

Fire and Building Department Findings and Recommendations

Summary of Stakeholder Input

ESCI solicited input from internal and external stakeholders through two separate venues: one-on-one interviews conducted by the ESCI team during the initial data gathering process and a citizens group formed to participate in the strategic planning process. As part of the interview process, the internal and external stakeholders were asked to identify their perspectives on the department's strengths and weaknesses, as well as the challenges facing the department and critical issues it needs to address.



Internal and External Stakeholders

Organizational Strengths

It is important for any organization to identify its strengths in order to assure it is capable of providing the services requested by customers and to ensure that strengths are consistent with the issues facing the organization. Often, identification of organizational strengths leads to the channeling of efforts toward primary community needs that match those strengths. Programs that do not match organizational strengths or the primary function of the business should be seriously reviewed to evaluate the rate of return on precious staff time. In the course of ESCI's stakeholder interviews, the strengths of the Kirkland Fire and Building Department were identified by both internal stakeholders (representatives of the City Council, city management, and department directors, and the fire department) and a select group of external stakeholders (neighboring emergency service providers). They are listed below as stated by those interviewed.

Organizational Strengths as Identified by:			
City Council	City Management & Department Directors	KF&BD Members	Neighboring Providers
Community satisfied with service	Best trained and highest morale in the area	Training division is good, personnel are well trained	Department has good people and a good leader

Organizational Strengths as Identified by:			
City Council	City Management & Department Directors	KF&BD Members	Neighboring Providers
Good department...they work well with each other and know how to cooperate	The fact that it is a city service—it is personal and available to the public	Comprehensive system that has identified hazards and appropriate resources	Good relations with KF&BD staff
Personnel are devoted and well trained	Service is excellent and well-coordinated	Building division is not under direction of Planning Department	Partnership in mutual aid and NORCOM
Provides good service and delivers what the public expects	Good quality service and effective	Good people who are interested and dedicated	
Good relationship between labor and management		Good neighbors that we train with	
Department is trusted and respected by the public		Good follow through on calls	
		Cohesive staff—no grandstanding	
		We do a lot with less	
		People are treated well by their peers	
		Good people	
		Citizens really appreciate the service	
		Training has improved significantly	
		Chief is motivated and provides leadership	
		Apparatus/equipment/ PPE are in good shape	
		Our people work hard	
		Training is really good, troops are very professional	

Organizational Weaknesses

Performance or lack of performance within an organization depends greatly on the identification of weaknesses and how they are confronted. While it is not unusual for these issues to be at the heart of the organization's overall problems, it is unusual for organizations to be able to identify and deal with these issues effectively on their own.

For any organization to either begin or to continue to move progressively forward it must not only be able to identify its strengths but also those areas where it does not function well. These

areas of needed enhancements are not the same as challenges, but rather those day-to-day issues and concerns that may slow or inhibit progress.

Organizational Weaknesses as Identified by:			
City Council	City Management & Department Directors	KF&BD Members	Neighboring Providers
System has never met response time goals	City departments don't see that finances are now really difficult; there is a new normal	Hard to say no to new projects	Rumor that KF&BD wants own paramedics—this will hurt regional strength
The issue of overtime	Loss of public information/education and outreach capabilities	Economy forces FDs to decrease resources and become over reliant on mutual aid	Redundancies among neighbors
Huge department with very few fires—most calls are for EMS; many people are sitting around waiting for something to happen	Public education loss is serious	No comprehensive wellness and fitness program	Government can be a barrier
Concerns about sustainability of the system		Struggle with relationships with other City Departments	Procedural differences; they seem to be out of position quite a bit (Engine 25)
Location of fire stations—difficult to serve Kingsgate and Finn Hill		Low company staffing	
Having building and fire under the same department is wrong		Struggle to maintain facilities	
		We struggle with appropriate discipline	
		Lack of buy-in on the importance of prevention by some operations personnel	
		Very limited ability to change	
		Uncertainties	
		Declining money	
		Officer training is non-existent	
		Lack of standards	
		Lack of administrative control	
		No support to take corrective action	

Challenges

To draw the strong suit and gain full benefit of any opportunity, the challenges to the organization must also be identified. By recognizing potential challenges, an organization can greatly reduce the potential for future setbacks. In this particular exercise, stakeholders were asked to identify up to three challenges facing KF&BD.

Organizational Challenges as Identified by:			
City Council	City Management & Department Directors	KF&BD Members	Neighboring Providers
<ul style="list-style-type: none"> Geography; jurisdictional boundaries Money 	<ul style="list-style-type: none"> Need for a fireboat Stability and predictability in costs Any incident will generate overtime 	<ul style="list-style-type: none"> Containing growth of call volume Number of non-emergency calls 	External political forces
Political issues	<ul style="list-style-type: none"> Getting people to engage in safe practices/emergency preparedness Firefighters at risk from injuries and age 	<ul style="list-style-type: none"> Fees are not enough to finance Building Division Adding new permit tracking software 	
<ul style="list-style-type: none"> Coverage Competition for financial resources Possibility of RFA 		<ul style="list-style-type: none"> Budget support Connecting to the community 	
Staffing levels		Need more staff (in prevention)	
		<ul style="list-style-type: none"> Building good relationships with neighbors Act/behave like the size city we are 	
		<ul style="list-style-type: none"> Reserve program is gone Finn Hill Station 	
		Annexation impacts	

Critical Issues

After organizational strengths and weaknesses and challenges posed by the current environs, ESCI asked stakeholders to identify the critical issues they perceive the agency is facing. The following reflect the critical issues that the respondents felt pose the greatest risk today to the success KF&BD's service delivery. As with the organizational challenges, each stakeholder was asked to identify up to three critical issues.

Critical Issues as Identified by:			
City Council	City Management & Department Directors	KF&BD Members	Neighboring Providers
Response time	Slow growth of expenses	Funding, leadership, too few administrative staff	<ul style="list-style-type: none"> • Cost of service • Housing prices down • Dramatically underprepared for a disaster
Coverage in annexation area	Funding that is sustainable for all city departments	Funding, levy approval for Medic One program	<ul style="list-style-type: none"> • Money • Ongoing workload/cultural shift—need to be more community connected • Need to be more agile in addressing change
Financial stability	Annexations, revenue, change in building stock	Budget challenge	King County EMS Levy Declining economy
Funding		Administrative support resources (for data extraction and analysis) IT support	<ul style="list-style-type: none"> • Revenues • Controlling expenses
Building codes are overwhelming		<ul style="list-style-type: none"> • Organizational communications • No recognizable vision—old strategic plan not implemented 	
		<ul style="list-style-type: none"> • Strategic planning • Organizational communication—most information comes via the rumor mill 	
		Lack of communication between fire and building	
		Team building	
		<ul style="list-style-type: none"> • Chief's decisions will set tone for organizational culture • Administration is understaffed Operations chief is overwhelmed 	
		<ul style="list-style-type: none"> • Structure and accountability for offenders • Staffing issue at the line (Fire Station No. 27) • Battalion aid needs to be staffed 24/7 	

Community Members

A citizens' group consisting of local business owners and representatives of several neighborhood associations were invited to participate in the strategic planning session facilitated by ESCI; a total of 11 community members attended the session. Rather than focusing on the organization's strengths, weaknesses, challenges, and critical issues, the community members were asked to identify their priorities, expectations, and concerns with regard to the department and its services.

Customer Priorities

In order to dedicate time, energy, and resources on services most desired by its customers, the Kirkland Fire and Building Department needs to understand the community's priorities. To assist with the overall strategic planning process, members of the citizens' group were asked to review a short list of planning considerations and rank them through a direct comparison process. The results of that ranking appear below (in priority order):

- Technical competence of firefighters and emergency medical personnel
- Ensuring that facilities and equipment are reliable and functional
- Improving the response time of the first engine or ambulance to arrive at a scene
- Maintaining the existing response times of the first engine or ambulance
- Compassion, empathy, and customer service of emergency responders
- Expanding the types of services offered by the Kirkland Fire and Building Department
- Keeping Kirkland Fire and Building Department costs and tax rates as low as possible

Customer Expectations

Understanding what the community expects of its fire and emergency services organization is critically important to developing a long-range perspective. With this knowledge, internal emphasis may need to be changed or bolstered to fulfill the customer needs. The following are the expectations identified by several members of the citizens' group.

- Well trained, competent, professional personnel
- Fast response times
- Reliable, appropriate equipment and facilities
- Community education and training for disaster preparedness
- Adaptable to changing conditions; willingness to consider alternative delivery methods

Areas of Customer Concern

The Customer Centered Strategic Planning process would fall short and be incomplete without an expression from the customers of their concerns about the organization. Some areas of concern may, in fact, be a weakness within the delivery system. However, they may also be perceptions of the customers based on limited knowledge.

- Does it have a sustainable structure? Can it adapt to changes in resources?
- How can services be provided equally across the city? Shift in City resources/personnel away from certain neighborhoods
- Accountable and efficient. Do they have what they need to do the job? Training, equipment, etc.
- Lack of public outreach; communication skills could be improved.

Positive Customer Feedback

For a strategic plan to be valid, the customer views on the strengths and image of the emergency services organization must be established. Needless efforts are often put into over-developing areas that are already successful. However, utilization and promotion of the customer-identified strengths may often help the organization overcome or offset some of the identified weaknesses.

- Personnel are professional, well trained, experienced, and knowledgeable
- Equipment and facilities are appropriate, adequate for the job, and well maintained
- The department enjoys good leadership
- KF&BD firefighters/EMTs are visibly committed to their community

Other Thoughts and Comments

The citizens' group participants were asked to share any other comments they had about the Kirkland Fire and Building Department or its services. The response that appeared most often was an appreciation for the opportunity to participate in the process and a desire to improve and enhance the partnership that exists between KF&BD and the community it serves.

Department Mission and Values

Mission (Vision) Statement



Mission and vision statements, goals, and objectives provide key organizational management foundations. Development of such organizational underpinnings is important, but communication of them is paramount. Leaders and workers alike need to understand why the organization exists, where it is headed, and how to

identify success. While the mission of a fire department may seem obvious, if the organization's purpose is left to an individual's imagination, many individual missions will result--which in the end may cause agency members to work at cross-purposes.

The City of Kirkland City Council has established a vision and goals for the City. The stated purpose of the City Council Goals is:

...to articulate key policy and service priorities for Kirkland. Council goals guide the allocation of resources through the budget and capital improvement program to assure that organizational work plans and projects are developed that incrementally move the community towards the stated goals.

The goal for public safety is to ensure that all those who live, work and play in Kirkland are safe and the ascribed Council Goal is:

Provide for public safety through a community-based approach that focuses on prevention of problems and a timely response.

The Kirkland Fire and Building Department has an adopted vision statement that provides the compass for the organization. The current KF&BD vision statement states:

The Kirkland Fire Department is committed to the protection of life and the preservation of property and the environment from the adverse effects of fire, medical, and all hazardous conditions through sustained training, progressive education, proactive prevention and a dedicated diligence to provide the highest level of customer service to our Community.

The Kirkland Fire and Building Department mission, vision, and value statement was reviewed as one element of the strategic planning process.

Mission, Vision, and Values Validation

The strategic planning process accomplished more than just the gathering of input and a document. It challenged elected officials, city staff, the membership of the KF&BD, and the community to look critically at paradigms, values, philosophies, beliefs, and desires. It challenged individuals to work in the best interest of the “team.” In addition, it provided the membership with an opportunity to participate in the development of their organization’s long-term direction and focus. The members of the KF&BD strategic planning team and the citizen’s advisory group did an outstanding job in committing to this important project and seeing it to final form.

Mission

Clearly stated and intentionally simplistic, the Kirkland Fire Department *Mission* accurately describes the organization’s general purpose. The validated Mission Statement for the Kirkland Fire Department is:

Providing timely, emergency response and safeguarding the lives, property, and environment of our community.

Vision

Building on this mission, the stakeholders identified a *Vision* for the department, thus establishing targets of excellence for the future. The proposed *Vision* for the Kirkland Fire Department is illustrated in the following:

The Kirkland Fire Department is a respected partner in our community and an innovative leader in the nation.

- *We inspire a culture of esprit de corps.*
- *We offer opportunity for personal and professional growth.*
- *We demonstrate professionalism, competency, compassion and a readiness to respond.*
- *We listen to, understand and keep the public informed.*
- *We provide fiscally prudent preventive and emergency services.*
- *Above all, we earn the confidence, trust and respect of the community we serve.*

Values

Recognizing that its collective personality and the values of its members enhance the organization, the stakeholders declared the following *Values* for the KF&BD:

- **Service** – *Demonstrated innovation and understanding of our internal and external customers’ needs.*

- **Professionalism** – Upholding industry standards and honoring the expectation of a professional firefighter both on and off the job.
- **Integrity** – Maintaining consistency between actions and words at all times.
- **Respect** – Being accountable and demonstrating mutual trust and respect.
- **Innovation** – Providing a supportive work environment that encourages and empowers innovation and risk taking within the norms of the department and the City.
- **Trust** – Trusting other and being trustworthy.
- **Teamwork** – Finding strength in diversity and working together for a common goal.

Conclusion – Department Mission and Values

KF&BD's appraisal, review, and update of its organizational mission, vision and values is consistent with best practices. ESCI recommends that upon completion of this study 2012 Strategic Plan it be validated by KF&BD and adopted by the City of Kirkland City Council.

Recommendation Summary – Department Mission and Values

- ❖ Recommendation 9: KF&BD review and validate the mission, vision, and values following completion of the 2012 strategic plan. (Implementation Order 1)
- ❖ Recommendation 10: Display the adopted mission, vision, and organizational values in City Hall and fire department facilities. (Implementation Order 2)

Management Components

ESCI reviewed management of the Kirkland Fire & Building Department, including an examination of philosophical ideals as expressed by its mission, vision, and values statements. We look to assure that such visionary principles conform to the core values of managers and members and address several other important questions: Are goals and objectives consistent with the City's direction? Are staffing levels adequate to meet City and organizational goals? Do human resource and administration systems meet legal requirements and department needs? Are appropriate financial controls in place?



Communication internal to the City and KF&BD was checked, as was external communication to the community. A review of security issues concerning hard records, electronic data, offices, and buildings was conducted as well as to ensure that all necessary reports and records were produced, completed, and maintained. Last, ESCI describes the merit, benefits and costs associated with fire department accreditation.

Staffing and Reporting Relationships

The position of director of fire and building/fire chief is appointed by, works for, and is under direct supervision of the City Manager. The city charter states that the fire chief shall be head of the fire department and shall have charge and supervision over all matters relating to the prevention and extinguishment of fires and of all measures necessary to guard and protect all persons and property impaired thereby.²⁷

Deployment

KF&BD operates six fire stations (five with career staffing) with 12 frontline units and has established a minimum daily staffing level of 19 personnel.²⁸ *KF&BD Department Manual Directive Number 3.001* dated February 1, 2000, states that the minimum staffing shall be 15

²⁷ Kirkland Municipal Code, City Charter, Title 3, Chapter 3.16 City Manager-Administrative Departments.

²⁸ Source: Minimum staffing design as compared to total staff assigned per shift, 02/15/2012.

with 1 being an officer and 14 firefighters. This directive needs to be updated to accurately represent current minimum staffing.

Figure 38 lists minimum staffing by unit and position in January 2012.

Figure 38: Minimum Staffing by Unit and Position, January 2012

Unit	Battalion Chief	Officer (Captain or Lieutenant)	Driver Operator	Firefighter
Engine 21		1	1	1
Engine 22		1	1	1
Engine 25		1	1	1
Engine 26		1	1	1
Engine 27		1	1	1
Aid 21		Cross-staffed with Engine 21		
Aid 22		Cross-staffed with Engine 22		
Aid 25		Cross-staffed with Engine 25		
Aid 26		Cross-staffed with Engine 26		
Aid 27		Cross-staffed with Engine 27		
Aid 29		Cross-staffed with Ladder 27		
Air Unit 21		Cross-staffed with Engine 22		
Ladder 27		1	1	1
Battalion Chief	1			
Shift Captain (Swing Position) ²⁹		1		
Total	1	6	6	6

A total of 30 personnel are assigned to each shift with minimum daily staffing set at 19. In the minimum staffing matrix, the swing staff position is not identified.

Human Resources Management

The Kirkland Human Resources and Performance Management Department (HR) develop, manage, administer, and is the information source for employee programs. Many of the human resource activities involve KF&BD:

- Recruitment and selection of new employees – KF&BD with HR involvement
- Civil service program management for public safety employees (police and fire) – HR
- Organizational training and career development – KF&BD
- Employee relations and contract interpretation – HR
- New hire orientation – HR

²⁹ Not included in minimum staffing total.

- Benefits administration – HR
- Compensation and classification – HR
- Performance evaluation tracking – KF&BD, HR records management
- LEOFF I Disability Board – HR
- Employee safety and risk management services – HR
- Tuition reimbursement – KF&BD
- Policies and procedures – KF&BD internal, HR City policies
- Diversity program – HR and KF&BD
- Wellness program – HR for day staff other departments
- Employee recognition and service awards – HR and KF&BD

The City's human resource department programs, documents, and processes appear to be all-inclusive and in-line with best practices. Human resource documents were not reviewed for legal compliance but appear to contain the depth and breadth of information to comply with federal and state requirements.

Fire department rules and regulations and standard operational guideline documents were reviewed for content, relevancy, and applicability to KF&BD's emergency operations. ESCI found that ARs (administrative rules) and SOGs (standard operating guidelines)³⁰ specific to the fire department were generally outdated. Additionally, variations were found between City and KF&BD AR documents including safety, purchasing, and public records access, and document retention. KF&BD reported that a limited number of ARs and SOGs have been updated and the department has plans to complete a total revision in 2012. The last time that comprehensive updates of the policies were completed was in 2000 with many dated from the 1990s.

The time and expertise to maintain, update, and verify legal compliance of ARs and SOGs is extensive. ESCI has recommended that a complete set of ARs and SOGs be developed and maintained by periodic review and updating on a set timetable. Review of ARs and SOGs should include involvement and oversight of the City Human Resources and Performance Management Department. However, the time and expertise to maintain, update, and verify legal compliance of ARs and SOGs for the fire department is extensive. Given the importance of creating a complete set of ARs and SOGs, ESCI recommends development and maintenance be outsourced to a third party.

³⁰ KF&BD uses the terms P & P (policies and procedures) and R & R (rules and regulations).

Succession Planning (Development)

A succession plan should be ongoing and provide a pool of trained, experienced, and promotable personnel to succeed current officers. Succession development is a process whereby a fire department can ensure that employees are recruited and developed to fill each key role within the organization. Actively pursuing succession planning ensures that personnel are constantly being prepared to fill each needed role. As KF&BD key employees retire or accept promotional opportunities, succession development guarantees that there will be officers and firefighters ready and available to fill new roles. Effective, proactive succession development leaves KF&BD well prepared for the loss of a key employee, filling a newly created position, employee promotions, and organizational redesign.

Through succession development, KF&BD can better retain superior personnel because they appreciate the time, attention, and development invested in them. Employees are motivated and engaged when they can see a potential for continued growth and development. KF&BD can use such practices as providing opportunities for assignment to special projects, smaller leadership roles, progressively increasing management roles, and both internal and external training opportunities.

KF&BD should identify and understand the developmental desires of personnel. It is not necessary nor does everyone need or want to be the fire chief. Ensure that firefighters understand the promotional paths and the roles that are available for them to aspire. Focus resources on retaining key personnel and having individuals ready to step up.

Keep succession planning and development simple. At times fire departments have created excessively complex criteria for the succession development process. Keep it simple: It is more important that individuals have a competent coach.

There are several factors typically found in successful succession development initiatives. Examples include:

- Personal involvement of the fire chief and senior officers.
- Senior officers hold themselves accountable for developing future leaders.
- Personnel are committed to their own self-development.
- Success is based on long-term department needs.
- Succession is linked to master planning, strategic planning, and an investment in the future.

- Leadership skill sets and competencies are identified and used when developing future department leaders.
- A pool of talent is identified and developed early for long-term needs.

Many of the costs for succession development are soft costs associated with a commitment of time by the current KF&BD leadership. Other expenditures involve a commitment of funds for internal and external training courses.

ESCI recommends that the KF&BD develop a succession plan to ensure employees are recruited and developed to fill each key role within the organization.

Financial Management

Budgeting

Beginning in 2004, the City of Kirkland changed from an annual to a biennial budget process. State law requires that the first year of a biennial budget be an odd numbered year. Accordingly, the preparation of the biennial budgeting process occurs during an even numbered year, beginning in June and continuing through the end of the year.

The City Council holds a mid-year budget review meeting in June and receives a status report on the current biennial budget and an updated six-year financial forecast, with an emphasis on the coming biennium. Additionally, the City Manager requests input from the City Council about budget priorities and overall direction. The following are key steps that the City takes to prepare its budget.

- 1) In July, the director of Finance & Administration (F&A) makes the official “budget call” to all department directors requesting expenditure and revenue estimates for the current year and the coming two years.
- 2) F&A prepares all general purpose revenue estimates, consisting mostly of taxes, state shared revenues and entitlements, and intergovernmental service revenues, during the first half of August. Additionally, the F&A department receives and reviews departmental revenue estimates during the same time period. Departmental expenditure estimates for the current year and “basic budget” requests for the coming biennium, which represent the estimated cost of maintaining the current service level, are received and reviewed by the F&A department during the second half of August.
- 3) In late August, the director of F&A meets with each department to review their basic budget requests.
- 4) In early September, departments submit additional funding requests (called “service packages”) for new positions, equipment, and projects which are over and above their basic budgets. F&A reviews all service package requests by mid-September.

- 5) In mid-September, the City Manager meets with each department to review their basic budget and service package requests. The City holds a public hearing in mid-September to gather citizen input on proposed revenue sources for the coming biennium.
- 6) The City Manager finalizes the preliminary budget proposal, which includes recommended service packages, by the end of September. In early October, the City Manager and director of F&A brief the council finance committee on the preliminary budget proposal.
- 7) In October, the F&A department prepares and prints the preliminary budget document for the coming biennium. By November 1st, the preliminary budget document is filed with the city clerk, distributed to the City Council and the departments, and made available to the public.
- 8) The City Council holds a series of budget study sessions in November to review the City Manager's proposed budget and to determine if there are any changes they wish to make.
- 9) The City holds a public hearing in mid-November to gather citizen input on the preliminary budget as well as on any changes made by the City Council during their budget deliberations.
- 10) In December, the City Council adopts the final property tax levy for the coming year and the final budget for the coming biennium each by ordinance via a simple majority of the members present. The appropriation approved by the City Council is at the individual fund level.
- 11) The F&A department publishes the final budget document during the first quarter of the following year, distributes the document to the City Council and the departments, and makes copies available to the public.

Interviewees described to ESCI a "tension" between the KF&BD and F&A. Concerns were expressed that the fire department:

- Has a "mind-set" of spending it all each year; if they have money they will spend it to the limit.
- Other City departments have gotten better results by involving F&A on process, budgeting, and making a budget case for fire department programs.

Stakeholder portrayals of the relationship between KF&BD and F&A included some recent positive elements. Affirmation included how the KF&BD successfully handled the EMS transport billing issue and training on internal financial controls of fire officers by F&A.

A new level of cooperation between KF&BD and other City departments is viewed as a positive outcome that is a result of direction from the City Manager's office.

Purchasing Management

KF&BD spends approximately \$500,000 per year purchasing supplies and services. City purchasing policies reflect best practices calling for separation of duties assigning buying functions to different people, obtaining appropriate authorizations and approvals, securing assets, and verifying charges. With proper segregation, no single person has complete control over all buying activities. KF&BD follows the adopted City purchasing policy for the acquisition of goods and services.

The City issues P-Cards (purchasing cards) to the training division, and fire department administration that have source and product limitations. Regardless of vendor or amount of purchase, all procurements require a P.O. (purchase order) to be generated in the City purchasing system. KF&BD participates in cooperative purchasing in particular for capital apparatus. As defined in City purchasing policy, high value items involve a bid process and assistance from F&A with the process; the fire department develops the specifications.

Adequate controls are in place to ensure fiduciary responsibilities for purchasing items and services for KF&BD are met.

Equipment Replacement Funding

KF&BD has reserve funds dedicated for the replacement of some capital equipment. The City currently funds replacement reserves for facility systems replacement, vehicles, and personal computers using a “sinking fund” approach, which sets aside funds each year through the operating budget toward the anticipated replacement of that equipment.

ESCI recommends that items with an individual value below capital threshold minimums that are generally purchased in volume and have a total value over \$5,000 be aggregated and included in capital replacement funding. Items generally below capital threshold minimums but acquired in bulk include:

- PPE (Personal Protective Equipment)
- Firefighting hose
- SCBA (self-contained breathing apparatus)
- Radio (portable and mobile)
- Firefighting appliances (nozzles and adaptors)
- Uniforms
- Disaster preparedness equipment (Ham radios, and emergency provisions)

- Generators, fans, and saws

Establishing these items as a capital asset and contributing to an annual replacement fund is appropriate. While a single set of firefighter PPE is approximately \$2,000, acquiring 20 complete sets would exceed \$40,000. It is understood that funding would need to follow the normal budget process, but anticipating the purchase requirement is prudent.

Records Keeping

Records management is a critical function for any organization. A variety of uses are made of written records. Misplaced, stolen, or lost documents can have serious consequences, so it is important that their integrity be protected. RCW 42.56.070 requires public access to certain documents and data.³¹ The Kirkland City Council, through approval of Resolution 4669, adopted Public Records Act Rules. A simple, straight-forward link on the City website launches a public records request form for citizens to complete with a stated goal to provide a response within five business days.

Fire department hard copy records are protected in either secured file drawers, secured offices, or both. Computer files are routinely backed up. Electronic files are password and level of authority protected, preventing access by unauthorized personnel.

Security

The citizens of the City of Kirkland have made a significant financial investment in facilities, apparatus, and capital equipment for the KF&BD. Protecting these assets is a fiduciary responsibility of the City and KF&BD and an expectation of the community which funded them. Fire stations were observed by ESCI and reported to be consistently locked and secure from unauthorized entry. Public access to the buildings is limited to community rooms and/or, when accompanied by an employee, business areas. Access to fire stations is via a coded keyless entry system.

KF&BD maintains a current inventory of capital assets. An asset tag and inventory control system is based on the value of an item and for items identified as “attractive assets.” No business-related cash is routinely kept on the premises, reducing the risks associated with burglary and theft. City Purchase Cards (P-Cards), such as VISA™ or MASTERCARD™ credit cards, with limited distribution, strict account controls, and low credit limits are issued for fire

³¹ RCW Sections 42.56.040, 42.56.070 and 42.56.100, Documents and indexes to be made public.

department use. A formal City purchasing policy and procedures for the acquisition of services and items are in place and strictly enforced.

Management Reporting

KF&BD uses an RMS (records management software) to enter and store emergency incident information. The software is compliant with NFIRS (National Fire Incident Reporting System) standards and incidents are entered appropriately. Exposure records for blood and airborne pathogens are recorded in HealthForce – Workplace Health Solutions. However, there is no formal process for managing other types of exposure records. Appropriate records are maintained for documenting the testing of self-contained breathing apparatus (SCBA), hose, ladder, pump, breathing air, vehicles, gas monitor, and radiological detection equipment.

ESCI recommends that the KF&BD and the Human Resources and Performance Management Department develop a procedure and policy for reporting and retaining all employee exposure records.

Periodic reports on the financial activities of KF&BD are provided to the City's elected officials by the Finance and Administration Department. Fire department operational reports are delivered to the City Council on a request basis. An annual report is produced and includes emergency response data analysis. The annual report is distributed to the City Council, City Manager, and others on an as-requested basis. At the time of this study the 2011 annual reported had not been completed.

Fire department personnel records are retained by the City Human Resources and Performance Management Department. They are maintained in a manner that protects private medical information in compliance with HIPPA (Health Insurance Portability and Accountability Act) requirements. Records retention includes documents related to an employee's relationship with the City (employment history), discipline, commendation, performance evaluation, work assignment, injury, exposure, and leave use.

Internal and External Communications

Media Relations/PIO

KF&BD's external communication effort is not robust. Due to budget decisions the KF&BD Community Information and Education Specialist position that served as the department public information officer (PIO) was eliminated at the end of 2010. KF&BD relies on the City's Communications Program Manager (CPM) to manage external messaging to the media. The

(CPM) reported to ESCI that it is too early to tell if dependence on this position will be effective long term. A barrier identified to the success is the availability of KF&BD administrative staff to respond promptly to CPM requests for information or when a time sensitive story must be approved prior to release. Messaging must be timely, especially when using the media as the vehicle for dissemination of material. A lack of available management personnel to draft, review and approve press releases which reduces the effectiveness of the message and may relegate the message to a footnote. KF&BD does not dedicate personnel to staff a media sector at emergency incidents.

The City CIO is the public affairs producer of “Currently Kirkland,” a local government channel that provides local news, information on community activities, and special features about the City of Kirkland. This medium could be leveraged by KF&BD as an outlet for telling its story and distributing public safety messages to the community. While viewership may not rival network television, these types of government access programs have a high percentage of actively engaged citizens who will multiply the message by their activism.

A recent example of the problem inherent in a passive approach to external communication and community outreach was Finn Hill Fire Station controversy. This community conflict could have been managed more effectively by anticipating where the controversy might lead, understanding what the key points of conflict are, and “getting ahead” of the story. Anticipating the spread of a controversy affords the fire department and City an opportunity to develop message points and get them out to the community to prevent a conflict or at a minimum avoid being placed in a defensive posture.

Proactive messaging can include public interest stories that are not time sensitive and can be run “on a slow news day” or in concert with a global news event that provides a local angle. These messages can be developed as staff has time to develop them and be kept on file until the fire department can leverage the story to the greatest advantage.

A dynamic, contemporary, up-to-date, and useful website provides an additional avenue of distributing information and communicating with the public. KF&BD’s web presence appears to be kept up to date in some areas and significantly out of date in others. Citizen interest is maintained in a website that is continuously changing to meet the needs of the community. The website could be enhanced by producing and adding citizen training videos to the site. Expanding the use of interactive components such as surveys and downloadable documents

(fire escape plans, preparedness, and self-help checklists) will help to keep the community engaged. Potential benefits include a reduction in community risk through education, and a multiplied impact of staff-hours dedicated to educational endeavors. To keep content fresh and relevant, a regular schedule of updating and maintenance of the fire department website is recommended.

ESCI recommends that the KF&BD make media messaging a priority and use “Currently Kirkland” and other media outlets as a tool to leverage the reach and impact of fire department public information and education messages. This should include a proactive message file where the subject is not time-sensitive, but timely release may position the message to its greatest advantage.

Internal Communications

Quality communication requires continuous attention and effort for any organization. At the KF&BD, the administration and operations chiefs conduct monthly meetings with staff. The building official and both deputy chiefs (executive staff) meet on a weekly basis and all chief officers attend company officer meetings once a month. The fire chief meets with the labor group (labor management) once a month and visits fire stations two to three times a month. Minutes for internal meetings are taken by a meeting attendee.

Fire departments should have a systematic method for distribution of written communications established and maintained in order to make certain that no members are excluded from the information loop. Critical information should not be distributed in a one-way communication model with the assumption that personnel have reviewed and understand the content. For these circumstances, the chain-of-command should be used to disseminate critical or time-sensitive information during crew meetings. KF&BD issues internal written, formal memoranda when major events occur, such as the hiring of new personnel, promotional announcements, or informal commendations. Otherwise, e-mail is used for routine fire department communication. Overall, ESCI found that a significant effort in communication is being invested internally by KF&BD staff to provide an opportunity for department personnel to be informed, heard, and involved.

With the high cost and logistical difficulty of bringing all members together for a briefing or meeting, selected fire departments are using other approaches to communication. One example is a department that employs monthly broadcasts made by fire chiefs that are delivered

over a secure network. The broadcast is recorded for later viewing by department membership unable or unavailable to view the content live. Questions arising from the broadcast or from e-mails submitted to the fire chief are answered in an internally distributed newsletter. The internal newsletter contains information specifically for employees. ESCI recommends that the KF&BD expand internal communication with a monthly informational broadcast meeting with department staff.

Live broadcasts are viewed as a viable method to deliver a consistent message on a regular basis to all KF&BD personnel. They are not intended to replace routine meetings between the fire chief, fire department leadership, and department personnel. It was ESCI observation that there are long periods of time between opportunities for personnel to meet and confer with the fire chief. With a live monthly informational broadcast meeting between the fire chief and department personnel it could be rebroadcast or replayed at a time that is convenient for department personnel.

Decision-Making Processes

It is widely recognized that when employees are provided with the opportunity to engage in the decision-making process, the organization benefits from a higher level of commitment and ownership in the success of the organization.

For fire departments, the opportunities to delegate decision-making down through the organization are quite numerous. Chief officers (deputy chiefs and battalion chiefs) are often given the task of making staffing decisions. Company officers can be given responsibility and/or authority for scheduling, program management, training, and fire station operations. Firefighters can make determinations as to patient care, station and apparatus maintenance.

The decision-making process for KF&BD is defined and participatory where appropriate. In the past, the relatively small size of the organization lent itself to a more personal and informal decision-making process. ESCI found that when making decisions KF&BD personnel tended to still view the department as intimate and insular. KF&BD and the City can still be intimate but the reality is that it is now a large, complex enterprise with multiple facets.

Where participation is solicited by management in the decision-making process, those involved should be knowledgeable of the key findings by which the decision was made. This process may go a long way in acceptance of the decision and providing a sense of worth and value in the employees, even though the decision may not reflect their input. ESCI observed that the fire

chief encourages and applies participatory communication to decisions with staff and operational personnel interacting through all levels of the department.

Kudos 3: Fire Chief Kevin Nalder encourages and applies participation in the decision-making process by involving staff and operational personnel from all levels of the department.

Interdepartmental Communications and Relationships

Throughout this process ESCI heard comments and observed interaction regarding KF&BD's relationships with other City departments. The description of fire department relations with other City departments were represented as okay then couched with "but," "The fire department does not understand how other departments can help them and that they are not the only City department." In more than a few instances relations with KF&BD and other City departments were described as being tense or that there is tension. It was suggested in discussions with stakeholders that one way for improving interdepartmental relations was to have KF&BD personnel receive exposure to other City departments. Such an example occurred recently between KF&BD and the finance and administration department.

In an effort to improve acquisition and internal control systems, Kirkland Finance and Administration Department delivered training to KF&BD fire officers. ESCI views this action as positive for fire department personnel to grasp an understanding of City procedures and building healthy inter-department relationships. The deeper understanding must go both ways however. Providing the other city departments with training and exposure to the challenges and issues facing the fire department also assists in improving interdepartmental relations. This is addressed in greater detail in the strategic planning elements of this report.

Other City departments were just as likely to commend the fire department for positive relationships and actions. KF&BD was recognized by two other City departments acknowledging the department's efforts at doing a good job with the Fire Corps program.

In the course of this evaluation the City instituted an *Internal Process Review*. The four stated goals of the process review are to:

- Optimize department administrative processes
- Ensure supportive work is completed
- Establish/reinforce effective working relationships between operating and support departments

- Better understand (individual) department's needs for future planning purposes

Health and Wellness Program

Keeping members safe and healthy is an important component of a fire department's method of operation. It has been clearly documented that it is by far cheaper to prevent injury than to pay for rehabilitation and work replacement.³² Modern, progressive departments are incorporating numerous methodologies into the daily routine of firefighters to help in this regard.

There is a need for fire departments to have access to a group of professionals with expertise in the occupational medicine field. Occupational medicine is dedicated to promoting and protecting the health of workers through preventive services, clinical care, research, and educational programs. One aspect of such a program is keeping up-to-date with health and safety regulations, standards, and current practices. Occupational medicine specialists review current practices to see if they meet industry regulations, make modifications if needed, and assist the department in adopting any changes. Another aspect of a holistic occupational medicine system is fitness programs. Fitness programs are used to monitor and develop required physical training to keep personnel ready for the tasks to be performed and reduce the possibility of injury while on the job.

The importance of employee health and welfare and the potential liability associated with the lack of such programs necessitates that fire departments establish close professional relationships with occupational medicine specialists to assure that emergency workers are protected by the most up-to-date occupational health and safety programs possible.

Occupational safety and health programs (sometimes referred to as Industrial Medicine) vary in depth, form, and delivery. A fire department may employ a physician full time, contract with a provider organization, or conduct a program partially in-house while contracting for the remaining services. There are several hospitals and medical centers in the area which have programs that may meet the needs of KF&BD.

One such occupational medicine program that ESCI is familiar with uses the fire department wellness coordinator to conduct audiometric, spirometric, and vision screenings before personnel complete their annual physical evaluation. The occupational medicine provider then

³² *American Journal of Industrial Medicine*, Volume 43, Issue 4; "The Economic Consequences of Firefighter Injuries and Their Prevention", National Institute of Standards and Technology, pgs 454 – 458, March 2005.

conducts blood draws at individual fire stations. Consequently, at the time of the medical physical, the physician has at his/her disposal the firefighter's historical and current medical screening records.

The medical physical, stress test, and all other components of the evaluation are done as part of the fire department's regular training rotation at a regional training center. Through a professional relationship developed with a medical service provider over several years, the fire department in this example was able to receive this level of service at a very competitive price.

The legal requirements for a fire department occupational safety and health program have been established. How a fire department administers and supports the program determines the success and the resultant benefit. In the example, the department mentioned previously had to hire back extra staff or pay employees overtime to take annual medical physicals. The occupational medical program resulted in a cost avoidance of more than \$15,000 through reduced overtime cost; some funding is still required for medical follow-ups and for employees not able to meet the schedule.

An additional advantage of using a local occupational safety and health provider is the ability to quickly evaluate and treat non-threatening injuries suffered by employees.

KF&BD has established medical physical standards and provides medical physical examinations; depending on the individual's age, risk factors, etc., additional evaluations and tests are provided. Examinations should follow *NFPA 1582*.³³ Baseline values for all firefighters should be established at time of hire/appointment that includes: titer level, vision, spirometry, audiometric, hepatitis, B, and C, and tetanus.

A stress test is used to determine the amount of stress that a heart can manage before developing either an abnormal rhythm or evidence of ischemia (inadequate blood flow to the heart muscle). The test provides information about how the heart responds to exertion. It usually involves walking on a treadmill or pedaling a stationary bike at increasing levels of difficulty, while heart rate, and blood pressure are monitored, with a physician present. The test helps to determine if there is adequate blood flow to the heart during increasing levels of activity and the likelihood of having a coronary event or the need for further evaluation. KF&BD fitness standards used during the hiring process are job-related. The fitness evaluation for incumbent

³³ *NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2007 Edition.

employees is not job related. Incumbent firefighter fitness is assessed by measuring the number of pull-ups, sit-ups, push-ups, and timing a run.

Medical physical assessment should involve periodic stress tests of incumbent employees/members every two to five years, based on age and risk factors. We recommend that a stress test be performed at the time of hire to determine if a candidate has an underlying heart defect or disease that would put them at risk while performing the duties of a firefighter. The leading cause of death for firefighters is heart attack (44 percent). Death from trauma, including internal and head injuries, is the second leading cause of death (27 percent). Asphyxia and burns account for 20 percent of firefighter fatalities.³⁴

Conclusion – Management Components

Fundamental tools necessary for organizational management are inadequate. ARs (administrative rule) and SOGs (standard operating guideline) specific to the fire department were generally outdated. Additionally, variations exist between City and KF&BD AR documents including safety, purchasing, and public access to records and document retention. There should be a sense of urgency given to developing a complete set of documents.

Internal tension between the KF&BD and F&A is concerning, though recent moves on the part of the two directors has made what is described as “improvement” to the working relationship.

KF&BD’s management of external communication effort has been reduced to reacting to media worthy events. Limited administrative staff for information requests on time sensitive stories further reduces the fire department’s ability to seize opportunities to tell its story. An effective option for linking with the community is through a website presence. KF&BD’s web presence appears to be kept up to date in areas and significantly out of date in others.

Without the assistance and a greater degree of cooperation between and from other City departments, KF&BD lacks the administrative and support staff to give public education and information programs little more than lip service.

Recommendation Summary – Management Components

- ❖ Recommendation 11: Outsource development and maintenance of Administrative Rules and Standard Operating Guidelines to a third party. Development and maintenance of

³⁴ The United States Fire Administration (USFA), *The USFA Firefighter Fatality Retrospective Study: 1990-2000*, October 2002.

Administrative Rules and Standard Operating Guidelines should include involvement of the City human resource department. (Implementation Order 1)

- ❖ Recommendation 12: Develop a succession plan to ensure employees are recruited and developed to fill each key role within the organization. (Implementation Order 11)
- ❖ Recommendation 13: Prioritize media messaging. Use “Currently Kirkland” and other media outlets as a tool to leverage the reach and impact of fire department public information and education messages. (Implementation Order 2)
- ❖ Recommendation 14: Anticipate controversies or events which may generate media or community interest and develop a media or messaging plan in advance. (Implementation Order 7)
- ❖ Recommendation 15: Develop a proactive message file where the subject is not time-sensitive, but timely release may position the message to its greatest advantage. (Implementation Order 12)
- ❖ Recommendation 16: Develop interactive content for the fire department website: citizen training videos and downloadable documents (fire escape plans, preparedness, and self-help checklists). (Implementation Order 9)
- ❖ Recommendation 17: Update existing content on the fire department website and schedule regular maintenance. (Implementation Order 8)
- ❖ Recommendation 18: Administer a stress test at the time of hire and periodically on incumbent employees/members based on age and risk factors. (Implementation Order 5)
- ❖ Recommendation 19: Develop a procedure and policy for reporting and retaining all employee exposure records. (Implementation Order 4)
- ❖ Recommendation 20: Aggregate like item equipment purchases with a total value of \$5,000 or more and include in the City’s annual budget. (Implementation Order 12)
- ❖ Recommendation 21: Develop, validate, and employ a physical evaluation process that is job related. (Implementation Order 6)
- ❖ Recommendation 22: Establish a medical baseline for new firefighters at the time of hire/appointment. (Implementation Order 2)
- ❖ Recommendation 23: Produce a live monthly informational broadcast meeting between the fire chief and department personnel. (Implementation Order 10)
- ❖ Recommendation 24: Provide a fire service-related occupational and health program. (Implementation Order 3)

Emergency Management (Disaster Preparedness)

Comprehensive planning that includes risk assessment, communications systems and networks, personnel training and exercising, and hazard mitigation, forms the basis of effective emergency management and disaster preparedness. Because the impact of these incidents is often widespread, a regional perspective for the plan's design is essential.



The Office of Emergency Management (OEM) is a City wide function under the Fire and Building Department. J. Kevin Nalder as the Director of the Fire and Building Department and City Emergency Management, directs the OEM while the deputy chief of administration serves as the emergency manager.

Overview of Emergency Management Services Provided

Elements of expected government functions entail: 1) preparedness, 2) response, 3) recovery, and 4) mitigation. The Preparedness Cycle calls for local agencies to perform the following tasks to ensure their ability to fulfill those expectations:

- Plan
- Organize, train, and equip
- Exercise
- Evaluate and improve

This section assesses the current status of the City of Kirkland's Comprehensive Emergency Management Plan (CEMP) and emergency management and disaster preparedness program design.

An emergency management program relies foremost on capable staff in sufficient numbers, to carry out the elements of the CEMP. We begin our survey of this program design with an overview of assigned staffing.

Staffing and Reporting Relationships

The director of fire and building/fire chief holds the title, responsibility, and accountability of emergency director³⁵ for the City of Kirkland but is not included in the staffing budgeted for the OEM.

Emergency Management Staffing

There are 1.5 FTEs assigned to staff the City emergency management program:

- Deputy Fire Chief (0.5 FTE)³⁶
- Coordinator (1.0 temporary FTE)

A cadre of external and internal volunteers has been recruited to assist with community preparedness:

- Volunteers (includes 2 emergency volunteers; 12 Fire Corps volunteers; 1 AmeriCorps VISTA volunteer through August 2012)
- Amateur Radio Emergency Services³⁷ (ARES) and Radio Amateur Civil Emergency Services³⁸ (RACES) (40 volunteer personnel)
- The EMAT (Emergency Management Action Team) is a group of City department representatives that coordinate updates to the CEMP and emergency preparedness activities and information

Emergency Management Action Team (EMAT)

The Emergency Management Action Team (EMAT) is an internal City team that assists emergency management with non-emergency communication. This team is comprised of a mix of staff members from each of the City's departments. The stated purpose is to assist with emergency preparedness, internal information dissemination and solicitation, monitor training requirements, and capturing feedback on emergency operations center (EOC) staff assignments. EMAT is led by the emergency management coordinator.

Amateur Radio Emergency Services (ARES)

Amateur Radio Emergency Services (ARES) is a group of community volunteers (approximately 40 members) dedicated to the delivery of communications during a disaster of large scale emergency incident. Established in 1995, this group of registered disaster volunteers can

³⁵ Kirkland Municipal Code 3.20; WAC 118.

³⁶ Amount of time dedicated to emergency management is an estimate provided to ESCI by the administration deputy fire chief.

³⁷ ARES (non-government) is typically activated before, during, and after an emergency; handles all types of communications.

³⁸ RACES (government) is active only during an emergency; provides communications support for government emergency management offices.

operate radio transmitters located in each fire station, city hall, the EOC, or the maintenance center. The City recently invested \$57,000 of CIP funds to upgrade the radio equipment used by ARES.

Community Emergency Response Training (CERT)

A group of 15 to 20 volunteers participate and assist with Community Emergency Response Training (CERT), Map your Neighborhood, and the Preparedness outreach programs. The deputy chief of administration (emergency manager) is the program coordinator.

There is a new cadre of volunteers that has been recruited to assist with community emergency preparedness. As of the date of this study program details have yet to be established. The AmeriCorps VISTA volunteer has been the point person for most of the volunteers in the OEM. This grant position ends in August 2012.

KF&BD lacks sufficient career personnel resources to fulfill essential roles for the mission and design of the emergency management program. In its place, the City assigns key responsibilities to senior managers of the KF&BD as part of their job description duties. The temporary nature of the emergency management coordinator position has created an uncertainty among staff and has left the program predisposed to turnover. The deputy chief of administration represents the single point of continuity for the emergency management program of the city from year to year, thus represents the single point of failure. This ties the program's success to an individual and reduces the availability of the deputy chief of administration in other fire department responsibilities.

The OEM relies on City staff to participate in emergency management functions. Staff from each of the City departments has employees that are actively involved in operation of the EOC, assigned to disaster response teams, and contributed to Kirkland's CEMP.

Current staffing practices mean that KF&BD must rely heavily on City staff from all departments during an emergency event. In order to capitalize effectively on these volunteer resources, KF&BD must develop and implement a plan that outlines how volunteers will be used and how they will be managed.

EOC (Emergency Operations Center)

When an emergency or disaster incident occurs, local agencies must carry out multiple functions swiftly and effectively in an effort to protect life, property, the environment, and the

economy in a concerted effort to restore normalcy. The number, nature, and urgency of problems during an emergency differ greatly from those during normal governmental operations. The complexity, criticality, and interdisciplinary nature of these events dictate the need for a centralized and unique planning and coordination center.

An Emergency Operations Center (EOC) at a central location should be used for information gathering, disaster analysis, and response coordination. Elected and appointed officials use this information for decisions concerning emergency actions and to identify and prioritize the use of needed resources. Emergency warnings, critical information, and instructions to government personnel and the public are vital for success.

Gathering information, making decisions, and taking necessary action requires close coordination between key officials who may not normally work together. Decisions and response actions must be coordinated, integrated, and applied thoughtfully from a central location. A proven way to maximize coordination and application of resources in an emergency is by centralizing response actions in an EOC.

The City of Kirkland does not have space designed and dedicated primarily to the functions of an EOC. Existing space is converted and workarounds must be instituted. These steps take time and lead to further delays and complexities when the space assigned as an EOC is otherwise in use.

Interdepartmental Communications

The emergency management coordinator with support from the community program manager facilitates internal communications through the Kirkland intranet network. Emergency Management Assistance Team (EMAT) members meet on a regular schedule and are supplemented with numerous face-to-face and e-mail communications. Newsletters and memoranda are not routinely used as part of internal communications.

External Communications

The City of Kirkland's website is the primary resource for public (external) communications with the community. Management of information distribution is directed by the OEM and supported by the City's communications program manager. Kirkland also participates in a regional public information network which community members can voluntarily receive posted information. Electronic reader boards are located at each of the fire stations to provide routine information

and can be deployed during an emergency event. The OEM directs external communication when the OEC is activated in a disaster or during emergency events.

Inter-jurisdictional

North East King County Regional Public Safety Communication Agency (NORCOM) serves as the community's public safety answering point (PSAP) for 9-1-1 calls and dispatching emergency resources. NORCOM maintains a reverse 9-1-1 system whereby it can deliver a recorded emergency notification to a geographically selected set of telephone service subscribers. The City of Kirkland has access to the emergency notification system for the dissemination of information.

Kirkland emergency management personnel are active with the Local Emergency Planning Committee (LEPC) and participate on regional planning committees with the school districts.

The City of Kirkland has a need to plan, prepare, and be in a position to manage natural and man-made emergency events. Given that many of the events are high risk – low frequency events, the focus of funding and personnel are often directed to other efforts. A strategy employed by various emergency service providers is to collaborate on staffing for services that are of mutual interest. Two neighboring fire districts and others jurisdictions have invested in emergency management. ESCI recommends that the City of Kirkland seek a cooperative effort with other agencies, contracting emergency management services from KF&BD.

Emergency Management Planning

All emergency management and preparedness planning documents, records, and reports are retained in electronic format.

Documentation

Kirkland's Comprehensive Emergency Management Plan (CEMP) includes a formally adopted mission and objectives linked to its programs.³⁹ The program mission provides guidance in disaster prevention, preparedness, response, and recovery. The plan emulates the National Response Framework, the Washington State and King County CEMPs, and the Zone 1 (Northeast area of King County) Regional Disaster Plan.

Kirkland's CEMP is posted on the City's website and is available for review and download. The current CEMP was developed in 2010 and is subject to review and revision on a four-year cycle.

³⁹ City of Kirkland Resolution R-4865; February 15, 2011.

While incomplete this plan is thorough, integrated with regional, state and national plans, and well organized. The Continuity of Operations (COOP) and Continuity of Government (COG) plans have not been completed due to a lack of funding.

The City of Kirkland has a current Hazard Identification and Vulnerability Assessment (HIVA). A HIVA provides a summary of risk to the City from a variety of different hazards. A Hazard Mitigation Plan (HMP) provides guidance to local public safety officials on projects that could help mitigate the effects of potential hazards such as severe storms, earthquakes, wildfire, and flooding. Federal Emergency Management Agency (FEMA) funding for pre-disaster mitigation is dependent on the adoption of an approved Local Hazard Mitigation Plan.

Training/Drills

The OEM staff plans, develops, and coordinates EOC training exercise. City employees with EOC or disaster team assignments participate in training and exercises. Like many urban cities today, there is little time among the work priorities of department employees to attend to emergency management roles and responsibilities. However, without leadership input into disaster preparedness planning and training, directors and department personnel can be surprised by plan components as an incident unfolds. City leaders must continue to prioritize time and focus attention to emergency management roles and responsibilities at key junctures in the planning processes.

Community Involvement

Citizen awareness and involvement in emergency preparedness is vital for success. Citizens need convenient access to emergency management staff to support community involvement. Individuals and groups can direct questions, suggestions, and complaints to the City by means of the website. Community and neighborhood meetings are not a normal component of external communications for emergency preparedness. Meetings to communicate the City's emergency preparedness to neighborhood and community groups should be conducted regularly.

The following paragraphs provide an overview of three key volunteer initiatives under the direction of the KF&BD deputy fire chief of administration

Community Emergency Response Team (CERT)

Emergency preparedness training is available to the community through the CERT (Community Emergency Response Team). Training classes are determined by the number of community members enrolling through the City's website. Emergency preparedness training is provided to

KF&BD personnel but fire department and other city personnel are not included in emergency exercises.

The development of the CERT program was a principal focus and activity of the City's emergency management program. CERT modules instruct neighbors in disaster preparedness for hazards that may impact their community and introduces basic disaster response skills such as fire safety, light search and rescue, team organization, and disaster medical operations.

Using the skills learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. Members of CERT are encouraged to support their emergency response agencies by taking a more active role in emergency preparedness projects in their wider community.

Program funding for CERT was decreased in the 2010 budget process. Volunteers and community members have raised funds to sponsor two CERT classes with the OEM in 2012. The CERT program is coordinated by volunteers, taught by a KF&BD firefighter and supervised by the deputy chief of administration.

Fire Corps

Fire Corps is the name of a Federal Emergency Management Agency (FEMA) grassroots strategy that brings together government and community leaders to involve people in all-hazards emergency preparedness and resilience. Fire Corps is one of five Citizen Corps programs and its mission is to connect community volunteers with their local fire department to assist with non-emergency tasks. Once trained these community volunteers perform non-operational roles that develop, implement, and sustain programs and services to help their fire department meet certain community needs.

Kirkland Fire Corps program has just been established in Kirkland. A KF&BD fire captain manages the program with oversight by the deputy chief of administration (emergency manager). Fire Corps has 12 members who are involved in activities that support the fire department and the OEM.

Map Your Neighborhood

A third external community preparedness activity is the Map Your Neighborhood (MYN) program.⁴⁰ Sample elements of the mapping survey includes ascertaining neighbors with relevant skills to assist, locating vulnerable neighbors, and determining the location of residential natural gas shut offs on a neighborhood map. Due to the autonomous nature of this program, there is no practical means to measure the currency and readiness of the Map Your Neighborhood program. The AmeriCorps VISTA resource person position that is responsible for oversight of OEM volunteers is available until August 31, 2012.

This program offers a unique way for neighbors to connect before, during, and after a disaster or emergency event. There are nine basic steps to the program whereby neighbors can take appropriate action to help each other. However, the program can be strengthened by developing a “block captain” concept and hosting a meeting with these block captains to facilitate brainstorming, share, and create an opportunity for the Kirkland professional staff to provide advice and counsel to the MYN program.

With this many community members involved in emergency management programs and a finite number of personnel resources for oversight, ESCI recommend that KF&BD develop and implement a plan that outlines how volunteers will be used and managed during emergency events.

Conclusion – Emergency Management

Given the number of tasks and functions required of managing an emergency management program, KF&BD is performing well considering the lack of FTEs allocated to the program. However, this comes at an opportunity cost to the fire department by squeezing out other program needs (financial, HR, IT, services to name a few) that would otherwise be provided by the deputy chief of administration. Acquiring additional staff to provide the daily work necessary to maintain a state of readiness would free the deputy chief to perform other essential tasks directly related to the administration of the fire department, relegating the emergency management workload to providing management guidance and gravitas to the program. Further, key plans and documents are missing from the program; specifically the COOP, COG, and HIVA/HMP. Emergency management program documents must be developed and volunteer groups (CERT, ARES/RACES, Fire Corps, AmeriCorps VISTA) need to be honed into

⁴⁰ Map Your Neighborhood is an award-winning program from the Washington State Emergency Management Division that seeks to build and strengthen preparedness within local neighborhoods.

a cohesive, focused team, each contributing as appropriate toward the emergency management mission.

Recommendation Summary – Emergency Management

- ❖ Recommendation 25: Develop and implement a plan outlining how volunteers will be used and managed during emergency events. (Implementation Order 5)
- ❖ Recommendation 26: Identify a location and develop a dedicated EOC; apply for a matching grant from the Washington EMD Emergency Operations Center Grant Program (requires a 25 percent local match). (Implementation Order 4)
- ❖ Recommendation 27: Seek potential partner agencies to provide contracted emergency management services from KF&BD. (Implementation Order 7)
- ❖ Recommendation 28: Complete and publish the COOP and COG plans. (Implementation Order 2)
- ❖ Recommendation 29: Develop a Hazard Identification and Vulnerability Assessment and a Hazard Mitigation Plan. Submit to King County for inclusion as an annex to the County plan. (Implementation Order 3)
- ❖ Recommendation 30: Involve KF&BD and other City of Kirkland employees in community-based emergency exercises at least annually. (Implementation Order 6)
- ❖ Recommendation 31: Hire a full-time City emergency manager, shifting daily responsibilities from the Deputy Chief of Administration to the emergency manager. (Implementation Order 1)

Fire Prevention Bureau

Overview of Fire Prevention Services Provided

This section assesses the current status of the KF&BD's fire prevention and public education program. A comprehensive and effective fire prevention program is grounded on adoption of the current Washington state building code.⁴¹

Services expected in such a program are:

1) regulation of new construction in the community; 2) regular inspection of regulated occupancies and enforcement of applicable codes; 3) delivery of fire prevention and life safety information and skills training to the general public; 4) investigation of all fire incidents and assisting in the prosecuting the crime of arson; and 5) a reliable, secure records management system.



Effective service delivery requires capable staff in sufficient numbers to carry out the mission of the program. We begin our survey of this program with a summary look at staffing.

Staffing and Reporting Relationships

Four full-time equivalent (FTE) personnel staff the Fire Marshal Office (FMO or Bureau of Fire Prevention) of the KF&BD. The position titles include:

- Fire Marshal
- Assistant Fire Marshal/Inspector
- Deputy Fire Marshal
- Inspector

New Construction Review

The City of Kirkland's process for permitting new construction actively involves the KF&BD fire marshal, beginning with a pre-application conference for commercial developments and continuing throughout the construction process. The fire marshal's signature is required on any permit for construction and on the subsequent certificate of occupancy.

⁴¹ Revised Code of Washington (RCW) 19.27.031

The new construction approval process incorporates a two-part fire and life safety plan review. First the building division applies the building code. Second, the fire marshal focuses on fire department access (less than or equal to 150 feet from the building), fire flow, sprinklers, hydrants, fire alarms, and extinguishers.

Kirkland's comprehensive fee schedule supports permit activity. Projected fire marshal service costs are built into the City's permit fees. Fire marshal charges are an actual hourly rate for plan review of a project. The Kirkland Building Division tracks permitting and inspection activity with EnerGov Solutions software.

KF&BD's emergency services have a need for pre-fire (quick access) plans of public, commercial, industrial, and assembly structures. Quick access plans are used in training activities and during emergency incidents to give firefighters familiarity with access and egress points, utilities, hazards, and a general layout of the structure. A considerable amount of building structure information is captured during the permitting, construction, and inspection process. Integration of the fire prevention records with EnerGov RMS used by the building division would meet the requirements of KF&BD for quick access plans.

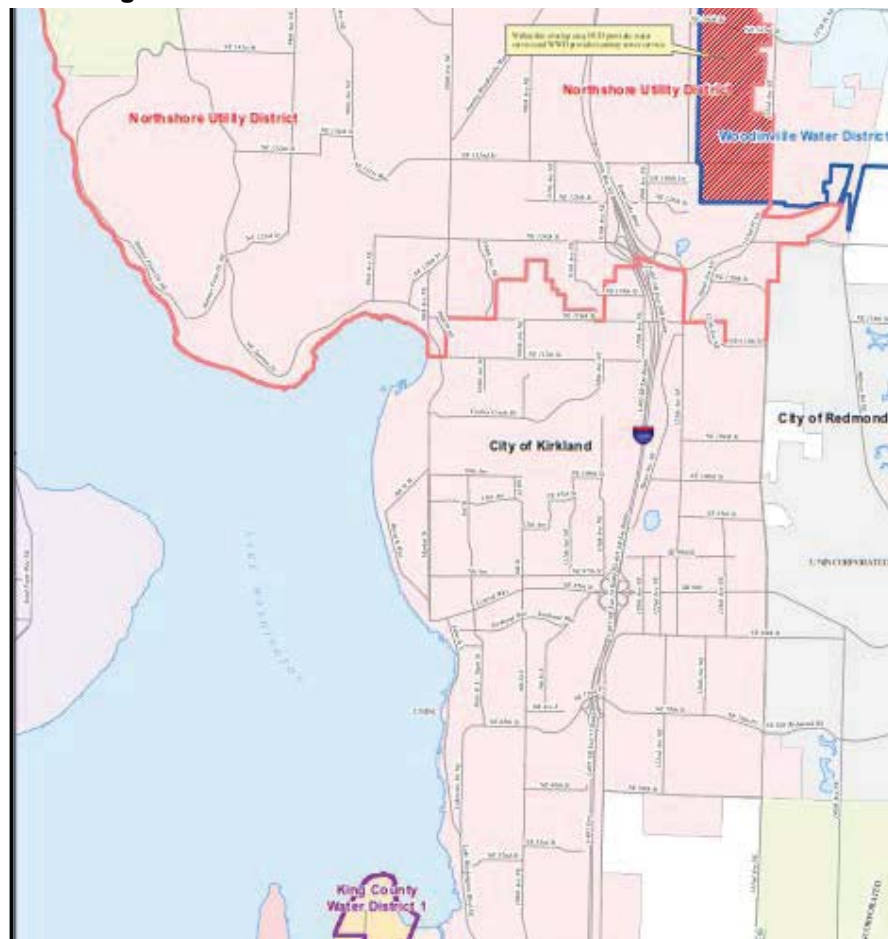
The City of Kirkland Water Division, the City of Bellevue and Northshore Utility, Woodinville, and King County Water Districts maintain the water supply and distribution system, including fire suppression and hydrant fixtures. The water purveyors use a water-modeling software application program for design and assessment purposes; City and District water staff also maintain the water system. Due to environmental restrictions, the water suppliers rarely flow test fire hydrants (system).

Water systems are constantly undergoing improvement, change in usage, and deterioration. As a result it is important to periodically flow test fire hydrants to determine what their capabilities would be in an emergency. Flow testing can uncover improperly operating valves, leaks and pump damaging debris in hydrants. Discovery of problems and repairs are vital before a hydrant is needed in an emergency.

Additionally, flow test data provides information necessary for water service planners and fire prevention staff can accurately estimate the capabilities of water mains. Water main and hydrant flow capabilities impact decisions on fire protection and fire resistance features that are required for new developments and priorities for upgrading older, smaller water mains.

Figure 39 is a water district and service area reference map. It displays three district boundaries (Northshore Utility, Woodinville Water, and King County Water District 1) and surrounding jurisdictions which provide water services. Service areas do not necessarily match the administrative or political boundaries of municipalities. For example, the City of Kirkland provides water service to the south part of Kirkland, City of Bellevue provides water services to Medina, Hunts Point, Clyde Hill, and part of Yarrow Point. The map label indicates generally the location of the service areas.

Figure 39: Water District Service Areas⁴²



The City of Kirkland Water Division performs bi-annual inspections of all fire hydrants in the Kirkland water service area. Bi-annual hydrant inspections consist of operation of the main valve, foot valve, caps, leaks, draining and pressure. Flow testing is performed as needed to calibrate the fire flow model. Inspections of fire hydrants are not conducted by the Kirkland Water Division in the Northshore, Redmond, or Woodinville service areas which are inside of

⁴² Source: City of Kirkland Water Department.

the City boundary. Kirkland Water Division is scheduled to begin maintenance of City fire hydrants in 2013.

A maintenance agreement with Northshore Utility specifies that all fire hydrants will be thoroughly checked bi-annually. Hydrant checks involve:

- Operation of the hydrant, checking for ease of operation, leaks, drain down
- Exercising the hydrant supply/auxiliary valve
- Logging water pressure at the hydrant
- Lubricating the upper stem section
- Checking accessibility of the hydrant trim shrubbery as needed
- Clean and paint fire hydrants, apply ID tag if needed
- Note all other deficiencies

Northshore Utility maintenance and out-of-service policies include dispatch center notification. Policies and procedures make no mention to fire flow testing for fire hydrants.

Woodinville Water's agreement for hydrant maintenance is with WFR (Woodinville Fire & Rescue). WFR hires seasonal personnel to conduct maintenance at \$3 per hydrant. Woodinville Water pays WFR \$2 and WFR contributes \$1 per hydrant check.

No reference in the Northshore Utility agreement is made for fire flow testing or how maintenance is handled for fire hydrants located in the City of Kirkland.

Fire Inspection

KF&BD has established a scheduled occupancy inspection program, which calls for inspectable occupancies to be inspected annually. Reduced staffing in the FMO does not allow regular completion of this goal. The current completion rate for scheduled annual inspections has fallen to an estimated 20 percent. The KF&BD has just begun an Engine Company Inspection (ECI) program which will apply to Type B,⁴³ M,⁴⁴ and R2⁴⁵ occupancies. The FMO has considered a "self-inspection program" but has no plans to pursue or implement such a program.

⁴³ Type B: Business where services are provided.

⁴⁴ Type M: Mercantile where goods are displayed and sold.

⁴⁵ Type R2: Providing accommodations for overnight stay such as apartments and dormitories (except institutions).

Inspection reports are recorded on paper forms, filed, and stored in hard-copy format. The FMO is awaiting implementation of a New World records management system in order to maintain these files electronically. The fire marshal notes that current staffing lacks resources to transcribe hard copy data into an RMS.

The FMO currently does not perform separate special risk inspections as a routine function; in most circumstances, special risk inspections are handled by the fire marshal in conjunction with related permits. FMO staff performs only limited inspections, attendant to storage tank installation permitting. Associated cost(s) for these activities are incorporated in the current permit fee schedule.

The KF&BD has authority to issue citations but rarely uses this enforcement tool. The fire marshal notes that compliance is typically obtained prior to the need for court action. If needed, however, the FMO citation would be sent to the City of Kirkland Municipal Court.

Code inspection service and compliance action result in different perspectives and experiences for recipients. Successful code enforcement programs usually include mechanisms for obtaining feedback on the process and human interaction. The fire marshal currently does not operate a formal community feedback system for evaluating staff activities, interactions, and performance. The FMO reacts solely to complaints registered with the City and/or its office.

Emergency Building Access System

When responding to automatic fire alarms in secured, unoccupied buildings, emergency response personnel need rapid access, especially when there is no external indication of an emergent situation. The KF&BD currently uses the Knox-Box® key-box entry system to facilitate emergency response and access to designated properties. The developer or the building owner purchases the security box, installs it per fire department specification, and inserts essential keys that allow emergency access to the facility. Using a fire department master key, response personnel can immediately enter the building to address the incident and minimize property damage. Rapid entry both reduces on-scene wait times and allows emergency response resources to return to service more quickly.

Code Enforcement

Effective code enforcement requires local adoption and use of the current state-adopted fire code. The State of Washington adopted the International Fire Code (2009), which the City of

Kirkland adopted and uses. The City also has adopted some minimal amendments, which serve local interests.

Within the parameters of the fire code, automatic fire sprinkler protection systems are a cost effective means to manage fire risk in multiple occupancy, large area, and certain high-risk occupancies. The City adopted a sprinkler ordinance that applies to structures greater than 5,000 square feet. This ordinance also incorporates both fire flow and fire department access (less than or equal to 150 feet) requirements. The sprinkler ordinance does not apply to residential structures smaller than 5,000 square feet.

Fire Cause Determination (Investigation)

The FMO of the KF&BD maintains an active fire investigation program, which includes fire origin and cause determination, and arson investigation. The fire marshal is responsible for the program and the team includes FMO staff, operations personnel, and two police officers. The program does not provide for the handling of juvenile suspects.

The KF&BD maintains scene control after a fire incident unless and until the crime of arson is suspected or determined. At that point, scene control is transferred to the Kirkland Police Department. The FMO completes, maintains, and securely stores reports and records for all fire incidents.

An informal working relationship (mutual aid) with neighboring jurisdictions for origin and fire cause determination is maintained. The program has regularly participated in external training.

An acceptable inventory of equipment and supplies, and secure process for collecting, recording, and filing/storing evidence has an established by the FMO. Evidence is maintained in a secured area, for which a formal release is required for entry.

Public Education

The fire and life-safety public education efforts of the KF&BD are significantly limited with the elimination of the single KF&BD community education specialist at the end of 2010. ESCI found that that virtually all public education efforts outside of some limited special requests have been discontinued since then.

While KF&BD is exploring alternative strategies to maintain its public education efforts, there is no clear plan in place to delineate the department's strategy, goals, and methodologies. The idea was to involve volunteers and on-duty personnel as the conduit for delivering fire

prevention information and conduct public education. ESCI recommends that a plan be developed for conveying fire prevention and community education.

Neither KF&BD nor the local school system conduct structured fire and life-safety education. The juvenile firesetter counseling program was eliminated in 2010; a result of funding priorities. KF&BD has no bi-lingual education resources; if needed, a work-around is possible using City resources. The FMO does not attempt to address wildland interface risks primarily because the risk in Kirkland is minimal.

Basic life safety services should include education and training to avoid and/or mitigate certain medical emergencies. Citizen training in the skill of cardiopulmonary resuscitation (CPR) is a common and very effective means to prepare citizens to capably respond to many cardiac arrest incidents. CPR instruction is offered to the public through the Medical Assistance Training (MAT) program and overseen by the deputy chief of operations. Funding of the program and compensation for off-duty firefighters to instruct the courses is from the King County Medic II Program. The City of Kirkland Parks Department handles the registration and the KF&BD administrative staff coordinates facilities for the classes. KF&BD also offers free blood pressure screening at each of its fire stations, which is an important and effective means to alert citizens to potential cardiovascular risks.

The FMO maintains a limited supply of fire and life safety literature, which is obtained either at no cost or through grant funding. Literature currently on hand is limited in quantity and scope; documents appear dated.

Every effort should be explored to provide for public education in the community. Employment of opportunities with other community groups and other City departments, engine company public education delivery, and leveraging passive methods of education should be explored. Other ideas involve the re-invigorated volunteer Emergency Medical Technician (EMT) program or expansion of the Fire Corps program to deliver public education.

Conclusion – Fire Prevention Bureau

The City of Kirkland's process for construction permitting delivers a higher level of service than is commonly seen by involvement of the fire and building department from pre-application conference for commercial developments and continuing throughout the construction process.

KF&BD's need for pre-fire (quick access) plans of public, commercial, industrial, and assembly structures can be met by integration of software used by the building division. The RMS used by the building division would meet the needs of KF&BD for quick access plans.

KF&BD current completion rate for scheduled annual inspections of an estimated 20 percent may expose emergency services personnel and public to unacceptable risk during a fire event. The KF&BD has just begun an Engine Company Inspection (ECI) program for Type B, M, and R2 occupancies.

Fire and life-safety public education efforts of the KF&BD were limited to outside special requests that have since been discontinued. It was determined during the budget development process that a plan for delivering public education would be developed. This has yet to occur.

Recommendation Summary – Fire Prevention Bureau

- ❖ Recommendation 32: Integrate KF&BD fire prevention records management with the EnerGov RMS software used by the Building Division. (Implementation Order 3)
- ❖ Recommendation 33: Conduct a fire and life-safety inspection of all inspectable occupancies in the next 12 months. If necessary use emergency services personnel to complete inspections. (Implementation Order 1)
- ❖ Recommendation 34: Develop and adopt a plan for the maintenance, repair, and flow testing of all fire hydrants in the City of Kirkland. (Implementation Order 2)
- ❖ Recommendation 35: Develop and implement a self-inspection program for light risk occupancies where the occupants have demonstrated regular code compliance. (Implementation Order 13)
- ❖ Recommendation 36: Acquire and deploy electronic tablet devices for field data entry and rapid downloading to the records management system. (Implementation Order 4)
- ❖ Recommendation 37: Develop and adopt a plan to actively solicit feedback from a representative sample of recipients of KF&BD inspection and enforcement services. (Implementation Order 10)
- ❖ Recommendation 38: Adopt a local residential sprinkler ordinance for new residential construction. (Implementation Order 5)
- ❖ Recommendation 39: Form a regional partnership to develop and deliver juvenile firesetter intervention and counseling. (Implementation Order 12)
- ❖ Recommendation 40: Develop, adopt, publish, and implement a KF&BD Public Education Plan. (Implementation Order 6)
- ❖ Recommendation 41: Form regional partnerships for the development and deployment of public fire and life safety education initiatives; also rotate operations personnel to deliver a structured curriculum. (Implementation Order 7)

- ❖ Recommendation 42: Rotate emergency operations personnel to a temporary duty assignment as a public educator to deliver the public education curriculum. (Implementation Order 11)
- ❖ Recommendation 43: Employ electronic information media from the United States Fire Administration and NFPA for linking or posting and making available on the Kirkland website. (Implementation Order 9)
- ❖ Recommendation 44: Create partnerships with other public agencies and private sector companies to provide public education and information to the citizens of Kirkland. (Implementation Order 8)

Fire and Emergency Medical Services (Emergency Response)

Overview of Fire and EMS Services Provided

KF&BD provides a variety of emergency response services, including:

- Fire suppression
- Emergency Medical Services (EMS) response
- Basic Life Support (BLS) transport
- Hazardous materials emergency response
- Entrapment and other technical rescue
- Emergency management
- Specialized rescue services
 - Confined space
 - Rope (high and low angle rescue)
 - Trench collapse
 - Structural collapse
 - Vehicle/machinery
 - Surface Water

Technical rescues require specialized equipment and a group of skilled practitioners. The cost for every individual fire department to equip, train, and maintain sufficient numbers of technical rescue personnel is not cost effective. Collaboration for specialized services is an attractive alternative. KF&BD participates with other fire departments as one part of the Zone 1 regional TRT (technical rescue team) and hazardous materials consortium.



Staffing and Reporting Relationships

Based on the Kirkland Fire & Building Department organizational chart, there are three direct reports to the fire and building department director/fire chief (Figure 4, page 21): the building services manager, the administrative deputy fire chief, and the operations deputy fire chief. ESCI observed and through interviews determined that the hierarchal structure operates as

intended with the building services manager. In contrast, ESCI found that in practice the fire chief is the direct report for any number of other fire department personnel and activities.

The certified classification position of deputy fire chief has two assignment descriptions—administrative services and emergency services bureau. Assignment descriptions of the position duties are:

- **Administrative Services:** Oversees operations in the area of fire prevention, city emergency management, communication center (NORCOM), EMS transport program, and administrative support. Works under the direct supervision of the fire chief, creates and recommends policies and procedures, bureau budgets and manages personnel assigned to the administrative services bureau. Directly supervises fire marshal, emergency preparedness coordinator, emergency medical services officer (EMSO), and administrative support.
- **Emergency Services:** Oversees operations in the areas of fire suppression, emergency medical, training, hazardous materials, rescue, support team, apparatus, equipment, and facilities. Works under the direct supervision of the fire chief, creates and recommends policies and procedures, bureau budgets and manages personnel assigned to the emergency services bureau. Directly supervises battalion chiefs assigned to training and emergency services.

Deputy fire chief is the second highest position in the KF&BD. It was reported to ESCI that deputy fire chiefs routinely perform administrative, technician, and clerical tasks. Time devoted to activities outside of essential functions and principal accountabilities have reduced the deputy chiefs' availability to perform job critical administrative and supervisory duties. Three areas of particular concern are:

- Coordination of activities with other fire department work units, other City department/divisions, and other fire service agencies
- Resolving personnel issues, citizen complaints, employee accountability, and corrective action as required
- Monitoring the efficiency and effectiveness of assigned bureaus to ensure departmental performance and operating standards are being successfully achieved

Recommendations on alignment to the administrative level of the KF&BD are found in Strategic Plan Recommendations and Priorities beginning on page 229.

Analysis of Overtime

Four particularly sensitive budget items are often the source of discussion among elected officials, management, and employee groups: compensation (pay), pensions, health and welfare, and overtime. As a task of this project, ESCI reviewed overtime usage in the Kirkland

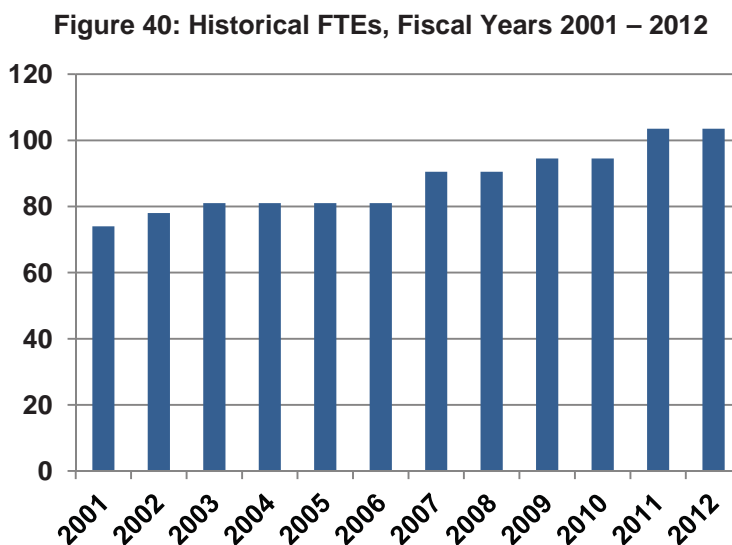
FD for any compelling reason to alter current practice or maintain the status quo. For this portion of the project, ESCI was provided with and reviewed the following documents:

- City of KF&BD, overtime data 2001 through 2012.
- KF&BD line-item budget documents for fiscal years 2008 through 2012.
- KF&BD leave time summary data 2009 through 2011.
- The IAFF agreement with the City of Kirkland, Washington, and Local 2545 of the International Association of Fire Fighters, January 1, 2008 through December 31, 2010. A one-year extension was added the agreement. That too has expired (December 31, 2011). Negotiations are ongoing at the time of this study.
- KF&BD staffing levels 2001 through 2012.

Historical and current personnel costs and financial records of the Kirkland Fire & Building Department were made available for the purpose of the project. Fire department FTEs and overtime were used for the generation of this analysis. Building division costs and FTEs were excluded from the analysis.

Staffing Levels and Personnel Deployment

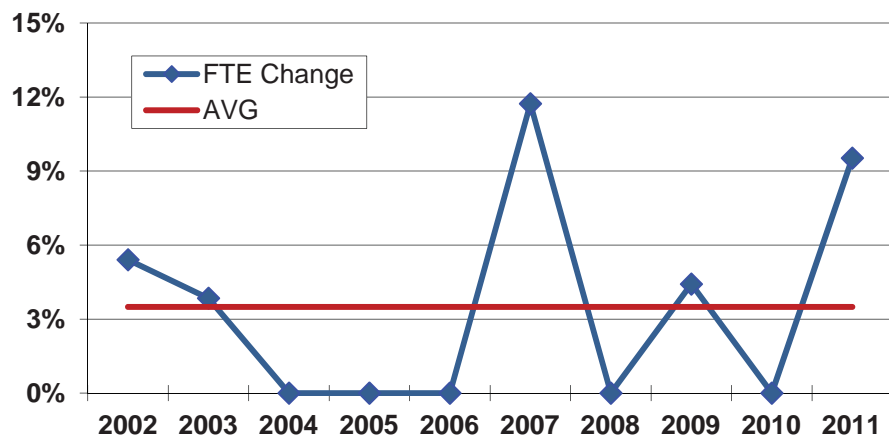
Before determining if overtime use is properly managed, a number of variables were identified. To begin, the number of FTEs for KF&BD in any given year was determined. The number of employees in the fire department has increased over the last 12 years in an effort to keep up with the growth of the City; these changes can impact the outcome of comparisons. Figure 40 is a historical presentation of the total FTEs in the fire department from 2001 through 2012.



Between 2001 and 2012 KF&BD had a high of 103.5 total fire department FTEs in fiscal year 2012 and a low of 74 FTEs in fiscal year ending in 2001.

Figure 41 illustrates the year-to-year percent of change in FTEs and the average percent of change from 2001 to 2011.

Figure 41: Historical Percent and Average Change in FTEs, 2001 – 2011

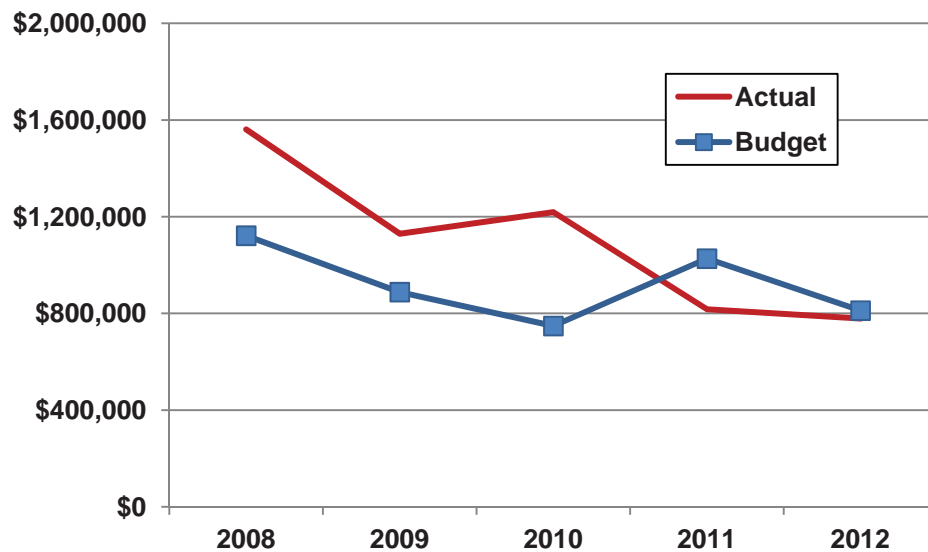


Over the ten-year period, the Kirkland FD has increased FTEs an average of 3.49 percent annually with the largest annual increase occurring between 2006 and 2007 (11.73 percent).

ESCI reviewed the amount budgeted for overtime and the actual expenditures for a five-year period. Figure 42 shows the budgeted versus actual overtime costs for the fiscal years 2008 through 2012.⁴⁶

⁴⁶ Kirkland budget document for 2012 includes \$200,000 in overtime outside the fire department budget.

Figure 42: Budget to Actual Overtime Cost, Fiscal Years 2008 – 2012

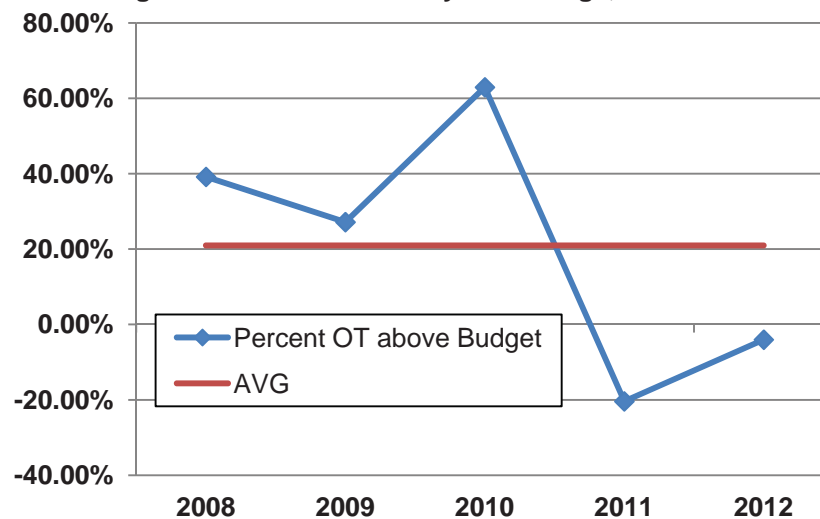


Overtime costs have decreased over the five-year period. In 2009, the elimination of overtime staffing for the Finn Hill Fire Station caused a significant reduction. During the past two fiscal years, KF&BD has stayed within the budgeted overtime amount.

Overtime use is often unpredictable in the fire service by the very nature of working with emergency activities. However, statistical data can be used as the predictor of future use.

The following figure (Figure 43) illustrates the actual percentage that expenditures for overtime exceeded budgeted overtime and the average percent for the last five fiscal years except in 2011 and 2012.

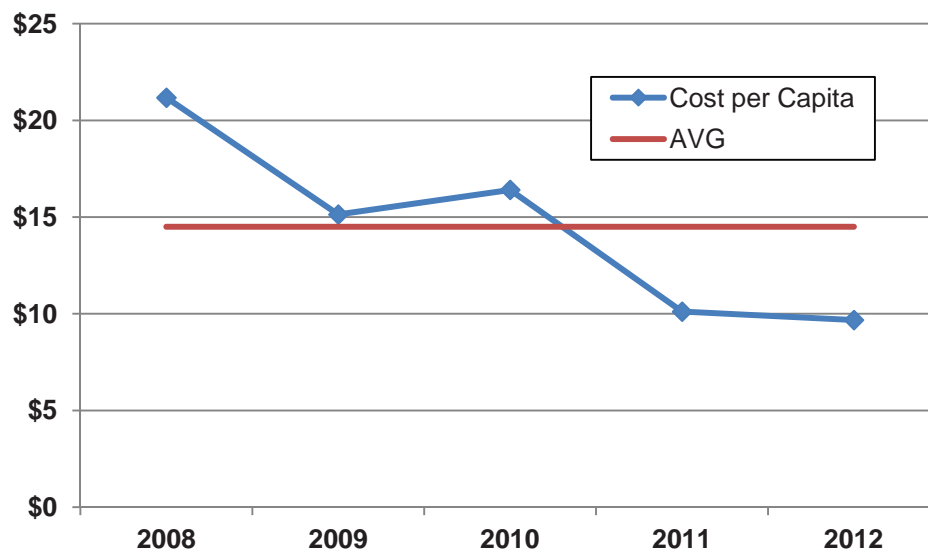
Figure 43: Budget to Actual Overtime by Percentage, Fiscal Years 2008 – 2012



Overtime in the fiscal year ending in 2008 exceeded the budgeted amount by 39.17 percent. The highest level of overtime cost over budget was recorded in 2010 with a 62.94 percent overage. In 2011, overtime costs were below budget by 20.4 percent and in 2012 the KF&BD is on budget.

The population for the City of Kirkland and the service area has steadily increased by 8.4 percent from 2001 to 2010. In 2011, the population grew 64.24 percent over 2010 due to annexations. To gauge the impact of overtime on the community, actual overtime costs were calculated on a per capita basis for each of the last five years. Figure 44 shows the cost per capita and average for fiscal years 2008 through 2012.

Figure 44: Annual and Average per Capita Cost of Overtime, Fiscal Years 2008 – 2012



The cost per capita for fire department overtime has steadily declined since 2008. In 2008 overtime was \$21.17 per capita and declined to \$9.67 in the 2012 budget. The reduction in 2009 was due to the elimination of overtime staffing of the Finn Hill station and, in 2011, the reduction was due to annexation (based on the larger population base). The annual average CPI-W for the Seattle-Tacoma-Bellevue, WA metro area was 2.458 percent for the ten-year period 2002 to 2011. When the CPI-W is applied to the cost of overtime, the downward trend of overtime is greater.

Personnel services costs for the KF&BD over the most recent five-year period were examined. Between fiscal years 2008 and 2012, the personnel services expenditures for the fire department have increased approximately 28.95 percent.⁴⁷

Figure 45 compares overtime expenditure as a percentage of wages for fiscal years 2008 through 2012.

Figure 45: Overtime as a Percentage of Wages, Fiscal Years 2008 – 2012⁴⁸

Description	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Budget
Wages	7,491,763	8,373,559	8,443,331	9,012,488	9,660,589
Overtime Dollars	1,554,425	1,128,720	1,212,232	810,879	773,858
Percent of Overtime	20.75%	13.48%	14.36%	9.00%	8.01%

The above table shows a significant decrease in the percent of overtime spent compared to wages in 2011 and budgeted for 2012. This is primarily from a reduction of minimum staffing to 19 and source re-allocation of personnel.

Deployment

KF&BD operates six fire stations (five with career staffing) with 12 frontline units and has established a minimum daily staffing level of 19 personnel.⁴⁹ KF&BD *Department Manual Directive Number 3.001* dated February 1, 2000, states that the minimum staffing shall be 15 with 1 being an officer and 14 firefighters. This directive needs to be updated to current minimum staffing levels. Figure 38 lists minimum staffing by unit and position in January 2012.

⁴⁷ Revenue offsets were not included in the calculation.

⁴⁸ Does not include Inspection cost center.

⁴⁹ Source: Minimum staffing design as compared to total staff assigned per shift, 02/15/2012.

Figure 46: Minimum Staffing by Unit and Position, January 2012

Unit	Battalion Chief	Officer (Captain or Lieutenant)	Driver Operator	Firefighter
Engine 21		1	1	1
Engine 22		1	1	1
Engine 25		1	1	1
Engine 26		1	1	1
Engine 27		1	1	1
Aid 21		Cross-staffed with Engine 21		
Aid 22		Cross-staffed with Engine 22		
Aid 25		Cross-staffed with Engine 25		
Aid 26		Cross-staffed with Engine 26		
Aid 27		Cross-staffed with Engine 27		
Aid 29		Cross-staffed with Ladder 27		
Air Unit 21		Cross-staffed with Engine 22		
Ladder 27		1	1	1
Battalion Chief	1			
Shift Captain (Swing Position)		1		
Total	1	6	6	6

A total of 30 personnel are assigned to each shift with minimum staffing set at 19. In the minimum staffing matrix, the swing staff position is not identified.

Based on the rank and number of positions required to meet minimum staffing there are a given number of shifts to fill per year. The table below summarizes the number of shifts to be filled based on minimum staffing.⁵⁰

Figure 47: Number of Shifts per Year, Minimum Staffing

	Battalion Chief	Officer	Driver-Operator	Firefighter EMT	Total
Minimum Staffing	1	6	6	6	19
Days per Shift	122	122	122	122	122
No. of Shifts times	122	732	732	732	2,318
Minimum Staffing					
Total Requirement	366	2,196	2,196	2,196	6,954

There are a total of 6,954 shifts to be filled to meet minimum staffing.

⁵⁰ Calculations on shifts per year are all based on a 366 day year.

KF&BD is authorized for 90 FTE emergency operations personnel. The personnel roster lists a total of 88 FTEs with one position vacant on A shift and one position vacant on B shift.⁵¹ Figure 48 shows a breakdown of the number of authorized positions by rank (30 per shift).⁵²

Figure 48: Number of Authorized Positions by Shift

	A Shift	B Shift	C Shift	Total
Battalion Chief	1	1	1	3
Captain	4	3	3	10
Lieutenant	3	4	4	11
Firefighter	22	22	22	66
Firefighter/EMT				
Total Authorized	30	30	30	90

During the course of this work KF&BD hired three personnel that were scheduled to complete recruit training and be sworn in to the department on Friday, June 22, 2012. Two of the positions are for the current vacancies and the third for a recent retirement. The new hires bring the department up to full staffing.

Figure 49 shows the annual number of scheduled shifts for the 90 authorized emergency services positions for the KF&BD.

Figure 49: Number of Scheduled Shifts by Position per Year

	Battalion Chief	Captain	Lieutenant	Firefighter EMT	Total
Positions	3	10	11	66	
Shifts per Position	122	122	122	122	
Total Shifts	366	1,220	1,342	8,052	10,980

A gross total of 10,980 scheduled shifts are available compared to 6,954 required to be filled at minimum staffing; a net difference of 4,026 shifts. However, Kelly, vacation, sick and injury, holiday, and other leaves obviously reduce the number of available shifts for personnel to work (net shifts available).

⁵¹ During the course of this work three personnel were hired and completed recruit training Friday, June 22, 2012 to fill two vacancies and one retirement.

⁵² Leave calculations based 90 FTEs.

Scheduled and Unscheduled Leave

The number of hours an employee has for vacation is based on the years of completed service with the City of Kirkland.⁵³ The following accrual rates were effective through December 31, 2010:

- 1st – 2nd year, 10 hours monthly, annual 120 hours
- 3rd – 5th year, 12 hours monthly, annual 144 hours
- 6th – 9th year, 15 hours monthly, annual 180 hours
- 10th – 13th year, 19 hours monthly, annual 228 hours
- 14th – 17th year, 20.5 hours monthly, annual 246 hours
- 18th – 21st year, 22.5 hours monthly, annual 270 hours
- 22nd – 24th year, 23.5 hours monthly, annual 282 hours
- 25th year or more, 24 hours monthly, annual 288 hours

The 14 to 17 years of service range was used as a median point, the number of accrued vacation hours is 246 per employee per year. The result is 10.25 shifts of vacation per employee and a total of 922.5 shifts. Actual vacation leave used by employees varies with employees having the ability to bank and carryover up to 300 hours.

The amount of sick, injury, and leave categorized as other used by fire department personnel varies by employee. Typically, sick leave use (excludes injury and other leave) in fire departments of similar size and character averages between 2.5 to 4.0 shifts per year. For this exercise, ESCI used the three-year KF&BD average of 9.65 shifts per year per employee to arrive at a total of 868 annual shifts of sick leave.⁵⁴ Sick leave accrual at KF&BD is currently not on a “use-it-or-lose-it” plan. The balance carries over from year to year and is cumulative to a maximum of 1,440 hours.

Figure 50 uses the total annual available shifts and deducts those required for minimum staffing, vacation leave, holiday, sick and injury, training, and other leaves (court and jury and bereavement) to arrive at the number of unallocated shifts. In addition to vacation, sick, and injury hours, 48 hours for training and other leave per year per employee were included.

- Vacation includes: emergency leave, family medical leave-vacation, vacation annual, and vacation routine.

⁵³ The IAFF agreement with the City of Kirkland, Washington, and Local 2545 of the International Association of Fire Fighters, January 1, 2008, through December 31, 2010.

⁵⁴ ESCI's experience is that the number of sick leave shifts will generally be less than 4.0 shifts per employee per year. Average sick leave use is 2.5 shifts.

- Sick and injury includes: dependent leave, family medical leave-sick, on-duty injury, disability off-duty, sick family member LEOFF 2, sick leave LEOFF 1, and sick leave LEOFF 2.
- Training and other leave includes: bereavement leave, community service leave, family medical leave, furlough annual, furlough routine, jury duty, military leave, on-duty department business, physical fitness leave annual and routine, union leave, and wellness/fitness leave.
- Holiday includes: family medical leave-holiday, holiday annual, and holiday routine.

Figure 50: Number of Shifts Available Less Minimum Staffing and Leaves per Year

Gross Number of Shifts	10,980
Less Leave Time	
Minimum Staffing	6,954
Vacation	923
Sick and Injury	869
Training and Other Leaves	360
Kelly Day	1,530
Holiday	450
Unallocated Balance	(106)

Assuming an average of 10.25 shifts of vacation, 9.65 shifts of sick and injury leave, 4.0 shifts for training and other leave, 17.0 Kelly, and 5.0 holidays per employee, a total of 106 shifts need to be filled to meet minimum staffing. Because there are more vacancies than available shifts above minimum staffing, KF&BD will frequently need to hire back firefighters on overtime. A complication of filling vacancies is the need to match available personnel with like rank and certification.

Step-Up (Acting Officer)

KF&BD promoted a lieutenant to captain in 2011 and assigned one captain per shift to fill vacancies in an effort to reduce the number and cost of overtime shifts replacing officers. It was reported to ESCI that the promotions and the availability of three officers have made a reduction in the number of overtime shifts for lieutenants, captains, and battalion chiefs. This was accomplished without increasing the number of FTEs in emergency services.

There are reasons why the given number of unallocated shifts would be inadequate to fill all instances a vacancy occurs. They include:

- Imbalance between the personnel of a given rank, on a given shift (A, B, and C) on leave and total qualified individuals available to fill the vacancy.
- Imbalance in vacation scheduling with more personnel than available to fill vacancies in a given rank or qualification.

- Abnormally large number or uneven distribution of sick and injury or other unplanned leaves.
- Insufficient number of qualified personnel to step-up.

Providing personnel with the requisite knowledge, skills, and abilities to accept responsibilities provides an experience that is a valuable tool in preparing for promotion. It is also acceptable to have individuals at the captain and lieutenant ranks work down to fill firefighter vacancies. Utilizing this approach could create pay issues with the workforce i.e. does an officer working down keep their same pay level or that of the lower paid position.

Alternative Scheduling Methodologies and Overtime Usage

Firefighters' work schedules depend on individual fire department need or agreement (memo of understanding, meet and confer, or collective bargaining agreement) between the agency and labor. Firefighter schedules vary from 72 hours on duty and 96 hours off (e.g., CAL FIRE), to 48 hours on duty and 96 hours off, to the more traditional 24 hours on duty and 48 hours off. Other departments have firefighters that work two 10-hour day shifts and two 14-hour overnight shifts in a seven-day schedule. With the exception of some very large fire agencies, the majority have either a 24 or 48-hour work shift with alternating day(s) off-duty. Larger departments may have a number of their firefighters on alternative schedules to align staffing to workload; an example is the staffing of PAUs (peak activity unit).

It has been argued that the 10-hour day and 14-hour overnight shift would allow firefighters to be more productive. To the contrary, whenever possible fire department management elects to have 24-hour shifts to cut down on overtime pay by limiting the chance fire personnel will work late due to emergency calls. For every scheduling scheme, there are many variations.

For fire departments, there are work rules that apply specifically to firefighters that allow for special work periods. Provisions in the Fair Labor Standards Act (FLSA) state that:

Public-sector (government) fire departments may establish special "7(k) work periods" for sworn firefighters, which can increase the FLSA overtime "thresholds" beyond the normal 40 hour week. Firefighters covered by these special work periods are entitled to FLSA overtime only for hours worked in excess of a threshold set by the Department of Labor on a chart. For example, in a 28 day work period, fire fighters would be entitled to FLSA overtime only for hours actually worked over 212 during that 28 day period (in essence, a 53 hour work week). "7(k)" refers to the section of the FLSA in which these special rules are contained, 29 USC §207(k). Most fire fighters who work "platoon schedules"

will be classified by their employers as "7(k) eligible" and compensated accordingly.⁵⁵

The City of Kirkland has established a 21-day, 168-hour FLSA period.⁵⁶ KF&BD operational firefighters' normal duty period is two 24-hour shifts followed by 96 hours off. In the absence of an FLSA work period, maintaining current staffing can significantly increase overtime costs. The City of Kirkland has through the collective bargaining process agreed that emergency services personnel of the KF&BD be compensated overtime for all time worked above scheduled hours. To mitigate the impact of overtime costs, Kirkland maintains a number of personnel above minimum staffing levels to fill vacancies.

What does this all mean? Under the FLSA, firefighters can work more than 40-hours per week and will only receive overtime for those hours that are either outside of the established work period, or if more restrictive, for those hours beyond scheduled work hours.

To maintain a minimum staffing level of 19 fire and EMS on-duty personnel and fill vacancies for vacation, sick leave, sick-injury, training, military leave, jury duty, Kelly relief, or any number of other ancillary issues, supplementary staff is needed to maintain the minimum staffing level. Given that many of the vacancies are unpredictable, KF&BD has essentially two options to maintain minimum staffing: hire back replacements from off-duty personnel on overtime or have additional personnel assigned to each shift. KF&BD has chosen the latter and has staffed 30 personnel per shift. Ideally this would allow up to 11 employees (approximately 33 percent) being off duty without hiring back at overtime.

What is the cost of the two options? It would seem that having a set number of extra firefighters on each shift would have the least financial impact. A caveat to maintaining personnel above minimum staffing is that they need to be filling vacancies or any potential cost avoidance is lost. This is a consequence of not paying supplementary fringe benefits costs when hiring off-duty personnel to fill vacancies. Fringe benefit costs of personnel have increased, eliminating most cost savings that may be realized by hiring new employees versus using overtime.

The question then becomes is KF&BD properly managing discretionary overtime? KF&BD has reduced the percentage of dollars expended on fire personnel overtime; however, it still

⁵⁵ Source: 29 U.S.C. §207(k).

⁵⁶ Note: An FLSA work schedule can be made more restrictive with a collective bargaining agreement that requires overtime for any hours worked exceeding that which is regularly scheduled, even though FLSA only requires overtime beyond the maximum hours in the cycle.

represents a significant portion of the personnel services budget. KF&BD emergency services personnel schedule vacation to achieve the maximum benefit from staffing above the minimum of 19 personnel per work day.

Vacation Leave

With an authorized operational staff of 90, there are 923 vacancies for vacation leave (see Figure 50) per year. Distribution of vacation leave over a year results in approximately 2.52 personnel off each day. With 11 personnel per shift above minimum staffing, three personnel on vacation leave gives the department a buffer of 8.5 for covering unanticipated vacancies, Kelly relief, training, sick, and injury leaves.

Kelly Day

The workweek for emergency operations (line personnel) is 48 hours per week on an average annual basis. Until January 1, 2010, the work schedule for bargaining unit line personnel was scheduled in 24-hour shifts. Employees would normally work one 24-hour shift followed by 48 hours off. This was accomplished by providing one Kelly shift (day) off after every six scheduled shifts, prescheduled on an annual basis; Kelly shifts are selected beginning with the employee with the greatest seniority annually.

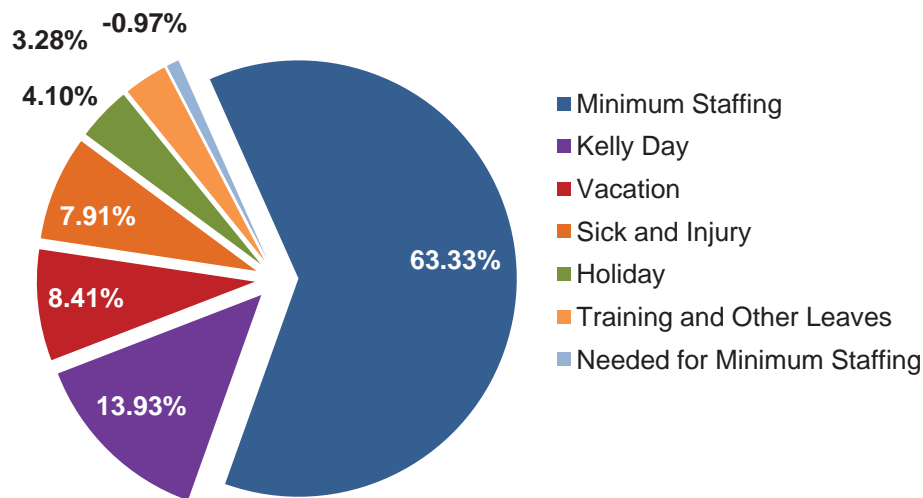
Effective January 1, 2010, the work schedule for bargaining unit emergency operations personnel was modified to two consecutive 24-hour shifts (48-hour “set”). Emergency operational employees work period is now normally two 24-hour shifts followed by 96 hours off. The workweek remains at 48 hours per week on an average annual basis. This is accomplished by providing two Kelly shifts off after every six scheduled sets. There are approximately 17 Kelly Days per year per employee. With 90 emergency operational FTEs there are 1,530 Kelly shift vacancies.

Holiday Leave

KF&BD personnel on the 24-hour shift schedule receive 120 hours off in lieu of holidays; since the fire service is a 365 days per year operation equal to five shifts per employee. Holiday time is credited to employees on January 1 of each calendar year.

The following figure shows a breakdown of the annual gross available operational shifts, leaves and unallocated shifts by percentage.

Figure 51: Percentage of Unallocated Shifts Less Minimum Staffing, and Leaves per Year



Annually there are 10,980 available shifts with 90 operations FTEs, 63.33 percent are needed to meet minimum staffing, 37.63 percent for leaves, leaving (0.97) percent (106 shifts) required to meet minimum staffing. Ideally there would be enough unallocated shifts to eliminate overtime. With unanticipated short and long-term disabilities, sick leave, Kelly leave, and vacation not being distributed evenly, there are instances when it is necessary to hire back personnel to meet minimum staffing levels. Likewise there are shifts with staffing above minimum levels.

Given the number of FTEs dedicated to emergency operations, a minimum staffing of 19 per day, 30 personnel assigned to each shift, scheduled vacation, and a limit to the number of people allowed on vacation, KF&BD's use of overtime is appropriate. The recent change of promoting officers has had an impact on reducing the number of overtime shifts. Company officers generally have more vacation leave and a higher salary. Having more than minimum staffing for officers has had the desired effect of helping to reduce and off-set some of KF&BD's overtime costs.

Another option employed by a limited number of fire departments is the addition of a D shift. D shift is made up of personnel that work by filling vacancies on A, B, or C shifts. Personnel assigned to a D shift select from available vacancies on the shifts they would like to work in a given time period. They would still work a minimum number of shifts and receive overtime opportunities, but they have the latitude to consolidate or spread out their work schedule to meet personal needs. There is a great deal of flexibility with scheduling for the department and the individual.

A portion of overtime costs are variable and unpredictable. Scheduled leaves can often be filled from the capacity above minimum staffing on each shift. Illness, work-related injuries, family emergencies, and other unscheduled leaves often result in overtime. While it was not the intent of this study to review the aspects of leave usage, it is appropriate that this be conducted regularly. For example: Is sick leave usage increasing? Is sick leave related to long-term illnesses? What is the annual sick leave use per employee? Can sick leave use be reduced by modifying the leave accrual policy?⁵⁷

Additional questions can be asked about work-related injuries. ESCI recommends that KF&BD investigate the source(s) of time loss from illness and work-related injuries. An analysis of causes by source and employee group would help to determine what modifications could be made to continue the trend of reducing overtime use at the KF&BD.

KF&BD has made the investment to purchase an employee staffing program (TeleStaff). With full implementation and proper monitoring of the software program benefits include:

- Receive and respond to scheduling notifications and other work communications by telephone, cell, pager, e-mail, Internet, and PC
- Check schedules and find out where they are working through self-service access points such as telephone, cell, Internet, or PC
- Sign-up for overtime
- Sign-up for special duty assignments
- Request time-off and leave
- Conduct shift trades
- Review payroll data and accrual balances
- Personally update profile based on security

Command staff can:

- Automatically align staffing demands with employee availability, qualifications, and regulatory constraints
- Generate and send schedule-driven notifications and communications to a telephone, cell, pager, or e-mail, automatically linking work assignment information for employee response base on your rules and guidelines
- Create and maintain an unlimited number of schedules supporting multiple shifts, rotating positions, future assignments and promotions

⁵⁷ The IAFF agreement addresses the use of sick leave by allowing for the accrual of up to 1,440 hours (60 shifts) for shift personnel.

- Manage daily operations with real-time rosters that track regular duty, special duty assignments, training, off-duty detail, and emergency deployments
- Manage time-off requests
- Monitor staffing levels
- Automatically alert management by way of real-time alarms when staffing levels fall below pre-determined requirements
- Find replacement personnel who are off-duty, can be held over, are not fatigued, or have signed-up for overtime work
- Track training and certifications
- Deploy personnel for emergency recall or mutual aid
- Account for, locate, and contact all staff at any given time
- Finalize pay sheets for payroll
- Ensure policy enforcement and Collective Bargaining Agreement compliance
- Run reports for greater insight into operations

KF&BD has not installed all of the functions available with TeleStaff software. Functions that the program is capable of managing automatically are being accomplished manually. ESCI recommends that the KF&BD use all of the functionality available with TeleStaff, including:

- Vacation scheduling
- Managing time off and leave requests
- Overtime replacement notification
- Compiling work hours summary for payroll input
- Employee certification records
- Input tool for response reports (requires an interface with NORCOM CAD)

Options for Staffing

The traditional model of static deployment of fire and EMS resources is changing. Several reasons often mentioned are an increased reliance on the fire department for EMS and improvements in construction methods (building and fire codes and the greater use of automatic fire sprinklers). One fire department has deployed cars driven by one paramedic that responds to medical emergencies in conjunction with an EMS transport unit. In May and June 2010, 400 or so calls were handled that otherwise would have required a four-person engine or truck. Several emergency service agencies are looking to experiment with paramedics on motorcycles in the future. Evaluating alternative staffing methods including the staffing of aid units with two personnel is recommended.

EMS (Emergency Medical Services)

The provision of Emergency Medical Services (EMS) has come to be the predominant service offered by many fire departments to their communities. It is common to find that 70 percent to 80 percent of emergency responses are to medical emergencies, as is the case in the City of Kirkland. Essential to the effective delivery of EMS services is quality system management: support and oversight, including the key components of logistical support, medical control, and quality assurance; and appropriate credentialing of personnel.

EMS is essentially an organized system that provides personnel, facilities, and equipment for the coordinated delivery of emergency medical services within a geographical area. An effective EMS system may involve multiple different agencies and organizations working together to provide rapid response, treatment, and transport to those in need of immediate medical attention. Generally, most EMS systems include at least system access and dispatch components, first response, ambulance transport, and definitive hospital care. Many people view EMS as simply ambulance transport or fire department response to medical events. However, those views are being challenged as insurance companies demand more accountability for ambulance transport and emergency treatment. EMS agencies are challenged to incorporate evidence-based medicine and seek better use of resources to extend services to the communities they serve.

EMS systems should have measures in place to determine the effectiveness and performance of both personnel and procedures. Standardized performance levels allow system regulators to not only evaluate performance but also to take steps to improve performance and quantify those improvements.

KF&BD EMS Response Overview

KF&BD maintains a fleet of six frontline aid units which are BLS (basic life support) transport-capable ambulances. Personnel are trained to the BLS level, able to provide initial treatment to EMS patients and transport them to a hospital if their condition does not require ALS (Advanced Life Support) intervention. In instances that necessitate a higher level of patient care, ALS-capable EMS units are dispatched to provide paramedic level treatment. The City of Kirkland receives ALS from Medic One. The City of Redmond has a contract to operate three Medic One ambulances that serve Redmond, Kirkland, and some surrounding unincorporated areas.

EMS responses in Kirkland constituted 75.27 percent of total incidents to which the department responded in the study period from September 2010 through August 2011. The number of EMS

responses totaled just over 5,000, with 68.08 percent classified as BLS and 31.92 percent classified as ALS.

EMS Authority and Regulation

Statutory authority for the delivery of EMS in Washington is under the Washington State Department of Health (WADOH). WADOH promulgates regulations for EMS with the King County EMS Division having responsibility for local oversight. KF&BD's EMS activities are subject to the rules of the County EMS Division, including the certification and training of EMTs and paramedics.

The KF&BD program maintains the appropriate certifications and state authorization to provide EMS services. Medical oversight and direction of patient treatment is provided by a local physician experienced in emergency medicine and EMS. The physician advisor and department EMS staff have enacted appropriate training and skills development practices internally, based on their responder's certification levels. EMS program oversight for KF&BD is assigned to an operational battalion chief.

In 2011, KF&BD appointed a captain to the position of EMSO (emergency medical services officer) coordinator. The EMSO coordinator is responsible for running the EMS transport fee program. Funding for the EMSO is being offset with revenue from BLS transports billings. KF&BD began billing for EMS transport services in March 2011. (For a history of transport revenue see Figure 6: KF&BD EMS Transportation Revenue, March 2011 – January 2012.)

EMS Deployment Methodology

The KF&BD aid units are staffed by firefighters who are also certified in providing BLS. KF&BD's deployment methodology has firefighter/EMTs cross-staffing fire suppression and aid units. Personnel respond based on the emergency type, taking a fire engine to a fire event and responding to EMS incidents with an aid unit. Ladder Truck No. 27 firefighters also cross-staff an aid unit (Aid 29).

Staffing for stations consists of three personnel who may respond with either a fire vehicle or aid unit. When a crew is dispatched to an EMS event, all three of the assigned personnel respond. Doing so maximizes the patient treatment capacity. Regionally and nationally it is common for EMS units to be staffed with two medically trained personnel.

Although the staffing methodology is advantageous for some EMS incidents, it has a negative impact on fire response capacity. With all three personnel responding in an aid unit, the engine or ladder truck in the station is no longer staffed and available for dispatch. ESCI reviewed the practice and finds that the importance of retaining a fire unit's ability to respond to a call, even with only one person, outweighs that of having three personnel on an aid unit.

A single-person response with a fire engine is not optimal and is not effective at a fire scene. However, in many instances, the two EMS responders on an aid unit may be able to meet the fire apparatus at an incident scene and fill out a three-person crew. Similar approaches are found in other fire departments and ESCI recommends that KF&BD discontinue the deployment practice of sending three personnel to an EMS incident in consideration of maintaining immediately available resources. Options include keeping the third firefighter/EMT available for secondary incidents, redeployment with dedicated staffing of two-person aid units, or single person quick response unit for low priority EMS incidents.

EMS Performance Measures

To track the quality and effectiveness of emergency medical service systems departments monitor the survival rates of cardiac arrest patients treated. Response times are often misused or misinterpreted as they are only a crude measure of the system. Clinical outcomes such as cardiac arrest survival rates are a more accurate indicator of performance. Response time for first responder BLS units could demonstrate if data correlates response time to cardiac arrest survival. Although total cardiac arrest survival rate is often referred to as a quality indicator, EMS professionals routinely use witnessed ventricular fibrillation (VF) survival rates as a standard.

KF&BD should develop a comprehensive evaluation program to assess all aspects of the EMS system. This program would include evaluation of structural, process, and outcome measures. In addition to survival rates, outcomes such as disease, disability, discomfort, dissatisfaction, and impoverishment could be used to evaluate the system.

Medic One Funding

An EMS levy in Washington may be imposed by a county, EMS district, city or town, public hospital district, urban EMS district, regional fire protection service authority, or fire protection district. For a countywide EMS levy to be placed on the ballot, it requires approval of any city in the county with a population exceeding 50,000. An EMS levy may be an amount equal to \$0.50 or less per \$1,000 assessed value. Any taxes collected as a result of the EMS levy can only be

used to provide emergency medical care or emergency medical services. The EMS levy tax may be imposed for:

- Six consecutive years,
- Ten consecutive years, or
- Permanently

King County EMS is funded by a countywide EMS levy, in partnership with local jurisdictions, to provide pre-hospital medical care. The EMS levy:

- Serves more than 1.9 million people in King County in an area of over 2,100 square miles.
- Has a six-year EMS levy that expires December 31, 2013.
- Provides approximately \$66 million in annual funding.
- ALS: Approximately 62 percent (\$41 million) of expenditures is dedicated to ALS:
 - Zone 3 (South King County) – ALS is provided directly by King County EMS.
 - Zone 1 – ALS is by contractual arrangement with Bellevue, Redmond, and Shoreline Fire Departments.
 - Zone 5 – City of Seattle, ALS is provided by Seattle Fire Department. Seattle and King County have executed an interlocal agreement for King County to return all EMS property tax revenue collected in Seattle to the City of Seattle in exchange for Seattle Fire Department delivering EMS. EMS property tax revenue in Seattle results in approximately \$40 million annually
- BLS: Approximately 24 percent (\$16 million) of expenditures is in the form of direct payments to 29 partner service providers to support BLS service throughout the county. Kirkland currently receives approximately \$850,000 annually.
- Regional Services: Approximately 14 percent (\$9 million) of expenditures is directed to regional services and initiatives, including:
 - Strategic initiatives (\$750,000)
 - Training (\$1.3 million)
 - Growth management initiatives (\$1.0 million)
 - Regional medical direction and quality improvement (\$1.5 million)
 - Data management (\$1.0 million)
 - Administration (\$2.7 million)

EMS Service Levels and Delivery Alternatives

KF&BD provides BLS EMS and transport inside of Kirkland and in some instances to neighboring fire departments and districts. The majority of medical incidents to which the department responds are in the BLS category and KF&BD personnel are certified to treat and transport these patients to a hospital for definite medical care. However, nearly a third of the

medical emergencies (calculated at 31.92 percent for the one-year study period) are of a more emergent nature, requiring ALS paramedic level care. For these emergencies, KF&BD personnel serve in a first response capacity as one component of a tiered response, initiating care and treatment while an ALS unit from the City of Redmond's Medic One service responds to the scene.

The King County Medic One program is nationally renowned for its tiered response approach to EMS incidents: citizen intervention, response by BLS fire department personnel, and paramedic level response for acutely ill or injured patients. The City of Redmond participates in the Medic One program by contracting to provide ALS services.

KF&BD's approach of providing BLS EMS service in a tiered response with Medic One resources is appropriate and effective. However, there are shortcomings that warrant review and consideration. Under the current system, Kirkland is able to exercise little control or influence on the availability of EMS response resources provided to Kirkland by Medic One (Redmond Fire Department). Three Medic One units serve Redmond, Kirkland, and the unincorporated area with one unit assigned to Evergreen Hospital to serve Kirkland. The Medic One unit at Evergreen Hospital is routinely dispatched to calls for service outside of Kirkland. When the other two Medic One units are committed to incidents, one may not be readily available for immediate response in Kirkland.

KF&BD can establish a contractual arrangement with King County Medic One, similar to that which is in place in Redmond. ESCI finds that exploring the alternative has merit and recommends that Kirkland analyze the feasibility of providing ALS response services for Medic One.

Potential benefits of KF&BD delivering ALS response services for Medic One in conjunction with BLS include:

- Continuous care from initial patient contact to delivery at a medical facility
- Earlier ALS intervention
- Kirkland residents are served by KF&BD
- Improved staffing
- Reduction in on-scene time

Community Medical Technician (CMT)

In February 2012, Public Health — Seattle & King County's Emergency Medical Services began a Community Medical Technician (CMT) pilot program. The CMT program utilizes firefighting personnel to serve as a single-person response unit that can be dispatched to patients requesting assistance through the 9-1-1 system, but who may not necessarily need full emergency medical response.

King County Public Health recognized that all medical situations do not necessarily meet the present criteria in sending a typically full medical response by fire departments. Fire department apparatus and personnel are often sent to patients experiencing minor medical conditions, and under present criteria and protocol, a fire engine and/or aid unit must be sent to answer the call. Once fire department units respond, they are unavailable to respond to other more severe and emergent situations.

A CMT unit is staffed with one firefighter/EMT that is dispatched to less-severe patients, and the firefighter/EMT can spend more time discussing the patient's non-emergent medical or other social needs. ESCI recommends that KF&BD participate in the CMT program.

Facilities and Equipment

KF&BD has six fire stations, five staffed with career personnel and a smaller community station with a BLS EMS unit staffed in the evenings by volunteers. The department has established a facility systems replacement plan funded using a “sinking fund”, setting aside funds annually toward anticipated component replacement from the operating budget. A CIP (Capital



Improvement Program) has a significant effect on the image and operation of a city and its capital assets. Policies should be designed to help ensure that current and future assets/projects are maintained at a high level and that capital projects do not restrict the city's financial ability to provide basic services. A city must preserve its current physical asset inventory and plan in an orderly manner for future capital investments, including the operating costs associated with those projects.

Kirkland's CIP for a six-year (2011 – 2016) planning period is updated annually and includes vehicle replacements over \$50,000. The CIP lays out a schedule for the replacement of components and maintenance of facilities: gutters, HVAC (heating, ventilation and air conditioning) systems, carpet, roofing, paint (interior and exterior), lighting, utility components and other parts of structures subject to break-down and wear. A schedule of component maintenance and replacement for all City facilities and apparatus is staggered over the life of the plan.

The fire department actively participates in the development of the City of Kirkland CIP. City departments submitting proposed capital improvement projects initially prioritize them according to need and identify work program goals and availability of funding. Proposed projects are then submitted to the city executive staff for review and prioritization, based on need and funding availability. Projects with specific, identified funding sources (e.g., grants, redevelopment funds, etc.) usually receive high priority. Conversely, those projects without identified funding sources must compete for the limited amount of general fund dollars available.

Development of an internal plan for the maintenance and replacement of facilities, apparatus, and capital equipment for KF&BD that aligns with the City CIP is considered appropriate and fiscally prudent.

Facilities

Fire stations need to be designed to adequately house equipment and apparatus, as well as meet the needs of the organization, its workers, and/or its members. Consideration should be given to a fire station's ability to support the department's mission as it exists today and in the future. The activities that take place within the fire station should be closely examined to ensure the structure be adequate in both size and function. Examples of these functions include:

- The housing and cleaning of apparatus and equipment
- Residential living space for on-duty crew members (male and female)
- Administrative or management office(s)
- Training, classroom, and library areas
- Firefighter fitness area

While this list may seem elementary, the lack of dedicated space compromises the ability of the facility to support all of these functions and can detract from its primary purpose.

KF&BD's administrative offices are located at 123 5th Avenue, in a combined city hall, police and fire headquarters building. The following provides a summary of each KF&BD fire station, its condition, year built, general appearance, square footage, and living and safety amenities.

Fire Station No. 21

Fire Station No. 21 (Forbes Creek) is a wood framed structure built in 1997. The building has been seismically upgraded, has auxiliary power, is well maintained, and is considered to be in very good condition. It has three apparatus bays, a workout room, kitchen, lockers, gender specific showers and restrooms. Features of the building include monitored smoke detection, keyed locks with keypads, and a positive pressure apparatus exhaust extraction system. A small community room with isolated access is available to the public. KF&BD staff at City hall is responsible for scheduling room use. Station has a disaster preparedness container with 10 days of food stuffs for station personnel and an amateur radio HAM radio transmitter and antenna for communication during a disaster.

One engine and aid unit staffed by three personnel per day is assigned to this fire station. Because of the station's location it is the second due station to many emergency incidents. The

station has a radiant heating system in the truck bays but lacks an auto shut-off interconnect. If bay doors are inadvertently left open, the radiant heater operates continuously in an attempt to keep the apparatus bay warm. Additionally, light switches lack timers or motion sensors, increasing energy consumption.

Fire Station No. 22

Fire Station No. 22 (Houghton) is a reinforced brick, masonry building, and has had two tenant improvements since construction in 1980. The building has been seismically upgraded, has auxiliary power, and is considered to be in good condition. There are three back-in truck bays, individual bedrooms (versus dormitory style sleeping quarters), an exercise room, kitchen, and gender-specific lockers and showers. Features of the building include monitored smoke detection, keyed locks with keypads, and a positive pressure apparatus exhaust extraction system. A small community room with isolated access is available to the public. City hall is responsible for scheduling room use. Station has a disaster preparedness container with 10 days of food stuffs for station personnel and an amateur radio HAM radio transmitter and antenna for communication during a disaster.

The station is a mirror image of Fire Station No. 27, minus one large drive-through apparatus bay. Daily staffing of the one engine, one aid unit, and one air/rehabilitation unit is by three assigned personnel per day. Fire Station No. 22 has the largest service area and is KF&BD's second busiest (call volume) of the six fire stations. There are 26 spaces available for the public meeting room parking.

Fire Station No. 24

Fire Station No. 24 (Finn Hill North) is a wood frame structure designed as a deep, two-story facility to fit the property. Constructed in 1993, it has been the subject of a local controversy. Originally a King County Fire District #41 fire station, it became a City property with the annexation of the area into Kirkland. Beginning around March 1, 1999 the station was staffed during the daytime by career personnel on overtime and reservists at night. Daytime career staffing ended December 31, 2008. After that time it was operated as a volunteer only fire station. Station has a disaster preparedness container with 10 days of food stuffs for station personnel and an amateur radio HAM radio transmitter and antenna for communication during a disaster.

The reserve program operating out of the station was eliminated due to budgetary constraints at the end of 2011, leaving the residents in the area concerned about emergency service delivery

to the area. An agreement was reached and volunteer EMTs provide EMS, allowing for re-opening the station earlier this year (2012). Service is limited to BLS EMS in the evening hours.

The building has been seismically upgraded, has auxiliary power and is considered to be in good condition, albeit inadequate to accommodate larger fire apparatus. There are offices but no community facilities. There are two back-in truck bays, small bunk room, locker (upstairs), exercise room, and kitchen. Features of the building include monitored smoke detection and keyed locks with keypad. The station aid car is staffed nightly from 7:00 PM to 5:00 AM with volunteer personnel.

The station is being actively considered for replacement and relocation to a location better suited to serve the Finn Hill neighborhood. Additional research and analysis in this report offers guidance to assist policymakers in determining next steps.

Fire Station No. 25

Fire Station No. 25 (Finn Hill South) is a reinforced brick, masonry building, constructed in 1974 with a kitchen remodel in 2006. The building has been seismically upgraded, has auxiliary power, and is considered to be in good condition. The station features two back-in truck bays, individual bedrooms instead of a dormitory style sleeping quarters located upstairs, an exercise room, kitchen, and gender specific lockers and showers. Features of the building include monitored smoke detection, keyed locks with keypads, and a positive pressure apparatus exhaust extraction system. There is limited office space but no community facilities or meeting rooms. Station has a disaster preparedness container with 10 days of food stuffs for station personnel and an amateur radio HAM radio transmitter and antenna for communication during a disaster.

Originally staffed by volunteers, the one engine and one aid unit are staffed by three assigned personnel per day. KF&BD addresses the terrain challenges of the Finn Hill area by using an engine at Fire Station No. 25 designed to handle steep grades and tight turns.

Fire Station No. 26

Fire Station No. 26 (North Rose Hill) is a wood frame and masonry structure that was built in 1995. The building has been seismically upgraded, has auxiliary power and is considered to be in very good condition. There are three apparatus bays, (one drive-through that is also double deep), a workout room, kitchen, lockers, and gender specific lockers and showers. A dormitory sleeps eight personnel. Features of the building include monitored smoke detection, keyed

locks with keypads, and a positive pressure apparatus exhaust extraction system. A large community/training room with an elevator for ADA accessibility and isolated access is available to the public. City hall is responsible for scheduling room use. Station has a disaster preparedness container with 10 days of food stuffs for station personnel and an amateur radio HAM radio transmitter and antenna for communication during a disaster.

The coverage area of the station is on the east side of Interstate 405 and personnel can respond into the City of Redmond. Daily staffing of the one engine and one aid unit is by three assigned personnel per day. A shift battalion chief and a training captain are assigned to the station. There are ten parking spaces available for the public multi-purpose room. Parking is inadequate for the number of people that routinely use the facility.

Fire Station No. 27

Fire Station No. 27 (Totem Lake) is a reinforced brick masonry building was built in 1976 and had limited tenant improvements in 2006. The building has been seismically upgraded, has auxiliary power, and is considered to be in fair condition. There are three apparatus bays (one double deep drive-through), workout room, kitchen, lockers, gender specific showers and restrooms, and individual bedrooms. Features of the building include monitored smoke detection, keyed locks with keypads, and a positive pressure apparatus exhaust extraction system. The station lacks adequate insulation. Station has a disaster preparedness container with 10 days of food stuffs for station personnel and an amateur radio HAM radio transmitter and antenna for communication during a disaster.

The station structure is a mirror image of Fire Station No. 22. Daily staffing of the one engine, one ladder truck, two aid units requires a minimum of six assigned personnel per day. The station is KF&BD's busiest and is ideally located near east and west arterials and has easy access to Interstate 405.

Planning for major remodeling and the replacement of fire stations is a major capital expense and requires long-range planning. Fire stations have a limited life expectancy from 35 up to approximately 50 years. Fire Station No. 25 (Finn Hill South), constructed in 1974 and Fire Station No. 27 (Totem Lake) built in 1976 have passed the 35 year life. ESCI recommends that a capital plan for the rebuild or replacement of fire stations be developed.

Apparatus

KF&BD has established an apparatus replacement plan funded through the general fund of the City. The plan is currently written for the period 2011 through 2016 and is updated every two years. This fund schedules replacement of apparatus on a cycle, with engines and ladder trucks replaced every 18 years, aid vehicles replaced every eight years, and command staff vehicles replaced every eight years.

Support and Small Equipment

Small equipment can be a significant part of a fire department's annual budget. It can be expensive to acquire and maintain and may have a limited technological life. ESCI surveyed a sampling of KF&BD's small equipment and found it to be in good condition. Fire department small equipment includes:

- SCBA (self-contained breathing apparatus)
- Small tools
- PPV (positive pressure ventilation fans)
- Computers
- Radios
- Breathing air compressors
- Hydraulic rescue tools
- Rescue tools
- Power saws

Maintenance and repair of small equipment and tools are handled both in house by fire department personnel, City mechanics, and by private sector vendors. SCBA servicing is handled by fire department personnel. Personnel assigned to SCBA duty receive incentive pay of 2 percent.

Pump, Hose, and Ladder Testing

Pump and hose testing are two important processes that need to be performed and documented annually. The purpose of testing fire hose is to have a reasonable assurance of firefighter safety and that the hose and couplings will work as designed. The life expectancy of a section of fire hose is often determined by the care it receives. Hose is susceptible to mechanical injury, heat and fire damage, mold and mildew, and damage due to chemical contact and excessive pressure. Inspection, care, and maintenance should extend to all appliances and nozzles as well.

An inventory of all fire hose should be maintained, along with a history of each section. KF&BD's recordkeeping and hose-testing program meets the requirements of *NFPA 1961: Standard on Fire Hose, 2007 Edition*.

Fire pumps are one of the most important and expensive parts of any fire apparatus. The care and routine check of a fire pump is a necessity and should be completed by personnel on a regular schedule. Fire pumps are tested annually by a third party vendor. Records are maintained in hard copy paper and electronic format.

Annual aerial ladder testing is conducted by a third party.

Personal Protective Equipment (PPE) Maintenance

Statistical data has shown that buildup of contaminants on turnout gear (PPE or Personal Protective Equipment) has a direct impact on the health and safety of firefighting personnel. Firefighters who are exposed to contaminated PPE have a much higher risk of contracting an illness. The health and safety risks associated with contaminated turnout gear are addressed in *NFPA 1500, 1581, and 1971*. Standards require that protective clothing be cleaned at least once every six months. While this standard may seem excessive, ESCI has found that regular cleaning and maintenance will extend the life expectancy of turnout gear. Proper care enables fire departments to lengthen the replacement cycle of PPE.

KF&BD has made provisions for routine cleaning of firefighting PPE. While all fire stations have residential washer and dryers only two have commercial extractors. KF&BD personnel have access to commercial extractors at Fire Station Nos. 21 and 26—the only units approved for cleaning PPE when used in conjunction with approved cleaning solutions.⁵⁸ Turnout drying and storage areas should be provided in each fire station. A common problem observed by ESCI in KF&BD fire stations is the storage of turnout gear in apparatus bays or in an adjacent room with no doors and/or ventilation. ESCI recommends that PPE be stored in a separate, well ventilated room.

Mutual and Automatic Aid Systems

There are numerous mutual aid agreements, both formal and informal, in place between fire, police, and emergency medical agencies in the Puget Sound area. Mutual aid is characteristically employed on an as-needed basis where fire units are called for and specified

⁵⁸ Fire Station No. 26 had a commercial extractor delivered that was being installed during this course of this study.

by an IC (Incident Commander). There are three basic types of mutual aid that are available to most fire departments.

1. *Basic Mutual Aid upon Request*

This form of mutual aid is the most basic and is typically permitted under broad public laws that allow communities to share resources upon request during times of disaster or during local and regional emergencies. Often, these broad laws permit communities to make decisions quickly regarding mutual aid under specified limitations of liability, allowing a community to tap into resources from their immediate neighbors, as well as very distant resources in communities with which they have very little day-to-day contact. Under this level of mutual aid, specific resources are typically requested by a fire department, through the chain of command or sometimes coordinated by local or regional emergency management personnel. Depending on the level of the request, the response can sometimes be slow and the authorization process may be cumbersome due to the exchange of official information or even elected officials' approval that may be required.

2. *Written Mutual Aid Agreement*

This form of mutual aid goes one step further by formalizing in writing an agreement between communities (typically immediate neighbors in a region) in an effort to simplify the procedures and reduce response times in an emergency. Frequently, these agreements are developed by fire department officials, but executed by the policy-makers of the participating jurisdictions. By signing such agreements, communities are "pre-authorizing" the deployment of their resources under specified circumstances. In Washington State, mutual aid agreements are generally reciprocal in nature without compensation for services or a subsidy. In other words, mutual aid must truly be "mutual." In King County, all fire agencies are guarantor to a master mutual aid agreement.

3. *Automatic Aid Agreement*

Automatic aid takes the process an additional step by spelling out circumstances under which one or more specific resources will respond automatically upon notification of a reported incident in the neighboring community. In essence, an automatic aid agreement expands a community's initial first alarm response to certain types of incidents by adding resources from a neighboring agency to that response protocol. Typically, such agreements are for specific geographic areas where the neighbor's resource can be expected to have a reasonable response time and are limited to specific incidents. An example of such an agreement is having a neighboring community's engine respond to all reported structure fires in an area where a neighboring agency's apparatus would be closer than the second or third-due engine from the home community. In other instances, an agreement might cover a specialized resource, such as an aerial apparatus that the home community does not possess.

Automatic aid agreements may be purely reciprocal or may involve the exchange of money for services provided. Reciprocal agreements are common when used where each community have mutually beneficial resources or services that can be provided. Services or resources need not be identical. For instance, one community may send an engine to a second community on automatic response to structure fires, while the second community agrees in

exchange to send a water tender to the first community's structure fire calls. These reciprocal agreements are usually made where some reasonable level of use balance is expected between the parties of the agreement.

A primary purpose of an automatic aid agreement is to improve the regional application of resources and staffing. Since fire protection resources are most frequently established because of the occupancy risks in a community and not necessarily a heavy workload, apparatus may be idle for long periods of time. While fire departments make productive use of this time through training, drills, pre-incident planning, and other functions, the fact is that expensive apparatus resources and personnel are not heavily tied up on emergency incidents. Communities that share certain resources back and forth are essentially providing a higher quality of service than would be otherwise available by the host agency, and reducing expensive redundancy and overlapping services.

KF&BD has entered into and relies upon, automatic aid agreements with Northshore, Bothell, Woodinville, Redmond, and Bellevue fire departments. Most of KF&BD's emergency response resources are committed when a single structure fire event occurs in the City. KF&BD depends on automatic aid partners that are proximate to Kirkland to augment responses or backfill empty fire stations.

There will never be an even balance between the amount of mutual and automatic aid given and received. Therefore, tracking of aid events is information that can be analyzed to determine if an inequity exists. Analysis involves several variables; the number of incidents; apparatus; personnel; and the length of time committed to mutual and automatic aid calls. If an imbalance is found in aid services, it is appropriate to negotiate a change in dispatch and response protocols to achieve a balance between fire departments.

Current Service Demand

In this section, the current condition of KF&BD's emergency response deployment and performance is analyzed. It covers the topics of service demand and distribution, reliability, incident control and management, water supply, and mutual and automatic aid.

Fire and EMS agencies traditionally have planned, trained, and deployed resources independent of each other although there is interdependence on emergency incidents. This paradox at emergency incidents occurs because emergency service agencies at times will require assistance from other jurisdictions. This can happen for any number of reasons. The

more common occurrences are for assistance at larger fire incidents, closest unit response by a neighboring apparatus, and when travel time from a fire station is nearer the scene of an emergency. Because of this interdependence, ESCI's GIS (geographic information system) analysis often incorporates fire and EMS service areas adjacent to Kirkland.

Incident Control and Management

KF&BD uses the Northeast King County Regional Public Safety Communication Agency (NORCOM) as its Public Safety Answering Point (PSAP) to receive, process, dispatch and track emergency response resources. NORCOM standardizes response assignments for each agency it serves based on the type of call dispatched. KF&BD establishes its "response assignments" for each call type. These assignments are intended to provide the quantity and type of apparatus needed for each incident type, as well as the correct number of staff to accomplish the critical tasks necessary to mitigate the emergency.

Technology has been deployed to manage dispatches and resources in real time. MDCs (mobile data computers) and AVL (automatic vehicle location) are available in all department apparatus. AVL provides satellite information in real time for a vehicle's specific location, typically within ten feet of its actual position. Thus, NORCOM can dispatch apparatus based on actual, not assumed location, such as the unit's assigned fire station. This technology improves response time by sending units that are physically closer to an incident versus an assumption of being in quarters. MDC technology allows real time information transmittal to response crews responding to an incident. Dispatch data pertinent to the emergency response should include target hazards or specific building records, water supply, and any other information that would help the officer prepare for an incident.

The fire department has one FTE deputy chief of operations working an administrative schedule and three operational battalion chiefs, one per 48-hour shift. KF&BD uses captains and lieutenants at each station as first line-supervisors for each response unit. In addition to the resources dispatched on a response assignment, a safety officer—the training chief—also responds. The agency uses the ICS (Incident Command System) on emergency responses and the Passport Accountability System for all fire ground incidents and other major or long-term incidents.

Response Activity

ESCI was provided with five years of summary response activity (2005 to 2009) and approximately two years of detailed incident response activity (2010 through 2011). A gap in

detailed incident data occurred in the first three weeks of September 2011 due to a software malfunction during an aborted startup of the New World RMS. For this reason ESCI used historical responses from September 2010 through August 2011 for analysis. A total of 7,380 incidents were included in the data set. Incidents defined as outliers (invalid, incomplete reports or data that was outside expected values) were eliminated prior to analysis. Another small percentage of incident reports were unusable because of data integrity issues. In ESCI's experience RMS software generally has validated user input and rejects those entries outside of the expected (normal) range.

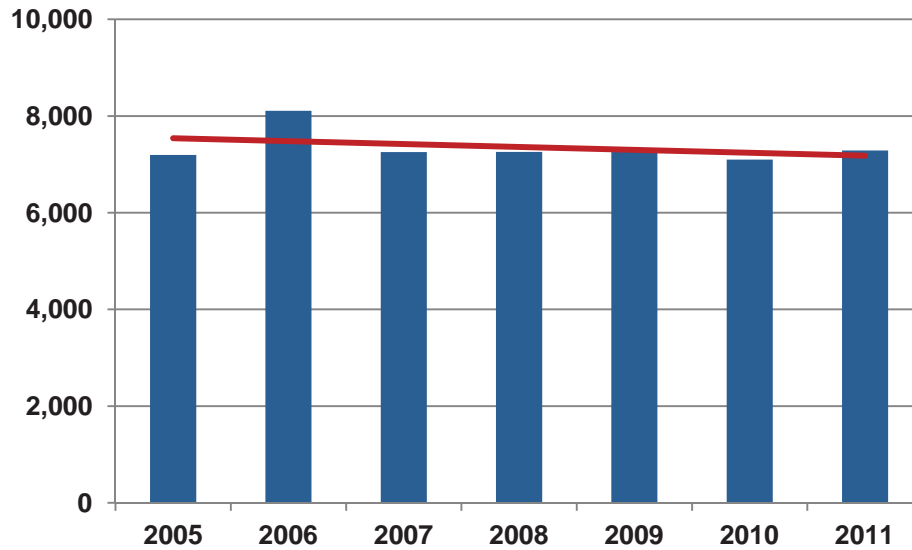
Frequent review of response data is necessary to understand how deployment changes impact coverage of service demand coverage. This is especially true when large changes occur. With only several months of post annexation data available the effect is not yet known. Prior to the annexation of a portion of Woodinville and the closure of Woodinville Fire Station No. 34, Fire Station No. 27 was busy. Going forward, fire station and unit work load needs to be monitored.

KF&BD's response data was categorized into the following three major categories:

- Fire: Structure fires, vehicle fires, wildland fires, and equipment fires
- EMS: Medical emergencies, traumatic injuries, MVAs (motor vehicle accident), and rescues
- Other: Hazardous materials, explosions or ruptures without fire, smoke investigations, and false alarms

Analysis of service demand began with a review of total response activity for KF&BD from 2005 to 2011 (Figure 52).

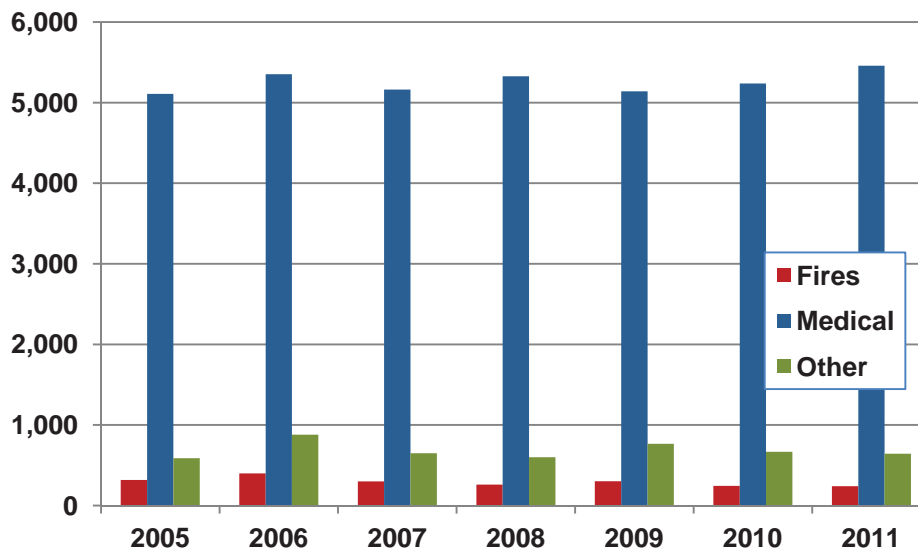
Figure 52: Total Service Demand, 2005 – 2011



With one exception, total annual responses varied less than 4 percent (225 responses). In 2006, calls for service were approximately 9 percent above the seven-year average (2005 to 2011). Total responses for the one-year analysis period (September 2010 through August 2011) were consistent with the seven-year average of 7,360.

Figure 53 examines service demand by major incident category from 2005 through 2011.

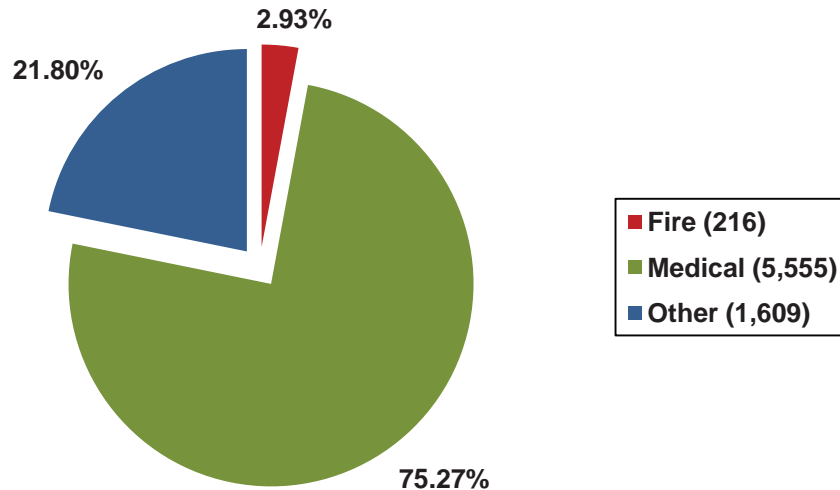
Figure 53: Service Demand by Incident Type, 2005 – 2011



There were only minor differences for incidents by category during the seven years that ESCI reviewed.

The following figure shows percentage of service demand by incident type for the one-year period September 2010 through August 2011.

Figure 54: Percentage of Service Demand by Incident Type, September 2010 – August 2011



While total service demand was consistent with the five-year average (2005 to 2009), the percentage of calls related to EMS increased by nearly 5 percent. Reasons for the increase are unknown but may be related to staffing and deployment changes of neighboring fire and EMS providers.

Figure 55 is a breakdown of the incident responses using the NFIRS (National Fire Incident Reporting System) three-digit code and the written description that best describes the type of incident. This description is generally the type of incident found when emergency personnel arrived; if a more serious condition developed after the fire department's arrival on the scene, that incident type is reported.

Figure 55: NFIRS Incident Type, September 2010 – August 2011

Series Description	Total	Percentage
100 – Fire	216	2.93%
200 – Overpressure Rupture, Explosion, Overheat (No Ensuing Fire)	3	0.04%
300 – Rescue and Emergency Medical Service (EMS) Incidents	5,555	75.27%
400 – Hazardous Condition (No Fire)	119	1.61%
500 – Service Call	240	3.25%
600 – Good Intent Call	610	8.27%
700 – False Alarm and False Call	594	8.05%
800 – Severe Weather and Natural Disaster	10	0.14%
900 – Special Incident Type	33	0.45%
Total	7,380	100.00%

The number of fire incidents declined in the September 2010 to August 2011 period when compared to the five-year period. Fires of all types decreased as a percentage of incidents from 4.23 percent to 2.93 percent. The decrease is statistically insignificant but is consistent with the trend being experienced in many fire agencies throughout the country.

Service Demand by Temporal Variation

ESCI continued the analysis by examining service demand by temporal variation. Incident data for the one-year period September 2010 through August 2011 was used to show how demand changes based on various measures of time. Figure 56 illustrates service demand for fire incidents by month of the year, Figure 57 for EMS incidents, and Figure 58 for other incident types.

Figure 56: Fire Incident Service Demand by Month of Year, September 2010 – August 2011

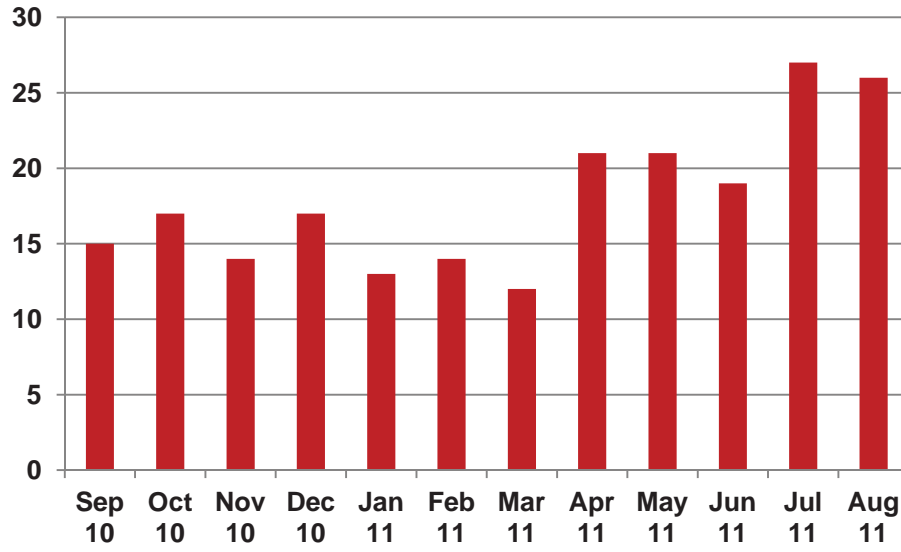


Figure 57: EMS Incident Service Demand by Month of Year, September 2010 – August 2011

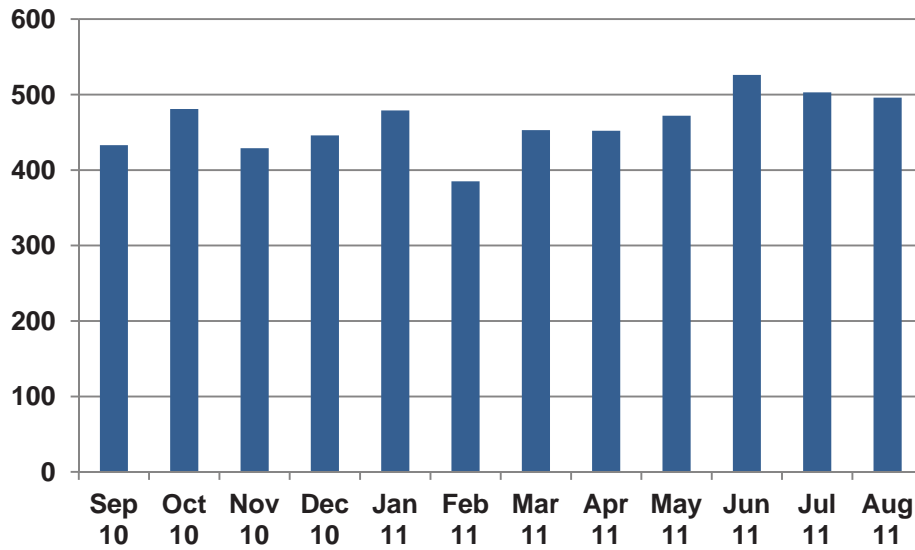
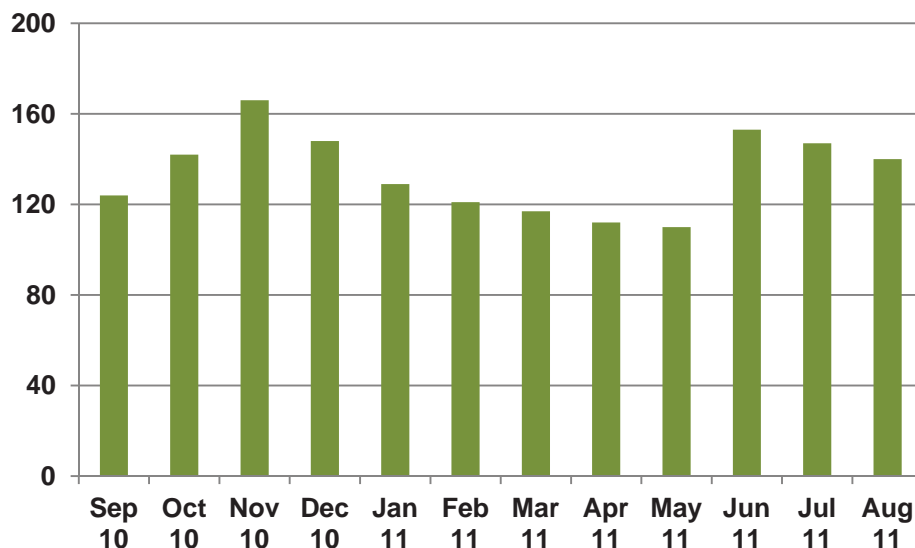


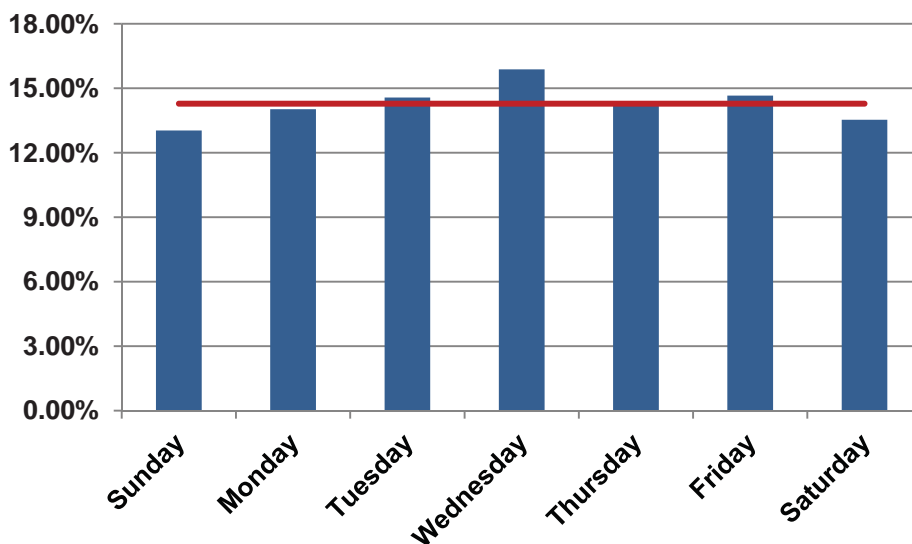
Figure 58: Other Incident Service Demand by Month of Year, September 2010 – August 2011



During the 12-month period service demand for KF&BD varied from a low of 7.05 percent in February to a high of 9.46 percent in June. The service demand average was 8.33 percent. The variation in service demand for fire incidents was highest in July and August. Fire incidents require the largest number of personnel and as a consequence should be monitored for periods of time when a potential exists to exceed available resources.

Figure 59 displays service demand by day of the week for the same time period for all incidents.

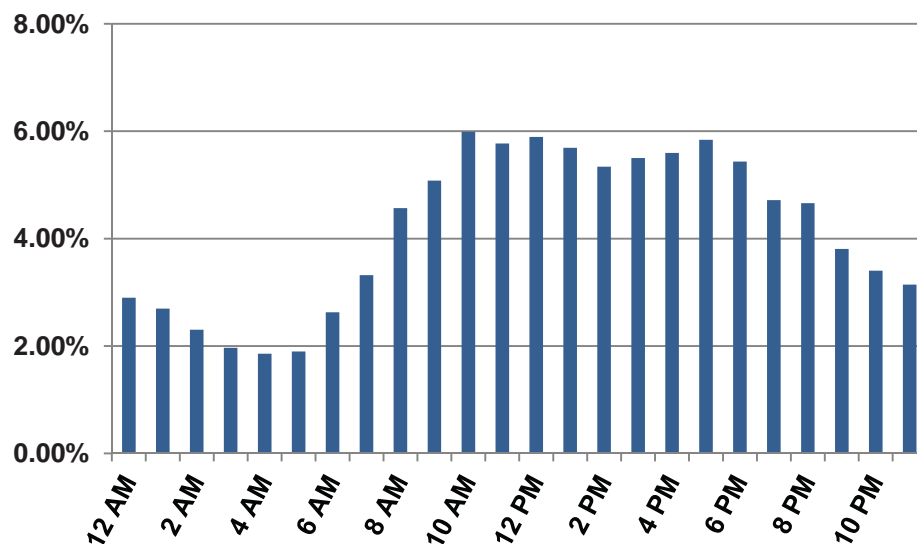
Figure 59: Service Demand by Day of Week, September 2010 – August 2011



Sundays had the lowest total call volume by day for KF&BD and Wednesdays had the highest number of calls for service. Average call volume by day of week ranges from a low of 13.04 percent to a high of 15.88 percent.

Another measure involves determining service demand by hour of day. Figure 60 displays service demand by the hour of the day from September 2010 through August 2011 for all incidents.

Figure 60: Service Demand by Hour of the Day, September 2010 – August 2011



Call data and response activity post annexation was not available for this study. Second, the data set was smaller than typically used by ESCI for analysis. Problems were identified with the CAD system included three full weeks of response information that was not available from the month of September 2011.

Service Demand by Geographic Distribution

In addition to the temporal analysis of service demand, it is useful to examine the geographic distribution of service demand. Using Geographic Information System (GIS) software, ESCI was able to geocode KF&BD incidents for September 2010 through August 2011. The first map (Figure 61) displays the service area of KF&BD, fire stations, major arterials, railroads, schools, and parks. The second map (Figure 62) shows an expanded view of the City and fire department service and perimeter area and incorporates the fire stations of neighboring fire agencies. Note: Fire Station No. 24 station aid car is staffed nightly from 7:00 PM to 5:00 AM with volunteer personnel and Woodinville Fire & Rescue Fire Station No. 34 is unstaffed.

Figure 61: KF&BD Service Area

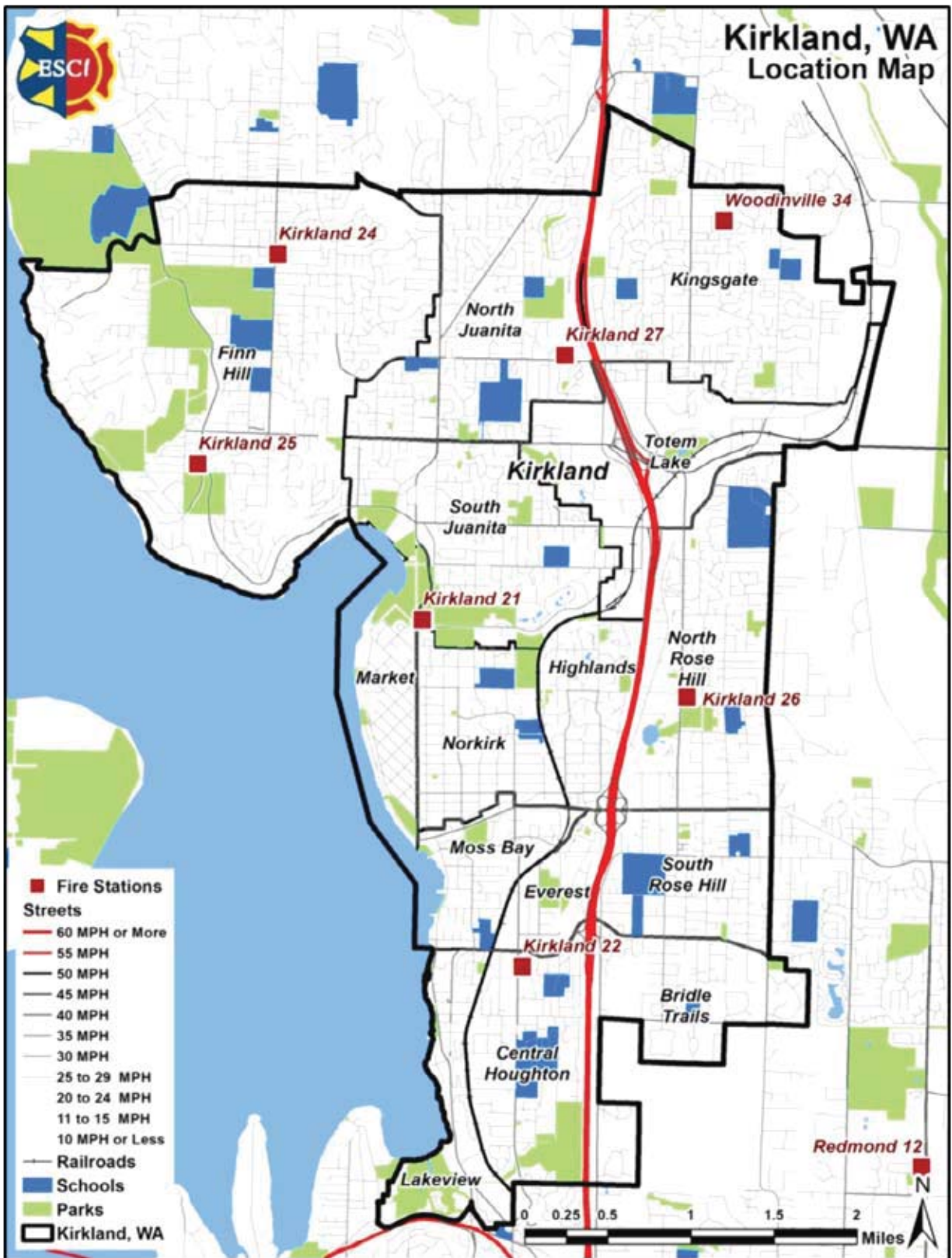
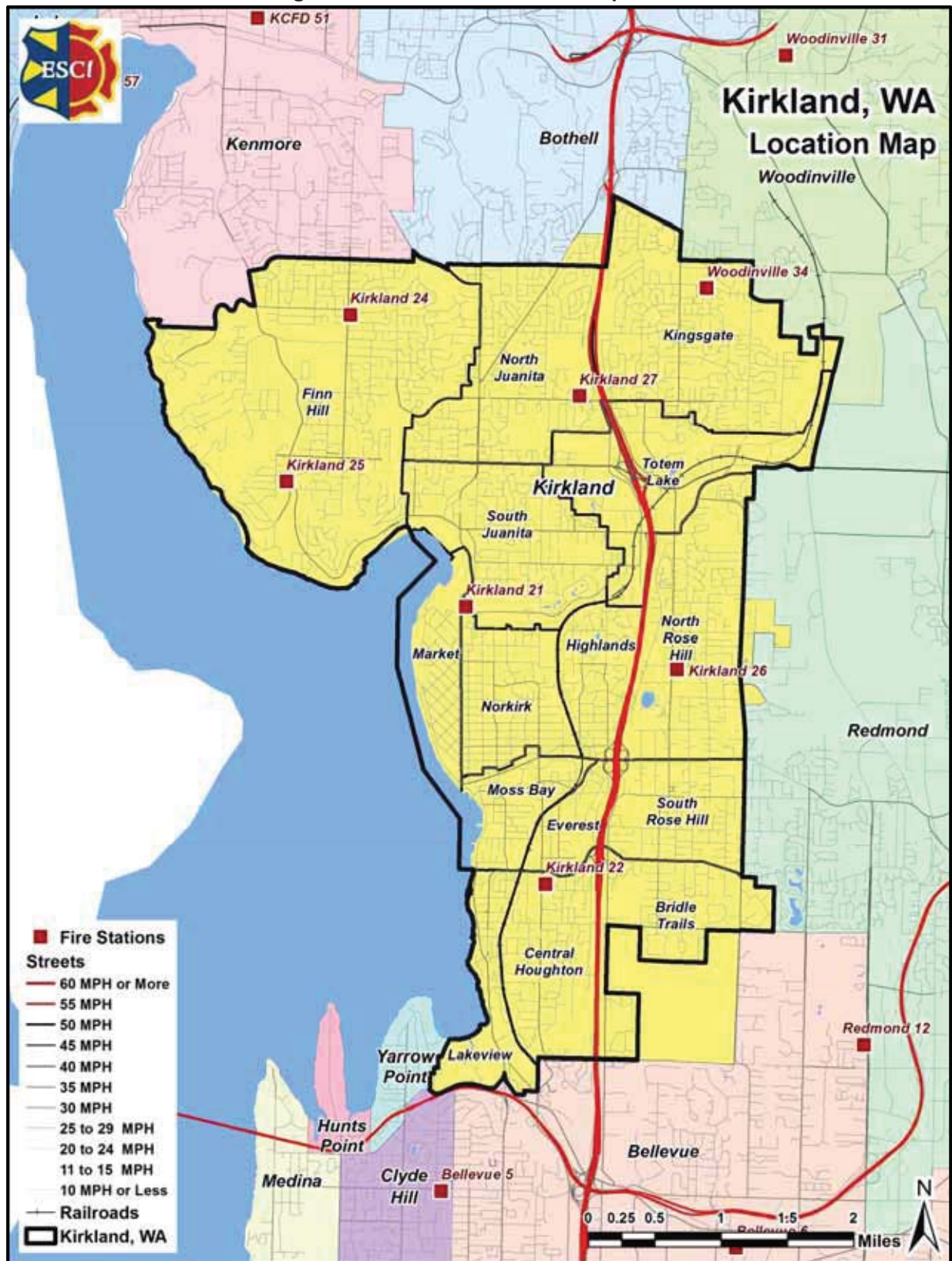


Figure 62: KF&BD Service Area Expanded

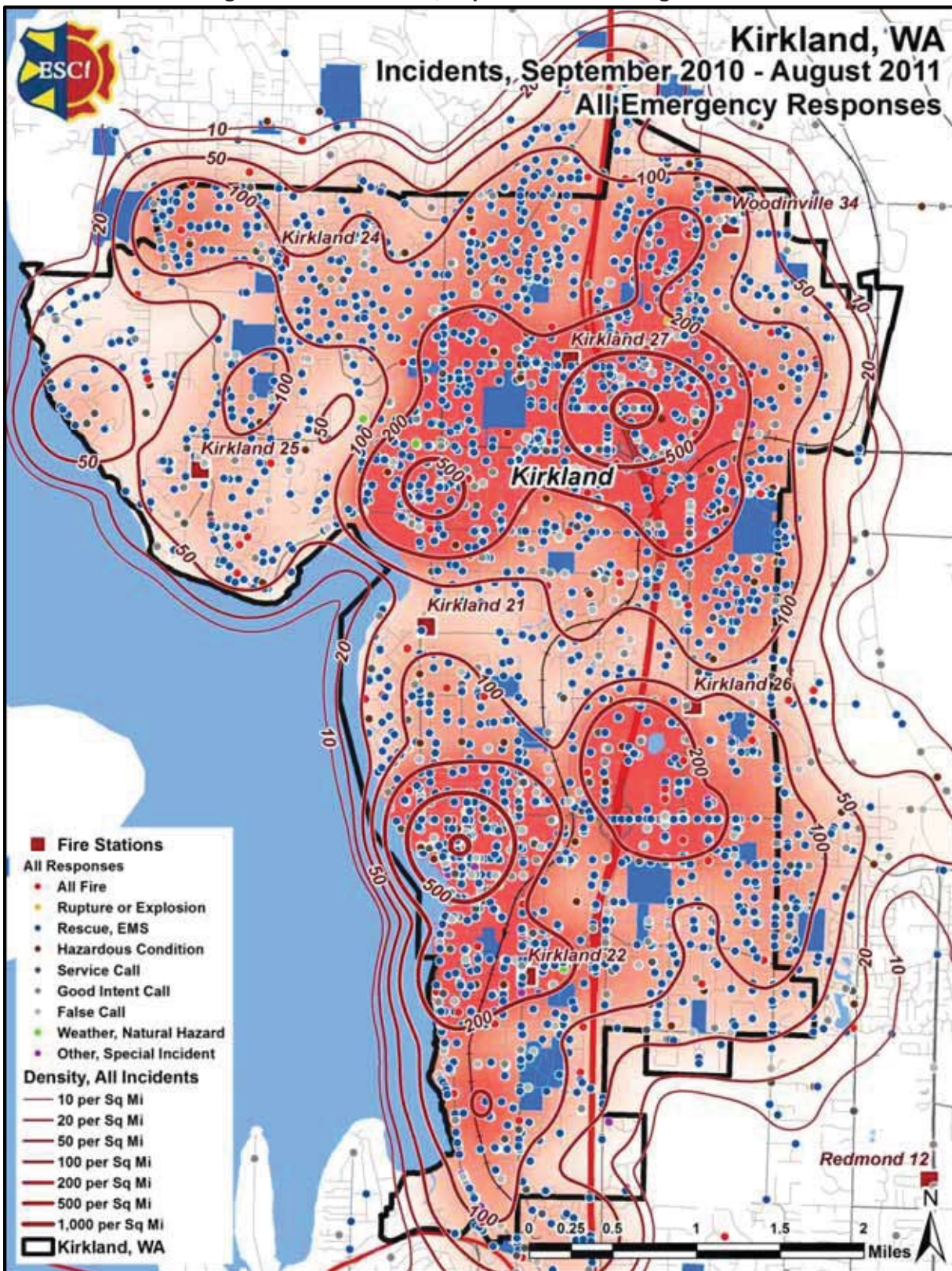


To one level or another, KF&BD functions with all of the fire agencies on the north and eastside of Lake Washington. More frequent operations are conducted with the Bellevue, Redmond, and Bothell fire departments and the Woodinville and Northshore fire protection districts.

Demand Analysis

ESCI examined service demand by incident type and temporal variation. Figure 63 illustrates the location of all incidents responded to by KF&BD that occurred between September 2010 and August 2011.

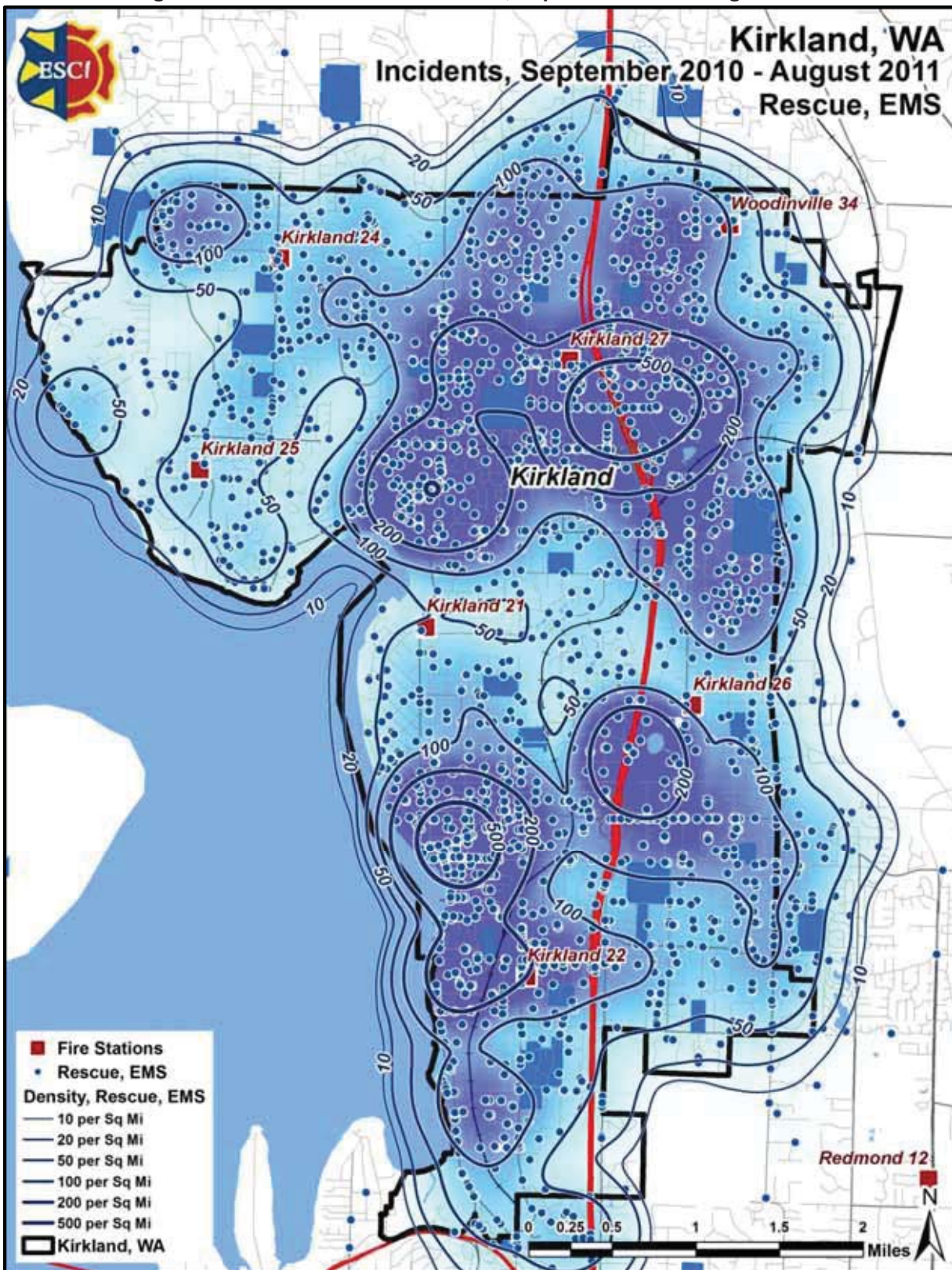
Figure 63: All Incidents, September 2010 – August 2011



With over 7,300 calls for service responded to by KF&BD, Figure 63 shows that while there are parts of the City that had higher service demand, none was immune to emergencies. From September 2010 through August 2011, the three areas of Kirkland with service demand that exceeded 500 calls per square mile occurred between Fire Station Nos. 21 and 27 and northwest of Fire Station No. 22.

In the next figure ESCI displays only the location of those incidents geocoded in the reports as rescue and EMS incidents for the same one-year period. As with fire incidents, rescue and EMS incidents are in similar clusters, but with a greater distribution throughout the City. Over 75 percent of the occurrences (5,555) were EMS related.

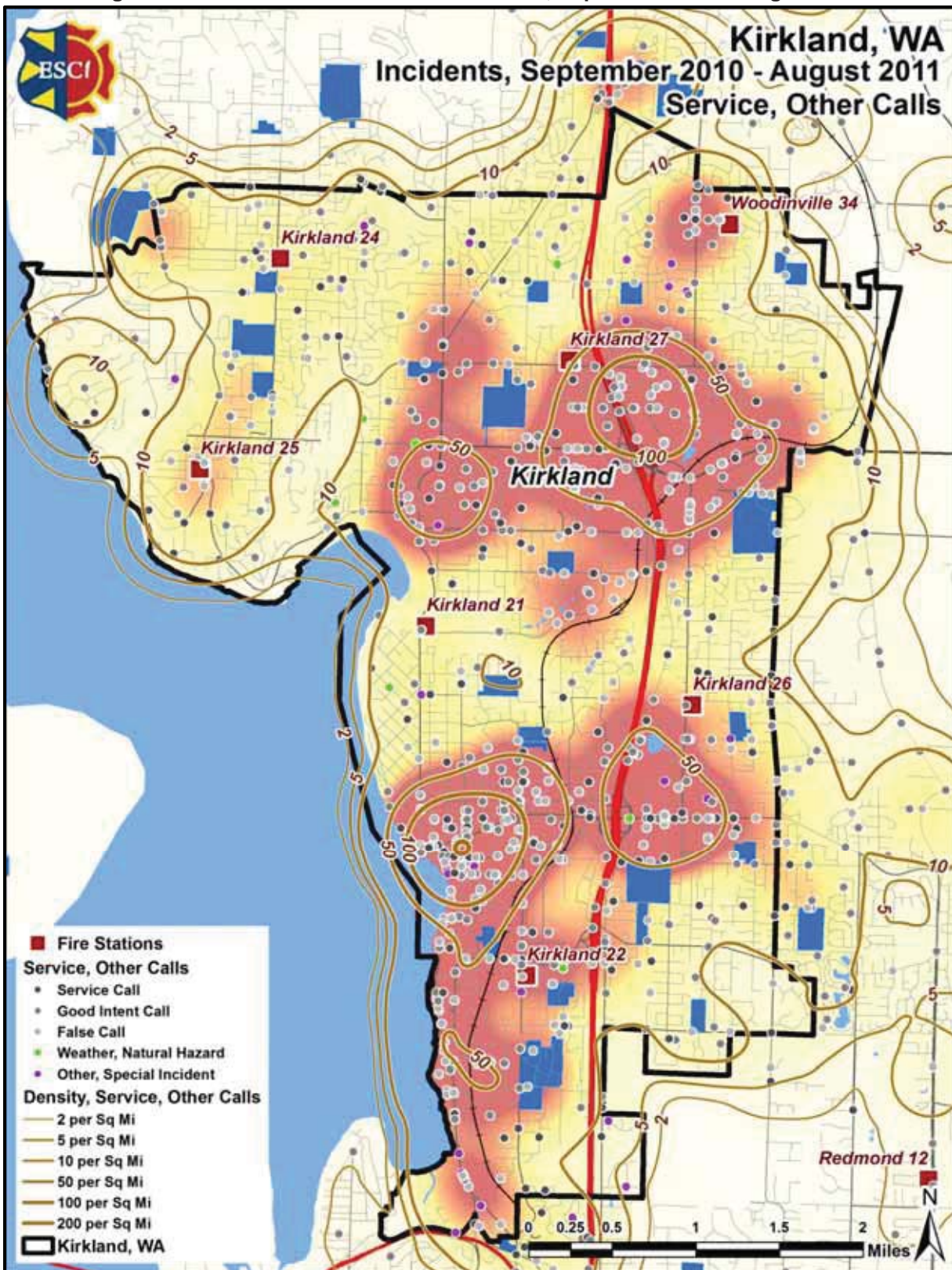
Figure 64: Rescue and EMS Incidents, September 2010 – August 2011



A cluster of EMS incidents to the west of Fire Station No. 24 is significant in that the closest response is from either Fire Station Nos. 25 or 27 during the time of day when the majority of calls for service occur.

Figure 65 shows the distribution of all incidents classified as other and service calls that occurred from September 2010 and August 2011. Fewer incidents classified in the other category occurred outside of the three highest density areas for fires and medical calls.

Figure 65: Service and Other Calls for Service, September 2010 – August 2011



There is a pocket of other incidents west of Fire Station No. 24 that is similar to the clustering of EMS incidents.

In the next map (Figure 66), incidents for the same one-year period categorized as fire, explosion, and hazardous materials events are shown. In Figure 67, only those incidents classified as structure fires are shown.

Figure 66: Fire, Explosion, and Hazardous Materials Incidents, September 2010 – August 2011

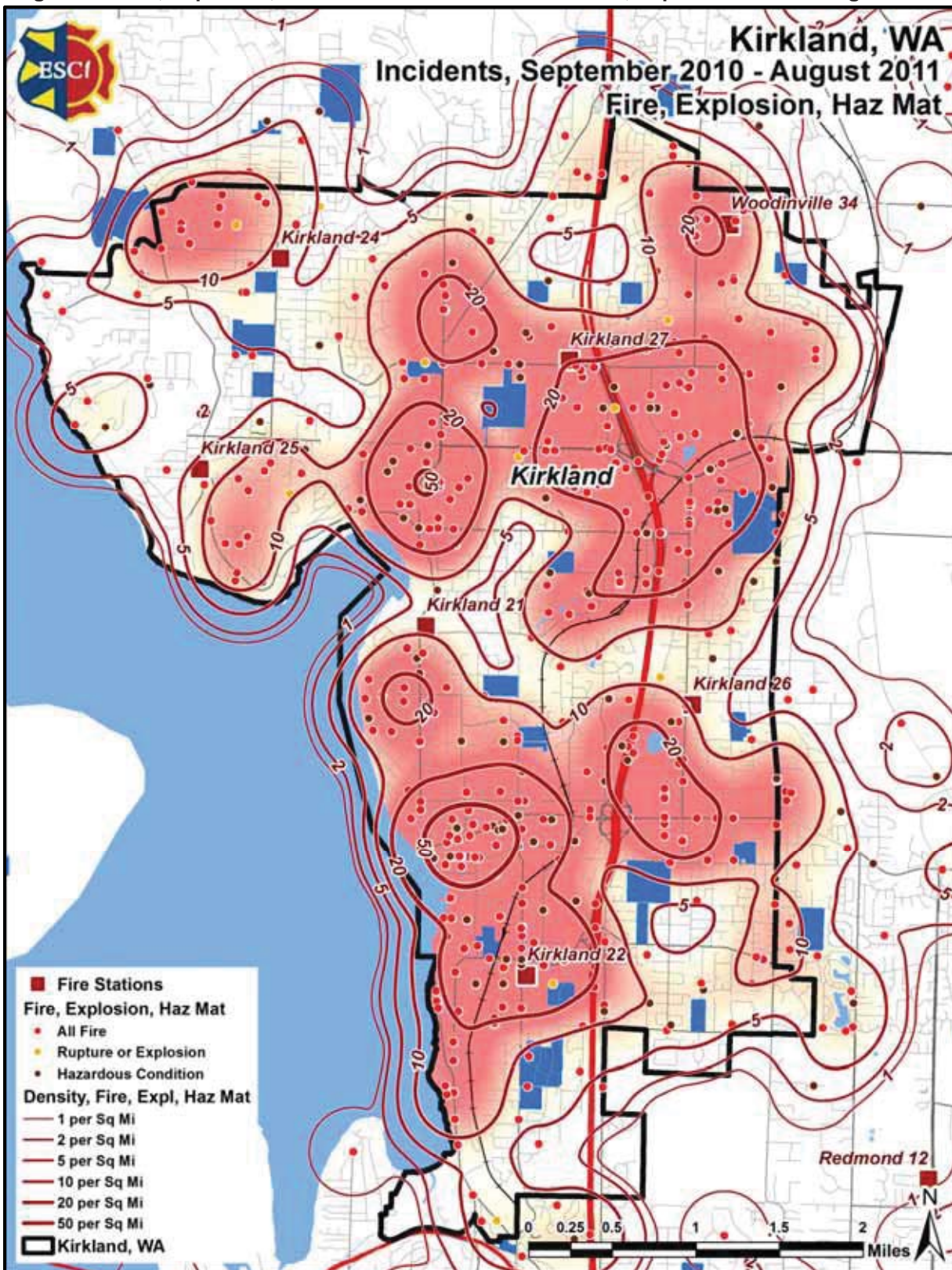
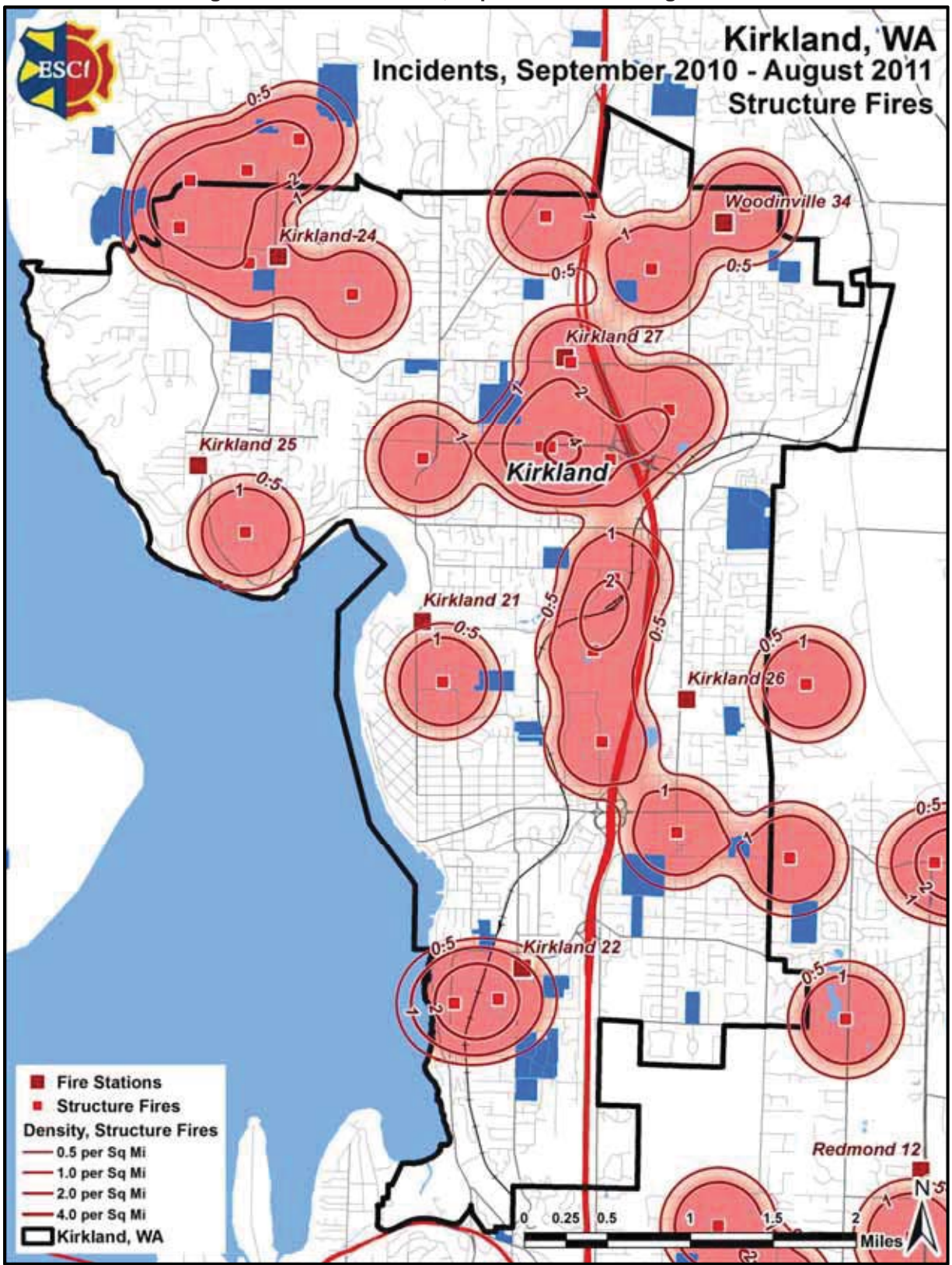


Figure 67: Structure Fires, September 2010 – August 2011



Structure fires were widely dispersed throughout the city. With fewer numbers of structural fire events it is difficult to draw any conclusion related to location of fire incidents.

A collection of EMS, fire, and other incidents occurred to the west of Fire Station No. 24 during the one-year study period. Multiple instances of calls for service also occurred just over the border in Northshore's service area.

Response Time

The fire service defines response time as the total time measured from the moment notification is received by the emergency communications center until arrival of the first apparatus on the scene of the incident. Components of response include discovery of the emergency, 9-1-1 activation, call processing and dispatch of emergency response, turnout time, travel time, arrival on the scene of the emergency, setup time (fire incidents), and when mitigation of the emergency begins.

Distribution Study

ESCI began the distribution analysis by examining travel time over the current road network. Travel is only one component of response time. National standards and KF&BD's adopted response standard is based on four minutes of travel time.

The following maps model the travel distance capability of emergency apparatus within 4 (4:00), 5 (5:00), 5.5 (5:30), and 8 (8:00) minutes travel time from each KF&BD fire station. Adjustments to speed capability of the streets were made to account for negotiating turns, grades, intersections, traffic calming devices, and other impediments. Travel time assumes that the fire of aid unit is responding from quarters.

Figure 68: Fire Station No. 21 – 4:00, 5:00, 5:30, and 8:00-Minute Travel Time

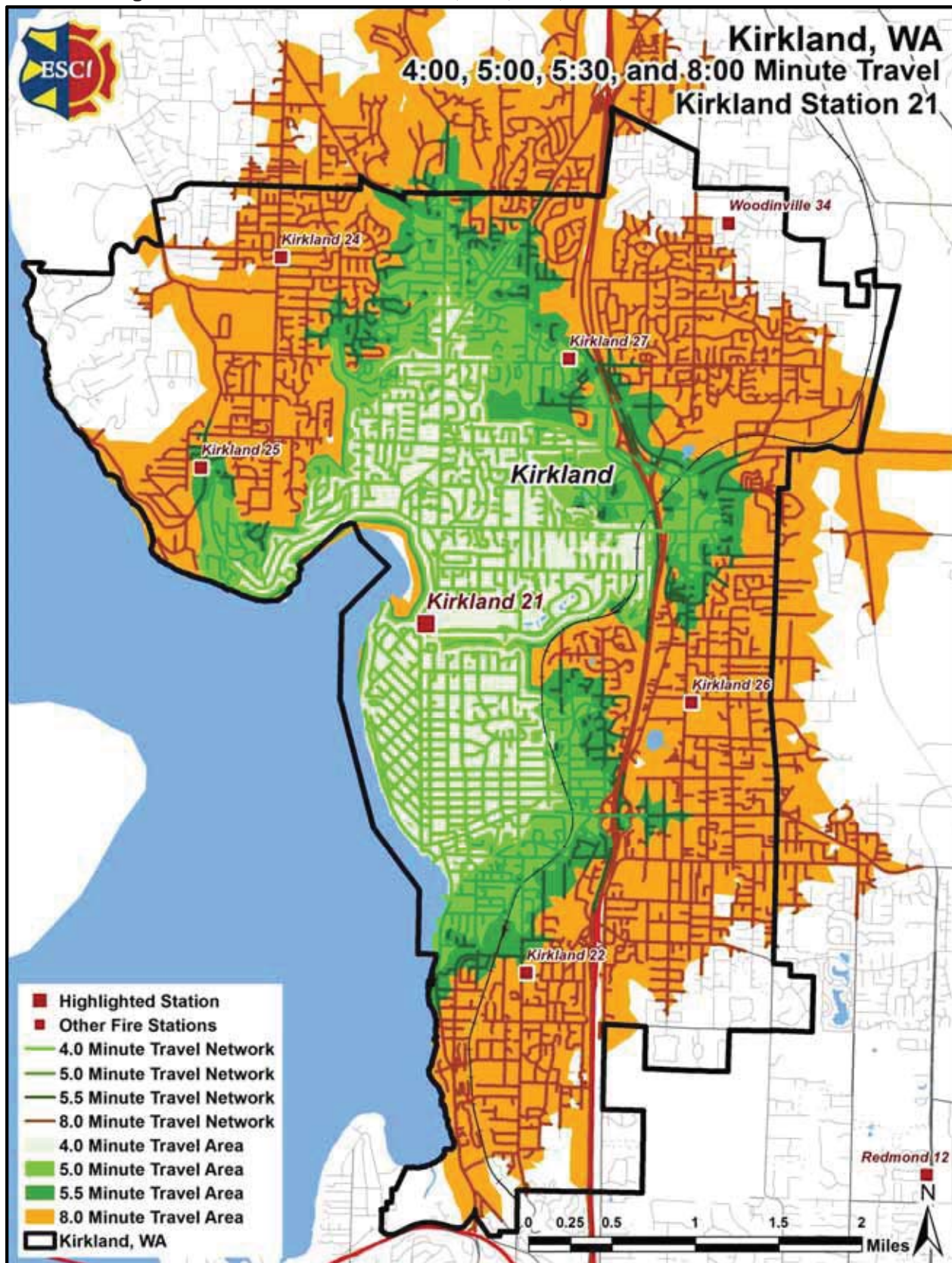


Figure 69: Fire Station No. 22 – 4:00, 5:00, 5:30, and 8:00-Minute Travel Time

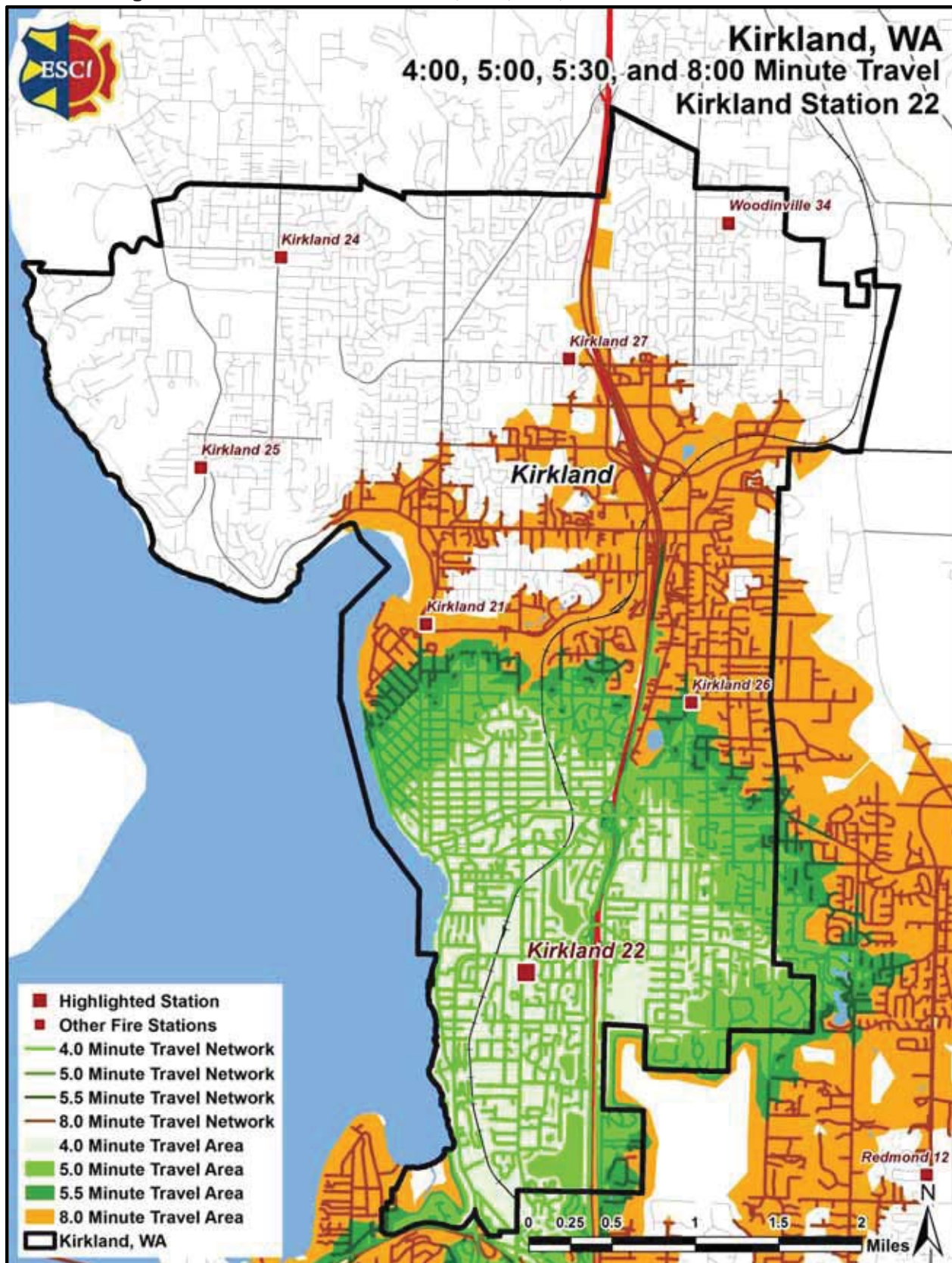
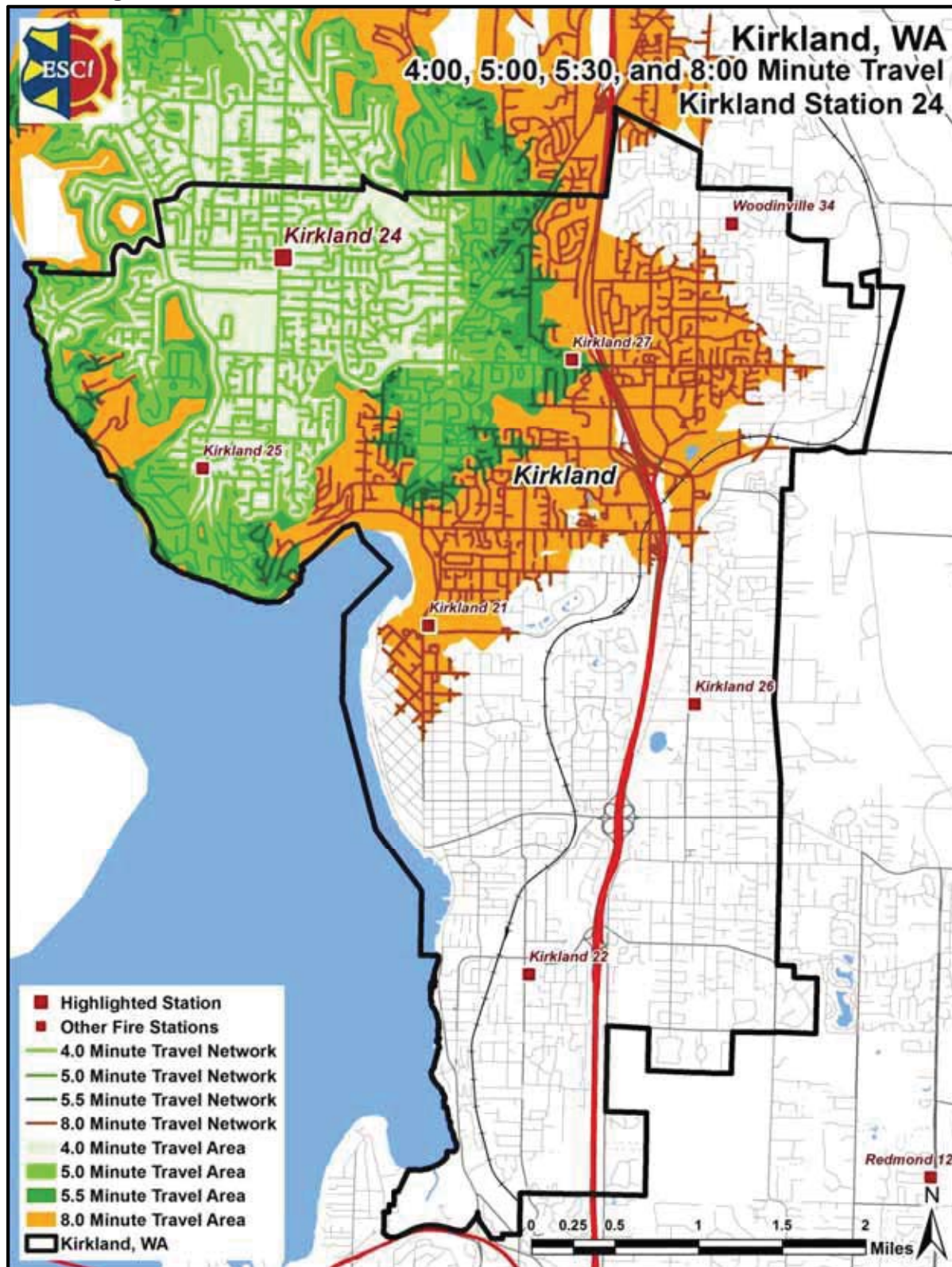


Figure 70: Fire Station No. 24 – 4:00, 5:00, 5:30, and 8:00-Minute Travel Time⁵⁹



⁵⁹ Fire Station No. 24 station aid car is staffed nightly from 7:00 PM to 5:00 AM with volunteer personnel.

Figure 71: Fire Station No. 25 – 4:00, 5:00, 5:30, and 8:00-Minute Travel Time

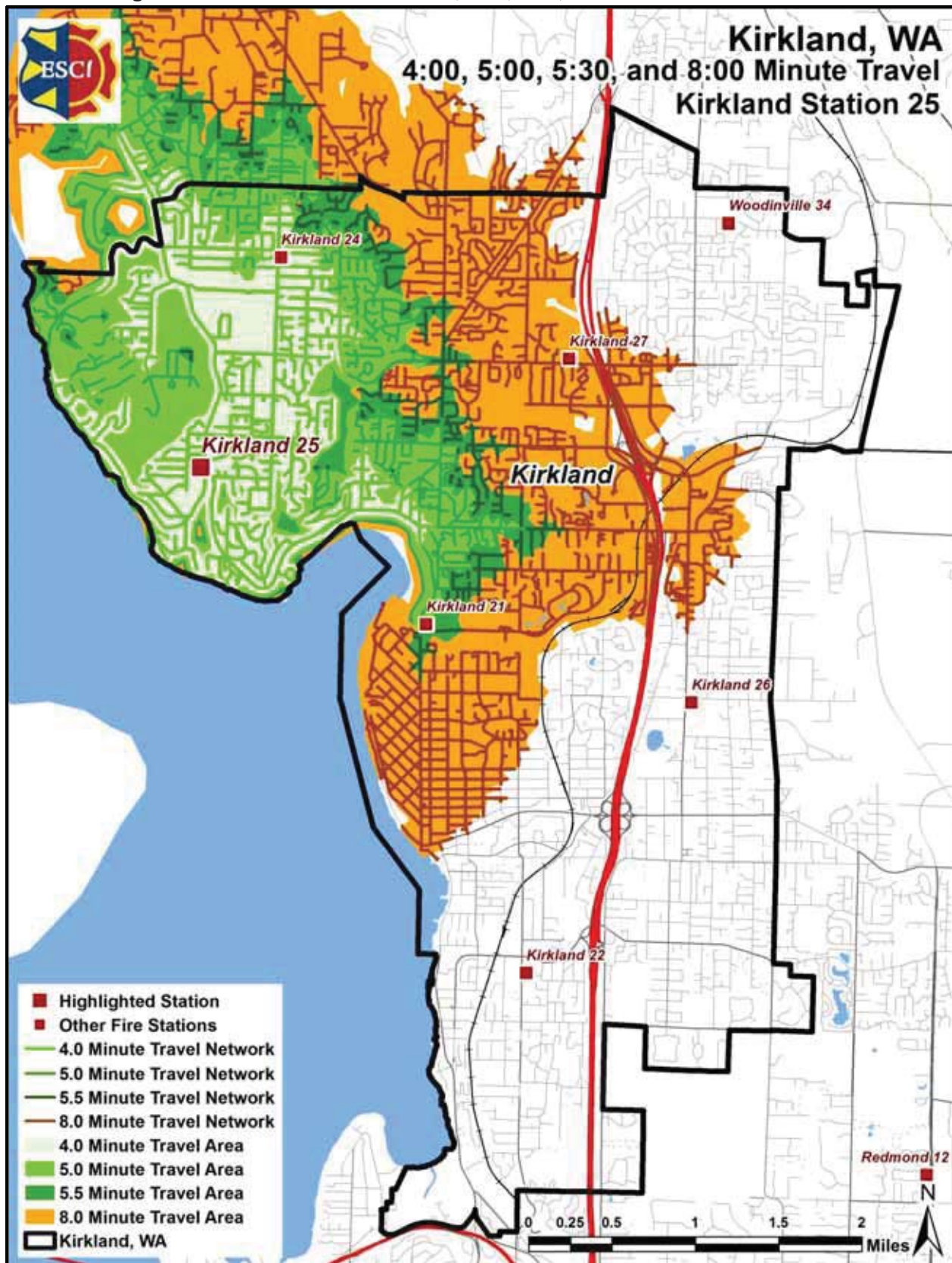


Figure 72: Fire Station No. 26 – 4:00, 5:00, 5:30, and 8:00-Minute Travel Time

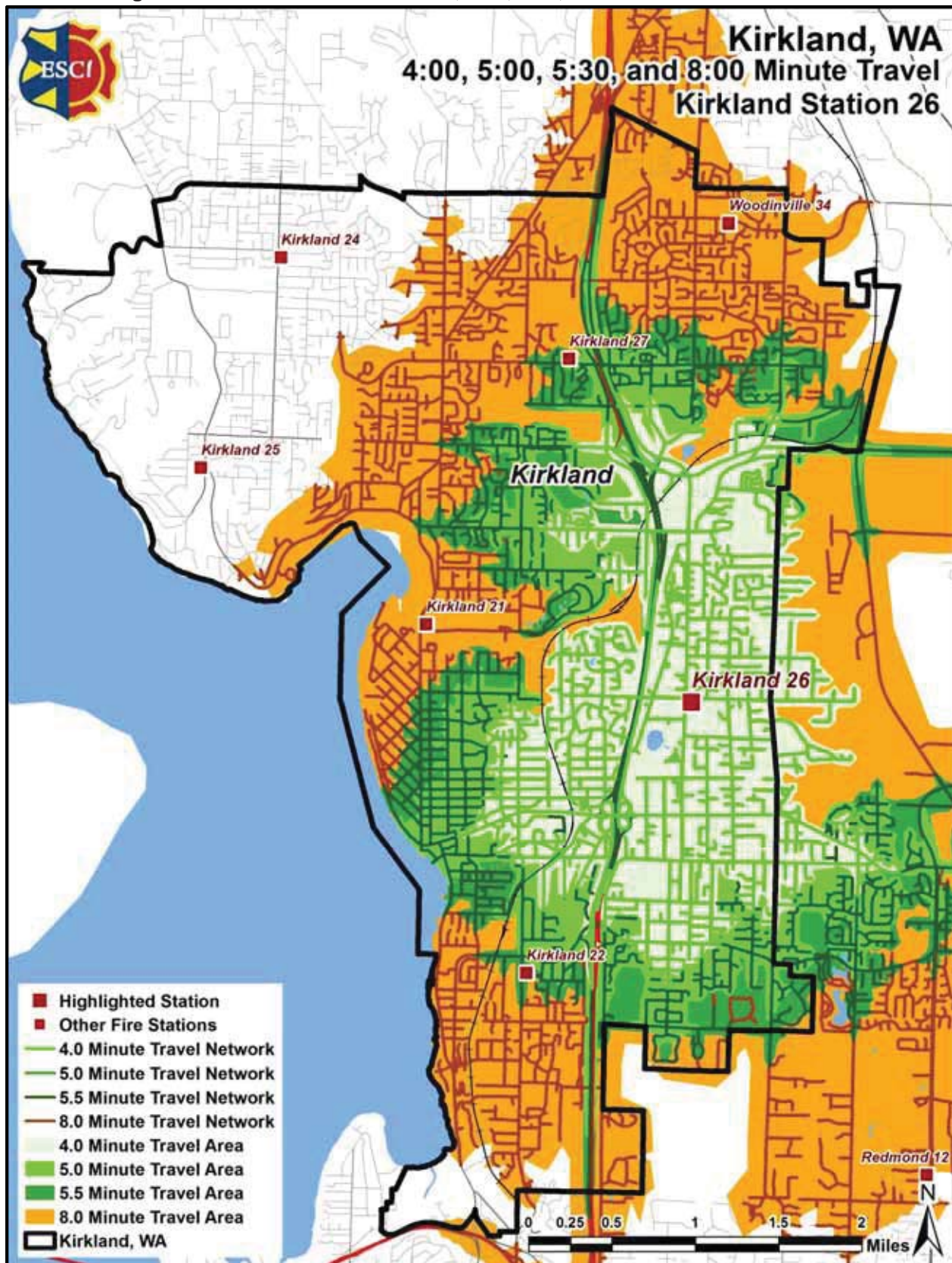
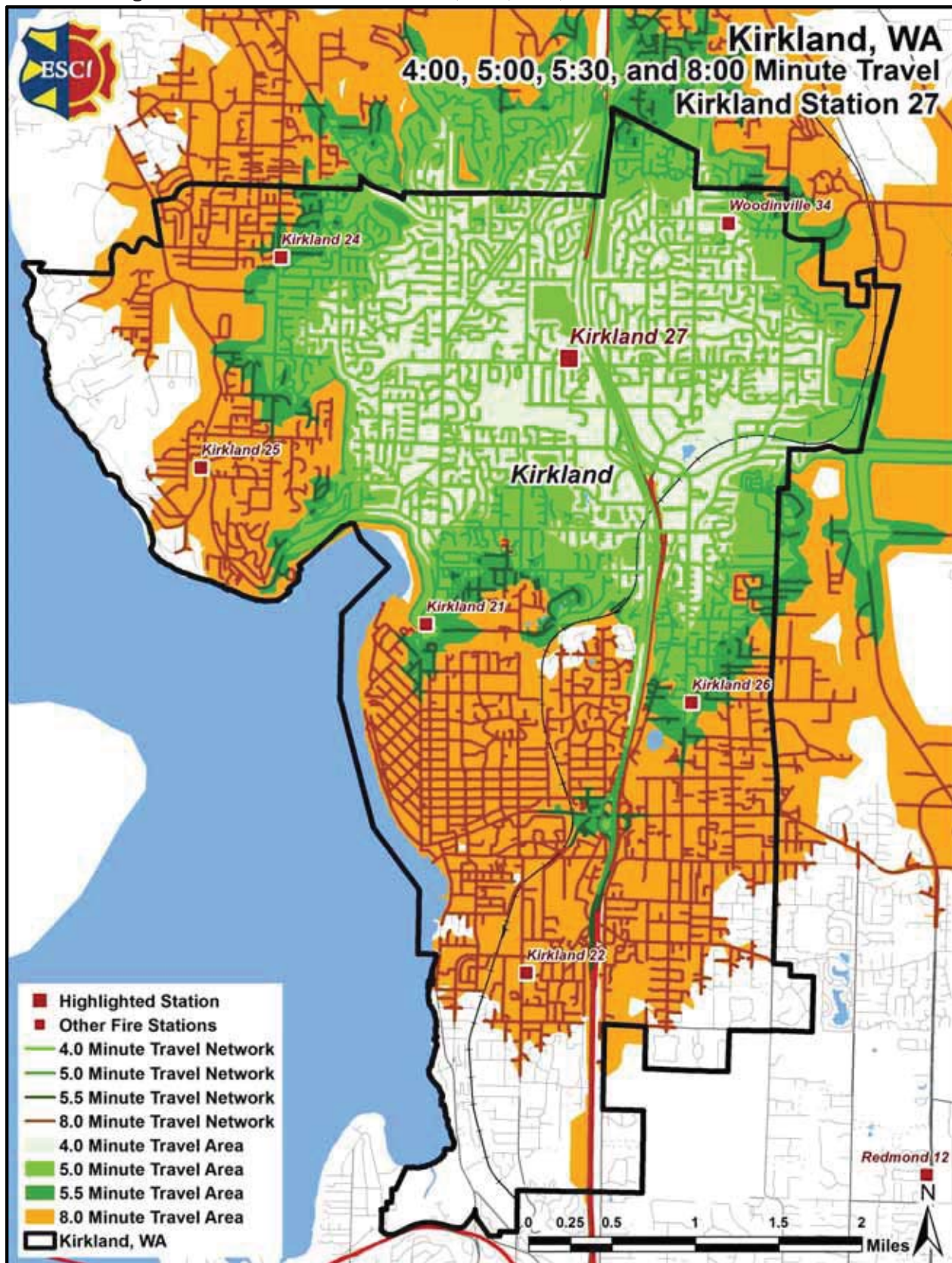


Figure 73: Fire Station No. 27 – 4:00, 5:00, 5:30, and 8:00-Minute Travel Time



Concentration Study

Standard firefighting procedures call for the arrival of the entire initial assignment (sufficient apparatus and personnel to effectively combat a fire based on its level of risk) within a certain amount of time. This is to ensure that enough people and equipment arrive soon enough to be effective in controlling a fire before substantial damage occurs.

Analysis of Response Time to Achieve Full-Effective Response Force

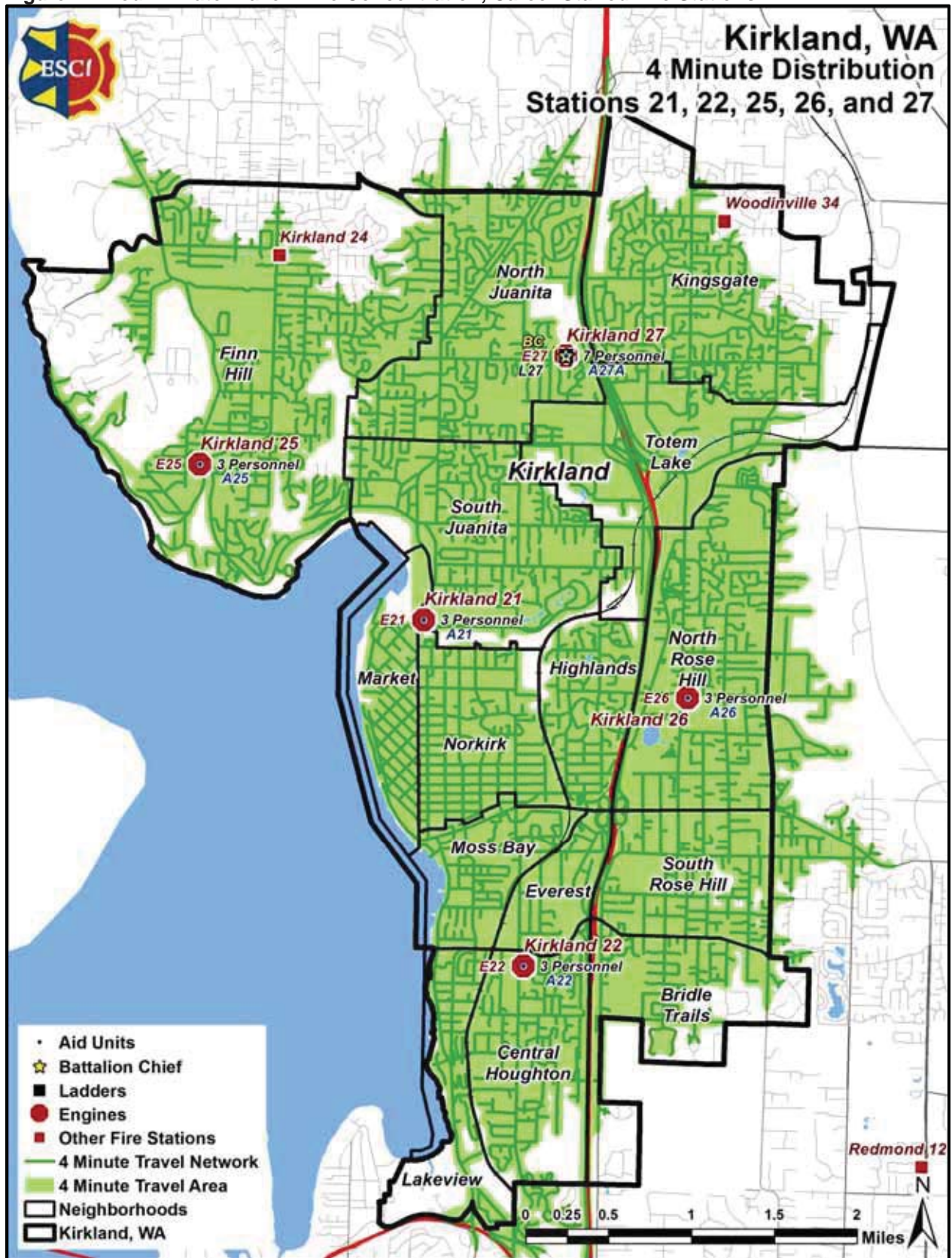
While it is important for KF&BD to reach all portions of the City with a single unit for EMS and many other calls for service as rapidly as possible, fire incidents require more than a single resource. An ERF (effective response force or initial full alarm assignment) involves the concentration and spacing of multiple resources arranged (close enough together) so that an initial group of resources can be assembled on the emergency scene within adopted time frames. An initial ERF is the apparatus, equipment, and personnel which will most likely stop the escalation of the emergency for a given risk.

The National Fire Protection Association (NFPA) has published a national fire service peer standard for all or mostly career staffed fire departments.⁶⁰ Among other things, *NFPA 1710* contains time performance standards for structure fire response as well as emergency medical response. Each will be discussed individually. Though not a legal mandate, *NFPA 1710* does provide a useful benchmark against which to measure a fire department's performance.

Figure 74 demonstrates the areas in the City of Kirkland that can be reached in four minutes of travel time from KF&BD's five career-staffed fire stations.

⁶⁰ *NFPA 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, National Fire Protection Association 2010.

Figure 74: Four-Minute Travel Time Concentration, Career Staffed Fire Stations*

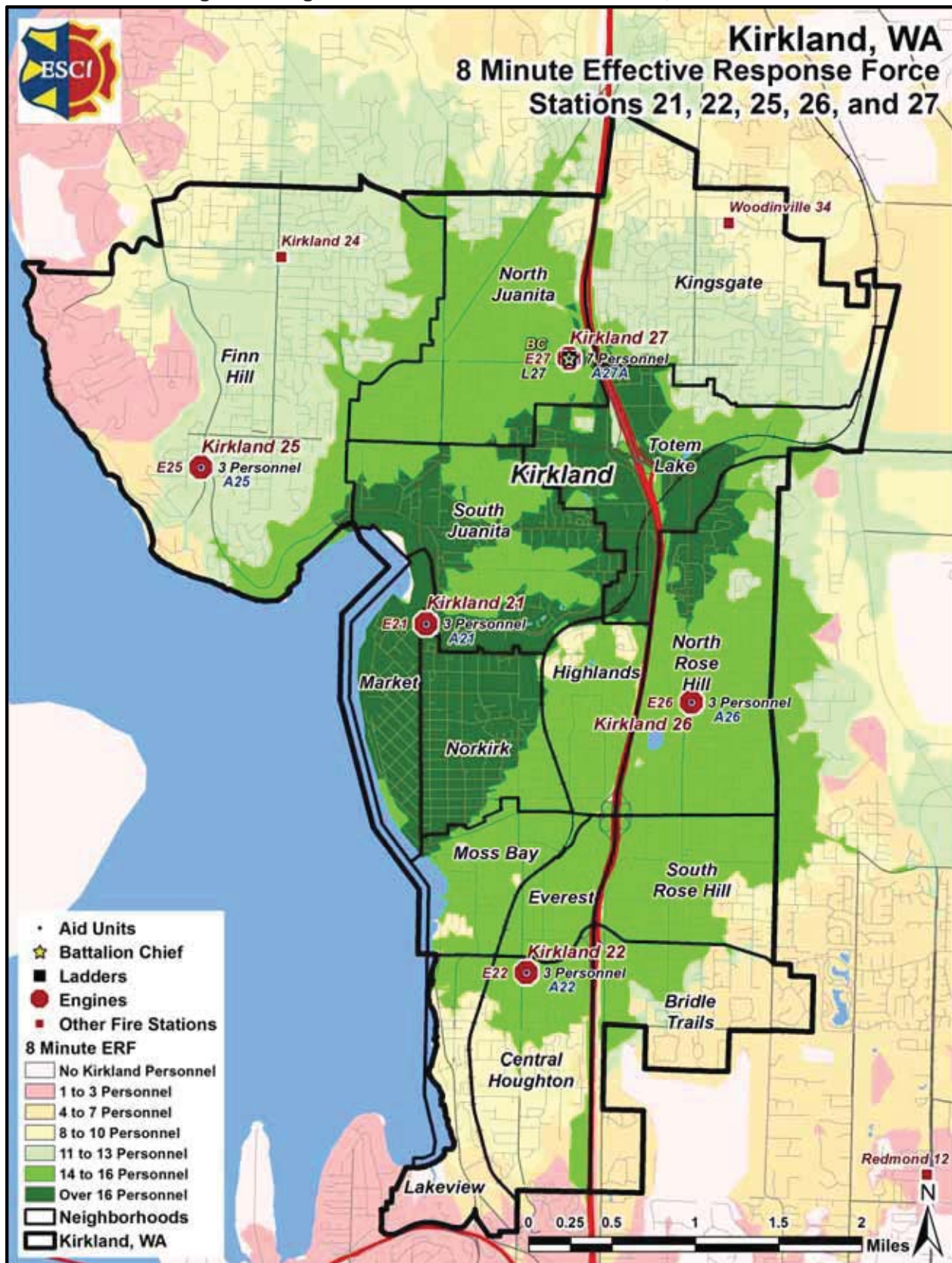


*New map requested.

There are small pockets of area in the City that require longer than four minutes of travel time to reach. The largest area is in the northwest section of Kirkland in the Finn Hill neighborhood, generally in the area surrounding Fire Station No. 24.

Where Figure 74 showed the areas of the City that could be reached from fire stations with a single fire engine in four minutes, structure fires require more than one fire engine and three personnel. A moderate risk incident involves multiple fire apparatus and firefighters. Figure 75 demonstrates the portions of the City of Kirkland and the number of personnel that can reach each given area in eight minutes of travel time or less.

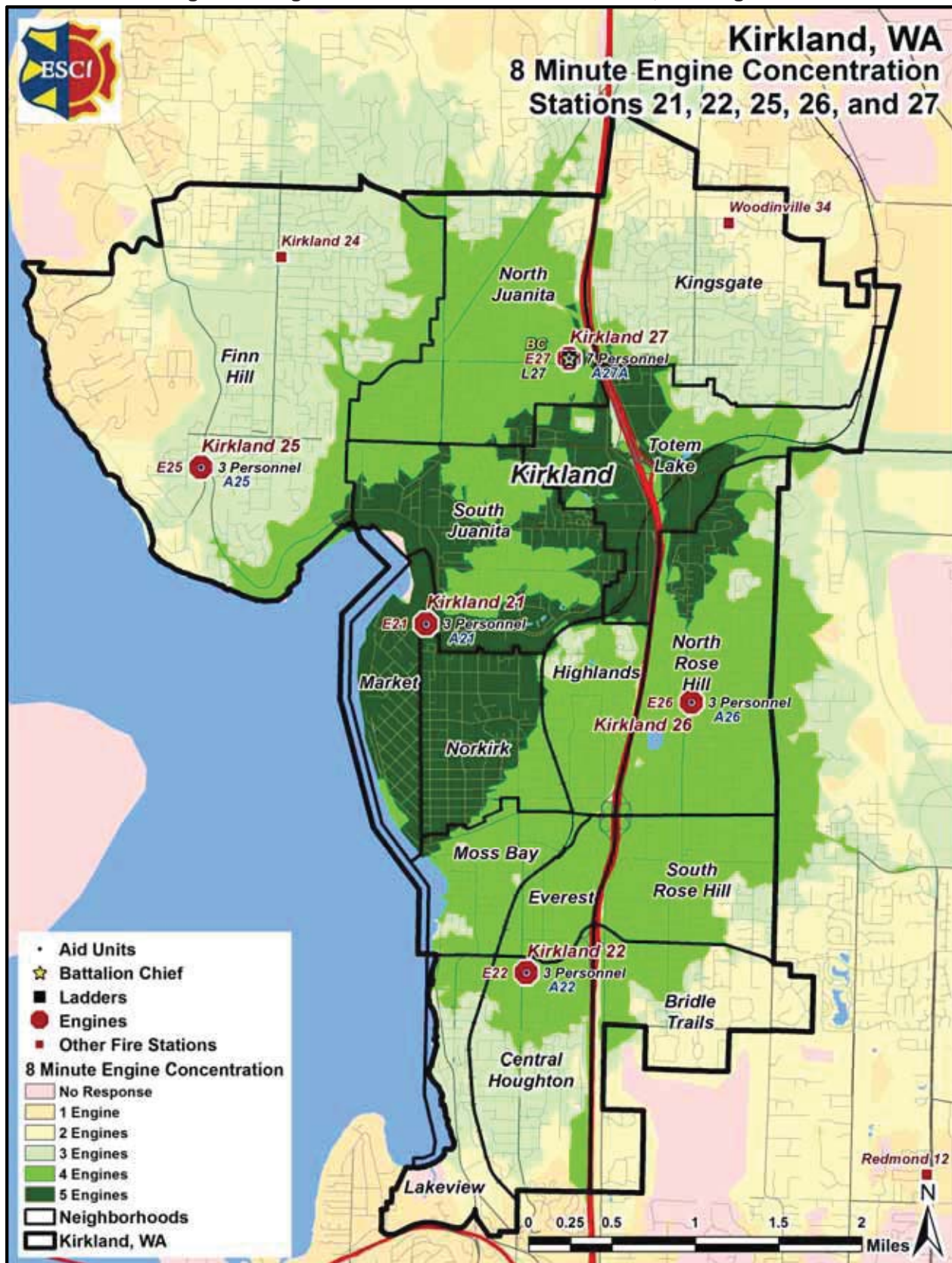
Figure 75: Eight-Minute Travel Time Concentration, Personnel



A minimum of three KF&BD personnel can reach all areas of the City in eight minutes or less travel time. Greater numbers are able to arrive in less travel time in the core area of Kirkland where fire stations are more closely spaced and in the area surrounding Fire Station No. 27 because of a higher minimum on-duty staffing for two companies. The analysis shows that in the Finn Hill and the Kingsgate neighborhoods, KF&BD can assemble ten or fewer personnel in eight minutes or less. This is true for the Central Houghton community as well. The difference being that KF&BD has automatic aid units in closer proximity to respond to Houghton. In the north of the City the travel distance for Northshore, unstaffed Kirkland Fire Station No. 24, and the closing by Woodinville of Fire Station No. 34 limit the options for outside resources to arrive in eight minutes or less.

Figure 76 illustrates the areas of the City where fire engines can reach in eight minutes of travel time.

Figure 76: Eight-Minute Travel Time Concentration, Fire Engines



All areas of the City can be reached by a fire engine within eight minutes of travel time over the existing roadway system. Those areas earlier identified as having a greater concentration of incidents in the core areas of Kirkland can be reached in eight minutes of travel time or less by up to five engines. The amount of overlapping coverage is considered to be appropriate given the number of concurrent calls for service and density of higher risk facilities.

Fire engines and aids unit respond to the majority of incidents in the City. KF&BD has two units that are more specialized and that respond to fire and larger, more complex incidents with a battalion chief and ladder truck. The battalion chief responds as the incident commander and a ladder truck for search, rescue, salvage, and overhaul tasks. Figure 77 illustrates the areas of the City where the KF&BD battalion chief and ladder truck can reach in eight minutes or less of travel time. With the ladder truck located at Fire Station No. 27, its eight-minute travel time coverage reaches to the north outside of the Kirkland city limits.

Figure 77: Eight-Minute Travel Time Concentration, Battalion Chief and Ladder Truck

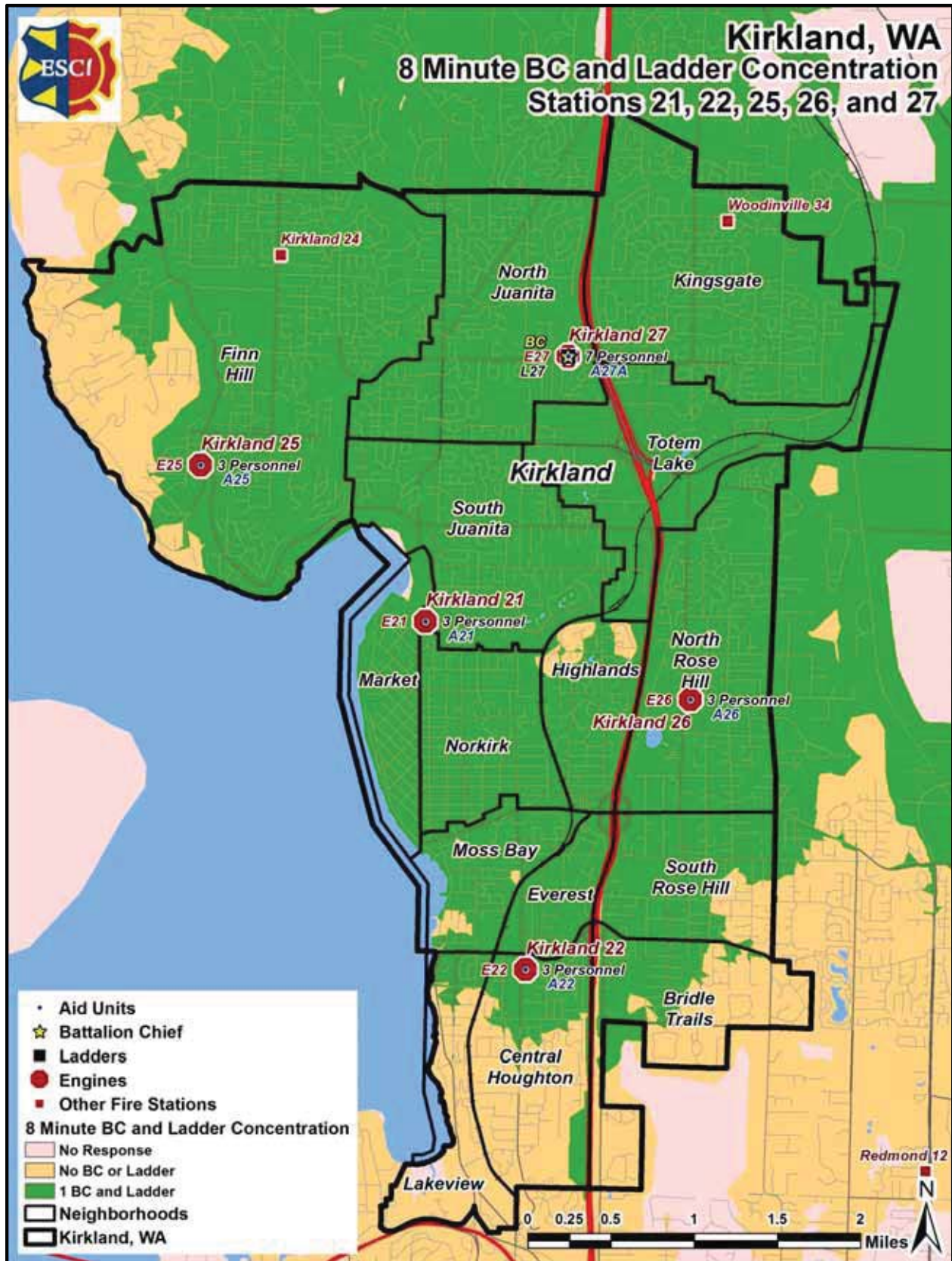
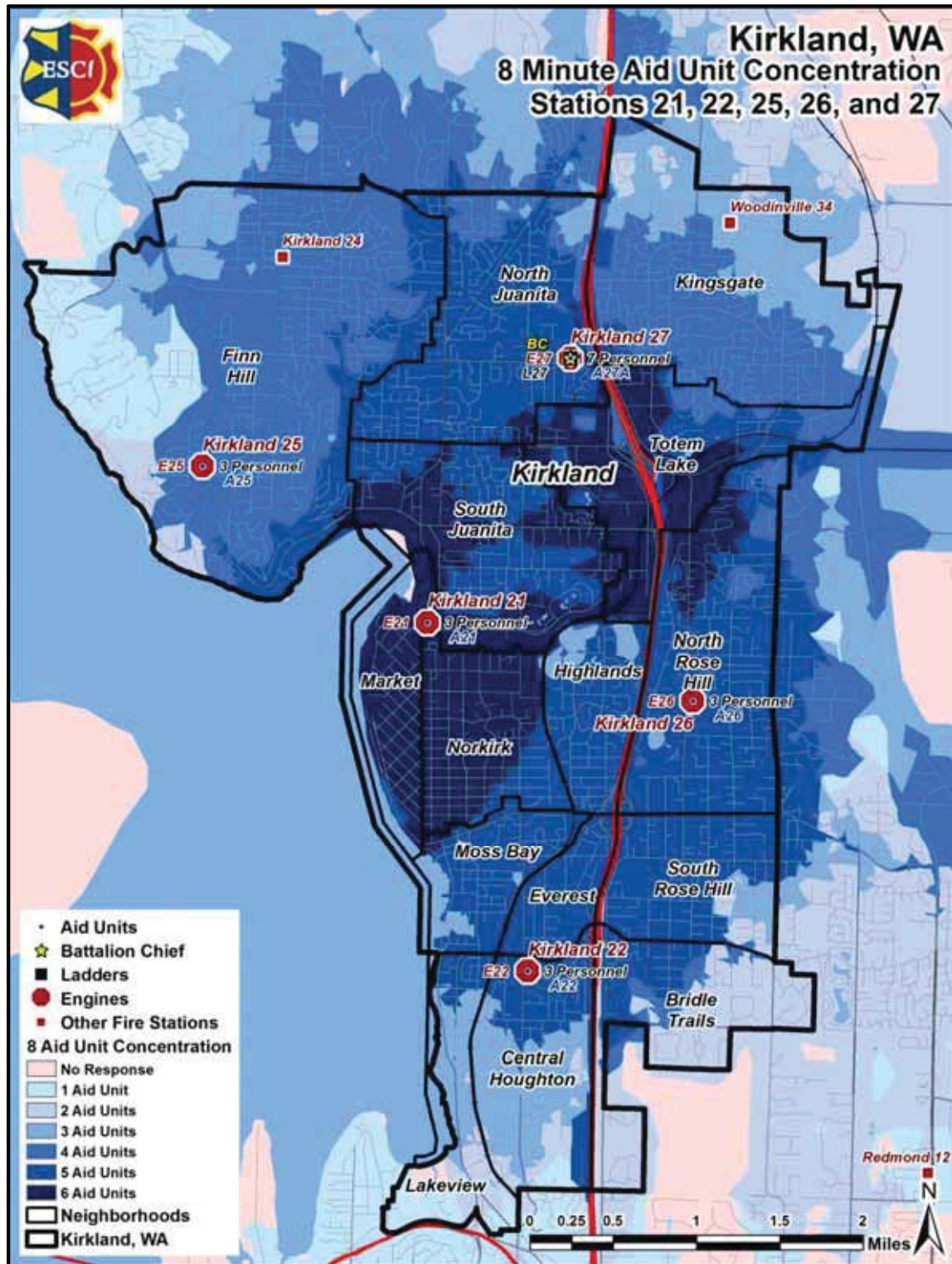


Figure 78 illustrates the areas of the City where a KF&BD aid unit can reach in eight minutes or less of travel time.

Figure 78: Eight Minute Travel Time Concentration, Aid Unit

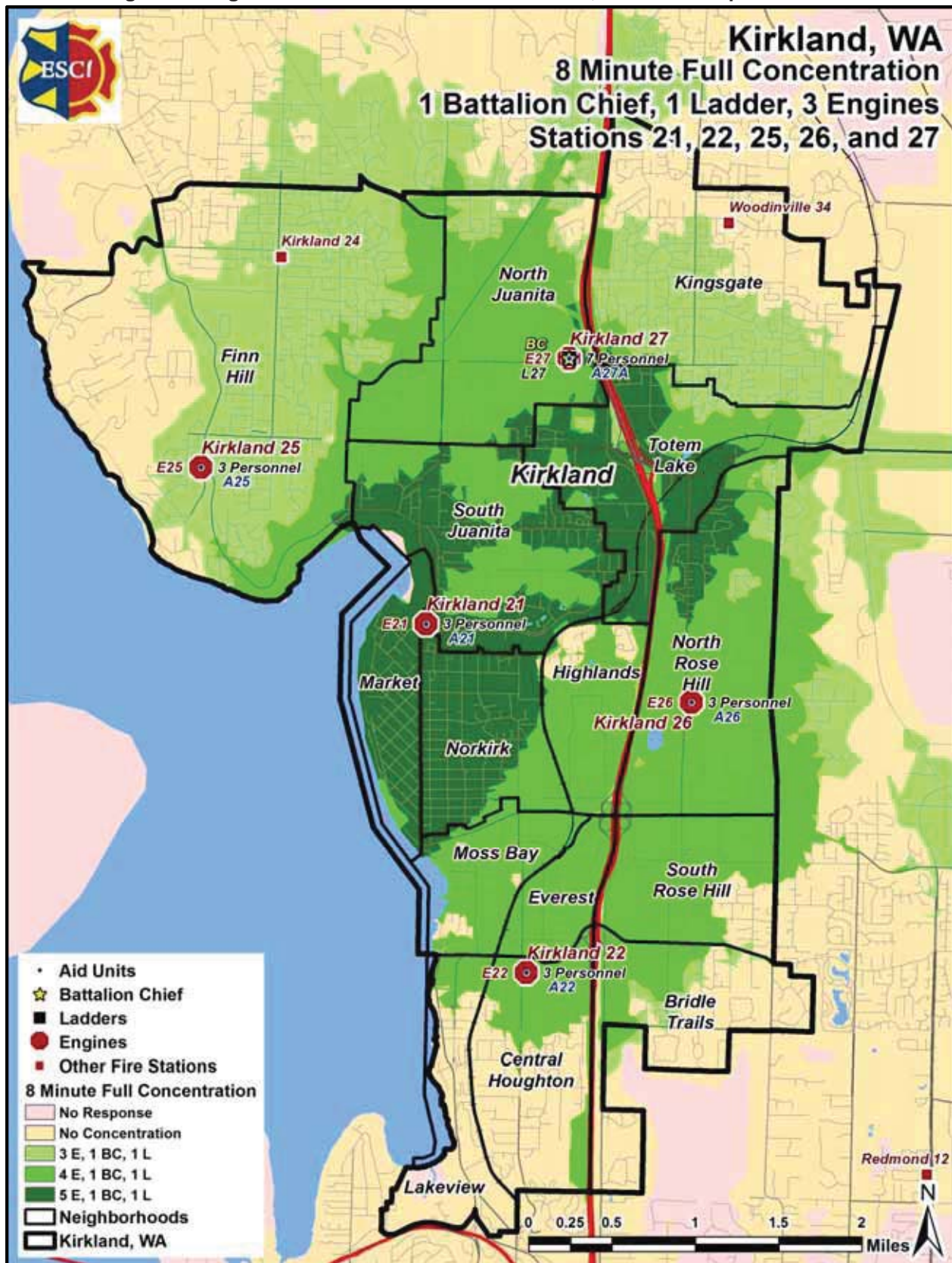


Virtually all of the City can be reached by an aid unit in eight minutes of travel time or less.⁶¹ An eight minute travel time is used to illustrate overlapping coverage. Those areas of the City identified earlier with the greatest concentration of EMS incidents have the largest overlapping aid unit coverage. Coverage overlap is less of a concern than coverage gaps and provides the needed response units for back to back calls.

The following map displays the eight-minute travel time concentration for an ERF (effective response force). An ERF for KF&BD involves one battalion chief, one ladder truck, and three engines in eight minutes or less travel time.

⁶¹ Response to all of the Yarrow Bay Wetlands in Lakeview is accessible in eight minutes of travel time.

Figure 79: Eight-Minute Travel Time Concentration, Effective Response Force



Fire Station (Siting) Relocation

KF&BD has adopted total response time objectives of:

- Five (5) minutes and thirty (30) seconds for the first fire engine to arrive when responding to a fire suppression incident (90) percent of the time
- Five (5) minutes for the first emergency medical unit with at least two (2) Emergency Medical Technicians to an emergency medical incident (90) percent of the time

Included in the total response time is the call processing time interval for the communications center of sixty (60) seconds and a turnout time of sixty (60) seconds. ESCI used four minutes of travel time to gauge which geographic areas of the City can be reached. Figure 74 shows the areas of the City that could be reached from fire stations with a single fire engine in four minutes, structure fires require more than one fire engine and three personnel. Most of Kirkland can be reached by an engine or aid unit in four minutes of travel time or less. The only area with longer travel times than four minutes are located in the area served by Fire Station Nos. 24 and 25.

KF&BD's fire stations are generally in the best physical locations to serve the entire City. All of the geographic areas of the City can be reached from one or more of the fire stations by an aid unit or engine in eight minutes travel time or less with a minimum of three KF&BD personnel. Fire engines and aids unit respond to the majority of incidents in the City with more complex incidents including a battalion chief and ladder truck. Some sections in the south and northwest of Kirkland are outside of eight minutes travel time for the battalion chief and ladder truck. A moderate risk incident involves multiple fire apparatus and firefighters. Figure 75 demonstrates the portions of the City of Kirkland and the number of personnel that can reach each given area in eight minutes of travel time or less.

There are options that the KF&BD can use to improve coverage to the northwest (Finn Hill) area of the City:

- Combine Fire Station Nos. 24 and 25 in a new location
- An additional (new) fire station
- Staff Fire Station No. 24 with career personnel
- Establish and maintain a shared facility with Northshore FD

Combining Fire Station Nos. 24 and 25 at a better location could result in, shorter travel time in Finn Hill and greater geographic coverage in the Finn Hill neighborhood. This would not resolve the need for a fire or EMS unit and additional personnel resources in this area of the City. There is no increase in the number of personnel available for incidents that require more than a

single unit. Either adding a new fire station or staffing Fire Station No. 24 with full time personnel is considered to be cost prohibitive. Annual personnel services cost of one full-time staffed fire engine with three firefighter/EMTs is approximately \$2.5 million. Above the expenditures for personnel services are capital apparatus, administrative and support, training, and supply costs.

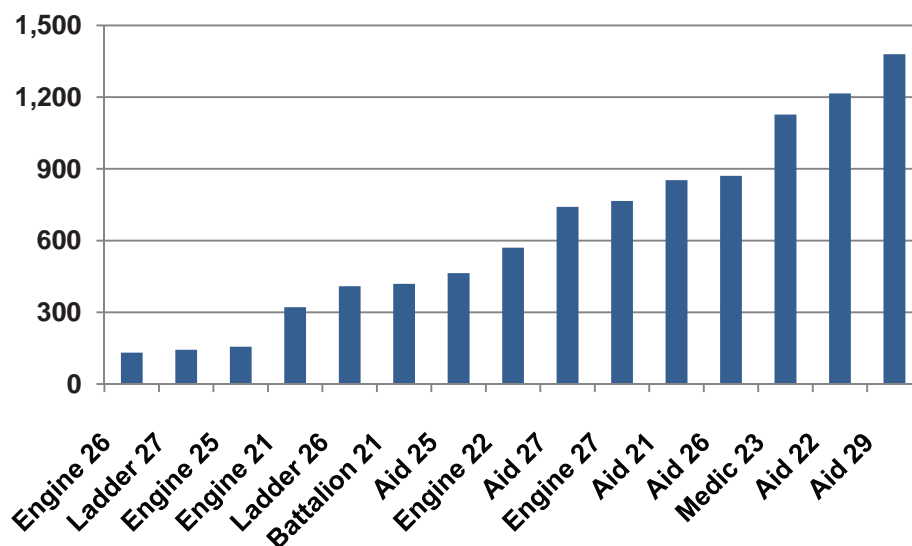
A shared or jointly staffed new facility in a location that would serve Northshore and Kirkland has benefits and cost avoidance for both fire departments. It would:

- Reduce travel time to an underserved area of Kirkland and Northshore
- Add an apparatus to an underserved areas of the City
- Add an apparatus for response to incidents requiring multiple units
- Make the total number of personnel equal to KF&BD's full alarm assignment staffing
- Cost much less than constructing a fire station independently
- Improve service demand coverage

Reliability Study

The workload of emergency apparatus can be a factor that affects overall service delivery. In the following figures ESCI examines various aspects of emergency workload for KF&BD.

Figure 80: Number of Responses by Apparatus, September 2010 – August 2011



Aid 29 had the highest number of incidents for the year studied with 1,380 responses for an average daily calls for service of 3.78. The average daily number of responses for KF&BD apparatus was 1.56, with a median of 1.27.

While the number of responses expresses apparatus numerically, it is one dimensional. Utilization is used to measure unit productivity, comparing the available hours of a resource (engine, aid unit, or ladder) with the amount of time a unit is actively involved with response activity. Measuring unit hour utilization (UHU) determines the percentage of unit hours actually consumed in productivity compared with the total available hours. Figure 81 displays the total hours and unit hour utilization (UHU) rate for KF&BD apparatus.

Figure 81: UHU (Unit Hour Utilization), September 2010 – August 2011

Apparatus	Hours	Count	UHU
Air Unit 21	36:49:36	18	0.42%
Aid 24	53:53:06	97	0.62%
Engine 26	56:58:44	131	0.65%
Ladder 27	47:29:26	143	0.54%
Engine 25	74:17:30	156	0.85%
Engine 21	148:28:57	321	1.70%
Ladder 26	158:08:42	409	1.81%
Battalion 21	158:25:58	419	1.81%
Aid 25	337:43:08	464	3.86%
Engine 22	231:16:18	570	2.64%
Aid 27	437:27:44	741	4.99%
Engine 27	293:39:34	766	3.35%
Aid 21	608:16:23	853	6.94%
Aid 26	507:19:28	871	5.79%
Medic 23	712:27:46	1,127	8.13%
Aid 22	753:23:25	1,216	8.60%
Aid 29	817:44:48	1,380	9.34%
Total	5,992:47:47	10,678	68.41%

Although Aid 21's call count is approximately 62 percent of Aid 29's, Aid 21's UHU is 74 percent of Aid 29's. The larger UHU indicates that on an average incident Aid 21 is committed longer per call. Aid 21's longer commitment per call appears to be related to a longer transport distance. The more extended the time on an incident the less time that Aid 21 is available for another call for service and the greater the likelihood of another apparatus having to respond.

In the next figure, ESCI summarized workload by the number of apparatus per incident.

Figure 82: Apparatus Commitment per Incident, September 2010 – August 2011

Number of Apparatus	Percentage of Calls
1	69.81%
2	22.40%
3	4.71%
4	1.12%
5	1.09%
6	0.38%
7	0.18%
8	0.03%
9	0.05%
10	0.11%
11	0.05%
12	0.01%
14	0.01%
15	0.01%
18	0.01%
19	0.01%

While the majority of incidents during the one-year study period required only one apparatus (69.81 percent), 30.19 percent of responses required two or more. Approximately 3.08 percent of the time, four or more units were engaged on a single incident. There were 17 times between September 2010 and August 2011 where ten or more emergency response units were committed to a single incident. Incidents where more than one unit is required reduce available apparatus and personnel for other calls for service. Additional apparatus often travel a greater distance and leave more of the City under protected.

Call Concurrency

Another way to look at resource workload is to examine the periods that multiple calls happen within the same period of time.

Figure 83: Concurrent Calls, September 2010 – August 2011

Call Count	Percentage of Calls
1	34.86%
2	31.34%
3	19.42%
4	8.69%
5	3.48%
6	1.50%
7	0.46%
8	0.11%
9	0.01%
10	0.04%
11	0.03%
12	0.01%
14	0.03%
23	0.01%

Incidents occurred singularly 34.86 percent of the time between September 2010 and August 2011. Nearly two-thirds (65.14 percent) of the time two or more incidents were happening simultaneously; 33.81 percent of the time, three or more. When two calls for service occur simultaneously resources are a minimum of six personnel below the number to meet KF&BD's identified 19 for an initial full alarm assignment.

Failure rate is the percentage of calls for which a unit/station is unavailable due to handling an existing call where it otherwise would have been dispatched as the primary unit. When a fire or EMS unit is unavailable to respond in its first due area there is a domino effect, in that outside resources are pulled in for coverage, thus leaving their own areas vulnerable to higher failure rates. ESCI attempted to determine the number of actual or estimated failure rates for KF&BD fire stations and individual companies from the data provided. Data was inadequate to conduct an analysis. A failure rate over ten percent will cause performance objectives at the 90th percentile to be missed, even if resource distribution keeps travel time low. ESCI recommends that failure rate by fire station and apparatus be tracked.

Response Performance

The ultimate goal of any emergency service delivery system is to provide sufficient resources (personnel, apparatus, and equipment) to the scene of an emergency in time to take effective action to minimize the impacts of the emergency. This need applies to fires, medical emergencies, and any other emergency situation to which the fire department responds.

System Reflex Time Performance

Throughout this document, certain descriptive statistical measures are used which may not be familiar to all readers. In an effort to reduce confusion or the drawing of inaccurate conclusions, ESCI provides a brief explanation of these terms below. The measures most often used which require clarification are average and percentile.

Average

The average measure is a commonly used descriptive statistic, also called the mean of a data set. It is a measure to describe the central tendency, or the center of a data set (mean). The average is the sum of all the data points in a set, divided by the total number of data points. In this measurement, each data point is counted and the value of each data point has an impact on the overall performance. Averages should be viewed with a certain amount of caution because the average measure can be skewed if an unusual data point, known as an outlier, is present within the data set. Depending on the sample size of the data set, the skewness can be either very large or very small.

Percentile

With the average measure, it is recognized that some data points are below the average and some are above the average. The same is true for a median measure which simply arranges the data set in order and finds the value in which 50 percent of the data points are below the median and the other half are above the median value. This is also called the 50th percentile.

When you deal with percentages, the actual value of the individual data does not have the same impact as it did in the average. The reason for this is that the fractile is nothing more than the ranking of the data set. The 90th percentile means that 10 percent of the data is greater than the value stated and all other data is at or below this level.

Higher fractile measurements are normally used for performance objectives and performance measurement because they show that the large majority of the data set has achieved a

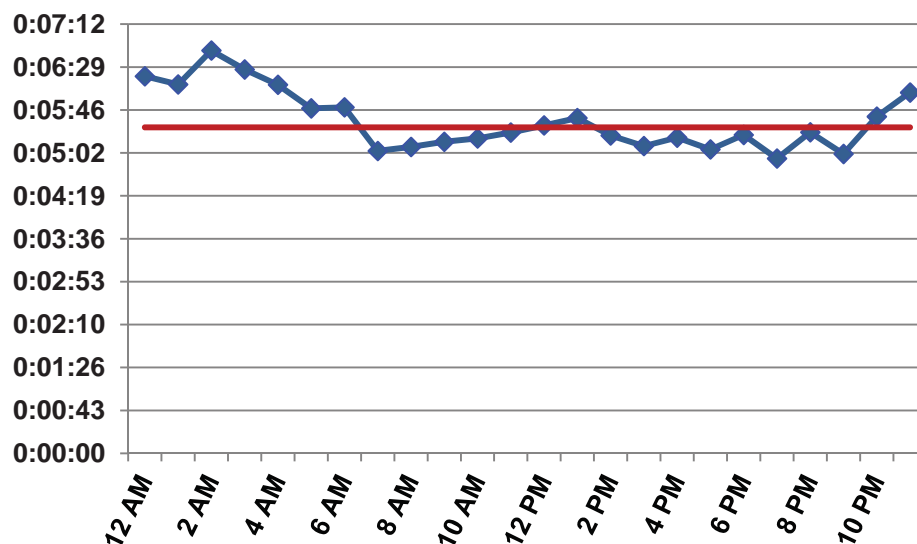
particular level of performance. This can be compared to the desired performance objective to determine the degree of success in achieving the goal.

ESCI recommends that KF&BD use fractile for benchmarking and measuring response components.

Current Response Time Performance

The following series of charts displays emergency response time performance for KF&BD from September 2010 through August 2011. Figure 84 illustrates the average response time frequency for KF&BD for the one-year period.

Figure 84: Average Response Time Frequency, September 2010 – August 2011



The most frequently recorded response time was within the 5-minute range, while the average response time was 5 minutes 28 seconds (05:28).

In the next figure, response time is summarized by incident type. Average and percentile response times are displayed (Figure 85).

Figure 85: Response Time Frequency by Incident Type, September 2010 – August 2011

Incident Type	Average	90 th Percentile
Fire	0:07:40	0:11:46
Medical	0:05:18	0:08:29
Other	0:05:42	0:08:32
All	0:05:28	0:08:42

Average and 90th percentile response times in Figure 85 are for the arrival of the first unit. For fire and some EMS calls for service there is a need to have more than one unit.

Non-Emergency and Automatic Alarm Response

Included in the more than 7,000 incidents to which KF&BD annually responds are a large number of events of a non-emergency nature. Many are medical related responses while others involve automatic alarm systems that falsely report an emergency. Still others fall into a general category of incidents that, while requiring fire department assistance, are not emergent situations or are simply mistaken alarms.

In many cases it is difficult to determine whether an incident is an actual emergency event until responders arrive at the scene. In others, call screening and prioritization by dispatchers can often determine the severity of a situation, from which pre-defined response protocols dictate the number and type of response resources that will respond. The challenge becomes one of balancing the need to send sufficient resources against the importance of limiting unnecessary responses.

Fire departments have historically adopted a practice of dispatching multiple units to a call in case the event should prove to be of a serious nature. The approach is appropriate in many situations, especially those of a high-risk nature. However, appropriately limiting the number of responding units, as well as the speed with which they respond, should also be considered. Fewer responding vehicles limits costs, reduces safety risks to firefighters and the public associated with emergency vehicle response, and keeps valuable response resources available for other incidents. An alternative is to have the first fire unit respond with lights and siren and all other fire apparatus travel with the traffic flow. Upon arrival of the first unit, it is then determined if additional units are needed or if they can be released back to quarters.

KF&BD adopted response protocols are based on risk and includes a policy of a single response unit for automatic alarms that is facility specific by business type.

Emergency Medical Response Deployment

Some medical emergencies necessitate the response of a full complement of equipment and personnel. The most visible example is a cardiac arrest situation, which requires three or more responders, at a minimum, to effectively manage.

However, many other medical calls can be handled adequately by only one or two responders. The highest percentage of calls in this category is those that occur at adult foster care and nursing facilities, which are often non-emergent assistance requests. Rather than sending a fire engine and full complement of firefighters to these calls, a limited response may be in order. A number of fire departments have adopted a deployment strategy for EMS incidents that consists of a single paramedic, driving a sport utility vehicle, dispatched to lower priority calls.

The key to the success of this methodology is effective call screening and prioritization by 9-1-1 operators that are trained in MPD (Medical Priority Dispatch) protocols. Properly applied, these procedures have proven to identify those calls that warrant a higher level of EMS response as contrasted to those that may be adequately managed by fewer responders.

Automatic Fire Alarm Response Deployment

Automatic fire alarms are commonly found not only in high risk commercial buildings, but in private homes, small commercial occupancies and construction sites. The alarms are activated by smoke or heat detection devices and offer the important advantage of early notification of a fire's occurrence. Fire alarms are also prone to malfunction and false activation. The problem is particularly common at construction sites where conditions are changing continuously.

Most fire departments experience a high percentage of false automatic alarm activations and the need to respond to them. Deployment decisions are made based on various factors including the type of building use and level of risk exposure, particularly to loss of life. While historic practices have been to dispatch a complete fire response assignment to alarms in preparation for a worst-case scenario, current trends are toward moderation of the deployment practices.

Criteria can be established that identifies risk levels and related factors with which response decisions are made. The approach may be to send a full complement of units but limit which, if any, travel with lights and sirens (code 3). Alternatively, only a single unit may be assigned to assess a situation. In some instances, it may be appropriate to simply have a single responder go to the address to evaluate the conditions. Recently, a fire department in Nevada made the decision to withhold response to automatic fire alarms entirely absent "visual verification" of a fire by someone at the location. The practice has been expectedly controversial and is offered only as an example of one approach. Another fire department has recently implemented a telephone verification procedure. The practice requires that fire alarm monitoring personnel attempt verification of an emergency by telephone within 90 seconds of receipt of the alarm and

prior to relaying the call to the 9-1-1 operator. If verification cannot be obtained, a normal response is dispatched.

Other Incident Types

In addition to the above examples, a host of other non-emergency situations are presented to fire departments on a daily basis. Although these are minor in nature, they often warrant some kind of action, and may include odor complaints, pet related problems, smoke detector issues, or back yard burning complaints, to name but a few. Like automatic alarm and EMS responses, practical decision-making needs to be applied regarding how and if the fire department is going to respond to these events. Appropriate protocols can be developed regarding many of the call types, and the responders themselves should be empowered to make deployment decisions when warranted.

In conjunction with call screening and prioritization by dispatchers and modified response for automatic alarms is development and adoption of an alarm ordinance. In an effort to reduce false alarms, the City of Kirkland Police Department developed the *False Alarm Reduction Program*. To operate an alarm system on any premise within the City of Kirkland individuals must register the system. This applies to both monitored and non-monitored security systems. Application information indicates that permit information includes fire alarms while the municipal ordinance and deterrents are applicable only to police response to security alarms. An option for the City is to expand the ordinance to include response to false, malicious, or repeat fire alarms. ESCI recommends that Chapter 21.35A of the Kirkland Municipal Code be expanded to include response by KF&BD to repeat false or malicious fire alarms.

Future Service Demand

ESCI completed a needs assessment of the KF&BD based on future system demand projections as developed through an analysis of population growth projections, service demand projections, and a summary community risk analysis. The process of forecasting growth within the KF&BD service area begins with an overview of current demographics. Data from the U.S. Census Bureau, City and County comprehensive plans, County and the Puget Sound Regional Council growth allocations were used in this section of the study.

KF&BD emergency services while not meeting its stated response time objectives is doing a good job of serving the fire and EMS needs of the City. The information that follows is beneficial in understanding where changes can be made to bring the fire department closer to their response goals.

People and Households

At the time of incorporation in 1905, the City of Kirkland's population was approximately 530.⁶² A chronological history of the City's population for 100 years is shown in Figure 86.

Figure 86: City of Kirkland Population History, 1900 – 2000

Census Year	Population	Percent of Change
1900	264	—
1910	532	101.52%
1920	1,354	154.51%
1930	1,714	26.59%
1940	2,084	21.59%
1950	5,718	174.38%
1960	8,541	49.37%
1970	15,249	78.54%
1980	18,779	23.15%
1990	40,052	113.28%
2000	45,054	12.49%

The City of Kirkland consolidated with the neighboring town of Houghton on July 31, 1968, to form one city. Kirkland annexed the neighborhood of Totem Lake in 1974 and the neighborhoods of South Juanita, North Rose Hill, and South Rose Hill in 1988. The annexation in 2011 caused a dramatic population increase to an estimated 80,505, up from 49,620 in 2010. The most recent ten-year history of Kirkland's population from 2001 and 2011 is shown in Figure 87.⁶³

Figure 87: City of Kirkland Population History (Table), 2001 – 2011

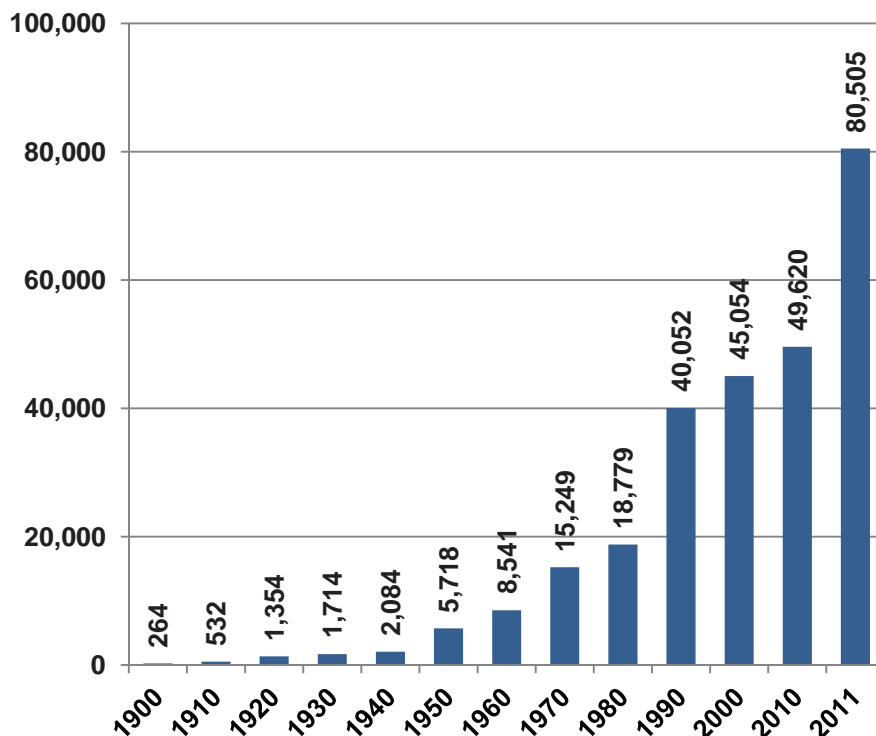
Year	Population	Percent of Change
2001	45,770	—
2002	45,790	0.04%
2003	45,630	-0.35%
2004	45,800	0.37%
2005	45,740	-0.13%
2006	47,180	3.15%
2007	47,890	1.50%
2008	48,410	1.09%
2009	49,010	1.24%
2010	49,620	1.24%
2011	80,505	62.24%

⁶² Ibid.

⁶³ Ibid.

Figure 88 is the entire population history for the City of Kirkland from incorporation in 1900 to 2011.

Figure 88: City of Kirkland Population History (Graphic), 2001 – 2011



Dramatic increases in population coincide with consolidations and annexations. Consolidations and annexations include:

- In 1968 Kirkland consolidated with the town of Houghton (July 31, 1968)
- Annexation of the neighborhood of Totem Lake in 1974
- Annexation of the neighborhoods of South Juanita, North Rose Hill, and South Rose Hill in 1988
- Annexation of the Juanita, Finn Hill, and Kingsgate neighborhoods in 2011

Prior to the annexation of 2011, KF&BD was already providing fire and EMS to King County FD #41. While the annexation added three areas to the City of Kirkland, only the properties from Woodinville (Fire District #36) and Redmond (Fire District #34) involved an increase in service area. Figure 89 gives a historical perspective of the population of the City and three areas that were annexed in 2011.

Figure 89: KF&BD Service Area Population, 2008 – 2011⁶⁴

Year	2008	2009	2010	2011
Kirkland	48,410	49,010	48,787	49,020
Fire District #41	25,309	25,622	25,506	25,585
Fire District #36 (Woodinville)	0	0	0	5,835
Fire District #34 (Redmond)	0	0	0	397
Population Served	73,719	74,632	74,293	80,837

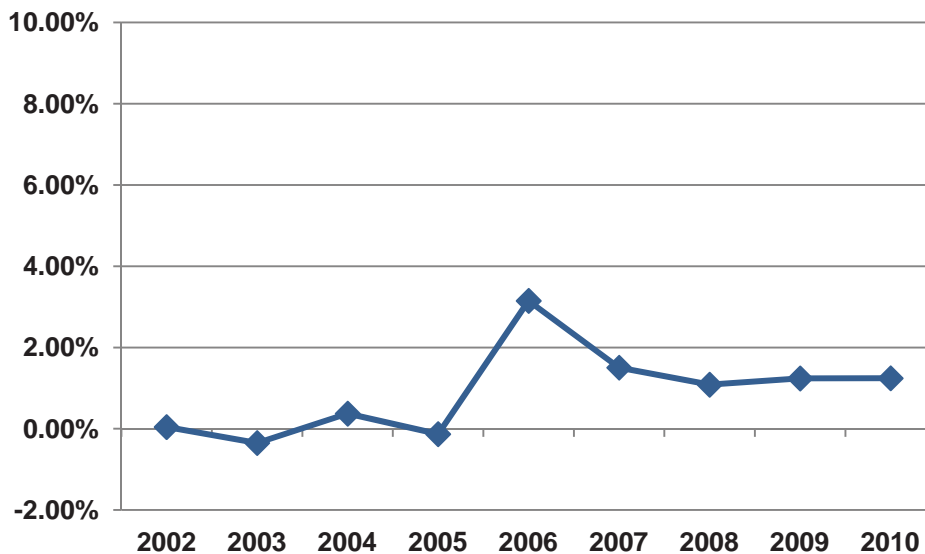
The next table shows the total population in 2010 and 2011 of the areas annexed to Kirkland in 2011.

Figure 90: Annexation Area Population, 2010 – 2011

Date	Population
As of April 1, 2010	31,718
As of April 1, 2011	31,816

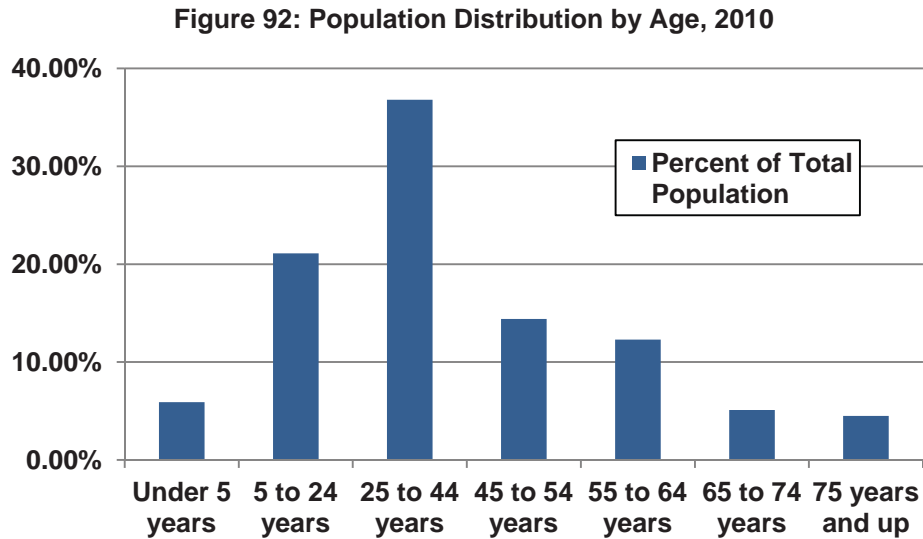
Between 2001 and 2011 Kirkland's population has increased over 75 percent; 62 percent of the population increase occurred in 2011. A visual presentation of the annual percent of population change from 2001 to 2010 is shown in Figure 91.

Figure 91: Annual Percent of Population Change, 2002 – 2010



⁶⁴ 2010 data as of April 1, 2010, Washington State Office of Financial Management. Population data in 2008 and 2009 is an estimate based on Kirkland population trends for the same years and 2010 and King County FD #41 population estimate of 25,506.

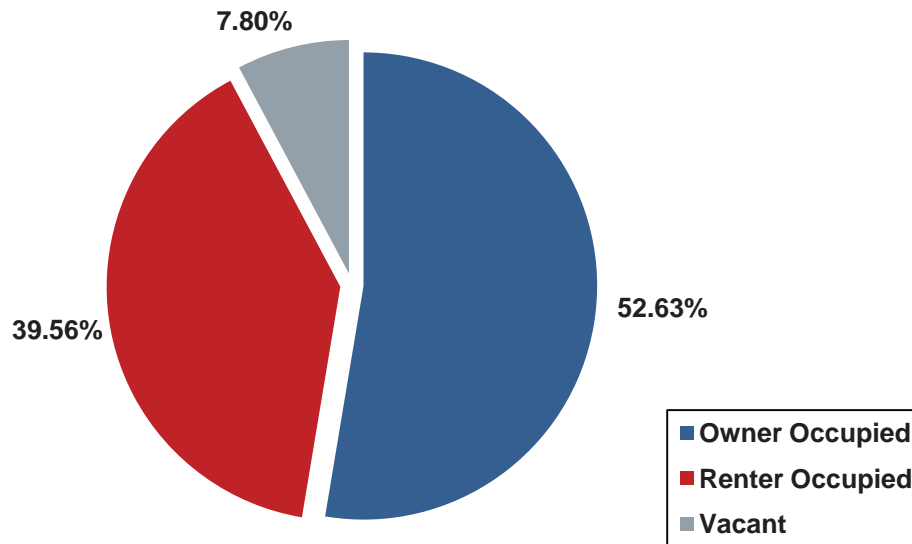
The following chart (Figure 92) distributes the population into age groups based on the census information for 2010.



Approximately 9.6 percent of the population is 65 years of age or older and 5.9 percent of the population is under 5 years of age, placing a total of 15.5 percent of Kirkland's population in the target age groups that pose the highest risk for fatalities in residential fire incidents.

The composition of housing is one indicator of levels of service demand. Areas with higher housing vacancies and rental property (outside of seasonal resort and higher educational institutional areas) correlate with higher demands upon the fire department and emergency services in general. The following chart details housing by occupancy for Kirkland.

Figure 93: Housing Occupancy Status, 2010



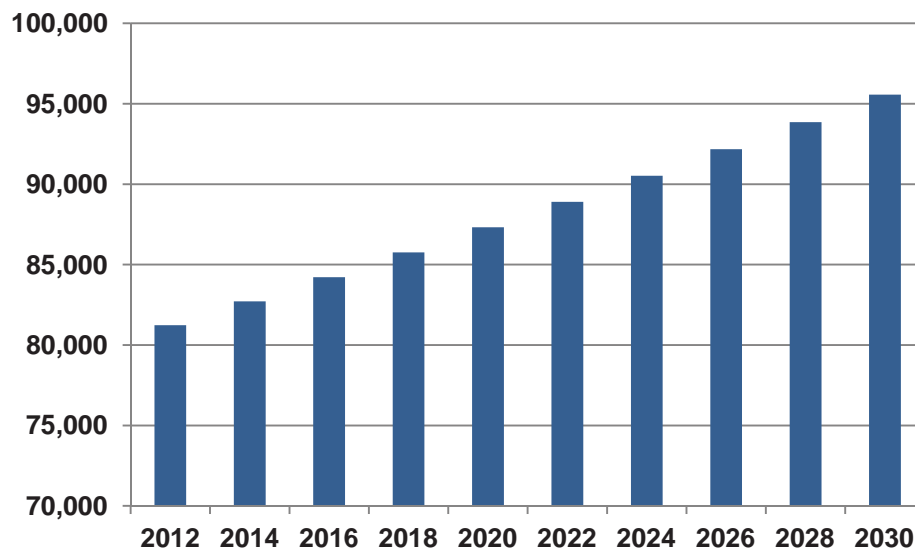
Approximately 53 percent of the housing units in Kirkland are owner occupied. By comparison, 55 percent of King County and 58 percent of Washington homes are owner occupied.

Population Growth Projections

An interpretation of census and community development data was used to develop a population forecast for the City of Kirkland. As indicated earlier, the population of Kirkland increased significantly in 2011. Information received from local planning officials indicates that they anticipate additional growth, albeit at a much slower rate than previously experienced.

ESCI typically develops a forecast based on several years of census experience. In the following figure, ESCI uses historical Census data for 2000 through 2010 for Kirkland to create a mathematical forecast from 2010 through the year 2030. The historical growth was applied to Kirkland's total population following the annexation that occurred in 2011.

Figure 94: Kirkland Forecast Population, 2012 – 2030



The mathematical projection shows Kirkland and KF&BD's service area population growing to 95,563 people in 2030. This is a nearly 19 percent increase in the population of Kirkland, which represents an annual increase of 0.91 percent. While census-based population projections provide a mathematically based estimate of future population based on historical data, they often fail to account for expected trends in the growth rate of an area. These changes often result from redevelopment, annexation, changes in employment capacity, or other socio-economic factors not reviewed in a census-based projection.

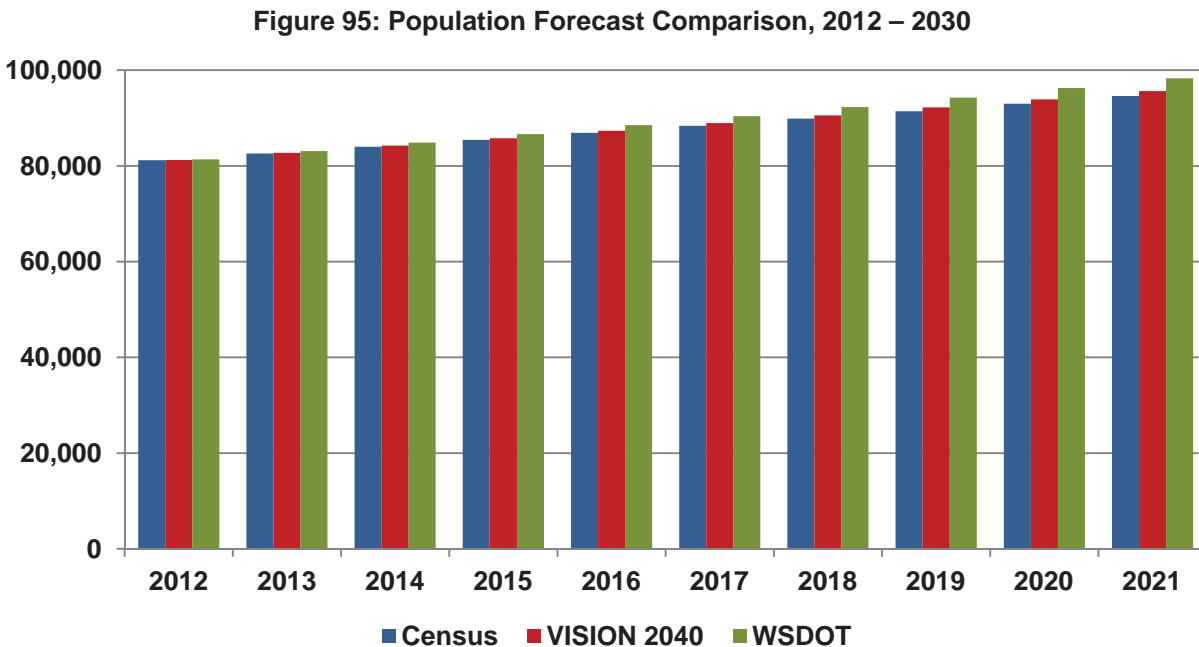
The 2003 Kirkland Community Profile Projected Target Population in 2030 at 62,086⁶⁵ and the City of Kirkland 2011 – 2012 Final Budget Document lists a population of 86,000 in 2020.⁶⁶ Kirkland has surpassed the target population and is nearly at the forecast population in the City's current year budget document. These forecasts of population were based on assumptions that have changed since the annexation of June 2011.

The Washington Department of Transportation (WSDOT) forecasts population growth for King County of 25.56 percent between 2000 and 2030, an average annual population growth of 0.85 percent. King County's annual population forecast by WSDOT of 0.85 nearly mirrors Kirkland's ten-year (2000 – 2010) annual population growth of 0.91. Estimates of population growth for King County based on VISION 2040 for the 40-year planning period is 42.3 percent; an annual rate of 1.06 percent.

⁶⁵ Population forecast is based on the 2022 Growth Management Planning Council housing targets.

⁶⁶ Ibid.

Figure 95 compares the Washington Department of Transportation population projection for King County, the ten-year historical Kirkland population growth, and the annual average growth from VISION 2040 from 2012 to 2030.⁶⁷



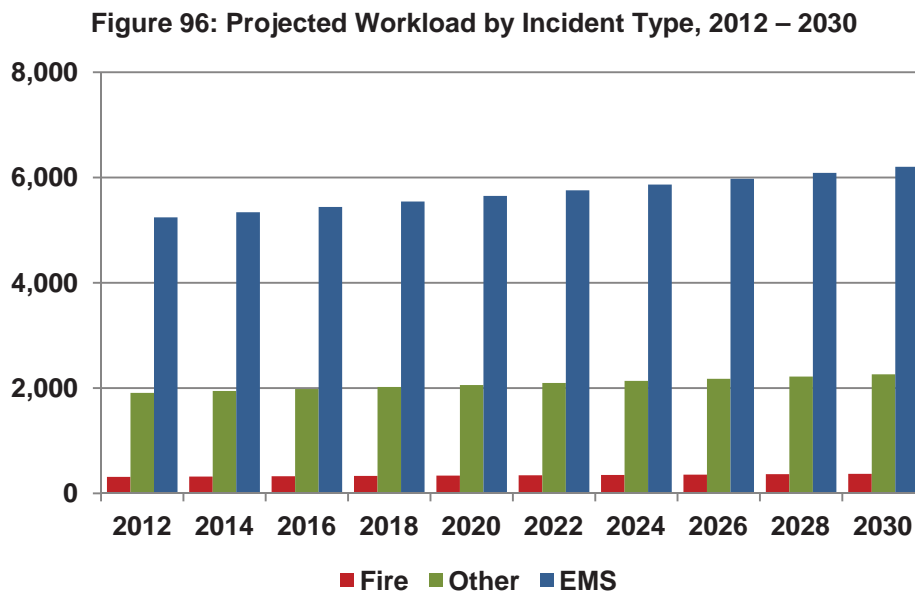
It is not the intent of this study to be a definitive authority for the projection of future population in Kirkland but rather to base our recommendations for future fire protection needs on a reasonable association with projected service demand. Since we know that the service demand for emergency agencies is based almost entirely on human activity, it is important to have a population-based projection of the future size of the community. While we can see some variation in the population projections discussed here, one thing is certain—KF&BD will continue to be an emergency service provider to a growing population, likely reaching 95,000 by 2030. Planning should begin now to maintain the resources needed to meet the continuing demand for services.

Service Demand Projections

In evaluating the deployment of facilities, resources, and staffing, it is imperative that consideration be given to potential changes in workload that could directly affect such deployment. Any changes in service demand can require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance. For

⁶⁷ Note: Population forecast data did not include the annexation to Kirkland in 2011.

purposes of this study, ESCI used the average projected growth rate from three sources (U.S. Census, VISION 2040, and WSDOT) of 0.94 percent and multiplied this by a the incident rate derived from a five-year history (2005 – 2009) of incident per capita to identify potential workload through the year 2030. The results of the analysis are shown in the following chart and table.



The increase in actual fire incidents is forecast to be relatively flat during the study period, but this is a reflection of trends for fire incident rates per capita. It is believed that the trend is a result of improvements made in building codes and public fire education over the last several decades. EMS is expected to continue to be the predominate factor affecting service demand. Other emergency service calls not involving actual fires are forecast to increase in part due to the use of automatic fire alarm and water flow systems.

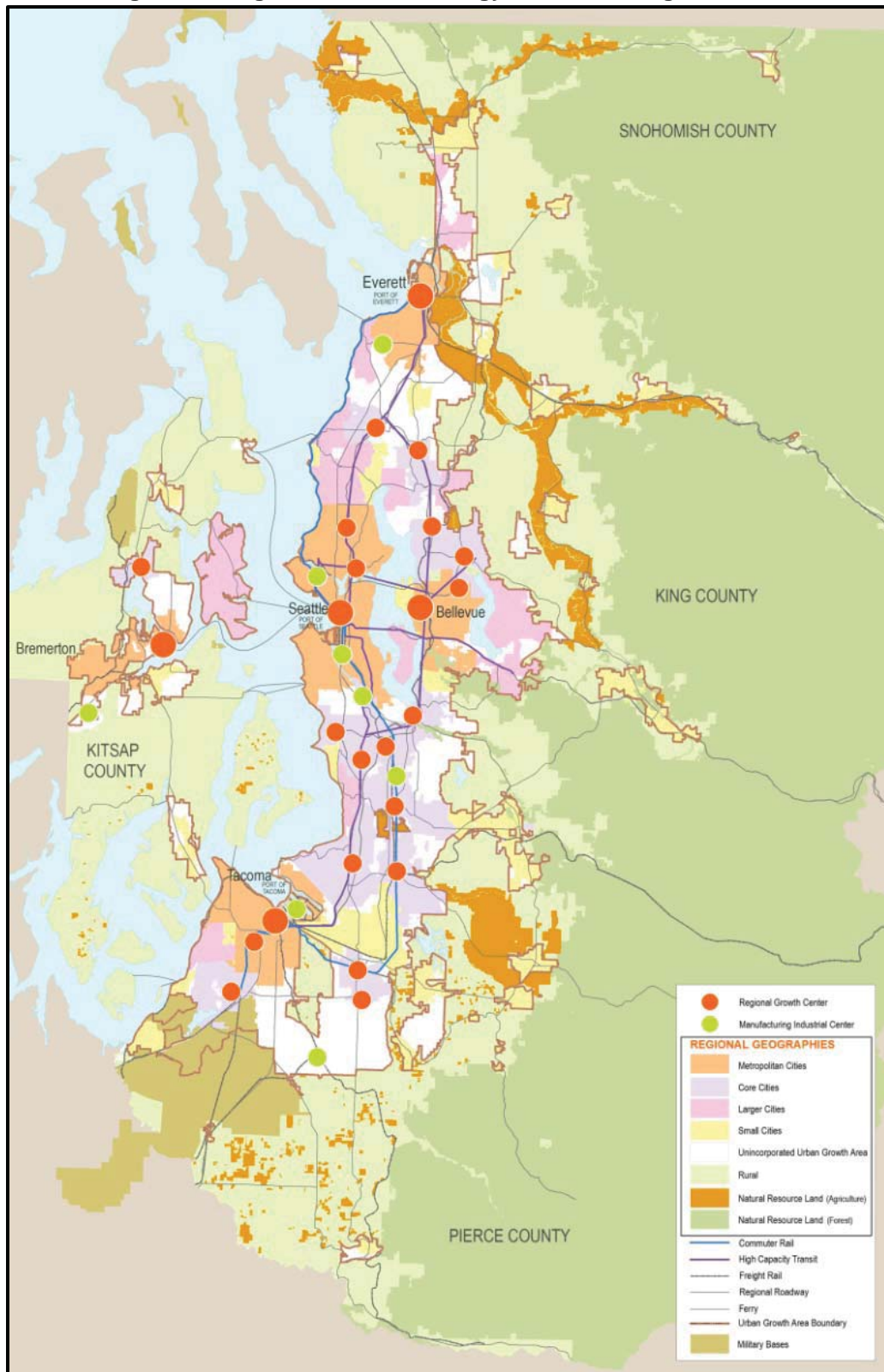
ESCI used GIS data from Kirkland and Puget Sound Regional Government and the City Comprehensive plan to examine how future land use planning and development might impact service demand for KF&BD. According to the 2009 VISION 2040 document, “King County’s Core Cities are expected to accommodate a much larger share of King County’s growth than Core City shares of Kitsap, Pierce and Snohomish counties.”⁶⁸ A strategy in the study focuses the region’s employment and housing growth into both metropolitan and core cities. Kirkland is identified as one of the regional growth centers. Core centers are intended to attract a greater

⁶⁸ VISION 2040, PSRC (Puget Sound Regional Council), December, 2009, page 14.

percentage of residents and businesses with a proximity to services and jobs, a variety of housing types, access to regional amenities, high quality transit service, and other advantages.⁶⁹ The following map shows the various growth centers in Central Puget Sound.

⁶⁹ Ibid.

Figure 97: Regional Growth Strategy for Central Puget Sound⁷⁰



⁷⁰ Ibid.

Kirkland planning documents list:

- 7,000 gross acres of land in Kirkland
- The developable land use base excludes all existing public rights-of-way
 - There are 5,200 net acres of land in Kirkland
- Total developable land use base in Kirkland:
 - 72 percent is zoned for residential use and 28 percent is zoned for non-residential uses
 - Approximately 64 percent of the developable land use base is actually developed with residential uses
 - Since 1991, residential land uses have increased 13 percent
 - Approximately 30 percent of the developable land use base is actually developed with non-residential uses
 - Parks and open space uses account for 8 percent
 - Vacant land accounts for 5 percent of the Kirkland land use base
- Kirkland has approximately 15,266,000 square feet of existing floor area dedicated to non-residential uses. Of that developed total:
 - 4,906,000 (42 percent) are office uses
 - 3,464,000 (30 percent) are commercial uses
 - 3,349,000 (29 percent) are industrial uses

The largest percentage of commercial and industrial uses is located in the Totem Lake neighborhood and the largest percentage of office uses is located in the Lakeview neighborhood.

Community Risk Analysis

The fire service assesses the relative risk of properties based on a number of factors. Properties with high fire and life risk often require greater numbers of personnel and apparatus to effectively mitigate a fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk within geographic sub-areas of a community.

A community's risk assessment is developed based on potential land use within its anticipated future boundaries. These potential uses are generally found in city and county development plans and zoning designations. Risk is then translated into land use maps (potential scale and type of development within geographic sub-areas) that show categories of relative fire and life risk.

- Low Risk – Areas zoned and used for agricultural purposes, open space, low-density residential and other low intensity uses.
- Moderate Risk – Areas zoned for medium-density single family properties, small commercial and office uses, low-intensity retail sales, and equivalently sized business activities.
- High Risk – Higher-intensity business districts, mixed use areas, high-density residential, industrial, warehousing, and large mercantile centers.

The following map (Figure 98) provides a view of the City of Kirkland zoning and the City's most recent adopted zoning designations.⁷¹ This map is the officially adopted zoning record. The following map (Figure 99) is the comprehensive land use map for Kirkland with land use designations.⁷²

⁷¹ Source: City of Kirkland Department of Planning and Community Development.

⁷² Ibid.

Figure 98: Kirkland Zoning Map

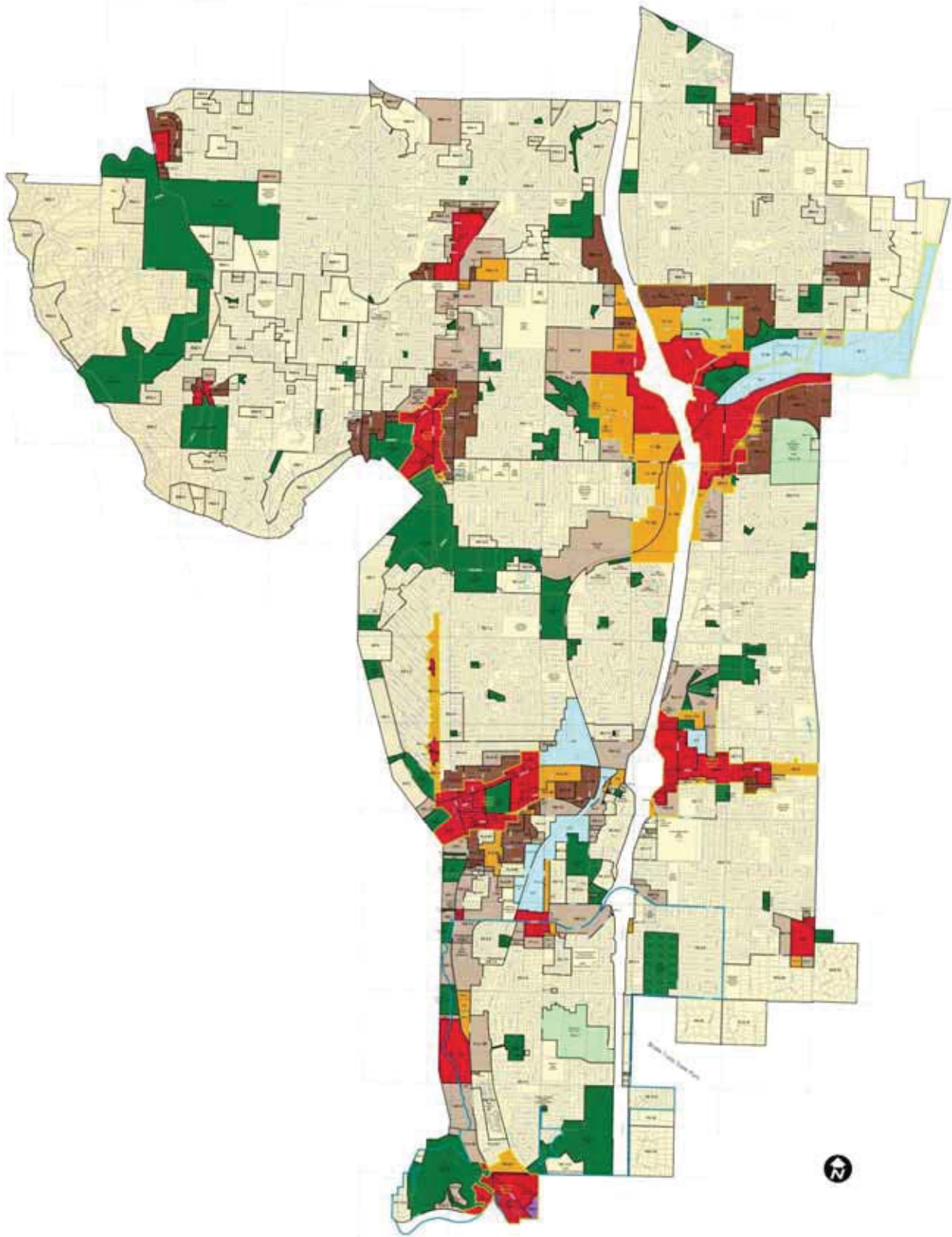
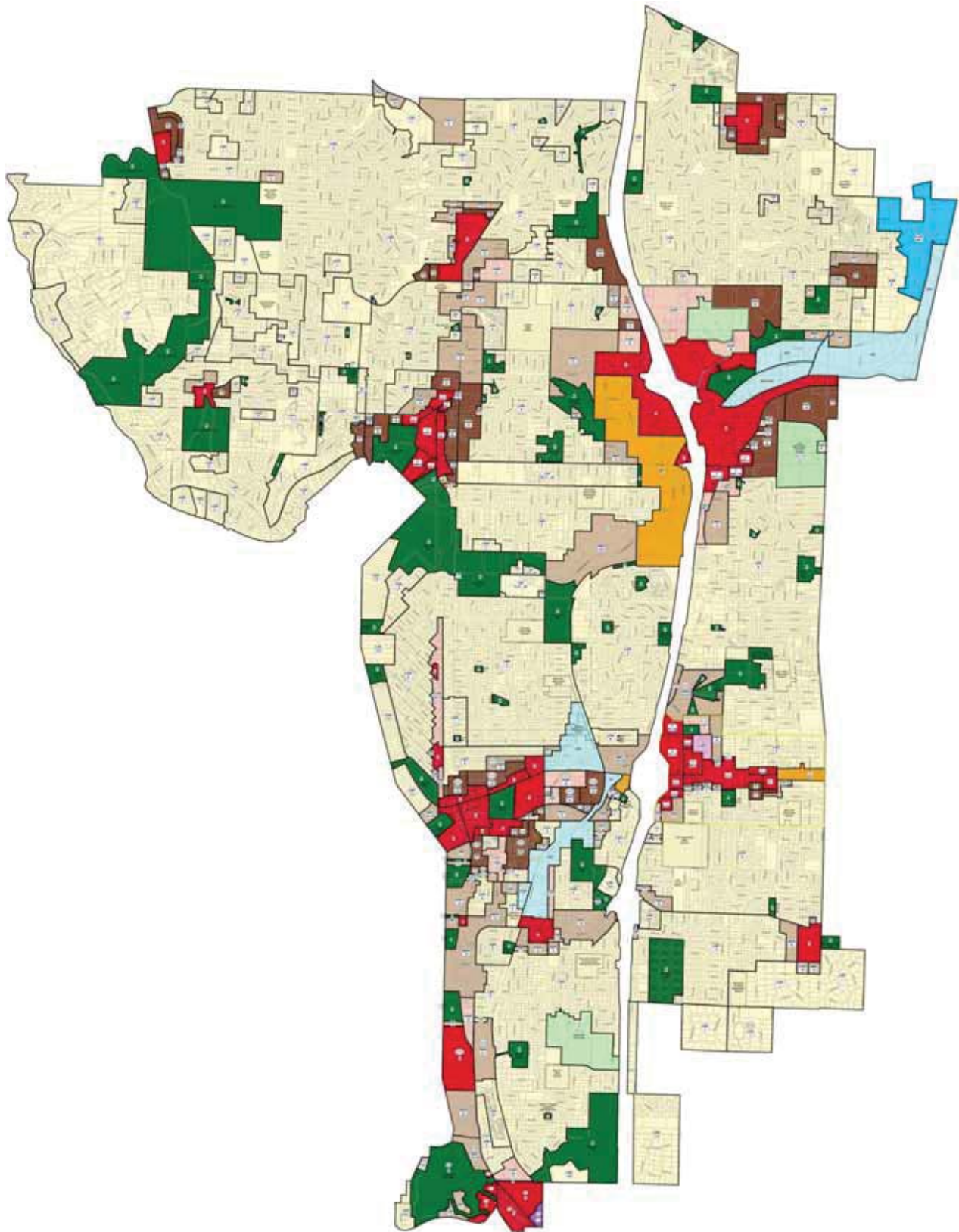


Figure 99: Kirkland Comprehensive Land Use Map



Much of the KF&BD service area (City of Kirkland) is zoned for residential use (62 percent).⁷³

Figure 100: City of Kirkland Zoning Classification in Acres

Zoning Classification	Acres	Percent of Total
Commercial	1,387	12.28%
Multi-Family Residential	794	7.03%
Industrial	83	0.73%
Single Family Residential	6,185	54.77%
Park/Open Space	1,007	8.92%
Right-of-Way	1,837	16.27%
Total	11,293	100.00%

A large presence of single family residents in the area annexed to the City in June 2011 increased Kirkland's single family residential zoning from 47 percent to 55 percent.⁷⁴

Based on information from the VISION 2040 report and City of Kirkland planning documents, development will be of higher density in the core center. Following this pattern of development ESCI believes that KF&BD will need to continue to place a heavy emphasis of resources, facilities, apparatus, and personnel in the current locations. If forecasts prove accurate, service demand will increase in the core area of the City and KF&BD will need to add response units. Additionally, KF&BD will need a new fire station to have adequate response units and personnel resources to effectively serve Finn Hill, North Juanita, and Kingsgate.

Ancillary and Supportive Services

Specialized Rescue

Like many other fire agencies, KF&BD has added a variety of specialized rescue to the main purpose of fire suppression and EMS. Specialized services include confined space, rope (high angle), trench collapse, structural collapse, vehicle/machinery, and surface water rescue. These specialized services are provided at the technician level consistent with *NFPA Standard 1670*.⁷⁵ The NFPA standard identifies and establishes the levels of functional capability for conducting operations at technical search and rescue incidents while minimizing threats to rescuers.

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ *NFPA 1670, Standard on Operations and Training for Technical Search and Rescue Incidents*, 2009 Edition, National Fire Protection Association.

Rescue services are under the responsibility of the deputy chief of operations; with routine management at an incident handled by the ladder company captain assigned Rescue Team Leader. KF&BD has personnel that are trained and have the expertise to handle routine technical incidents. Larger incidents require the regional team. Most of the fire agencies in the region, including Kirkland, do not have sufficient numbers of personnel to perform all of the specialized rescue services. Specialized rescue services for larger incidents are organized and delivered regionally under terms of a regional agreement whereby rescue personnel and equipment respond cooperatively.



A zone system was established to address standard operating procedures, training, personnel and equipment standards and emergency operations issues regionally with Kirkland as the lead agency. KF&BD and their neighboring agencies belong to Zone 1. Activities in Zone 1 are managed by a technical rescue committee that reports to the Zone 1 operations chiefs. KF&BD maintains a staffing level of three on duty “ladder technicians” per shift trained to specialized rescue standards.

Training

Training Administration

One component in support of emergency response, KF&BD has a comprehensive training program for its members. KF&BD participates in the East Metro Training Group (EMTG) in cooperation with other eastside fire agencies. In stakeholder interviews conducted during the course of this project, training was viewed as one of KF&BD’s most positive strengths.

While the EMTG exists as both a resource and a constraint (training initiatives must be evaluated in consideration of consistent application by the other member agencies), the training chief and training captain are responsible for administering and coordinating fire training for the KF&BD. Both training positions have administrative roles (daytime, 40 hours per week). As of the writing of this report, the incumbent training chief is set to retire and his replacement has yet to be selected. The current training chief has over 30 years of experience in the fire service and

has an Associate Degree in Fire Command/Administration and is a certified Incident Safety Officer. He has completed additional coursework from the National Fire Academy, Health & Safety Officer, Advanced Safety Operations and Management; Designated Infection Control Officer – Basic & Advanced, and Train the Trainer endorsement as an OSHA bloodborne pathogens and TB (tuberculosis) instructor.

The training division lacks administrative support staff. The EMTG has support staff since Kirkland is a participating agency. However, if Kirkland was to withdraw or the EMTG folded, support staff will be necessary to support a stand-alone training division.

Figure 101: Training Division Staffing

Position	Number of Personnel
Battalion Chief	1.00
Captain-Fire Suppression	1.00
Total	2.00

Training Facilities

KF&BD does not have a complete training center but has towers with standpipes, confined space and vent props (located at Fire Station No. 26), and a medium-sized classroom for didactic training. The classroom has computer projection capability and a training library. As part of the EMTG, Kirkland has use of the Bellevue Training Center facilities, which does provide the full array of training props, tower, and burn facilities. Additionally, Northshore Fire District, a recent addition to the EMTG, has a state-of-the-art training facility that is a resource for Kirkland's north end crews.

General Training Competencies

Like any other activity, training should be conducted using a comprehensive plan. The plan should include a clear definition of the goals and objectives of the training program and a schedule of training activities to achieve them. The training chief should ensure that lesson plans are developed, approved, and easily accessible; training objectives and measurements are clearly defined; and record keeping and documentation are seamless throughout the department. Frequent monitoring and mentoring of all members during training sessions by the training officers is important for continuity among companies and personnel.

KF&BD meets federal standards for National Incident Management System (NIMS) Incident Command System (ICS) certification. Homeland Security Presidential Directive 5 requires all

federal emergency management agencies to meet the federal NIMS training and certification standards and encourages compliance with these same standards for state and local governments. That encouragement comes in the form of the same training standards being the prerequisite for federal preparedness grant funding eligibility and other federal support. The standards include ICS-100 (Introduction to Incident Command System) and IS-700 (NIMS – An Introduction) for all personnel who are involved in emergency management, regardless of discipline or government structure. The OEM coordinates NIMS training activities.

Those with operational field responsibilities are required to obtain certifications consistent with their expected field responsibilities. Such responsibilities include ICS-200 (Basic Incident Command System) for supervisory personnel, ICS-300 for battalion chiefs and ICS-400 for staff chiefs expected to fill command and general staff positions. While not required, IS-800 is a key certification for fire department command staff and city management staff expected to make critical policy decisions on behalf of the city during a declared emergency or disaster. It is also valuable for field personnel, who must understand how local plans relate to the National Response Framework during incidents of national significance. Further guidance can be found in the NIMS Training Program, located on-line through FEMA's National Integration Center.

Department fire operations should follow industry best practices in conjunction with the training division. However, training is a support function for operations and should therefore take its cues from the Operations Division. Training should establish goals and objectives and a master calendar laying out a multi-year plan in order to meet the needs of the Operations Division.

Training personnel have the responsibility of managing the EMS training schedule, including the OTEP (Ongoing Training Evaluation Program). A BLS (Basic Life Support) instructor is assigned to each KF&BD crew to handle the responsibility of managing the training schedule. The Redmond Fire Department provides cardiac arrest training to KF&BD. Redmond instructors use the "Sim-Man" (training simulator mannequin) two to three times per year and perform medical incident chart review and develop EMS training based on identified educational gaps.

To better assure quality emergency scene performance, training should be based on established standards of practice. KF&BD recently decided to use Fire Engineering as its primary resource for standards and training materials. Fire Engineering's Firefighter I and II curricula meet industry standards and are consistent with best practices. Minimum performance

thresholds (competencies) must be identified in writing and disseminated to all personnel with regular testing and evaluating performance and as reinforcement.

Recruit Training

Training for KF&BD's new hires is outsourced to either the Washington State Training Center in North Bend or Bates Technical College in Tacoma. Previously there have been joint academies conducted with the Northshore and Bellevue fire departments. If the EMTG becomes a formalized consortium, recruit academies could be run concurrently with the participating agencies in a more cost efficient manner. If the EMTG does not happen, sending recruits to another agency, as is currently the practice, is the second most efficient method of providing Washington State minimum standards skills training. Additional KF&BD organization-specific training is required to augment initial recruit training received at Bates or North Bend.

Training Procedures, Manuals, and Protocols

KF&BD has not developed an agency-specific training manual. ESCI recommends that KF&BD defer addressing this gap in favor of a combined EMTG training manual. A training manual is an important "deliverable" for a training consortium, but only in the context of a formalized agreement. In the absence of a collaborative training manual, KF&BD should develop its own training manual.

Training Methodology

KF&BD currently provides manipulative skills training, task performance based training, and multi-company and multi-agency drills. There is no established minimum number of training hours an individual or company is required to receive. Night drills occur infrequently. Lesson plans are developed as the need occurs, and there are no company or individual training evaluations performed. Battalion chiefs may perform evaluations at their sole discretion. KF&BD uses training objectives for activities, but goals and purpose statements for objectives need to be developed further and refined.

Department physical standards are established on an individual basis, using general calisthenics as a measurement. Individuals are rewarded with time off for their ability to complete tasks related to department physical standards.⁷⁶ Physical tasks involve an individual

⁷⁶ The Employer and the Union agree to abide by the Physical Fitness Policy outlined in Kirkland Fire Department Directive 3.016 dated December 6, 2007, or as modified and agreed upon by the Employer and the Union.

running 1.5 miles, performing 75 push-ups, 150 sit-ups, and 20 pull-ups. Fire suppression personnel are provided time for fitness and exercise activities during the on-duty work day.

Training Record Keeping

Most of the KF&BD's training records are recorded and maintained on a web-based records management system (RMS) called *FireTime*™. Reports can be produced from *FireTime*™ by individual, category (or type of training), and number of hours. Recordkeeping for company level training activities is not currently maintained. Company level training activities integrate fire incident pre-fire planning of community target hazards (locations with the potential for large loss of life or property).

Opportunities for Regional Partnerships

Most fire departments today are recognizing the need to look for ways in which they can work together more effectively. The motivation to do so is generally driven by a combination of factors, including deteriorating financial conditions and a recognition of the importance of increasing effectiveness and efficiency simply in the interest of quality service delivery.

The following section provides an overview of the various concepts that are applied to identifying and analyzing partnership opportunities. Prospective strategies are listed and explained in context as they may apply to the KF&BD.

Most public agencies are experiencing a period of transformation which has been accelerated by recent financial declines. Rapid economic change in virtually every sector of the nation is driving increasing demand for more collaborative and sophisticated fire and EMS protection. Many fire departments that have existed virtually unchanged for decades today find themselves challenged to anticipate and provide acceptable emergency service delivery with progressively constricting revenue.

As communities that are in close proximity to each other grow, their economies and emergency service demands become progressively more interdependent. The notion of cooperative service delivery is not a new one and has been undertaken in private industry for many years. Public providers of emergency services have sought ways to work more closely together only in relatively recent years and to a lesser extent. Those that have been reluctant to work together and have instead held to independent and territorial practices are being forced by new economic challenges to reconsider their outlook.

Compounding the impact of the economic downturn experienced in 2008, numerous states like Washington have experienced a public service funding crisis brought on by tax limitation laws or other policy shifts that squeeze the ability of communities to unilaterally finance and manage needed change. Even those rare communities not directly experiencing a funding crisis are pressured by residents and others to lower cost, increase service, and operate more efficiently.

Beyond financial considerations, it has become clear that rather than autonomous service delivery by stand-alone entities, emergency response needs are often more effectively met by a larger, regionally based, fire protection agency. This is because the successful outcome of an emergency is highly dependent on the rapid mobilization of significant numbers of personnel and equipment. Regionalized fire protection strategies inherently have the ability to field greater numbers of emergency workers and equipment while capitalizing on economies of scale in management and oversight.

Today, fire departments are sophisticated and indispensable channels for all forms of emergency service, including natural and man-caused disaster management, fire and accident prevention, and pre-hospital care. In the process, the role of many fire agencies has transformed to regional emergency service providers.

Combining fire and EMS service delivery providers by way of merger, consolidation or any of the many other available approaches is frequently viewed as a cost saving initiative. While financial advantages are often realized, ESCI's experience had been that savings are usually modest when smaller agencies pool their resources because the economies of scale found when large organizations are merged do not exist. However, what is gained when small agencies cooperate is significant in terms of increased efficiency, long-term cost avoidance, and depth of resources.

Processes for Collaboration

The potential efficiencies to be gained by pursuing cooperation between agencies can be described on a continuum. Identified partnering strategies fall in a range, from remaining autonomous to the creation of a new organization encompassing multiple or all of the agencies.

To comprehend the opportunities for cooperative efforts, a basic understanding of the available methods for collaboration available is necessary. The information we provide here should be considered for what it is—a primer regarding the legal aspects of collaborating public agencies. At the point where City policymakers have decided to pursue any of the cooperative efforts, the

advice of legal counsel should be sought in order to ensure that the appropriate procedures are followed.

A method used frequently in Washington is for government units to legally partner through the use of an ILA (Interlocal Agreement). Other methods of collaboration include consolidation, merger, contracting, or the formation of a Regional Fire Authority. The movement toward more intergovernmental cooperation in the delivery of emergency service goes by many names, including unification, regionalization, consolidation, alliance, and merger.

General Partnering Strategies

The various partnering strategies are described, beginning with a do-nothing approach and ending with complete consolidation into a new emergency service provider. The following alternatives will be evaluated and discussed:

- Complete Autonomy
- Administrative Consolidation
- Functional Consolidation
- Operational Consolidation
- Legal Unification or Merger
- Regional Fire Authority Creation

Complete Autonomy

This is a status quo approach in which nothing changes. While often viewed negatively, in some cases the best action is no action. In this case, KF&BD and its neighboring agencies simply continue to do business as usual, cooperating with and supporting each other as they do today, but with no change to governance, staffing or deployment of resources. Current collaborative practices are not altered.

This approach carries with it the advantage of being the easiest to accomplish as well as maintaining the independence of the organizations and local control. The currently elected city councils or boards continue to oversee their individual agencies as their electorates' desire, without the complication of considering the views of a different constituency. It creates the least stress on the organizations and does not necessitate reorganization. What it lacks is long-term commitment and the virtues that can be gained in terms of increased efficiency that is realized in a cooperative service delivery environment.

In today's environment, taxpayers typically hold their elected officials accountable for delivering a quality level of service at an affordable rate and expect creative thinking to solve problems or achieve those ends. While "maintaining the status quo" is easy and involves the least amount of impact, it may well be one of the riskier decisions to make politically.

Administrative Consolidation

Under an administrative consolidation, agencies remain independent of each other from a governance standpoint, but they blend some or all of their administrative functions. The result is often one of increased efficiency in the use of administrative and support personnel. Overhead costs are typically reduced and duplication of efforts is eliminated.

The advantages of such a model include cost savings by eliminating administrative duplication; a gradual alignment of otherwise separate operations under a single administrative head; less resistance to change by the rank and file in the operational elements than other consolidation options; and singularity of purpose, focus, and direction at the top of the participating organizations. This strategy lends itself well to a gradual move toward a single, consolidated agency where differences in attitude, culture and/or operation are otherwise too great to overcome in a single move to combine.

The disadvantages include potential conflicts in policy direction from the governing bodies; potentially untenable working conditions for the fire chief ("one man, two bosses"); and increased potential for personnel conflict as separate employee groups vie for dominance/supremacy.

An administrative consolidation is most effective in larger organizations where duplication exists and workload assignments can be re-aligned to gain efficiencies.

Functional Consolidation

A functional consolidation maintains separate agencies with their governing bodies and administrations left unchanged. The approach is focused primarily on the response agency's programs as opposed to its operations or administrative composition. It may be applied to nearly any program or practice and is commonly applied to training, fire prevention, and similar programs that are of a common interest and need for the participating agencies.

The initiative is often found to increase efficiency and make better use of limited resources. Advantages of elimination of duplication and more effective use of resources are often realized. Direct cost savings may be limited; however, long-term gains can be anticipated.

Functional consolidations require a greater collaboration between agencies than other partnering strategies and independence and autonomy are reduced in the areas of consolidation to some extent.

Operational Consolidation

An operational consolidation strategy takes the next step in the continuum of closer collaboration development. In this case, all operations are consolidated under a single organization that serves all partnering agencies. The organizations remain independent agencies from a legal standpoint; but from a service delivery perspective, they operate as one.

An operational consolidation, accomplished through a written agreement between the agencies, requires a significant commitment toward a full consolidation and is usually undertaken as a segue toward integration. The level of trust required to implement operational consolidation is very high, since independence and autonomy have been willingly relinquished in favor of the preferred future state of a complete integration.

The advantages of this form of consolidation are that the greatest opportunity for efficiency is typically in the operational element where the expense is greatest and the level of trust and cooperation required to make this strategy successful implies a near-readiness to take the next step to full consolidation.

The disadvantage is that administrators and policy-makers must share power and gain consensus where they once had unilateral authority to control and implement.

Legal Merger

While this partnership is not directly applicable to Kirkland, it is offered as information as to the other possibilities that exist for some of KF&BD's neighbors. A merger is a complete integration of two or more fire districts into one and requires a vote of people in each affected area. Each is absorbed into and becomes part of the other agency(s). For multiple fire districts to merge, some cease to exist (merging agency or agencies) and one becomes the surviving entity (merger agency). The employees and volunteers of the merging agencies are transferred to the merger agency, and the elected positions are either eliminated from the merging district or

brought into the merger district through an agreement to re-configure the composition of the board of directors.

Tax rates become a key factor in a merger. In this case, the taxing authority of the surviving agency may be applied to the entirety of the newly merged district. However, while the taxing authority is expanded, the board of commissioners of the new district chooses whether it will levy the full taxing authority to the constituents of the district or some lesser amount based on identified needs and the willingness of the voters to agree.

Regional Fire Authority Creation

To establish a new, singular agency, an alternative to a merger is the formation of a Regional Fire Authority (RFA). An RFA is a new entity whereby all participating agencies fall under the new structure with a new tax base, a new operational plan, and a new legal framework. An RFA requires an affirmative vote from the citizens in each jurisdiction.

An RFA is established by the formation of a Planning Committee charged with establishing the RFA Plan, which specifies how the Authority will be funded, operated and governed. The Planning Committee is comprised of three elected officials from each participating agency, assuring equal representation. Most successful RFAs have established formal steering committees composed of a wide variety of stakeholders to determine the feasibility of creating an RFA far in advance of forming the actual Planning Committee.

Legislation passed in Washington State in 2004 provided the ability to establish Regional Fire Authorities.⁷⁷ Since that time, numerous RFAs have been created in the state with a high degree of operational success. Benefits that fire departments have experienced with an RFA are in line with the needs of the KF&BD.

Cooperative Effort Strategies

Moving forward from the discussion of overarching cooperative concepts, specific strategies are identified by which KF&BD might develop cooperative practices and programs with neighboring emergency service providers. The listing below is representative of potential cooperative opportunities, while not all-inclusive; it lists many that have been used successfully by other fire and EMS agencies.

⁷⁷ A summary of recent Washington legislation is found in Appendix D: Summary of Recent RFA (Regional Fire Authority) Legislation.

It is important to point out that KF&BD already has or is working towards implementing some collaborative efforts. Regardless of the existing level of implementation, we list the strategies to provide the reader with a complete picture of cooperative efforts potential.

The strategies may be accomplished with willing partners on an individual basis or they may be incorporated into various approaches to the concepts of administrative, functional, or operational consolidation detailed in the previous discussion. Each cooperative efforts strategy identified is followed by the objective(s) that may be achieved (Figure 102).

Figure 102: Cooperative Effort Strategies

Strategy	Objectives
Administration	
Conduct Joint Strategic Planning	<ul style="list-style-type: none"> • Enable agencies to develop a Mission, Vision, Values, and Guiding Principles that are common to the organizations. • Empower the fire departments to identify needs and establish plans to meet them, including shared organization goals and objectives.
Create a Unified Occupational Medicine Program	<ul style="list-style-type: none"> • Provide a fire-service related occupational medicine and health program.
Create a Unified Wellness and Fitness Program	<ul style="list-style-type: none"> • Provide a wellness and fitness program that promotes the improved health and well-being of personnel at all ranks. • Increase fitness levels and decrease injuries. • Reduce frequency and number of sick/sick injury incidents. • Reduce the number of days used for sick/sick injury leave.
Develop Uniform Fees for Service	<ul style="list-style-type: none"> • Provide participating fire departments with a uniform schedule of fees for service.
Operations	
Develop Uniform Pre-Incident Plans	<ul style="list-style-type: none"> • Provide a system of shared operational plans for use during emergencies and non-emergent incidents.
Implement Enhanced Use of Mutual and Automatic Aid	<ul style="list-style-type: none"> • Refine, enhance, and increase the application of mutual aid and automatic aid practices to improve response effectiveness.
Provide for Regional Deployment of Fire Stations and Apparatus	<ul style="list-style-type: none"> • Provide for distribution of facilities and deployment of personnel consistent with a regional standard of cover. • Provide consistent fire and emergency services within areas efficiently before, during, and after development.
Implement Regional Incident Command and Operations Supervision	<ul style="list-style-type: none"> • Provide for IC (Incident Command) supervision of emergency operations. • Provide for supervision of on-duty personnel during routine operations.
Develop Standard Operating Guidelines	<ul style="list-style-type: none"> • Provide guidelines for operation during emergencies and non-emergency incidents and activities.
Establish Shared Specialty Teams	<ul style="list-style-type: none"> • Provide specialty teams or specialty functions by allocating and distributing resources to achieve minimum cost and maximum operational benefit.

Strategy	Objectives
Provide Joint Standards for Service Delivery	<ul style="list-style-type: none"> • Comply with RCW 35A.92.040 Fire Departments – Performance Measures. • Establish a joint Standards for Service Delivery Policy, defining services, service levels, and response times to the 90th percentile so that adequate system planning can take place. • Develop a system-wide reporting structure to standardize the collection and reporting of relative compliance with the Standards for Service Delivery Policy.
Implement the Use of Peak Activity Units (PAUs)	<ul style="list-style-type: none"> • Provide special response units in areas of high incident activity and for replacement of units attending training sessions or called to cover special events.
Develop Common Deployment Standards	<ul style="list-style-type: none"> • Develop deployment standards that establish the distribution and concentration of emergency resources, both fixed and mobile.
Adopt/Enhance Dropped Border Response	<ul style="list-style-type: none"> • Improve service delivery to partnering agencies by sending the closest unit to an emergency call for service without regard to jurisdiction.
Joint Staffing of Fire Stations	<ul style="list-style-type: none"> • Improve initial response times in adjoining areas. • Reduce response times for additional apparatus and personnel to respond to incidents requiring multiple units. • Improve overall service demand coverage.
Expand partnership with King County Sheriff's Marine Unit	<ul style="list-style-type: none"> • Provide a coordinated response to marine firefighting and rescue incidents.
EMS	
Adopt Criteria-Based Dispatch	<ul style="list-style-type: none"> • Send the most appropriate unit to an emergency based on medical criteria established by experts in the field.
Provide for Shared EMS Supervision	<ul style="list-style-type: none"> • Provide a single point for training and recertification of all EMS personnel in participating organizations.
Establish System-Wide Guidelines for EMS Response	<ul style="list-style-type: none"> • Standardize EMS response and deployment protocols in the participating agencies.
Training	
Consolidate Training into a Single Training Program	<ul style="list-style-type: none"> • Eliminate duplication in training emergency responders to increase effectiveness. • Create a single unified training division.
Implement a Shared Computerized Training Records Management System	<ul style="list-style-type: none"> • Provide a shared and integrated training records management system (RMS).
Develop Mutual Training Strategies	<ul style="list-style-type: none"> • Provide purpose and direction for training program management and delivery. • Combine strengths and resources to: <ul style="list-style-type: none"> ○ Overcome current training obstacles and deficiencies ○ Provide a comprehensive and integrated training structure ○ Develop a mutually beneficial training program ○ Train and certify a cadre of knowledgeable and skilled emergency responders
Develop an Annual Shared Training Plan	<ul style="list-style-type: none"> • Provide standardized and consistent training. • Provide a well-trained emergency workforce. • Provide long-term vision and direction for training delivery.

Strategy	Objectives
Develop and Adopt Training Standards	<ul style="list-style-type: none"> • Adopt uniform training guidelines. • Adopt uniform certification standards.
Create a Shared Training Manual	<ul style="list-style-type: none"> • Provide consistent, standardized training procedures.
Develop a Shared Fire and EMS Training Facility	<ul style="list-style-type: none"> • Provide training facilities readily available to all partnering agencies. • Enhance the fire department's ability to develop and maintain the knowledge and skills of emergency services personnel.
Implement and Cooperatively Use a Video Conferencing System	<ul style="list-style-type: none"> • Provide standardized, consistent, and high-quality classroom training. • Reduce training staff hours required for curriculum delivery. • Increase in-service time of emergency response apparatus.
Fire Prevention	
Develop Joint Fire Prevention and Code Enforcement Practices	<ul style="list-style-type: none"> • To provide uniform fire prevention services to the region. • Reduce the threat to life or property from fire via coordinated and standardized practices.
Conduct Joint Public Education/Public Information Activities	<ul style="list-style-type: none"> • Provide Public Education and Public Information services regionally. • Implement the use of a shared RMS (Records Management System). • Establish a shared or common electronic Records Management System, including NFIRS (National Fire Incident Reporting System), NEMSIS (National EMS Information System), and WEMSIS (Washington Emergency Medical Service (EMS) Information System) compliant software.
Develop a Regional Fire Safety Education Coalition	<ul style="list-style-type: none"> • Provide for the cost effective, regional dissemination of public fire safety education.
Develop a Regional Juvenile Fire Setter Intervention Network	<ul style="list-style-type: none"> • Provide an effective means for intervening in juvenile-set/caused fires.
Support Services	
Develop a Joint Support and Logistics Services Division	<ul style="list-style-type: none"> • Develop a joint Support Services Division that promotes improved operational readiness and achieves procurement efficiencies by eliminating duplication in the acquisition and distribution of supplies. • Create a uniform set of standards for apparatus, small equipment, PPE (personal protective equipment), emergency supplies, and IS/IT services. • Develop a joint preventative maintenance and repair service program for physical assets, apparatus, small equipment, and IS/IT systems.
Develop a Single Apparatus Refurbishment/Replacement Plan	<ul style="list-style-type: none"> • Create a single set of emergency apparatus specifications. • Accommodate joint purchasing of emergency apparatus. • Provide for shared use of reserve apparatus. • Establish a jointly planned and managed apparatus replacement schedule.
Provide Joint EMS Supply Purchasing and Logistics Services	<ul style="list-style-type: none"> • Standardize supply purchases through group purchasing. • Standardize supply distribution.

Recommended Regional Partnership

Of the available options for legal unification, consolidation, or partnership between KF&BD and neighboring fire and EMS service providers, ESCI considers Northshore and Bellevue fire departments to be feasible partners. Consolidation of fire and EMS into a single operational unit, either through Interlocal Agreement (ILA) or the formation of an RFA would provide increased fire and emergency service efficiency in the areas served by the current fire departments.

Functional Cooperation Recommendations

The following recommended strategies are judged as being feasible and most likely to result in significant improvement to systems and/or programs. These initiatives should be acted on regardless of action on a regional partnership.

Short-Term Cooperative Recommendations

- Develop Uniform Fees for Service
- Develop Uniform Pre-Incident Plans
- Implement Enhanced Use of Mutual and Automatic Aid
- Adopt/Enhance Dropped Border Response
- Adopt Criteria-Based Dispatch
- Develop Mutual Training Strategies
- Develop an Annual Shared Training Plan
- Develop and Adopt Training Standards
- Create a Shared Training Manual

Mid-Term Cooperative Recommendations

- Conduct Joint Strategic Planning
- Create a Unified Occupational Medicine Program
- Create a Unified Wellness and Fitness Program
- Develop Standard Operating Guidelines
- Establish Shared Specialty Teams
- Provide Joint Standards for Service Delivery
- Develop Common Deployment Standards
- Expand partnership with King County Sheriff's Marine Unit
- Provide for Shared EMS Supervision
- Establish System-Wide Guidelines for EMS Response

- Consolidate Training into a Single Training Program
- Implement and Cooperatively Use a Video Conferencing System
- Develop Joint Fire Prevention and Code Enforcement Practices
- Conduct Joint Public Education/Public Information Activities
- Develop a Regional Fire Safety Education Coalition
- Develop a Regional Juvenile Fire Setter Intervention Network
- Provide Joint EMS Supply Purchasing and Logistics Services

Long-Term Cooperative Recommendations

- Provide for Regional Deployment of Fire Stations and Apparatus
- Implement Regional Incident Command and Operations Supervision
- Implement the Use of Peak Activity Units (PAUs)
- Joint Staffing of Fire Stations
- Implement a Shared Computerized Training Records Management System
- Develop a Shared Fire and EMS Training Facility
- Develop a Joint Support and Logistics Services Division
- Develop a Single Apparatus Refurbishment/Replacement Plan

Conclusion – Fire and Emergency Medical Services

ESCI observed and through interviews determined that the hierarchal structure the KF&BD operates as intended with the building services manager. In contrast, ESCI found that in practice the fire chief is the direct report for any number of other fire department personnel and activities. Deputy fire chiefs routinely perform administrative, technician, and clerical tasks. Time devoted to activities outside of essential functions and principal accountabilities have reduced the deputy chiefs' availability to perform job critical administrative and supervisory duties. The addition of support staff allowing the two deputy chiefs to focus on administrative duties is fitting.

Given the number of FTEs dedicated to emergency operations, a minimum staffing of 19 per day, 30 personnel assigned to each shift, KF&BD's use of overtime is appropriate. Leave time use categorized as sick leave and injury is considered to be high. Some fire departments are using staffing options including the addition of a D shift. D shift is made up of personnel that work by filling vacancies on A, B, or C shifts. There is a great deal of flexibility with scheduling for the department and the individual.

The provision of Emergency Medical Services (EMS) has come to be the predominant service offered by many fire departments to their communities. EMS is expected to continue as the predominate factor affecting service demand. KF&BD is heavily invested in the BLS system. ESCI recommends that the KF&BD move forward and analyze the feasibility of providing ALS response services for Medic One. There are multiple benefits of KF&BD delivering ALS response services for Medic One in conjunction with BLS.

Capital facilities, apparatus, and capital equipment for the KF&BD constitute a large investment. Planning for remodels and the replacement of fire stations is a major capital expense and requires long-range planning. With Fire Station No. 25 (Finn Hill South) and Fire Station No. 27 (Totem Lake) nearing their life expectancy, ESCI recommends that a capital plan for the rebuild or replacement be developed. It is further recommended that KF&BD develop an internal long-term plan for funding the maintenance and replacement of capital equipment that aligns with the City CIP.

KF&BD relies on automatic aid to have adequate personnel for most fire incidents. Over the past two years, each of the neighboring fire and EMS agencies has gone through some reduction of fire stations, staffed apparatus, or personnel. To mitigate the reduction and improve coverage to the northwest (Finn Hill) area of the City, ESCI recommends that the KF&BD construct and staff a joint fire station with the Northshore Fire Department. Joint staffing of a shared new facility in a location that would serve Northshore and Kirkland would improve service in areas currently underserved by both agencies.

There are two alternative methods for KF&BD to meet the current adopted response time objectives. First, change the response time objectives to match the response that the fire department is able to meet. Second, add facilities, emergency response units, and personnel to the department to the level that will meet the response objectives. For Kirkland to increase resources requires a large capital investment and ongoing expenditures. Capital requirements involve the addition of two fire stations, one in the Finn Hill neighborhood and a second in the southern section of the City. Each fire station would need an engine and aid unit and a minimum of six personnel per day to cross-staff the units.

Of the potential partnerships with neighboring fire and EMS service providers, ESCI considers Northshore and Bellevue fire departments to be feasible partners. Consolidation of fire and EMS into a single operational unit, either through Interlocal Agreement (ILA) or the formation of an RFA would provide increased fire and emergency service efficiency in the areas served by

the three fire departments. An ILA between Kirkland and Northshore is viewed as an interim step to an RFA. The ILA can be more quickly accomplished and allows for the two agencies to move forward on capturing the benefits of operating as a single fire and EMS provider.

ESCI developed 34 recommended cooperative efforts strategies that the KF&BD could pursue. These strategies are judged as being feasible and most likely to result in significant improvement to systems and/or programs. These strategies should be acted on regardless of action on a regional partnership.

Recommendation Summary – Fire and Emergency Medical Services

- ❖ Recommendation 45: Update KF&BD Department Manual Directive Number 3.001 to accurately reflect current daily minimum staffing level. (Implementation Order 22)
- ❖ Recommendation 46: Maintain a minimum per shift of two personnel (swing personnel) at firefighter EMT, two at lieutenant, and two at the captain rank with the qualifications and appropriate certifications to fill vacancies or step-up. (Implementation Order 24)
- ❖ Recommendation 47: Within the limits of the collective bargaining agreement use personnel at the captain and lieutenant rank to work down to fill vacancies. (Implementation Order 30)
- ❖ Recommendation 48: Periodically (annually or more frequently) review minimum staffing levels and options for filling vacancies. (Implementation Order 25)
- ❖ Recommendation 49: Periodically review sick leave and work-related injuries for patterns and opportunities to reduce occurrences. (Implementation Order 26)
- ❖ Recommendation 50: Develop an internal CIP for the maintenance and replacement of KF&BD capital equipment. (Implementation Order 27)
- ❖ Recommendation 51: Perform an energy audit on all fire stations and follow recommended energy efficiency measures.⁷⁸ (Implementation Order 35)
- ❖ Recommendation 52: Replace apparatus using a combination of age, mileage (for gas powered units), engine hours (for diesel apparatus) and condition. (Implementation Order 34)
 - If an apparatus meets age and mileage or engine hour thresholds, use the condition as the determining factor when considering replacement.
 - Condition factors such as maintenance records and cumulative maintenance costs should help determine if a unit is actually ready to be replaced.
 - If a unit has not met the age and mileage or engine hour thresholds but the condition factors are alarmingly high, consider early replacement.
- ❖ Recommendation 53: Store PPE in a separate, well ventilated room. (Implementation Order 6)

⁷⁸ Energy audits are generally provided free of charge by electric and natural gas utility companies.

- ❖ Recommendation 54: Monitor mutual and automatic aid for equity. (Implementation Order 28)
- ❖ Recommendation 55: Make upgrades to incident reporting RMS software to eliminate erroneous data entries. (Implementation Order 9)
- ❖ Recommendation 56: Track failure rate of units to respond to incidents in their first due area by fire station and apparatus.
- ❖ Recommendation 57: Expand Chapter 21.35A of the Kirkland Municipal Code to include response by KF&BD to repeat false of malicious fire alarms. (Implementation Order 21)
- ❖ Recommendation 58: ICS training is currently at the federal minimum. Department minimum should be IS-100, IS-200, & IS-700 and IS-800b for all response personnel, and IS-300 & IS-400 for all chief officers. (Implementation Order 23)
- ❖ Recommendation 59: Create a formal mentoring program to develop for officers to use with subordinates. (Implementation Order 31)
- ❖ Recommendation 60: Formalize the East Metro Training Group via an interlocal agreement between participating agencies, with Kirkland Fire & Building Department as a permanent member. (Implementation Order 7)
- ❖ Recommendation 61: Identify training competencies in writing, teach, train, test, and evaluate personnel regularly by the training division in concert with shift battalion chiefs. (Implementation Order 8)
- ❖ Recommendation 62: Develop a consistent program for training hazardous materials technicians. (Implementation Order 32)
- ❖ Recommendation 63: Dedicate a reserve engine to the training division, preferably a unit that can be shared by agencies. (Implementation Order 22)
- ❖ Recommendation 64: Develop a joint recruit academy with other members of the EMTC. (Implementation Order 29)
- ❖ Recommendation 65: Maintain the practice EMTC recruit training or use the practice of sending recruits to either Bates or North Bend, augmented with agency specific training. (Implementation Order 10)
- ❖ Recommendation 66: In the absence of a combined EMTG training manual, KF&BD should develop its own training manual, preferably in concert with the other members of the EMTG. (Implementation Order 20)
- ❖ Recommendation 67: Refine and expand goals and purpose statements of training objectives. (Implementation Order 11)
- ❖ Recommendation 68: Establish a minimum number of annual training hours an individual or company is required to complete. (Implementation Order 19)
- ❖ Recommendation 69: Conduct at a minimum two night drills per shift per year that involve all fire suppression personnel. (Implementation Order 18)
- ❖ Recommendation 70: Develop lesson plans for core competencies requiring instructors to follow plans when instructing. (Implementation Order 14)
- ❖ Recommendation 71: Establish a minimum requirement for annual company and individual training evaluations. Include shift battalion chief involvement in annual evaluations. (Implementation Order 5)

- ❖ Recommendation 72: Include company level training activities by subject in the RMS. (Implementation Order 16)
- ❖ Recommendation 73: Integrate pre-fire incident planning of community target hazards in training activities. (Implementation Order 17)
- ❖ Recommendation 74: Refine and expand goals and purpose of training objectives. (Implementation Order 13)
- ❖ Recommendation 75: Jointly construct and staff a new fire station with Northshore FD. The fire station should be located in an area to serve the Finn Hill neighborhood and Northshore FD. (Implementation Order 3)
- ❖ Recommendation 76: Develop a comprehensive evaluation program to assess all aspects of the EMS system. (Implementation Order 12)
- ❖ Recommendation 77: Provide Advanced Life Support services within the City of Kirkland via the King County Medic One program. (Implementation Order 1)
- ❖ Recommendation 78: Participate in the King County Medic One Community Medical Technician (CMT) pilot. (Implementation Order 2)
- ❖ Recommendation 79: Modify the EMS response protocol of sending three responders to medical incidents. Redeploy with dedicated staffing of two-person aid units, or single person quick response unit for low priority EMS incidents. (Implementation Order 3)
- ❖ Recommendation 80: Expand the current partnership with the King County Sheriff's Marine Unit and the Seattle Fire Department to provide a joint, coordinated response to marine firefighting and rescue incidents. (Implementation Order 4)
- ❖ Recommendation 81: Develop a capital plan for the rebuild or replacement of Fire Station No. 25 (Finn Hill South) and Fire Station No. 27 (Totem Lake). (Implementation Order 33)

Accountability and Reporting

Emergency Services Standards

Institutions have long used professional member associations and accreditation to establish a level of professionalism. Groups like the JCAHO (Joint Commission on Accreditation of



Healthcare Organizations) for hospitals, WASC (Western Association of Schools & Colleges) for higher education, and CALEA (Commission for Accreditation of Law Enforcement Agencies) for police agencies are but a few. Accreditation is also seen as a way for member groups to provide a standard of excellence and a forum for collaborative industry efforts.

Likewise, the IAFC (International Association of Fire Chiefs) functions as the key professional organization of the fire service. The IAFC was founded in 1873 on the recognized need to provide standards across the fire protection industry for equipment and practices (such as standard hose and hydrant threads). That pursuit continues today, represented by the IAFC's active partnership with other organizations to form the CFAI (Commission on Fire Accreditation International).⁷⁹ The CFAI accreditation program grants accreditation to fire and emergency service agencies upon the successful completion of a comprehensive self-assessment and on-site evaluation. The Commission on Fire Accreditation International is:

...[D]edicated to assisting the fire and emergency service agencies throughout the world in achieving excellence through self assessment and accreditation in order to provide continuous quality improvement and the enhancement of service delivery to their communities. The CFAI process is voluntary, and provides an agency with an improvement model to assess their service delivery and performance internally and then work with a team of peers from other agencies to evaluate the self-assessment completed.⁸⁰

⁷⁹ The umbrella organization of the CFAI (Commission on Fire Accreditation International) was changed to the Center for Public Safety Excellence, Inc., in March 2006.

⁸⁰ <http://www.cfainet.org/home/aboutus.asp>, *Who are We?* – Commission on Fire Accreditation International website, December 2009.

Fire departments have used accreditation as a tool for continuous improvement. Accreditation is also a way to demonstrate professionalism to the community served by a fire department.

Response Time Reporting

The state of Washington adopted legislation (Substitute House Bill 1756; 2005) requiring fire departments to establish service delivery and response time standards for the major emergency response services provided by the agency.⁸¹ The legislation, as presented below, requires a local policy declaration concerning service delivery objectives:

RCW 35A.92.040; Policy Statement — Service Delivery Objectives

- (1) Every city and town shall maintain a written statement or policy that establishes the following:*
 - (a) The existence of a fire department;*
 - (b) Services that the fire department is required to provide;*
 - (c) The basic organizational structure of the fire department;*
 - (d) The expected number of fire department employees; and*
 - (e) Functions that fire department employees are expected to perform.*
- (2) Every city and town shall include service delivery objectives in the written statement or policy required under subsection (1) of this section. These objectives shall include specific response time objectives for the following major service components, if appropriate:*
 - (a) Fire suppression;*
 - (b) Emergency medical services;*
 - (c) Special operations;*
 - (d) Aircraft rescue and firefighting;*
 - (e) Marine rescue and firefighting; and*
 - (f) Wild land firefighting.*
- (3) Every city and town, in order to measure the ability to arrive and begin mitigation operations before the critical events of brain death or flash-over, shall establish time objectives for the following measurements:*
 - (a) Turnout time;*
 - (b) Response time for the arrival of the first arriving engine company at a fire suppression incident and response time for the deployment of a full first alarm assignment at a fire suppression incident;*
 - (c) Response time for the arrival of a unit with first responder or higher level capability at an emergency medical incident; and*
 - (d) Response time for the arrival of an advanced life support unit at an emergency medical incident, where this service is provided by the fire department.*

⁸¹ Chapter 35A.92 RCW (Revised Code of Washington) Fire Departments — Performance Measures.

- (4) *Every city and town shall also establish a performance objective of not less than ninety percent for the achievement of each response time objective established under subsection (3) of this section.*

In accordance with RCW 35A.92⁸² and by means of Resolution R-4673 (October 2007), the City of Kirkland formally established required service delivery objectives for fire and emergency medical response services. This action is subsequent to previously adopted response time performance standards contained in KF&BD's 2000 Strategic Plan. KF&BD does not deliver special operations, aircraft rescue and firefighting, marine rescue and firefighting, or wild land firefighting response services. As required by state law, the City established the following response time objectives for fire response and emergency medical response services.

Turnout Time Objective

KF&BD adopted turnout time objective is sixty (60) seconds, ninety percent (90%) of the time.

Response Time Objective from Dispatch Time; Arrival of 1st Arriving Engine Company at Fire Suppression Incident

KF&BD adopted response time objective is four (4) minutes and forty-five (45) seconds for the first fire engine to arrive when responding to a fire suppression incident ninety percent (90%) of the time.

Total Response Time Objective from Time of 9-1-1 Call; Arrival of 1st Arriving Engine Company at Fire Suppression Incident

KF&BD has historically measured response time from the time of the 9-1-1 call to the time the first arriving unit was on the scene. Therefore, dispatch time, plus turnout time, plus travel interval equals total response time. The total response time standard is five (5) minutes and thirty (30) seconds for the first fire engine to arrive when responding to a fire suppression incident ninety percent (90%) of the time.

Response Time Objective for Full First (1st) Alarm Response

KF&BD adopted response time objective is ten (10) minutes for the first full alarm assignment when responding to a fire suppression incident ninety percent (90%) of the time. KF&BD's first full alarm assignment to a fire suppression response is four (4) engine companies, one (1)

⁸² Ibid.

ladder company, one (1) aid car, one (1) medical services officer, and two (2) battalion chiefs; a total of twenty (20) firefighting personnel.

KF&BD determined in 2000 that it would use total response time beginning from receipt of call at 9-1-1. In 2008 the State of Washington defined that total response time begins at the time of dispatch for the fire department.

Response Time Objective From Dispatch Time; Arrival of First Unit at an Emergency Medical Incident

KF&BD adopted response/travel time objective is four (4) minutes and thirty (30) seconds for the arrival of the first emergency medical (Aid) unit with at least two (2) emergency medical technicians ninety percent (90%) of the time.⁸³

Total Response Time Objective From Time of 9-1-1 Call; Arrival of First Unit at an Emergency Medical Incident

KF&BD has historically measured response time from the time of the 9-1-1 call to the time the first arriving unit was on the scene. Therefore, dispatch time, plus turnout time, plus travel Interval equals total response time. The total time objective is five (5) minutes for the first unit to arrive when responding to an emergency medical incident ninety percent (90%) of the time.

Response Standards Reporting

The state of Washington legislation also requires an annual reporting process regarding service delivery and response time standards. The reporting requirements of that regulation are:

RCW 35A.92.040; Annual Evaluations — Annual Report.

- (1) Every city and town shall evaluate its level of service and deployment delivery and response time objectives on an annual basis. The evaluations shall be based on data relating to level of service, deployment, and the achievement of each response time objective in each geographic area within the jurisdiction of the city or town.*
- (2) Beginning in 2007, every city and town shall issue an annual written report which shall be based on the annual evaluations required by subsection (1) of this section.*
 - (e) The annual report shall define the geographic areas and circumstances in which the requirements of this standard are not being met.*
 - (f) The annual report shall explain the predictable consequences of any deficiencies and address the steps that are necessary to achieve compliance.*

⁸³ KF&BD includes thirty (30) seconds for NORCOM to receive and transmit an alarm to KF&BD.

KF&BD has routinely submitted a Response Time Objectives Report since first required by RCW in 2007. However, its most current report (2010) does not define the geographic areas in which the requirements are not being met [RCW 35A.92.040(2)(a)]. Additionally, while the report contains information entitled, “Predictable Results,” this information does not explain predictable consequences and steps necessary to achieve compliance [RCW 35A.92.040(2)(b)]. The *2010 Kirkland Fire Department Response Time Objectives Report* does, however, enumerate five initiatives in response to the report’s information, all of which are clearly intended to address deficiencies and improve response times.

Reporting on Response Time Objectives; 2010

A summary of KF&BD’s documented emergency response time performance data and percent of the goal that was achieved by year is shown in the following figure (Figure 103).⁸⁴

Figure 103: Response Performance by Percentage, 2007 – 2010

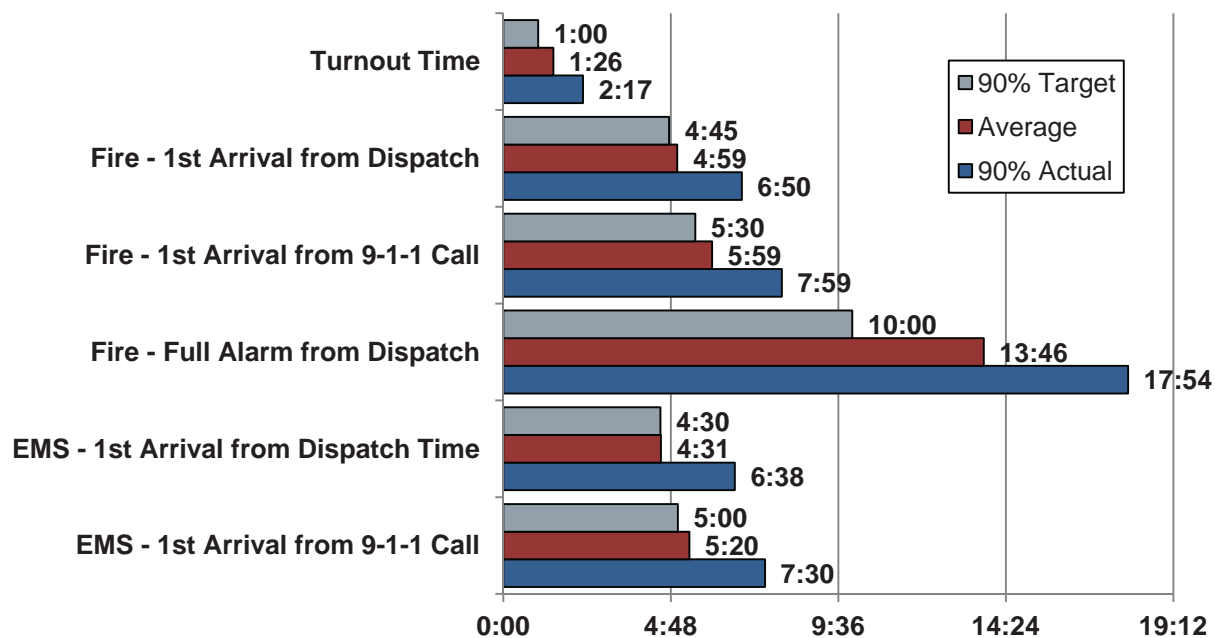
Incident Type	2007	2008	2009	2010	Target
Percent of EMS Responses under 05:00	49%	50%	48%	53%	90%
Percent of Fire Responses under 05:30	47%	53%	51%	52%	90%
Percent of Building Fires Contained to Room of Origin	41%	80%	70%	82%	60%
Percent of Full First Alarm Assignment Deployment	62%	53%	36%	17%	90%

As a general conclusion, KF&BD is meeting its stated response performance goals (including turn out time) approximately 50 percent of the time. This performance is measured against the response time objectives of five minutes (05:00) or less for EMS and 5 minutes 30 seconds (05:30) or less for fires 90 percent of the time. The percent of full alarm assignment deployments has decreased markedly from a high of 62 percent in 2007 to a reported 17 percent in 2010. One possible reason is the change in KF&BD’s definition of a full response from 18 to 19 personnel in 2011. While the change in the number of personnel may be an explanation for some of the decrease it is unlikely to be the entire reason. ESCI recommends that KF&BD determine the reason for the large decrease in the percent of full alarm assignment deployments.

The following data from the *2010 Response Time Objectives Report* compares actual response time performance (90th percentile) with the target time; and also includes the average time.

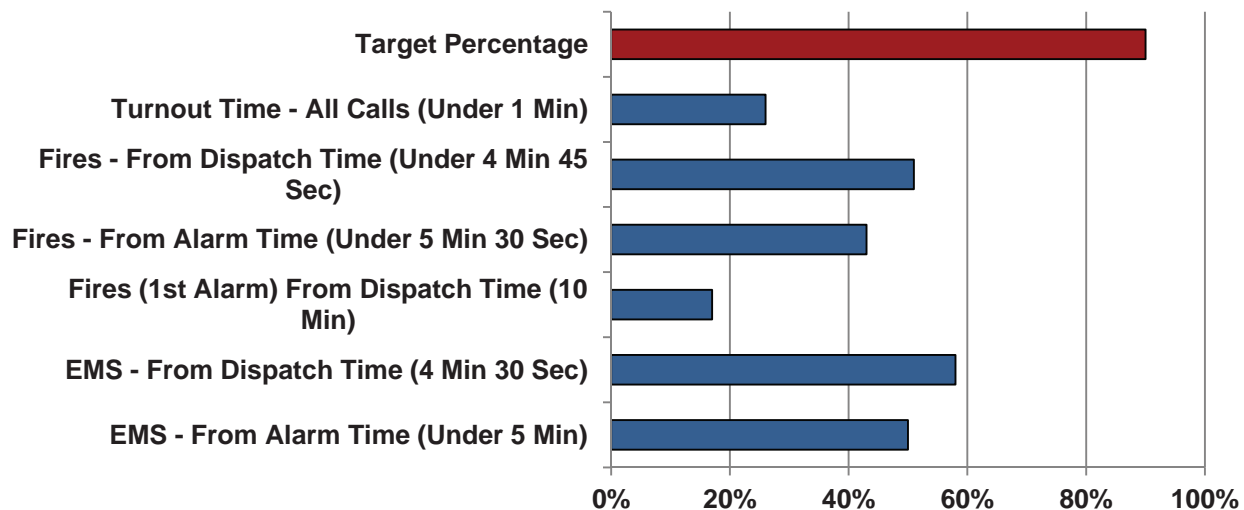
⁸⁴ Performance Measures 2010, City of Kirkland.

Figure 104: 90 Percent Targets – Actual versus Target, 2010



The following chart depicts the percentage of KF&BD responses that achieve the established response time objectives.

Figure 105: Response Time – Percent of Calls Meeting Target



KF&BD is commended for developing and maintaining significant compliance with the state's legal policy and reporting requirements. However, in the context of four years of data, KF&BD consistently has achieved its response time objectives less than 60 percent of the time. ESCI concludes that, given KF&BD's current staffing, deployment model, and service demand, the

established response time targets are not realistic. We recommend that the City of Kirkland and the KF&BD revisit the response time targets and identify values that will better reflect current ability and yet retain an incentive to continue to improve performance (Additional discussion on response objectives and performance expectations is found beginning on page 212).

Emergency Response Tiered by Geographic Composition

While service demand is forecast to remain high in areas of dense population, those areas with anticipated population and infrastructure growth will see service demand increases. Moderate call volume will continue in the more suburban areas of Kirkland. KF&BD's service area contains two basic types of communities: a densely populated area and a suburban area.

The two community types present different risks of fire incident impact as well as a varied level of service demand. Thus, each area has unique fire protection and emergency service requirements. These areas are delineated "service delivery planning zones," and are suitable for considering tiered response levels and system capacity.

It is a simple truth that the cost of fire protection and emergency services increases as the number of facilities, resources, and personnel increase. Resources are typically increased to achieve a reduced response time, faster assembly of an effective firefighting force, increased system capacity, and the ability to protect higher levels of risk. However, in Kirkland where there exists a variation in the levels of service demand and risk, it is also recognized that a single level of service delivery performance may not be appropriate.

In other words, a fire department that provides protection for a jurisdiction that is primarily dense urban residential, commercial, and industrial development may find a single service delivery performance plan to be perfectly appropriate. A department serving a community mix of dense urban areas as well as suburban areas will find this much more difficult. Were such a fire department to attempt to achieve the same level of response performance and resources for its suburban area as in the urban area, costs would be prohibitive. A smaller number of taxpayers and lower assessed valuation of the suburban portions of the City would not generate sufficient revenue to support the service. This is why many communities choose to deliver levels of service; levels that more closely match the risk and demand, as well as the expectations of the citizens.

KF&BD has not made use of service delivery zones; instead, single response standards for fire and EMS have been developed for the entire City.

Urban Response Zones

Urban Response Zones are areas with high population density and greater community risk properties, corresponding with current higher service demand levels. Projected to remain an area of high service demand, urban areas should adhere to response time objectives that consist of a large number of apparatus and personnel resources and should include some overlapping coverage for fire stations that primarily serve this area. Response time performance relies on road network and speed limit levels. While the amount of road ways in the urban zones accounts for only a portion of the total roadway miles in the City, there are hindrances to fire response capability typical in urban environments. In the urban environ more turns are necessary to arrive at a destination, reducing the ability of a multi-ton fire apparatus to maintain speed. This, along with daytime traffic, signaled intersections, and narrow streets, impede response performance potential. The urban response zones where annual service demand exceeds 500 calls per square mile are located between Fire Station Nos. 21 and 27 and northwest of Fire Station No. 22. Redevelopment and new development may cause population densities to increase to the urban level in areas of the City.

Suburban Response Zones

Suburban Response Zones extend from urban zones (usually along major arterials) and generally established neighborhoods of single family homes, recently developed, or have high growth potential. Suburban areas extend out from the Kirkland's core, along Interstate 405, and to all corners of the City. There are other pockets of residential/commercial development. The response time objective within the suburban zone can reasonably be slightly longer than the urban zone because of moderate call volume and a reduced level of community risk.

Classification of Incident Risk Types for Deployment Planning

The Community Risk Assessment identifies both fire and non-fire risks in the City and places the risk in a risk category. Risk categories include:

- Maximum Fire Risk – Hazards that require the maximum amount of fire protection resources or which could result in the greatest loss of life or property.
 - Examples: Malls, multi-story apartments, large department stores, hotels, high-rises, theaters, entertainment centers, large industrial or commercial properties and hazardous materials production facilities.
- Special Hazard Fire Risk – Hazards which if destroyed would be a critical or essential economic loss to the community. This could also include cultural, environmental, governmental, or historical loss.
 - Examples: Strip centers, hospitals or medical facilities, apartment buildings of three or more stories, governmental infrastructure facilities, and schools.

- Typical Hazard Fire Risk – Those risks most common to Kirkland.
 - Examples: Single family housing, easily accessible one and two story apartments, low risk industrial properties, and commercial properties under 10,000 square feet.
- Remote Hazard Fire Risk – Those risks most distant from other risks as to be almost unique to the City.
 - Examples: Rural land, unoccupied structures, and recreational areas, parks, etcetera.
- Non Fire-Maximum Hazard Risk – Hazards not involved with fire which require the maximum amount of fire department manpower to control or hazards which could result in the greatest loss of life or property.
 - Examples: Water plants, health care centers, large employer business facilities, power plants, chemical storage facilities and oil refineries.
- Non Fire-Special Hazard Risk – Hazards not involved with fire that could pose a special fire department manpower requirement.
 - Examples: Stadiums, auditoriums, and large recreational facilities.
- Non Fire-Typical Hazard Risk – Hazards not involved with fire which generally are typical in nature in the City.
 - Examples: Single family residences, freeways, apartments, and motor vehicle accidents.
- Non Fire-Remote Hazard Risk – Hazards not involved with fire which present a unique problem with efforts towards rescue, hazardous materials, and EMS services.
 - Examples: Railroads, canals, block parties, stadiums (soccer), malls, and lakes.

ESCI recommends that the completed risk assessment be managed by the KF&BD Fire Prevention Division. The risk assessment should be provided to all fire companies, administration and staff through an RMS, and should be updated on a predetermined schedule.

Critical Tasking by Incident Risk Type

Risk-based critical tasking and resources for structure fires is one type of incident that KF&BD responds. It should be understood, however, that today's fire departments respond to many other incidents besides structure fires, including hazardous materials incidents, motor vehicle collisions, basic and advanced life support incidents, and non-structural fires.

Critical tasks are those activities that must be conducted in a timely manner by firefighters and EMS personnel at emergency incidents in order to control the situation, stop loss, and perform necessary tasks required for a medical emergency. KF&BD is responsible for assuring that responding companies are capable of performing all of the described tasks in a prompt,

efficient, and safe manner. Figure 106 is an example of critical tasking for non-structure fire events and Figure 107 is for a motor vehicle collision with entrapment.

Figure 106: Non-Structure Fire Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Total	4

Figure 107: Motor Vehicle Collision with Entrapment Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Extrication	3
Patient Care	2
Total	9

ESCI recommends that field validation exercises be conducted to verify minimum staffing criteria of critical tasking. Following field validation, KF&BD may find that critical task staffing can be adjusted either upward or downward for each incident type. Additionally, some incidents may require automatic/mutual aid response to supply the personnel necessary to meet all critical tasking needs.

KF&BD will need to rely on mutual aid (preference for automatic aid) to achieve the number of apparatus and personnel needed for a high or maximum risk structure fire, hazardous materials, or technical rescue incident and incidents in outlying sections of the City. The reason for a large number of apparatus is related to equipment needs, such as air packs, hand tools, and hose lines, rather than pumping capacity. Actual apparatus and equipment needs may vary, based on incident type and magnitude.

Performance Expectations

There are time points and time intervals (continuum) that when recorded and analyzed against benchmarks become the basis for making modifications, additions, and deletions of resources. A set of time definitions includes:

- Event Initiation – The point in time when events occur that may ultimately result in an activation of the emergency response system. Precipitating factors can occur seconds, minutes, hours or even days before there is a perception that an event is occurring. For example, a person may ignore chest discomfort for days prior to making a decision to

seek assistance. Rarely is it possible to quantify the point at which event initiation occurs.

- **Emergency Event** – The point in time when conditions exist that cause an activation of the emergency response system. Considered the “point of awareness,” it may be the recognition by an individual that assistance is needed or it may consist of a mechanical or electronic recognition of an event such as smoke or heat detector activation.
- **Alarm** – The point in time when the emergency response system is activated. The transmittal of a local or central alarm to public safety answering point is an example of this time point. Again it is difficult to determine with any degree of reliability the time interval during which this process occurs.
- **Notification** – The point in time when an alarm is received by the agency, generally at a 9-1-1 communications center.
- **Alarm Processing** – The time interval from the notification to the time when the dispatcher notifies the appropriate emergency responder. NFPA 1221 (2007) states that 95 percent of emergency call processing shall be completed within 60 seconds and 99% of emergency call processing shall be completed within 90 seconds (see Figure 108).
- **En Route** – The point in time when the responding company informs the communications center via MDT/MDC or radio they are responding (traveling out the door).
- **Travel Time** – The time interval from when the responding company reports en route to the arrival time on-scene at the emergency.
- **On-scene** – The point in time when the responding company physically arrives at the emergency site. This is applicable to fire and EMS incidents. For EMS incidents it is the point in time when patient contact is made. “On-scene” time is confirmed by the company officer notifying NORCOM via MDT/MDC or verbal confirmation via mobile radio.
- **Working Period** – The time interval from when the responding company arrives on scene to when the company goes back in service. This is the period when fire department personnel physically take steps to mitigate an event. This stage is dynamic due to various types of incidents, incident locations, time of day and year and emergency actions performed at the scene.
- **Back In Service** – The point in time when a company has mitigated the incident and is available to respond again. Units use the MDT/MDC or verbal confirmation to indicate that the company is “back in service.”

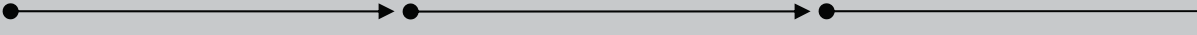
Dispatch Call Processing Time Objectives

Performance standards drive the staffing requirements for dispatch agencies. Operational performance requirements are the measurement of call answering and call duration/processing, up to and including, the point of initial dispatch. To underscore the importance of performance standards, *NFPA 1221*⁸⁵ notes compliance with performance standards “...shall be evaluated

⁸⁵ *NFPA 1221: Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.*

monthly using data from the previous month.” NFPA 1710⁸⁶ further defines this portion of call alarm time as call ring time, call processing time, and dispatch processing time. The following chart illustrates the benchmarks for performance measurements.

Figure 108: Communication Center Performance Measurement Benchmarks

Call Ring + Call Processing + Dispatch Time		
		
Call Ring Time	Call Processing Time ⁸⁷	Dispatch Processing Time
The time elapsed from time call enters the dispatch center telephone switch and the time elapsed until the call is answered. (Ring Time)	The time elapsed between call answer and entry into CAD with enough information for dispatch.	Dispatch processing time is the time elapsed between the call being time stamped for dispatch and the notification to the first unit for dispatch.
NFPA STANDARD 15 seconds, 95% of the time	NFPA STANDARD 60 seconds, 95% of the time	
Call Answer + Processing + Dispatch <i>Best Practice = 75 seconds</i>		

North East King County Regional Public Safety Communication Agency (NORCOM) serves as the community's public safety answering point (PSAP) for 9-1-1 calls and dispatching emergency resources including KF&BD. Data for analyzing recommended standards for call answering, call processing, and dispatching was outside of the scope of work for this project.

Company Turnout Time Objectives

Turnout time is defined as the period of time from receipt of dispatch to departure of the apparatus from its parked location. Total response time consists of three elements: alarm processing time, turnout time and travel time. Total response time can be critical to the outcome of an emergency incident. Safety considerations, traffic conditions, travel distance, and weather are examples of factors that influence travel time. KF&BD has little or no control over those factors but can control turnout time. Proper preparation and attitude are the primary elements that affect turnout time.

Different turnout time objectives are often implemented in recognition of the difference in preparation time to respond to incidents that require greater protective equipment. One

⁸⁶ NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.

⁸⁷ NFPA definition for call alarm time, call processing time, and dispatch time duration, NFPA 1710 Chapter 3, Section 3.3.37.1-3. ESCI utilizes the total call processing time, i.e. time on the phone for calculation of staffing data, and refers to this time as call duration.

standard is for the donning of PPE (personal protective equipment) for primarily EMS or non-emergent incidents. A turnout time for calls not requiring full PPE (turnout clothing), is often 60 seconds or less. For incidents with an IDLH (imminent danger to life and health) or the potential of an IDLH environment and atmosphere, the turnout time is 80 seconds or less.

Time of day has a bearing on turnout time. Turnout time when firefighters are asleep is generally longer.

Unusual circumstances may occasionally prevent an engine, aid unit, or other response company from meeting this standard. It is expected that turnout standards will be met without compromising safety during response.

ESCI recommends the following turnout standards be adopted by KF&BD:

- Turnout time for fire incidents between 0700 and 2200 hours of 80 seconds or less, 90 percent of the time
- Turnout time for fire incidents between 2200 and 0700 hours of 90 seconds or less, 90 percent of the time
- Turnout time for EMS incidents between 0700 and 2200 hours of 60 seconds or less, 90 percent of the time
- Turnout time for EMS incidents between 2200 and 0700 hours of 60 seconds or less, 90 percent of the time

Recording and benchmarking turnout time should be a regular measure of response time and service delivery.

ESCI recommends that KF&BD adopt the following total response time objectives. The following table (Figure 109 and Figure 110) details response by zone performance objectives for a two-tier response strategy for fire and EMS incidents.

Figure 109: Response Zone Performance Objectives, 0700 and 2200 hours

Modified Tiered					
Zone	Dispatch	Turnout	Travel	Total Response Time	Percentile
Urban					
Fire	60 seconds	80 seconds	4 minutes	6 minutes 20 seconds	90%
EMS	60 seconds	60 seconds	4 minutes	6 minutes	90%
Suburban					
Fire	60 seconds	80 seconds	5 minutes	7 minutes 20 seconds	90%
EMS	60 seconds	60 seconds	4 minutes 30 seconds	6 minutes 30 seconds	90%

Figure 110: Response Zone Performance Objectives, 2200 and 0700

Modified Tiered					
Zone	Dispatch	Turnout	Travel	Total Response Time	Percentile
Urban					
Fire	60 seconds	90 seconds	4 minutes	6 minutes 30 seconds	90%
EMS	60 seconds	60 seconds	4 minutes	6 minutes	90%
Suburban					
Fire	60 seconds	90 seconds	5 minutes	7 minutes 30 seconds	90%
EMS	60 seconds	60 seconds	4 minutes 30 seconds	6 minutes 30 seconds	90%

These response time objectives apply to the first due unit (engine company or aid unit). Specialty vehicles such as truck companies and hazardous materials units generally have longer response time objectives. Specialized response units are fewer in number, and typically cover a larger response area.

Reporting Frequency and Format

KF&BD has a tremendous amount of data to record, manage, and retrieve when they need it. Compiling data and information into a digestible report can be time-consuming to draft and costly to produce. What data to include in a report and the format to present information is as important as the material contained in the document. KF&BD creates reports and documentation of a large variety for internal and external use, and to meet compliance with federal and state law. Required reports and records maintained by KF&BD include:

- Incident reports
- Patient care reports
- Exposure records for blood and airborne pathogens
- Fire prevention documents
- Compliance testing
 - SCBA
 - Hose
 - Ladder
 - Pump
 - Breathing air
 - Vehicles
 - PPE (personal protective equipment)
 - Gas monitors, radiological detectors

Other reports produced by the fire department are related to specific programs or for KF&BD as a whole. These reports include:

- Emergency management quarterly
- Staff
- Performance objectives
- Annual EMS training
- Fire cause determination

Some KF&BD reports and records are produced and retained in electronic format for easier production, storage, retrieval, replication, and cost. However, other records including fire prevention inspections remain in hard copy only. The Fire Prevention Bureau is waiting for New World system to become operational. Even with an available computer system, the bureau reports that it does not have resources to enter the data.

Internal to Department

Internal reports for KF&BD should at a minimum include:

- Fire Investigation
- Fire department annual report including performance and activities
- Risk and Hazard analysis
- Standard of Cover
- EMS QA (Quality Assurance)
- Response activity

A newer tool being employed to report and display information is referred to by the coined name “Dashboard.” With a dashboard a visual summary of data is displayed, generally at a high level. Dashboards are popular as they enable a manager to view several performance indicators at once.

According to an article in Businessweek “The dashboard is the CEO’s killer app. A must have, making the gritty details of a business that are often buried deep within a large organization accessible at a glance to senior executives.” Dashboards allow for managers to instantly view developments and trends, empowering them to make changes rapidly.

External to City Council and Community

Information needs of the City Council and community require different report formatting, data elements and distribution methods. Information that might be important internally to KF&BD

may not be relevant to other audiences. Customizing a dashboard application for City Council members to match their requests is a way to keep current data in front of policymakers. Dynamic linking to incident activity data, response times, fire inspections, financial information, and other material is possible. Some of ESCI's clients have gone to tablet devices for delivering agendas, meeting minutes, documents, and have installed a dashboard for elected officials.

ESCI recommends that KF&BD disseminate reports (information) in a dashboard display customized for the end user. With a dashboard a visual summary of data is displayed, generally at a high level and with a view of multiple performance indicators. Two sample customized dashboards for internal and external customers are shown in the appendices (Appendix H: Dashboard View Examples).

For many communities, social media websites have become common avenues for public agencies to disseminate timely topical information quickly, efficiently, and economically. The City of Kirkland has a Twitter account that is available to the fire department. Current use of Twitter by KF&BD was reported as little and often used after the fact. Other popular media websites employed by fire departments includes MySpace and Facebook.

Conclusion – Accountability and Reporting

While the KF&BD is mostly meeting accountability and reporting requirements, there is a need for improvement. The accreditation process is one way for a fire department to make certain it is covering all of the accountability and reporting bases. The process of becoming an accredited agency is a time consuming, labor intensive, costly process. Therefore ESCI has recommended that the KF&BD make accreditation a long-term item and focus on other issues first.

In the last *Response Time Objectives Report* submitted (2010), KF&BD did not define the geographic areas where requirements are not being, explain predictable consequences, or the steps necessary to achieve compliance. The report does, include five initiatives in response to the report's information to address deficiencies and improve response times. KF&BD is meeting its stated response performance goals (including turn out time) approximately 50 percent of the time. KF&BD has not developed options to improve response performance. Without action to improve response time performance, subsequent reports will include similar results.

Tools for the reporting and archiving data and information of KF&BD activities are labor intensive. This is exemplified by the number of staff hours required to capture background

information for this study. Most of the improvements to reporting hinge on deployment of the New World CAD. Efforts should be directed at the implementation of the CAD system.

ESCI recommends that KF&BD disseminate reports (information) in a dashboard display customized for the end user. With a dashboard a visual summary of data is displayed, generally at a high level and with a view of multiple performance indicators.

Recommendation Summary – Accountability and Reporting

- ❖ Recommendation 82: Develop a long-term plan to become a CFAI accredited fire agency. (Implementation Order 9)
- ❖ Recommendation 83: Define and report (Response Time Objectives Report) geographic areas where response time objectives are not being met. Include information on predictable consequences and steps to achieve compliance. (Implementation Order 7)
- ❖ Recommendation 84: Determine the cause of the dramatic decrease in the percent of full alarm assignment deployments. Develop a plan to reach the stated deployment goal of 90 percent. (Implementation Order 6)
- ❖ Recommendation 85: Adopt a two tiered response time objectives for fire, EMS, hazardous materials, technical rescue, and specialized rescue incidents. (Implementation Order 3)
- ❖ Recommendation 86: Risk assessment RMS should be managed by the KF&BD Fire Prevention Division. (Implementation Order 8)
- ❖ Recommendation 87: Develop and adopt response time intervals, benchmark, and review at a minimum annually. Response time benchmarks should be monitored and analyzed to determine factors causing trends including increased service demand, concurrent alarms, and staffing levels. (Implementation Order 2)
- ❖ Recommendation 88: NORCOM – Establish communication center performance measurement benchmarks that meet national standards. (Implementation Order 5)
- ❖ Recommendation 89: Adopt turnout time standards based on incident type and time of day. (Implementation Order 1)
- ❖ Recommendation 90: Integrate the New World RMS (records management system) with emergency management plans, records, and reports. (Implementation Order 4)

