides a summary of the existing equipment and apparatus of the 6 BFD stations.

Fire / Emergency Station	Equipment and Apparatus
Station 1 1800 Broadway	<ul style="list-style-type: none">• Engine 51• Medic 1 (ALS)• Medic 2 (ALS)• Battalion 1• Fire/Arson Investigation Unit• Rehab/Multi-casualty Unit• Aid/Medic 51 (BLS Transport)• Reserve Engine 57
Station 2 1590 Harris	<ul style="list-style-type: none">• Engine 52• Aid/Medic 52 (ALS/BLS Transport)
Station 3 1111 Indian Street	<ul style="list-style-type: none">• Engine 53• Rescue 91• Ladder 41
Station 4 2306 Yew Street	<ul style="list-style-type: none">• Engine 54• Aid/Medic 54 (BLS Transport)• Reserve Engine 58
Station 5 3314 Northwest Avenue	<ul style="list-style-type: none">• Engine 55• Aid/Medic 55 (BLS Transport)• Fire Belle
Station 6 4060 Deemer Road	<ul style="list-style-type: none">• Engine 56• Aid/Medic 56 (ALS/BLS Transport)• Ladder 42
Medic 3 Station 1886 Grandview Road Ferndale	<ul style="list-style-type: none">• Medic 3 (ALS)
Medic 4 Station 858 E. Smith Bellingham	<ul style="list-style-type: none">• Medic 4 (ALS)

The BFD provides fire suppression and rescue and emergency services with 6 engines, 2 reserve engines, 1 ladder, and 1 reserve ladder. The ALS services are provided by 4 ALS transport Units and an additional ALS staffed engine company. Additionally, the City of Bellingham maintains additional “aid” units that are transport capable. The aid units are generally utilized during system overload periods to provide

Basic Life Support (BLS) level transportation. These units may be upgraded to ALS status depending on available paramedic staffing.

Currently, for the respective apparatus, the BFD utilizes 3-person engine companies, and an EMT/Firefighter and paramedic for the ALS units, with a goal to staff each of the ALS Medic Units within the City with 2 paramedics. The Fire Department does staff the County medic units with two paramedics.

6. FIRE AND EMS RESPONSE LEVELS

The following table shows the response policies of the Bellingham Fire Department. The information was obtained from a policy document utilized and recently updated by the Prospect Communications Center. The unit totals are cumulative

INCIDENT TYPE	BC	Engine	Ladder	Medic/Aid
ALARM FIRE				
STRUCTURE FIRE COMMERCIAL				
First Alarm	1	4	1	1
Second Alarm	1	8	1	2
Third Alarm	1	12	2	3
Fourth Alarm	1	16	2	4
STRUCTURE RESIDENTIAL				
First Alarm	1	4	1	1
Second	1	8	1	2
VEHICLE FIRE				
First Alarm		2		
RESCUE				
HEAVY AND HIGH ANGLE RESCUE				
First Alarm	1	2	1	
HEAVY AND HIGH ANGLE RESCUE w/MEDIC				
First Alarm	1	2	1	1
MEDICAL				
ACCIDENT INJURY - VICTIM TRAPPED				
First Alarm	1	2	1	1
ACCIDENT MULTIPLE VICTIMS				
First Alarm	1	2	1	2
MASS CASUALTY INCIDENT, MAJOR				
First Alarm	1	4	1	8
VEHICLE ACCIDENT INJURY				
First Alarm		1	1	1
V/A TRAPPED OR MULTIPLE VICTIMS				

INCIDENT TYPE	BC	Engine	Ladder	Medic/Aid
First Alarm	1	2	1	1
HAZMAT				
HAZMAT RESPONSES 1, 2 AND 3				
First Alarm*		1	1	
SERVICE CALL				
ASSISTANCE AND PUBLIC SERVICE CALLS				
First Alarm*		1	1	

* - Requires an Engine OR Ladder Response

The Whatcom Medic 1 system utilizes “Priority Dispatch” protocols in addressing incident responses. This tool has been in various stages of implementation for approximately 2 years and is gaining greater acceptance as time progresses. Currently, it is expected that the prominence of priority dispatch in the system will increase. This is based upon the current efforts of the County and the City of Bellingham to mitigate the growth of demand on the system by innovative approaches to demand management – including telephone triaging/prioritization of calls.

Unlike many “high performance” EMS systems found today, the Whatcom Medic 1 system does not measure it’s current level of performance on response times. Rather, system performance is measured by the ability to avoid “stacking” calls, or stated another way, maintaining enough ALS resources so that the system maintains sufficient capacity to respond immediately to every call for service at an ALS level.

The table, which follows, summarizes the performance of the current system based upon this measure:

Total Medic and Medic/Aid Responses	Number of Reserve Medic/Aid Responses	Percentage of Total Reserve Medic/Aid Units Utilized*
11,120	838	7.5%

*- May be a lower percentage if addressing only when BLS resources were available.

As shown above, there were 11,120 specific unit responses for a total number of Medic 1 incidents of 10,797. A review of the data indicates that some number of these calls reflect Aid unit utilization in cases of multi-casualty or multiple unit dispatches.

7. FIRE AND EMS WORKLOAD

This section of the profile provides overall fire and EMS workload (i.e., calls for service), and overall response demands and resource utilization for both BFD fire suppression (i.e., non-EMS calls) and EMS.

(1) Overall Call for Service and Response Demands

The following table shows the number of total incidents the BFD responded to by day of week and time of day for 2003. The table was developed based on detailed 2003 incident information provided by the BFD to the consultant project team which shows various types of data for each incident, including incident date and time, incident number, district, station, shift, apparatus type, postal code, date and time for alarm, dispatch, and on-scene arrival, etc.

	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.	TOTAL	%
0000-59	58	46	45	51	61	66	81	408	3.2%
0100-59	42	46	48	44	54	76	63	373	2.9%
0200-59	42	35	47	44	54	71	59	352	2.7%
0300-59	37	38	26	20	48	46	48	263	2.0%
0400-59	42	40	37	25	28	37	36	245	1.9%
0500-59	49	41	43	36	42	40	36	287	2.2%
0600-59	32	40	48	52	37	43	41	293	2.3%
0700-59	52	53	60	68	70	57	45	405	3.2%
0800-59	67	60	82	72	78	61	71	491	3.8%
0900-59	105	98	95	84	84	72	81	619	4.8%
1000-59	96	108	87	97	92	85	90	655	5.1%

	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.	TOTAL	%
1100-59	96	120	95	124	93	97	91	716	5.6%
1200-59	89	100	94	82	92	98	106	661	5.1%
1300-59	91	102	104	80	112	100	83	672	5.2%
1400-59	106	94	110	114	94	101	90	709	5.5%
1500-59	95	97	103	99	115	89	87	685	5.3%
1600-59	109	107	105	104	122	103	82	732	5.7%
1700-59	98	101	116	115	108	90	78	706	5.5%
1800-59	95	105	97	110	80	99	74	660	5.1%
1900-59	99	113	88	81	89	106	95	671	5.2%
2000-59	83	78	93	92	96	109	81	632	4.9%
2100-59	92	82	75	88	109	77	84	607	4.7%
2200-59	76	64	61	80	96	95	71	543	4.2%
2300-59	64	63	67	58	79	68	54	453	3.5%
TOTAL	1,815	1,831	1,826	1,820	1,933	1,886	1,727	12,838	
%	14.1%	14.3%	14.2%	14.2%	15.1%	14.7%	13.5%		100.0%

The following points summarize the information above.

- The BFD responded to a total of 12,838 separate incidents during 2003 in which at least 1 piece of apparatus responded.
- On average, the BFD as a whole responds to 35.17 calls for service per day, or approximately 1.5 calls per hour.
- Incidents are distributed relatively evenly between the days of the week, with the highest percentage of calls occurring between 1000 and 1900 hours.

The following table provides a summary of the fire and EMS calls for service broken down by call type for the past three years. The table can be found on the following page:

Summary of Calls for Service by Type
Bellingham Fire Department 2001-2003

Incidents by Type	2001	2002	2003	% of Total
Building Fires	41	50	55	0.40%
Fires in Other Structures	1	5	6	0.00%
Chimney Fires	3	12	13	0.10%
Vehicle Fires	36	49	65	0.50%
Brush/Grass/Forest Fires	22	16	20	0.20%
Chemical Spills	4	12	10	0.10%
Rescues	8	10	12	0.10%
EMS *	9,299	10,065	11,120	89.00%
Public Service	480	515	500	4.20%
False Fire Alarms	461	676	700	5.40%
Mutual Aid Calls	5	5	5	0.00%
TOTAL	10,360	11,415	12,506	100.00%

* - Figure represents actual responses, which includes runs in both the City and County.

The table on the following page shows the total number of responses (or runs) for each primary piece of apparatus, which may be responses to either to fire and/or emergency medical calls during 2003, noting that multiple apparatus can respond to a single incident.

Apparatus	# of Responses	# of Responses per Day
Fire Units		
Engine 51	1,627	4.5
Engine 52	1,046	2.9
Engine 53	1,640	4.5
Engine 54	1,473	4.0
Engine 55	1,140	3.1
Engine 56	1,121	3.1
Reserve Engine 57	6	0.0
Reserve Engine 58	0	0.0
Ladder 41	1,018	2.8
Reserve Ladder 42	1	0.0
Sub-TOTAL	9,072	24.9
EMS Units		
Medic 1	2,993	8.2
Medic 2	2,962	8.1
Medic 3	2,089	5.7
Medic 4	2,225	6.1
Aid/Medic 51	39	0.1
Aid/Medic 52	289	0.8
Aid/Medic 53	24	0.1
Aid/Medic 54	10	0.0
Aid/Medic 55	54	0.1
Aid/Medic 56	422	1.2
Rescue 91	13	0.0
Sub-TOTAL	11,120	30.5
TOTAL	20,192	55.4

The following points summarize the information above.

- All primary BFD vehicles together experienced a total of 20,192 emergency responses, or runs.
- Engine 53 responded to the most fire and/or EMS incidents, followed by Engine 51, Engine 54, Engine 55, Engine 56, and Engine 52.
- Medics 1 and 2 (out of Station 1) responded to the most fire and/or emergency medical incidents, followed by Medic 4 and Medic 3.
- Engines 51-56 average approximately 3.7 responses per engine per day, or 1 every 6.5 hours, while Medic 1-4 average approximately 7 responses per unit per day, or 1 every 3.4 hours.

The following sections provide basic statistical reviews of the BFD fire suppression and EMS resource utilization.

(2) Fire Resources

The following table shows the total fire calls by station by time of day for 2003.

FIRE CALLS	STA 1	STA 2	STA 3	STA 4	STA 5	STA 6	Avg. / Hr.
0:00 to 00:59	10	15	23	10	3	7	0.2
1:00 to 1:59	15	11	24	3	6	3	0.2
2:00 to 2:59	9	14	17	15	6	4	0.2
3:00 to 3:59	8	9	14	9	1	3	0.1
4:00 to 4:59	11	10	8	9	3	3	0.1
5:00 to 5:59	10	10	14	8	3	8	0.1
6:00 to 6:59	6	10	14	10	2	6	0.1
7:00 to 7:59	18	10	20	16	6	14	0.2
8:00 to 8:59	15	11	19	26	9	10	0.2
9:00 to 9:59	16	17	21	12	9	16	0.2
10:00 to 10:59	22	15	19	18	5	18	0.3
11:00 to 11:59	15	26	32	16	8	15	0.3
12:00 to 12:59	19	16	12	22	9	13	0.2
13:00 to 13:59	17	16	18	28	9	14	0.3
14:00 to 14:59	18	17	19	23	13	16	0.3
15:00 to 15:59	18	19	14	22	5	24	0.3
16:00 to 16:59	14	22	19	26	14	21	0.3
17:00 to 17:59	22	23	21	27	4	16	0.3
18:00 to 18:59	23	21	19	18	7	18	0.3
19:00 to 19:59	18	20	29	16	8	13	0.3
20:00 to 20:59	23	24	11	26	9	20	0.3
21:00 to 21:59	20	15	2	26	6	7	0.2
22:00 to 22:59	15	11	24	18	9	10	0.2
23:00 to 23:59	12	18	24	14	5	14	0.2
Average / Day	1.0	1.0	1.2	1.1	0.4	0.8	5.6

As shown above, the average number of fire calls per station is approximately 1, or 5.6 total fire calls per day for the entire BFD.

(3) Mean Time Out of Service

The following table shows the mean time (in minutes) out of service for the fire suppression apparatus for all calls in which they are dispatched (including fire and/or EMS).

Unit	Mean Time Out-of-Service/ Completed Call
E51	0:23 Minutes
E52	0:29 Minutes
E53	0:25 Minutes
E54	0:25 Minutes
E55	0:24 Minutes
E56	0:26 Minutes
E57	0:18 Minutes
L41	0:41 Minutes
Call Avg.	0:24 Minutes

This data indicates that fire apparatus, system wide can expect to be committed to an average of 24 minutes for each incident to which they are dispatched.

(4) Modeling of Units Needed to Support System Demand

The project team applied two models of demand analysis to determine the optimal number of units required to meet this call demand for both fire and total calls on an hour-to-hour basis. The first model, known as the “Slip Form Need” recognizes that calls for service do not fit into neat single hour increments. Based on the standard deviation of the differences between the call demand from sequential hours, the model takes varying percentages of the call volume of those hours and applies the need to the hour under analysis. A second method utilizes statistical probabilities and applies the second standard deviation of the population to the call demand per hour. This results in a 95% probability of the system meeting the demand in a given hour based upon historical call demand trends. The results of this analysis is summarized by the following tables:

(4.1) Non-EMS Call Loading and Demand

		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need
St.	1			2			3			4			5			6		
0	10	0.05	0.06	15	0.07	0.07	23	0.09	0.12	10	0.05	0.04	3	0.03	0.02	7	0.05	0.04
100	15	0.07	0.06	11	0.06	0.06	24	0.09	0.11	3	0.03	0.04	6	0.04	0.03	3	0.03	0.02
200	9	0.05	0.05	14	0.06	0.06	17	0.07	0.09	15	0.07	0.06	6	0.04	0.02	4	0.04	0.02
300	8	0.05	0.05	9	0.05	0.05	14	0.06	0.07	9	0.05	0.05	1	0.03	0.01	3	0.03	0.02
400	11	0.06	0.05	10	0.05	0.05	8	0.05	0.05	9	0.05	0.04	3	0.03	0.01	3	0.03	0.02
500	10	0.05	0.05	10	0.05	0.05	14	0.06	0.07	8	0.05	0.04	3	0.03	0.01	8	0.05	0.03
600	6	0.04	0.05	10	0.05	0.05	14	0.06	0.08	10	0.05	0.06	2	0.03	0.02	6	0.04	0.04
700	18	0.08	0.08	10	0.05	0.05	20	0.08	0.09	16	0.07	0.09	6	0.04	0.03	14	0.06	0.06
800	15	0.07	0.08	11	0.06	0.06	19	0.08	0.10	26	0.10	0.10	9	0.05	0.04	10	0.05	0.06
900	16	0.07	0.09	17	0.07	0.08	21	0.08	0.10	12	0.06	0.08	9	0.05	0.04	16	0.07	0.08
1000	22	0.09	0.10	15	0.07	0.09	19	0.08	0.12	18	0.08	0.08	5	0.04	0.03	18	0.08	0.09
1100	15	0.07	0.09	26	0.10	0.11	32	0.11	0.12	16	0.07	0.09	8	0.05	0.04	15	0.07	0.08
1200	19	0.08	0.09	16	0.07	0.09	12	0.06	0.09	22	0.09	0.11	9	0.05	0.04	13	0.06	0.07
1300	17	0.07	0.09	16	0.07	0.08	18	0.08	0.09	28	0.10	0.13	9	0.05	0.05	14	0.06	0.07
1400	18	0.08	0.09	17	0.07	0.09	19	0.08	0.09	23	0.09	0.12	13	0.06	0.05	16	0.07	0.09
1500	18	0.08	0.09	19	0.08	0.10	14	0.06	0.08	22	0.09	0.12	5	0.04	0.05	24	0.09	0.11
1600	14	0.06	0.09	22	0.09	0.11	19	0.08	0.09	26	0.10	0.13	14	0.06	0.05	21	0.08	0.10
1700	22	0.09	0.11	23	0.09	0.11	21	0.08	0.10	27	0.10	0.12	4	0.04	0.03	16	0.07	0.09
1800	23	0.09	0.11	21	0.08	0.11	19	0.08	0.11	18	0.08	0.10	7	0.05	0.03	18	0.08	0.08
1900	18	0.08	0.10	20	0.08	0.11	29	0.11	0.11	16	0.07	0.10	8	0.05	0.04	13	0.06	0.08
2000	23	0.09	0.11	24	0.09	0.11	11	0.06	0.06	26	0.10	0.12	9	0.05	0.04	20	0.08	0.08
2100	20	0.08	0.10	15	0.07	0.08	2	0.03	0.05	26	0.10	0.12	6	0.04	0.04	7	0.05	0.05
2200	15	0.07	0.08	11	0.06	0.07	24	0.09	0.10	18	0.08	0.09	9	0.05	0.04	10	0.05	0.05
2300	12	0.06	0.05	18	0.08	0.06	24	0.09	0.09	14	0.06	0.06	5	0.04	0.02	14	0.06	0.05

(4.2) All Calls – Call Loading and Demand

		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need		STD Model	Slip Need
St.	1			2			3			4			5			6		
0	44	0.29	0.26	43	0.29	0.21	83	0.40	0.41	36	0.27	0.18	18	0.22	0.11	25	0.24	0.14
100	49	0.30	0.24	38	0.27	0.19	86	0.41	0.40	25	0.24	0.18	27	0.24	0.12	23	0.23	0.11
200	48	0.30	0.22	32	0.26	0.16	60	0.33	0.32	57	0.33	0.23	18	0.22	0.09	16	0.21	0.09
300	31	0.25	0.18	27	0.24	0.14	53	0.31	0.26	36	0.27	0.18	11	0.20	0.06	20	0.22	0.10
400	37	0.27	0.19	29	0.25	0.15	40	0.28	0.21	18	0.22	0.13	11	0.20	0.06	19	0.22	0.09
500	46	0.30	0.21	34	0.26	0.18	37	0.27	0.20	36	0.27	0.16	15	0.21	0.07	17	0.22	0.10
600	35	0.27	0.22	43	0.29	0.21	44	0.29	0.23	32	0.26	0.16	16	0.21	0.10	24	0.24	0.14
700	55	0.32	0.29	41	0.28	0.21	55	0.32	0.28	29	0.25	0.19	32	0.26	0.16	41	0.28	0.19
800	75	0.38	0.39	44	0.29	0.25	60	0.33	0.31	61	0.34	0.29	38	0.27	0.19	43	0.29	0.24
900	97	0.44	0.49	69	0.36	0.31	68	0.36	0.36	72	0.37	0.34	37	0.27	0.20	59	0.33	0.31
1000	113	0.48	0.57	57	0.33	0.32	82	0.39	0.41	58	0.33	0.31	45	0.29	0.22	79	0.39	0.37
1100	123	0.51	0.59	70	0.36	0.32	91	0.42	0.44	61	0.34	0.31	42	0.28	0.21	71	0.36	0.38
1200	104	0.45	0.56	57	0.33	0.30	85	0.40	0.43	65	0.35	0.34	41	0.28	0.20	83	0.40	0.40
1300	114	0.48	0.56	53	0.31	0.29	80	0.39	0.41	73	0.37	0.39	32	0.26	0.20	78	0.38	0.39
1400	111	0.47	0.53	66	0.35	0.32	82	0.39	0.42	93	0.42	0.42	56	0.32	0.24	71	0.36	0.37
1500	86	0.41	0.47	62	0.34	0.33	90	0.42	0.45	67	0.35	0.39	38	0.27	0.22	77	0.38	0.41
1600	93	0.42	0.51	70	0.36	0.32	91	0.42	0.45	89	0.41	0.41	48	0.30	0.23	93	0.42	0.44
1700	129	0.52	0.59	52	0.31	0.29	87	0.41	0.46	76	0.38	0.38	47	0.30	0.22	81	0.39	0.41
1800	106	0.46	0.56	60	0.33	0.30	96	0.43	0.47	64	0.35	0.34	34	0.26	0.19	69	0.36	0.36
1900	106	0.46	0.54	63	0.34	0.32	92	0.42	0.46	69	0.36	0.34	38	0.27	0.20	71	0.36	0.36
2000	107	0.46	0.51	67	0.35	0.32	81	0.39	0.44	66	0.35	0.34	45	0.29	0.22	70	0.36	0.33
2100	84	0.40	0.44	54	0.32	0.27	96	0.43	0.46	71	0.36	0.35	44	0.29	0.20	53	0.31	0.26
2200	75	0.38	0.38	44	0.29	0.22	88	0.41	0.43	70	0.36	0.33	30	0.25	0.16	34	0.26	0.20
2300	71	0.36	0.27	38	0.27	0.15	69	0.36	0.27	52	0.31	0.21	25	0.24	0.10	39	0.28	0.14

(5) EMS Resources

The tables below further summarize the calls for service as measured by bills generated per station area and level of service (i.e. ALS or BLS) for calendar year 2003

ALS Calls for Services by District

Station	Jurisdiction	No. Calls
011	EVERSON	117
012	NUGENT'S	82
021	GENEVA	20
022	SUDDEN VLY	75
032	LAUREL	95
033	DELTA	51
034	NORTHWOOD	23
035	WISER LAKE	56
041	AGATE BAY	72
042	VAN WYCK	35
043	E BAKERVIEW	47
051	PT ROBERTS	33
061	CHUCKANUT	14
071	FERNDALE	206
072	WHITEHORN	37
073	N BELLINGHAM	71
075	ENTERPRISE	48
076	CHURCH	66
081	BENNETT	111
084	AIRPORT	13
085	GOOSEBERRY	141
091	LK SAMISH 1	21
092	LK SAMISH 2	7
101	YEW ST RD	40
111	LUMMI ISLAND	15
131	BIRCH BAY	164
132	CUSTER	41
133	HAYNIE	14
134	BLAINE	127
135	SEMAHMOO	18
141	SUMAS	65
142	KENDALL	127
143	WELCOME	22
161	ACME	17
162	VAN ZANDT	15
171	SANDY PT	24
181	S LK WHAT 1	4
182	S LK WHAT 2	13
191	GLACIER	38
201	LYNDEN	406
	TOTAL	2,591

	Bellingham City	
511	Station 1	457
521	Station 2	442
531	Station 3	568
541	Station 4	408
551	Station 5	297
561	Station 6	459
	TOTAL	2,631

The data presented above represents that of the 11,120 medical calls for service responses in 2003 (as shown in the previous table), with 8,656 receiving some kind of bill assignment. Of these, 5,122 (59% of bills and 46% of total responses) were ultimately determined to be subject to billing at an ALS (or above BLS) level care. The table below summarizes the calls for service that received bills for BLS level care:

BLS Calls for Service by District

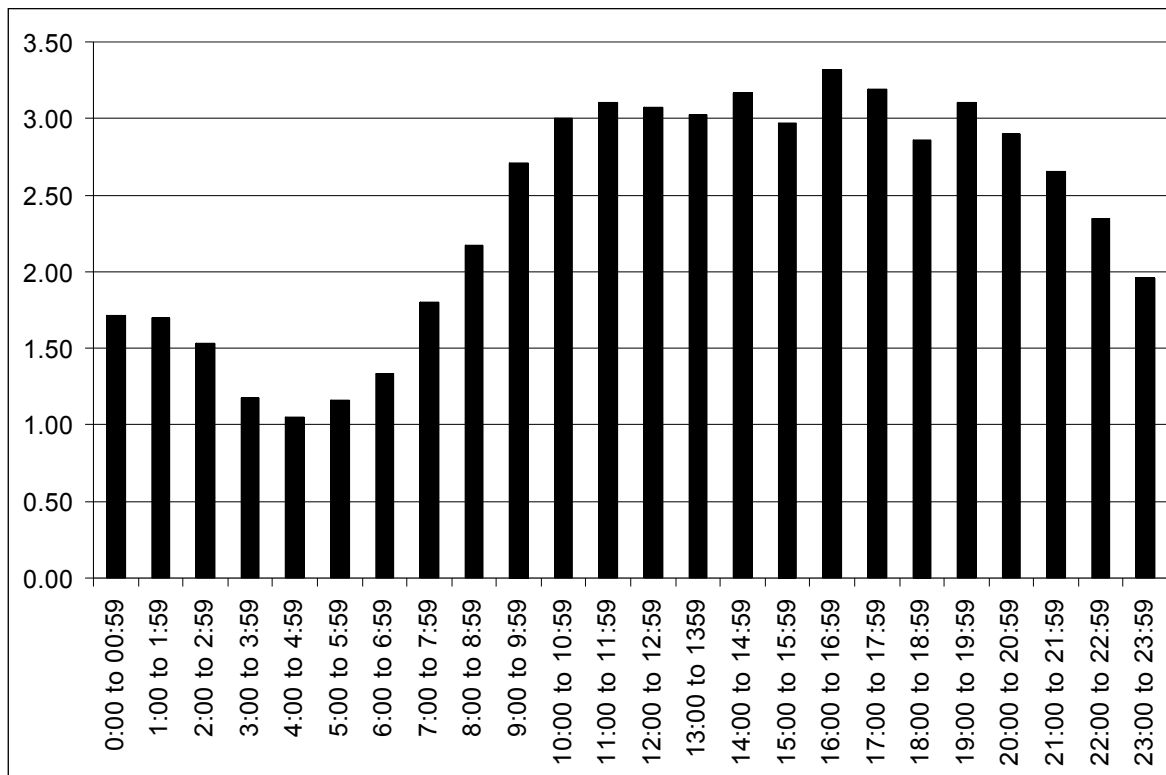
Station	Jurisdiction	No. Calls
011	EVERSON	84
012	NUGENT'S	45
021	GENEVA	10
022	SUDDEN VLY	21
032	LAUREL	59
033	DELTA	38
034	NORTHWOOD	15
035	WISER LAKE	31
041	AGATE BAY	45
042	VAN WYCK	16
043	E BAKERVIEW	24
051	PT ROBERTS	6
061	CHUCKANUT	4
071	FERNDAL	169
072	WHITEHORN	22
073	N BELLINGHAM	42
075	ENTERPRISE	40
076	CHURCH	55
081	BENNETT	88
084	AIRPORT	3
085	GOOSEBERRY	101
091	LK SAMISH 1	23
092	LK SAMISH 2	2
101	YEW ST RD	29
111	LUMMI ISLAND	7
131	BIRCH BAY	64
132	CUSTER	19
133	HAYNIE	11

Station	Jurisdiction	No. Calls
134	BLAINE	68
135	SEMAHMOO	7
141	SUMAS	36
142	KENDALL	49
143	WELCOME	4
161	ACME	9
162	VAN ZANDT	11
171	SANDY PT	11
181	S LK WHAT 1	4
182	S LK WHAT 2	6
191	GLACIER	30
201	LYNDEN	175
	TOTAL	1,483
	Bellingham City	
511	Station 1	347
521	Station 2	248
531	Station 3	453
541	Station 4	348
551	Station 5	255
561	Station 6	296
	TOTAL	1,947

BLS service calls represent 3,434 billed incidents (40%) or 31% of total system responses. The table below summarizes the ALS and BLS provided within the City and in the remainder of the County as represented by accounts receivable records (i.e., these were billable events – not the total events handled):

	BLS	ALS	Total
City	1,947	2,591	4,538
Remainder of County	1,483	2,631	4,114

Demand for medical services falls into a demand pattern typical of most contemporary EMS systems. The table below shows this pattern of the average EMS responses by hour-of-day for the calendar year 2003:



On average, there are approximately 2.37 total EMS units responding to any number of incidents per hour.

(6) EMS Time Out of Service

The CAD call for service data indicates that ALS ambulances, system-wide can expect to be committed to an average of 44 minutes for each incident to which they are dispatched. It is important to note that the committed time for Medic 3 and Medic 4 exceed an hour by almost 25%. However, system wide the commitment time required for system design purposes is well within the 60-minute time usually associated with medical incidents and transports.

(7) Modeling of Units Needed to Support System Demand

The project team applied two models of demand analysis to determine the optimal number of units required to meet this call demand on an hour-to-hour basis. The

first model, known as the “Slip Form Need” recognizes that calls for service do not fit into neat single hour increments. Based on the standard deviation of the differences between the call demand from sequential hours, the model takes varying percentages of the call volume of those hours and applies the need to the hour under analysis. A second method utilizes statistical probabilities and applies the second standard deviation of the population to the call demand per hour. This results in a 95% probability of the system meeting the demand in a given hour based upon historical call demand trends. The result of this analysis is summarized by the table below.

Hour of Day	Needed Units - Slip Form Need Model	Needed Units -2 StD	Variation from Actual (Slip Form)	Variation from Actual (2 StD)
0:00 to 00:59	3	3	-1.19	-0.76
1:00 to 1:59	3	3	-1.33	-0.77
2:00 to 2:59	2	3	-1.60	-0.93
3:00 to 3:59	2	3	-2.05	-1.29
4:00 to 4:59	2	3	-2.25	-1.42
5:00 to 5:59	2	3	-2.13	-1.31
6:00 to 6:59	2	3	-1.77	-1.13
7:00 to 7:59	3	3	-1.14	-0.67
8:00 to 8:59	4	4	-0.47	-0.30
9:00 to 9:59	4	4	0.26	0.24
10:00 to 10:59	5	5	0.74	0.53
11:00 to 11:59	5	5	0.92	0.63
12:00 to 12:59	5	5	0.91	0.60
13:00 to 13:59	5	5	0.90	0.56
14:00 to 14:59	5	5	0.97	0.70
15:00 to 15:59	5	5	0.92	0.50
16:00 to 16:59	5	5	1.17	0.85
17:00 to 17:59	5	5	1.04	0.72
18:00 to 18:59	5	4	0.74	0.39
19:00 to 19:59	5	5	0.83	0.63
20:00 to 20:59	5	4	0.63	0.43
21:00 to 21:59	4	4	0.23	0.19
22:00 to 22:59	4	4	-0.27	-0.12
23:00 to 23:59	3	3	-1.34	-0.51

The current deployment model of utilizing the 24/7 Medic One units as the primary ALS/BLS transport service is unable to meet the projected call demands of the system between the hours of 9:00 a.m. and 10:00 p.m., resulting in deployment of

reserve medic units and/or reliance on “as available” county/city BLS transport resources. The capacity of the system meets or exceeds the call demand placed on it during the remaining hours of the day.

(8) Workload Trend

The final summary table shows the workload trend information for fire engine responses, EMS responses, and incidents handled by the Prospect Communications Center between 2000 and 2004.

	2000	2001	% Change	2002	% Change	2003	% Change	2004	% Change
	Actual	Actual		Actual		Actual		Proj.	
Fire Suppression/EMS Responses	8,113	8,538	5.2%	8,920	4.5%	9,072	1.7%	9,417	3.8%
Medic Fire/EMS Responses	8,890	9,299	4.6%	10,065	8.2%	11,120	10.5%	11,984	7.7%
Prospect Comm. Incidents	13,116	13,449	2.5%	14,744	9.6%	15,776	7%	16,880	7%

The following points summarize the information above.

- The BFD fire engines and ladders have increased their actual responses to either fire and/or EMS incidents by approximately 12% since 2000 (8,113 engine responses), while the BFD medic units have increased their actual responses to either fire and/or EMS incidents by approximately 25% since 2000 (8,890 medical responses.)
- The 2003 actual figures were based on the 2003 BFD incident information discussed in the previous section (above).
- Based on the average percentage increases between 2000 and 20003, the fire engine responses are projected to increase by nearly 4% over the next year, while the medic unit responses are project to increase by nearly 8% over the next year.

Overall, based on BFD’s budget documents, the Prospect Communications Center is projected to generate and handle 16,880 fire, rescue, and EMS incidents

Countywide in 2004, which is nearly 29% greater than 2000. However, this includes duplicate incidents where BFD and other agency units were dispatched together. Unique incidents handled by the center totals 12,800 in 2003.

8. OPERATIONAL REVENUES AND COSTS

This section of the profile provides various types of financial information pertaining to the BFD and Medic 1's provision of services.

(1) Overall Budget Trends

The summary tables that follow show the annual revenue and expenses structure of the BFD and EMS services between 2000 and 2004. This information was compiled from adopted City budget documents.

	2000	2001	2002	2003	2004
	Actual	Actual	Actual	Revised	Approved
REVENUES					
Licenses and Permits	NA	\$839,605	\$1,150	\$800	\$800
Intergovernmental	NA	\$1,389,306	\$1,375,646	\$1,450,169	\$1,380,346
Charges for Services	NA	\$6,860,367	\$6,845,532	\$6,866,502	\$7,271,463
Fines and Forfeits	NA	\$60	-	-	-
Miscellaneous	NA	\$259,579	\$104,982	\$22,150	\$27,100
Non-Revenues	NA	\$108,661	-	-	-
Other Financing Sources	NA	\$4,098,251	\$1,340,076	\$1,353,696	\$1,365,272
Sub-Total of Revenues	NA	\$13,555,829	\$9,667,386	\$9,693,317	\$10,044,981
Sub-Total Reserves	NA	\$6,899,015	\$10,599,659	\$11,109,272	\$10,885,016
TOTAL ALL SOURCES	NA	\$20,454,844	\$20,267,045	\$20,802,589	\$20,929,997
EXPENSES BY GROUP					
Administration	\$2,266,734	\$1,848,200	\$2,139,405	\$1,709,415	\$1,242,472
Operations - Fire	\$6,227,126	\$6,683,186	\$7,439,190	\$7,929,554	\$8,169,411
Operations - Life Safety	\$491,805	\$457,227	\$480,696	\$530,005	\$459,368
Training Operations	\$404,116	\$381,951	\$416,383	\$453,389	\$443,227
Medical Services*	\$7,202,943	\$7,945,034	\$9,033,232	\$9,384,953	\$9,771,586
Building Services	\$1,434,199	\$2,417,784	-	-	-
Dispatch Operations	\$634,937	\$721,462	\$758,139	\$795,273	\$843,933
TOTAL EXPENSE	\$18,661,860	\$20,454,844	\$20,267,045	\$20,802,589	\$20,929,997

* - Amounts include the direct/indirect labor costs that are shared between the City and County, versus the actual labor costs attributed only to the Medic 1 program.

Between 2000 and 2004, the BFD budget has increased by approximately 12%, with an average yearly increase of approximately 3%. The following table shows the BFD expenses by type.

	2001	2002	2003	2004
	Actual	Actual	Revised	Approved
EXPENSES BY TYPE				
Salaries and Benefits	\$11,970,999	\$11,943,068	\$13,057,954	\$13,664,968
Supplies	\$568,437	\$543,313	\$678,026	\$631,803
Other Services and Charges	\$1,333,232	\$543,078	\$717,888	\$686,209
Intergovernmental Services	\$236,672	\$159,058	\$484,915	\$139,950
Inter-fund Charges*	\$5,442,550	\$5,185,515	\$5,612,314	\$5,720,567
Sub-Total Operations	\$19,551,890	\$18,374,032	\$20,551,097	\$20,843,497
Debt Service	\$17,093	-	-	-
Capital Outlay	\$868,327	\$1,773,252	\$251,492	\$86,500
Inter-fund Transfers	\$17,534	\$119,761	-	-
TOTAL EXPENSE	\$20,454,844	\$20,267,045	\$20,802,589	\$20,929,997
TOTAL FTE	166.1	158.3	159.6	162

* Amounts reflect more accurate cost of the Medic 1 Program due to the job costing approach that determines the expenses attributable to a specific, complete unit of an actual ALS/BLS service provided.

Between 2001 and 2004, the budget for salaries and benefits has increased by 14.2%, while the sub-total for Operations has increased by 6.6% during the same time period. Overall, the total expenses for the BFD have remained relatively constant at only a 2.3% increase during the past 4 years, with a reduction of 4 positions since 2001.

(2) EMS Financial Summary and Description

The financial impacts on the City of Bellingham related to the delivery of EMS services is a somewhat complex analysis. The City is the provider of the core services, as well as support services, such as communications. As such it is both a payer and a payee within the Whatcom Medic 1 system. This section will provide a brief summary of

our understanding of the financial relationships and performance of both the City of Bellingham and the Medic 1 Program.

(2.1) Accounts Receivable

The table below summarizes the revenues to the Medic 1 system in 2003:

Source of Funds	Sub-Total	Percentage of Total
Fees for Service ¹	\$2,743,977	51.0%
Whatcom County Contribution	\$1,275,357	23.7%
City of Bellingham Contribution	\$1,317,759	24.5%
Other	\$41,941	0.8%

The payer mix (i.e. the percentage of various payers that comprise the revenue stream) of the Whatcom Medic 1 system is summarized by the table below:

Payer Source	Percent of Payer Mix
Medicare and Medicare Plus	49%
Medicaid	13%
Private Insurance	29%
Private Pay	8%

Approximately 70% of the payer population is going to be unresponsive to rate increases (i.e. Medicare/Medicaid and private pay). This will result in relatively low marginal collection rates in any addition to service fees. This payer mix provides an overall collection rate of approximately 66% for the Medic 1 entity. It is likely that this rate will decrease as the adjustments to the Medicare Fee schedule continue to impact the rate profiles of ambulance agencies. Additionally, the entity has not accepted Medicare assignment historically. Under recent changes to Medicare reimbursement policies, agencies must now accept assignment which will have a negative impact on collections as the difference between the actual rates charged and the Medicare allowable rate increases. The table below summarizes the current rates charged by Medic 1 in comparison with the allowable Medicare rates:

¹ Figure is net of bad debt and un-collectables.

	BLS Emergent	ALS Emergent	ALS 2 Emergent	Mileage
Medic 1 Base Rates	\$320	\$540	\$540	\$11
Medicare Allowable	\$320	\$369.39	\$426.86	\$5.96

(2.3) Accounts Payable

The table below summarizes the broad category of 2003 expenditures listed by both Whatcom Medic 1 and the City of Bellingham Fire Department related to EMS operations:

Program/Category	Medic 1	City of Bellingham
Fire/EMS Operations	\$3,615,462	\$9,384,953
Dispatch	\$598,886	\$795,273
Indirect Cost Allocation	\$150,336	-
Drugs/Medical Supplies	\$185,000	-
Fuel	\$25,500	-
Professional Services	\$81,700	-
Repair and Maintenance of Equip	\$104,365	-
Other GNA	\$217,056	-
Total	\$4,978,305	\$10,180,226

3. SUMMARY OF THE EMPLOYEE SURVEY

This section of the report provides the results of the employee survey, which was developed and distributed to the BFD personnel in order to obtain perspectives within the following areas:

- Service to the Community
- Organization and Operations
 - Leadership and Management
 - Staffing and Operations
 - Training
 - Equipment and Apparatus

The survey was completed and returned by 91 employees representing a response rate of nearly 60%, with the breakdown of their assignment as follows:

CURRENT ASSIGNMENT	#	%
Administration	10	11.0%
Fire Operations	46	50.5%
Medic One	22	24.2%
Dispatch	7	7.7%
Not-Styled	6	6.6%
TOTAL	91	100%

In the pages, which follow, are provided response tables of each of the topic areas covered by this survey, along with summary discussions highlighting the main points. The response results are organized in the following general categories.

- General Perceptions
- Department Overview
- Department Management
- Staffing and Resources
- Specific Programs

For the response bar charts that follow, the black represents the percentage of respondents that marked either “strongly agree” and “agree;” the dark grey represents “neutral” responses; and the light grey represents “disagree” and “strongly disagree.”

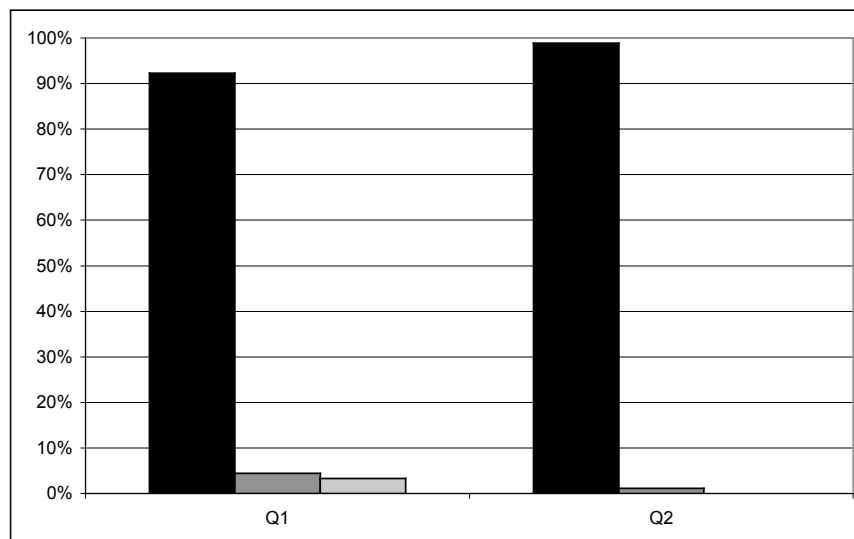
1. GENERAL PERCEPTIONS

This section provides the results for questions regarding overall perceptions of service provisions to the public, including their quality, effectiveness, efficiency, and timeliness.

(1) The BFD Personnel Perceive the Department as Providing High Quality Fire Services and EMS for the Public.

The chart below shows the response results to the following questions.

- Question #1: Our Department provides a high quality fire and rescue services to the public.
- Question #2: Our Department provides a high quality emergency medical service.



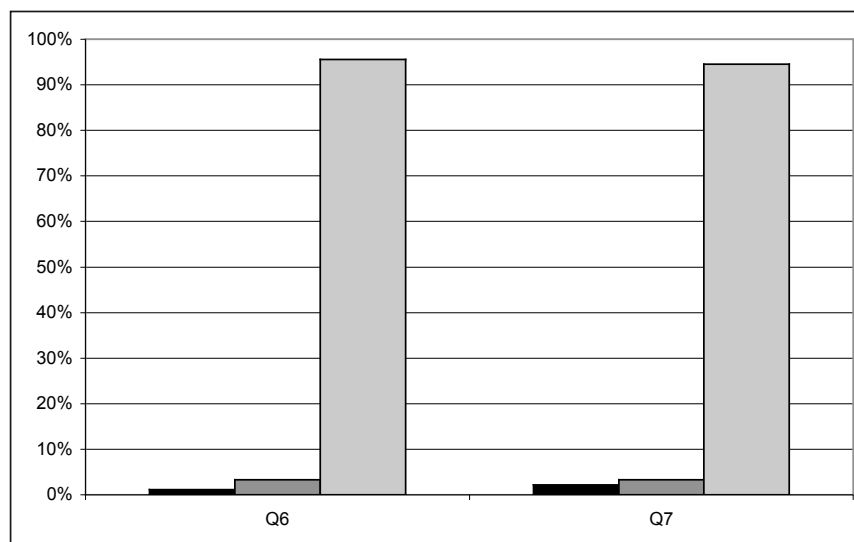
As shown above, 92% of personnel agreed with Question #1 that the BFD provides high quality fire and rescue services for the public, while 4% were neutral, and

3% disagreed. Regarding Question #2, 99% of personnel agreed that the BFD provides high quality EMS for the public, while 1% were neutral.

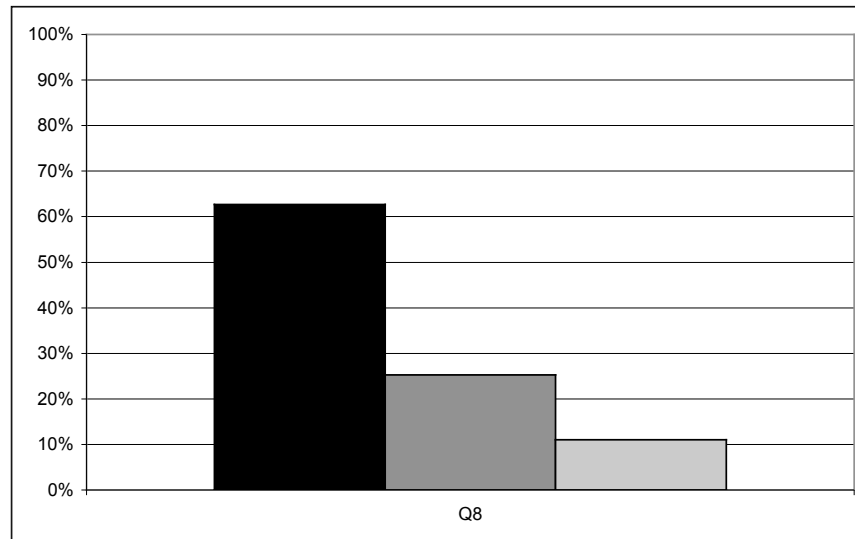
(2) Although BFD Personnel Do Not Believe the Public Understands How the Fire Services and EMS System Operates, They Do Believe that the Public Views Them as a High Priority.

The chart below shows the response results for the following.

- Question #6: The residents of the County understand how our fire and EMS system operates.
- Question #7: City residents understand how our fire, rescue and EMS system operates.



As shown above, 96% of respondents disagreed with Question #6 that the County residents understand how the fire, rescue and EMS system operates, 3% were neutral, while only 1% agreed. For Question #7, 95% of respondents disagreed that the City residents understand how the fire, rescue and EMS system operates, 3% were neutral, while 2% agreed. Although personnel perceives that the public does not understand how their operations function, they do believe the public views them as a high priority, as shown in the following chart for Question #8.

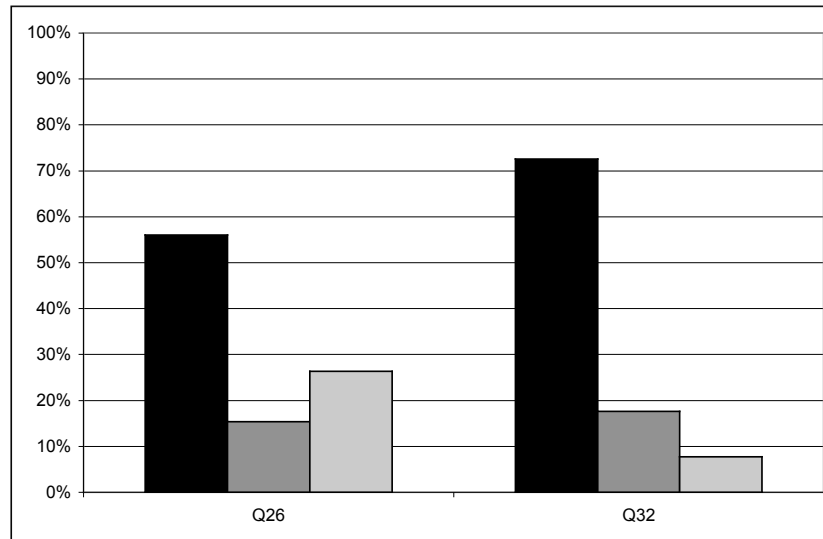


As shown above, 63% of respondents agreed with Question #8 that the residents view the BFD as a high priority, 25% were neutral, while 11% disagreed.

(3) The Majority of BFD Personnel Perceive That They Provide Emergency Services to Both the City and the County Efficiently, Effectively, and in a Timely Manner.

The chart below shows the response results to the following questions.

- Question #26: Providing EMS services to both the City and County is efficient and effective.
- Question #32: Our response times to fire, rescue, and emergency medical incidents are good.



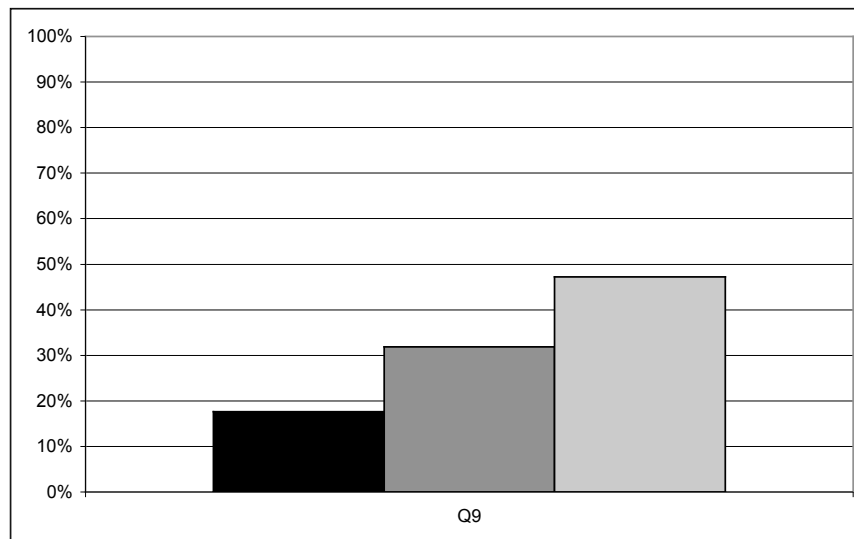
As shown above, 56% of respondents to Question #26 agree that providing EMS service to both the City and the County is efficient and effective, 15% were neutral, and 26% disagreed. For Question #32, 73% of respondents agree that the BFD response times to emergencies is good, 18% were neutral, and 8% disagreed.

2. DEPARTMENT OVERVIEW

This section provides the survey results for questions relating to the BFD's future direction, its innovation, and the ability of its personnel to work well with each other and other agencies during incidents.

(1) BFD Personnel Do Not Perceive That the Department Has a Clear Vision or Direction for the Future.

The chart below shows the results to Question #9 that the BFD has a clear vision/direction for the future.

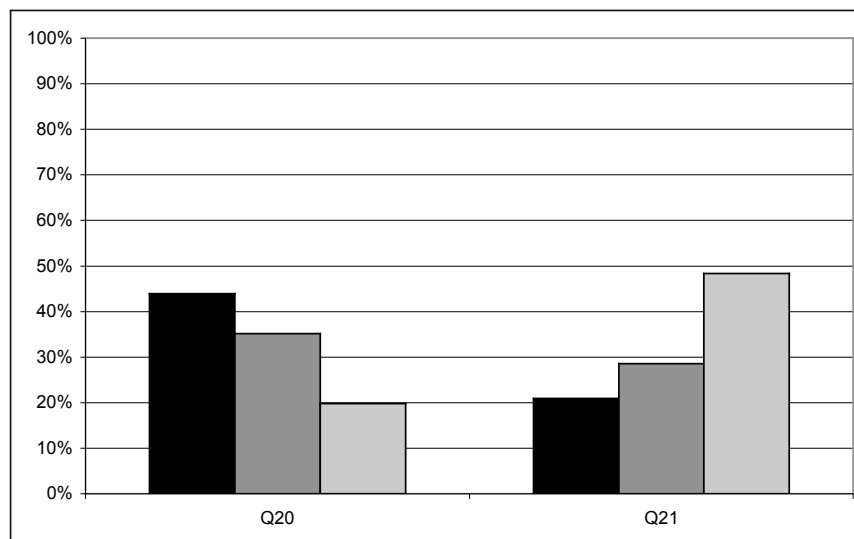


As shown above, 47% of respondents disagreed that the BFD has a clear vision/direction for the future, 32% were neutral, while 18% agreed.

(2) BFD Personnel Perceive the Department as Being Innovative and Progressive, but Not So with the Planning and Scheduling of Shift Assignments.

The chart below shows the response results to the following questions.

- Question #20: Our Department seems to be innovative and progressive.
- Question #21: Our Department does a good job planning and scheduling our shift assignments.

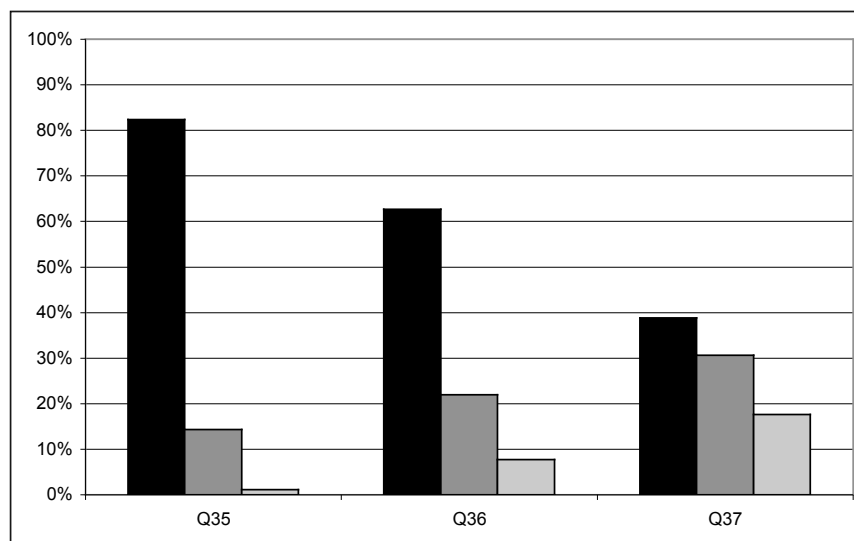


As shown above, 44% of respondents agreed with Question #20 that the BFD seems innovative and progressive, 35% were neutral, while 20% disagreed. For Question #21, 21% of respondents agreed that the Department does a good job of planning and scheduling personnel shift assignments, 29% were neutral, and 48% of respondents disagreed that the BFD does a good job of planning and scheduling shift assignments.

(3) The Majority of BFD Personnel Perceive That They Work Well with Each Other and Other County / District Agencies During Incidents.

The chart below shows the response results for the following questions.

- Question #35: Our personnel work well with each other on calls for service for which they respond.
- Question #36: We coordinate efficiently and effectively with County/District Fire Departments on EMS calls.
- Question #37: We coordinate efficiently and effectively with County/District Fire Departments on Fire/Rescue incidents.



The following points summarize the results above.

- 82% of respondents agree with Statement #35 that personnel works well with each other during calls for service, 14% were neutral, and 1% disagree.

- 63% of respondents agree with Statement #36 that BFD personnel coordinates well with outside agencies during EMS incidents, 22% were neutral, and 8% disagreed.
- 39% of respondents agree with Statement #37 that BFD personnel coordinates well with outside agencies during fire and rescue incidents, 31% were neutral, and 18% disagreed.

Overall, BFD personnel perceive themselves to work well with each other, as well as with outside agency personnel during incidents.

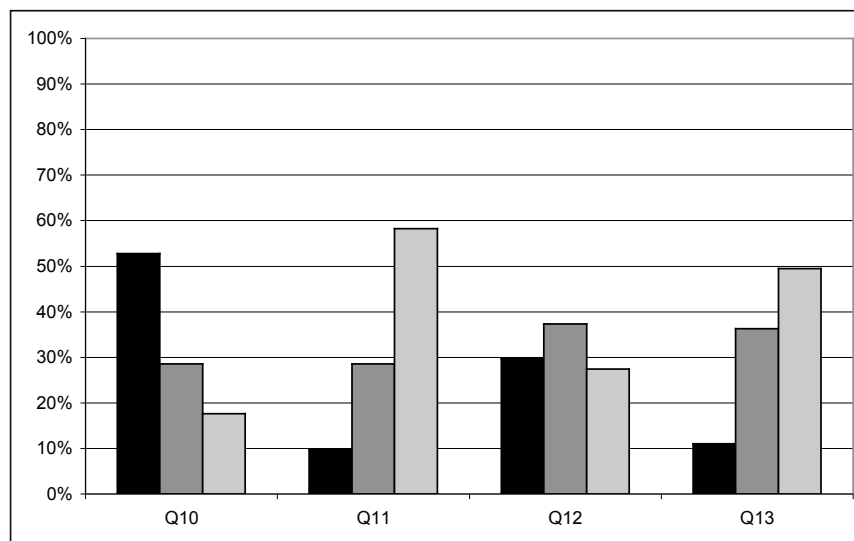
3. DEPARTMENT MANAGEMENT

This section provides the survey results for the questions relating to the overall management of the Department, the relationship between line personnel and the chiefs, policies and procedures, and discipline.

(1) Employee Perceptions Are Mixed Regarding How Informative and Responsive Management Is.

The chart below shows the response results to the following questions.

- Question #10: The Chief and Assistant Chief keep us informed of important BFD information.
- Question #11: The Battalion Chiefs keep us informed of important BFD information.
- Question #12: The Chief and Assistant Chief care highly about my opinions on important issues.
- Question #13: The Battalion Chiefs care highly about my opinions on important issues.



The following points summarize the results above.

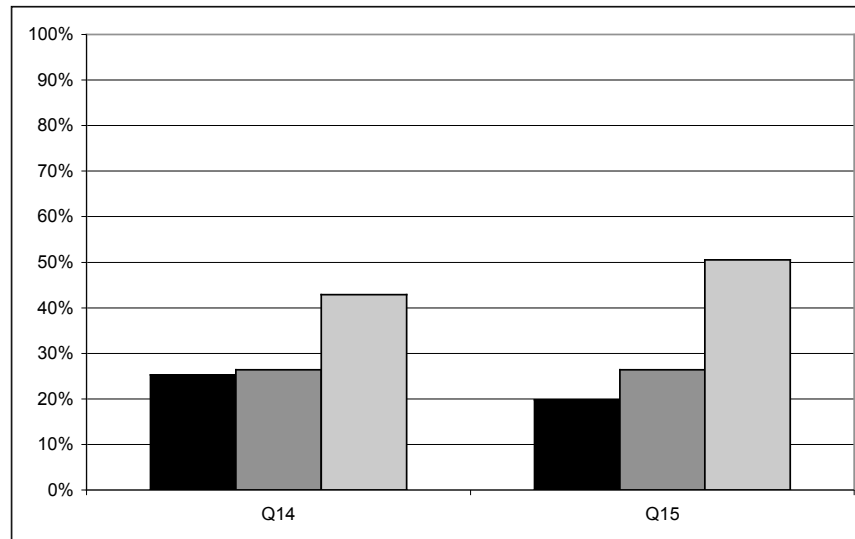
- 53% of respondents believe that the Chief/Assistant Chief keep BFD personnel informed, 29% were neutral, while 18% disagreed that they were well informed.
- 10% of respondents believe that the Battalion Chiefs keep personnel informed of important information, 29% were neutral, while 58% disagreed.
- 30% of respondent believe that the Chief/Assistant Chief care highly about the opinions of personnel, 37% were neutral, while 27% disagreed.
- 11% of respondents believe that the Battalion Chiefs care highly about the opinions of personnel, 36% were neutral, while 49% disagreed.

Overall, respondents perceived the Chief and Assistant Chief as being more informative and responsive than Battalion Chiefs.

(2) Employees Have Mixed Perceptions as to Whether Management Is “In Touch” with Line Personnel and Operations.

The chart below shows the results response to following questions.

- Question #14: The Chief and Assistant Chief are properly “in touch” with line and staff operations.
- Question #15: The Battalion Chiefs are properly “in touch” with line and staff operations.

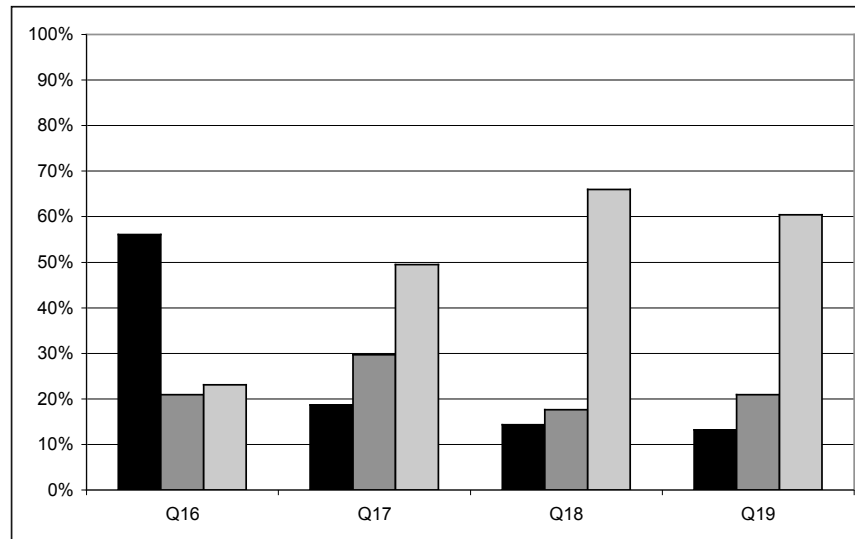


As shown above, 25% of respondents agreed with Question #14 that the Chief and Assistant Chief are properly “in touch” with line and staff operations, 27% were neutral, and 43% disagreed. For Question #15, 20% of respondents agreed that the Battalion Chiefs are properly “in touch” with line and staff operations, 26% were neutral, and 51% disagreed.

(3) Employees Perceive That Their Work Expectations Are Clear; However, They Have Mixed Perceptions Regarding Problem Resolution, Accountability, and the Consistency of Disciplinary Action.

The chart below shows the response results for the following question.

- Question #16: My work performance expectations are made clear.
- Question #17: When problems arise, they are resolved quickly.
- Question #18: Staff are held accountable for their actions.
- Question #19: Our Department is consistent when taking disciplinary action.



The following points summarize the results above.

- 56% of respondents agreed with Question #16 that their work expectations are made clear, 21% were neutral, while 23% disagreed.
- 19% of respondents agreed with Question #17 that problems are resolved quickly, 30% were neutral, while 49% disagreed.
- 14% of respondents agreed with Question #18 that staff is held accountable for their actions, 18% were neutral, while 66% disagreed that there is proper accountability.
- 13% of respondents agreed with Question #19 that the BFD is consistent when taking disciplinary action, 21% were neutral, while 60% disagreed that discipline is consistent.

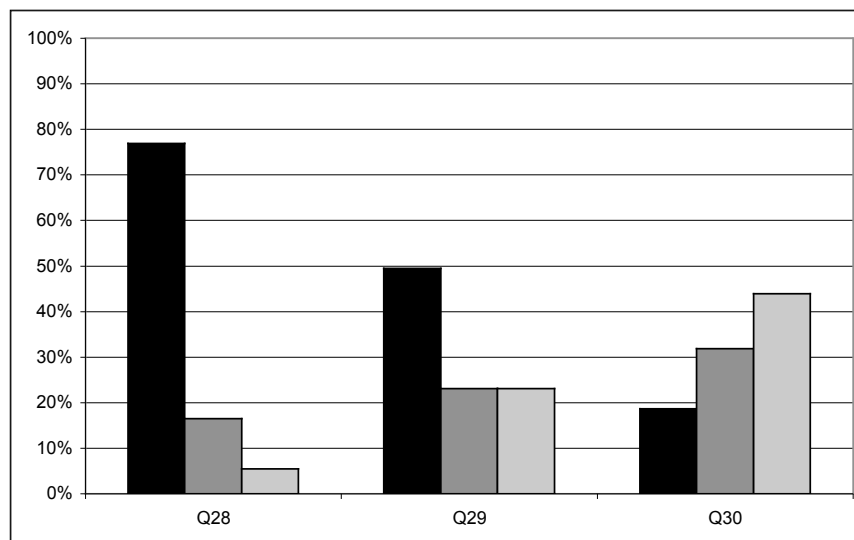
Overall, personnel perceive their work expectations are clear, however, when it comes to proper discipline and accountability, they perceive that to be lacking.

(4) The Majority of Employees Perceive That Policies and Procedures Are Standardized and Clear; However, They Are Not Consistently Followed Throughout the Department.

The chart below shows the results for the following questions.

- Question #28: Our Department has standardized policies and procedures for operations.

- Question #29: Our policies and procedures are clear, concise and relevant to our actual experiences.
- Question #30: Our policies and procedures are consistently followed throughout our Department.



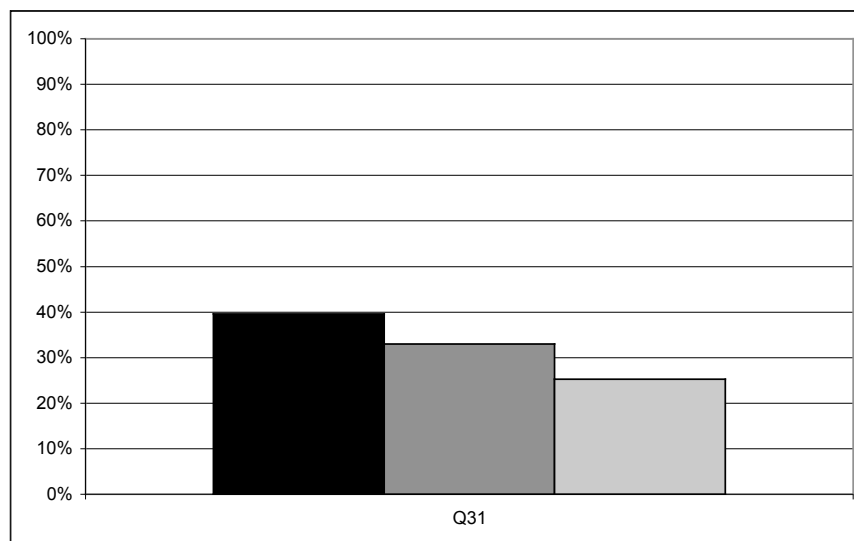
The following points summarize the results above.

- 77% of respondents to Question #28 agreed that the BFD has standardized policies and procedures, 16% were neutral, and 5% disagreed.
- 49% of respondents to Question #29 agreed that the policies and procedures are clear, concise, and relevant to actual experiences, 23% were neutral, and 23% disagreed.
- 19% of respondents to Question #30 agreed that the policies and procedures are consistently being followed throughout the Department, 32% were neutral, and 44% disagreed that policies and procedures are being consistently followed.

Although the BFD personnel perceive their policies and procedures are standards, clear and concise, there is a perception that they are not being consistently followed.

(5) The Majority of Respondents Perceive That BFD Divisions Are Well Integrated and Working Well Together.

The following chart shows the response results for Question #31 that the BFD Divisions are well integrated and work well together.



As shown above, 40% of respondents to Question #31 agree that the BFD Divisions are well integrated and working well together, 33% were neutral, and 25% disagreed.

4. STAFFING AND RESOURCES

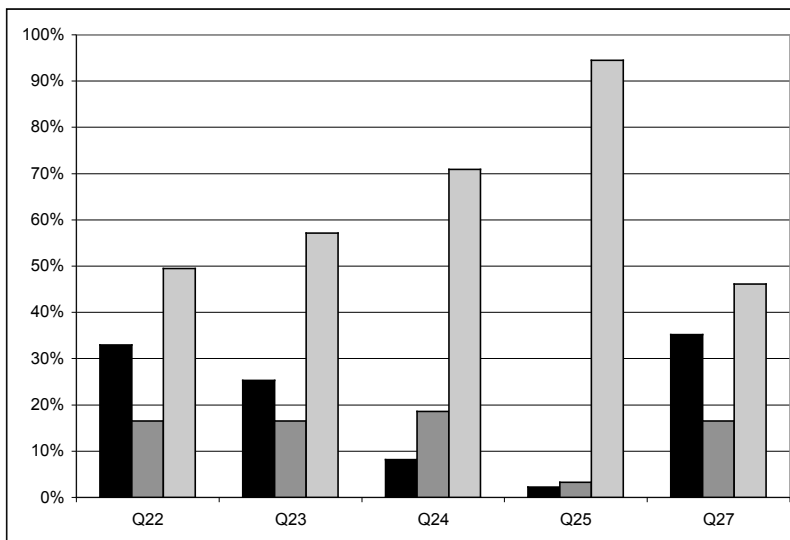
This section provides the results to the questions related to the overall adequacy of current and future resources.

(1) The Majority of BFD Personnel Believe That Staffing Resources Are Not Adequate to Meet Current and Future Service Needs, Nor That Cross Staffing Is a Good Way to Increase Abilities to Answer Calls for Service.

The chart below shows the response results for the following questions.

- Question #22: Staff resources are adequate to meet the current fire and rescue needs of the City.
- Question #23: Staff resources are adequate to meet the current EMS service needs of the City.

- Question #24: Staff resources are adequate to meet the current EMS needs of the County.
- Question #25: Our Department is adequately staffed to meet future demand for services.
- Question #27: The cross staffing of personnel is an efficient and effective way to increase our abilities to answer calls for service.



The following points summarize the results above.

- 33% of respondents to Question #22 agree that staff resources are adequate to meet current fire and rescue needs, 16% were neutral, and 49% disagree that current staff resources are adequate.
- 25% of respondents to Question #23 agree that that staff resources are adequate to meet current EMS needs of the City, 16% were neutral, and 57% disagree that current resources are adequate to meet EMS needs in the City.
- 8% of respondents to Question #24 agree that staff resources are adequate to meet the current EMS needs of the County, 19% were neutral, and 71% disagree that current resources are adequate to meet EMS needs in the County.
- 2% of respondents to Question #25 agree that the BFD is adequately staffed to meet future demand for services, 3% were neutral, and 95% of respondents disagree that the BFD is adequately staffed to meet future service demands.

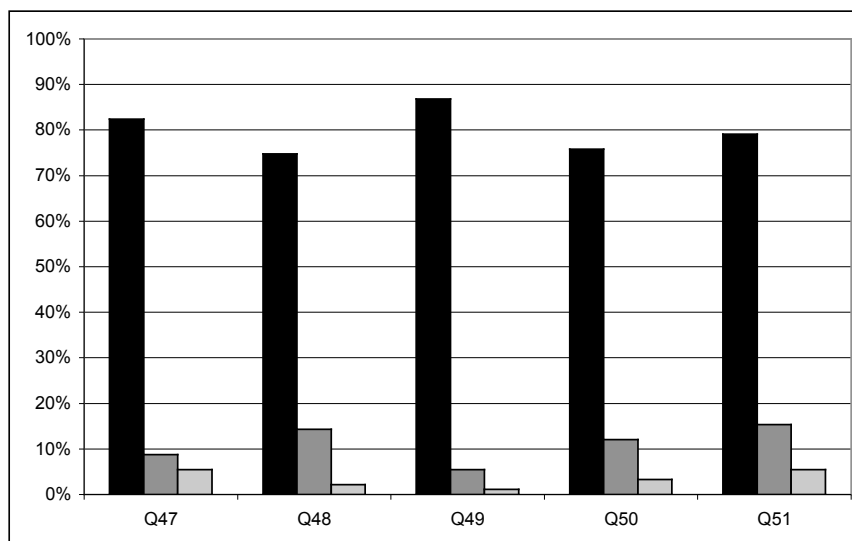
- 35% of respondents to Question #27 agree that cross staffing is an efficient and effective way to increase abilities to answer calls for service, 16% were neutral, and 46% disagreed.

Overall, the BFD personnel do not believe they have the necessary staffing resources to meet fire, rescue, or EMS needs in the City, nor the County, and overwhelmingly believe that staff resources are not adequate to meet future demand. Further, staff does not believe cross staffing is an efficient and effective way to increase their capacity.

(2) The Majority of BFD Personnel Are Satisfied with Fire Station Locations and Conditions, as well as the Equipment and Apparatus.

The chart below shows the response results for the following questions.

- Question #47: We have the equipment and apparatus to provide high levels of service.
- Question #48: Our equipment for fire and rescue is up to date.
- Question #49: Our equipment for emergency medical services is up to date.
- Question #50: The locations of our fire stations are effective in meeting community needs.
- Question #51: The physical condition of our fire stations is good.



The following points summarize the results above.

- 82% of respondents to Question #47 agree that the BFD has the equipment and apparatus to provide high levels of service, 9% were neutral, and 5% disagreed.
- 75% of respondents to Question #48 agree that fire and rescue equipment is up to date, 14% were neutral, and 2% disagreed.
- 87% of respondents to Question #49 agree that emergency medical service equipment is up to date, 5% were neutral, and 1% disagreed.
- 76% of respondents to Question #50 agree that the locations of fire stations are effective in meeting community needs, 12% were neutral, and 3% disagreed.
- 79% of respondents to Question #51 agree that the physical conditions of the fire stations is good, 15% were neutral, while 5% disagreed.

Overall, respondents had no issues with the physical attributes associated with conducting their operations and responding to incidents.

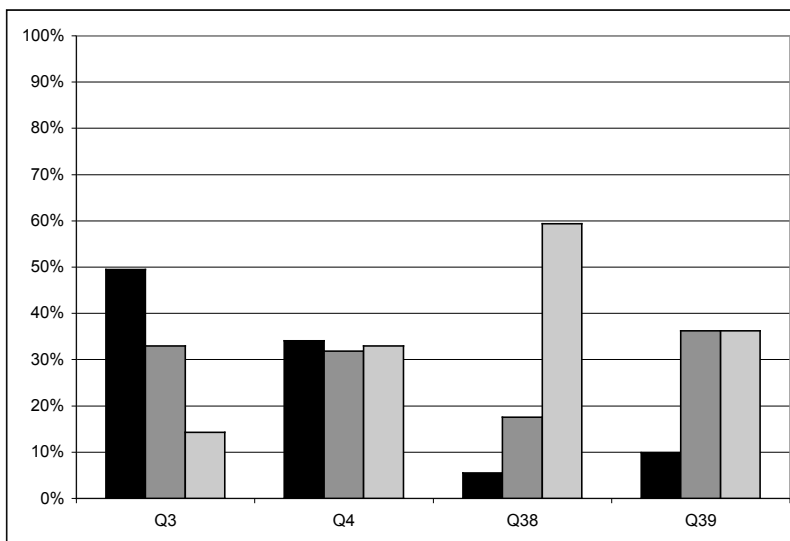
5. SPECIFIC PROGRAMS

This section provides the survey results to questions relating to the more specific programs such as HazMat and special rescue services, fire prevention programs and inspections, dispatching, and training.

(1) Perceptions Were Mixed Regarding the Level of HazMat and Special Rescue Services, as Well as That of Fire Prevention, Education, and Inspection Programs.

The chart below shows the response results to the following questions.

- Question #3: Our Department provides a high level of HazMat and special rescue services.
- Question #4: The Department provides a high level of fire prevention and public education.
- Question #38: Our pre-fire plans are well maintained and up to date.
- Question #39: Our inspection programs are efficient and effective.



The following points summarize the results above.

- 49% of respondents agreed with Question #3 that the BFD is providing high quality HazMat and special rescue services, 33% were neutral, while 14% disagreed.
- 34% agreed with Question #4 that the BFD is providing a high level of quality for fire prevention and education, 32% were neutral, while 33% disagreed.
- 5% of respondents to Question #38 agree that pre-fire plans are well maintained and up to date, 18% were neutral, and 59% disagreed.
- 10% of respondents to Question #39 agreed that inspection programs are efficient and effective, 36% were neutral, and 36% disagreed.

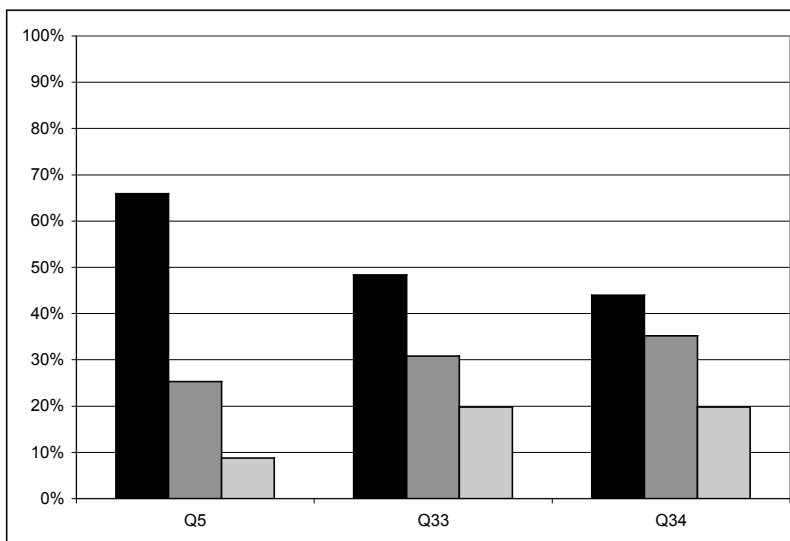
Overall, the BFD personnel perceive there to be some issues regarding their specialized services, especially with the maintenance of pre-fire plans and the inspection programs.

(2) The BFD Personnel Perceive Their Dispatch Center as Providing a High Level of Service.

The chart below shows the response results for the following questions.

- Question #5: Our Fire and EMS Dispatch Center provides a high level of service to the community.
- Question #33: The fire, rescue and EMS related dispatch information provided to us on incidents is accurate and timely.

- Question #34: The emergency medical service dispatch information provided to us on incidents is accurate and timely.



The following points summarize the results above.

- 66% of respondents agreed with Question #5 that the dispatch center is providing high levels of service, 25% were neutral, while 9% disagreed.
- 48% of respondents to Question #33 agree that fire and rescue related dispatch information is accurate and timely, 31% were neutral, and 20% disagreed.
- 44% of respondents to Question #34 agree that EMS related dispatch information is accurate and timely, 35% were neutral, and 20% disagreed.

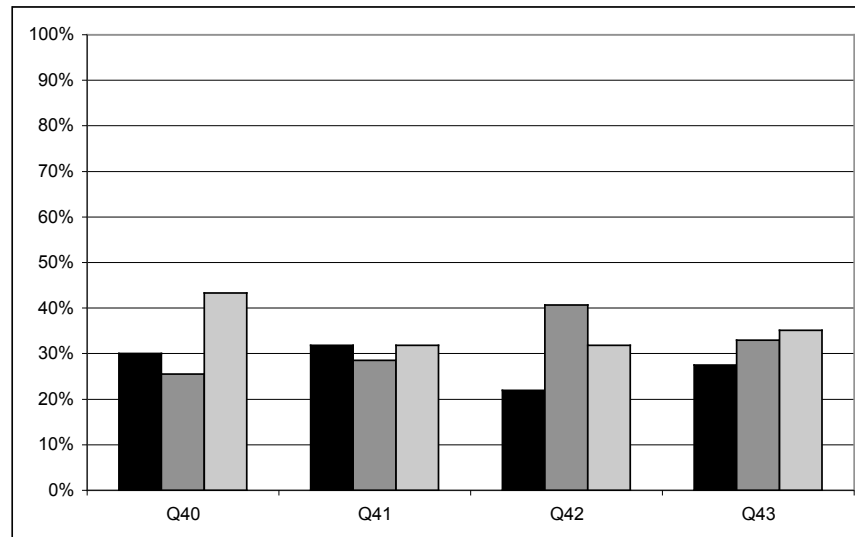
Overall, respondents believe the BFD dispatch center is providing a high quality service to both the community, as well as to the emergency personnel.

(3) Personnel Had Mixed Perceptions Regarding the Level of Practical Training Received, the Training of Company Officers, and Converting Field Issues into Relevant Training.

The chart below shows the response results for the following question.

- Question #40: We receive the practical training we need to keep all of our skills high.
- Question #41: Our company officers receive the training required to be good leaders and trainers.

- Question #42: Our company officers do a good job of providing interesting and useful training.
- Question #43: Our Department does a good job of converting issues identified in the field into proper training for personnel.



The following points summarize the results above.

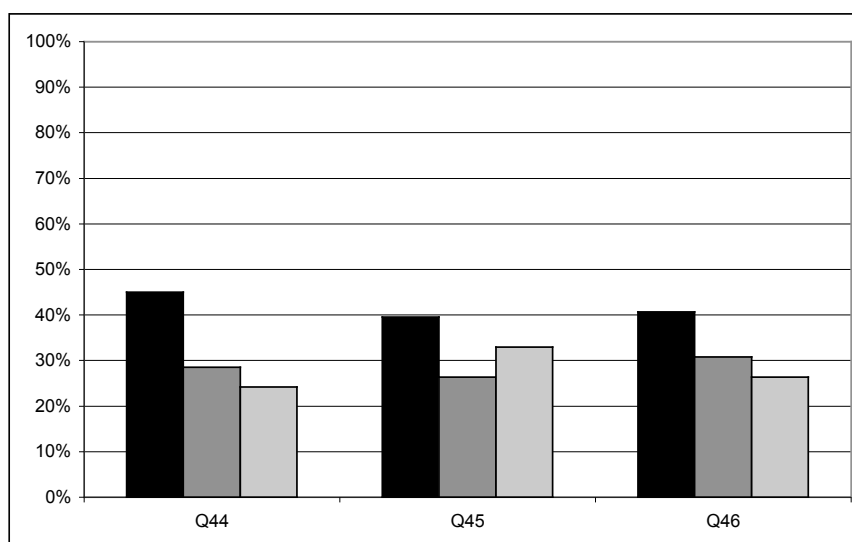
- 30% of respondents to Question #40 agree that they receive the practical training needed to keep skill high, 25% were neutral, and 43% disagreed.
- 32% of respondents to Question #41 agree that company officers receive the training required to be good leaders and trainers, 29% were neutral, and 32% disagreed.
- 22% of respondents to Question #42 agree that company officers do a good job of providing interesting and useful training, 41% were neutral, and 32% disagreed.
- 27% of respondents to Question #43 agree that the Department does a good job of converting issues identified in the field into proper training for personnel, 33% were neutral, and 35% disagreed.

Overall, respondents were somewhat dissatisfied with the level of practical skills training, the company officers' training and abilities to train, and with identifying training to address field issues.

(4) The Majority of Personnel Perceive the BFD as Providing the Necessary Resources for That Training, and Conducting Training for New Equipment.

The chart below shows the response results to the following questions.

- Question #44: Our Department places a high value on ensuring proper training for field personnel.
- Question #45: Our Department provides the necessary resources for training to occur.
- Question #46: We are properly trained before using new types of equipment and tools.



The following points summarize the results above.

- 45% of respondents to Question #44 agree that the BFD values proper training for field personnel, 29% were neutral, and 24% disagreed.
- 40% of respondents to Question #45 agree that the BFD provides the necessary resources for training to occur, 26% were neutral, and 33% disagreed.
- 41% of respondents to Question #46 agree that personnel receive the proper training before using new equipment and tools, 31% were neutral, and 25% disagreed.

Overall, personnel perceive the BFD as both placing a high value on proper training, and providing the necessary resources to deliver the training.

4. THE BELLINGHAM FIRE DEPARTMENT IN A COMPARATIVE CONTEXT

This chapter of the report provides the results of the comparative survey which was distributed to a number of fire and emergency service departments in Washington and Oregon. There were a total of 8 completed responses, which contain summary information pertaining to their respective community demographics and the organization and operational aspects of their fire and emergency medical service, including staffing levels, equipment and apparatus, fire stations, mutual/automatic aid, etc. The responding cities were as follows: Kent, Kennewick, Yakima, Olympia, Redmond / King County Fire District #34, and Shoreline, WA, and Gresham and Bend, OR.

1. BASIC DEMOGRAPHIC AND FIRE DEPARTMENT INFORMATION

The first set of comparative questions obtained basic demographic information for each of the respective communities (i.e., population and land area), as well as summary information for the fire department, relating to budget, staffing, and fire stations.

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Name of the City / District	Kent, WA	Kennewick, WA	Yakima, WA	Olympia, WA	Redmond, WA/KCFD 34	Shoreline, WA	Gresham, OR	Bend, OR
Population protected:	133,000	58,000	79,000	42,514	270,789	56,000	130,000	90,000
Square Miles/Area:	58	22	24	18	142	14	60	250
Total Budget:	\$17,597,919	\$16,124,230	\$6.2 Million – FD	7.6M	\$14.2M	11.5M	\$11,800,000	\$10,628,000
Number of Fire / EMS Calls in 2003	13,334	7,028	8,016	6,977	14,908	8,698	10,400	6,000
How many staff people on the department?	165: 1 Fire Chief; 1 Assistant Chief; 8 Battalion Chiefs; 27 Lieutenants; 111 firefighters; 15 Civilian FTEs; 2 PT Civilians	77: 1 Chief; 1 Operations Chief; 1 Fire Marshal; 1 Training/Safety BC; 3 Shift BC; 1 Captain Inspector; 1 EMS Captain; 1 Training Captain; 12 Station Captains; 54 FF's; 2 Civilians	82: 1 Chief; 2 Deputy Chiefs; 1 Secretary; 1 AA; 3 BC's; 1 Deputy Fire Marshal; 1 Assistant Fire Marshal; 1 Training Supervisor; 1 Training Assistant; 1 Mechanic; 69 Firefighters	82: 1 Chief; 3 Assistant Chiefs; 4 Code Enforcement; 1 Captain; 1 MSO; 68 Line; 4 Civilian	137: 1 Chief; 3 Deputy Chiefs; 91 Support; 2 Training; 6 Fire Prevention; 24 MSOs and Paramedics; 9.25 Civilian	93: 1 Chief; 5 BC; 12 Lt.; 36 FF; 4 CPT/MSO; 24 FF/PM; 1 Direct Support Services; 1 Admin. Director; 4 AA; 1 Pub. Ed.; 3 FF/Inspector; 1 CPT/Fire Marshal	97: 1 Chief; 1 Deputy Chief; 3 BC's; 1 Training Chief; 1 Fire Marshal; 7 Captains; 17 Lt.; 54 FF's; 5 Fire Prev. Spec.; 1 Analyst; 3 AA; 1 EMS Coord.; 1 Asst. Training Off.; 1 Emerg. Mgr.	76: 1 Fire Chief; 3 Deputy Chiefs; 3 BC; 15 Captains; 19 Fire Engineers; 23 FF's; 1 Fire Training Officer; 1 AA; 2 Office Spec.; 1 Fire Insp. II; 3 Fire Insp. I; 1 EMS Coord.; 3 Paramedic/FF
Do you have any personnel who are EMS only? If so, how many?	No	No	No	No	No	No	EMS Coordinator	95% of FT personnel are paramedics; 15 medical transport team volunteers
How many stations does your department operate?	7	4	4 + 1 Co-Location	3	6 + 2 Medic Locations	3	6 + 1 Co-Location (Jan-May)	5

The following points summarize the highlights of the comparative information above.

- The population protected of these agencies range from approximately 42,500 in Olympia, WA to a high of over 270,000 for the King County Fire District #34.
- The total budget for fire and EMS ranges from a low of \$6.2 Million in Yakima, WA to a high of over \$17.5M in Kent, WA.
- The number of fire and EMS calls for services that these agencies responded to range from a low of approximately 6,000 in Bend, OR to a high of nearly 15,000 by the King CO Fire District.
- Staffing for these agencies range from a low of 76 personnel in Bend, OR to a high of 165 personnel in Kent, WA.
- The number of fire stations that these agencies operate out of range from a low of 3 in Olympia and Shoreline, WA to a high of 7 fire stations in Kent, WA.

The following section provides a summary of the responses regarding basic service provision.

2. BASIC SERVICES

This section obtained information relating to services outside/inside the City boundaries, other surrounding departments, and scheduled shifts/hours of personnel.

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
MUTUAL AID								
Provide?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compensated	No	No	No	No	In Budget	No	Reciprocal	No
How Comp'd?	NA	NA	NA	NA	NA	No	NA	NA
AUTO AID								
Provide?	Yes	Yes	Tentative	Yes	Yes	Yes	Yes	Yes
Compensated	No	No	Yes	No	No	No	Reciprocal	Yes
How Comp'd	NA	NA	Exchange for Co-Location	NA	NA	No	NA	Mutual Aid
EMS								
Provide Outside City	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes
Compensated	No	Yes	NA	No	No	Yes	Yes	Yes
How Comp'd	NA	Billed	NA	NA	NA	ILA,	Contracted	Cost

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
						Contract		
FIRE SERVICES								
Provide?	Yes	Yes	NA	No	Yes	Yes	Yes	Yes
Compensated	No	Yes	NA	NA	No	Yes	Yes	Yes
How Comp'd	NA	OT and Backfill	NA	NA	NA	Contract	Contracted	Cost
TRAINING								
Provide Outside City	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Compensated	No	NA	Sometimes	NA	No	Yes	Yes	Yes
How Comp'd	NA	NA	Exchange for Co-Location	NA	NA	ILA	Contracted	Cost
PLAN REVIEW								
Provide Outside City	Yes	No	NA	No	No	Yes	Yes	No
Compensated	Yes	NA	NA	NA	NA	Yes	Yes	No
How Comp'd	Contract	NA	NA	NA	NA	Contract	Contracted	No
INSPECTIONS								
Provide Outside City	Yes	No	NA	No	No	No	Yes	No
Compensated	Yes	NA	NA	NA	NA	NA	Yes	No
How Comp'd	Contract	NA	NA	NA	NA	NA	Contracted	No

The following points summarize the highlights from the comparative information above.

- All of these agencies provide some type of mutual aid to surrounding areas, with most receiving no direct compensation for it.
- All of these agencies provide automatic aid to surrounding areas, with most receiving no direct compensations for it.
- All of these agencies, with the exception of Yakima, provide emergency medical services outside of their jurisdiction, with most receiving some type of compensation for it.
- Most of the agencies provide fire suppression services outside of their jurisdiction, with most receiving some type of compensation for it.
- Most of the agencies provide training outside of their jurisdiction, with most receiving some type of compensation.

- Most of the agencies do not provide plan review or inspection services for other agencies.

The following section provides a summary of our findings regarding the operations of these departments.

3. BASIC DEPARTMENT OPERATIONS

This section obtained information regarding minimum staffing levels, types of apparatus utilized, incident response policies and procedures, response goals, etc.

Name of the City / District	Kent, WA	Kennewick, WA	Yakima, WA	Olympia, WA	Redmond, WA/KCFD 34	Shoreline, WA	Gresham, OR	Bend, OR
Are there other departments nearby that automatic or mutual aid? Please name and indicate whether career, volunteer or mixed.	Career: Auburn, Federal Way, Renton, Des Moines, FD 40. Volunteer: FD 44 Combination: Maple Valley	Career: Richland Fire (Mutual and Automatic), Pasco FD (Mutual) Volunteer: 10 Districts	Combination: East Valley, West Valley, Naches Heights, Tieton, Cowiche, Selah, District 5 and Union Gap. Volunteer: Gleed	Combination: Tumwater, Lacey, District 5, 6, 7, 8, 9.	Career: Bellevue, Kirkland, Woodinville, East Side Fire and Rescue	Auto, Career: Northshore. Mixed: Bothel. Mutual, Career: Seattle. Mixed: Edmonds	Career: Portland. Combination: Clackamas Fire District, Sandy, Corbett. Volunteer: Corbett	10 Mixed Departments
What are the average scheduled hours worked for line staff (after any Kelly days)?	50.11 (Modified Detroit)	49.8	51.38	48.6	48.5	48 Hours (24 Hour Shift)	56, No Kelly Days	24/48 56 Hours

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Name of the City / District	Kent, WA	Kennewick, WA	Yakima, WA	Olympia, WA	Redmond, WA/KCFD 34	Shoreline, WA	Gresham, OR	Bend, OR
Do field staff all work the same shift?	Yes	Yes	Yes	Same	Yes	1 ALS unit works a 12 hour day shift	All shift personnel are 24/48. Fire Prevention Specialist 4-10s.	40-Hour peak demand ambulance - about to add 1 more
What schedule do your Battalion Chiefs work?	Shift Commanders work Modified Detroit, others a 40 hour flex schedule	Same as shift workers 49.8	51.38	Shift Work	Modified Detroit - 48 Hour Work Week	24 Hour Shift	24/48. Straight time for additional shifts	24/48 56 Hours
How many staffed front line pieces of apparatus in your agency? Are any of these cross-staffed from other units?	6 Engines, 1 Truck, 2 Aid Units	3 Engines, 3 Medic Units and 3 Grass Rigs	5 Engines, 1 Rescue, 1 Command, 1 ARFF	3 Engines, 1 Truck, 2 Medics, 1 BC, no cross staffing	12 Apparatus, 10 of the 12 are cross-staffed	1 Dedicated Engine, 1 Dedicated BLS Unit, 25 Dedicated ALS Units, 1 Engine Cross Staffed w/BLS, 1 Engine Cross Staffed w/ Ladder Truck	6 Engines, 1 Ladder. Crossed with specialty units (Haz-Mat, Water Rescue, Technical Rescue)	All stations (except 1) have a Pumper, Water Tender, Interface Pumper and Ambulance. 1 40-Hour peak demand Ambulance
What is your minimum staffing overall (including BC and line staff)?	26	17	19	17	21 for 6 FD Stations; 7 for 3 Medic Locations	17	22	15
What is your minimum staffing for medic units, engines and trucks?	3 for Engine, 2 for Aid	3 for Engine, 2 for Medic, 3 for Quint	3 for Engine/Ladder, 2 for EMT Rescue	3 for Engine, 2 for Medic	3 for Engine and Ladder, 2 for Medic	3 for Engine, 2 for BLS and ALS Units	3 for Engine/Truck.	NA

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Name of the City / District	Kent, WA	Kennewick, WA	Yakima, WA	Olympia, WA	Redmond, WA/KCFD 34	Shoreline, WA	Gresham, OR	Bend, OR
Who provides dispatch? Is this service merged with your police service provider?	Merged Valley Comm.	Merged Southeastern Communication Center	Merged Police/Fire	CAPCOM, yes merged	Eastside Comm. in Bellevue w/Bellevue PD, not Redmond	Bellevue PD, not merged	Merged Portland BOEC	County 911 Center, All police, fire, and EMS
If your dispatch is merged, do they staff dedicated fire dispatch positions	Yes	Yes	Mostly, w/some crossover	Yes	Yes, 2-3 positions	Yes	Yes	Yes, Priority system
Are your call takers utilizing some form of emerg. medical dispatch? If so, which system?	NA	NA	Yes, King County	CBD	CBD	CBD	Yes	NA
Is EMD used to triage / prioritize calls?	Calls Prioritized	Yes	Yes, Prioritize with no differential response	NA	Quick Dispatch Booklet	Yes	Yes	NA
Is EMD being used to provide pre-arrival instructions to the caller?	Only CPR pre-arrival instructions	Yes	Yes	NA	Yes	Yes	Yes	Yes
Are you providing medical oversight (QA/QC) for dispatch?	Yes, but limited	No	Yes, in-house	Yes	Yes, through Medical Director	Yes	No, they are planning to begin this soon	Yes

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Name of the City / District	Kent, WA	Kennewick, WA	Yakima, WA	Olympia, WA	Redmond, WA/KCFD 34	Shoreline, WA	Gresham, OR	Bend, OR
What are your standard initial responses to the following kinds of incidents:								
EMS – BLS	Aid or Engine	Medic Unit	Fire Pumper or Aid, 1 Private Ambulance	Engine	1 Aid Car	1 Aid Car	Engine	40-Hour Peak Demand, ALS engine based on ALS call
EMS – ALS	Aid or Engine plus Medic	Engine and Medic	Fire Pumper or Aid, 1 Private Ambulance	1 BLS, 1 ALS	1 Aid Car, 1 Medic Car	1 Aid Car, 1 Medic Unit	1 Engine and 1 AMR Ambulance	
Fire Alarm	Engine	Engine and Quint	Pumper with some special run orders	Engine	2 Engines	1 Engine, 1 Truck	Engine (Res.) Engine and Truck (Commercial)	Engine
Residential Structure Fire	4 Engines, 1 Truck, 1 BC	2 Engines, Quint, Medic Unit, BC	4 Pumpers or 1 Rescue/3 Pumpers	5 Engines, 1 Truck, 1 BC, 2 Medics	3 Engines: 1 Ladder Truck; 1 Aid Car; 1 BC	2 Engines, 1 Truck, 1 Medic, 1 BC, 1 MSO	4 Engines, Truck, BC	3 Engines, 1 BC
Commercial Structure Fire	4 Engines, 1 Truck, 1 BC	3 Engines, Quint, Medic Unit, BC	4 Pumpers and/or Ladder	5 Engines, 1 Truck, 1 BC, 2 Medics	4 Engines; 1 Ladder Truck; 1 Aid Car; 1 BC	3 Engines, 1 Truck, 1 Medic, 1 BC, 1 MSO	5 Engines, Truck, BC	3 Engines, 1 Ladder, 1 BC
Non-Structure Fire (Car, Trash)	1 Engine	1 Engine	1 Pumper	1 Engine	1 Engine	1 Engine	1 Engine	1 Engine
Charge for responding to accidents ?	NA	No	No	No	No	No	NA	NA
Charge for structure fire response ?	NA	No	No	NA	No	No	NA	NA

Name of the City / District	Kent, WA	Kennewick, WA	Yakima, WA	Olympia, WA	Redmond, WA/KCFD 34	Shoreline, WA	Gresham, OR	Bend, OR
Charging for mutual aid response	NA	No	No	NA	No	No	NA	NA
Others? If so, what are they?	Securing local and federal grants	3rd Party Billing	No	NA	Fire Prevention is proposing fees for false alarms and re-inspects and uniform code permits	No	Billing for transportation route, fire inspections	NA
Has your agency est. perf. standards for EMS and Fire response (i.e., x minutes to y% of calls)? If so, what are they?	Efforts to obtain CFAI Accreditation has produced an SOC document	Developing a deployment plan for 1710 response	NFPA 1710	NFPA 1710	5 minutes or less on 80% of fire and EMS calls	NA	6 minutes or less to 90% of calls	Response time in 6.5 minutes
Have these been adopted by your governing body?	No	No	NA	Yes	Yes	NA	Adopted by City Council	Yes
Do you meet them?	Not all	No	NA	No	A % of the time.	NA	No, only about 60-65% of the time	Yes, most of the time

The following points summarize the highlights from the comparative information above.

- The average number of scheduled hours worked for line staff range from a low of 48.5 for Redmond/KCFD 34, Shoreline and Olympia, to a high of 56 hours in Bend, OR.

- Most of the comparative agencies' Battalion Chiefs work the same schedule as the line personnel.
- The minimum staffing of the comparative agencies range from a daily minimum of 15 in Bend, OR to a high of 26 in Kent, WA.
- The staffing is typically 3 for an Engine and 2 for a Medic unit for these comparative agencies.
- Most of the agencies utilize a consolidated dispatch center with positions dedicated only for fire dispatching functions.
- Agencies typically utilize 1 engine or medic unit for a BLS call, an engine and a medic unit for an ALS call, 1 engine for a fire alarm, 2-5 engines for a residential structure fire, in addition to a medic unit and the BC, 3-5 engines for a commercial structure fire, in addition to medic units and the BC, and most agencies utilize 1 engine to respond to a non-structure fire.
- Most of the agencies are not charging for responding to accidents, structure fires, or for mutual aid.
- All of the agencies have established some performance standards for EMS and Fire responses, with some of the official governing bodies' adoption. Most agencies conclude that these performance standards are not always being met.

The following section provides a summary of the survey responses regarding EMS.

4. EMERGENCY MEDICAL SERVICES

This section focused on the delivery of emergency medical services.

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
Does the department provide EMS? If so, at what level (1st resp., basic life support, advanced life	Yes, EMT-D, all line personnel	All personnel are certified EMT's with 28 Paramedics. Run a minimum of 2 ALS Medic Units and 1 ALS Engine. 75% of time staffed to ALS	BLS EMT/Defib	BLS and ALS	Depending on type of call, tiered response system.	BLS, ALS, both transport	ALS on all engines and the truck. No trans.	ALS Trans.

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
support, transport)?		out of all stations						
How is 911 ambulance transport provided? (private company, 3 rd service, fire depart. staffed, etc)?	Majority of transport is by private Amb	Fire Department Staffed	Private Amb.	Private	Fire Department	ALS transports - FD only BLS - Split with FD and Private Amb.	AMR through the County Health Department	Provides all service. Cross staff all ALS Engines
Does the agency staff any ALS engine or trucks? If so, how many?	No	All Engines and Quint ALS equipped; depends on availability of paramedics	No	No	No	No	Yes, 6 engines, 1 truck	NA
How many are 24-hour transport units?	No		None	NA	NA	All	None	45
How many are BLS or ALS units?	NA	All	All EMT/D efibs	NA	6 BLS, 3 ALS	3 ALS, 2 BLS	NA	NA
If agency has ALS engines and BLS transports, are PM's from engines used to convert the amb. to ALS?	NA	Yes	NA	NA	Don't use that deployment model	NA	AMR is all ALS. Put a Paramedic on their unit for serious patient transport	NA
Are flexible hour units utilized?	No	No	No	No	No	No	NA	40-Hour peak demand 1 ALS

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
If so, how many peak-hour transport units are staffed? Are these BLS or ALS units?	NA	NA	NA	NA	NA	NA	AMR uses a system status staffing method.	NA

Overall, these comparative agencies all provide some level of emergency medical service, either BLS or ALS. Some agencies utilize private ambulance providers for transport, and most of the agencies do not staff an ALS engine or truck company. Further, most of the agencies do not utilize flexible hours in the system.

5. PROVISION OF DEPARTMENT TRANSPORT

If the Department provided transport, the agencies were asked to complete this section.

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
Does the agency bill for service using internal staff or does it contract?	No	Finance Department	NA	NA	No	No	NA	City Staff
If agency uses a private billing service, how is the contractor paid (e.g., % of collections, % of bill)?	NA	NA	NA	NA	NA	NA	NA	NA
What are your base charges to transport (BLS / ALS)?	NA	Emergency Transports: \$562 + \$5/mile Non-Emergency: \$392 + \$5/mile	NA	NA	0, almost 100% of King County is levy funded.	NA	NA	ALS: \$567 + \$12.55/mi BLS: \$532 + \$12.55/mi

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
What are other charges	NA	NA	NA	NA	Cost recovery for some fire	NA	NA	NA
If you provide service in another jurisdiction, is there a contribution to financing this service?	NA	We do, they do not	NA	NA	No	NA	NA	NA

6. PREVENTION, EDUCATION, AND OTHER SUPPORT FUNCTIONS

This section obtained information regarding the performance of public education and inspection activities, as well as training.

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
Does your FD perform plan reviews?	Yes	Yes	Yes	Yes	Yes	Contract with City Building Reviews	Yes	Yes
Does the FD perform inspections?	Yes, annual permit and new const.	Annual Fire Safety and Construction	Pre-incident planning only	Yes, annual and constr.	Fire code permit, new constr. and T.I. And fire code maint.	Yes - All	Business License, New Const., Annual on Existing Businesses, Permits	Sprinkler Systems, annual at businesses
Does the FD use companies to perform inspections on-shift?	No	Yes	Pre-incident planning	No	Yes	Yes	No	No
If so, who coord. the company inspection program?	NA	Captain Inspector	Station Captains - Oversight by designated Spec. Proj. Captain	NA	Assistant Fire Marshal, Fire Protection	Captain / Fire Marshal	NA	
What kind of properties are inspected by companies?	NA	Commercial, Institutional	Pre-plan all buildings	NA	All non-fire code permitted occupies.	Small Commercial	None, pre-fire plan site evaluations only	NA

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
What frequency is targeted (annual, bi-annual, etc.)?	NA	Annual	Annual visit to Class A buildings, bi-annual to Class B and C	Annual	Currently bi-annual	Annual	Annual	Annual
Are these targets met?	NA	No	NA	Yes	No	Most of the time	No, about every 18 months	No
Does the FD perform routine hydrant checks? Maintenance? Painting? Flow tests?	Yes, hire temp employees annually to accomplish flow testing. Maint. and painting by DPW	Checks	No, Water Department Handles	No	Hydrant markers are maintained, obvious problems are dealt with	Yes - only checks	No, Water Dept. maintain and paint, flow test as requested. No annual flushing or flow testing	Public Works performs all
What are educational efforts? Are there staff? Do companies play a role?	Fall factors, school safety training, CERT and the crews are involved	Life Safety House, Station Tours, Public Presentations, (Fire Marshal and Line Personnel do bulk of work)	Public safety handouts, school visits, station tours, juvenile fire stoppers, pres.	Limited, admin. officer, no engine companies	Heavily involved in the regional training division with Kirkland, Redmond, and Woodinville	1 Public Educator, FF staff participated as coord. by Pub. Ed.	Public Out Reach, schools, civic groups; mobile home parks, apts. Staff are dedicated and companies assist	Fire prevention programs at schools
What is the daily training target for staff in the stations?	3 Hours per day	1 hour physical training, 2 hours of Fire / EMS training	Drill/School each shift	Performance Based Training Program	Suppression and EMS	Competency based - about 2-4 hours daily	Monthly targets. In station: 4 hrs EMS, 4 hrs fire. 8 hours at Training Center	1 Day/week scheduled, most crews are training 7 days week
Who develops and coordinates this program? What role do station officers play in developing training programs?	Training Division	Training Captain	Training Supervisor. Station officers participate and support curriculum.	Training Officer, AC for Ops	Training department and CO partially responsible for delivery	Consolidated training division w 1 BC from Shoreline	Training Division develops. Review by Training Advisory Group, cross section of Dept.	Training officer, captains carry out a lot of the training

Name of the City / District	Kent	Kennewick	Yakima	Olympia	R/KCFD 34	Shoreline	Gresham	Bend
Are multi-company drills performed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes, limited due to resources	Yes
Does the department have dedicated training facilities? Types?	Tower with Symtron System	Training Center with Classroom and Training Tower	Tower, Burn Room,, Drill Grounds	Yes, small tower	Yes, some off-site through agreements (North Bend Training Facility)	Yes - Large building tower, drill ground, technical rescue	Classroom, training ground, stair tower, live fire containers.	Yes, classrooms, driving, tower draft site
Do you share with other departments?	Yes	Yes, with Benton County Fire Protection District	Yes	Yes	We share what is available in consortium	Yes - Consolidated with Northshore and Bothell	Others use these, as does Portland Community College (for rent)	Yes

The following points summarize the highlights from the information above.

- All of the agencies provide some level of plan reviews and inspections. However, only a few of the agencies utilize an engine and other companies to perform inspections on-shift.
- Most of the agencies have either an annual or bi-annual inspection target, but these targets are typically not being met.
- All of the agencies partake in some level of public fire education.
- Most of the agencies indicated some level of training targets for staff, ranging from 2-3 hours per day, to monthly training targets of 4 hours of EMS and 4 hours of Fire – other agencies utilize a performance based training program and drills/school each shift. All of the training is coordinated through the Training Division or Department.
- All of the agencies perform multi-company drills, have dedicated training facilities, as well as share training resources with other department and jurisdictions.

The following chapter provides a comprehensive analysis of operations and deployment.

5. ANALYSIS OF EMERGENCY SERVICES DEPLOYMENT AND OPERATIONS

This chapter is focused on the analysis of the emergency services provided by the Fire Department. The first several sections of this chapter focus on an analysis of the EMS service delivery system. Following this analysis, the project team considers a range of other deployment and operational issues.

1. DESCRIPTION OF EMS SERVICE ISSUES AND EXISTING MODEL OF SERVICE DELIVERY.

This section provides a summary of the EMS system currently operating within Whatcom County and, specifically, within the City of Bellingham. Additionally, an analysis is presented of the ability of the current system to fully meet the service demands presented to it. Future service demands are projected through 2010 and the resources needed to provide current levels of service to that projected population and call demand are presented. The revenue structure of the current system is described and the impacts of a loss of the government subsidy portion of that revenue stream is described. Alternative system and deployment designs are identified and the cost impacts of those design changes are described.

(1) Description of the Current Operational EMS System

The City of Bellingham Fire Departments operates the ALS and ALS transport component of a countywide EMS system. This system is comprised of four ALS-level transport units, two of which are located (or posted) at Bellingham Fire Station #1. The remaining two units are stationed at ambulance stations in the eastern and western portions of Whatcom County. The system minimally staffs the ALS resources with one

paramedic and one EMT. There are times, however, when two paramedics staff the medics. It is the stated intent of the system to staff the more rural units with two paramedics as a first priority. Interviews show that the hospital and medical community have an extremely high level of confidence in the ALS component of the EMS system.

The paramedics also provide the hospital with a very high level of service and cooperation as evidenced by the efforts to transport patients in hospital gowns and initiating procedures in the field whenever possible, thus saving the time and resources of the hospital based personnel. ALS staffing is supplemented by almost constant staffing of Engine 56 as a “ALS Engine” with paramedics assigned and equipped to operate off of this unit on a constant basis. Engine 52 is also staffed as an ALS Engine when staff are available.

Stations 2, 4 and 6 have “Aid Units” located within their facilities. These units are not staffed full time, but are cross-staffed with personnel in those stations. They provide back-up transport capability at a BLS level when system demand depletes the availability of ALS transport resources. The table below summarizes the existing transport resource capacity of the system:

Fire / Emergency Station	Transport Resources
Station 1 1800 Broadway	<ul style="list-style-type: none">• Medic 1 (ALS Ambulance)• Medic 2 (ALS Ambulance)• Aid/Medic 51 (BLS Ambulance – Cross Staffed from the engine)
Station 2 1590 Harris	<ul style="list-style-type: none">• Aid/Medic 52 (ALS/BLS– Cross Staffed)• ALS Engine 52
Station 4 2306 Yew Street	<ul style="list-style-type: none">• Aid/Medic 54 (BLS Ambulance – Cross Staffed)
Station 5 3314 Northwest Avenue	<ul style="list-style-type: none">• Aid/Medic 55 (BLS Ambulance – Cross Staffed)

Fire / Emergency Station	Transport Resources
Station 6 4060 Deemer Road	<ul style="list-style-type: none">• Aid/Medic 56 (ALS/BLS– Cross Staffed)▪ ALS Engine 56 (Staffed with Paramedics who are not in “active rotation” into Medic Units)
Medic 3 Station 1886 Grandview Road Ferndale	<ul style="list-style-type: none">• Medic 3 (ALS Ambulance)
Medic 4 Station 858 E. Smith Bellingham	<ul style="list-style-type: none">• Medic 4 (ALS Ambulance)

Access to the EMS system is primarily through “Prospect Communications”, which is a Countywide Fire and EMS dispatching entity also staffed by the City of Bellingham Fire Department. Medical Priority Dispatch is currently in use, although differentiation of response based upon call priority may not be utilized optimally throughout the entire system. Ambulances are also viewed by the BFD as fire resources, and as such, are fully integrated into the existing CAD system utilized by Prospect Communications.

A physician who is contractually retained by the Medic One system provides medical Direction. Medical oversight is direct and all aspects of initial and recurrent training are directly supervised by the Medical Director. Quality Assurance and Training are the responsibility of an EMS Division Chief and two EMS Captains. One of these positions is essentially responsible for on-going training and continuing education while the other position is primarily responsible for organizing, implementing and managing the initial paramedic certification course and related clinical experiences. The Medical Director takes a very active and personal involvement in quality control and education development opportunities within the EMS and medical communities in the County and the Fire Department.

(2) Level of Service and Demand for Services

As the provider of ALS services for the entire Whatcom County regional area, the City of Bellingham must understand the demand for services both within the City and within the context of the surrounding jurisdictions. The exhibits, which follow, summarize the calls for service as measured by bills generated per station area and level of service (i.e. ALS or BLS) for calendar year 2003 (this does not show all calls):

Number of ALS Charges for Services by District

Station	Jurisdiction	# Charges
201	LYNDEN	406
71	FERNDAL	206
131	BIRCH BAY	164
85	GOOSEBERRY	141
134	BLAINE	127
142	KENDALL	127
11	EVERSON	117
81	BENNETT	111
32	LAUREL	95
12	NUGENT'S	82
22	SUDDEN VLY	75
41	AGATE BAY	72
73	N BELLINGHAM	71
76	CHURCH	66
141	SUMAS	65
35	WISER LAKE	56
33	DELTA	51
75	ENTERPRISE	48
43	E BAKERVIEW	47
132	CUSTER	41
101	YEW ST RD	40
191	GLACIER	38
72	WHITEHORN	37
42	VAN WYCK	35
51	PT ROBERTS	33
171	SANDY PT	24
34	NORTHWOOD	23
143	WELCOME	22
91	LK SAMISH 1	21
21	GENEVA	20
135	SEMAHMOO	18
161	ACME	17
111	LUMMI ISLAND	15
162	VAN ZANDT	15
61	CHUCKANUT	14
133	HAYNIE	14

84	AIRPORT	13
182	S LK WHAT 2	13
92	LK SAMISH 2	7
181	S LK WHAT 1	4
	TOTAL	2,591
	City of Bellingham	
531	Station 3	568
561	Station 6	459
511	Station 1	457
521	Station 2	442
541	Station 4	408
551	Station 5	297
	TOTAL	2,631

A critical element in determining system design options involves an understanding of the extent to which ALS resources are actually needed and how these resources are actually utilized in the system. In the absence of definitive clinical outcome or admissions data, the best method of determining the level of service actually delivered by caregivers within the system is to analyze the bill coding of the bills that result from transport activities. A review of this data suggests that the current system generates an ALS service level demand (or services above the basic BLS level of care) in 46% of all billable episodes. The table below summarizes the calls for service that received bills for BLS level care by jurisdiction and/or Bellingham Fire Station:

Number of BLS Charges for Service by District

Station	Jurisdiction	No. Calls
201	LYNDEN	175
71	FERNDAL	169
85	GOOSEBERRY	101
81	BENNETT	88
11	EVERSON	84
134	BLAINE	68
131	BIRCH BAY	64
32	LAUREL	59
76	CHURCH	55
142	KENDALL	49
12	NUGENT'S	45
41	AGATE BAY	45

73	N BELLINGHAM	42
75	ENTERPRISE	40
33	DELTA	38
141	SUMAS	36
35	WISER LAKE	31
191	GLACIER	30
101	YEW ST RD	29
43	E BAKERVIEW	24
91	LK SAMISH 1	23
72	WHITEHORN	22
22	SUDDEN VLY	21
132	CUSTER	19
42	VAN WYCK	16
34	NORTHWOOD	15
133	HAYNIE	11
162	VAN ZANDT	11
171	SANDY PT	11
21	GENEVA	10
161	ACME	9
111	LUMMI ISLAND	7
135	SEMAHMOO	7
51	PT ROBERTS	6
182	S LK WHAT 2	6
61	CHUCKANUT	4
143	WELCOME	4
181	S LK WHAT 1	4
84	AIRPORT	3
92	LK SAMISH 2	2
	TOTAL	1,483
	Bellingham City	
531	Station 3	453
541	Station 4	348
511	Station 1	347
561	Station 6	296
551	Station 5	255
521	Station 2	248
	TOTAL	1,947

BLS service calls represent 3,430 billed incidents (40%) or 31% of total system responses. The remainder of the call population either didn't receive a bill (i.e. cancelled call) or the type of service delivered was outside of normal coding parameters.

An understanding of the differences between service demand in the City and the County is essential to the determination of system design options. If a large difference exists, deployment of resources may be concentrated in areas of predictable demand.

The table below summarizes the ALS and BLS provided within the City and in the remainder of the County as represented by accounts receivable records:

Comparison of ALS and BLS Charges in City and Remainder of County

	BLS	ALS	Total
City	1,947	2,591	4,538
Remainder of County	1,483	2,631	4,114

An analysis of these data suggest that the patterns of demand for services are nearly identical in both the incorporated areas of the City and the remainder of the Whatcom County Medic One area. This limits the options that would provide for system design based on service demand type.

(3) Demand for Services by Time of Day and Needed Resources

System design options are impacted by the hour-of-day in which demand occurs. An understanding of the service demand by time is important for purposes of identifying resource allocation and system design options. Given definitive peak- and low-demand times, resource distribution may be adjusted to meet the predicted demand. Within the current Whatcom Medic One area, demand for medical services falls into a pattern typical of most contemporary EMS systems. The table below summarizes the call demand by hour-of-day for the calendar year 2003:

Hour of Day	No. Calls/Year	Call/Hour/Day
0:00 to 00:59	625	1.71
1:00 to 1:59	620	1.70
2:00 to 2:59	560	1.53
3:00 to 3:59	430	1.18
4:00 to 4:59	383	1.05
5:00 to 5:59	423	1.16
6:00 to 6:59	488	1.34
7:00 to 7:59	658	1.80
8:00 to 8:59	793	2.17
9:00 to 9:59	988	2.71
10:00 to 10:59	1095	3.00
11:00 to 11:59	1132	3.10
12:00 to 12:59	1121	3.07
13:00 to 13:59	1105	3.03
14:00 to 14:59	1157	3.17
15:00 to 15:59	1085	2.97
16:00 to 16:59	1212	3.32
17:00 to 17:59	1164	3.19
18:00 to 18:59	1043	2.86
19:00 to 19:59	1132	3.10
20:00 to 20:59	1058	2.90
21:00 to 21:59	969	2.65
22:00 to 22:59	857	2.35
23:00 to 23:59	714	1.96

Resource needs for these service demands are identified in the next section.

(3.1) Modeling of Units Needed to Support System Demand

The project team utilized two models of demand analysis to determine the minimum number of units required to meet call demands on an hourly basis. The first model, known as the “Slip Form Need” method, recognizes that calls for service do not fit into neat single hour increments. Based on the standard deviation of the differences between the call demand from sequential hours, the model takes varying percentages of the call volume of those hours and applies the need to the hour under analysis. A second method utilizes statistical probabilities and applies the second standard deviation of the population to the call demand per hour. This results in a 95% probability of the system meeting the demand in a given hour based upon historical call demand trends. The results of this analysis are summarized below:

Current System Transport Units Needed by Hour

Hour of Day	Needed Units - Slip Form Need Model	Needed Units –2 StDev	Variation from Actual (Slip Form)	Variation from Actual (2 StD)
0:00 to 00:59	3	3	-1.19	-0.76
1:00 to 1:59	3	3	-1.33	-0.77
2:00 to 2:59	2	3	-1.60	-0.93
3:00 to 3:59	2	3	-2.05	-1.29
4:00 to 4:59	2	3	-2.25	-1.42
5:00 to 5:59	2	3	-2.13	-1.31
6:00 to 6:59	2	3	-1.77	-1.13
7:00 to 7:59	3	3	-1.14	-0.67
8:00 to 8:59	4	4	-0.47	-0.30
9:00 to 9:59	4	4	0.26	0.24
10:00 to 10:59	5	5	0.74	0.53
11:00 to 11:59	5	5	0.92	0.63
12:00 to 12:59	5	5	0.91	0.60
13:00 to 1359	5	5	0.90	0.56
14:00 to 14:59	5	5	0.97	0.70
15:00 to 15:59	5	5	0.92	0.50
16:00 to 16:59	5	5	1.17	0.85
17:00 to 17:59	5	5	1.04	0.72
18:00 to 18:59	5	4	0.74	0.39
19:00 to 19:59	5	5	0.83	0.63
20:00 to 20:59	5	4	0.63	0.43
21:00 to 21:59	4	4	0.23	0.19
22:00 to 22:59	4	4	-0.27	-0.12
23:00 to 23:59	3	3	-1.34	-0.51

An analysis of the preceding data reveals that the current number of ALS transport units that are available within the Medic One system are unable to meet the call demands of the system between the hours of 10:00 a.m. and 9:00 p.m. The capacity of the system meets or exceeds the call demand placed on it during the remaining hours of the day. An extension of this model with the application of projected call demand growth is presented later in this section.

(3.2) Projections of Service Demand

Equally important for effective long-range planning is the ability to forecast future demand on services. Historically, call demand has risen dramatically within the Medic One System. On average, call demand for EMS call-types has increased about 7.8%

per year over the past five years. A range of call demand projections was created by extending this demand increase on a “straight-line” basis through the year 2010. Additionally, a planning scenario that applied the ratio of calls/1,000 population (and an extension of the year-over-year changes in that number) to the projected population increases based on U.S. Census data. The results of these two scenarios are represented in the table below

Projected Call Volume Scenarios (EMS) by Year

Year	2005	2006	2007	2008	2009	2110	Cumulativ e Total Increase
Projected Demand Based on Calls/Population (Calls/Year)	12,788	13,619	14,475	15,356	16,262.6 6	17,195	43.5%
Projected Demand Based Upon Historical Percentage Increase	12,906	13,900	14,970	16,123	17,365.2 2	18,702	56.1%

An analysis of these data reveal that the demand for services in the Medic One service area in 2010 is likely to increase between 44% and 56% from the service demand levels currently experienced. The impact of this growth on system demand and needed system resources is discussed in detail in the following section of this report.

(4) Time Out of Service

An analysis of the “time-on-task” for deployment is essential to understanding the actual workload experienced by resources in delivering services to the community. An analysis of available data indicates that ALS ambulances, system wide, can expect to be committed to an average of 44 minutes for each incident to which they are dispatched. This is a relatively low “time-on-task” number, as the national standard

planning protocol assumes about one-hour for each assigned call for service. However, this number is consistent with a system in which the primary receiving hospital is within the boundaries of the jurisdiction providing the ambulance services. It is also important to note that the “time-on-task” for Medic 3 and Medic 4 exceed an hour by almost 25%. These are the transport units primarily serving the areas outside of the City of Bellingham. However, system-wide, the time-on-task required for system design purposes is well within the 60-minute time usually associated with medical incidents and transports.

(5) System Growth Projections and Related Impacts

Utilizing the same models utilized to determine needed resources in the current system, the needed transport units in 2010 are likely to be as summarized in the table below:

Impact of Growth Scenarios on Needed Ambulance Transport Resources

	Non-Peak Hour	Peak Hour
Current Required Transport Resources	3	5
2010 Projected Transport Resources	5	8

The costs associated with this level of service are summarized in the table below utilizing 2004 constant dollars:

Annualized Cost BLS Ambulance 2004 Dollars

Expense	No. Needed	Total
Firefighters (Mid-Range)	8	\$535,638.95
Ambulance and Equipment (Depreciated over 6 years) Annual Cost	1	\$14,500
Maintenance and Supply Slippage		\$6,000
Total Annualized Expense Per Unit		\$556,139
Number Additional Units Needed	3	\$1,668,417

This approach reflects the total (not marginal) cost of providing this service. The current system utilizes BLS transportation in approximately 7.5% of the call for services.

The majority of these transports are as a result of insufficient ALS level transport capacity to handle peak-hour demand. Additionally, when logical growth scenarios are included, additional resources will be required within the system to meet greater demand. This analysis indicates that to meet transport demand (at a BLS level only) the increased annualized cost to the system will be approximately \$1.668 million utilizing 2004 constant dollars. This assumes the continuation of existing methods of staffing and response. Recently, North Whatcom, District 7, District 8 and the City of Lynden have begun to provide BLS Transport.

Recommendation: Based upon an analysis of hour-by-hour system demand, the current number of ALS transport units (4) are unable to meet call demands of the system between the hours of 10:00 a.m. and 10:00 p.m. New system design options should include a planned need deployment of at least 5 transport units between the hours of 10:00 a.m and 10:00 p.m. at a minimum. The capacity of the system meets or exceeds the call demand placed on it during the remaining hours of the day. As a result, an additional 3 units would be required at an additional cost of \$1.668 million per year.

The section which follows describes the basic financial structure of the Medic 1 system and the City of Bellingham's relationship(s) within that financial structure.

2. SYSTEM FINANCIAL DESCRIPTION AND OVERVIEW

An understanding of the current and projected revenue picture operating within the Medic One are is essential to identifying system design options that meet the needs of the community. The financial impacts on the City of Bellingham related to the delivery of EMS services is a somewhat complex analysis. The City is the provider of the core services, as well as support services, such as communications. As such it is both a payer and a payee within the Whatcom Medic 1 system.

(1) Accounts Receivable

The Medic One system operates on revenues from both “fee-for-service” and government subsidy. The table, which follows, summarizes the revenues to the Medic 1 system in 2003:

Revenue Sources – Whatcom Medic One

Source of Funds	Sub-Total	Percentage of Total
Fees for Service *	\$2,743,977	51.0%
Whatcom County Contribution	\$1,275,357	23.7%
City of Bellingham Contribution	\$1,317,759	24.5%
Other	\$41,941	0.8%

* Figure is net of bad debt and uncollectible bills.

Approximately 51% of the system revenue comes from fee-for-service charges. A review of these charges reveals that they are consistent or exceeding Medicare allowables and are consistent with usual and customary charges found in the ambulance industry within the region. Collection rates are relatively high – primarily owing to the fact that charges are very much in alignment with Medicare allowable charges. This results in a larger percentage of billings actually being paid as opposed to rates that far exceed Medicare allowables and require additional expense on the part of non-government third party payers and private citizens.

The payer mix (i.e. the percentage of various payers that comprise the revenue stream) of the Whatcom Medic 1 system is summarized by the table below:

Medic One Payer Mix by Type of Payer

Payer Source	Percentage of Payer Mix
Medicare and Medicare Plus	49%
Medicaid	13%
Private Insurance	29%
Private Pay	8%

An analysis of this payer mix reveals that approximately 70% of the payer population is going to be unresponsive to rate increases (i.e. Medicare/Medicaid and

private pay). This will result in relatively low marginal collection rates in any addition to service fees. This payer mix provides an overall collection rate of approximately 66% for the Medic 1 entity. It is likely that this rate will decrease as the adjustments to the Medicare Fee schedule continue to impact the rate profiles of ambulance agencies. Additionally, the entity has not accepted Medicare assignment historically. Under recent changes to Medicare reimbursement policies, agencies must now accept assignment which will have a negative impact on collections as the difference between the actual rates charged and the Medicare allowable rate increases. The table below summarizes the current rates charged by Medic 1 in comparison with the allowable Medicare rates:

Current Ambulance Rates vs. Medicare Allowable

	ALS Emergent	ALS 2	BLS Emergent
Medic 1 Base Rates	\$540	\$540	\$320
Medicare Allowable	\$360	\$448	\$320

An analysis was undertaken to evaluate the sensitivity of the market to increases in ambulance bills. As already stated, Medicare and Medicaid patients will not generate any revenue above the Medicare or Medicaid allowable rate. Given this payer mix, where only 30% of the population would be responsive in any form to an increase in rates and the continuing effects of the implementation of the modifications to the Medicare ambulance fee schedule, it is estimated that the marginal collection rate for each new dollar billed would be less than 20%. Put another way, for each new dollar of revenue the system requires, an additional 5 dollars must be added to the charges. To put this in perspective, the table below summarizes the charge scenario required to meet the additional expenses in 2004 dollars of the resources projected to be needed to meet future demand:

Impacts on Rates to meet Future System Demands

Projected Transports	Revenue Needed	Revenue/Transport needed	Application of Marginal Collection Rate	New Bill Amount
11,349	\$ 1,668,417	\$ 147.01	0.2	\$1,050

In the absence of continued subsidies, the system will require BLS transport bills in excess of \$1,050 to meet the demands of the system if current system design parameters continue into the future.

(2) Impact of Loss of Subsidy on Needed Rates

If the current government subsidy were totally removed there would be a dramatic impact on rates needed to support the system costs on a fee-for-service basis. The table below summarizes this impact:

Impact on Rates to Replace Current Subsidy Levels

Projected Transports	Revenue Needed	Revenue/Transport needed	Application of Marginal Collection Rate	New Bill Amount
7,909	\$2,593,116	\$ 327.85	0.2	\$ 1,959.25

This analysis reveals that in order to support the current system costs in the absence of governmental subsidies, a BLS ambulance charge of approximately \$1,959 dollars would be necessary in the current environment. ALS charges would be proportionately higher.

Recommendation: The relatively high percentage of Medicare/Medicaid payers makes a reduction of subsidies in the system problematic. Given the elimination or reduction in subsidy, the degree of increases necessary to offset the current costs of the system through fee-for-service billings alone is dramatic. As such, alternative system designs and/or cost structures must be identified to ensure the sustainability of the emergency medical system in both Whatcom County and the City of Bellingham.

3. ALTERNATIVE SYSTEM DESIGNS AND DEPLOYMENT OPTIONS

Based upon the data and accompanying analysis presented above, the project team believes the long-term sustainability of the current EMS is very questionable. This is based upon the following findings:

- Current resources (i.e. 4 dedicated ALS transport units) do not meet the theoretical or actual demands presented by the current system. Supplemental transport capacity is provided from cross-staffed units when they are available. However, 7% of calls historically were provided BLS services when ALS care may have been appropriate.
- The payer mix found in the system results in approximately 30% of the payer population responsive to any rate increases in charges for service.
- Government subsidies could be reduced and/or eliminated given the failure of voter approval for a levy to support the Whatcom County Medic One System.
- Projected growth in call demand will require additional resources to those needed just to meet current system demands.

System design options for the EMS system in the City and County should include strategies for:

- Managing demand for services, and
- Alternative staffing and system design options

There have been multiple efforts aimed at managing call demand in the EMS environment. The most well-known, and the mechanism with the largest set of data with respect to quality control is Priority Medical Dispatch. This system has been implemented within the Prospect Communications Center.

However, while call prioritization and Emergency Medical Dispatch (pre-arrival instructions) have been implemented, the resources dispatched to the variety of medical priorities that are identified has not changed. There are two issues involved in identifying the impact that full implementation of Priority Medical Dispatch can have on

the Whatcom Medic One system. The first is 1) an understanding of the potential degree to which inappropriate calls can be diverted out of the EMS system, and 2) the extent to which calls can be diverted to BLS resources from the current practice of ALS response to all calls for service.

In the project team's national experience, approximately 10% - 15% of calls for service within urban and suburban EMS systems can be safely triaged to other forms of access to the health care system. Data from Priority Medical Dispatch© is consistent with these data.

The public policy question that must be addressed is – in the absence of an EMS response what mechanism exists for this population of patients to access the health care system? There have been a variety of alternatives developed to meet these needs. These include issuance of cab vouchers for self-transportation to urgent care centers or hospital emergency departments, creation of mobile physician services and integration of EMS with well-established public health infrastructures.

In order for any effort at demand management to be successful, there must be an alternative to access the community's health care system. This requires a coordinated effort between the community's health care providers, public health system and the EMS system.

National experience with Priority Medical Dispatch also has shown that approximately 10% to 15% of calls historically triaged as ALS can be safely and appropriately diverted to BLS levels of service. It is important to note that the definition of "safely" lies completely at the discretion of the supervising Medical Director of the

EMS system. Additionally, initial empirical data suggests that the ability to consistently and accurately triage calls via the information via the telephone is difficult at best.

This mandates the application of strenuous quality control measures in any effort to manage call demand. Again, the most widely utilized vehicle for statistical validation of both the dispatchers and EMT triage efforts is the ProQA© software and attendant quality control program. This provides the agency with the ability to compare priority assignments at dispatch with the actual acuity of the patient given the ability, after the call, for retrospective analysis. This program, or one similar in nature, is an essential component of any effort at reducing ALS call demand. The estimated costs of acquiring and implementing such a program exceeds \$110,000. There will also be additional on-going costs for maintenance of this software.

Given these assumptions the following table summarizes the potential savings and/or cost avoidance that the system may reasonably expect to attain through the implementation of a demand management program:

Adjustments to Demand based upon Projected Demand Management

	2005	2006	2007	2008	2009	2110
Calls/Pop	12,788	13,619	14,475	15,356	16,263	17,196
ALS Calls	5,883	6,265	6,659	7,064	7,481	7,910
BLS Calls	6,906	7,354	7,817	8,292	8,782	9,286
Adjusted for Screening	11,254	11,985	12,738	13,513	14,311	15,132
ALS Adjusted for Triage	5,177	5,513	5,860	6,216	6,583	6,961
BLS Adjusted for Triage	7,611	8,106	8,616	9,140	9,680	10,235

In the project team's opinion, full implementation of the Quality Assurance efforts required to receive maximum benefit of potential system savings cannot be implemented within this fiscal year. An application of these projections, however, on to the projected demand for services and needed resources through 2010 reveals that this

level of demand management will reduce the maximum number of needed transport resources within the system as described in the table below:

Cost Impacts of Demand Management Strategy

	Unadjusted Projection	Adjusted for Demand Management	Cost Avoidance
Peak Hour Units	8	7	\$ 556,139
Non-Peak Hour Units	5	4	\$ 556,139

As noted earlier in this report, the current resources are not sufficient to meet overall system demand during peak demand hours. It is projected that the level of call demand will generate the need for an additional peak hour unit by 2006. The above table represents the projected cost savings available given reasonable planning assumptions. These cost savings, especially in the context of the immediate system needs, provides an immediate full return-on-investment of the costs associated with the immediate implementation of a quality assurance program such as ProQA.

Recommendation: The City should work collaboratively with public health officials, the community hospital and physician groups to design and designate an alternative pathway to the healthcare system for those who utilize EMS in an inappropriate manner for such purposes.

Additionally, the City should acquire and implement a quality assurance audit program for its Priority Medical Dispatch functions to evaluate the efficacy of current and future protocols for telephone and field triaging of patients to the appropriate level of care. The one time cost of this is estimated to be \$110,000 plus any on-going maintenance costs. However, the potential cost-avoidance for the planning period resulting from this investment is estimated to be more than \$5 million.

5. ALTERNATIVE SYSTEM DESIGN AND DEPLOYMENT STRATEGIES

This section will outline and review several options for system re-design and/or re-deployment of existing resources. The goal of these models will be to minimize increases to the cost structure while maintaining or expanding levels of service. There will be several options presented. Each will include a brief description of the model and

the changes from the current system or deployment scheme. Additionally, advantages, disadvantages and known or projected cost impacts will be outlined.

(1) ALS Engine Company Based Service

The table, which follows, summarizes the staffing configuration and essential details of this model.

	Current	Model
City Paramedics	1). Assigned to Transport Units Medic 1, 2, 3, 4 and ALS Engine 56 and sometimes ALS Eng. 52. 2). 38 Total line Paramedics	1). 1-Paramedic assigned to each engine (24/7).
County Units (Medic 3 and 4)	1). Staffed with 2 Paramedics when possible.	1). Medic 3 and Medic 4 staffed with 2-paramedics
BLS Transport Units	1). Cross staffed units available at Stations 1, 2, 4, 5 and 6.	1). Dedicated BLS Units at Stations 1 and 2. Unit at Station 5 cross staffed but identified as primary ambulance in system. Other ambulances remain at other stations for reserve/mass casualty response.

In this model the existing paramedic workforce is re-deployed. Rather than staffing transport ambulances, paramedics are assigned to engine companies and ambulances are staffed with EMT's. The exception to this is Medic 3 and Medic 4 which would remain staffed with two paramedics. This would result in those units with the longer transport times and more difficulty in obtaining on-line medical control 2-paramedics during normal operations. For ALS level calls within the City, the engine-based paramedic then can accompany the patient into the hospital in an ambulance. This system model would provide the following advantages and disadvantages:

Advantages	Disadvantages
<ul style="list-style-type: none"> • Lower ALS response times with no addition to overall staffing levels • Provides for needed additional transport unit during peak hours • Provides sufficient capacity for peak overload times (i.e. backup ambulances) • Provides greater "depth" of ALS response. More simultaneous calls are able to receive ALS level of care. • Provides flexibility of response in every station (i.e. ambulance or engine based on call) • May extend engine and/or truck life depending on how responses are handled (i.e. ambulance or engine). • Provides large BLS capacity to meet system demands and preserve ALS resources in response-ready state. 	<ul style="list-style-type: none"> • Lowers system redundancy/depth for fire department's historical mission • Lack of redundancy/clinical quality control provided by 2 medics on every call. • Provides a higher-cost level of service to the lower call volume areas represented by the County (Medic 3 and Medic 4) thus providing a de facto subsidy to areas outside the City of Bellingham.

This model can be implemented utilizing the existing workforce. The table below summarizes the number of paramedics needed to staff the model described and the associated costs:

Description	Paramedics Needed
2 County Ambulances	4
6 Stations	6
3 City Ambulances	0
Medics/Shift	10
X 1.35 Leave Factor	13.4
X 3 Shifts	40.2
Cost Item	Marginal Cost
Paramedic Differential	\$6,789
Benefits Applied (X 1.21)	\$1,425.69
Medic Differential Unit Cost	\$8,215
Number of Additional Needed Medics	2.2
Total Marginal Cost	\$18,072

The existing system requires 38 paramedics. The analysis above indicates that this model can be staffed utilizing the existing paramedic staffing patterns found in the Bellingham Fire Department. Earlier analysis has already indicated the relative lack of risk posed by duplicate calls demonstrated by the systems relative lack of non-EMS call demand and extensive overlap of the existing station network.

With respect to call demand, the redeployment of resources requires an analysis of the specific, cumulative call demand in those areas where ambulances would be deployed. The following table summarizes the needed resources by hour based upon the more conservative “Slip Hour” resource analysis method:

Cumulative Resource Demand – Various Combined Station Areas

	Cumulative Demand Stations 1 and 5 by Hour		Cumulative Demand Stations 1 and 2 by Hour	
	Total Call Demand	Needed Units	Total Call Demand	Needed Units
0:00 to 00:59	0.2	0.35	0.2	0.46
1:00 to 1:59	0.2	0.36	0.2	0.43
2:00 to 2:59	0.2	0.31	0.2	0.38
3:00 to 3:59	0.1	0.24	0.2	0.33
4:00 to 4:59	0.1	0.26	0.2	0.35
5:00 to 5:59	0.2	0.28	0.2	0.39
6:00 to 6:59	0.1	0.32	0.2	0.42
7:00 to 7:59	0.2	0.44	0.3	0.50
8:00 to 8:59	0.3	0.58	0.3	0.65
9:00 to 9:59	0.4	0.69	0.5	0.80
10:00 to 10:59	0.4	0.79	0.5	0.89
11:00 to 11:59	0.5	0.80	0.5	0.91
12:00 to 12:59	0.4	0.76	0.4	0.85
13:00 to 13:59	0.4	0.77	0.5	0.85
14:00 to 14:59	0.5	0.77	0.5	0.85
15:00 to 15:59	0.3	0.69	0.4	0.80
16:00 to 16:59	0.4	0.75	0.4	0.84
17:00 to 17:59	0.5	0.81	0.5	0.88
18:00 to 18:59	0.4	0.75	0.5	0.86
19:00 to 19:59	0.4	0.74	0.5	0.86
20:00 to 20:59	0.4	0.73	0.5	0.83
21:00 to 21:59	0.4	0.64	0.4	0.71
22:00 to 22:59	0.3	0.54	0.3	0.61
23:00 to 23:59	0.3	0.36	0.3	0.41

This analysis indicates that the cumulative demand when the Station areas 2 and 5 are combined with Station 1’s area does not exceed a single unit in any given hour of the day. This combined with the high degree of overlap provided by these stations in geographic coverage allows the consideration of a system design that is alternative to the existing deployment configuration.

The high degree of overlap in the Station 1 area provides the opportunity to disperse both ALS and transport capacity to a greater extent throughout the city. Currently, ALS and transport resources are deployed at Station 1 and respond “outward” from that station to calls for service. Because of the overlap in both 4-minute and 8-minute responses provided by Stations 3 and 5, the opportunity exists to maintain, or even enhance, EMS service levels to Station 1’s first-due area by distributing ALS resources to engine companies and transportation elements to these other stations.

Additionally, this allows for an ALS assessment on almost every call and allows the system maximum flexibility in evaluating patients at an ALS level as well as billing for ALS level care when appropriate. The Fire Department might also need to acquire additional ambulances to augment the current fleet (some of the units that are in service as aid cars are truly reserve units that would be difficult to use full-time).

(2) Redeployment of Paramedic Resources to Engine Companies with Maintenance of 1 Paramedic on Each Needed City Ambulance

The project team understands that the transition from a “2-Medic” system to a “1-Medic” system is traditionally met with a degree of uncertainty and concern (i.e., two medics on an ambulance versus one medic on an ambulance). While this transition is becoming the norm in systems across the country, an alternative is presented that would provide for the advantages of dispersing the ALS capacity to engine companies while maintaining the ability of the system to deliver two paramedics to a patient’s side. The following table provides a summary of such a system model:

	Current	Model
City Paramedics	1). Assigned to Transport Units Medic 1, 2, 3, 4 and ALS Engine 56 sometimes ALS Engine 52 2). 41 Total Paramedics	1). 1-Paramedic assigned to each engine (24/7). 2). 1- Paramedic assigned to each of 3 transport units found within the City (Stations 1, 2 and 5)
County Units (Medic 3 and 4)	1). Staffed with 2 Paramedics when possible.	1). Medic 3 and Medic 4 staffed with 2-paramedics
BLS Transport Units	1). Cross staffed units available at Stations 1, 2, 4, 5 and 6.	1). Cross staffed units available at Stations 1, 4, and 6.

In this model, paramedics would be re-deployed to engine companies so that each station would have a minimum of one paramedic on duty 24-hours/day, 7-days a week. Additionally, the primary transport ambulances would have a single paramedic assigned to them as well. Thus, when an ALS response is received, the engine-based medic would “team-up” with the ambulance based medic to provide 2-paramedics at each patient.

This model would require additional paramedic staff and as such, does not meet the objective of reducing or maintaining system costs. The table below summarizes the number of paramedics needed to staff the model described and the associated costs:

Description	Paramedics Needed
2 County Ambulances	4
6 Engines	6
3 City Ambulances	3
Medics/Shift	13
X 1.35 Leave Factor	17.42
X 3 Shifts	52.26
Cost Item	Marginal Cost
Paramedic Differential	\$6,789
Benefits Applied (X 1.21)	\$1,425.69
Medic Differential Unit Cost	\$8,215
Number of Additional Needed Medics	15
Total Marginal Cost	\$123,219

As discussed above, the existing system utilizes 38 medics. The model described above would require approximately 53 paramedics in the Department, requiring 15 more to be trained and certified from among existing staff. The sole advantage of this model over the preceding analysis is the ability to deliver dual paramedics to the patient's side as part of the normal, planned response patterns. There is no clinical data or literature that supports the alleged advantages of a dual medic system, and many systems throughout the country that have not moved to a single medic system are considering some form of single medic system adoption.

This analysis indicates an increased cost of approximately \$123,219 per year. While no new positions would be required, it would necessitate the certification of an additional 15 paramedics from within the existing workforce.

Recommendation: The City should immediately move to a deployment model that distributes paramedic personnel and resources as described in the first model above. This places personnel in each of the City's stations, enhancing the rapidity of ALS intervention. This will provide the number of transport resources necessary to meet current demand. There are service improvements associated with this change without additional costs.

6. THE FIRE AND EMS RESPONSE SYSTEM IS DESIGNED TO PROVIDE EFFECTIVE COVERAGE THROUGHOUT THE CITY OF BELLINGHAM.

This section is focused on a comprehensive analysis of the current service delivery network made up of the six fire stations located throughout the City of Bellingham. The project team evaluated the system with a state of the art geographic information system (GIS). The approach that has been utilized is as follows:

- Identify appropriate response-time standards against which to evaluate the system.
- Develop a model which includes:
 - The existing fire station locations.

- Known locations of calls for service (by type).
- Staffing by station and unit type.
- Travel speeds, direction of travel, response impediments, etc.
- Assess the current system and the impact of various alternatives using the model (my moving or removing stations from the system for example).

The sub-section, which follows, describes the various standards against which the project team evaluated the model.

(1) The Project Team Used Both NFPA 1710 and Guidance from CFAI to Develop Assumptions Regarding Appropriate Performance Targets for the Fire Department.

The project team examined the Fire Department's response network using two primary sources: the National Fire Protection Association's recommended standard 1710 "Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments (2001 Edition)." and guidance from the Commission on Fire Accreditation International and the comparative information derived from agencies around the northwest. It is important to take a moment to describe these two sources of performance standard guidance.

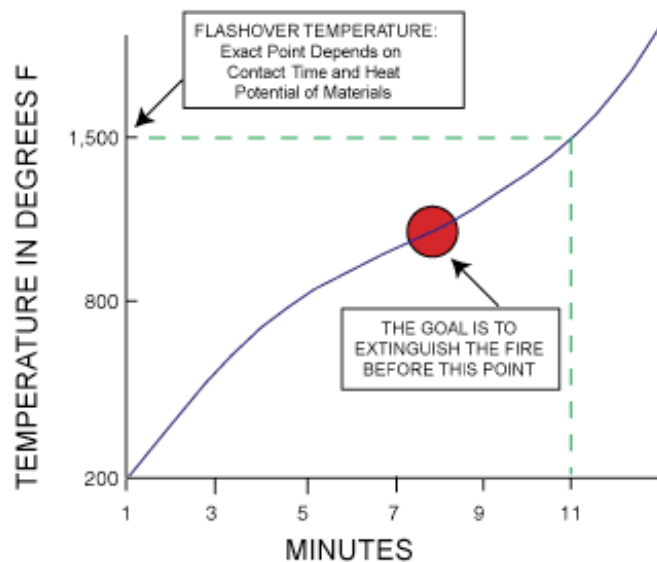
(1.1) The National Standards for Fire and EMS Service Delivery Are Based on Research Into Fire Behavior and Cardiac Survival.

The standards promoted for fire rescue and EMS have their basis in research that has been conducted into two critical issues:

- What is the critical point in a fire's "life" for gaining control of the blaze?
- What is the impact of the passage of time on survivability for victims of cardiac arrest?

The exhibit, that follows, shows the typical “flashover” curve for interior structure fires. The point of “flashover” is critical because it defines when all of the contents of a room become involved in the fire. This is also the point at which a fire changes from “room and contents” to a structure fire – involving a wider area of the building.

Generalized Flashover Curve



Note that this graphic depicts a fire from the moment of inception – not from the moment that a fire is detected or reported. This demonstrates the criticality of early detection and fast reporting and dispatch of responding units. This also shows the critical need for a rapid (and sufficiently staffed) initial response – by quickly initiating the attack on a fire, “flashover” can be averted. The points, below, describe the major changes that occur at a fire when “flashover” occurs:

- It is the end of time for effective search and rescue in a room involved in the fire. It means that likely death of any person trapped in the room – either civilian or firefighter.
- After this point in a fire is reached, portable extinguishers can no longer have a successful impact on controlling the blaze. Only hand-lines will have enough water supply to affect a fire after this point.

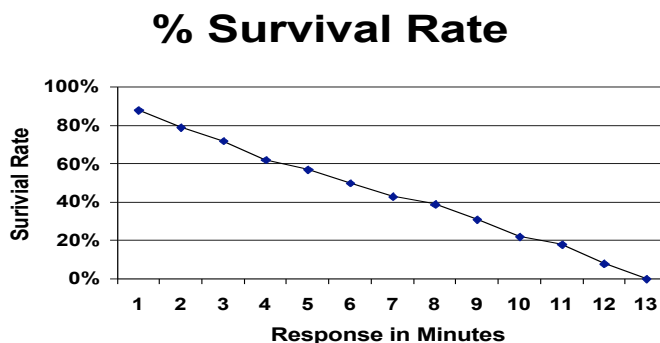
- The fire has reached the end of the “growth” phase and has entered the fully developed phase. During this phase, every combustible object is subject to the full impact of the fire.
- This also signals the changeover from “contents” to “structure” fire. This is also the beginning of collapse danger for the structure. Structural collapse begins to become a major risk at this point and reaches the highest point during the decay stage of the fire (after the fire has been extinguished).

It should be noted that not every fire will reach flashover – and that not every fire will “wait” for the 8-minute mark to reach flashover. A quickly responding fire crew can do things to prevent or delay the occurrence of flashover. These options include:

- Application of portable extinguisher or other “fast attack” methodology.
- Venting the room to allow hot gases to escape before they can cause the ignition of other materials in the room.
- Not venting a room – under some circumstances this will actually stifle a fire and prevent flashover from occurring.

Each of these techniques requires the rapid response of an engine company that can safely initiate these actions. Under most circumstances, this requires at least three firefighters on-scene. However, many agencies wait to have at least two firefighters outside the structure to back up a two-person interior attack team.

The second issue to consider is the delivery of cardiac and other emergency medical first response. The exhibit, below, demonstrates the survivability of cardiac patients as a timeline:



This graph shows the results of extensive studies of the survivability of patients suffering from cardiac arrest. This is the most-often studied issue due to the ease of evaluating the outcome (a patient either survives or does not) from a cardiac arrest. This research results in the recommended standard of provision of basic life support within four minutes of notification and the provision of advanced life support within 8 minutes of notification. The goal is to provide BLS within 8 minutes of the onset of the incident (including detection, dispatch and travel time) and ALS within 12 minutes. Further descriptions of practical research into these issues are summarized in the section that follows.

(1.2) The National Association of Fire Protection Association 1710.

The topic of “appropriate” deployment and response to fires and other emergencies has been on the forefront of consideration in the fire service and among policy makers and municipal managers for the past several years. The intense focus has resulted from the development and promulgation of a document called NFPA 1710 (for short – the full title is: “Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments (2001 Edition).”

What NFPA 1710 Is:

- A recommended standard of service for fire, EMS and other fire department activities.
- A tool for local policy makers to use when evaluating their own service delivery network.
- A standard that should be considered against the current response capabilities of the local fire / rescue / EMS service.

What NFPA 1710 Is Not:

- A law, a regulation or a requirement for cities and other municipalities to follow.
- Something that needs to be fully implemented immediately.

What NFPA 1710 Recommends:

- Dispatch handling times equal to one (1) minute or less.
- En route times (reaction times) equal to one (1) minute or less.
- Travel times for the initial arriving unit (or for the delivery of BLS level care in an EMS system) of four (4) minutes or less.
- Travel times for a full structure fire response (defined below) or for an ALS response (also defined below) in eight (8) minutes or less.
- The standard for fire can also be met if four (4) firefighters are on-scene in four (4) minutes or less.
- An ALS response is defined in the standard as at least four people, at least two (2) of whom should be paramedics and two (2) of whom are at the EMT–basic level.
- An initial full structure fire response is defined as a total of 13 (up to 15) people:
 - One (1) incident commander (plus one (1) assistant).
 - One (1) supply line.
 - Two (2) attack lines of two (2) people plus one (1) support person (for a total of six people).
 - One (1) search and rescue team of at least two (2) people.

- One (1) ventilation team of at least two (2) people.
- One rapid intervention team (RIC) comprised of at least two (2) people. This team can be formed from other staff on scene until a dedicated RIC arrives. This would reduce the staffing required on the first response to 13 people.
- If in use, one (1) aerial operator should be assigned to maintain control of the aerial unit.
- Goal should be to achieve these response times and staffing levels at a minimum of 90% of applicable calls for service.
- Engine / aerial company staffing should be a minimum of four (4) people:
 - NFPA 1710 recognizes explicitly that there are many ways to achieve this.
 - Standard does not require that four (4) people arrive on the scene in the same unit.
 - Could use, for example, a department with many two-person units that provide this level of coverage (i.e., all calls receive two units minimum).

The project team's approach to this analysis using the GIS model enables us to consider the various elements of these standards. Specifically, the model was programmed to determine the areas in which the network could travel in four and eight minutes. Once these calculations were performed, the model was then able to determine the number of calls that could be reached in these time periods.

(1.3) The Commission on Fire Accreditation International (CFAI)

The major weakness attributed to NFPA 1710 is that it lacks any flexibility with regards to the size and type of community providing fire protection. The approach taken by the Commission on Fire Accreditation International is to more closely tie local risk, tolerance for risk and local resources to the development of the system. In so doing, the CFAI encourages the local agency to develop their own understanding of the risks

which they face and to develop (locally) appropriate responses to those potential events. The comparative survey information (in Chapter 3) allows the project team to draw the following conclusions about the local approaches to delivering fire and EMS services in the Pacific Northwest (in communities that are comparable to Bellingham on a range of demographic factors):

- Most are career departments though some make use of volunteers in a range of capacities.
- Every agency surveyed sets a minimum staffing for fire apparatus of three firefighters and assigns two personnel to their medic units.
- Response protocols in each of the systems surveyed mirror (for the most part) those used by the BFD:
 - Single medic response to BLS calls.
 - Medic and Engine to ALS calls.
 - Single engine to Fire Alarm calls.
 - The largest variation comes in the residential and commercial structure fire responses. In these cases the departments surveyed are typically sending 3 or 4 engines, a medic and a Chief officer, resulting in between 12 and 15 responders (in two cases the responses include five engines but these are much larger systems). In all cases, it appears that the initial responses are designed to provide a fairly large initial response while still holding back one or two engines (or more) for a next call.

These findings suggest that the Bellingham Fire Department's current approaches to calls (exactly the same as the EMS and Alarm calls and similar for Fire) are in keeping with reasonable responses to the risk involved. It should be noted that the goals of the BFD in terms of its initial responses (5 fire units, a medic and a Chief officer) would result in an 18-person first response – well in keeping with the NFPA 1710 goals.

(2) The Model Was Tested Against Itself to Ensure That it Is Accurately Predicting Travel Times from the Current Network.

The Matrix Consulting Group and Applied GIS developed the GIS model by taking the following specific steps:

- The GIS data files describing municipal boundaries, streets, addresses and other geographic features of the City of Bellingham were obtained directly from the City Planning Department.
- The project team then placed each of the fire stations into the street network.
- Next, the project team obtain a data set from the Fire Department that described the location of the calls for service. These were then geo-coded into the model. Each call type is represented by a different color (red = Fire, green = EMS and blue = "Other").
- Once the calls are located in the GIS mapping environment the model then projects the travel time capability of each station.
- In addition to their geographic location the calls for service have an "attribute" of response time which was then tested against the predictions made by the model.

The model was then used to develop a series of analyses, each of which is discussed in a sub-section, below. The analyses developed by the project team include the following:

- The percentage of calls that can be reached (by type) in four minutes and eight minutes from the current response system.

- The impact of stations being out of the network (for whatever reason) including a series in which Station 1 is not available. This analysis shows the impact, for example, of units being unavailable because they are already responding to a call. This enables the flexibility and overlap of the system to be better understood.
- The overlap counted by the number of stations.
- Analysis of the overlap as counted by the number of personnel (the model is able to assign the “attribute” of unit staffing to each station as well).

The sub-sections, which follow, provide the project team's analyses in each of these areas. The maps related to each of these analyses can be found at the end of this chapter.

(3) The Current Service Delivery System Provides for an Effective Coverage Network for Both EMS and Fire Service Response.

Prior to making use of the analytical model, the project team first evaluated current response time performance against the two primary measures discussed previously. The table, below, shows the findings of the project team:

Target	Initial Response First Unit: Less than 4 Minutes	Initial Structure Fire Response: Less than 8 Minutes
Actual Performance 2003	92.3%	96.5%

This shows that the large majority of the handled by the Fire Department were met in both of the targeted time frames and exceed the 90% compliance target in both. It is important to note that this performance includes calls outside the City – suggesting that performance inside the City is even higher than indicated above.

The first analyses by the project team focused on assessing the current service delivery's systems ability to respond at least a single unit in the four minute and eight minute time frames. These specific time frames have been selected based on the factors discusses previously in this section. The results from the model are shown in

terms of the ability to respond to fire, EMS and “other” types of calls. The table, which follows, provides a summary of the current system capability in terms of achieving both standards:

Call Type	Fire	EMS	Other	Total
4-Minute	95.8%	96.7%	100.0%	96.5%
8-Minute	99.9%	99.8%	100.0%	99.9%

This analysis shows that the current service delivery system is able to provide at least one unit to more than 95% of all calls in four minutes or less, Citywide. The maps that show this analysis can be found at the end of this chapter. These data show that the system has been very effectively structured to provide services at both of these nationally recognized service levels.

(4) The Service Delivery Network Provides Effective Cross-Protection.

The next level of analysis focuses on the ability of the system to provide overlapping coverage. This is a critical component of effective system design. With overlapping coverage, multiple calls for service can be handled more effectively. In a system with no overlap, the Fire Department’s ability to respond to concurrent calls and to respond effectively to more demand incidents (e.g., structure fire calls) can be limited or non-existent. The table, which follows, provides a summary of the overlapping coverage capability under the four-minute response time performance standard:

	Fire	EMS	Other	All
0 Stations (No Coverage)	62 (4%)	185 (3%)	10 (3%)	257 (4%)
1 Station (No Overlap)	381 (26%)	1,337 (24%)	131 (35%)	1,849 (25%)
2 Stations of Overlap	717 (48%)	2,704 (49%)	164 (43%)	3,585 (48%)
3 Stations of Overlap	251 (17%)	921 (17%)	46 (12%)	1,218 (16%)
4 Stations of Overlap	38 (3%)	255 (5%)	13 (3%)	306 (4%)
5 Stations of Overlap	40 (3%)	146 (3%)	14 (4%)	200 (3%)
Total Counts	1,489	5,548	378	7,415

Note that more than 70% of calls for service are within an area that offers at least some overlap of two or more stations. This is a very high level of overlap at the four

minute response time standard. The following table provides the results of the same analysis when applied to the eight-minute response time standard:

	Fire	EMS	Other	All
0 Stations (No Coverage)	2 (0%)	9 (0%)	0 (0%)	11 (less than 1 %)
1 Station (No Overlap)	0 (0%)	1 (0%)	0 (0%)	1 (less than 1%)
2 Stations of Overlap	43 (3%)	110 (2%)	72 (2%)	160 (2%)
3 Stations of Overlap	24 (2%)	44 (1%)	5 (1%)	73 (1%)
4 Stations of Overlap	118 (8%)	415 (7%)	32 (8%)	565 (8%)
5 Stations of Overlap	172 (12%)	989 (18%)	35 (9%)	1,196 (16%)
6 Stations of Overlap	1,130 (76%)	3,980 (72%)	299 (79%)	5,409 (73%)
Total Counts	1,489	5,548	378	7,415

These analyses indicate that the system provides 100% overlap by two or more stations within the eight-minute response time standard. In addition, the system is able to provide 90% overlap to all call types and in aggregate by five or more stations. This is an extremely high level of overlap and indicates that the Department is benefiting from good planning in terms of fire station location as well as a road network and development which has limited the dispersal of population and commercial development.

(5) The Station Network Does Have Three Stations Which Could Be Individually Removed With Little Impact on the System.

The next analyses performed by the project team was to assess the criticality of any single station on the system. The purpose of this analysis is two-fold:

- To assess the flexibility and capacity of the response network to provide service when stations are out of service responding to a call. To ensure our under
- To determine if there are stations which could be removed from the network to improve the efficiency of the response system (i.e., closing a station).

As before, the project team completed these analyses under two different scenarios. These include the four-minute and eight-minute response time standards previously discussed. The maps for each of these analyses can be viewed at the end of the Chapter. The level of overlap is shown using different colors which are detailed in

the map key. The results under the four-minute response time standard are presented, below:

	Fire	EMS	Other	All
No Station 1	1,423 (96%)	5,357 (97%)	368 (97%)	7,148 (96%)
No Station 2	1,201 (81%)	4,741 (85%)	292 (77%)	6,234 (84%)
No Station 3	1,415 (95%)	5,309 (96%)	364 (96%)	7,088 (96%)
No Station 4	1,322 (89%)	4,897 (88%)	325 (86%)	6,544 (88%)
No Station 5	1,407 (94%)	5,197 (94%)	362 (96%)	6,966 (94%)
No Station 6	1,413 (95%)	5,340 (96%)	366 (97%)	7,119 (96%)
No Station 1 & 2	1,197 (80%)	4,735 (85%)	292 (77%)	6,224 (84%)
No Station 1 & 3	1,204 (81%)	4,587 (83%)	302 (80%)	6,093 (82%)
No Station 1 & 4	1,318 (89%)	4,891 (88%)	325 (86%)	6,534 (88%)
No Station 1 & 5	1,336 (90%)	4,892 (88%)	353 (93%)	6,581 (89%)
No Station 1 & 6	1,409 (95%)	5,334 (96%)	366 (97%)	7,109 (96%)

The numbers in parentheses show the percentage of calls in that type that can be responded to within the four-minute response time standard. The results from the analyses, shown above, indicate that there are several stations which could be eliminated (singly) from the network with little impact at the four-minute time standard. These include Station 1, Station 5 and Station 6. While Station 3 could be taken from the system, its proximity to the University make it a critical location in its own right.

The next analyses by the project team considered the impact under the eight-minute response time standard. The impacts under this scenario are much less significant due to the substantial overlap that exists in the station network:

	Fire	EMS	Other	All
No Station 1	1,489 (100%)	5,547 (100%)	378 (100%)	7,414 (100%)
No Station 2	1,488 (100%)	5,543 (100%)	378 (100%)	7,409 (100%)
No Station 3	1,489 (100%)	5,544 (100%)	378 (100%)	7,411 (100%)
No Station 4	1,488 (100%)	5,545 (100%)	378 (100%)	7,411 (100%)
No Station 5	1,489 (100%)	5,547 (100%)	378 (100%)	7,414 (100%)
No Station 6	1,489 (100%)	5,547 (100%)	378 (100%)	7,414 (100%)
No Station 1 & 2	1,488 (100%)	5,543 (100%)	378 (100%)	7,409 (100%)
No Station 1 & 3	1,489 (100%)	5,544 (100%)	378 (100%)	7,411 (100%)
No Station 1 & 4	1,488 (100%)	5,545 (100%)	378 (100%)	7,411 (100%)
No Station 1 & 5	1,489 (100%)	5,547 (100%)	378 (100%)	7,414 (100%)
No Station 1 & 6	1,489 (100%)	5,547 (100%)	378 (100%)	7,414 (100%)

These analyses underscore the capability of the current response network to provide a redundant and high-level of service even when multiple stations are engaged or otherwise removed from the system.

(6) The Fire Department Can Utilize a Number of Staffing Alternatives for Delivering EMS and Fire Services in the City (and Region).

This section examines the alternatives that exist for the Fire Department in terms of overall staffing. The project team examined the following approaches:

- **Current:** Current deployment of personnel.
- **Alternative 1:** A “squad” approaches which would assign “2+2” staffing to all stations. In this configuration, the units would respond together to fire and ALS calls but could operate independently to less serious events. Units could also be combined from several stations to meet incident staffing needs. Station 1 has 5 responders due to the Battalion Chief on-duty there.
- **Alternative 2:** Another “squad” approach with an extra person assigned to Station 3 due to the presence of the aerial at that location.
- **Alternative 3:** Another “squad” approach with an extra 2-person unit assigned to staff a second medic unit from Station 1. However, in this example, Station 5 has been closed.
- **Alternative 4:** Same as Alternative 3 but an extra firefighter has been added to Station 3 due to the presence of the aerial.
- **Alternative 5:** Same as Alternative 3 but instead of closing Station 5, the model has been run with Station 6 closed.
- **Alternative 6:** Same as Alternative 4 but instead of closing Station 5, the model has been run with Station 6 closed.

Minimum Staffing by Alternative

Station	Current	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
1	8	5	5	7	7	7	7
2	3	4	4	4	4	4	4
3	6	4	5	4	5	4	5
4	3	4	4	4	4	4	4
5	3	4	4	0	0	4	4
6	3	4	4	4	4	0	0
Total	26	25	26	23	24	23	24

Note that all of these alternatives would allow the Department to run with a minimum staffing that is below the current level for in-City stations. In all alternatives the project team assumes that the ladder companies would be cross-staffed from both stations. In order to test these options, the project team ran the GIS model assigning varying levels of staffing to each station per the table, above. The model depicts the resulting coverage areas (i.e., how many people can reach each area of the City) using different colors, each of which depicts a different level of “overlap.” The results from the analyses under the four-minute standard are shown, in the tables, which follow. The left-hand column indicates the number of personnel who can arrive on-scene:

**Distribution of Personnel Arriving On-Scene
Four Minutes or Less
Under Current Deployment and Alternatives 1 - 6**

# FF	Cur	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
0	0%	0%	0%	3%	3%	1%	1%
1-3	25%	0%	0%	0%	0%	0%	0%
4-7	16%	26%	26%	43%	43%	40%	40%
8-11	22%	50%	50%	37%	37%	44%	44%
12-15	23%	17%	17%	15%	15%	12%	12%
16-19	9%	4%	4%	3%	3%	4%	4%
20+	6%	3%	3%	0%	0%	0%	0%

The City of Bellingham and the national standards supported by the NFPA, American Heart Association and others recommend that at least four people arrive on-scene for ALS level EMS care or to be the initial response to a fire. The matrix, above, shows that all of the alternatives provide a higher level of service in four minutes or less than the current approach in which 25% of calls receive three or fewer responders initially. This is strong evidence in support of the idea of shifting to a “squad” concept (2+2) from the current 3-person engine / aerial staffing approach.

The next table, below, provides a similar summary for the eight-minute response time performance standard:

**Distribution of Personnel Arriving On-Scene
Eight Minutes or Less
Under Current Deployment and Alternatives 1 - 6**

# FF	Cur	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
0	0%	0%	0%	0%	0%	0%	0%
1-3	0%	0%	0%	0%	0%	0%	0%
4-7	0%	0%	0%	0%	0%	0%	0%
8-11	2%	2%	2%	2%	2%	2%	2%
12-15	1%	1%	1%	1%	1%	6%	1%
16-19	0%	8%	8%	23%	0%	18%	5%
20+	97%	89%	89%	74%	97%	73%	91%

This analysis shows that there are less-obvious changes when it comes to the eight minute response time. This is another demonstration of the compact service area and the well-designed response system. Even when stations are removed from the response network (Alternatives 3 – 6) the system can provide 16 or more responders in eight minutes or less more than 96% of the time. This is an exceptional level of service that can support numerous ALS – EMS calls for service or a structure fire response.

The project team believes that a shift to a “squad” approach would provide significant benefits to the community because it so significantly enhances the ability to deliver four or more responders in such a short period of time to 100% of calls for service. This approach could be implemented in conjunction with the recommendation made previously to enhance service delivery by assigning a medic to every engine company. This analysis also suggests that the network could easily support a transport capable unit in every station and still retain significant flexibility in terms of handling concurrent and multiple calls for service.

Recommendation: Move to implement the “squad” approach to deployment. In the near term, this should include Alternative 2 in which Station 3 is staffed with a

third firefighter due to the assignment of the aerial in that location. If budgetary constraints arise, the Department can begin to implement other Alternatives which would enable them to reduce minimum staffing and thereby make position reductions as well. There are no new costs associated with the ability to achieve a significant service level enhancement of delivering four or more persons to 100% of calls in the City within 4 minutes or less.

6. ANALYSIS OF PERSONNEL POLICIES

This chapter focuses on an analysis of personnel policies such as the scheduling of personnel, contractual issues and utilization of line personnel. The chapter is organized into several sections. The first section, which follows, examines the specific issue of assigning Battalion Chiefs on a separate schedule from the fire / EMS platoons.

1. BATTALION CHIEFS SHOULD BE PLACED ON THE SAME SCHEDULE AS OTHER LINE PERSONNEL. ONE BATTALION CHIEF POSITION SHOULD BE ELIMINATED.

Currently, Battalion Chiefs work a one-on, two-off, one-on, four-off 24-hour schedule while the platoons that they supervise work a one-on two-off 24-hour schedule. This has several significant impacts on the operations of the Fire Department:

- Battalion Chiefs will see the same platoon once every 12 days (every 3rd time they work). This has been promoted as a way to ensure consistency across the shifts and as a way to eliminate the issue of three “mini-Departments” that each have their own way of providing service.
- Due to the contractual obligations, the Battalion Chiefs owe the Department four hours of administrative time each week. This is paid back during normal business hours as each Battalion Chief has a range of ancillary duties which require they interact with other departments (e.g., vehicle maintenance, radios).

The project team evaluates the advantages and disadvantages of this approach and the alternative of having one Battalion Chief per platoon in the table, which follows:

	Four Battalion Chiefs	Three Battalion Chiefs
Advantages	<ul style="list-style-type: none"> • May encourage more consistency across the line shifts. • Give back of administrative time (16 hours / week). 	<ul style="list-style-type: none"> • Encourages accountability for each platoon. • Chief and Assistant Chief know who to turn to for issues on a particular shift. • More cost-effective approach (50 hour average work week rather than 42 hour; reduction of one position).
Disadvantages	<ul style="list-style-type: none"> • Consistency exists due to efforts of command staff and support services personnel. For example, training is developed centrally and is applied by company officers. • Costly compared to the alternative. This approach is more expensive due to shorted average work week as well as due to extra position costs. • The administrative hours are difficult to track and to manage. Difficult to hold BC's accountable for their use. 	<ul style="list-style-type: none"> • Loss of a Battalion Chief as a member of the command staff – one fewer person with whom to share the administrative duties assigned at this level. • Loss of the administrative hours in the current schedule. • This will have to be bargained – this schedule is in the contract. • BC's will want additional compensation for working additional hours.

The project team does not believe that the consistency across shifts is due to this approach to scheduling Battalion Chiefs. In fact, the Matrix Consulting Group believes that these benefits have been derived from the work of the support functions such as the Training Division. The fiscal impact is estimated in the table, below:

Number of BC's Required Current System	4
Number of BC's Required Under Alternative	3
Difference	1
Cost of BC Position (Salary and Benefits) (\$77,638 + \$7,764 + 23% Benefits Rate)	(\$105,000)
Hourly Cost @ 42 Hour's (Salary Only)	\$35.55
Cost of BC Position (Salary and Benefits) @ 50 Hours (\$35.55 x 50 x 52) + \$7,764 x 23%	\$123,000
Difference From Current for 3 BC's (\$18,000 x3)	\$54,000
Estimated Direct Savings	\$51,000

This analysis has shown that the Fire Department can improve accountability and supervision of the three shifts while 1) maintaining the consistency of service across the three platoons and 2) generating recurring savings of more than \$50,000 annually.

Recommendation: The Fire Department and the City should move to reduce shift Battalion Chief staffing from four to three. This should be accomplished by moving them to the same 50-hour workweek as the line operations. This will have to be negotiated as the current 42-hour workweek is in the contract. The estimated annual savings from this recommendation are \$51,000.

2. ANALYSIS OF SHIFT TIME MANAGEMENT AND STAFF UTILIZATION SHOWS THAT THE FIRE DEPARTMENT IS EXCEEDING BEST PRACTICES.

The Bellingham Fire Department has adopted a number of best management practices for managing the utilization of their line personnel and for ensuring that the Department provides a high level of service. These steps include the following:

- Line companies are involved in providing annual inspections of commercial and multi-family occupancies.
- Line companies are responsible for checking the hydrants in their areas.
- Companies are involved in training that is established and monitored centrally.

In addition, line personnel are involved in the provision of emergency services each day. The project team documented the level of these activities for each person or company. It is common to target 80% utilization of a 10-hour work day for personnel assigned to fire and EMS operations (it is unreasonable to expect personnel to work for their entire 24-hour shift on a regular basis). These data are summarized, below:

	Average / Day
Hours of Emergency Response	6.5
Hours of Training	1
Hours of Inspections	0.5
Hours of Pre-Planning	0.5
Maintenance of Equipment	1
Total	9.5
Target Utilization Hours (10 / day)	10
Level of Utilization	95%

This summary analysis shows that the Fire Department has developed a comprehensive approach to maximizing utilization of personnel assigned to fire and EMS line responsibilities. It should be noted that those persons assigned to the medic units are likely working more than 6.5 hours per day on medic responses. Conversely, those personnel assigned to the fire apparatus are working more hours per day than shown on company inspections. Finally, the project team notes the innovative peer-based approach to review and tracking of workload. The Department has placed training and inspection assignments on their intranet, allowing all personnel to check on their own progress as well as that of their peers. This appears to be an excellent method for ensuring compliance with the Department's objectives.

Recommendation: Continue with the current programs which maximize the utilization of line personnel. Consider opportunities to improve pre-fire planning as part of the company inspection efforts already on-going.

3. THE FIRE DEPARTMENT CAREFULLY MANAGES SCHEDULES AND LEAVE TO MINIMIZE OVERTIME.

The project team reviewed current personnel practices as they apply to the management of the schedule and leave in the various line functions. The exhibit, which follows, provides a summary of our findings:

Issue	Discussion
Schedules: FLSA	<ul style="list-style-type: none">• Suppression staff work a 24-hour shift based 50-hour average work week. This is computed properly using “Kelly” days within an FLSA approved cycle of 27 days with a “Kelly” day granted every 7th shift.• Communications staff work a 12-hour shift based 42-hour work week. This is derived by having the “work week” start mid-shift. This is an allowed practice under the FLSA (as long as the start time is maintained consistently). Staff are paid two hours of overtime each week under this schedule.• Paramedics work a 46.5 hour work week, also scheduled in accordance with the requirements of the FLSA.
Management of Leave	<ul style="list-style-type: none">• The Fire Department carefully tracks and manages the use of leave, “Kelly” days and other factors that influence minimum staffing.• A review of the use of leave shows that the Department is effectively managing vacation and “Kelly” days to effectively minimize overtime.

The project team’s review of the contract indicates that the provisions relating to overtime payment for callback and other such factors are in line with common practice among fire departments nationwide.

4. STAFFING REQUIREMENTS FOR MINIMUM STAFFING LEVELS ARE APPROPRIATE.

The final section in this chapter presents an analysis of the number of personnel required to achieve targeted minimum staffing levels. Previously, the project team has identified several potential minimum staffing levels given various alternative deployments or service levels. This section provides a methodology for determining the number of personnel required to meet line staffing goals.

Based on BFD daily rosters for the first week of each month in 2003, the project team estimated the number of personnel that worked some number of overtime, who worked out of assignment, as well as the number of personnel who were on sick (e.g., family leave, etc.), on vacation, training, on a Kelly day (e.g., “K”, “EK”, etc.), on a

pension day (relating to disability benefits), and bereavement. The table below shows the overall number of staff that were in each of these categories.

	1st Week / Month 2003														
	1	2	3	4	5	6	7	8	9	10	11	12	Avg. / Week	Est. / Year	Est. / Day
Overtime	6	13	12	4	1	9	4	5	12	14	4	10	9.4	488.8	1.3
Out of Class	21	20	23	27	24	22	22	28	32	10	17	20	26.6	1383.2	3.8
Sick	12	11	11	12	6	11	23	26	23	12	12	3	16.2	842.4	2.3
Vacation	6	9	18	11	13	10	3	2	7	7	9	14	10.9	566.8	1.6
Kelly	40	30	31	37	30	38	31	39	28	40	37	42	42.3	2199.6	6.0
Bereavement	1	0	1	0	0	0	0	0	0	0	0	0	0.2	10.4	0.03
Pension	0	1	1	1	4	2	3	4	4	0	0	0	2	104	0.28
Training	0	0	0	0	0	0	0	0	3	0	0	0	0.3	15.6	0.04

The following points summarize the information above.

- There was an estimated 9.4 personnel that worked any number of overtime hours per week.
- Based on the daily roster assignment, 26.6 personnel worked out of their classification per week (i.e., personnel assigned to D56, but worked C56 for that day).
- In any given week in 2003, there was an estimated 16.2 individuals out sick, 10.9 individuals on vacation, and over 42 personnel on a Kelly day.

Further, based on the information above, on any given day there is roughly one staff person working overtime, nearly four working out of class, two calling in sick, between one and two on vacation, and six personnel on a Kelly day. Further, there is a minimal number of personnel on bereavement, pension, or training day – based on the daily rosters. This is an average of 10.25 people off on leave per day.

The BFD has a minimum staffing of 30 personnel on-duty every 24 hours. Each shift starts with approximately 42 people assigned (turnover will impact this number). This allows up to 12 people to be off before the shift begins to drop below minimum staffing (as evidence by the low levels of overtime this rarely occurs – a ‘best management practice’ target is between 5% and 7% of total wages). If we apply this

factor in reverse, we can show what the staffing level requirements would be for varying levels of minimum staffing (these do not take into account rank):

1-Shift Minimum Staffing	30	29	28	27
3-Shift Minimum Staffing	90	87	84	81
Shift Factor (31.75/42)	0.7143	0.7143	0.7143	0.7143
Total Required 1-Shift	42	40.6	39.2	37.8
Total Required 3-Shifts	126	123	117	114

Note that the “Total Required” has been adjusted to account for the need to have an even number of personnel assigned to each shift. This shows that if the Department were to shift from its current deployment approach to one of the alternative “squad”.

7. ANALYSIS OF FIRE PREVENTION SERVICES

This chapter focuses on the delivery of Life Safety (fire prevention and education) services by the Fire Department. The Department has a unit of three professional staff and one support position dedicated to providing and coordinating these services. The unit is responsible for the following activities:

- Plan review.
- New construction and other technical inspections (fire suppression systems, hood systems).
- Public education programming.
- Technical or more complicated “Company” inspections which are targeted for an annual basis.

The following sections provide the analysis of workload and other factors which impact the staffing requirements and management of the unit.

1. ANALYSIS OF CURRENT WORKLOAD AND STAFFING LEVELS SHOWS THAT STAFFING LEVELS IN THE LIFE SAFETY DIVISION EXCEED WORKLOAD REQUIREMENTS.

The staff assigned to prevention duties in the Fire Department have a range of functions for which they are responsible. The assignments are broken down between the three professional staff members, as follows:

Position	Area of Responsibility
Senior Fire Inspector	Site and building plan reviews
Fire Inspector	New Construction and follow-up to “company” inspections.
FF / Fire Inspector	“Company” inspections and public education.
Secretary	Provides administrative support to the unit.

In an effort to understand the workload handled by the members of the unit, the project team worked with the unit and with Building Services to obtain data regarding inspections and plan reviews. These data are summarized in the following sections.

The following table shows the number and type of plan reviews for new construction conducted by the BFD Life Safety Division, as well as their associated task times.

Type of Permit	# of Reviews (2003)	Estimated Hours per Review	Estimated Annual Hours
Fire Protection	145	1.0	145
Building	349	2.0	698
Electrical	20	1.0	20
Mechanical	14	1.0	14
Demolition	1	1.0	1
Fire Alarm	1	1.0	1
Sign	2	0.5	1
		TOTAL	880

Based on the number of plan reviews conducted, and the estimated time (per BFD staff) for each type of permit, the BFD Life Safety Division staff utilizes 880 hours annually to conduct plan review of the types of plans for which they are responsible.

The following table shows the total number of inspections scheduled/completed for the entire month of March 2004. The table shows the date of the completion, the type of inspection, as well as the hours scheduled/required to complete.

Date	Inspection	Hours	Date	Inspection	Hours
3/2/04	NA	0.5	3/17/04	AG Hydro	1
3/3/04	UG Hydro	0.75	3/18/04	UG tank	1

Date	Inspection	Hours	Date	Inspection	Hours
3/3/04	Final sprinkler acct	0.75	3/22/04	UG tank	1
3/3/04	Final	2.25	3/23/04	NA	1.5
3/4/04	Fire Alarm	1	3/26/04	TI AG hydro	1
3/4/04	Home Road Key box	0.75	3/26/04	NA	1.5
3/8/04	Extinguisher Location	1	3/29/04	Hood acct	1.5
3/9/04	Hood acct	1.5	3/29/04	NA	1.5
3/16/04	Fire alarm acct	1.5	3/30/04	Fire alarm acct	1.5
3/16/04	NA	0.5	3/31/04	AG Hydro	1
				Total Hrs.	23
				Avg. Hrs.	1.15

As shown above, this inspector had a total of 20 inspections for the month of March 2004, each requiring an average of 1.15 hours to complete. This is applied to the annual data for 2003 as shown, below. The following table shows the number of BFD inspections performed in 2003 by type, as well as their associated task times.

Type of Permit	# of Inspections (2003)	Estimated Hours per Inspection	Estimated Annual Hours
Fire Protection	189	1.15	217
Building	175	1.15	201
TOTAL	364	NA	418

As shown above, the BFD staff utilize approximately 1.15 hours per inspection (based on a review of calendars maintained by the staff of the unit). For 364 inspections in 2003, this equals an estimated 418 annual hours to conduct.

The table, which follows, provides a summary of these data and shows an analysis of the staffing required to handle these workloads:

Element	Value
Total Plan Review Hours	880
Total Inspection Hours	418
Total Hours	1,298
Estimated Availability of Staff	1,785
Number of Staff Required to Handle Workload	0.73

This analysis shows that a single position should be able to handle the workload of conducting plan reviews and performing the inspections for which the unit is responsible. It should be noted that the data that are available describing the workload of the unit are potentially incomplete since the project team had to rely on schedules maintained by each inspector (electronic and hard copy) as well as other hardcopy sources. The additional time can be spent on meetings and preparation for the responsibilities of this position.

The project team next worked with the members of the unit to document the level of public education programming that has been provided by the unit. A review of the various date books and other notes in the unit indicated that approximately 100 hours of public education have been specifically provided by the unit in the past six months. The project team's interviews indicated that the position assigned to the position assigned to conduct public education has been (necessarily) focused on learning the various life safety codes and on performing inspections. However, the Fire Department has no functioning public education program at this time.

The Life Safety Division is also responsible for conducting a number of "Company" inspections (the Division is treated as a 25th unit for this purpose). The LSD receives a lesser number of inspections (202 compared to 600 – 800 per unit) but they

also tend to be more complicated inspections. A review of the assignment database shows that examples of the inspection types assigned to the Division include Western Washington University, oil companies, day cares, schools. Others include more routine inspections that might have been assigned to line staff (apartment complexes, light commercial and retail). The table, below, shows the project team's analysis of this workload:

Element	Value
Number FCOS Inspections	202
Estimated Time to Complete (Hours)	3
Time to Complete	606
Engine Company Inspection Referrals	15
Time to Complete (Hours)	1
Total Time to Complete	15
Total Inspection Time Commitment (Hours)	621
Estimated Personnel Availability (Hours)	1,785
Personnel Required for Workload	0.35

This analysis shows that the total time to conduct these inspections and to provide the engine companies with follow-up inspection assistance is approximately 621 hours annually – or 0.35 of the available time of a position in the Fire Department.

The unit is supported by Secretary position. This position is responsible for all filing and for preparing most of the unit's correspondence. Both of these tasks require on-going maintenance (in response to the workload of the three inspectors) as well as other major projects such as enhancing the filing system for inspection records.

In conclusion, the project team has found that there is sufficient workload to justify the dedication of two professional positions to these tasks:

- One to handle plan reviews and technical inspections.
- One to handle FCOS "company" inspections and public education.

As a result, the project team recommends that the Department eliminate the FF / Inspector position in the Life Safety Division. The savings from this position reduction are estimated to be approximately \$71,000 in salary and benefits.

Recommendation: The staffing of the Life Safety Division should be reduced by one position (FF / Inspector). Concurrently, the unit should reassign various tasks within the unit as described above. No change should be made in the support staffing for the unit. The savings from this position reduction will be approximately \$71,000. Given the issues with availability of data, the unit should intensively track their workload. After three to six months, the Fire Department should reassess their staffing needs in this area.

2. THE LIFE SAFETY FUNCTIONS SHOULD REMAIN IN THE FIRE DEPARTMENT BUT SOME STAFF TIME SHOULD BE DEDICATED TO WORKING ON-LOCATION WITH PLANNING STAFF.

The Life Safety Division is currently located within the Fire Department. The personnel in the unit work closely with the Planning Department. The Planning Department is responsible for coordinating all development review in the City and is also responsible for collecting the fees for plans and related inspections. The relationship between the two Departments can be summarized as follows:

- Planning coordinates the plan review and inspection process.
- The two departments share information regarding new properties, changes in use and other important factors.
- Both departments work closely with developers and other interested parties in an effort to make the process as effective and efficient as possible.
- The Planning Department has been developing a “one-stop” location for permitting and plan review. The Fire Department is not currently assigning personnel to that location (there appears to be adequate space for this to happen, however).

The City has several options for organizing and coordinating these two departments and their functions. These options are as follows:

- Continue to maintain staff for Life Safety functions within the Fire Department and continue to locate them within the Fire Administration offices.
- Continue to maintain the staff within the Life Safety Division but have them located (at least part of the time) at the “one-stop” location with other plan review and permitting functions.
- Reassign the personnel in the Life Safety Division to the Planning Department.

The table, below, provides the project team’s analysis of each of these options:

Option	Benefits	Challenges
Maintain Current Approach	<ul style="list-style-type: none"> • High level of coordination between the two departments. • Successful sharing of information under current arrangement. • Single coordinating agency (Planning) has reduced potential for confusion or delay. • Single fee collecting agency (Planning) has reduced cash-control issues. • Fire Department is able to utilize personnel for purposes of public education and other life safety goals. 	<ul style="list-style-type: none"> • Lack of participation in the “one-stop” arrangement. • Potential for increased utilization of staff is lost (staff could be used to perform wider range of inspections, etc.).
Staff in Department / Locate With Planning	<ul style="list-style-type: none"> • High level of coordination between the two departments. • Successful sharing of information under current arrangement. • Single coordinating agency (Planning) has reduced potential for confusion or delay. • Single fee collecting agency (Planning) has reduced cash-control issues. • Fire Department is able to utilize personnel for purposes of public education and other life safety goals. • Participation in the “one-stop” plan review and inspection process. 	<ul style="list-style-type: none"> • Potential for increased utilization of staff is lost (staff could be used to perform wider range of inspections, etc.). • Ability to use personnel for other functions in the Fire Department may be lost. • Challenge of supervising personnel who are located within another facility. Also a challenge to supervise them to a different set of policies and procedures when working co-located with Planning.
Shift Staff to Planning	<ul style="list-style-type: none"> • Improved service through location with Planning Department. • Enhanced ability to cross-utilize staff. • Maintains / enhances benefits of fee collection and coordination of plan review and inspections. 	<ul style="list-style-type: none"> • Would complicate sharing of information between the two Departments. • Loss of staff to perform additional functions for Fire Department.

The Matrix Consulting Group recommends that the City and Departments make only a small change to the current approach to organizing these services. This would involve establishing office hours for the Life Safety Division staff to work from the “one-stop” location within the Planning Department. This change of perhaps two to four hours per day would enable the departments to offer enhanced services to the community while maintaining the positive attributes of the current approach. The Senior Inspector could do his own plan review work while located at the Department. Supervision should be maintained by the Fire Department.

Recommendation: The Life Safety function should continue to be supervised by and assigned to the Fire Department. One of the Life Safety Division staff should maintain some scheduled office hours in the Planning “one-stop” location as a way to enhance services and accessibility for the community.

3. THE FIRE DEPARTMENT SHOULD DEVELOP A COMPREHENSIVE PUBLIC EDUCATION PROGRAM FOCUSED ON MITIGATING THE RISKS PRESENT IN THE COMMUNITY.

The Bellingham Fire Department does not, at this time, have a comprehensive public education and prevention program. The project team’s interviews and a review of relevant records and data show indicate the following characteristics are present:

- There is limited proactive effort on the part of the Life Safety Division or other staff in the Fire Department aimed at public education or prevention.
- The Life Safety Division and the Fire Department will respond to requests for programs and services.
- The Fire Department has assigned a FF / Inspector with the intention of having this position 50% responsible for providing public education.

The delivery of a successful public education and prevention program are key elements in reducing overall risk, loss of property and injury and illness in the

community. The elements of a successful public education and prevention program include the following:

- Identification of the major risks in the community.
- Evaluation of those risks which can be mitigated through public education (e.g., faulty wiring, storage of chemicals).
- Identification of those for which the risk itself cannot be reduced. In these cases, steps should be taken to work with the community to prepare to effectively react (e.g., severe weather, earthquakes).
- Development of programming to address these issues. This can include a wide range of approaches, including:
 - Direct education and programming provided by the Division of Life Safety.
 - Programming provided by the engine, ladder and ambulance companies.
 - Programs in the schools, adult care facilities and other groups.
 - Printed and web-site based materials.

The Bellingham Fire Department should focus its prevention and public education efforts on a wide range of issues, which might include:

- Fire prevention.
- Injury prevention in targeted populations (youth and elderly). Particular focus might be on issues such as:
 - Drowning prevention.
 - Cardiac care.
 - Identifying signs of major illnesses such as strokes.
- Development of effective community responses to major incidents and natural disasters. Effective examples include the creation, training and maintenance of CERT (Community Emergency Response Team) made up of public volunteers.
- Identification of abandoned or unsafe buildings (or “no-entry” buildings for fire response).

- Working to identify false or frequent response locations and to reduce the needs to respond to those locations. This could include working with property owners, identifying ordinance changes to be made to alarm regulations and other such changes.

The focus of the prevention and public education program should be two-fold. To reduce the risk of property loss and injury to the community and to reduce the need for unnecessary response by the Fire Department. The workload analyses in the preceding sections have shown that the staffing in the Life Safety Division exceeds current workload demands.

Recommendation: The Fire Department should re-focus on the delivery of public education and prevention services. One-half of the Inspector's time should be dedicated to developing, providing and coordinating these services.

8. ANALYSIS OF ORGANIZATIONAL STRUCTURE AND MANAGEMENT SYSTEMS

This chapter is focused on the overall organizational structure and management systems of the Fire Department. The chapter is divided into several sections each of which focuses on a key area of organization and management.

1. ORGANIZATIONAL STRUCTURE

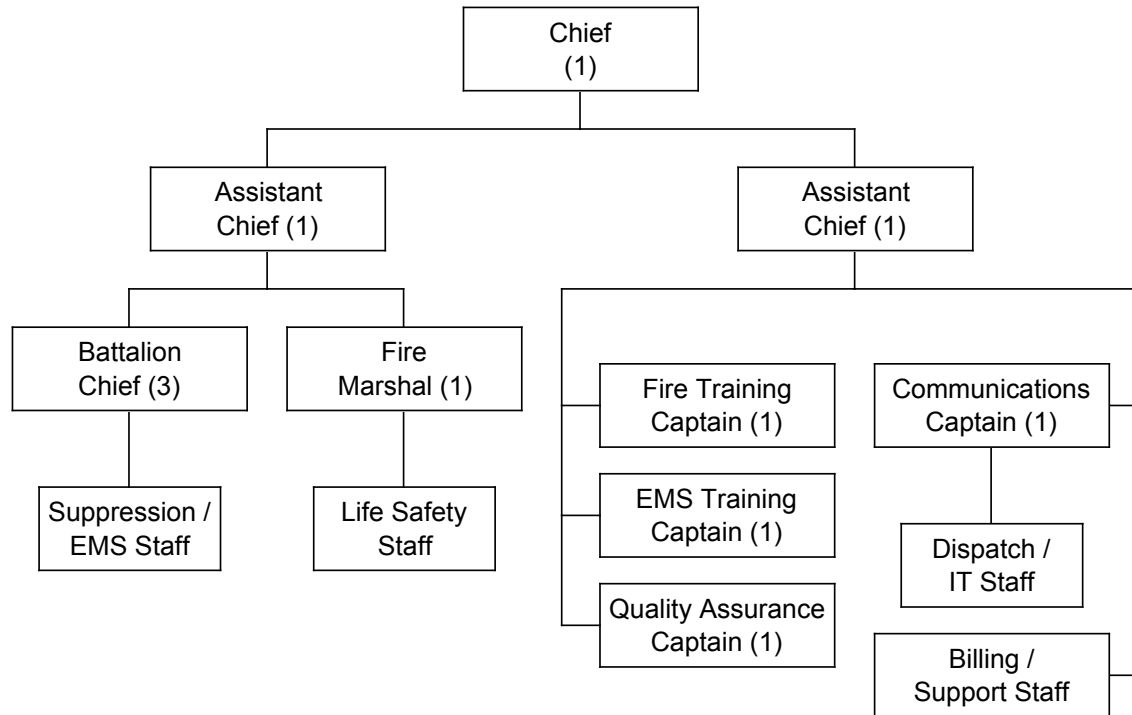
The Fire Department's current organizational structure is shown in the Descriptive Profile in Chapter 2. The project team has elsewhere in this report made recommendations to reduce the staffing of the Fire Department as follows:

- Suppression Battalion Chief
- Training Division Chief
- Training Captain
- FF / Inspector (Life Safety Division)

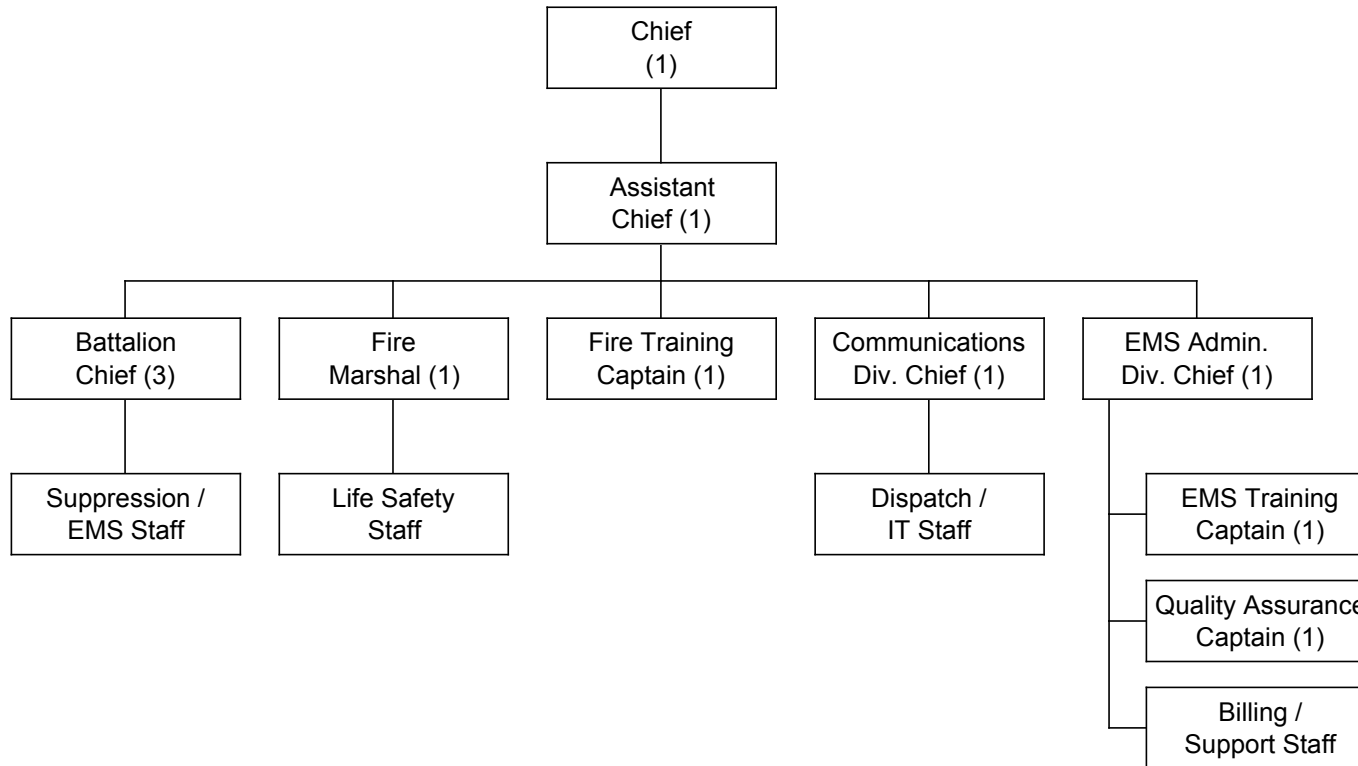
These recommendations are reflected in both of the organizational alternatives considered by the project team. The two options are summarized graphically on the following two pages. The major differences between them are described, below:

- **Option One - Two Assistant Chiefs** Under this scenario, a new Assistant Chief position is created to consolidate Operations and Support functions logically. Fire Marshal position is created to allow Assistant Chief to focus on long term planning and other important management issues. Eliminates Division Chief position for EMS.
- **Option Two – One Assistant Chief** Creates a new position of Fire Marshal to oversee Life Safety operations and to free Assistant Chief from focusing directly on these issues. Reclassifies Communications Division Chief as a Captain.

Option One: Two Assistant Chiefs



Option Two: Single Assistant Chief



The table, below, provides a summary and comparison of the two organizational alternatives:

Option	One: Two Assistant Chiefs	Two: One Assistant Chief
Description	<ul style="list-style-type: none"> • Create a new Assistant Chief position. One for Operations, one for Support Services. • Create a Fire Marshal Position. • Eliminate the EMS Division Chief position. • Eliminate, as previously recommended, Battalion Chief, Training Chief, Training Captain, FF / Inspector. • Assign suppression / EMS and Life Safety to Operations Chief. • Assign Communications, Training and EMS Oversight to Support Services. 	<ul style="list-style-type: none"> • Create a new Fire Marshal position. • Eliminate, as previously recommended, Battalion Chief, Training Chief, Training Captain, FF / Inspector. • Assistant Chief supervises line functions.
Advantages	<ul style="list-style-type: none"> • Creates clear division between operations and support services. • Provides second high-level command staff position for sharing planning and other key roles. • Eliminates direct program supervision from the Chief and Assistant Chief. 	<ul style="list-style-type: none"> • Maintains appropriate focus on EMS issues. • Cost-neutral reorganization (after previous recommendations). • Provides Assistant Chief and Chief with clear division between operations and support. • Eliminates direct program supervision from the Chief and Assistant Chief.
Disadvantages	<ul style="list-style-type: none"> • Utilizes potential salary savings from previous staff reduction recommendations to fund the creation of the Assistant Chief position. 	<ul style="list-style-type: none"> • Continues broad oversight responsibility for Assistant Chief (who would continue to function as de facto operations commander).

It is important to note that some form of reorganization will be necessary for the project team's earlier recommendations to be implemented. The recommended elimination of the Training Division Chief position, in conjunction with the recent elimination of the Chief in the Life Safety Division, raises several organizational issues that will need to be addressed through organizational structure changes.

The cost / savings from the two options are shown, below:

Description	Fiscal Impact
+1 Assistant Chief	\$113,000
Swap EMS DC for Fire Marshal	\$0
-1 Division Chief (Comm)	(\$104,900)
+1 <u>Captain (Comm)</u>	<u>\$98,400</u>
Total	\$106,500
+1 Fire Marshal	\$104,900

The cost of implementing the two options are almost the same. Given this, the project team recommends the implementation of the two Assistant Chief option (Alternative 1). This approach maximizes the flexibility of the organization and provides for positions to focus on long term planning.

Recommendation: Re-organize the Department using two Assistant Chiefs. The cost of \$106,500 will be off-set entirely by the savings from previous position reductions. This will assist the Department more effectively address its management and oversight issues and will enable the recommendations made in other sections to result in significant savings for the City.

2. POLICIES AND PROCEDURES

The project team provided an extensive review of the Policies and Procedures of the Bellingham Fire Department. Additionally, interviews with both line personnel and supervisors covered, in part, the issue of Policies and Procedures in the Department. This review yielded the following conclusions:

- The Policies and Procedures are sufficiently comprehensive to meet day-to-day operational needs.
- Specifically, operational policies are straight-forward and easily understood.
- The department is in the process of automating the policy and procedures so that updates will be in near real time and simultaneously available to all personnel.
- Conversely, the existing system faces challenges in timely updates and consistency between supervisor interpretation or version review.
- The policies as written generally appear to be sufficient for personnel guidance and, when necessary, disciplinary action.

- There is not a widespread understanding within the organization of how or why specific policies are adopted or disseminated.
- Generally speaking, supervisors (i.e. Battalion Chiefs) are satisfied with the policies and procedures found within the Bellingham Fire Department.

The project team's review and findings suggest that, in general, the BFD has developed and maintains comprehensive and up to date policies and procedures. The major issue that should be addressed is to increase the inclusiveness in the review and development process.

Recommendations: The Department should continue with the automation of the Policies and Procedures of the Department. While it is generally believed that the Assistant Chief is responsible for policy distribution, this responsibility should be clearly defined and performance standards defined. A mechanism for organization-wide input and review should be implemented as part of the policy/procedure development process.

3. TRAINING IN THE FIRE DEPARTMENT

The Bellingham Fire Department has dedicated personnel to delivery of training to the staff in both fire / rescue and EMS services. The Training Division is comprised of a Division Chief (who oversees operations) and two Captains (one for EMS and one for Fire related training). In addition, there is a third Captain who provides training coordination for paramedics who is assigned within the EMS Division of the Department.

(1) The Fire Department Is Entirely Self-Sufficient in Terms of Providing Training. The Regional Training Consortium (FRITS) Is Not a Significant Portion of Current Training.

This section shows the estimated number of BFD fire-related training hours for FRITS, as well as the estimated time utilized for each of the 2 Fire Training Captains to fulfill training-related requirements/duties over a year's period. The following table

shows the number of hours and type of training conducted between FRITS members and the BFD.

Type of Training	Estimated Hours
During the month of June 2003, 2 of the Training Captains conducted an Air Management class, provided to the FRITS members.	26
Conducted the Air Management class to the BFD members.	24

This represents the only combined training between the FRITS members and the BFD. Further, some of the BFD personnel attended classes that were provided by FRITS – however the hours were minimal.

Recommendation: Carefully monitor on-going utilization of and participation in the FRITS program. Future consideration should be given to withdrawing from the program if participation continues at these low rates.

(2) Staffing of the Training Division Should Be Reduced by Two Positions.

The Training Division, as mentioned above, is staffed by three full-time positions – a Division Chief and two Captains. Each of these positions rotates on a two-year cycle that is staggered and overlapped. The workload of the Training Division can vary widely depending on whether there is a new recruit academy on-going. There is, in addition, a fourth professional position dedicated to training in the EMS Division, where another Captain is responsible for overseeing initial training for paramedics.

The following table shows the estimated number of hours required to develop and administer various types of training. The first shows the hours (between January 2003 and December 2003) for the 2nd year training captain, followed by the hours (between January 2004 and May 2004) for the new training captain, which shows the estimated annualized time.

Training Captain A

Type of Training	Time / Occurrence	Estimated Annual Hours
EVAP	Annual	50
SCBA	Annual	100
Quarterly Training	80 hours x 4	320
Monthly Training	40 hours x 12	480
Daily Training	1 hour x 52 weeks	52
TOTAL HOURS		1,002

As shown above, this Captain is estimated to be conducting/administering actual training for 1,002 total hours per year.

Training Captain B

Type of Training	Time / 1/2004 thru 5/2004	Estimated Annual Hours
Annual Respiratory Training for BFD members	92 hours	220
Facilitate EMT Training of BFD Firefighters	200 hours	480
Training Video Development	30 hours	72
Researching structures for "live fire" training	105 hours	105
Developing BLS transport guidelines	10 hours	24
Responding to training questions from Firefighters	105 hours	252
TOTAL HOURS		1,153

As shown above, these hours represent an estimate of the various types of duties this Captain was associated with for a 5-month period. The times were then annualized for the types of training-related duties (with the exception of researching structures for "live fire" training). Thus, the project team estimates 700 annual hours for the administration of actual training (Respiratory and EMT training), and 453 hours for

the other support duties, such as developing training videos, developing guidelines, structure research (one-time), and responding to training questions and problems. In addition, it's estimated that a Training Captain participates in approximately 120 hours over a year for planning meetings/sessions with staff, captains, etc.

Taken together, these data suggest that the two Training Captains account for approximately 2,157 hours of training activities. These account for approximately 1.2 FTE's of time as shown, below:

Annual Scheduled Hours	2,080
Availability (from Schedules)	85%
Hours Available	1,768
Total Training Hours	2,157
Positions Required	1.22

The project team attempted to document the workload of the third Captain who is assigned to the training function with the EMS Division. While we were unable to document this as completely as we were for the other two positions, this position is also less than a full-time set of duties due to recent changes in the finances and a lack of new recruit paramedics to train. Given this finding it is clear that the current training workload requires two Captain positions to oversee, develop, monitor and provide training. The following steps should be taken:

- One of the three Captain positions dedicated to training should be eliminated.
- All on-going EMS training should be handled by one Captain. This position should be assigned within the EMS Division (unless the Division is shifted away from the Fire Department as part of a reorganization of Medic One).
- All Fire and other technical training should be handled by a second Captain. This position should report within operations (see the organization chapter).
- The Division Chief position should be eliminated. A Captain can be adequately supervised through a number of other organizational approaches (see the organizational chapter).

These recommendations will result in significant savings to the Department and the City. The project team's estimate of the costs are shown, below:

Captain Salary	\$78,000
Division Chief Salary	\$86,000
Total Salaries	\$164,000
Benefit Rate	23%
Total Savings	\$201,720

Recommendation: The Fire Department should reduce the staffing in the training function by two positions: (1) Division Chief and (1) Captain. Concurrently, all EMS training should be consolidated into a single position and all Fire training consolidated within the other. Total recurring savings from these changes are estimated to be more than \$201,000 annually.

(3) The Training Program of the Bellingham Fire Department Is Comprehensive in Scope and is Well Managed Using Innovative Approaches.

Fire Departments face two major demands for training – EMS and Fire / technical skills. The BFD has developed a widely varied training program in both major areas that appear to be well designed to ensure that the firefighters receive on-going training and skills maintenance. The challenges and demands for both of these types of training are different and require varying approaches:

- **EMS Training** requires the Fire Department to meet mandates for training for both EMT's and Paramedics. In addition, the training provided by the BFD is appears designed to introduce new skills to the EMS professionals in the Department. In many cases the skills and techniques practiced are used frequently by the EMT's and Paramedics.
- **Fire Training** is driven less by mandates than by the need to maintain infrequently used critical skills.

The Fire Department has centrally developed a series of annual and quarterly training requirements for both EMS and Fire skills. The exhibit, which follows, provides a summary of the quarterly training requirements for each professional staff person:

Q1 2003	Q2 2003	Q3 2003	Q4 2003	Q1 2004	Q2 2004
SCBA Certification	SCBA Certification	SCBA Certification	SCBA Certification	SCBA Certification	SCBA Certification
HEPA Certification	HEPA Certification	HEPA Certification	HEPA Certification	HEPA Certification	HEPA Certification
Hose and Ladder Evolutions	Hose Evolutions	Hose	Hose	Hose	Hose
Read and Discuss the Article "Tips for Driving Safely"	Ladder Evolutions	Ladder	Ladders	Ladders	Ladders
Read and Discuss the Article "Fighting Fires in Cluttered Residences"	Emergency Response Guidebook Exercise	Read and Discuss "Managing Chemical Exposure"	Read and Discuss "Due Regard"	Read and Discuss "Firefighter Rescue-The Ultimate Challenge"	"Stretching Hoselines to Upper Floors of Residential Buildings"
Read and Discuss "GP Drill Lessons Learned"	Read and Discuss "Buried Alive: Cemetary Rescue"	Read and Discuss "When would you call Mayday-Mayday-Mayday"	Read and Discuss "LPG Tanker Rollover"	Read and Discuss "Stretching Hoselines to Upper floors of Residential Buildings"	"Rescue Guidelines for Air-Bag Equipped Vehicles"
Tool of the Month:	Read and Discuss "Developing a Quick Action Plan"	Complete the Hydraulics Worksheet	Read and Discuss "Haz-Mat Recipes for Disaster"	Read and Discuss "Water Talks"	"Search Rope Basics for Larger Areas"
January	Streets and Numbers	Streets and Numbers	Tool Review:	Tool Review:	Tool Review:
Tool of the Month	Tool of the Month	Tool of the Month	Manifold/Triple Y	Niosh Chemical Hazards Reference	paraPAC Automatic Ventilators
Tool of the Month	Tool of the Month	Tool of the Month	Halligan Tool	Deck Guns	Rope Bags
Quicktraining	Tool of the Month	Tool of the Month	Ground Monitor	Dolmar 1111 Chainsaw	Thermal Imaging Camera
Review Administrative Chain of Command	Tool of the Month	Tool of the Month	Quickdrill	Quickdrill	Quickdrill

Ongoing Annual	Ongoing Annual	Ongoing Annual	Ongoing Annual	Ongoing Annual	Ongoing Annual
EVAP Maintenance	EVAP Maintenance	EVAP Maintenance	EVAP Skill Maintenance	EVAP Skill Maintenance	EVAP Skill Maintenance

This exhibit shows that the Department is engaged in a number of positive elements related to training:

- The training program is centrally developed and tracked. This helps ensure consistency in training and in exposure to training opportunities.
- The Department uses a web-based tracking system which enables every employee to check on their own training as well as on the training that others are receiving and completing. This “peer pressure” approach has improved compliance with training mandates since its implementation.
- Company officers are required to deliver the training, thereby making them more accountable for their own personnel, their own skills and enabling them to assess the skills of the people that work with and for them on a daily basis.

The project team also examined the distribution of training among employees. To do this on a detailed basis (whereby we could also examine the distribution among types of training) the project team took a sample of 13 employees (approximately 9% of the total line staffing of the Department). This sample is shown on the following page.

The following table shows the number of hours of training per category per 13 employees for the entire year of 2003, along with the average per category and the average per employee.

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Category	1	2	3	4	5	6	7	8	9	10	11	12	13	Avg./ Category
Basic Life Saving	9.5	18.5	25.8	17.5	30.0	17.3	27.3	16.5	10.8	23.3	15.5	25.5	9.8	19.0
Apparatus Operations	14.0	30.7	35.7	11.8	43.5	33.5	42.5	20.0	9.0	12.5	12.6	15.9	19.5	23.2
Fire Ground Operations	25.2	24.1	29.5	28.1	21.8	30.5	34.9	29.8	24.5	26.4	21.2	37.6	22.8	27.4
General Operations	4.5	5.3	6.2	9.5	13.5	4.5	7.5	9.5	17.8	3.5	27.3	17.5	4.8	10.1
HAZMAT	0.8	1.8	5.8	2.0	5.0	2.5	4.8	3.0	1.8	2.1	3.3	4.5	2.8	3.1
Life Safety	33.3	43.8	45.3	20.3	50.8	36.3	37.0	29.3	29.5	17.0	38.5	30.3	27.6	33.7
Protective Equipment	12.0	13.3	12.5	13.8	13.3	12.5	16.5	11.0	9.0	17.5	10.9	12.5	13.5	12.9
Professional Training/ Administration	2.0	5.3	1.0	0.3	8.0	1.0	5.0	2.3	7.0	4.0	4.0	2.0	2.5	3.4
Quick Training	4.3	5.3	4.0	2.5	3.0	3.3	2.0	5.5	3.6	4.0	3.0	5.0	3.8	3.8
Rescue/ Extraction	2.8	4.3	4.0	1.0	1.8	15.3	71.8	2.0	2.1	1.8	3.0	3.8	11.8	9.6
Safety	6.3	7.0	5.8	9.7	3.8	5.5	5.3	6.0	5.5	10.2	7.8	8.0	6.0	6.7
Tools/ Equipment	6.4	8.1	4.0	3.3	3.0	6.5	8.5	3.5	1.7	1.8	4.3	2.3	4.3	4.4
Water Supply	0.5	1.1	1.5	2.0	0.5	1.0	0.3	0.5	0.3	1.0	0.3	0.8	3.0	1.0
Marine Firefighting	0.0	1.0	0.0	0.0	1.5	2.0	0.5	2.0	5.8	25.5	4.0	4.0	4.0	3.9
FO II	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	59.0	0.0	64.0	0.0	1.0	9.7
Avg./Emp.	121.4	169.3	180.9	121.5	200.8	171.5	263.7	140.9	187.1	150.5	219.5	169.5	137.0	171.8

A review of more extensive data shows that this is a representative sample of employees (the average for all employees is slightly higher than shown in the table).

Recommendation: Continue with the current approach. The Fire Department has developed an approach to training which is varied, comprehensive and which encourages consistency, accountability and participation among staff at all levels.

4. MANAGEMENT SYSTEMS

This section of the report focuses on the management systems utilized by the Fire Department to assess and oversee operations. These systems focus on both the day to day oversight of the Department as well as on more strategic issues. The exhibit, which follows, provides a summary of the project team's evaluation of management systems within the BFD.

Issue	Evaluation
How does the BFD plan, schedule and control the work?	<ul style="list-style-type: none">• Much of the work of the Fire Department can not be predicted of pre-planned. However, the staff of the Department does review workload trends to evaluate needs.• Non-response workload is generally planned and scheduled in advance. Life Safety personnel, line personnel (conducting inspections) and others effectively plan for and track work to be completed.
How is long rang planning and research accomplished?	<ul style="list-style-type: none">• Long range planning has not been a major focus within the Fire Department until recently. Efforts are underway (including this study) to address this historic gap.
How effectively are individual managers utilizing information to assess operational issues.	<ul style="list-style-type: none">• Some managers are effectively managing using data available from the various information systems in the Department. Others make less effective use of this information.
Is the BFD actively setting performance goals for its operational units? Are these goals evaluated?	<ul style="list-style-type: none">• Performance goals have been established for a number of service areas provided by the Department. The system has been designed with no specific performance targets in mind. EMS units are evaluated against performance standards .
Does each unit have access to timely and accurate information about its performance?	<ul style="list-style-type: none">• All personnel in the unit have excellent access to information. A number of innovative approaches using the Departments intranet have been developed recently.

Issue	Evaluation
Are managers and supervisors held accountable for unit performance?	<ul style="list-style-type: none">• Generally, unit performance is evaluated but managers are not held strictly accountable. However, efforts are made to improve unit performance by the command staff.
How are goals, objectives and service level targets developed? Is community or policy maker input sought?	<ul style="list-style-type: none">• Policy objectives appear to be developed internally by command staff and others in the Department with “sign off” by policy makers.
Do policy makers and senior managers receive the information that they need to assess the performance of the BFD?	<ul style="list-style-type: none">• The Fire Department provides information regularly and as requested. Command staff members participate in meetings on budget and other key policy issues.
Does the BFD make effective use of meetings to manage itself?	<ul style="list-style-type: none">• The Fire Department effectively and appropriately uses meetings among command staff, subject matter working groups, between management and labor and so on.• The Department holds regular staff meetings and will hold additional meetings as major issues arise.• Department personnel are held accountable for commitments made in management meetings.
Is the BFD making use contemporary methods of communication?	<ul style="list-style-type: none">• Extensive use is made of email and other modern communications techniques.
Are management personnel devoting their time to higher priority issues?	<ul style="list-style-type: none">• In general, most management personnel are focusing their efforts on high priority issues and are not engaged in low-level administrative tasks.

The Matrix Consulting Group’s review of major management systems and approaches in the BFD indicate that these systems are effective and provide for data-based decision making. The Department is making effective use of meetings, and communicates well as a group and to all personnel. The project team also notes that the Department has recently implemented a process of performance review for the Battalion Chiefs which will be expanded after a year to include the Captains. This is an excellent addition to the management and personnel systems of the Fire Department.

5. THE FIRE DEPARTMENT SHOULD RECONSIDER THEIR PARTICIPATION IN SEVERAL INTERLOCAL AGREEMENTS.

The Bellingham Fire Department participates in a number of interlocal agreements which govern their interactions with neighbors, other fire districts, the County and others. This section is specifically focused on those which impact two areas: the fire provision at the airport in District 8 and the interlocal agreement with the County regarding emergency management. Issues relating to the FRITS training agreement have been raised elsewhere (as have the possibility of pursuing PILOT revenues from the WWU and the County for responses at the Jail).

Agreement	District 8	Emergency Operations
Positive Elements	<ul style="list-style-type: none">• Provides career suppression support to the airport area.• Increases utilization for the City's suppression units.• Provides some payment to the City for this response.	<ul style="list-style-type: none">• Encourages regional approach to emergency planning and management.• Also provides for regional drill.• County has single emergency command center used by all agencies.
Improvement Opportunities	<ul style="list-style-type: none">• Make response full-cost even for false alarms.	<ul style="list-style-type: none">• City payment of \$95,000 may exceed the benefit received from the City.• \$95,000 could be used (even partially) to pay for a dedicated EM position in the Fire Department.

The Matrix Consulting Group recommends that the City and Fire Department make several changes to these interlocal agreements:

- Work with District 8 to identify the full cost of providing services to the airport. The project team has already identified that the full cost of each unit "run" is approximately \$1,000 per run (based on 2003 costs and activity). This cost would be applied to each unit that responds (regardless of the time spent on-scene) if this philosophical approach were taken by the City.
- Consider a reduction in the contribution to the County for Emergency Management services. The project team recommends that the City consider paying 1/3 the cost of the recommended new Assistant Chief position or

approximately \$38,000 from this agreement. This position could focus on emergency management, planning and coordination issues for the Fire Department.

- At the same time, the project team does not recommend that the City withdraw from participation in the countywide emergency planning and management initiatives. Specifically, we recommend that the City avoid establishing their own emergency management center (unless it is established in conjunction with the County as a back-up center).

Recommendation: During future negotiations over the District 8 and the Emergency Management contract, the City and Department should work to increase the per-call payments to the BFD for responding to the airport and should also reduce their payments to the County for emergency management by \$38,000 to offset the cost of the new Assistant Chief.

9. ANALYSIS OF REVENUE GENERATION OPPORTUNITIES

This chapter focuses on the potential for enhanced revenue within the fee structure charged by the Fire Department for plan review, false alarm and other services. The Department's fees are currently set by an ordinance of the City of Bellingham. These fees are currently focused on inspections and plan reviews. The Department, through Medic One, also charges for responses to medical emergencies for which there is a resulting transport (the limited opportunities to increase EMS fees is discussed previously in this report).

1. DESCRIPTION OF CURRENT FEES AND CHARGES

The Fire Department currently charges fees for conducting a number of plan reviews, initial inspections and recurring inspections. There are currently no fees charged for responses other than for EMS transport. The ordinance and fee schedule for the current fees are presented, below:

17.20.080 - Permits And Fees - U F C Section 105.3 Amended

Section 105.3 of the Uniform Fire Code, 1997 Edition, is hereby amended to read:

Section 105.3(a) Permit Applications. All applications for a permit required by this Code shall be made to the Fire Department in such form and detail as it shall prescribe. Applications for permits shall be accompanied by such plans as required by the Chief.

Section 105.3(b) Permit Fees. The Fire Department shall collect fees for permits, plan review, and inspection services as prescribed in Table No. 105.3.

Table 105.3

PERMIT, PLAN REVIEW AND INSPECTION SERVICE FEES

FIRE PROTECTION SYSTEM INSTALLATIONS

	Permit	Plan Review	Inspection
A. Fire alarm systems*			
*New or remodeled			
1. One to four zones	\$ 50.00	\$100.00	\$100.00
2. Each additional zone		10.00	10.00
3. Sprinkler supervision only	50.00	25.00	100.00
B. Fire sprinkler systems			
1. Each new sprinkler system having up to and including 99 sprinklers	25.00	2.00 per sprinkler	50.00
2. Each new sprinkler system having 100 or more sprinklers	50.00	150.00	250.00
3. Revisions to existing systems*	25.00	2.00 per sprinkler	50.00
*To a maximum fee of \$450.00			
C. Standpipe systems			
1. Each new Class I system			
Manual	50.00	50.00	75.00
Automatic or Semi-Auto	50.00	100.00	150.00
2. Each new Class II system	50.00	100.00	150.00
3. Each new Class III system	50.00	100.00	150.00
4. Each new combination sprinkler and standpipe system	50.00	250.00	300.00
D. Fire pumps	50.00	250.00	250.00
E. Range hood fire suppression systems			
1. Pre-engineered	50.00	10.00	50.00
2. Custom engineered	50.00	200.00	100.00
G. All categories			
Call back inspections for more than three site visits			50.00 each

HAZARDOUS MATERIALS INSTALLATIONS AND OPERATIONS

	Permit	Plan Review	Inspection
A. Hazardous materials storage tanks or piping (per facility)			
1. Installation	\$ 50.00	\$150.00	\$200.00
2. Removal	50.00		50.00
B. Hazardous materials storage and use (containers and portable tanks)			
1. 120 - 660 gallons	25.00	100.00	200.00
2. 661 - 9,999 gallons	50.00	150.00	100.00
3. 10,000 gallons or more	100.00	200.00	150.00
C. Medical gas storage and piping systems			
1. Per manifold	25.00	50.00	100.00
Plus each outlet (more than two)		2.50	10.00
D. Spraying booths			
1. Pre-engineered	50.00	50.00	50.00
2. Site-built	50.00	50.00	50.00
E. Compressed gas storage facilities			
1. Flammable 2,500 cu.ft. or more	50.00	200.00	100.00
2. Non-flammable 6,000 cu.ft. or more	50.00	200.00	100.00
F. Explosive storage magazines			
1. Class 1-4	50.00	150.00	100.00
2. Class 5	25.00	50.00	50.00
G. Explosives and Blasting Agent Transfer	50.00		100.00
H. Fireworks			
1. Public Display	50.00		50.00
2. Retail Sales	50.00		
I. Aerosol Storage			
1. More than 500 lbs. net (Exception: Level 1 aerosols)	50.00	150.00	50.00
J. High-piled combustible storage			
1. Class I-IV	50.00	100.00	50.00
2. High-Hazard	50.00	200.00	100.00

SPECIAL PERMITS

	Permit	Plan Review	Inspection
A. Places of Public Assembly (excluding churches)			
1. Group A, Division 3	\$ 50.00	\$150.00	\$ 50.00
2. Group A, Divisions 2, 2.1	100.00	150.00	50.00
3. Group A, Division 1	150.00	200.00	50.00
4. Temporary assembly permit	50.00	50.00	50.00

The project team recognizes that these fees were established both some time ago and with little reference to the actual cost of providing these services. The exhibit, on the following pages, provides a summary of the types of charges that other communities in the region are charging for similar (and other) services. The paragraphs which follow summarize the key points to be taken from this exhibit:

- There are a number of alternative approaches used by the agencies in the survey for setting their fees.
- Some communities are charging multiples above what the City of Bellingham charges for permits, plan reviews and inspections.
- One very interesting option is the ability to charge on an hourly rate. This is increasingly appearing in other states on the West Coast as they struggle to deal with their own budget issues.
- Some fees are set on the square footage of the facility being reviewed or inspected.
- A number of communities charge not only for technical or mandated inspections but for all inspections – including those routine inspections performed by engine companies.

The next section provides the project team's analyses regarding the opportunities to increase the revenues of the Department.

(1) Annual and Re-Inspection Fees

TYPE OF FEE	King County FMO	Renton	Gig Harbor Fire	Bothell	Snohomish County	Pierce County
Annual Inspection	\$132.00 hr per inspection including travel time. Minimum usually is \$100.00. Only occupancies with UFC permits are inspected. Travel time is figured on actual time traveled the entire day and averaged against number of inspections done that day.	NA (also nothing is credited to the Fire Dept. from business licenses)	\$47.00 initial inspection. This fee was charged during the year 2001. All fees are covered for the year 2002 by the City of Gig Harbor who contracts with this Department for inspections.	Included with business license fee	Annual fee based on type of occupancy and building sq. ft. B, M, R & U1 <20 units (A, E, LC, & R2 >20 units in red) - 0 to 1,000= \$45.00(\$75); 1,001 to 2,500= \$65.00(\$105); 2,501 to 5,000= \$95.00(\$155); 5,001 to 7,500= \$115.00(\$185); 7,501 to 10,000= \$125.00(\$195); 10,001 to 12,500= \$145.00(\$230); 12,501 to 15,000= \$165.00(\$275); 15,001 to 17,500= \$175.00(\$295); 17,501 to 20,000= \$190.00(\$310); 20,001 to 30,000= \$215.00(\$350); 30,001 to 40,000= \$230.00(\$375); 40,001 to 50,000= \$245.00(\$400); 50,001 to 60,000= \$260.00(\$425); 60,001 to 70,000= \$275.00(\$450); 70,001 to 100,000= \$300.00(\$475); 100,001 to 150,000= \$350.00(\$500); 150,001 to 200,000= \$400.00(\$525); 200,001+ = \$450.00(\$550)	Minimum of \$45.00 (for buildings of 500 sq. ft. or less) to \$500 (for buildings of 200,000 sq. ft. or more).
Re-inspection of annual insp.	Same hourly rate as above	\$50.00 upon 2nd re-inspection	following two re-inspections when required are at no additional fee.	Included with business license fee	\$25.00 after first re-inspection, \$50.00 after second re-inspection	NA

(2) UFC Section 105 Permits

TYPE OF FEE: UFC Section 105 Permits	King County FMO	Renton	Bellevue	Edmonds	Bothell	Kirkland	Snohomish County	Pierce County	Shoreline
Most permits	NA- included as part of hourly rate	\$30.00 every year, each permit item with exceptions listed below. Multiple tanks require separate fee each of \$30.00	\$50.00 charged per occupancy with no additional charge for multiple permits at the same location.	\$5 per year	If not specifically listed base fee is \$53. For listed permits see below	NA	NA	Incorporated in annual inspection fee as listed above	\$125.00 first permit and \$55.00 per permit after that
Hazardous Production Materials	NA- included as part of hourly rate	\$100.00 per year	NA	\$5 per year	No HPM currently in town; see hazmat below	NA	NA	NA	NA
Church place of assembly	NA- included as part of hourly rate	\$10.00 per year	NA	Free	\$32 for all non-profit p.2's (\$54 for commercial)	NA	NA	NA	\$55.00
Residential oil tank removal	NA- included as part of hourly rate	\$30.00 each tank	NA	\$40	\$54.00 each tank	NA	NA	NA	NA
Others:	NA	NA	NA	NA	Most common:			NA	NA
					Battery systems, Compressed gases, Cryogenics, High pile storage, LPG, tire storage are \$108 Radioactive materials	Recreational Fires= \$79.00 per hr, one hr. min.; Tents & Canopies= \$79.00 per	Special event permit inspections= \$100.00 or after hours at a rate of \$60.00 hr for		

TYPE OF FEE: UFC Section 105 Permits	King County FMO	Renton	Bellevue	Edmonds	Bothell	Kirkland	Snohomish County	Pierce County	Shoreline
					\$162 Flammable/combustible liquids \$216 Hazardous Materials \$323	hr, one hr. min.	actual time spent.		

(3) Fire System Permits and Plan Checks

TYPE OF FEE: Fire System Permits and Plan Checks	King County FMO	Renton	Bellevue	Gig Harbor Fire	Edmonds	Bothell	Mercer Island
Plans/Permit Intake processing fee	\$187.00 for all fire alarm, extinguishing systems, standpipe system, water main extension and sprinkler supply mains	NA	Operations Fee for Sprinkler systems: ≤15 heads=\$5.00; >15 heads=\$25.00. Also \$25.00 for Underground main for sprinkler system, Fixed Fire Systems, Standpipes, Fire Alarms, and Smoke Control Systems. \$5.00 for Pre-wire of Fire Alarm	NA	see below	NA	\$166.00
Plans/Permit Issuance fee	\$187.00 (same as above)	NA	NA	NA	NA	NA	NA
Tank Plans/Permit Intake processing fee	\$93.50 for installation of all tanks (Commercial or Residential),	NA	NA	NA	see below	included with annual permit fee - and first year operations	\$103.00

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	King County FMO	Renton	Bellevue	Gig Harbor Fire	Edmonds	Bothell	Mercer Island
Tank Plans/Permit Issuance fee	\$93.50 for installation of all tanks (Commercial or Residential),	NA	NA	NA	see below	included with annual permit fee - and first year operations	\$103.00
Plan Review fee	see below	based on total value of construction/installation <\$50.00 = \$10.00; \$50 to <\$250 = \$15.00; \$250 to <\$1000 = \$10.00 + 2% of value; \$1000 to <\$5000 = \$25.00 + 1% of value; \$5,000 and over = \$60.00 + 1/2 of 1% of value	see below	NA	\$50 per hr review fee/\$50 per inspection hour fee	Fire plans check fee - \$0.06 per square foot	UBC Based Formula
Construction/installation permit fees	see below	10% of plan review fee or a minimum of \$50.00 whichever is greater	see below	NA	same	see below	NA
Permit review fee for Fire Alarms	\$176.00 for 1 to 4 zone panels, \$33.00 each additional zone, \$627.00 for addressable panel, \$2.42 for each device for all panels. \$237.60 for each monitoring transmitters plus \$2.42 for each	See plan review fee	\$69.00 for existing systems, \$139.00 for new systems.	NA	\$150 fee/If inspection time exceeds 2 hours addl \$50 per hour charged	\$108.00 for 1 to 4 zone panels, \$27.00 each additional zone, \$216.00 for addressable panel, \$1.00 for each device for all panels. No additional monitoring fees	\$166.00

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	King County FMO	Renton	Bellevue	Gig Harbor Fire	Edmonds	Bothell	Mercer Island
	device.						
Permit review fee for Fire Extinguishing System (hood and duct, halon, dry chem, CO2, etc.)	\$352.00 plus \$18.70 for each nozzle	See plan review fee	\$69.00 for existing systems, \$139.00 for new systems.	NA	\$150 includes plan review and inspection	"Special Systems" fees of \$199, nozzle fees \$17 each	\$166.00
Permit review fee for Automatic Sprinklers	\$335.50 for each commercial riser plus \$3.30 per head or plug; \$269.50 for each residential riser plus \$2.20 per head or plug	See plan review fee	Sprinkler Systems(over 15 heads)= \$139.00(new), \$69.00(existing) no fee under 16 heads	NA	Based on contract bid/\$50per hour review and inspection fee	New risers are \$216 per riser, TI's charge a \$108 per riser impact fee, plus \$1 per head (no additional for plug); 13D systems are a flat \$54	\$547.00
Permit fee for Standpipe Systems	\$352.00 each Class 1; \$352.00 for each Class 2; plus \$66.00 for each Class 1 & 2 outlet; \$969.10 for each Class 3; \$313.50 for each fire pump	See plan review fee	Each Floor= \$25.00	NA	same as above	Charged under "Special Systems" at \$199 per riser	\$166.00
Plan review fee of water main extension	\$253.00 plus \$71.50 per hydrant	NA	NA	NA	NA	Underground charged at \$199 from fire; may also necessitate a city utility permit	under review
Permit review fee for Sprinkler System supply mains	\$236.00 for each main to riser	See plan review fee	\$69.00 for existing systems, \$139.00 for new systems.	NA	\$200 Fire Line Permit	Underground charged at \$199 from fire; may also	\$166.00

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	King County FMO	Renton	Bellevue	Gig Harbor Fire	Edmonds	Bothell	Mercer Island
						necessitate a city utility permit	
Permit review fee for installation of Flammable or Combustible Tanks in a commercial occupancy	\$236.50 for 1st commercial tank, \$123.20 for each additional tank.	See plan review fee	NA	NA	\$40	\$216.00; included with annual permit fee - and first year operations	\$166.00
Permit review fee for installation of Flammable or Combustible Liquid Tanks in a residential occupancy	\$176.00 for first residential underground tank, \$94.60 each additional tank and \$176.00 for each above ground tank.	not regulated	NA	NA	\$40	\$216.00; included with annual permit fee - and first year operations	\$103.00
Permit review fee for Removal or Abandonment of Commercial Flammable/Combustible Liquid Tank(s)	\$236.50 for 1st commercial tank, \$123.20 for each additional tank.	See plan review fee	\$50.00 permits to remove Commercial U/G Tanks	NA	\$40	\$216.00 per tank - inspections required	\$103.00
Annual Contractor's Permit fee for removal or abandonment of Residential underground fuel tank.	\$165.00	not regulated	\$50.00	NA	NA	no annual permit; does require city business license	\$25.00
Permit fee for fuel tanks for Commercial Oil Burning Equipment	\$176.00	See plan review fee	NA	NA	NA	\$216.00; included with annual permit fee - and first year operations	\$103.00
Permit fee for Residential fuel tanks for Oil Burning Equipment	\$84.70	not regulated	NA	NA	not regulated	Install permit - no annual for SFR; multi-	\$103.00

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	King County FMO	Renton	Bellevue	Gig Harbor Fire	Edmonds	Bothell	Mercer Island
						family would be \$216	
Permit for Commercial underground piping to flammable or combustible liquid storage tank(s)	\$236.50	See plan review fee	NA	NA	see plan review fee	Currently billed out under mechanical fees by bldg dept; no additional fees from fire	plan review
Permit fee for Phase I Vapor Recovery Systems	\$191.40	See plan review fee	NA	NA	NA	Currently billed out under mechanical fees by bldg dept; no additional fees from fire	plan review
Permit fee for Phase II Vapor Recovery Systems	\$237.60	See plan review fee	NA	NA	NA	Currently billed out under mechanical fees by bldg dept; no additional fees from fire	plan review
LPG tank permit review fees	no fee = 1 to <125 gal./ \$176.00 = 125 gal. to <500 gal/ \$352.00 = 500 gal. to <10,000 gal./ \$693.00 = 10,000 gal or more	See plan review fee	NA	NA	\$40	\$108; included with annual permit fee - and first year operations	\$166.00
Others:	NA	NA	NA	NA	NA	NA	\$166.00
Permit Review fee Smoke Control Systems	NA	See plan review fee	\$125.00 deposit for review at \$31.00 per hour.	NA	NA	NA	NA

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	Kirkland	Redmond	Snohomish County	Auburn	Pierce County	KENT
Plans/Permit Intake processing fee	NA	A 3% technology surcharge effective through 12/31/02 is applied to all permit fees listed below.	NA	NA	NA	NA
Plans/Permit Issuance fee	NA	NA	NA	NA	NA	NA
Tank Plans/Permit Intake processing fee	NA	NA	NA	NA	NA	NA
Tank Plans/Permit Issuance fee	NA	NA	NA	NA	NA	NA
Plan Review fee	Fire Department Access, Fire Lanes, Access to Buildings and Hydrants= \$79.00 per hr, one hr. min.	NA	see below	65% of permit fees	see below: note all installation permits and inspection fees are collected by the building dept.	Fee based on UBC Table 1-A for all installations.
Construction/installation permit fees	NA	NA	NA	based on Table 1A of UBC and the valuation of the project.	residential- 2% of the building plan review fee. Commercial- 10% of the building plan review fee	NA
Permit review fee for Fire Alarms	New Installations- 1 to 100 devices= \$300.00; 101 to 200 devices= \$410.00; 201 and more devices= \$410.00 for first 200 + \$50.00 per 100 or fraction thereof. TI of existing system- 1 to 5 devices= \$110; 6 to 10= \$150.00; 11 to 20= \$200.00; 21 to 40= \$260.00, 41 to 100= \$330.00; 101 to 200= \$410.00; 201 and up= \$410.00 for first 200 +	Fee based per device- New Systems- 1 to 100= \$338.46; 101 to 200= \$462.65; >200= \$462.65 + \$55.97 per each additional 100 or portion thereof over 200. System Modifications- 1 to 5= \$124.19; 6 to 10= \$169.23; 11 to 20= \$226.26; 21 to 40= \$293.42; 41 to 100=	\$50.00	NA	One to four zones= \$175.00; each additional zone= \$12.00; Sprinkler Supervisory only: \$85.00; One and two family dwelling= \$30.00	NA

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	Kirkland	Redmond	Snohomish County	Auburn	Pierce County	KENT
	\$50.00 per 100 or fraction thereof. In addition, \$150.00 per FACP and Transmitter or \$200.00 for combination FACP and Transmitter. Replacement FACP and/or Transmitter= \$110.00; Replacement combination FACP/Transmitter= \$120.00.	\$373.64; 101 to 200= \$462.65; >200= \$462.65 + \$55.97 per each additional 100 devices or portion thereof over 200. In addition to the device fee above the following also applies- New FACP or Transmitter= \$169.23 each; New FACP with Transmitter= \$226.26. Replacement FACP or Transmitter= \$124.19 each; Replacement FACP with Transmitter= \$135.11.				
Permit review fee for Fire Extinguishing System (hood and duct, halon, dry chem, CO2, etc.)	New Installations- based on device or nozzle= 1 to 20= \$160.00; 21 to 40= \$200.00; 40 and up= \$200.00 + \$40.00 per each 40 additional or portion thereof over 40. System Modification- 1 to 5= \$100.00; 6 to 10= \$120.00; 11 to 20= \$160.00; 21 and up= \$160.00 + \$40.00 per each additional 20 or portion thereof over 20.	Fee based per device or nozzle. New Installations- 1 to 5= \$112.99; 6 to 10= \$135.11; 11 to 20= \$181.22; ≥21= \$181.22 + \$45.04 per each additional 20 devices or portion thereof over 20. Modifications to existing systems- 1 to 20= \$181.22; 21 to 40= \$226.26; ≥41= \$226.26 + \$45.04 per each 40	NA	NA	Hood and Duct- Pre-engineered= \$85.00; Custom engineered= \$175.00; Fixed Pipe Systems- Pre-engineered= \$115; Custom engineered= \$285.00	NA

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	Kirkland	Redmond	Snohomish County	Auburn	Pierce County	KENT
		additional devices or portion thereof over 40.				
Permit review fee for Automatic Sprinklers	New Installations- based on # of sprinkler heads- 1 to 100 heads= \$330.00; 101 to 200= \$410.00; 201 to 300= \$500.00; 301 and up= \$500.00 + \$50.00 per 100 or fraction thereof over 300. SFR, NFPA 13D Systems= 1 to 40 heads= \$180.00; 41 and up= \$240.00. Each Riser= \$25.00. Each post/wall indicator valve, double detector check and FDC= \$25.00. Modification or TI per head= 1 to 5= \$110.00; 6 to 10= \$150.00; 11 to 20= \$200.00; 21 to 40= \$260.00; 41 to 100= \$330.00; 101 to 200= \$410.00; 201 to 300= \$500.00; 301 and up= \$500 + \$50.00 per 100 or fraction thereof above 300.	Fee based per head or device. New System- 1 to 100= \$373.64; 101 to 200= \$462.65; 201 to 300= \$564.72; >300= \$564.72 + \$55.97 per each 100 devices or portion thereof over 300. Modification to existing systems- 1 to 5= \$124.19; 6 to 10= \$169.23; 11 to 20= \$226.26; 21 to 40= \$293.42; 41 to 100= \$373.64; 101 to 200= \$462.65; 201 to 300= \$564.72; >300= \$564.72 + \$55.97 per each additional 100 devices or portion thereof over 300. Each Riser= \$28.51. Each Supply (includes post or wall valve, FDC, Detector check valve assembly)= \$28.51. NFPA 13D in SFR fee per head- 1 to 40= \$203.08; >40= \$271.31	\$50.00 per riser system	NA	13D systems= \$85.00; 13 & 13R systems- each new riser up to 99 heads= \$30.00 + \$2.25 per head; Each wet riser over 99 heads= \$255.00; Each dry riser over 99 heads= \$285.00; each new deluge or pre-action system= \$285.00; Each new sprinkler/standpipe combination= \$345.00; Revision to existing system= \$30.00 + \$2.25 per head	NA

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	Kirkland	Redmond	Snohomish County	Auburn	Pierce County	KENT
Permit fee for Standpipe Systems	Horizontal Standpipes for Piers= \$79.00 per hr, one hr. min.	NA	NA	NA	Each new Class I system: wet= \$115.00, dry= \$115.00; Each Class 2 or 3 = \$175.00	NA
Plan review fee of water main extension	Fire Hydrants= \$79.00 per hr, one hr. min.	NA	NA	NA	NA	NA
Permit review fee for Sprinkler System supply mains	NA	NA	NA	NA	Included as part of 13 & 13D plan review fees.	NA
Permit review fee for installation of Flammable or Combustible Tanks in a commercial occupancy	\$79.00 per hr, one hr min.	NA	\$50.00	NA	NA	NA
Permit review fee for installation of Flammable or Combustible Liquid Tanks in a residential occupancy	NA	NA	NA	NA	NA	NA
Permit review fee for Removal or Abandonment of Commercial Flammable/Combustible Liquid Tank(s)	\$79.00 per hr, one hr min.	NA	NA	NA	NA	NA
Annual Contractor's Permit fee for removal or abandonment of Residential underground fuel tank.	NA	NA	NA	NA	NA	NA
Permit fee for fuel tanks for Commercial Oil Burning Equipment	NA	NA	NA	NA	NA	NA
Permit fee for Residential fuel tanks for Oil Burning Equipment	NA	NA	NA	NA	NA	NA
Permit for Commercial underground piping to flammable or combustible liquid storage tank(s)	NA	NA	NA	NA	NA	NA

BELLINGHAM, WASHINGTON
Fire Department Planning Study

TYPE OF FEE: Fire System Permits and Plan Checks	Kirkland	Redmond	Snohomish County	Auburn	Pierce County	KENT
Permit fee for Phase I Vapor Recovery Systems	NA	NA	NA	NA	NA	NA
Permit fee for Phase II Vapor Recovery Systems	NA	NA	NA	NA	NA	NA
LPG tank permit review fees	NA	NA	NA	NA	NA	NA
Others:	NA	High piled storage, haz mat or flammable liquids reviewed at hourly rate of \$131.66	NA	NA	Revisions to approved plans= \$50.00 per hour (1 hr. min.)	revisions to approved plans= \$75.00 per hour, 1/2 hr minimum.
Permit Review fee Smoke Control Systems	NA	Hourly rate of \$131.66	NA	NA		NA
		Overtime review fee if available= \$112.99 per hr. min. two hours. Second re-submittal and subsequent reviews= \$98.88 per hour.			High piled stock or rack storage systems additional to sprinkler riser fee= \$230.00	

(4) Inspection Fees (Not Part of Plan Checks or Permit Fee)

Inspection Fees (if not part of the Plans Check or Permit Fee)	King County FMO	Renton	Bellevue	Edmonds	Bothell
Construction/installation re-inspection fee	see below	\$30.00 per hour, one hour minimum, paid prior to insp.	\$155.00 deposit for inspections at \$31.00 per hour for smoke control systems; Fire Alarm Pre-wire Only= \$31.00	NA	no additional fees; rolled into plans check/permit fees
Inspection of alarm, extinguishing system, sprinkler system, standpipe system	\$143.00 for NFPA 13D and residential fire alarm systems plus \$2.20 per head, plug, device or	NA	Mechanical Inspection fee for Standpipes=\$12.70 for each floor; Fixed Fire Suppression Systems=\$48.00; Alarm system based on valuation- ≤\$500= \$28.00 + \$.52 per	NA	no additional fees; rolled into plans check/permit

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Inspection Fees (if not part of the Plans Check or Permit Fee)	King County FMO	Renton	Bellevue	Edmonds	Bothell
	nozzle; \$154.00 for commercial alarm systems NFPA 13 or 13R systems plus \$2.42 per head, plug, device or nozzle.		device. \$501 to \$2000= the value - \$501/100 X \$5.95 + \$39 X 25%. \$2001 to \$25,000= The value - \$2001/1000 X \$17.60 + \$128 X 25% + \$.52 per device. \$25001 to \$50000= the value - \$25001/1000 X \$15.80 + \$533 X 25% + \$.52 per device. \$50001 to \$100000= the value - \$50001/1000 X \$10.80 + \$928 X 25% + \$.52 per device. \$100001 and above= the value - \$100001/1000 X \$9.30 + \$1468 X 25% plus \$.52 per device.		fees
Inspection of Water main extension or replacement	\$126.50 per main	NA	Mechanical Inspection fee= \$28.00	NA	no additional fees; rolled into plans check/permit fees
Inspection of installation or removal of Commercial or Residential Oil Tanks	\$143.00	NA		NA	no additional fees; rolled into plans check/permit fees
Other inspection fees:	NA	NA	Mechanical Inspection fee for sprinkler systems in single family: 1-15 heads=\$46.00; 16-50 heads=\$48.00; 51-100 heads=\$48.00+.89 each over 50; over 100 heads=\$93.00 +.65 each head. Electrical Inspection fee for Low Voltage Alarm Systems (based on valuation) \$500 or less= \$28.00, other amounts are the same as the Fire Inspection Fee listed above but does not include the \$.52 per device	NA	no additional fees; rolled into plans check/permit fees
False Alarm Fines	NA	NA	Preventable Responses- 2nd occurrence within a year=\$75.00 each up to six, then charged for cost of response. Will cancel the billing if owner agrees to invest the amount in the alarm system.	NA	NA

Inspection Fees (if not part of the Plans Check or Permit Fee)	Mercer Island	Kirkland	Redmond	Pierce County	Kent
Construction/installation re-inspection fee	\$83.00/hr minimum 1 hr	NA	NA	\$50.00 per hr. see UBC 108.8 for explanation when it applies.	based on UBC section 305.8= \$75.00 per hour.
Inspection of alarm, extinguishing system, sprinkler system, standpipe system	\$83.00/hr minimum 1-hr	Low voltage Electrical for Fire Alarms based on linear feet- up to 1000 LF= \$79.00; 1001 to 10,000 LF= \$79.00 + \$5.00 for each additional 1,000 over 1001; 10,001 to 50,000 LF= \$180.00 + \$3.00 for each additional 1,000 over 10,001; 50,001 to 200,000 LF= \$300.00 + \$2.00 for each additional 1,000 over 50,001; 200,000 to 1 million LF= \$700.00 + \$1.00 for each additional 1,000 over 200,001 LF; Over 1 million LF= \$2,000.00 + \$.50 for each additional 1,000 over 1 million.	NA	Inspection of new or remodeled alarm system with One to four zones= \$115.00; each additional zone= \$12.00; Sprinkler supervisory only= \$115.00; One and two family dwellings= \$85.00. Hood System or other fixed pipe system- pre-engineered=\$60.00, custom engineered= \$115.00. Sprinkler system , each riser up to 99 heads= \$230.00; each riser over 99 heads and deluge or pre-action= \$285.00; each combination sprinkler/standpipe= \$345.00. Revision to existing sprinkler system = \$60.00. Rack system inspection fee= \$30.00. 13D systems= \$60.00. Standpipe inspections- Class 1 dry= \$85.00; Class 1 wet and each Class 2 or 3= \$175.00.	NA
Inspection of Water main extension or replacement	under review	NA	NA	Included in the 13 & 13D inspection fee	NA
Inspection of installation or removal of Commercial or Residential Oil Tanks	\$103.00	NA	NA	NA	NA
Other inspection fees:	NA	After normal hours inspection= \$118.50, min two hours. Re-inspections when work is not complete= \$79.00. Other inspections called for and not specifically	Third and subsequent reinspections= \$98.88 per hour. Overtime rate for inspections after	Inspections outside normal business hours= \$50.00 hr. with 2 hr. minimum. Inspections not specifically indicated= \$50.00 per hr (minimum one hr.)	Hydrant flow tests= \$75.00 per hour. Inspections not specifically indicated= \$75.00 per hour, 1/2 hr

BELLINGHAM, WASHINGTON
Fire Department Planning Study

Inspection Fees (if not part of the Plans Check or Permit Fee)	Mercer Island	Kirkland	Redmond	Pierce County	Kent
		listed= \$79.00	hours= \$112.99 per hr, minimum of two hours.		minimum. Inspections outside of normal work hours= \$75.00 per hour, 1/2 hr minimum.
False Alarm Fines	NA	NA	NA	NA	NA

2. THE FIRE DEPARTMENT SHOULD INCREASE FEES FOR PLAN REVIEWS AND INSPECTIONS AND COULD CHARGE FOR SOME KINDS OF NON-EMS RESPONSES.

The Fire Department's current fee structure is generally flat. Most fees range between \$50 and \$200. The range is generally accounted for by the complexity of the plan review and inspection. These fees do not appear, however, to have been related back to the cost of providing the services. The table, below, provides the project team's analysis of the true direct cost of providing these services today:

Salaries (2 Professional / 1 Support)	\$180,000
Benefits (@23%)	\$41,400
Total Compensation	\$221,400
Operating Cost / Overhead Estimate (10%)	\$22,140
Indirect Cost Estimate (3%)	\$6,642
Total Life Safety Operating Cost	\$250,182
Hourly Rate (3 Position Average) - All Hours	\$40
Hourly Rate (3 Position Average) - Available Hours	\$47
Inspection / Plan Review Hours	1,913
Support Hours	1,768
Total Productive Hours	3,681
Hourly Rate / Productive Hours (3 Positions)	\$68
Number of Inspections / Plan Reviews	1,113
Cost Per Inspection / Plan Review	\$225

This analysis shows a number of alternatives methods for calculating the true cost of providing services. Setting fees for inspections and permits at these levels would allow the Life Safety Division to cover its costs. For example, charging the true cost of \$68 per hour (and shifting to an hourly charge system) would allow the Division to fully cover its costs.

Another, simpler, method for examining the fees collected is to examine the proportion of cost that is collected by the Division. The table, below, shows the current rate of collections relative to the cost of providing the services:

Type	Fees
Fire Prevention Permits	\$71,464
Uniform Fire Code	\$2,000
Plan Reviews (Est. 532 @ \$150)	79,800
Total	153,264

This would suggest that increasing the fees that are in place by 50% would result in the ability to cover the costs of the service. It should be noted that the current costs in the unit are higher (since there are three professionals in that unit at this time not the recommended two). Given that the services of the Division are largely focused on supporting businesses and development, it is appropriate that the full cost of providing these services be supported by that constituency through fees.

The Fire Department should also consider other ideas for fee-for-service. A number of communities around the United States, under pressure to address budgetary shortfalls, have begun to consider a range of fees for responding to non-EMS incidents, including:

- Responding to automobile accidents.
- Responding to non-structure fires (cars, dumpsters, etc.).
- Responding to structure fires.
- Responding to false alarms (typically after second or third).

The opportunity to raise revenue from these types of fees is comprised of several parts:

- The level at which the fees are set.
- The number of incidents.
- The success (and effort) with collections.

A number of communities that have established these fees make only a single effort to collect them. The table, below, shows the potential revenues from these types of fees:

Type	Number	Fee	Maximum	10%	25%	50%	75%
Service Calls	600	\$50	\$30,000	\$3,000	\$7,500	\$15,000	\$22,500
Car Accidents	1,200	\$100	\$120,000	\$12,000	\$30,000	\$60,000	\$90,000
Structure / Contents Fires	300	\$500	\$150,000	\$15,000	\$37,500	\$75,000	\$112,500
False Alarms (50% of Total)	440	\$50	\$22,000	\$2,200	\$5,500	\$11,000	\$16,500
Total			\$322,000	\$32,200	\$80,500	\$161,000	\$241,500

Recommendation: The City and the Fire Department should consider implementing some of these response-based fees for service. The project team cannot estimate the likely revenue other than to say that if all of the above are implemented, revenues may range between \$32,000 and \$161,000 annually. However, the project team's experience with these types of fees is that collections are more likely to be in the 25% range than the 75% range.

3. THE FIRE DEPARTMENT SHOULD ALSO CONSIDER SOME ADDITIONAL FEE OPPORTUNITIES

The Bellingham Fire Department should also examine other potential cost-avoidance or revenue generation opportunities. These include the following types of revenue sources:

- Impact fees for new development.
- Payment in lieu of taxes for tax exempt locations.
- Payment (or increased payment) within the various mutual aid agreements.

The approach for setting the fees for each of these options is described, below:

Option	Description of Methodology
Impact Fees	The intention of impact fees is to offset future capital costs derived from growth in the community with dedicated fees. Analysis indicates that current station locations provide service effectively in the current boundaries of the City. However, growth in all directions will continue to increase demand for stations. At this time, impact fees would not be justified for the current service area.

Option	Description of Methodology
Payment in Lieu of Taxes	In this case the Fire Department (and possibly other City service providers) would charge the University for services provided. Typically these fees are charged on a per-call or per unit basis. For example, if calls to the University represent 250 unit runs per year (of a total 20,823) – the University would represent 1.2% of the Fire Department's activity. If applied to the total budget of the Fire Department, the University could be approach to make a PILOT of \$250,000. Similar efforts could be made to recover costs from other institutions in the service area such as the County Jail (which uses services at the same level). Total PILOT fees using this approach could exceed \$500,000. The Fire Department should implement such a program.
Mutual Aid Cost Recovery	As the primary EMS / Fire provider in the service area the City of Bellingham is often called upon to provide services to communities and fire districts outside the City. Efforts to recover costs from mutual aid provision typically are done when there is an asymmetrical exchange of services (when the exchange of assistance is symmetrical the cost is assumed to be a "wash"). However, the City provided units outside the City of Bellingham 139 times in 2003 (these do not include any Medic units sent into the County). If the same approach is utilized as described, above, the City could recoup an additional \$139,000. Note that the per-run cost for the Fire Department in 2003 was approximately \$1,000. The Fire Department should work with neighboring jurisdictions to reduce this figure or to institute a cost-recovery approach.

The Matrix Consulting Group recommends that the Fire Department and the City pursue two of these options: payment in lieu of taxes (from the University and the County for the Jail) and to recover some portion of the mutual aid cost.

Recommendation: Pursue opportunities to increase Departmental revenues by as much as \$640,000 annually through these two approaches. Any additional revenues would be useful in offsetting the costs of operating the Fire Department. There are few immediate opportunities to implement impact fees given current City boundaries the existing service system.

City of Bellingham, Washington

4 Minute Travel Time From Existing Fire Stations With EMS Calls



1 inch equals 1.804738 miles

Legend



Bellingham Fire Stations

4 Minute Drive Times



Station 1



Station 2



Station 3



Station 4



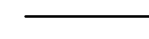
Station 5



Station 6



2003 EMS Calls



Streets



City Limit

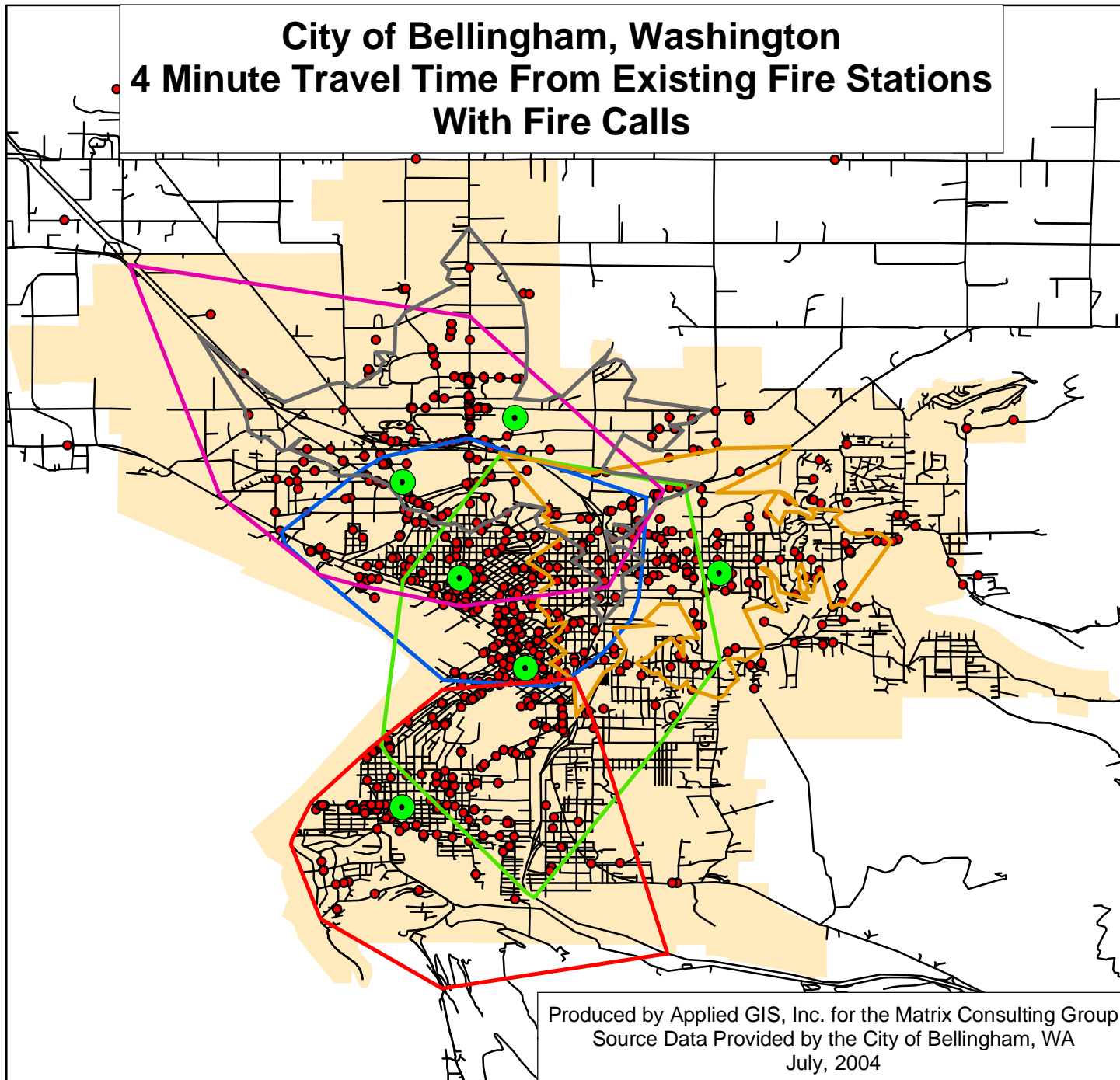
Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington

4 Minute Travel Time From Existing Fire Stations With Fire Calls



1 inch equals 1.804738 miles



Legend



Bellingham Fire Stations

4 Minute Drive Times



Station 1



Station 2



Station 3



Station 4



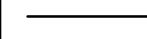
Station 5



Station 6



2003 Fire Calls



Streets



City Limit

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Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington

4 Minute Travel Time From Existing Fire Stations With "Other" Calls



1 inch equals 1.804738 miles

Legend



Bellingham Fire Stations

4 Minute Drive Times



Station 1



Station 2



Station 3



Station 4



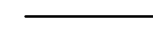
Station 5



Station 6



2003 "Other" Calls



Streets



City Limit

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Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington

8 Minute Travel Time From Existing Fire Stations With EMS Calls



1 inch equals 1.804738 miles

Legend



Bellingham Fire Stations

2003 Calls

Type of Call



EMS

Streets



City Limit

8 Minute Drive Time

Fire Stations



Station 1



Station 2



Station 3



Station 4



Station 5



Station 6

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Source Data Provided by the City of Bellingham, WA
July, 2004


City of Bellingham, Washington

8 Minute Travel Time From Existing Fire Stations With Fire Calls




1 inch equals 1.804738 miles

Legend

 Bellingham Fire Stations

2003 Calls

Type of Call

 Fire

 Streets

 City Limit

8 Minute Drive Time

Fire Stations

 Station 1

 Station 2

 Station 3

 Station 4

 Station 5

 Station 6

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Source Data Provided by the City of Bellingham, WA
July, 2004


City of Bellingham, Washington

8 Minute Travel Time From Existing Fire Stations With "Other" Calls




1 inch equals 1.804738 miles


Legend

 Bellingham Fire Stations

2003 Calls

Type of Call

 Other


 Streets

 City Limit


8 Minute Drive Time


Fire Stations


 Station 1

 Station 2

 Station 3

 Station 4

 Station 5

 Station 6

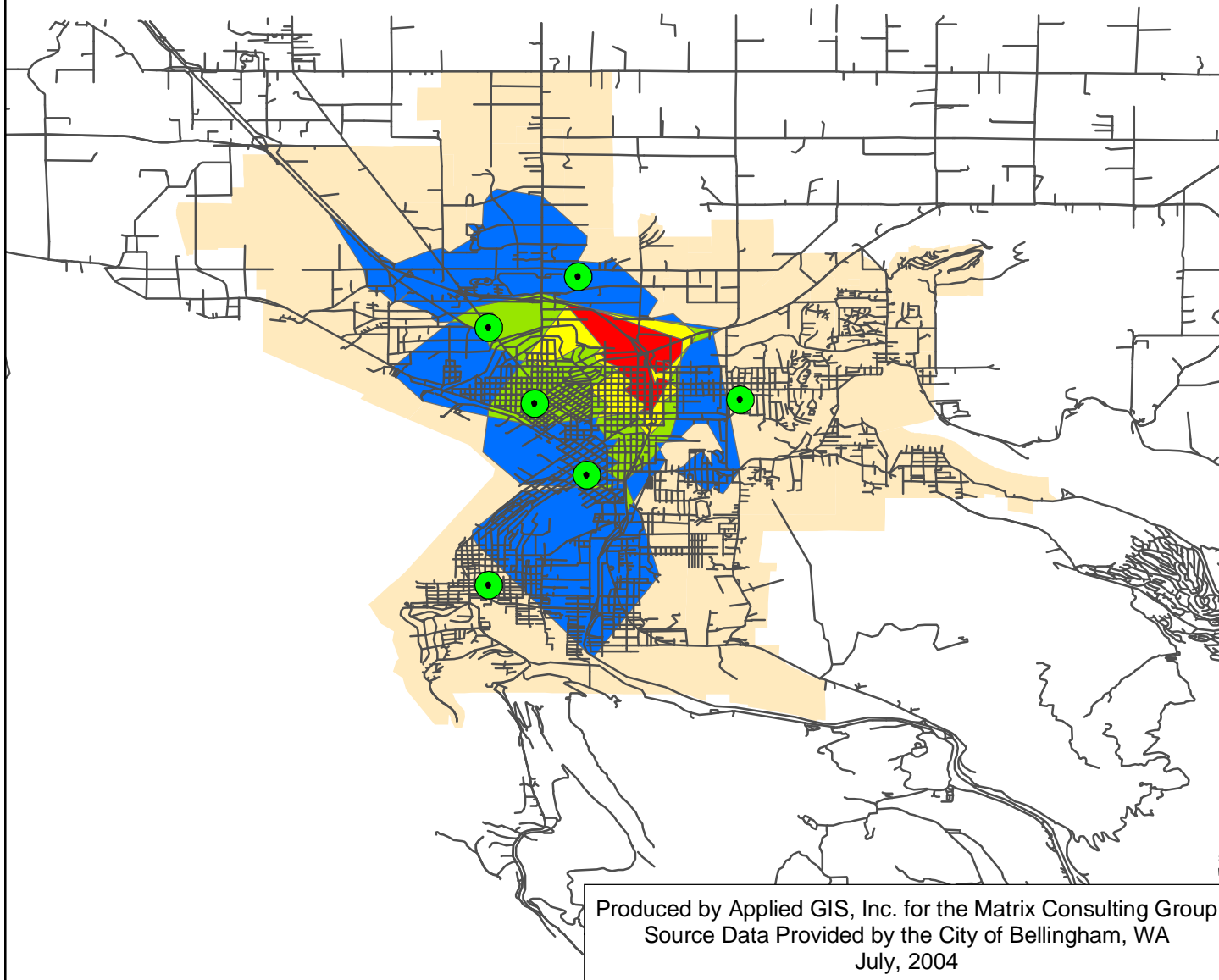
Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington




Areas of Overlap For 4 Minute Travel Times From Existing Fire Stations



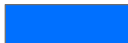



1 inch equals 2.480832 miles



Legend

-  City Limit
-  Fire Stations
-  Streets

Response Time Overlap

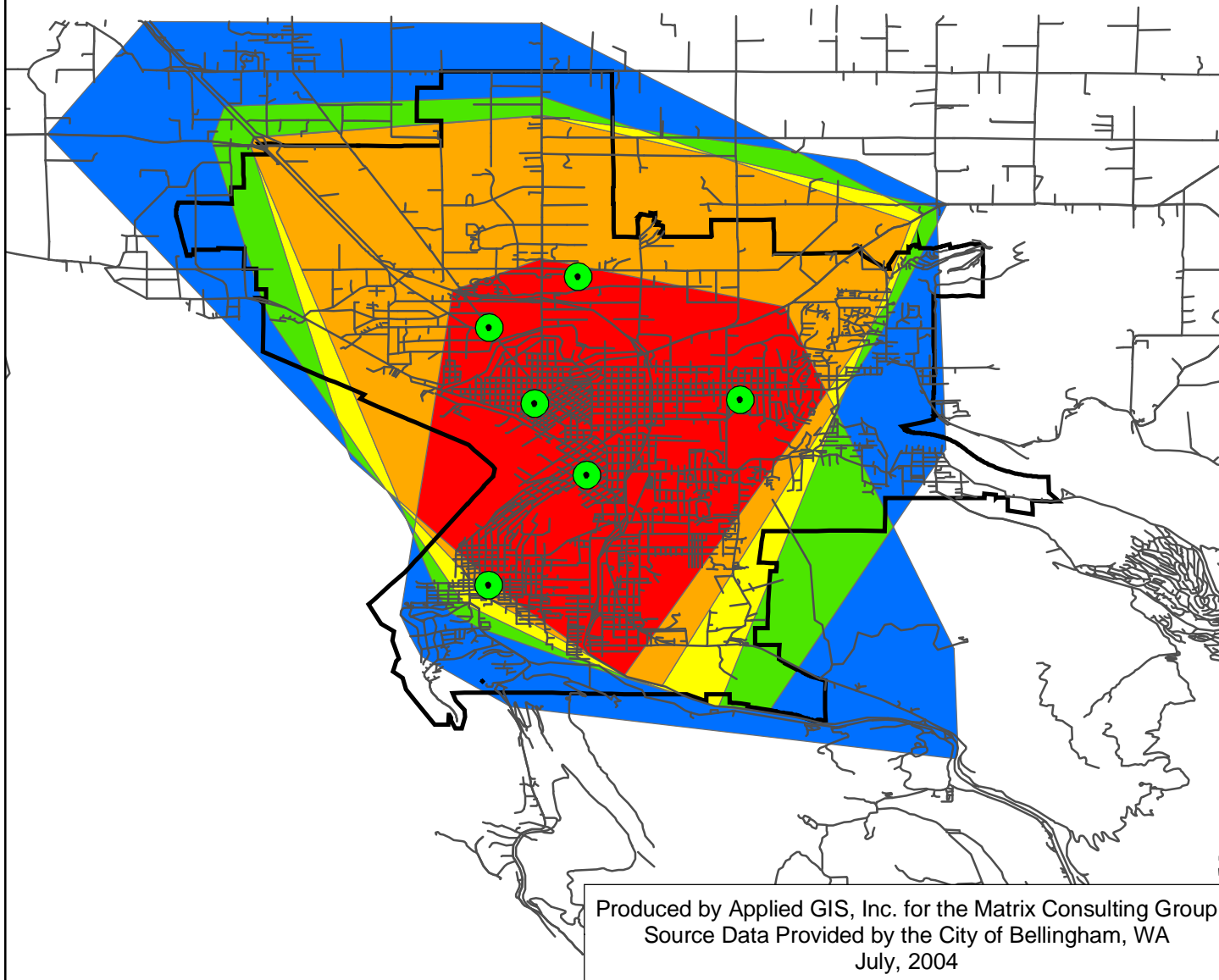
-  2 Stations
-  3 Stations
-  4 Stations
-  5 Stations

Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington Areas of Overlap For 8 Minute Travel Times From Existing Fire Stations



1 inch equals 2.480832 miles



Legend



Fire Stations



Streets



City Limits

Response Time Overlap



2 Stations



3 Stations



4 Stations



5 Stations



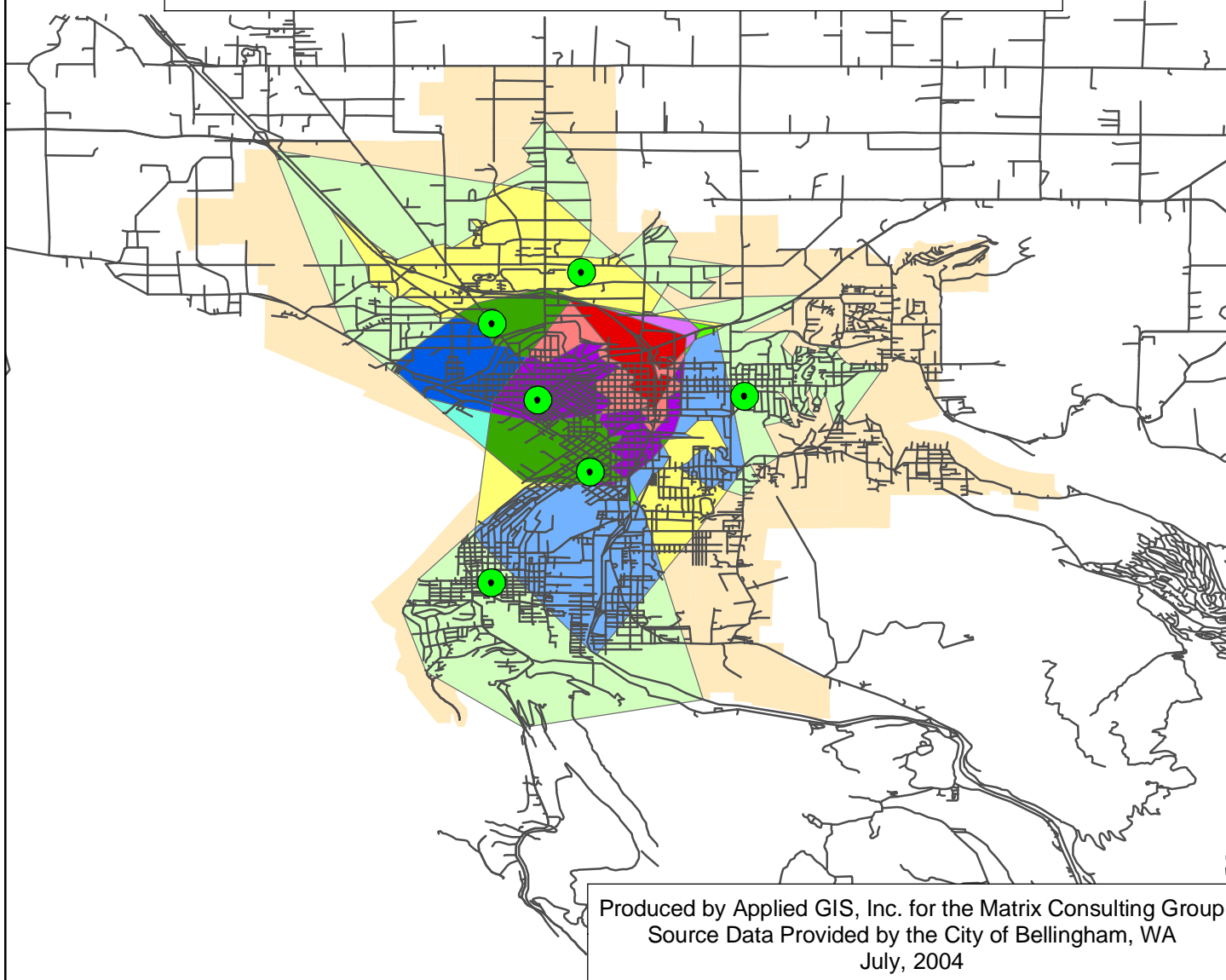
6 Stations

Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington **Areas of Overlap For 4 Minute Travel Times** **From Existing Fire Stations** **With Current Maximum Deployment Potential**



1 inch equals 2.480832 miles



Legend













- City Limit
- Fire Stations
- Streets
- Current Max # of Personnel**
- 3
- 6
- 8
- 9
- 11
- 12
- 14
- 15
- 17
- 20
- 23

**City of Bellingham, Washington
Areas of Overlap For 4 Minute Travel Times
From Existing Fire Stations
With Alternative #1 Maximum Deployment Potential**



1 inch equals 2.480832 miles

Legend

-  City Limit
-  Fire Stations
-  Streets
- Alt 1: Max # of Personnel**
 -  4
 -  5
 -  8
 -  9
 -  12
 -  13
 -  16
 -  17
 -  21

Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington
Areas of Overlap For 4 Minute Travel Times
From Existing Fire Stations
With Alternative #2 Maximum Deployment Potential




1 inch equals 2.480832 miles












Legend

 City Limit

 Fire Stations

 Streets

Alt 2: Max # of Personnel

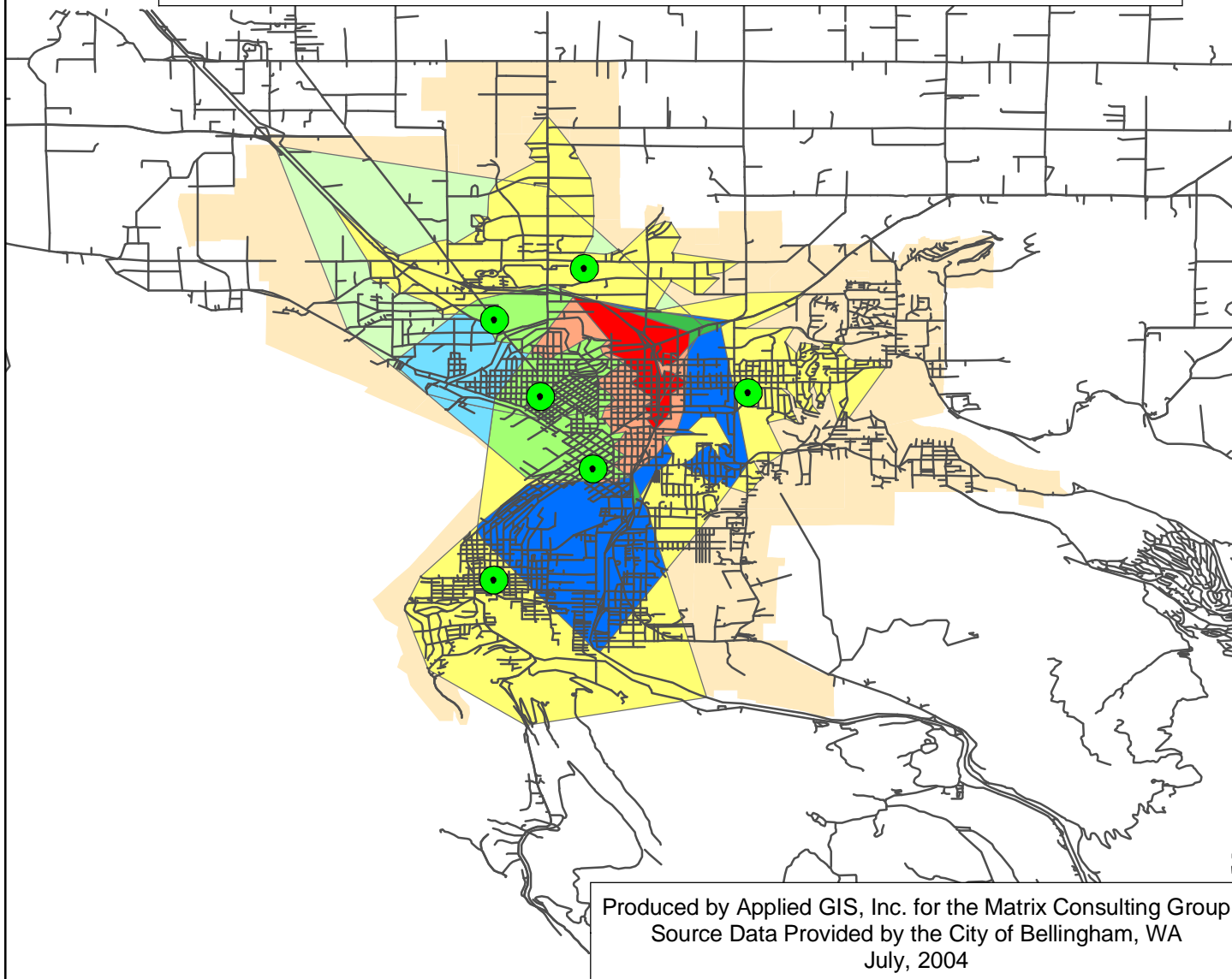
-  4
-  5
-  8
-  9
-  10
-  12
-  13
-  14
-  17
-  18
-  22

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 Source Data Provided by the City of Bellingham, WA
 July, 2004












**City of Bellingham, Washington
Areas of Overlap For 4 Minute Travel Times
From Existing Fire Stations
With Alternative #3 Maximum Deployment Potential**



1 inch equals 2.480832 miles



Legend

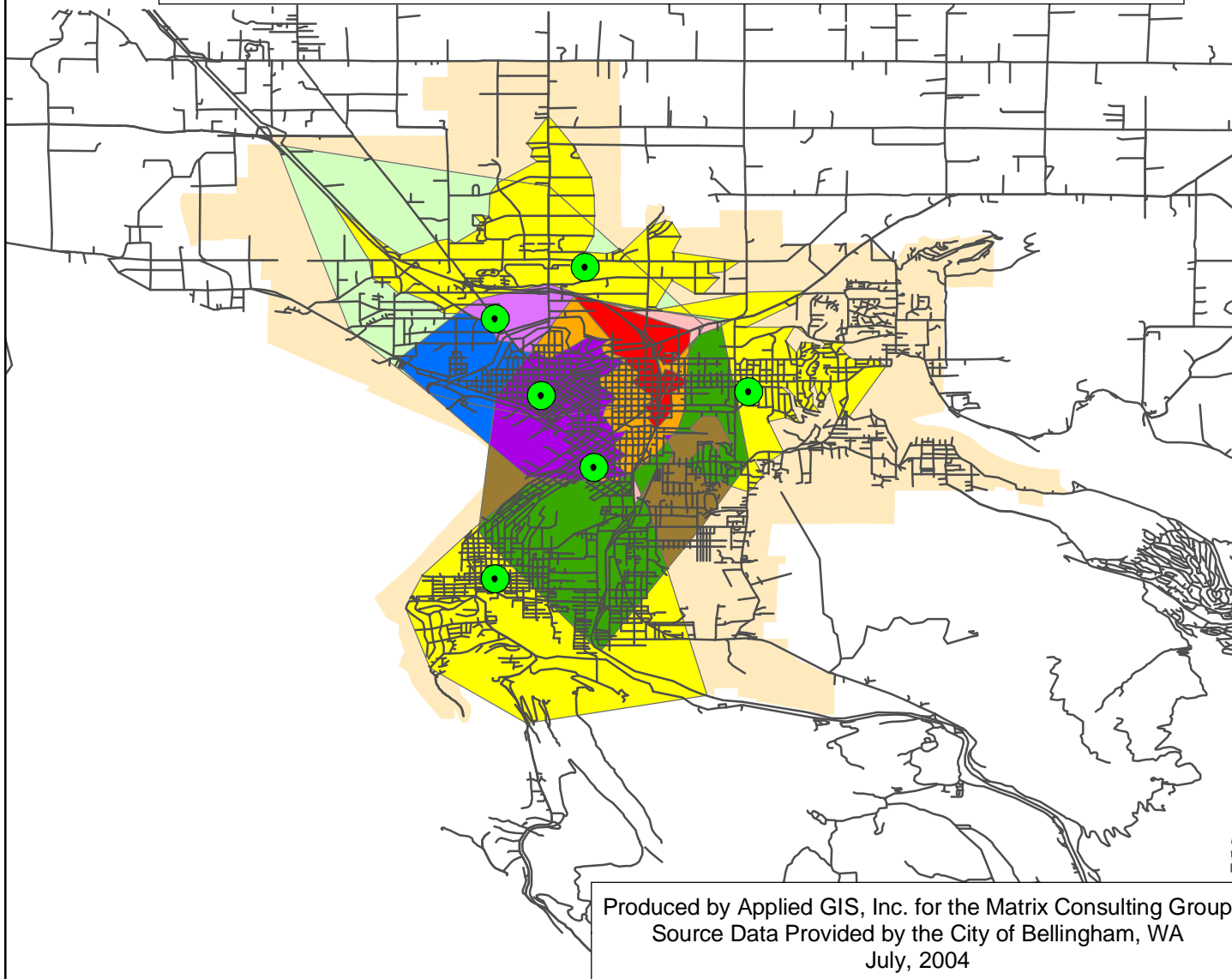
-  City Limit
-  Fire Stations
-  Streets
- Sum_Alt3**
-  0
-  4
-  7
-  8
-  11
-  12
-  15
-  19

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Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington
Areas of Overlap For 4 Minute Travel Times
From Existing Fire Stations
With Alternative #4 Maximum Deployment Potential



1 inch equals 2.480832 miles



Legend

- City Limit
- Fire Stations
- Streets

Alt 4: Max # of Personnel

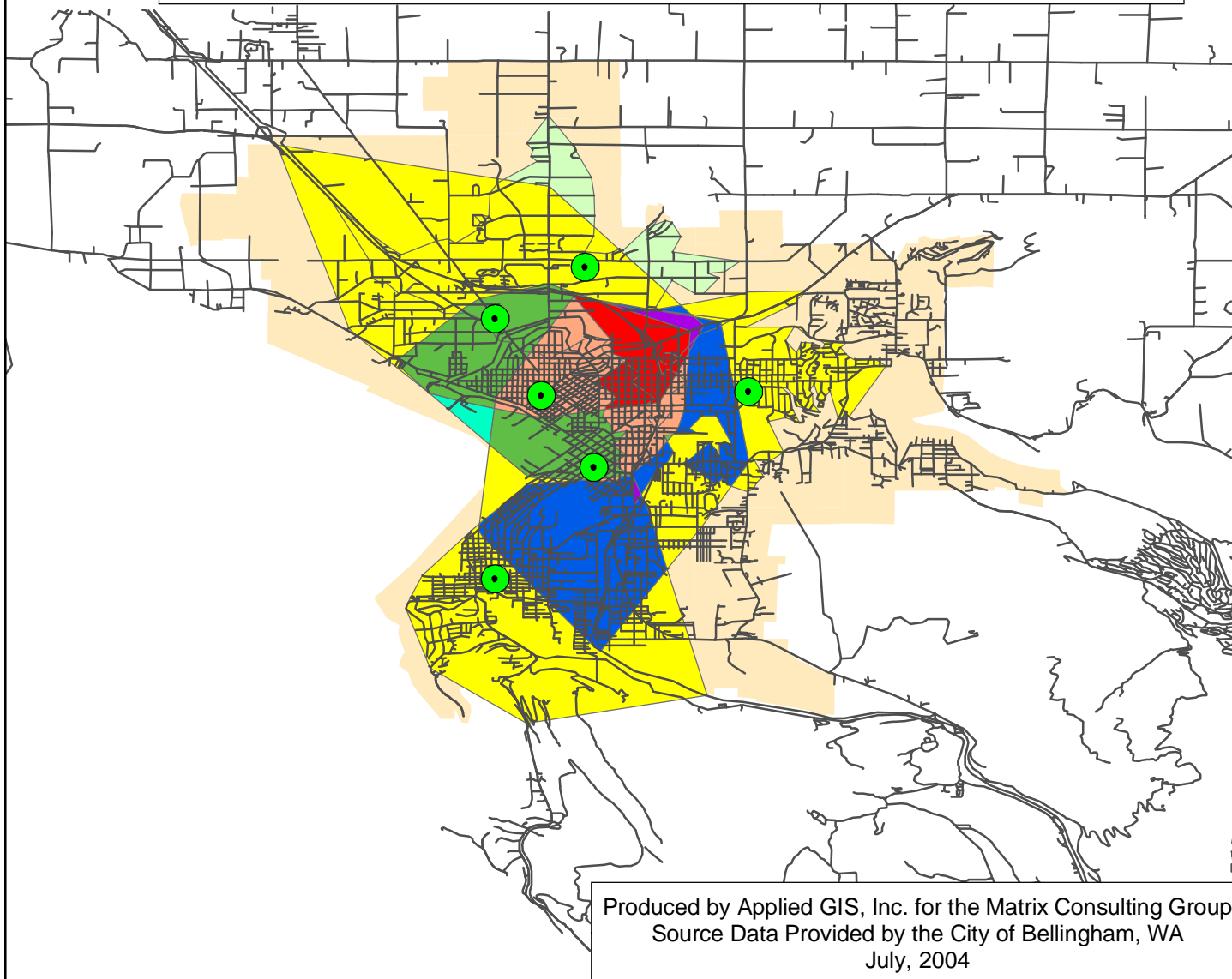
- 0
- 4
- 5
- 7
- 8
- 9
- 11
- 12
- 13
- 15
- 16
- 20

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 July, 2004

**City of Bellingham, Washington
Areas of Overlap For 4 Minute Travel Times
From Existing Fire Stations
With Alternative #5 Maximum Deployment Potential**



1 inch equals 2.480832 miles



Legend

 City Limit

 Fire Stations

 Streets

Alt 5: Max # of Personnel

 0

 4

 7

 8

 11

 12

 15

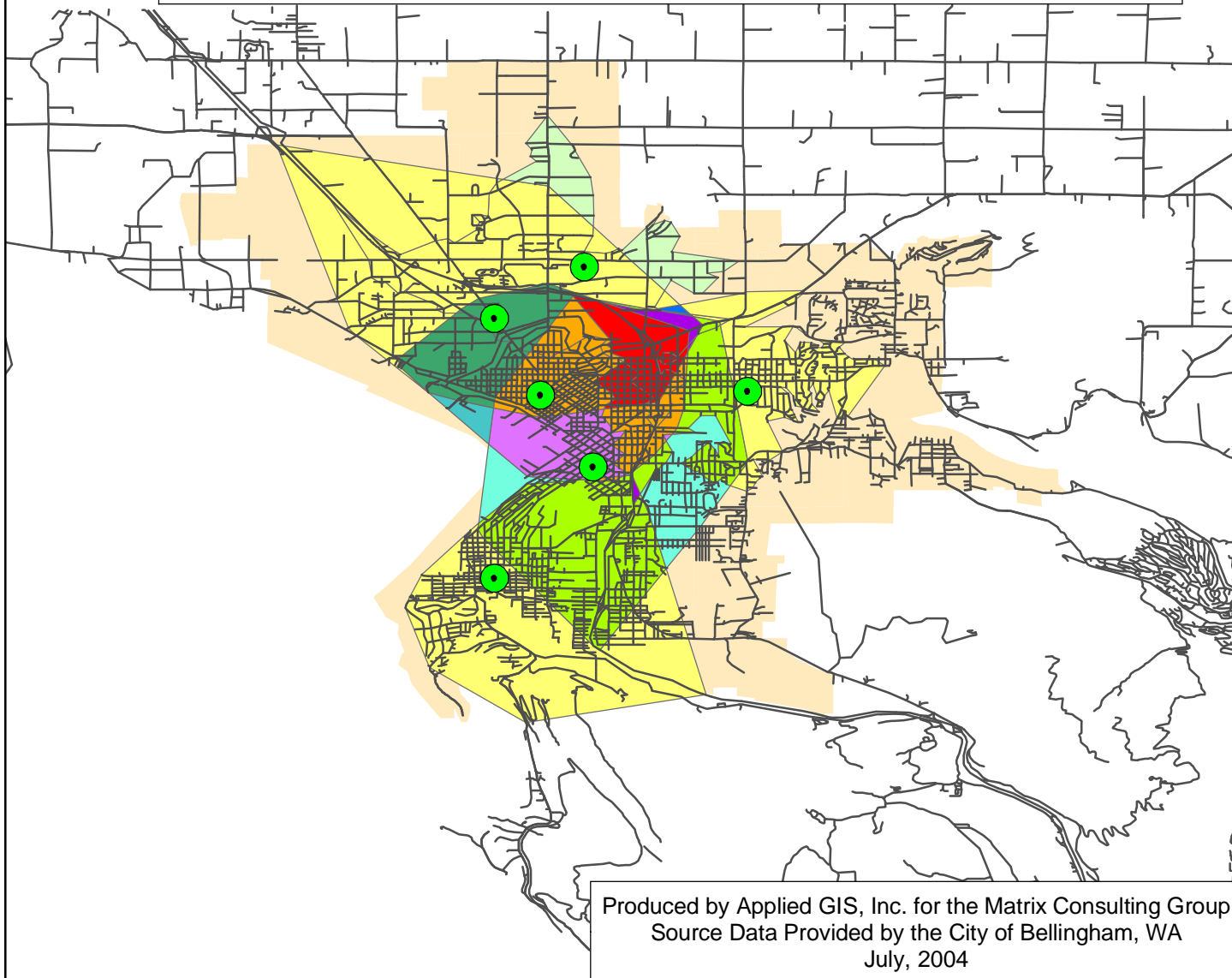
 19

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Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington
Areas of Overlap For 4 Minute Travel Times
From Existing Fire Stations
With Alternative #6 Maximum Deployment Potential




1 inch equals 2.480832 miles















Legend

 City Limit

 Fire Stations

 Streets

Alt 6: Max # of Personnel

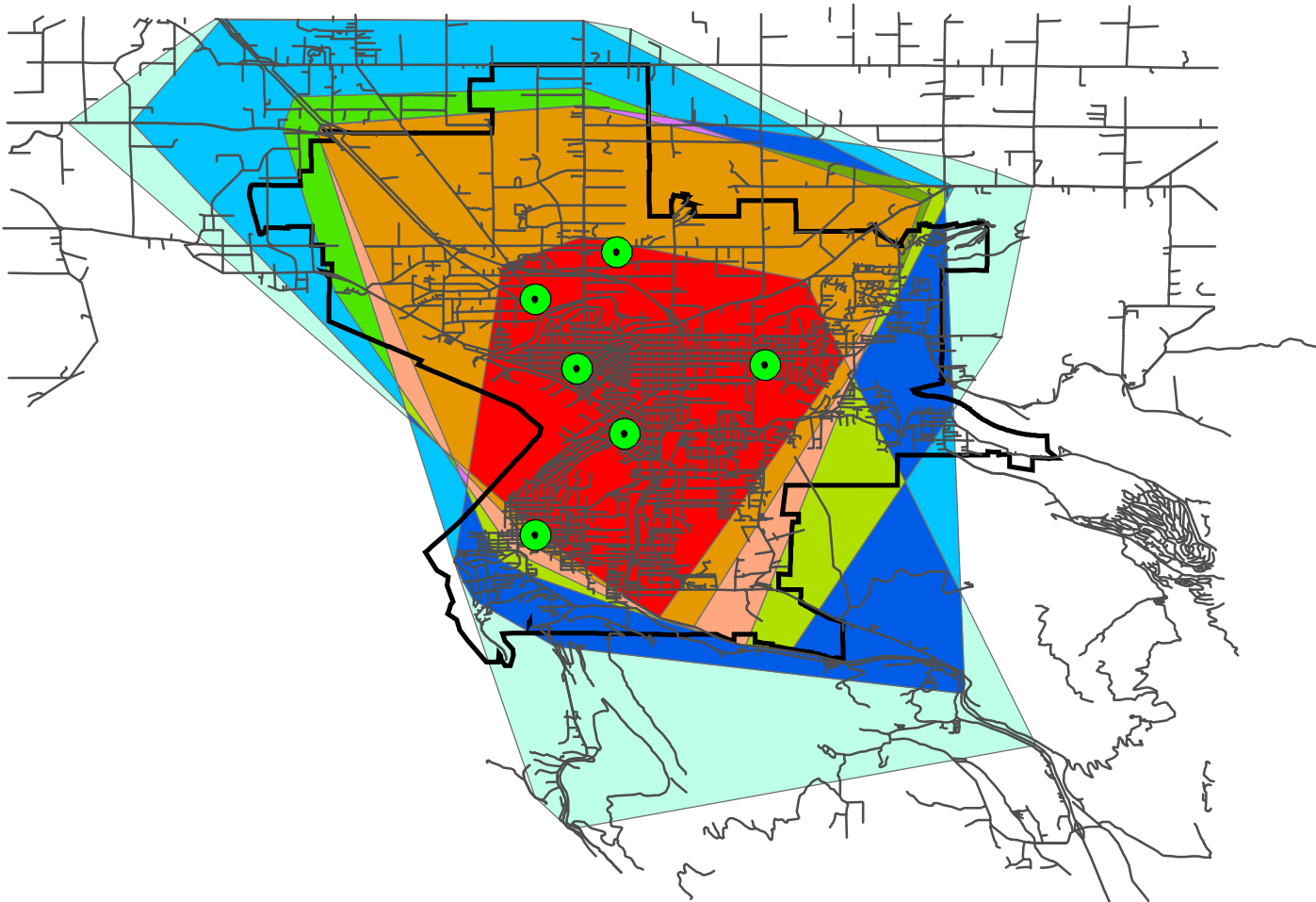
- | | |
|---|----|
|  | 0 |
|  | 4 |
|  | 5 |
|  | 7 |
|  | 8 |
|  | 9 |
|  | 11 |
|  | 12 |
|  | 13 |
|  | 15 |
|  | 16 |
|  | 20 |

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 Source Data Provided by the City of Bellingham, WA
 July, 2004

**City of Bellingham, Washington
Areas of Overlap For 8 Minute Travel Times
From Existing Fire Stations
With Current Maximum Deployment Potential**



1 inch equals 3.026299 miles



Legend



Fire Stations



Streets

Current Max # of Personnel



3



6



9



12



14



15



17



20



23



26



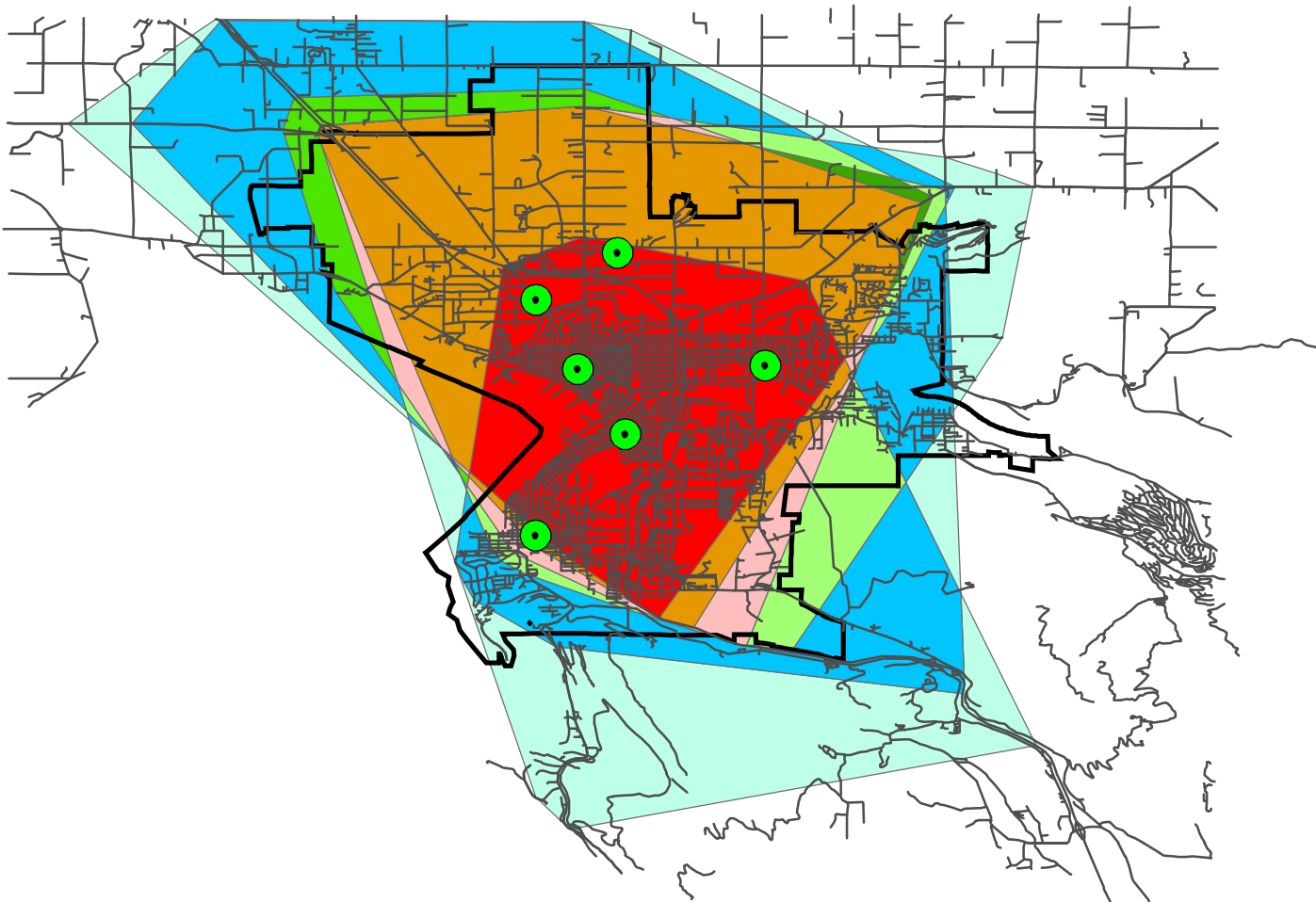
City Limits

Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

**City of Bellingham, Washington
Areas of Overlap For 8 Minute Travel Times
From Existing Fire Stations
Alternative #1 Maximum Deployment Potential**



1 inch equals 3.028672 miles



Legend



Fire Stations



Streets

Alt1: Max # of Personnel



4



8



9



12



13



16



17



21



25



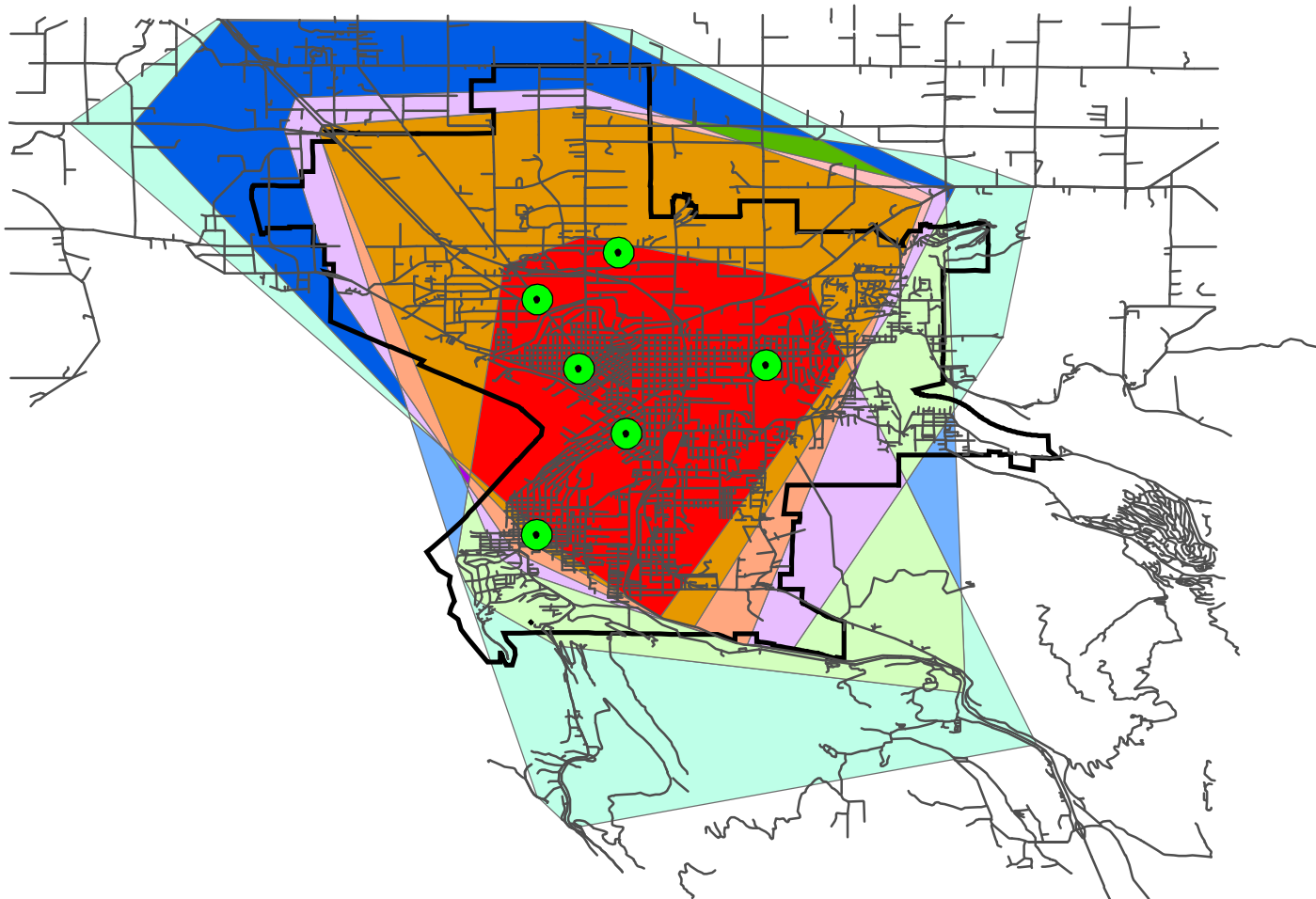
City Limits

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Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington
Areas of Overlap For 8 Minute Travel Times
From Existing Fire Stations
Alternative #2 Maximum Deployment Potential



1 inch equals 3.028672 miles

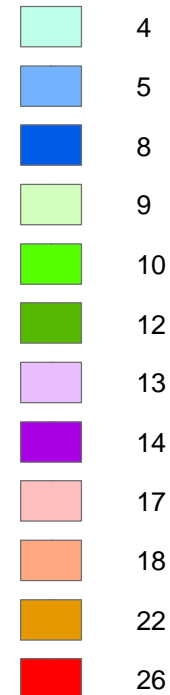


Legend

Fire Stations

Streets

Alt2: Max # of Personnel



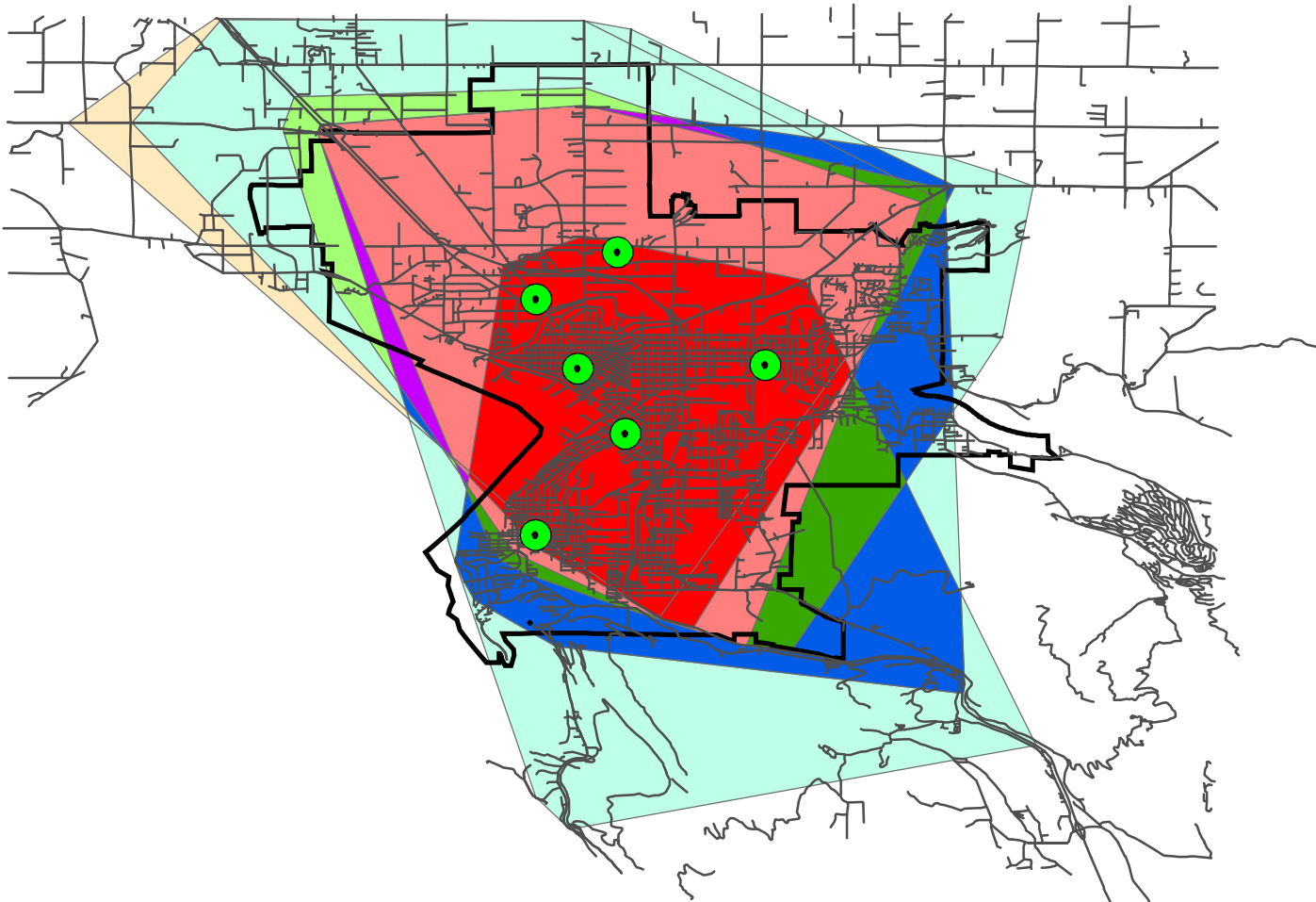
City Limits

Produced by Applied GIS, Inc. for the Matrix Consulting Group
 Source Data Provided by the City of Bellingham, WA
 July, 2004

**City of Bellingham, Washington
Areas of Overlap For 8 Minute Travel Times
From Existing Fire Stations
Alternative #3 Maximum Deployment Potential**



1 inch equals 3.028672 miles



Legend



Fire Stations



Streets

Alt 3: Max # of Personnel



0



4



8



11



12



15



19



23



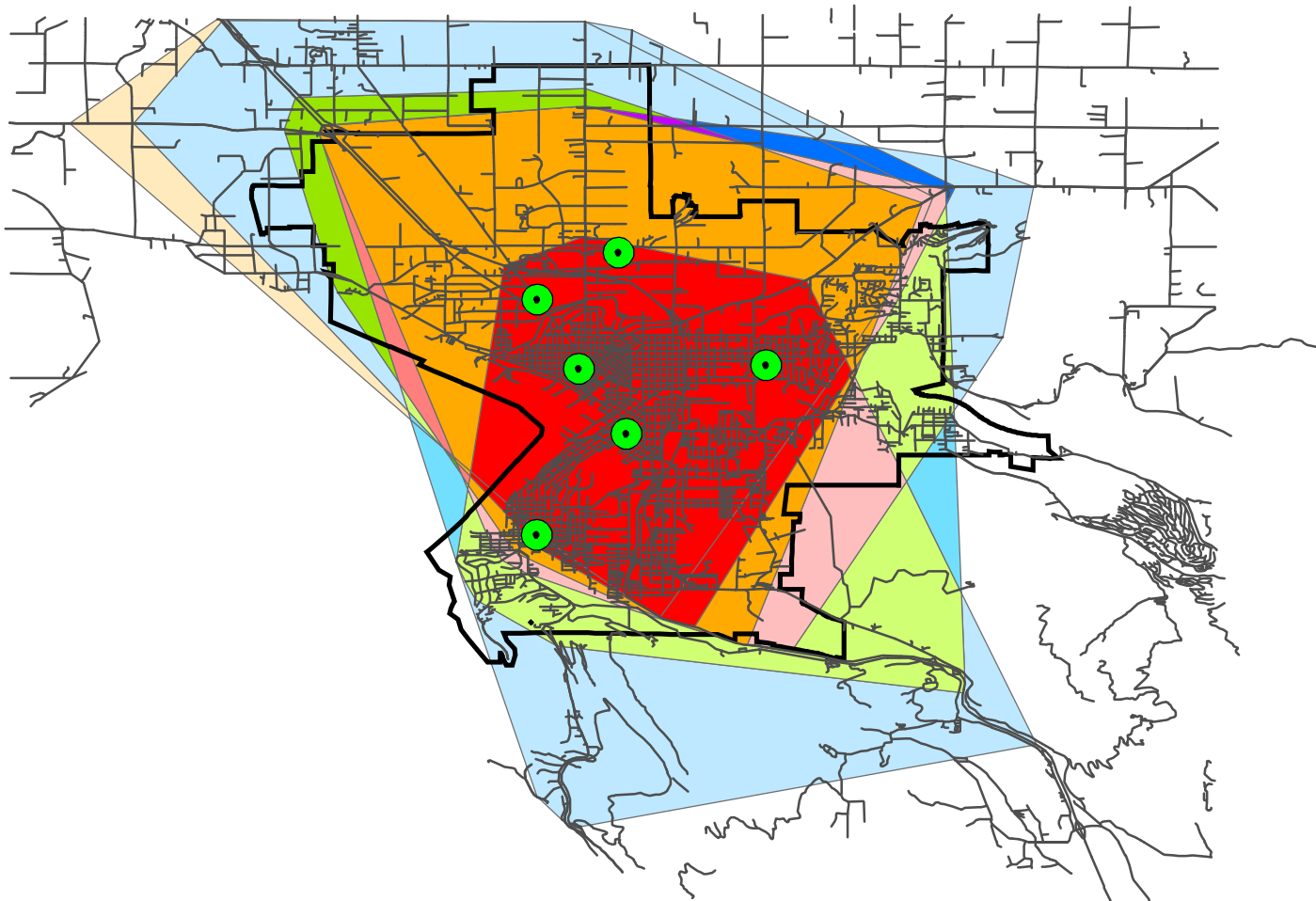
City Limits

Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

**City of Bellingham, Washington
Areas of Overlap For 8 Minute Travel Times
From Existing Fire Stations
Alternative #4 Maximum Deployment Potential**



1 inch equals 3.028672 miles

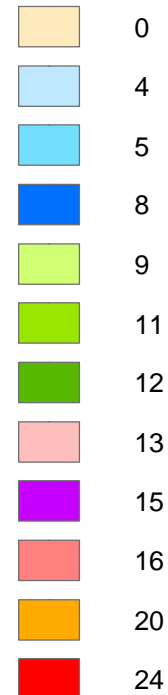


Legend

● Fire Stations

— Streets

Alt 4: Max # of Personnel



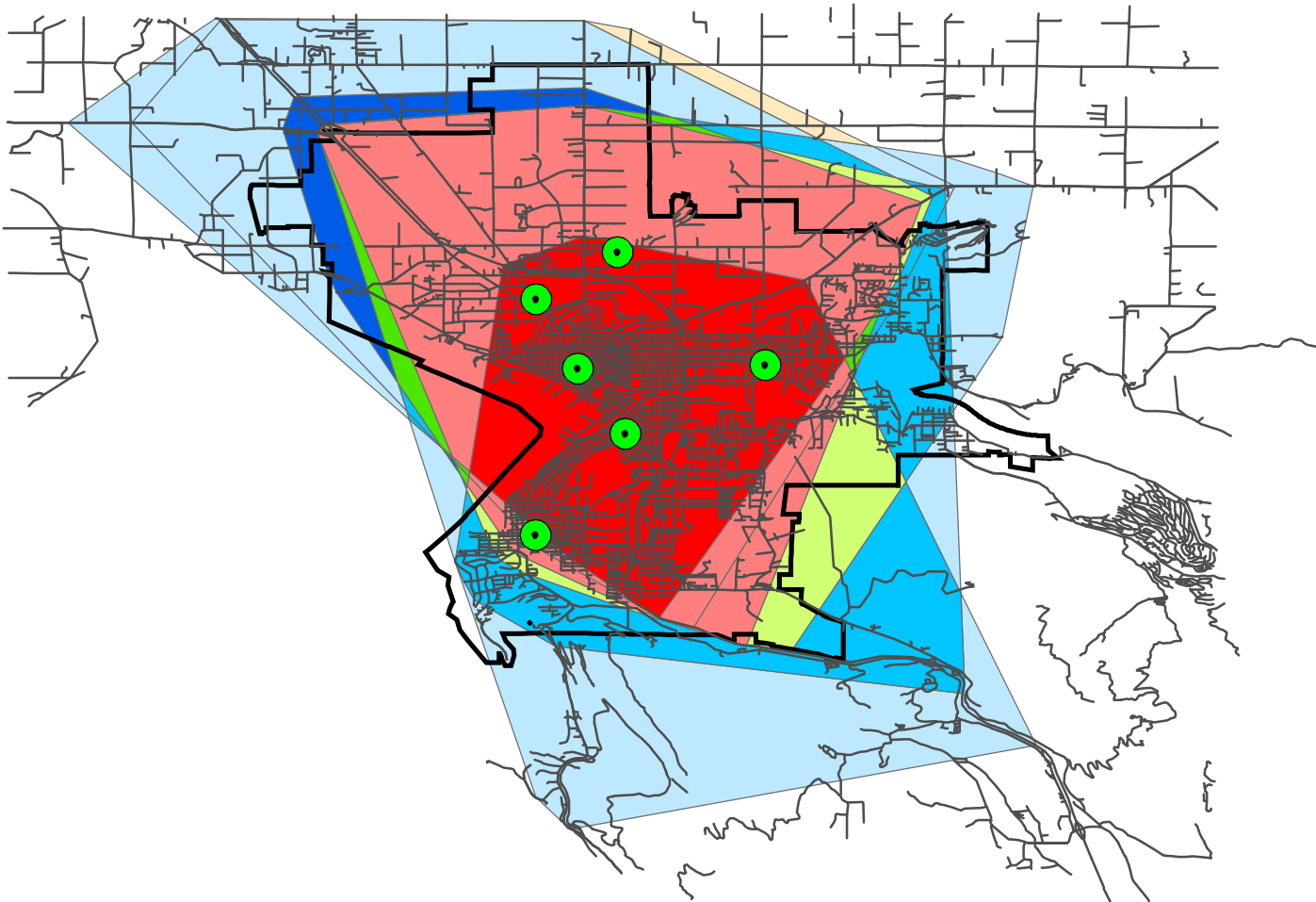
□ City Limits

Produced by Applied GIS, Inc. for the Matrix Consulting Group
Source Data Provided by the City of Bellingham, WA
July, 2004

**City of Bellingham, Washington
Areas of Overlap For 8 Minute Travel Times
From Existing Fire Stations
Alternative #5 Maximum Deployment Potential**



1 inch equals 3.028672 miles



Legend



Fire Stations



Streets

Alt 5: Max # of Personnel



0



4



8



11



12



15



19



23



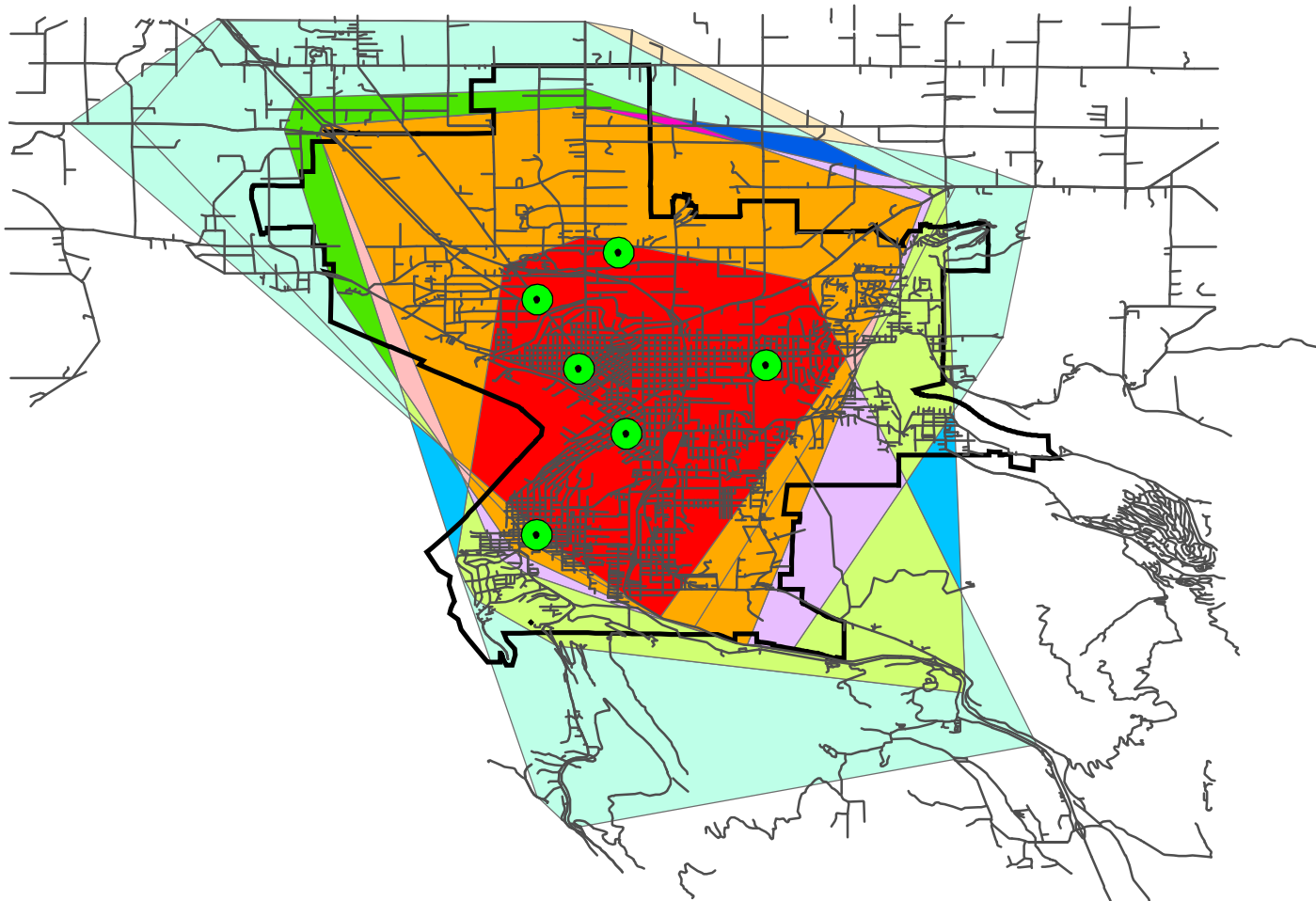
City Limits

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Source Data Provided by the City of Bellingham, WA
July, 2004

City of Bellingham, Washington
Areas of Overlap For 8 Minute Travel Times
From Existing Fire Stations
Alternative #6 Maximum Deployment Potential



1 inch equals 3.028672 miles

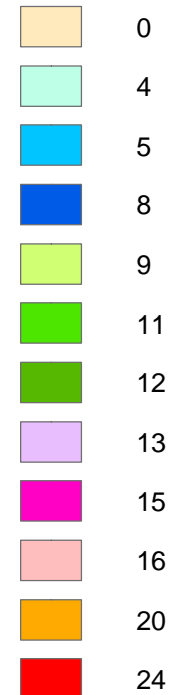


Legend

● Fire Stations

— Streets

Alt 6: Max # of Personnel



City Limits

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 Source Data Provided by the City of Bellingham, WA
 July, 2004



4322 N. Beltline Road, Suite 112B
Irving, Texas 75038

August 9, 2004

To: Bill Boyd, Fire Chief, Bellingham Fire Department
From: Travis Miller

SUBJECT: TWO OPTIONS FOR CONSIDERATION

The purpose of this memo is to apprise the City of two major alternatives to consider relating to the provision of fire and emergency services. These are areas which were outside of the scope of our work, so these alternatives were not explored in the final report. However, we believe that these alternatives should be considered should current financial circumstances change. The first section, which follows, presents an analysis of the potential impact from consolidating emergency communications services in the County. The second section presents an analysis of the possibility of privatizing EMS transport services.

1. THE POTENTIAL TO CONSOLIDATE THE TWO COMMUNICATIONS CENTERS IN WHATCOM COUNTY.

To assess all the cost saving options available to the City and the Bellingham Fire Department, the project team conducted an initial assessment of current communication center staffing, as well as the staffing requirements under a potentially consolidated What-Comm and Prospect Communications Center.

This preliminary staffing analysis consists of the following components.

- Basic profile of current operations.
- Staffing and workload analysis.

The following section provides our basic understanding of the overall operations for the two communication centers.

(1) Current Communications Centers

The What-Comm Communications Center is operated by the Bellingham Police Department, with the following points highlighting its operations.

- The staffing includes 23 dispatch staff positions (working 8 and 12-hour shifts), 1 computer technician, 1 administrative assistant, and 1 center director (sworn position). The minimum staffing is typically 4-5.
- The operation consists of 2 dispatching consoles (1 for the County and 1 for the City), and 4 call-taking consoles.
- The total budget for police dispatch operations is approximately \$2.4 Million.
- The total number of calls into the Center as a result of being the Public Safety Answering Point was 403,191 in 2003.
- The total number of dispatched incidents handled by What-Comm was approximately 96,514 in 2003, which includes incidents dispatched for both the City and the County.

The Prospect Communications Center is operated by the Bellingham Fire Department with the following points highlighting its operations.

- The staffing includes 11 dispatch staff positions (working 12-hour shifts), and 1 Division Chief position. The minimum staffing is typically 2-3.
- The operation consists of 4 dispatching / call taking consoles and 2 back-up call-taking console positions.
- The budget for fire dispatch operations is approximately \$830,000, which does not include shared phone charges and CAD expenses with What-Comm.
- The total calls for service (i.e. dispatched incidents) handled by Prospect was approximately 12,838 – out of approximately 16,000 transfers from What-Comm.

Together, for the two communication centers, there are 34 call-taking/dispatch staff positions, over 10 consoles, a budget of approximately \$3.2 Million, a total call for service workload of over 400,000, including a total dispatch workload of over 109,000.

(2) Staffing and Workload Analysis

This section explains the project team's analytical approach to examining the staffing requirements of communication centers.

(2.1) Analytical Approach Based on Quantifiable Elements of Communications Workload.

There are several approaches which can be used to assess the staffing needs of a public safety communications center serving individual or regional areas. These approaches include the following:

- Methods which are based on comparisons with other agencies. These methods are inconsistent because the workload, technology and service level requirements vary tremendously among agencies.
- Approaches which are based on staffing a targeted number of "fixed posts" allocated on a functional basis (e.g. call taker, law enforcement radio, fire / rescue radio, etc.). These approaches are unsound because they do not tie staffing to actual workload.

The Matrix Consulting Group used a quantitative process for assessing communications staffing needs based on actual workloads in the existing communications centers. The paragraphs below summarize this approach, its assumptions and the time standards used.

- As an analytical starting point, there are relationships among communications center workloads that are relatively constant from one agency to another and in a single agency over time. These workload relationships include measuring calls by type such as:
 - The total number of telephone calls received in a communications center expressed on a "per incident" or "per call for service" basis.
 - The total number of radio transmissions handled in a communications center expressed on a "per incident" or "per call for service" basis.
 - The total number of other workloads handled and expressed on a "per incident" or "per call for service" basis.
- Since most agencies do not track individual work elements of a communications center, such as the number of transmissions, and since virtually no agency consistently measures the time taken for each task, standards are borrowed from other agencies and verified, where data exists, against workloads handled in the dispatch centers.
- These standards were developed by the project team and others using detailed time and motion studies of communications centers nationwide. These communications centers incorporated state of art CAD technology and provided service to both law enforcement and fire / rescue agencies and emergency medical dispatch (EMD).
- Since police and fire calls for service are typically counted consistently and by most agencies, these communications "standards" are converted on the basis of total minutes of workload per call for service.

- More specifically, estimates of total communications center police and fire workloads (including not only calls for service related workloads, but also workloads associated with self-initiated and administrative activities) are expressed as a ratio of time per call for service. These time standards include the following:
 - For each law enforcement call for service, the equivalent of 8.9 minutes of call, self-initiated and administrative related communications workloads are allocated. This includes time estimates of radio, telephone, record check and administrative tasks. The 8.9 minutes is comprised of the following elements:
 - 130 seconds are allocated to process a service request (citizen generated call for service) and transfer to a radio dispatcher. This standard incorporates the fact that multiple calls can be generated by the same incident and that administrative / business calls are handled by staff in the communications center.
 - 327 seconds of total radio transmissions related activity expressed on a “per call for service” basis -- including call-related and officer / deputy initiated field workloads and administrative transmissions.
 - 13 seconds are allocated for record checks via the teletype -- expressed on a “per call for service” basis.
 - 64 seconds are allocated for other tasks associated with the dispatch center (administrative, record-keeping, other activities).
 - For each fire, emergency medical and service related incident, the equivalent of 8.2 minutes of call and administrative workloads are allocated. This includes time estimates of radio, telephone and administrative tasks. The 8.2 minutes is comprised of the following elements:
 - 120 seconds are allocated to process service requests and to transfer the call to a fire / rescue dispatcher. This standard incorporates the fact that multiple calls can be generated by the same incident and that administrative / business calls are handled by staff in the communications center. This includes time accounting for Emergency Medical Dispatch (EMD).
 - 372 seconds are allocated to radio transmissions -- this is also expressed on a “per call for service” basis.
- These time standards are then applied against known or estimated call for service workloads handled by the dispatch center. Call for service counts are

distributed on a time of day basis and multiplied by the time standards described above (i.e., 8.2 minutes per call for fire / rescue and 8.9 minutes per call for law enforcement). This calculation yields total average communications workloads on a time of day and day of week basis.

- In addition, the project team has included a factor to account for the other communications workload handled by the agencies in the region. This factor is equivalent to 2% of total calls for service for all agencies.
- Finally, to arrive at the number of dispatch center staff required to handle these workloads, a critical assumption needs to be made regarding the levels of productivity desired. An allowance needs to be made regarding the proportion of time which is desirable to have a dispatcher actually involved in call handling, radio transmission and related workloads. There are several reasons why direct task allocation should not be 100% of available time, including:
 - Dispatch centers which have relatively high utilization levels tend to "burn out" staff leading to high employee turnover and abuse of sick leave, disability, etc.
 - Communications centers which have relatively high utilization levels experience "queuing" problems in which responses to incoming calls are delayed because of the number of calls or field units handled.
 - Quality begins to suffer because dispatch personnel are cutting calls and radio transmissions short. This impacts service levels both to field units and the public.

The project team used a task-loading factor of 30 minutes of actual call/radio activity per dispatch personnel per hour. The basis of this assumption is that one-half of every working hour should be used for direct communications workloads. This 30-minute factor is divided into the hourly workload amount in the dispatch center. The next sections show how the project team applied this methodology to both of Bellingham's communications centers.

The next sections show how the project team applied this methodology to both of Bellingham's communications centers. First, however, the following shows the basic assumptions made by the project team that determines the overall staffing requirements.

- The staff would work 12-hour shifts, for a shift factor of 2 (24 hour day divided by 12), and a workweek factor of 2 (8 total days divided by 4 working days).
- Based on What-Comm's 2003 leave utilization figures, staff would be available for approximately 82% of the annual working hours, after leave times (i.e., sick,

vacation, comp time, holidays), which equals 1,785.4 available hours out of 2,184 total annual gross hours, or a leave shift factor of 1.22 (2,184 divided by 1,785.4).

- Based on Prospect's 2003 leave utilization figures, staff would be available for approximately 79% of the annual working hours, after leave times (i.e., sick, vacation, comp time, holidays), which equals 1,724.85 available hours out of 2,184 total annual gross hours, or a leave shift factor of 1.27 (2,184 divided by 1,724.85).
- Turnover is assumed to be 10%. To justify this estimate, both communications centers lost 3 positions during 2003 (out of over 30 positions) - Prospect lost 2 positions and What-Comm lost 1 position during 2003.

These are important shift factors that will be utilized to calculate total staffing need, once the project team calculates the hourly shift requirements for the separate police and fire dispatch centers as follows, followed by the combined center.

(2.2) What-Comm Communication Center

The exhibit, below, provides a summary of this preliminary analysis and shows the resulting staffing requirements by hour. The following points explain the team's methodology and the criteria for developing the exhibit:

- The analysis summarizes the staffing required by hour of day of week.
- As an important reminder, the project team's analysis makes an allowance which states, each communicator should work only 50% of each working hour (i.e., 30 minutes).
- A total number of 95,339 police dispatches (resulting from community generated calls for service) was used as the workload basis for the analysis.
- A time estimate of 8.9 minutes per dispatch, which includes provisions for calls for service handling (i.e., transfers, duplicative calls, administrative call handling, etc.).

The following table shows our preliminary staffing analysis.

Hour	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.	Annual CFS Total	Average CFS / Day	Staffing / Hour
0000	221	297	312	275	284	522	608	2,519	7	2.0
0100	249	239	245	157	251	441	469	2,049	6	1.7
0200	225	183	210	177	243	366	358	1,763	5	1.4
0300	168	159	156	107	194	324	277	1,385	4	1.1
0400	121	164	107	141	143	152	282	1,111	3	0.9
0500	169	144	158	151	161	264	170	1,216	3	1.0
0600	304	273	337	274	318	249	228	1,983	5	1.6
0700	499	477	455	416	425	340	260	2,872	8	2.3
0800	666	659	692	575	682	572	374	4,220	12	3.4
0900	757	720	747	650	634	603	506	4,617	13	3.8
1000	799	767	755	651	740	740	533	4,985	14	4.1
1100	748	795	763	690	711	772	630	5,109	14	4.2
1200	838	785	842	680	745	774	636	5,301	15	4.3
1300	807	750	839	800	883	687	586	5,352	15	4.3
1400	809	824	878	834	887	714	612	5,558	15	4.5
1500	904	981	868	804	902	785	662	5,906	16	4.8
1600	909	914	939	746	1,023	719	660	5,909	16	4.8
1700	922	919	888	815	1,003	746	660	5,952	16	4.8
1800	909	848	824	832	873	698	719	5,702	16	4.6
1900	711	791	706	670	706	676	649	4,909	13	4.0
2000	620	661	637	616	692	655	604	4,484	12	3.6
2100	613	697	650	591	605	782	627	4,564	13	3.7
2200	503	567	576	538	745	765	573	4,267	12	3.5
2300	396	453	390	456	678	717	514	3,604	10	2.9
Total	13,866	14,066	13,972	12,648	14,528	14,063	12,197	95,339	261	3.2

As shown above, the average staffing per hour is estimated to be approximately 3.2 positions which we adjusted upward to 4.0 by examining how actual staffing could work during an average day. This was multiplied by the shift factors identified above. The following table shows the result of this analysis:

	Shift Factor	Staffing Requirement
Average Staffing (from above)		4.0
Leave @ 82% (2,184/1,797.4)	1.22	
Shift Factor (24/12-hour day)	2	
Workweek (8/4 work days)	2	
Sub-Total Staff		19.52
Turnover @ 10%		1.95
TOTAL Police Comm. Staff		21

Based on this analysis, the total number of staffing required to meet the police call for service workload is 21 positions (which is 2 fewer positions than the current number of 23 personnel). The following section shows this analysis for the Prospect Communications Center.

(2.3) Prospect Communications Center

The exhibit, below, provides a summary of this preliminary analysis and shows the resulting staffing requirements by hour. The following points explain the team's methodology and the criteria for developing the exhibit:

- The analysis summarizes the staffing required by hour of day of week.
- As an important reminder, the project team's analysis makes an allowance which states, each communicator should work only 50% of each working hour (i.e., 30 minutes).
- A total number of 12,838 fire and EMS dispatches (resulting from community generated calls for service) was used as the workload basis for the analysis.
- A time estimate of 8.2 minutes per dispatch, which includes provisions for calls for service handling (i.e., transfers duplicative calls, administrative call handling, etc.).

The exhibit on the following page shows our preliminary staffing analysis:

Hour	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.	Annual CFS Total	Avg. CFS / Day	Staff / Hour
00	58	46	45	51	61	66	81	408	1	0.3
01	42	46	48	44	54	76	63	373	1	0.3
02	42	35	47	44	54	71	59	352	1	0.3
03	37	38	26	20	48	46	48	263	1	0.2
04	42	40	37	25	28	37	36	245	1	0.2
05	49	41	43	36	42	40	36	287	1	0.2
06	32	40	48	52	37	43	41	293	1	0.2
07	52	53	60	68	70	57	45	405	1	0.3
08	67	60	82	72	78	61	71	491	1	0.4
09	105	98	95	84	84	72	81	619	2	0.5
10	96	108	87	97	92	85	90	655	2	0.5
11	96	120	95	124	93	97	91	716	2	0.6
12	89	100	94	82	92	98	106	661	2	0.5
13	91	102	104	80	112	100	83	672	2	0.5
14	106	94	110	114	94	101	90	709	2	0.6
15	95	97	103	99	115	89	87	685	2	0.6
16	109	107	105	104	122	103	82	732	2	0.6
17	98	101	116	115	108	90	78	706	2	0.6
18	95	105	97	110	80	99	74	660	2	0.5
19	99	113	88	81	89	106	95	671	2	0.5
20	83	78	93	92	96	109	81	632	2	0.5
21	92	82	75	88	109	77	84	607	2	0.5
22	76	64	61	80	96	95	71	543	1	0.4
23	64	63	67	58	79	68	54	453	1	0.4

Ttl.	1,815	1,831	1,826	1,820	1,933	1,886	1,727	12,838	35	0.4
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Based on the workload, the average staffing required to meet the workload is less than 1 position. However, the absolute minimum staffing per shift in any of the smaller alternatives should be at least two positions for the following reasons:

- To ensure that concurrent incidents could be handled.
- To ensure that a single position could be dedicated to a high priority call without eliminating the ability of the center to handle routine business.
- To provide dispatchers with on-duty relief without having to call in personnel from the field to cover the position.

Based on this, the average staffing per hour is two positions, which is then multiplied by the shift factors identified above as follows.

	Shift Factor	Staffing Requirement
Average Staffing (from above)		2
Leave @ 79% (2,184/1,724.85)	1.27	
Shift Factor (24/12-hour day)	2	
Workweek (8 / 4 working days)	2	
Sub-Total Staff		10.16
Turnover @ 10%		1.02
TOTAL Fire/EMS Comm. Staff		11

Based on this analysis, the total number of staffing required to meet the fire and EMS call for service workload is 11 positions (which is the current number of personnel.) The final section shows the staffing requirements under a consolidated police and fire/EMS communication center.

(2.4) Consolidated Center

The following points highlight the primary issues of a combined communication center.

- The police dispatching workload (96,514) would be combined with the fire dispatching workload (12,838) – for a total dispatching workload of 109,352. The time requirement for this total dispatch workload is a weighted average of 8.8 minutes (96,514 police dispatches at 8.9 minutes and 12,838 fire/EMD dispatches at 8.2 minutes).
- The time requirement includes provisions for total calls for service that come into the communication center, including duplicative calls, non-emergency calls, administrative calls, etc.

- The leave utilization factor used to calculate staffing in a combined center is a weighted average of the respective center staffing (i.e., 23 What-Comm dispatchers with a leave factor of 1.22, and 11 Prospect dispatchers with a leave factor of 1.27 – this equals approximately 1.24).

Based on these factors, the following shows the total call handling and dispatching average hourly staff requirements for a consolidated communication center.

Hour	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.	CFS Annual Total	Avg. CFS / Day	Staff / Hour
00	282	346	361	330	349	594	696	2,958	8	2.4
01	294	288	296	202	308	522	537	2,448	7	2.0
02	270	220	259	223	300	442	421	2,137	6	1.7
03	207	199	183	129	245	374	329	1,665	5	1.3
04	164	206	146	168	173	191	322	1,370	4	1.1
05	220	187	202	189	205	307	208	1,518	4	1.2
06	340	317	389	330	359	295	272	2,300	6	1.8
07	557	536	521	490	500	401	308	3,312	9	2.7
08	741	727	782	654	769	640	450	4,763	13	3.8
09	871	827	851	742	726	682	594	5,293	15	4.3
10	905	885	851	756	841	834	630	5,701	16	4.6
11	853	925	868	822	813	879	729	5,888	16	4.7
12	937	894	946	771	846	882	750	6,027	17	4.8
13	908	861	953	890	1,006	795	676	6,090	17	4.9
14	925	928	999	958	992	824	709	6,335	17	5.1
15	1,011	1,090	981	913	1,028	883	757	6,664	18	5.4
16	1,029	1,032	1,056	859	1,158	831	750	6,714	18	5.4
17	1,031	1,031	1,015	940	1,123	845	746	6,732	18	5.4
18	1,015	964	931	952	963	805	802	6,432	18	5.2
19	819	914	803	759	804	791	752	5,640	15	4.5
20	711	747	738	715	796	772	692	5,172	14	4.2
21	712	787	733	687	721	868	719	5,227	14	4.2
22	586	638	644	625	850	870	651	4,863	13	3.9
23	465	522	462	520	766	794	574	4,102	11	3.3
Ttl.	15,852	16,070	15,970	14,623	16,640	16,122	14,075	109,352	12	3.7

As shown above, the total average hourly staffing requirement is 3.7 positions to handle the combine workload of a consolidated center. However, we adjusted this upward to 4.5 to reflect how an actual 12 hour shift would work. Thus, based on the shift factors identified earlier, the following table shows the total staffing needed.

	Shift Factor	Staffing Requirement
Average Staffing (from above)		4.5
Average Leave Utilization Factor	1.24	
Shift Factor (24/12-hour day)	2	
Workweek (8 / 4 working days)	2	

Sub-Total Staff		22.32
Turnover @ 10%		2.23
TOTAL Communication Staff		25

Based on this analysis, the total number of staffing required to meet police, fire and EMS call for service and dispatching workload is approximately 25 positions (or 9 fewer positions than the current number of combined staff).

(2.5) Summary

The project team's staffing analysis of the police and fire communication centers shows that a consolidated center would result in a need of 25 call-taking and dispatch personnel, 9 fewer than the current number of 34 personnel.

To estimate the potential staff savings in a consolidated center under different assumptions of personnel utilization, the following table shows 2004 Council Budgets for regular salaries and wages, and personnel benefits, and the average per each position.

	What-Comm 2004 Council Budget (23 positions)	Prospect 2004 Council Budget (11 positions)	Average Cost / position (34 positions)
Regular Salaries and Wages	\$980,337	\$482,557	\$43,026
Personnel Benefits	\$331,007	\$168,831	\$14,701
Total Salary/Benefits	\$1,311,344	\$651,388	\$57,727

Based on the financial information above, a potential savings of \$519,543 (9 positions multiplied by \$57,727) could be experienced under a communication center consolidation.

The City should evaluate the feasibility of consolidating police and fire dispatch operations with potential annual operating cost savings of up to \$519,543.

2. PRIVATIZING THE AMBULANCE TRANSPORT COMPONENT OF THE EMERGENCY MEDICAL SYSTEM.

This sub-section outlines the potential of privatizing the ambulance transport function within the City of Bellingham and entire Medic One service area. This analysis begins with an estimate of the private provider's costs based on comparable systems. Next the impacts to the overall staffing plan of the fire department will be presented, and finally, the essential public policy issues will be outlined.

Private sector ambulance costs are commonly described on a “unit-hour basis.” A “unit-hour” is each hour that a fully staffed and equipped ambulance is funded and available for a response or transport. A simplistic description of the unit-hours required for the current system is described in the table, on the following page:

Single Unit – Hours/year	365 days X 24 hours/ day = 8,760 hours
Peak Demand Hours/day	12
Number Units Needed – Peak Demand	5
<i>Total Peak Demand Hours/Day</i>	<i>60</i>
Non-Peak Demand Hours/day	12
Number Units Needed – Non-Peak Demand	3
<i>Total Non-Peak Demand Hours/Day</i>	<i>36</i>
Total Unit Hours Required/day	96
Total Unit Hours Required/year	35,040
Total Unit Hours at 5 Unit Constant Staffing	43,800

Prior analysis has already outlined the need for 5-peak hour transport units in the current system. There are currently 12 hours of the day associated with peak hour demand. Therefore, the total unit hours required to respond to the current demand for services under the current measures of performance is 35,040 Unit-Hours. If it were to be assumed that a constant 5-unit staffing configuration would be utilized, the total unit hours for the system would rise to 43,800 unit hours.

The Unit-hour Costs associated with private ambulance ALS systems in the west coast region of the Country is between \$68.50 and \$85.00 per Unit hour. This is a fully loaded cost that include dispatch communication services and other essential service components. The table below summarizes the potential cost structure of a private ambulance company given the unit hours described above:

Estimated Cost of Private Provider

Cost Element	Units Minimum	Unit Cost	Estimated Cost
Unit Hours Range	43,800	\$85.00	\$3,723,000
	35,040	\$68.50	\$2,400,240
Profit	15%	Max Scenario	\$558,450
	15%	Min Scenario	\$360,036
Total Cost Maximum Scenario			\$4,281,450
			\$2,760,276

The above scenario indicates that given the extremely conservative planning numbers utilized in the model above, the system could achieve savings of between \$400,000 and \$1.9 million depending upon the ultimate system design chosen. This model assumes continuation of payments to Prospect Communications for Dispatch/Communications services consistent with the present budget amount and continuation of approximately \$300,000 in administrative and professional expenses remaining with Medic One (i.e., Medic One would continue billing and overseeing the EMS system under the direction of local medical control physicians).

The following table provides a more detailed description and summary of this model and its comparison to the present system:

	Current	Model
City Paramedics	1). Assigned to Transport Units Medic 1, 2, 3, 4 and ALS Engine 56 2). 41 Total Paramedics	1). 1-Paramedic assigned to each engine (24/7).
County Units (Medic 3 and 4)	1). Staffed with 2 Paramedics when possible.	1). Privatized with 2 Paramedics/Unit – Existing Medic 3 and 4
BLS Transport Units	1). Cross staffed units available at Stations 1, 2, 4, 5 and 6.	1). Cross staffed units available at Stations 1, 2, 4, 5 and 6.

Under this model, the fire department would still maintain first response ALS capabilities. The Medic One infrastructure could remain in place, do all billings and provide quality assurance and medical direction/oversight. As such, this system would fit the configuration described nationally as a “Utility Model” EMS system (this is different than the Public Utility concept recently declared unconstitutional in Washington State). The Medic One entity would be essentially a management services organization overseeing the management and revenue of the EMS services in the county. This could also allow for open bidding for ALS services in which the Fire Department or any other qualified entity could bid for the ability to provide services in the Whatcom County region. If the system were to be privatized, a potential Fire Department staffing model would have the impacts described in the following table:

Impact of Privatization on Fire Department Staffing Model

Cost Structure Element	Staff Needs/Cost
2 County Ambulances	0
6 Engines	6
3 City Ambulances	0
Medics/Shift	6
X 1.35 Leave Factor	8.04
X 3 Shifts	24.12
Cost	
Paramedic Differential	\$6,789
Benefits Applied (X 1.21)	\$1,425.69
Medic Differential Unit Cost	\$8,215
Number of Needed Medics	-16.88
Total Marginal Cost (Savings)	-\$138,663.97

The savings of \$138,664 represented above only reflects the marginal differential of paramedic pay savings given the number of needed paramedics to provide staffing on each engine company. If a reduction in force were to be considered with respect to the loss of need to staff the ambulance transport units on a full time basis, the cost scenario would be impacted as summarized below:

Potential Cost Impacts if Reduction in Force Where Utilized

Cost Element	Cost/Units
Firefighter Mid-Range Total Expense/Position	\$66,622
Number of Units	4
Staffing/day/unit	2
Number of Shifts	3
Total Positions	24
Total Potential Cost Savings	\$1,598,922.24

If a reduction in force were implemented in the absence of ambulance transport responsibilities, a total cost savings of approximately \$1.599 million could be achieved. The relative advantages and disadvantages of this system are described in the table below:

Comparison of Advantages and Disadvantages of Privatized EMS System

Advantages	Disadvantages
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<ul style="list-style-type: none"> • Reduced Costs • Defined and capped expense for ambulance transport services on an annual or contract period basis. • Provides sufficient capacity for peak overload times (i.e. backup ambulances) • Provides greater “depth” of ALS response. More simultaneous calls are able to receive ALS level of care through ALS Engine Company availability • System has ability to provide ALS First Responder pass through revenue to the City or other ALS First Responder agencies • Greater Level of ALS response capability – ALS transport as well as ALS first responder 	<ul style="list-style-type: none"> • Lowers system redundancy/depth for fire departments historical mission • Private system lacks “stability” of public safety based system (i.e. workforce changes, medical control ability) • Requires more paramedics in the system with associated impacts on quality assurance efforts • Potential re-alignment of tasks could have major impacts on labor groups • Less multi-hazard, public safety personnel to respond to incidents beyond EMS type responses. • Not known whether any private company would be interested in bidding the Medic One System.
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In an effort to summarize the cost impacts of a privatized EMS system, the following table is offered:

Cost Element	Cost/Units
Current Medic One Budget (Operational Expenses Only)	\$4,687,000
Potential Privatization Costs (Max)	\$4,281,450
Potential Privatization Costs (Min)	\$2,760,276
<i>Potential Operational Savings (Max)</i>	<i>\$(405,550)</i>
<i>Potential Operational Savings (Min)</i>	<i>\$(1,926,724)</i>
Potential Savings in Reduction in Force	\$(1,598,922.24)
Alternative Reduction in Paramedic Pay	\$(138,663.97)
Potential Maximum System Savings	(\$3,525,646.24)
Potential Minimum System Savings	(\$544,213.97)

Recommendation: The Medic One entity should thoroughly review the option of establishing itself under a Utility Model. This would include the preparation of a Request for Proposals to provide ALS ambulance services and undertaking a competitive bid for the provision of such services within the Whatcom Medic One area. The project team’s pro forma analysis shows that this approach could significantly reduce public costs for EMS delivery in the City and Whatcom County. This approach could save the system between \$544,000 and \$3.5 million per year.



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December 3, 2004

Mr. Bill Boyd
Fire Chief
City of Bellingham
1800 Broadway
Bellingham, Washington 98225

Dear Chief Boyd:

The Matrix Consulting Group is writing this letter to further clarify a previous correspondence from August 9, 2004.

In the Planning Study our firm completed earlier this year, the project team identified two issues which were presented to the Fire Department Study Committee during the draft report review process. These two issues were: (1) privatization of emergency medical transports in the City of Bellingham; and (2) consolidation of the two emergency communications centers. The purpose of identifying these issues and conducting preliminary analysis of them was to determine the magnitude of the opportunities that these two options might present to the City.

While the potential magnitude of these two alternatives is clearly significant, we could not conduct a complete and defensible analysis within the scope and resources available in this project. After reviewing these two analyses with the steering committee, we determined that it would be more appropriate to present these issues and potential alternatives to the City in a separate side letter. This letter was distributed to the City Council at our final report presentation on August 23, 2004. This letter provided the preliminary analysis which we were capable of conducting at the time.

If you have any questions or need additional assistance, please do not hesitate to contact me at 972-871-7950.

Matrix Consulting Group

Travis Miller
Vice President



2470 El Camino Real, Suite 210
Palo Alto, CA 94306

Chief Bill Boyd
Bellingham Fire Department
1800 Broadway
Bellingham, WA 98225

June 11, 2005

Dear Chief Boyd:

The Matrix Consulting Group is writing this letter to address several questions that have arisen relating to our analysis of more recent data than that used in the completion of the Fire Department Planning Study. With the help of you and your staff, the Matrix Consulting Group examined a full year of data from calendar year 2004 rather than the partial year utilized in the study. The analysis of these calls has shown the following:

- Fire service objectives (e.g., NFPA 1710) indicate that the time it takes to process incoming emergency calls for service should take no more than one minute in at least 90% of calls for service. The actual "fractile" performance against this standard for EMS calls for service in Bellingham for calendar year 2004, however, was 55.6%, with the average call processing time at 1.14 minutes. It should be noted that the BFD utilizes an EMD protocol which enables them to distinguish between emergency (ALS) and non-emergency (BLS) calls and to dispatch them to different units. The current database structure does not enable us to determine which calls were dispatched as which type. Future analyses by the BFD should focus on the emergency calls for service (once this data is tracked). **Recommendation: The BFD should adopt as policy the standard for handling and dispatching emergency calls in one minute or less 90% of the time (fractile performance) and should hold dispatch managers and staff accountable for achieving this objective.**
- Fire service objectives (e.g., NFPA 1710) indicate that it should take no more than one minute for fire crews to respond once they have been dispatched in at least 90% of emergency calls for service. The Bellingham Fire Department's current performance is 25.7%, or an average "reflex" time of 1.65 minutes. This is a significant response issue which needs to be addressed by the Department. The Matrix Consulting Group did not have the data to identify or address this issue in the final report of the Fire Department Planning Study.

Recommendation: The BFD should adopt as a policy the standard of achieving at least a one minute 'reflex time' 90% of the time (fractile performance). Engine company officers and crews should be held accountable for achieving this standard.

- Another service objective is the ability to deliver a first response to EMS calls in four minutes or less to 90% of emergency calls. The Matrix Consulting Group's analysis of 2003 data showed that the BFD was accomplishing this at a rate of 92.3%. Our analysis of the 2004 data, however, shows that the BFD accomplished this in 81.5% of EMS calls inside the City. **Recommendation: Continue to closely monitor system 4-minute travel time performance. Improvements in dispatch processing and reflex times, as described above, will also enable the BFD to improve performance against a total 6-minute initial response time objective (dispatch + reflex + travel time).**
- The Matrix Consulting Group was and is unable to assess the delivery of ALS service within the eight (8) minute drive time (or 10 minute total response time) standard given a lack of data. Without the ability to determine which calls are ALS and which are BLS we cannot distinguish the service level associated with each type of call. Findings which can be identified indicate that first units arrive on scene within eight (8) minutes in more than 99% of the calls for service and that paramedic transports arrive on-scene within that time standard at least 83% of the time. However, this does not take into account the impact of the paramedic staffed engine companies such as Engine 52, Engine 56 and others which were more occasionally staffed with paramedics. **Recommendation: The Fire Department should add an additional data field in CAD / RMS to enable the assessment of compliance with the standard of delivering paramedics on-scene. This data field should enable the BFD to assess paramedic arrival regardless of unit type, as long as the arriving unit carries paramedic equipment and medications.**
- Our review of complete 2004 calendar year data relating to full structure fire responses indicates that the BFD does not achieve the objective of delivering a this within eight minutes. However, the sample size of working structure fire calls is very small. As a result, there can be large swings in the Department's compliance with this service objective because of the impacts of randomness of call locations and other factors. **Recommendation: The Department should monitor the time it takes for a full structure fire response to working fires over a multi-year period.**
- Our final report for Fire Department Planning Study indicated that there could be the potential of closing one station in the system. Our report showed that this was a feasible alternative either because the level of response overlap in the first-due areas of several fire stations were significant or because of relatively low call volumes for several stations. This finding has not changed, based on the analysis of the performance of the Department's response system. In spite of

this, there was no recommendation in the report to close a station because service level maintenance was not sufficiently uniform. In addition, the lack of other full-time career fire departments in the region results in a redundancy that might not be required in a more urbanized environment. Also, the BFD is making an effort to increase utilization of every station in the system by implementing BLS transport program (which also supports the Medic One program by maintaining ALS resources until they are needed most). **Recommendation: The Matrix Consulting Group continues to believe that the BFD will function best with six fire stations in the response system, thereby providing for sufficient overlap and back-up coverage to ensure high quality EMS and fire services.**

In closing, we hope that this letter has been helpful in clarifying our findings from review of the complete 2004 data. If you have any additional questions, please do not hesitate to contact us. You can reach me at 972.871.7950 or via email at tmiller@matrixcg.net.

Matrix Consulting Group

Travis Miller
Vice President