Table of Contents

Executive Summary **1**
Section I - Current System Analysis **3**
Organizational Overview 3
Management Components 11
Planning 18
Risk Management 24
Human Resource Management 29
Staffing 33
Capital Assets and Resources 37
Service Delivery 45
Training 59
Fire Prevention 66
Section II - Financial Analysis **72**
Overview 72
Cost Recovery Efforts 73
Future Organization Alternatives 74
Section III - Short and Mid-Term Strategies **76**
Policy Level Strategies 76
Administrative and Management Strategies 78
Capital Asset Strategies 80
Emergency Service Delivery Strategies 81
Training Program Strategies 82
Fire Prevention Strategies 84
Methods for Prioritization of Recommendations 85
Section IV - Recommended Long-Term Strategy **87**
Appendix I - Apparatus Condition Chart **91**
Appendix II: Dynamics of Emergency Response **92**

Table of Figures

Figure 1: Resource Allocation Comparison 4
Figure 2: Dundee Fire Department Organization Chart 7
Figure 3: Observed Decision-Making Organizational Structure 8
Figure 4: Population by Age Group Compared to U.S. Average 10
Figure 5: DFD Number of Incidents by Type and Year 10
Figure 6: City of Dundee Insurance Coverage Summary 25
Figure 7: Operations Staffing Summary 34
Figure 8: Comparison of Firefighters per 1,000 Population 35
Figure 9: Dundee Fire Station Facility Description 39
Figure 10: Apparatus Replacement Funding Table 40
Figure 11: Dundee FD City Vs Rural Response Comparison 47
Figure 12: Dundee Fire Department Five-year Workload History 47
Figure 13: Dundee Fire Department Responses by Period of Day 48
Figure 14: Dundee Fire Department Service Area 51
Figure 15: Dundee Fire Department Four-minute Travel Coverage 52
Figure 16: Dundee Fire Department Seven-minute Travel Coverage 53
Figure 17: Example Premiums Based on ISO Ratings 56
Figure 18: Table of Benchmark Comparisons 57
Figure 19: Recommended Inspection Frequency 69
Figure 20: Expenditures by Category and Year 73
Figure 21: Fire Growth vs. Reflex Time 93
Figure 22: Cardiac Arrest Event Sequence 95
Figure 23: Minimum Firefighting Personnel Needed Based Upon Level of Risk 98

Executive Summary

Purpose

Emergency Services Consulting inc. (ESCi) was engaged by the City of Dundee in cooperation with the Dundee Rural Fire Protection District to conduct an analysis of the City's fire service delivery system and to develop recommendations that will help guide the organizations plan to meet the future needs of the greater Dundee community.

The first section of the report provides a thorough and detailed evaluation of the agency, its management, assets, operations, and service delivery. The second section discusses the financial status of the department with a look at cost recovery options as well as a discussion on annexation opportunities. The final two sections provide feasible strategies for changes in the overall organizational structure of the fire department, and recommendations for the deployment of facilities, apparatus, and staff necessary to achieve a reasonable performance target.

City staff, especially City Administrator Eve Dolan and Fire Chief John Stock, as well as Dundee Rural Fire Protection District Board President Herb Kuhn were very generous with their time and provided a great deal of written and verbal information that was used to develop this report. The project team is grateful for their able assistance and cooperation throughout this process.

The information and data that was collected, by its very nature, is often dynamic and changes from moment to moment. Every effort has been made to compile data that is as comprehensive and accurate as possible. ESCi's information gathering process includes a broad evaluation checklist of the organization, measuring results against acceptable industry standards and good practices. Whenever possible, the project team made quantifiable comparisons to other fire service organizations.

Current System Analysis

The Dundee Fire Department has performed steadily for a long time in the current environment. The community has experienced moderate growth in population and service demand over the past five years. However, significant population growth is expected to occur over the next five to

ten years, which the current delivery system will be unable to accommodate. The future service delivery system will be very different from today.

The project team developed a list of recommendations that, if followed, will help to set the stage for future success. The list will appear daunting to fire department personnel and could lead one to believe that there are serious defects in the current system. This is not the case. The fire chief and fire department have done well with the resources that have been allocated.

System Demand

Dundee Fire was unable to provide the data necessary to conduct a thorough community risk analysis. However, it is apparent that with the planned water and sewer system improvements the City of Dundee can anticipate a steady pattern of growth and increased demand. ESCi relied on population projections provided by City staff to estimate future system demand. Annual service demand is expected to climb to over 744 incidents by 2025.

Short and Mid-Term Strategies

The report provides a list of recommendations for improving the efficiency and effectiveness of the current system.

Recommended Long-Term Strategy

The long-term strategy provides recommendations for the following critical issues.

- Community growth will rapidly outstrip the departmentôs ability to respond to calls for service.
- The departmentôs administrative infrastructure does not have the resource capacity to support expansion.
- The fire prevention, training, and safety functions are not adequate to address the needs of a growing department and community.
- The departmentôs fire station is currently inadequate and will not be able to house additional personnel required to meet increased demands from the organizationôs customers.
- The departmentôs current staffing level cannot accommodate the additional workload of increased emergency response demands.

Section I - Current System Analysis

Organizational Overview

The Dundee Fire Department (DFD or Department) is a department of the City of Dundee (City), which is a municipal corporation, formed under the laws of the State of Oregon. The City has the authority to levy taxes for the purposes of providing municipal service including fire and emergency medical services (EMS). The Departmentôs jurisdiction encompasses all areas within the city limits of Dundee. The Dundee Rural Fire Protection District contracts with the City for services. The current response area includes suburban areas containing residential development, limited commercial and industrial development, and rural farmland areas. The Departmentôs jurisdiction is situated in Yamhill County approximately two miles southwest of the City of Newberg.

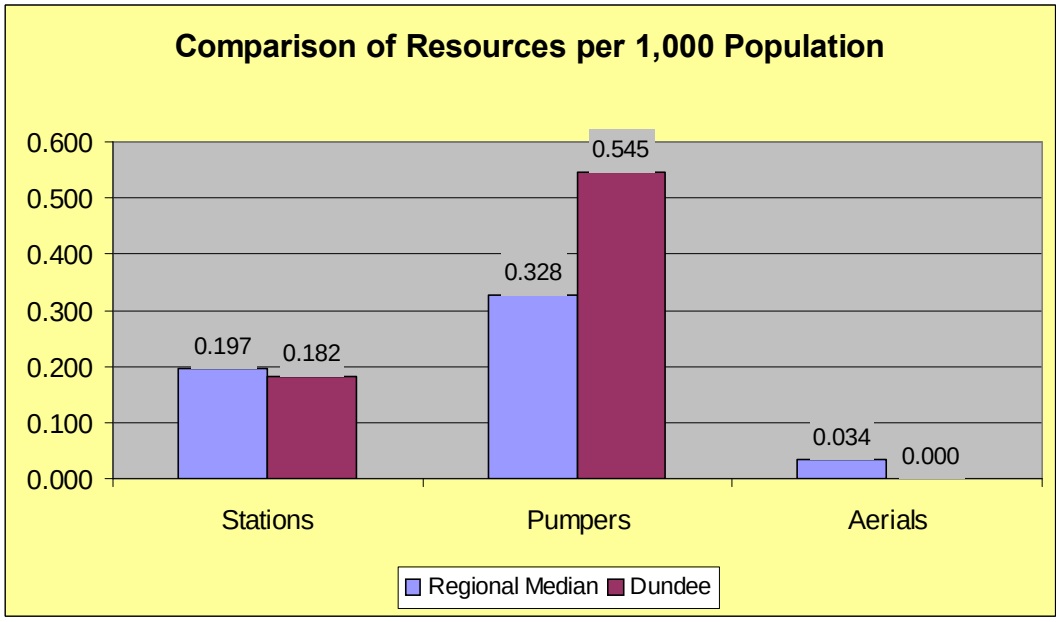
DFD provides emergency services to a population of 5500[1] in an area of roughly 13 square miles. Fire services are provided from a single fire station located within the City of Dundee. The Department maintains a fleet of vehicles including three fire engines, one water tender, two wildland firefighting vehicles, one light rescue, and one command unit.

In addition to the fire chief and one temporary/part time firefighter, 18 volunteers provide emergency response coverage. Three volunteer lieutenants assist with command responsibilities and manage specific projects. This makes up the total of 20 personnel involved in delivery of service to the jurisdiction.

The following figure provides an overview of the Dundee Fire Departmentôs fire suppression resources and compares these with the average rate of resource allocation in other communities of similar size within the western region of the United States[2].

[1] Data provided by the City of Dundee.
[2] U.S. Fire Administration/National Fire Protection Association, *Fire Department Profiles,* 2003, NFPA, Quincy, MA.

Figure 1: Resource Allocation Comparison



The chart demonstrates that DFD has a slightly below average allocation of stations when compared to the typical deployment for communities of its population. Furthermore, DFD has a reasonably average number of pumpers and is below the average for aerial devices when compared as a ratio to population served.

The DFD provides a limited number of services including fire suppression, EMS first response, hazardous material response, and vehicle extrication. Life safety inspections in commercial and industrial occupancies are provided on request, as are fire and accident education programs and community relationsôactivities.

Dundee Fire Department has achieved a current score of Class 4/8/9 on the Insurance Services Office (ISO) Community Fire Protection Rating system used to determine fire insurance rates on many structures. The most recent full survey conducted by ISO on the Department was performed in 1998/2000. The City is equipped with pressurized fire hydrant systems, however no hydrants are provided in the rural sections of the service area.

Responsibilities and Lines of Authority

Dundee operates under a council-manager form of government. The city council has the power and authority to govern the provision of fire protection and emergency services within the City including organizing a fire protection system, purchasing land and equipment, entering into contracts, issuance of bonds, and levying of taxes. The city administrator carries out day-to-day management of the City's affairs. The city administrator has delegated the responsibility of appointing members of the fire department to the fire chief.

The role and authority of the city council and the city administrator is further clarified within city ordinances and written policy documents describing their function and tasks. The elected officials typically maintain strictly policy-level involvement, avoiding direct management and hands-on task assignment.

The fire chief's position is appointed by the city administrator and is not provided with a personal services contract. The city administrator provides a formal written performance evaluation of the fire chief on an annual basis that documents performance and establishes personal objectives.

Foundational Policy

Organizations that operate efficiently are typically governed by clear policies that lay the foundation for effective organizational culture. These policies set the boundaries for both expected and acceptable behavior, while not discouraging creativity and self-motivation. Most municipalities maintain policy and procedure manuals at multiple levels.

Municipal code is the basic policy-level direction given by the governing body, such as the city council. Administrative rules are usually developed and maintained by the highest-level administrator of the organization and provide direction that fulfills the policies described in the city code as well as providing guidance and instruction to all employees. The department manager develops operational policies or guidelines that provide department-specific guidance.

The City, as well as the Department, should maintain a comprehensive set of rules and operating guidelines. Dundee does maintain city codes and administrative rules. DFD has drafted a set of standard operating procedures (SOPs).

ESCi recommends that a review of the City administrative rules be initiated. The administrative rules should contain all of the rules that all personnel in the organization are required to comply with at all times. Administrative rules, by definition, require certain actions or behaviors in all situations. The city administrator or city council will typically adopt or approve the cityôs administrative rules. The authority to enforce the administrative rules should be delegated to the city administrator and department managers. The administrative rules should govern all employees of the city, career and volunteer. The administrative rules should be updated on a regular and systematic basis.

Specifically, the administrative rules should contain sections that address:

- Public records access and retention
- Contracting and purchasing authority
- Safety and loss prevention
- Hazard communication program
- Harassment and discrimination
- Personnel appointment and promotion
- Disciplinary and grievance procedures
- Other personnel management issues

Organizational Structure

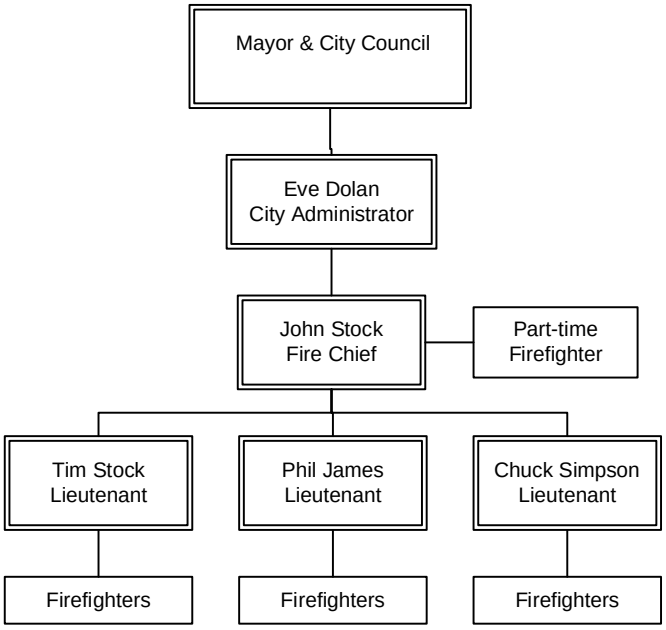
A well-designed organizational structure should reflect the efficient assignment of responsibility and authority, allowing the organization to accomplish effectiveness by maximizing distribution of workload. The lines on an organizational chart clarify accountability, coordination, and supervision. Thorough job descriptions should provide the details of each position and ensure that each individualôs specific role is clear and centered on the overall mission of the organization.

The Dundee Fire Department operates with job classifications and descriptions for fire chief and volunteer firefighters that accurately reflect the responsibilities and activities of the agencyôs members[3]. They were last revised in 2004.

A review of this agencyôs organizational chart reveals that they are organized in a typical top-down hierarchy. There is a reasonable distribution of responsibilities and authority.

[3] Job descriptions provided.

Figure 2: Dundee Fire Department Organization Chart



The organizational structure of the Department, as shown on the organization chart, demonstrates a clear unity of command, in which each individual member reports to only one supervisor (within the context of any given position) and is aware to whom he or she is responsible for supervision and accountability. This method of organization encourages structured and consistent lines of communication and prevents positions, tasks, and assignments from being overlooked. The overall goals and objectives, if developed, of the organization can be more effectively passed down through the members in a consistent fashion.

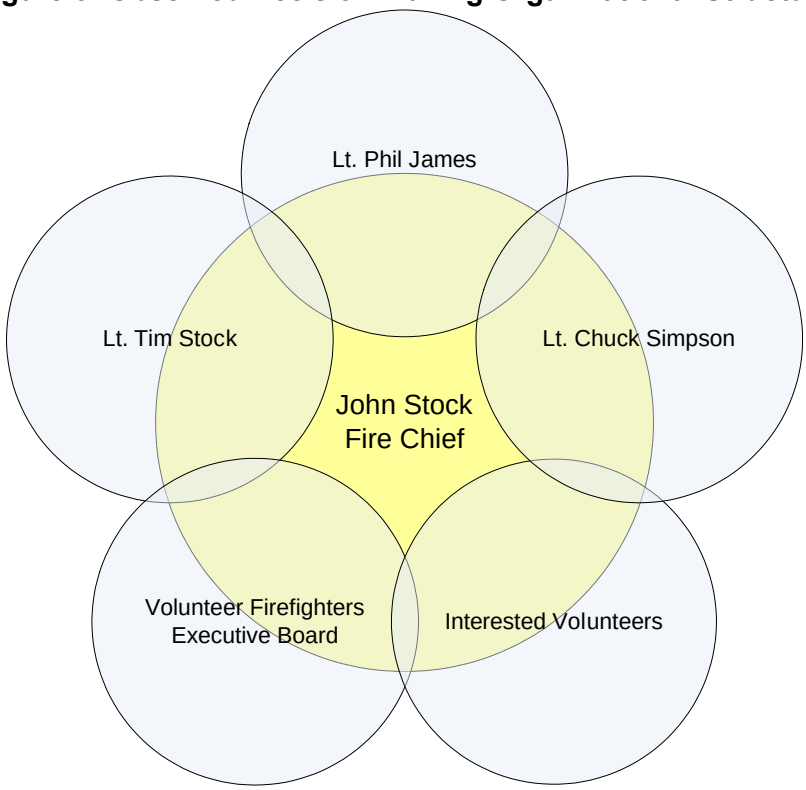
As shown, the organizational structure is charted with clear, designated operating divisions that provide for a clear chain of command. The fire chief directly supervises only three individuals, the lieutenants. The span of control in an organization of this size is typically very small. In reality, the fire chief supervises all of the personnel on occasion, which falls within an acceptable span of control.

In growing organizations, chief officers often accept or encourage a span of control that greatly exceeds their ability to maintain good communication and leadership. While well intentioned, excessive span of control is often a detriment of the department. As DFD grows, the chief will

need to review and adjust the Departmentôs organization to maintain an appropriate span of control.

The organizational chart shown above does not fully represent the management of the organization. The fire chief includes the lieutenants as well as all the personnel in the decision-making process. Through our interviews, we conclude that the decision-making organizational structure of DFD is more accurately reflected in the following figure.

Figure 3: Observed Decision-Making Organizational Structure



Maintenance of History

The Dundee Fire Department maintains a minimal amount of history retention. The city administrator maintains the appropriate records of municipal meetings in accordance with state laws governing public meetings and decisions involving public funds. The Department does formally maintain a scrapbook and produces an annual report. The file containing items of historical significance, including pictures, newspaper articles, etc. needs to be updated.

A historical perspective of a departmentôs activities and growth is an invaluable tool in the organizationôs development. A regularly maintained historical record serves as a tool for planning and decision-making. It allows quick recollection of how the department has adapted to changes in the community. It provides valuable historical data to the governing body and agencies, such as the Insurance Services Office, for evaluation purposes. It also allows for the permanent memory of the people who have contributed to the success of the department in its service to the community.

The fire chief produces an annual report that does not include all of the elements mentioned above. A comprehensive annual report will serve to organize the departmentôs history into a format that is easily retrievable. In addition, an annual report is an effective communications tool for sharing the efforts and activities of the department with the public.

At a minimum, an annual report should include:

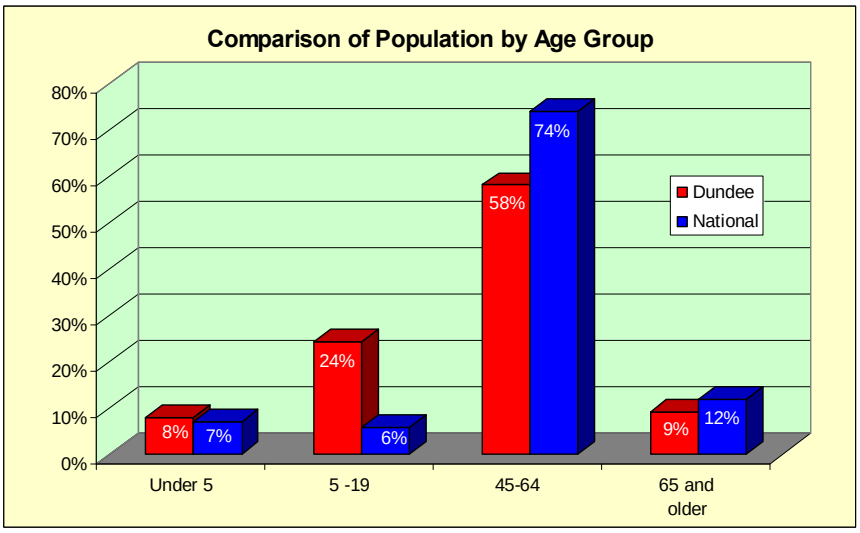
- A brief history of the department
- Summary of events and activities during the report year
- Description of major incidents handled by the department
- Descriptions of new or improved services and programs
- List of people who served with the department during the year
- Awards received by the department or individuals
- Financial summary including revenues and expenditures, grants, etc.
- Statistical analysis, with trends, of key community service level indicators

The annual report should be printed and distributed to the community and made available at City facilities, the fire station, and community gathering places.

Population

The Dundee Fire Department provides direct emergency services to an estimated population of nearly 5,500. The City population has grown at an average rate of 5.5 percent over the past 25 years with the greatest growth occurring in the 1990ôs.

Figure 4: Population by Age Group Compared to U.S. Average

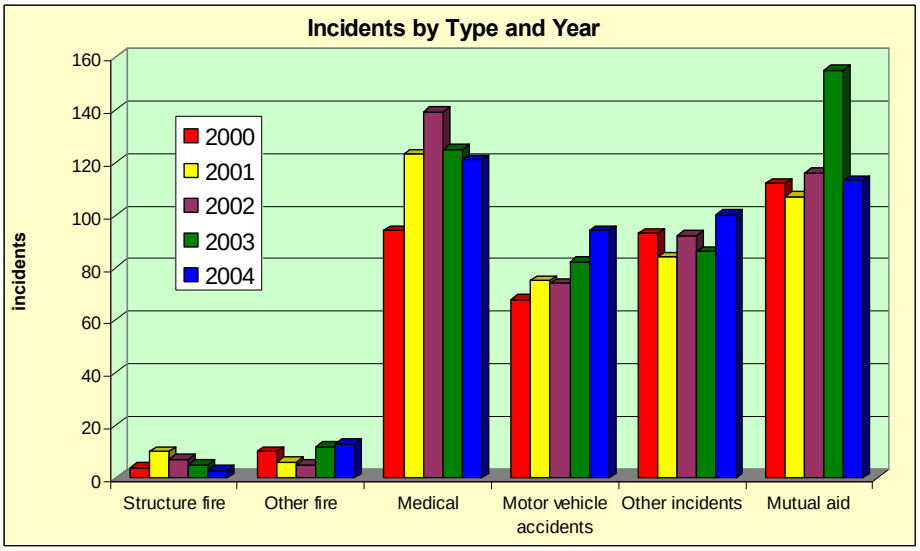


During the last decade (1990-2000), the population of Dundee grew by 56 percent. Additional growth is expected over the next ten to fifteen years.

Alarms

According to the data provided, the Dundee Fire Department responded to 444 emergency calls in 2004. The following figure provides a breakdown of the workload for DFD emergency responses. If response workload continues at this pace, the Department can expect to respond to nearly 900 calls for service by the year 2025.

Figure 5: DFD Number of Incidents by Type and Year



Management Components

Organizational growth and management are common fire service challenges. In Dundee, growth and management have not been significant challenges. Dundee has been facing moderate growth over the past five years. Future growth predictions hinge on the proposed state highway bypass and development of expanded water and sewer services. Once the major infrastructure issues are addressed, dramatic growth will follow. With community growth comes an increase in workload, changes in staffing to meet the increasing demand, and increases in organizational infrastructure to support the personnel responding to the community's needs.

Personnel management always presents unique issues involving the consistency and adequacy of response, maintenance of competencies, and recruitment of the future workforce. This portion of the report examines the Department's efforts in personnel management and its preparation for the future health of the organization.

Mission, Vision, Strategic Planning, Goals, and Objectives

The City of Dundee has recently updated the 1978 Comprehensive Plan to include the Transportation System Plan, Wastewater Facility Plan, Water Master Plan and is in the process of updating the Storm water Master Plan and Downtown Refinement Plan. The City and DFD annually review and update a list of goals that includes a mission statement, vision, and values statement for its employees to embrace.

Availability of Standard Operating Guidelines, Rules, Regulations, and Policies

The City maintains city codes and administrative rules. The department maintains a set of standard operating guidelines (SOGs). The existing SOGs are in draft form only. Regardless of the quality or condition of such policies and guidelines, their availability and familiarity to all personnel is critical.

Copies of the SOGs are kept in the chief's office, and are otherwise not readily accessible to the Department's members.

A significant financial and legal risk exists when common practice does not follow guidelines, procedures, or policy. A number of factors can cause a practice to shift gradually away from policy. An out-of-date policy is one of the factors where practice commonly does not match

policy. When this occurs, the policy-making authority must either reinforce the policy or change it to match the practice. When policies are driven by regulation, such as federal OSHA rules, the practice must match the policy.

There are a number of effective policy and procedure formats and ESCi recommends the creation of a three-section document called the Manual of Operations.

The Manual of Operations will contain standard operating guidelines (SOGs), policy statements, and general orders. The manual should provide for a program of regular, systematic updating to assure it remains current, practical, and relevant. The contents of the manual should be developed, approved, and enforced under the direction of the fire chief.

The SOG section should contain operational standards of practice for personnel of the department. SOGs are different from policy statements and the city administrative rules in that variances are allowed in unique or unusual circumstances where strict application of the SOG would be less effective. SOGs should be developed for standard fire ground operational practices, communications, vehicle operation, training, uniforms, and appearance, and others.

The policy statement section should contain the departmentôs rules that regulate behaviors and actions. Policy statements should be developed that address, at a minimum, the departmentôs safety program[4], respiratory protection program[5], and personal protective equipment program[6].

General orders (GO) are temporarily instructions to personnel regarding current or new SOGs or policy statements. GOs should sunset in 180 days or less, or should become a policy or SOG.

Critical Issues

It is extremely important that there be a clear understanding of critical issues facing a fire department. Without a clear understanding, the department leadership cannot be prepared to

[4] National Fire Protection Association, *NFPA 1500: Standard on Fire Department Occupational Safety and Health Program,* 2002, NFPA, Quincy, MA.
[5] As per Code of Federal Regulations ï 1910.134 and NFPA 1500.
[6] As per NFPA 1500.

face these issues. In addition, the enunciation of critical issues to department members increases their awareness of the organization's priorities and helps them to focus on solutions. Fire Chief John Stock has articulated the following critical issues as issues with significant potential for affecting the success of the organization and the effectiveness of its service. Further exploration of critical issues should occur during a strategic planning process with internal and external stakeholder input.

In the Dundee Fire Department, they are:

- The continuation of positive, professional, and mission driven relationship between the City of Dundee and Dundee Rural Fire Protection District
- The need to provide additional staffing - volunteer and career
- The need to address structural integrity and adequacy of the Dundee fire station
- The need to provide adequate funding for capital projects, maintenance, and replacement
- The need for improvement in working relationship between the Newberg Fire Department, Newberg Dispatch Center, and Dundee Fire Department

As with critical issues, it is important for any agency to have an appropriate level of future thinking. This permits an agency to identify what external challenges may present themselves to the organization in the coming years. This awareness of future challenges ensures that the department does not miss opportunities or blindly stumble into a crisis unprepared.

Internal and External Communications

Quality communications is an important and achievable goal for any organization, but one that always seems to be most elusive. The fire chief has established some simple, but effective communication processes within DFD that provide opportunities for department personnel to be heard and be involved. Additional effort should be put into communication during periods of change in order for the organization to be successful.

Officer meetings involving the chief and lieutenants are held on a regular basis, approximately once a month. Regularly scheduled meetings permit personnel to exchange ideas, share issues and concerns, apply creative teambuilding and problem solving, and improve the overall flow of communications.

Minutes or summaries of staff meetings are kept and available for review by members each month by being posted on the station bulletin board each month**.** This form of communication encourages members to share ideas on issues involving departmental issues, enhancing a feeling of empowerment among personnel.

Written formal memorandums are not regularly utilized for distribution of information. Information is generally disseminated to the members verbally or by posting information on the Department bulletin board. Formal memorandums would ensure that all members receive critical data in an organized and consistent fashion. This process also provides a critical written record of internal communications that are important to organizational efficiency. A systematic method for distribution of written communications is currently not available and the potential exists for members to be left out of the information loop.

The chief meets with nearly all personnel on a regular basis during Monday night drills. Meetings or forums are held for the purpose of exchanging information and discussing concerns, ideas, or issues directly with senior staff. These types of opportunities enhance the feeling of teamwork, open lines of communications, and encourage a feeling of ownership among the members. The fire chief is very comfortable with the method of communication and is encouraged to continue.

Due to limited staff time, a member newsletter has not been developed. Internal newsletters provide an excellent opportunity for distribution of the organizationôs news and information, as well as less formal information about members such as birthdays, marriages, or personal off-duty accomplishments. Though such newsletters require significant effort, they have proven very beneficial in organizations that utilize them.

Departmental bulletin boards are adequately controlled and organized, with information being sorted and updated on a regular basis.

Except for the fire chief, departmental email addresses are not available to members and email is not used to distribute information. Email can be an efficient and verifiable method of

information distribution. Voicemail is available for the fire chief, but is currently impractical for use by other department members.

External communication is limited at this time; however, a number of the Departmentôs members are active in community organizations and service clubs. The most typical external communication methods are newsletters, advisory committees, community surveys, websites, and focus groups.

The City produces a quarterly community newsletter and the fire chief provides information for these newsletters. These publications are an excellent way to release information about the fire department and its accomplishments, and to provide fire and accident prevention messages. It is an excellent tool for improving and maintaining positive public relations.

A formal procedure has not been established for handling complaints from the public. A procedure should be developed that ensures that complaints are handled consistently, quickly, and with due process.

Dundee Fire Department is included on the City website at www.DundeeCity.org. The current information provides the viewer with basic information regarding alarms, equipment, and personnel. A website is an excellent way of distributing information and communicating with the public. Future web pages should include fire prevention information, strategic and master plans, messages from the leadership, and a variety of information sufficient to answer the most frequent inquiries of the public at-large. The current site is updated weekly.

The Department should consider the establishment of a public survey or questionnaire intended to provide customer feedback on service priorities, quality issues, or performance efforts. Surveys, when utilized appropriately, can provide valuable input for organizational planning, especially during a phase of significant growth.

Document Control and Security

Records management is a critical function to any organization. A variety of uses is made of written records and, therefore, their integrity must be protected. State law requires public access to certain fire department documents and data. Clear written procedures are in place to provide

for public records access through the department. Paper records (hard copy files) are adequately secured with passage and/or container locks with limited access. Important computer files are backed-up to a secure data location on a regular and consistent basis.

The Dundee Fire Department has a significant investment in facilities, apparatus, equipment, and other items, along with its financial assets. Protecting these assets is very important. The station is consistently locked and offices are adequately secured from unauthorized entry. Public access to the building is sufficiently limited to business areas. Keys are issued to all DFD personnel for access to the fire apparatus and fire station common areas. Punch code lock mechanisms are recommended for access by volunteer responders and key access should be limited to senior staff.

A security and fire alarm system have not been installed to provide for automatic notification of unauthorized entry or break-in and early smoke and fire detection. DFD is strongly encouraged to install appropriate security and fire detection system through out the fire station.

The Department has one computer that is password protected for use and sensitive file access. Firewall protection is in place for internet access. The protection is adequately up-to-date and capable of preventing most unauthorized network intrusions. Up-to-date virus protection software is utilized on all incoming email, and files and operating systems are regularly scanned for undetected virus infection.

The Department maintains a current inventory of capital assets and a process is in place to maintain this inventory.

Currently, the city administrator and the utility billing clerk have a City issued credit card. DFD uses a purchase order system or personal credit card when small purchases are necessary for operations. Accounting systems are in place to provide security and reimbursement for appropriate expenses.

The Health Insurance Portability and Accountability Act (HIPAA) included regulations that require all individually identifiable health care information be protected to ensure privacy and confidentiality when stored, maintained, or transmitted. The law primarily applies to agencies

involved in transportation and billing of patients. Still, the Department, as it is involved in EMS first responder services, should appoint a HIPAA compliance officer and institute strict policies to guide medical records security. Efforts to access response records containing protected medical information should be strictly controlled and require appropriate identification of the purposes involved in such access.

Reporting and Records

The Department does not utilize records management software to enter and store incident information. Incident reports are handwritten and filled with the State Fire Marshal. ESCi recommends that a computer program that is compliant with NFIRS (National Fire Incident Reporting System) standards be purchased and utilized at the earliest opportunity.

Training records are maintained in the CertRight® records management system, permitting retrieval of reports on training attendance, certification status, and subject matter. DFD also uses CROSSFIRE software for storing and reporting on a wide variety of code enforcement, public education, and hydrant records. Maintenance records for apparatus and equipment are maintained in a manual system.

Personnel records are complete and up-to-date, and maintained in a manner that protects private medical information. Records are maintained on employment history, discipline, commendations, work assignments, injuries, and exposures. Financial activities, including budgets, expenditures, revenues, purchase orders, and other encumbrances are kept in a financial records management software system. Microsoft Excel® is used for departmental budget preparation and expenditure monitoring.

The Department uses a PC-based computer with Windows XP Professional® as its primary operating system. The Department computer is not networked to the municipal server. Current internet access is through a broadband connection

Planning

Emergency services exist in a rapidly changing environment. Along with improvements in tools and methods used to provide service comes increased regulation of activities, new risks to protect, and other challenges that can quickly catch the unwary off guard. Only through continuous internal and external environmental awareness and periodic course corrections can an organization stay on the leading edge. The DFD has recognized the need for a stronger planning effort by pursuing this evaluation and master plan.

Organizational Planning Processes

The process of advanced planning for occurrences that will take place in the future requires both discipline and organization. In order to be truly effective, an emergency services agency must consider planning on four distinct levels - tactical planning, operational planning, strategic planning, and master planning. Tactical planning is practical preparation of incident strategies for potential emergency incidents. Operational planning is preparation for the day-to-day activities of the agency and its integration into other regional or national response networks. Strategic planning supports the departmentôs mission and sets the short-term departmental goals. Master planning (long range planning) is preparation for the future success and effectiveness of the agency in a changing environment.

The only planning that is being actively pursued in DFD and the City is comprehensive community planning and limited capital improvement planning. In the absence of a strategic or master planning effort, it is difficult for policy makers and department managers to know when an appropriate level of service is achieved or when service levels are being negatively impacted. The long-term planning process that is conducted in this study will suggest a future quantitative analysis of the level or quality of service. However, DFD must engage in the other planning processes in order to develop well-defined performance objectives at the department level, provide for the safest and most efficient emergency response, and to ensure that future goals and objectives are met.

Tactical Planning

A firefighterôs emergency work area is foreign to him or her. Normally, a firefighterôs first visit to a building is when the building is involved in fire or other emergency. This is also the point in time where the internal environment is at its worst. Contrary to Hollywoodôs portrayal of the

inside of a building on fire, visibility is at or near zero due to smoke. A lack of familiarity with a building can easily lead a firefighter to become disoriented or injured by an unfamiliar internal layout, or by equipment or other hazards that might be encountered.

It is critically important that firefighters and command staff have comprehensive, accurate information readily at hand to identify hazards, direct tactical operations, and use built-in fire resistive features. This can only be accomplished by building familiarization tours, developing pre-fire plans, and conducting tactical exercises, either on-site or by tabletop simulation.

Establishing a comprehensive process to create and maintain pre-incident plans should become a priority for the DFD. A defined list of target hazards should be developed and aggressive effort taken to ensure response crews have copies of these plans available. Target hazards are defined by:

- Buildings with large potential occupant loads
- Buildings with populations who are partially or completely non-ambulatory
- Buildings of large size (greater than 12,000 square feet)
- Buildings that contain process hazards such as hazardous materials or equipment

Pre-incident plans should be easy to use, quick reference tools, for company officers and command staff. At a minimum, a pre-incident plan should include information such as:

- Building construction
- Occupant characteristics
- Incorporated fire protection systems
- Capabilities of public or industrial responding personnel
- Water supply
- Exposure factors
- Facility layouts

National Fire Protection Association (NFPA) 1620 provides excellent information on the development and use of pre-incident plans and should be used as a reference.

Once pre-plans are established and/or updated, training should be provided to all personnel who may respond to an incident at those locations. In addition, copies of pre-incident plans and drawings should be available on each response vehicle.

Operational Planning

The DFD has local mutual aid agreements with neighboring emergency services organizations. Automatic response agreements are in place with Newberg Fire Department and Dayton Fire District. Hazardous materials and technical rescue response is available on an informal, special request basis through neighboring departments.

DFD has a working relationship with Yamhill County Emergency Management, participating in the county's last disaster-planning project. A comprehensive and current emergency plan is maintained by Yamhill County and is an excellent resource for ensuring adequate resources are readily available to control major events. The City does not have a current emergency operation plan.

The Superfund Amendment and Reauthorization Act, found in Title III of the Federal Code (SARA Title III), defined requirements for the tracking of hazardous materials used in fixed facilities and established requirements for emergency response planning. Yamhill County Emergency Management Office facilitates the Local Emergency Planning Committee (LEPC) responsibility for the City. The LEPC is charged with the responsibility to identify and collect information on the use of hazardous materials by private and public entities. Information collected includes the type of material, quantity, and location at each site. Additionally, the LEPC is charged with ensuring local response plans are adequate based on potential risk.

SARA Title III requires industries that use over a threshold limit of certain highly hazardous materials (extremely hazardous substance facilities ï EHS) must develop comprehensive emergency plans for their facility. The Act requires that local fire departments coordinate with the involved industry to ensure a quality response to the emergency.

The DFD and the Yamhill County emergency manager, in concert with the LEPC, need to confirm that all EHS facilities within DFD's service area have been identified, ensure that a local

plan has been developed, confirm that all mandated reporting forms are being received, and that Department operations have been coordinated with it.

Strategic Planning

A strategic plan sets in motion a process for meeting the short-term needs of a department. A planning document or strategic business plan provides direction for both day-to-day activities as well as larger or long-range projects. It charts a clear direction for future.

Due to its small membership, DFDôs strategic planning effort could involve all of its members. External stakeholder input should also be gathered from senior city staff, city council, the Rural Fire Protection District, and a citizens group to help the organization identify critical issues and goals. Experience has shown that strategic planning efforts commonly lead to improved morale, commitment, and an increased sense of responsibility for organizational problem solving.

Establishing a customer oriented, long-term strategic plan would accomplish the following:

- Develop a mission statement giving careful attention to the services currently provided and which logically can be provided in the future
- Develop a vision of the future
- Establish the guiding principles of the members of the department
- Identify the strengths of the department
- Identify the weaknesses of the department
- Identify areas of opportunity for the organization
- Identify potential threats to the organization
- Define the services provided to the community
- Establish the communityôs service priorities
- Establish the communityôs expectations of the department
- Identify any concerns the community may have about the organization and its services
- Identity those aspects of the organization and its services the community view positively
- Establish realistic goals and objectives for the future
- Identify implementation tasks for each objective
- Define service outcomes in the form of measurable performance objectives and targets
- Develop organizational and community commitment to the plan

Master Planning

A master plan is intended to complement the City's planning process. The master plan provides an over arching view of how the City should to respond to the approaching significant growth. This evaluation is intended to support a master planning process for the City of Dundee and Dundee Rural Fire Protection District.

External Planning Involvement

Because the community is the recipient of services and the source of funding for services, their needs and expectations must be a key consideration to selecting the type and level of provided services. Though some effort is made to solicit these views, additional involvement tools should be considered.

The Dundee Fire Department has not conducted a community survey that would solicit a base of community expectations, concerns, or positive feedback. A well-crafted survey should be considered, as it will provide valuable information to the organization. Surveys should be conducted periodically to ensure the department's knowledge of community expectations is current, and any concerns are documented and dealt with appropriately.

The DFD may wish to consider establishing a citizen's advisory committee/board. This committee/board would provide advice and input to the Department and elected officials on such matters as:

- Long-term strategies
- Staffing strategies
- New services and programs
- Performance objectives and targets

This third party approach can provide another perspective to fire department needs and provide additional credibility to department budgetary, policy, and resource requests.

Internal Customer Planning Involvement

The members of a fire department are also, in a fashion, customers of the organization. They depend on the chief to ensure they have the tools, training, and other support they need to be successful in providing vital community services.

Those delivering the service often have the best ideas about how to improve it. Effective member involvement is a proven management strategy that is a significant opportunity for the department. Fire Chief Stock subscribes to a participatory leadership style that is open and available. He has a solid sense of his authority and responsibility, and understands how participatory leadership leads to decision-making.

Risk Management

It is the responsibility of a manager to safeguard the assets of their organization. This is just as applicable to a fire department as to any business. The management of internal risk is just as important as managing community risk. The fire department is open to a variety of risk similar to those faced by every private organization. These risks can keep the organization from successfully carrying out it mission.

There are interesting parallels between a fire department and private enterprise. A risk manager in the private sector tries to protect the assets of the enterprise and ensure that it can stay in business. Similarly, a fire department risk manager tries to protect public assets including personnel, facilities, equipment, and making sure the organization can perform its mission.

The fire department manager is a custodian of public funds and assets. The manager must restrict any undesirable outcome that costs money, consumes public dollars, and reduces the capacity to spend funds where they would do the most good.

The risk management function for City of Dundee is performed by the city administrator who is also responsible for human resource management and many other functions. City County Insurance Services conducted a risk assessment for the City this past year and the report has been reviewed by the Department. ESCi congratulates the City for being proactive in its approach to risk management and human resource management. ESCI further recommends that continued interaction between the City Administrator (functioning as the risk manager) and the department include:

- Periodic safety and risk inspections of fire department facilities including ergonomic assessment of all work spaces
- Periodic comprehensive risk analysis consisting of claim experience, judicial issues, benchmarks, and insurance review
- Safety committee oversight
- Claim frequency review, workplace and work process evaluation, and loss reduction strategy development
- Employment risks including records management, and hiring and termination practices
- Liaison between department and regulatory (safety) agencies

- Review of city and departmental code, administrative rules, and procedures for potential risk exposure
- Review of contracts and agreements for potential risk exposure
- Training of fire officers on emerging risk such as national liability claim trends, injury prevention, etc
- Periodic review of facility, liability, equipment, and vehicle insurance coverage
- Risk pool management

Liability Issues

Nothing is accomplished without some element of risk. Since avoiding risk altogether is impossible, effective management of risk is necessary. This involves a variety of strategies including transferring risk to a third party via insurance. Dundee maintains liability insurance coverage for the DFD through the City County Insurance Services as follows:

Figure 6: City of Dundee Insurance Coverage Summary

City of Dundee Insurance Coverage[7]	
Liability Insurance Coverage's	**Amount**
General and Auto Liability	$2,000,000
Property/Mobile Equipment	$3,071,165
Excess Crime	N/A
Auto Physical Damage	Various amounts on specific apparatus
Boiler and Machinery	Various amounts on specific equipment
Excess earthquake	N/A
Workers compensation insurance	Data not available

We suggest the City continue to review insurance coverage needs with their Agent of Record on an annual bases.

Employment Risks

The DFD hiring process is defined in the Dundee Personnel Handbook and is administered by the city administrator. The fire chief manages the recruitment of new volunteer firefighters from

[7] Source: City of Dundee insurance declaration to auditorâs document.

the community. Interested persons must complete a formal application for employment in order to be admitted as a volunteer. Documentation of a high school diploma or GED is required.

In national surveys, firefighters are routinely considered the most trusted and respected members of our society. Firefighters are charged with the responsibility of entering and taking control of another personôs possessions in order to extinguish a fire. Fire departments must ensure that the people they hire are of the highest moral character. Properly conducted background and driving record checks are a way to determine if a person can meet societyôs standards, and reduce risk.

Entry-level knowledge or physical ability testing is also important to the success of the organization and the individuals that it hires. Testing provides the department with solid information as to whether an individual has the knowledge base and is physically capable of performing the rigorous tasks involved in emergency services. DFD performs an adequate knowledge and physical ability testing process.

The City maintains the official personnel files for employees, and duplicate files are maintained by DFD including training documentation, disciplinary actions, medical, and attendance records. Annual safety training is conducted by DFD, including basic fire ground safety, infection control, driver training, respirator training, self-contained breathing apparatus (SCBA) fit test, and SCBA safety checks.

The personal protective equipment for todayôs firefighter consists of a multitude of items. The basic firefighting ensemble includes a helmet, hood, jacket, pants, boots, and gloves. When operating machinery such as saws or rescue tools, the responder must also wear hearing and eye protection. The face shield supplied by most helmet manufacturers is not considered sufficient eye protection when operating power saws and a standard set of safety glasses or goggles must be worn for that activity.

Medical responders must wear, at a minimum, latex or nitrile gloves and eye protection for disease and blood born pathogen protection. When more contagious, communicable diseases are suspected, a HEPA filtration mask and gown must be added. It is the responsibility of the agency to provide and have readily available all of these protective items.

All DFD members are provided with a full structural firefighting ensemble. Goggles and hearing protection are not available. Communicable disease protection is limited to a supply of nitrile or latex gloves on each apparatus.

Property Issues

The City maintains property loss coverage for DFD through the City County Insurance Services. Appropriate property insurance coverage appears to be in place for DFD.

Health and Safety

Firefighting is a very stressful job that requires physically and mentally fit personnel to perform it safely and efficiently. Heart attacks account for approximately 50 percent of firefighter fatalities. Of those, 50 percent had existing heart problems. It is clearly in the interest of a department and the individual firefighters to ensure programs are in place to periodically review and support high levels of medical and physical fitness.

DFD conducts an annual physical abilities evaluation of each member. The agility program was adapted from programs conducted by neighboring organizations. The evaluation does provide the Department with solid information as to whether an individual remains physically capable of performing the rigorous tasks involved in emergency services.

Physical ability testing cannot detect all potential limiting conditions of an individualôs health and fitness levels. A periodic medical examination is necessary. National standards for firefighters recommend a regular medical examination. The evaluation should include all the criteria included in the entry-level examination as well as periodic stress EKGs and blood toxicology screening. Communicable disease vaccinations can also be updated as needed during this process.

DFD provides a basic program of medical testing for respiratory certification for all personnel that wear self-contained breathing apparatus (SCBA). The medical evaluation is based on standards recommended in NFPA 1582. Annually, a comprehensive medical questionnaire is completed by each member and reviewed by the DFD physician. Follow up medical evaluations are provided for those members indicated by the physician.

The DFD does not currently provide a formal physical fitness or wellness program for its personnel. An on-going fitness and wellness program is an important aspect of an overall firefighter training and performance system. NFPA 1583 provides excellent guidance to the development of a comprehensive fitness screening, improvement, and maintenance program. Another good source of guidance for on-going fitness programs is the Wellness/Fitness Initiative jointly produced by the International Association of Fire Chiefs and the International Association of Firefighters.

The City does maintain a safety committee that meets on a monthly basis. NFPA 1500 recommends a fire department have an active safety committee of its own that meets on a regular basis. DFD has organized a safety committee in compliance with NFPA 1500 requirements.

Human Resource Management

An organization's people are its most valuable resource. Careful attention must be paid to managing that resource to achieve maximum productivity for the organization and maximum satisfaction for the individual. A safe working environment, fair treatment, and recognition for a job well done are key components to job satisfaction.

Personnel Policies and Rules

It is important that members of the organization know to whom they should go when they have a problem, question, or issue related to their relationship to the department. In large companies, this function is typically handled by a human resource (HR) department. Staff within an HR department handle questions, issues, and tasks related to appointment, benefits, performance, disciplines, promotion, or termination of employees.

In the City, the city administrator has retained the human resource function. The fire chief is the Department's primary point of contact when it comes to questions regarding member's employment or membership.

The City maintains a personnel handbook, revised in 2005, that describes the recruitment and appointment of employees or members, salary and benefits to which they are entitled, the conditions under which leave time may be utilized, systems to rate personal performance, processes, and qualifications for promotion to higher positions, and a grievance process.

Compensation and Benefits

The DFD is primarily a volunteer fire department with a paid full time chief, a part time firefighter, and no administrative or support personnel. All volunteer personnel are utilized in emergency response operations.

The fire chief receives the typical forms of compensation including salary, retirement pension, unemployment, workers compensation, and health and dental insurance. The chief receives a maximum annual salary of approximately $43,467.00, along with a variety of compensated leave time.

The Department's volunteer personnel receive reimbursement based on a participation point system.

A compensation analysis was not included in the scope of this study. ESCi is forwarding a separate simple comparison report independent of this report. It is important that the City maintain a level of compensation that is fair and competitive. Unfair compensation affects employee morale, loyalty, turnover, and presents a threat to the welfare of the organization.

Personnel Records

The maintenance of adequate and up-to-date personnel records is critical in every organization that depends on the effective performance of its people. It is every bit as important for volunteer members as for career employees. The city administrator and DFD keep adequate written or computerized records of its personnel.

Original application materials are retained in order to create a full historical record of the member's participation in the organization, from initial appointment to separation. Additional documents and records referring to assignments, promotions, commendations, discipline, and other personnel actions personnel are kept organized and updated. Records describing details of accidents or other injuries or injury-related incidents are maintained for future reference.

Records of health evaluations, exposures to hazardous substances or contagious diseases, and other medical records are protected under federal privacy laws, and are kept separate from routine personnel records. Access is strictly limited.

Disciplinary Process

A formal progressive disciplinary process for personnel is adequately identified in the Dundee Personnel Handbook. The handbook clearly describes the purpose for a disciplinary process, the reasons for disciplinary action, and the levels of disciplinary action that can be taken.

A multi-level grievance and appeals process is described in the Dundee Personnel Handbook and affords the member who feels aggrieved by the opportunity to have his/her issues heard by the city administrator. The procedure described is typical of most municipalities and adequate.

Counseling Services

Emergency services bring otherwise ordinary people into life and death situations that many times end very tragically. Even though Department personnel are trained responders, they do not have an impregnable shield that prevents them from being affected by traumatic events.

Stress is a psychological condition that affects all emergency service workers to some degree or another. Emergency service workers affected by their experiences will cope with job related stress on different levels. Stress can manifest itself in a number of ways, from simple irritability to burnout to posttraumatic stress disorder (PTSD). There is no specific trigger for significant psychological trauma. It may be a single event, or a series of events compounding on each other.

Fire and EMS departments have recognized the need to provide a support system for their personnel who are exposed to traumatic incidents. DFD can call upon the services of trained personnel to conduct critical incident stress debriefings through the City County Insurance Services and the Yamhill County Mental Health Office. Critical incident stress interventions are short-term processes. Frequently, longer-term support is needed. Failure to provide that support can ultimately lead to the loss of a valuable employee and could have a devastating impact on that individualôs family.

The City has contracted for an employee assistance program (EAP) as a long-term stress intervention tool. Most EAPs also provide counseling for other life problems that may affect a memberôs motivation and work quality such as substance abuse, marital difficulties, and financial complications.

Application and Recruitment Process

Recruitment of personnel is a critically important function for emergency service agencies. As mentioned previously, the community places a tremendous amount of trust in fire department personnel. The process used to select personnel should be quite comprehensive.

The Americanôs with Disabilities Act (ADA) prohibits discrimination against individuals with physical disabilities, but permits employers to establish the physical standards that are required to perform the primary functions of any job safely and effectively. History has shown that the

most effective method of avoiding a litigation suit involving ADA is through reasonable and consistent application of job-relevant pre-employment physical ability testing. Applicants for volunteer and future career positions in emergency response with DFD are subjected to a formal physical ability test to measure the applicant's ability to perform critical physical tasks and functions.

Modern firefighting and medical response also requires extensive technical training, much of which is presented at the college level. Volunteer and future career applicants must demonstrate their aptitude to learn and perform the necessary mental skills to perform the work through a specific written aptitude test.

All applicants should also be required to pass a pre-employment medical examination. The examination should be required after a contingent offer of employment as a volunteer or future career firefighter.

Ongoing Competency Evaluation

Once on staff, personnel should be evaluated periodically to ensure their continued ability to perform job duties safely and efficiently. Technical and manipulative skills should be evaluated on a regular basis. This provides documentation about a personôs ability to perform their responsibilities and provides valuable input into the training and education development process.

Regular evaluation and feedback for personnel is critical to behavior modification and improvement. A formal performance evaluation system should be adopted for all members of the Department and evaluations should be conducted, at a minimum, on an annual basis. Volunteer performance evaluations are more challenging with personnel who are not observed on a daily basis. A volunteer evaluation program can be simplified and documented with a checklist.

It is important to maintain such programs whenever possible. It has long been proven that employees and members sincerely wish to perform well and to be a contributing part of any organization. The desire to succeed is cultivated when feedback allows a member to know what they are doing well, or what needs improvement.

Staffing

As indicated, the Dundee Fire Department utilizes volunteer personnel to deliver service. Administrative and support functions are the responsibility of the fire chief. Staffing for emergency response to fire, emergency medical and related incidents is provided by volunteer personnel that are paged for response.

Administration and Support Staff

One of the primary responsibilities of a fire departmentôs administration and support staff is to ensure that the operational elements of the organization have the ability and means to mitigate an emergency incident. Efficient and effective administration and support are critical to the success of any fire department. Without sufficient oversight, planning, documentation, training, and maintenance, the operational elements of the organization will fail any operational test. Additionally, like any other part of a fire department, administration and support require appropriate resources to function properly.

Analyzing the ratio of administration and support positions to the total positions of the department facilitates an understanding of the relative number of resources committed to this important function. The appropriate balance of the administration and support component to the operational component is crucial to the success of the departmentôs mission and responsibilities.

All of the administration and support functions for DFD are provided by the career fire chief who is the only full time equivalent (FTE) in the organization.

Each organization should determine the proper ratio of administration and support staff to operational positions dependent upon local requirements. Based on our experience with similar organizations, ESCi has determined emergency service departments usually require a 10 to 15 percent ratio of administration and support staff to operational personnel. DFDôs administrative and support-staffing level is well below this comparison range.

ESCi feels that DFDôs current ratio of support to operational personnel is not adequate to perform all of the functions required of todayôs fire service. Two additional personnel, such as an

administrative assistant and a volunteer coordinator/training officer, would bring the ratio up to 15 percent.

Emergency Services Staff

It takes an adequate and well-trained staff of emergency responders to put the appropriate emergency apparatus and equipment to its best use mitigating incidents. Insufficient staffing at an operational scene decreases the effectiveness of the response and increases the risk of injury to all individuals involved. The following figure summarizes the personnel assigned to operations, or street-level service delivery.

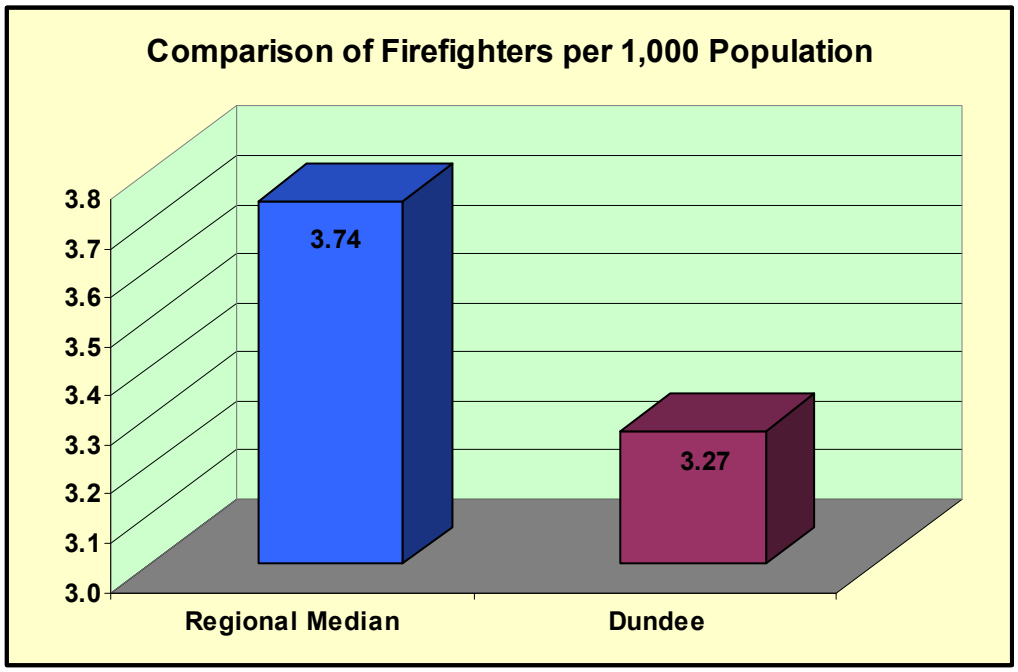
Figure 7: Operations Staffing Summary

Dundee FD Operations Staffing	
Position Title	**Number of Personnel (Career/Volunteer)**
Fire Chief	1 ï Career
Lieutenants	3 ï Volunteer
Captains	0 ï Volunteer
Driver/Operator	3 ï Volunteer
Firefighters	14 - Volunteer

An analysis of emergency service staffing begins with a comparison of available emergency service personnel to other communities of similar size and organization. The following chart, using NFPA benchmark data for the region[8], provides an overview of the staffing level of the DFD based on firefighters per 1,000 population.

[8] U.S. Fire Administration/National Fire Protection Association, *Fire Department Profiles, 2003*, Quincy, MA.

Figure 8: Comparison of Firefighters per 1,000 Population



The chart indicates that DFD has .47 fewer volunteer firefighters per 1,000 population than the regional mean. DFD would have to add two volunteer firefighters to equal the regional mean. Career personnel were not included in the study group for fire departments the size of Dundee.

The International City Manager's Association (ICMA) places the national average for city fire department strength at 1.59 per 1,000 population, with an on-duty strength of .48 per 1,000 population. DFD would have to add four career personnel 24 hours per day to meet the ICMA average.

Regardless of the raw number of personnel available to a department, what matters most is the actual number of emergency responders the agency is able to muster at an emergency scene. Additional information on the effect of staffing levels at emergency scenes will be provided in the Service Delivery section of this report.

Assignment of Responsibilities

Previously in the report, the need for adequate levels of management and administrative support and staffing are discussed. It is apparent that DFD is challenged to meet the staffing demands of a modern emergency services organization. The fire chief is to be commended for accomplishing all that he has accomplished as a one-person shop.

The volunteer lieutenants have been given some administrative responsibilities, primarily in the training function. These individuals have full-time employment and have limited time to devote to the functions that have been assigned to them. The fire chief and lieutenants rotate after-hours and weekend emergency response command duty on a limited basis. Expanded use of other properly trained personnel would reduce the burden on the fire chief.

The addition of administrative and support personnel would allow for the distribution of responsibilities for a more effective delivery of the support function. Depending on the positions added, the command duty function could be enhanced as well. Additional administrative and support personnel would also allow time to make improvements to non-emergency services such as fire and life safety prevention activities.

Capital Assets and Resources

Fire departments need a balance of three resources to successfully carry out their emergency mission - people, equipment, and facilities. Because firefighting is an extremely physical pursuit, the adequacy of personnel resources is a primary concern. Regardless of how competent or numerous the firefighters are, the department will fail to execute its mission if it lacks sufficient fire apparatus distributed in an efficient manner.

Facilities

There are many questions facing a department that has outgrown its facilities, or is facing continued growth as Dundee is. The solutions are more complicated than buying a fleet of fire trucks. While volunteer, career, and combination departments have different facility requirements, there are basic needs each fire station has to address. Specifically, these are quick response time and the housing of apparatus and equipment. Everything else depends on a particular department's budget and needs.

Consideration should be given to the ability of the facilities to support the functions of the department, as it may exist today and in the future. The primary functions that will take place within the fire station environment should be closely examined. Adequate and efficient space for all functions should be provided. Some examples are:

- Housing primary and reserve apparatus and equipment
- Decontamination facilities for personnel and equipment
- Separate ventilated personal protective equipment storage
- Restroom, locker, and bathing facilities for male and female personnel
- Sleeping or residential living space for male and female crew members
- Cooking facilities
- Administrative office space
- Classroom training facilities
- Fitness equipment space
- Storage

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

Dundee has one fire station that was built in the 1930ôs, with additions and remodeling completed during the 1960ôs and 1970ôs. The fire station is marginally efficient and does not adequately meet the demands of todayôs fire service.

Figure 9: Dundee Fire Station Facility Description

	Dundee Fire Station 759 Hwy 99W Dundee, Oregon .
Design:	.
Construction:	• The age of construction conducive to wood and unreinforced masonry • Inadequate downspout and footing drainage • Rear drive-through apron has inadequate turning radius • Earthquake reinforcement appears limited
Safety:	• No fire detection or burglar alarm system • Building secured by key lock instead of combination lock • No fire sprinkler system • Turnout gear stored in apparatus room ï subject to carbon contamination • Buildings ability to withstand a natural disaster event is in question
Environment:	• No vehicle exhaust system
Code Compliance:	• No problems noted
Staff Facilities:	• No space available for additional career staff • No equipment decontamination facilities • No locker or shower facilities • Limited kitchen facilities
Efficiency:	• Insufficient storage • Not wired for modern communication system such as broadband

This section dealt only with an analysis of the current facility. However, we are recommending development of a full long-range facilities management plan, as well as specific plans to address the current problems.

Apparatus

Dundee maintains a fleet of response vehicles that is well maintained. The average age of the apparatus is 10.375 years. Average condition is considered good. The Department needs to make apparatus replacement a significant issue in both the short and long-term to ensure continued reliability for emergency service use.

The life expectancy of fire apparatus varies widely. Apparatus replacement should take into account age, type of apparatus, use, and condition. As a general rule of thumb, fire apparatus with light use will have a total life expectancy of 25 years, a front-line life of 15 to 20 years, and a reserve life of five to ten years. NFPA recommends the replacement of front line and reserve fire apparatus after 25 years of service. Smaller apparatus that are built on a commercial chassis will have a shorter useful life. Combination apparatus like DFD's Tender 32 which also has a rated pump, are treated like any other apparatus for the purposes of this schedule. Light vehicles used for command will have a seven to ten year useful life.

The following table lists all primary apparatus and front line vehicles used by Dundee, including smaller commercial-style utility or staff vehicles. It includes current age, estimated life expectancy, and roughly estimated replacement funding requirements.

Figure 10: Apparatus Replacement Funding Table

Unit	Year	Remaining Life	Replacement Year	Replacement Cost	Reserve Fund Contribution
Engine31(Reserve)	1976	0	ASAP	$295,000	ASAP
Engine 35	2003	22	2028	$295,000	$13,400
Engine 36	1996	15	2021	$295,000	$19,666
Tender 32	1990	9	2015	$175,000	$19,444
Brush 37	1985	4	2010	$75,000	$18,750
Brush 39	1997	16	2022	$85,000	$5,312
Rescue 3	2003	17	2028	$100,000	$5,882
Command 3	2003	7	2010	$40,000	$5,714
				Annual Reserve Fund Contribution	**88,168**

There are several methods of financing the purchase of fire apparatus. Lease-purchase, bonding, impact fees, and reserve funding are the most common. If DFD continues to utilize the same type and number of fire apparatus, the City will need to set aside approximately $88,200 per year in capital reserve funds in order to meet apparatus replacement needs. It should be

noted that during periods of low interest rates, municipal lease-purchase programs could be financially efficient. Based on the calculations used in the previous schedule the apparatus replacement fund that exists today is not adequate to meet the projected need.

Regardless of the funding mechanism, it is far more important that elected officials make a firm commitment toward a scheduled apparatus replacement program. In todayôs difficult financial environment, competing interests often take precedence over a large capital purchases. A delay in the purchase of public safety equipment can compromise the fire departmentôs efficiency and the safety of citizens and firefighting personnel.

Apparatus Descriptions

The primary front-line apparatus of DFD were reviewed and a basic inspection was performed to determine the general condition, safety, and life expectancy. The following charts describe results of this review. Please refer to Appendix I for a complete description of the rating scale.

	Engine 35 2003 International-E-One Pumper 1000 gallon tank, 1,250 GPM pump Five-person cab Condition: Excellent Remaining life expectancy: 17 years/5 reserve NFPA compliant: Yes
Remarks: No problems noted. Some equipment has not been secured within compartments.	

	Engine 36 1996 International-E-One Pumper 1000 gallon tank, 1,250 GPM pump Five-person cab Condition: Good Remaining life expectancy: 10 years/5 reserve NFPA compliant: Yes
Remarks: No problems noted. Some equipment has not been secured within compartments.	

	Engine 31 1976 Ford/Western States Pumper 1250 gallon tank, 1,250 GPM pump Two person cab Condition: Serviceable Remaining life expectancy: Recently failed pump test, replacement or repair needed ASAP NFPA compliant: No
Remarks: Limited seating for firefighters, tailboard riding not recommended	

	Tender 32 1990 Ford-Western States Class II 1650 gallon tank, 1,000 GPM pump Two-person cab Condition: Good Remaining life expectancy: 9 years/5 reserve NFPA compliant: Yes
Remarks: No problems noted.	

	Brush 39 1997 GMC 3500/Cascade Type V 300 gallon tank, 250 GPM pump Two person cab Condition: Good Remaining life expectancy: 11 years/5 reserve NFPA compliant: Yes
Remarks: No problems noted.	

	Brush 37 1985 Ford F-350 Type V 200 gallon tank, 250 GPM pump Two person cab Condition: Good Remaining life expectancy: 4 Years NFPA compliant: Yes
Remarks: 20 years old, unknown history	

	Rescue 3 2003 Ford 550/E-One Condition: Excellent Remaining life expectancy: 17 years
Remarks: No problems noted.	

	Command 1 2003 Ford Expedition Condition: Good Remaining life expectancy: 7 Years
Remarks: No problems noted.	

Support and Small Equipment

Small equipment can take a significant bite out of an annual budget. Small equipment can be quite expensive and has the additional challenge of having its life limited by technological improvements. A small equipment replacement schedule should be established for DFD. Equipment replacement funding is included in the annual budget for equipment that is known to be in need of replacement.

The replacement plan, like with facilities and apparatus, should include a schedule of equipment covered, estimated life expectancy, replacement cost, and annual contributions required to replace equipment as needed. It is recommended that all equipment with a value of more than $5,000 be included, as well as groups of equipment such as:

- Breathing apparatus
- Portable and mobile radios
- Computer software (major systems)
- Computer equipment and systems
- Heart monitor/defibrillators

Service Delivery

The most visible and valued of the services provided by the Dundee Fire Department is the response to, and control of, emergency events. The Department provides a basic set of emergency response services including:

- Fire suppression
- EMS first response
- Entrapment rescue
- Public assistance

Notification System

Emergency dispatch is provided to DFD by the Newberg Dispatch Center. This department functions as the dispatch center for all emergency calls within Dundee and is the primary Public Safety Answering Point for the Dundee/Newberg communities. The center is housed in the Newberg public safety building.

An emergency dispatch is simulcast on both police and fire frequencies. The fire chief and firefighters are notified through a pager system.

All dispatchers are emergency medical dispatch certified; the center does give pre-arrival instructions for medical emergencies.

The dispatch center has no supervisors that monitor or takes calls. The communicationsô administrator is the only management representative at the dispatch center.

The center uses Vision computer-aided dispatch (CAD) software.

Communications interoperability in the region is a major issue. Currently, Newberg/Dundee operates on an 800 MHz system with dedicated fire TAC (tactical) channels. There is not a countywide dedicated fire frequency, except for a statewide mutual aid channel.

Queuing occurs when there are more 9-1-1 calls coming in than can be answered. Calls go into a queue to be answered in the order in which they came in. There is occasional queuing on the

system, which usually occurs because of a major accident, school incident, or a fire. If all lines are busy, the calls roll to Yamhill Communications located at the McMinnville Police Station in McMinnville.

Yamhill Communications also is the redundant site if the center is out-of-service.

The communication center has nine employees, is staffed by two people 24/7, with a third dispatcher during peak times, five days a week. Callbacks are made for major incidents. Looking at expected growth in the community, room is available within the communications center to house a fourth staffed console.

Emergency Response Resources

Dundee Fire provides fire protection to its community from one fire station located near the center of the city. The Department is staffed by volunteer personnel with a career fire chief that responds on all incidents with a command vehicle. The Department has 20 volunteers that respond to the station, staff apparatus, and respond to emergency calls.

Department members are trained and the apparatus is equipped to respond to medical events. The Newberg Fire Department ambulance currently provides medical transport and advanced life support (ALS) services in the greater Dundee area.

Response Activity

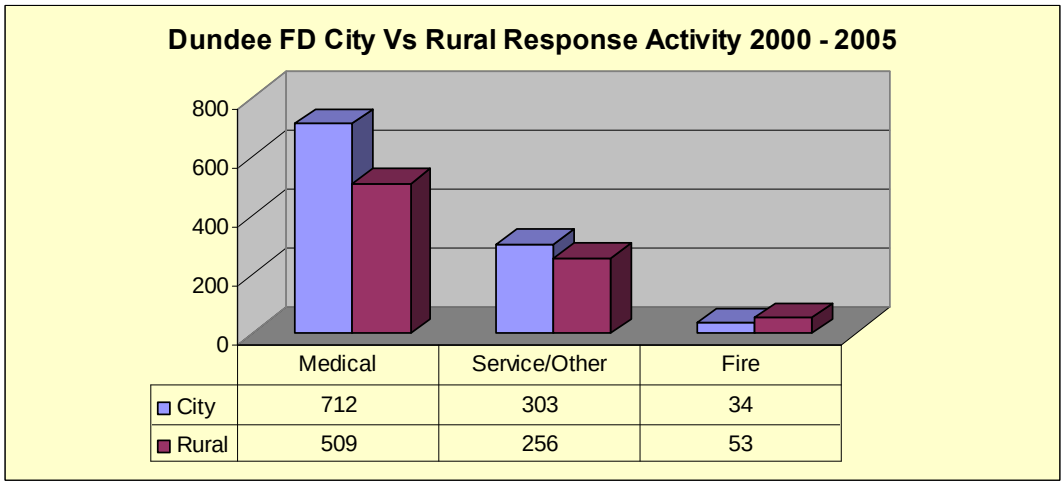
Incident Response

Dundee Fire responds to incidents in the city of Dundee and the rural district directly adjacent to the city. The following chart compares the number of responses to each area by major incident type. Medical incidents include all medical call types plus motor vehicle accidents. Fire incidents include structure, chimney, vehicle, and wildland fires. Service/other incidents include all other incident types that are not fire or medical incidents, such as public assists and false alarms.

The city is generating the largest number of incidents when compared to the rural district, which would be typical of this type of arrangement. However, there are more fire incidents in the rural district than in the city. When analyzing the fire responses, ESCi found that there were an equal

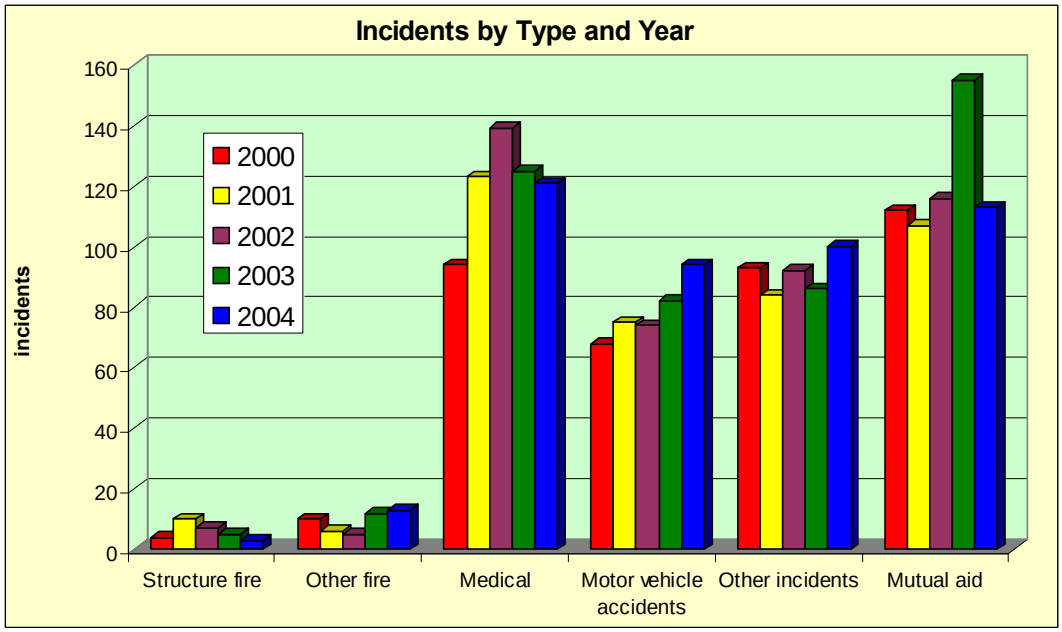
number of structural fire calls (16) in each jurisdiction, but the number of vehicle and wildland fires were higher in the rural area.

Figure 11: Dundee FD City Vs Rural Response Comparison



The following chart provides a historical view of the Departmentôs workload over the past five years. It should be noted that workload has risen just over 16 percent during this period.

Figure 12: Dundee Fire Department Five-year Workload History



Geographic Distribution

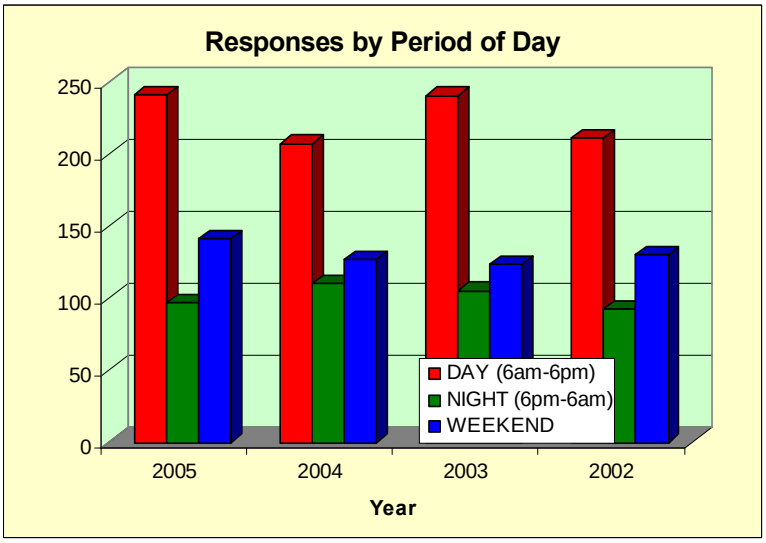
Population and more specifically, the activity of a population are the primary drivers of service demand. Human activity typically accounts for over 95 percent of the incidents generated for a fire service delivery system. The geographic distribution of workload can therefore be tied to population distribution and its activity. Employment and tourism are activities that drive demand as well as the other daytime activities of any community.

ESCi was unable to display incident locations graphically on a map for this report, as DFD does not keep an electronic database of incident information necessary to do that analysis. The dispatch center was also unable to export data in electronic form.

Temporal Variations

The following chart depicts response activity by three different time-periods throughout the day. During 2005, 50 percent of all responses occurred Monday through Friday, between the hours of 6:00 am and 6:00 pm. This is also the period when volunteer personnel are not as available to respond to emergencies. This will be an important factor in discussions of service improvement opportunities.

Figure 13: Dundee Fire Department Responses by Period of Day



Response Protocols

Incident response protocols are used to determine the number and type of resources that will be sent initially to a particular incident type. For instance, a car fire or automatic fire alarm may require the dispatch of a single resource, where a fire in a single-family residence may require the dispatch of multiple resources. Response protocols are based on the critical tasks, staffing, and equipment that are required to mitigate an incident.

DFD has established response protocols for different types of incidents. When an incident occurs, a voice page is initiated that alerts all personnel, who if available, respond to the station. Available personnel respond to the station on all incidents and respond with assigned apparatus as directed by dispatch.

Performance and Outcomes

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 goal applies to fires, medical emergencies, and any other emergency to which the fire department responds.

Before discussing the Departmentôs current performance, it is important to gain an understanding of the dynamics of fire and medical emergencies. ESCi has provided material in Appendix II ï *The Dynamics of Emergency Response*, which will describe the factors and resources that play into successful mitigation of an emergency event.

Response Performance Objectives

Clearly defined response performance objectives are necessary for the proper evaluation of the capability of an emergency service delivery system. An organizationôs performance objectives should clearly state both the current and desired emergency service capabilities in measurable terms. For emergency response, performance objectives should define response performance using both time and resource criteria. The Department has established two response performance measures and identified target performance for each. Current performance is only an estimate based on anecdotal information. Verification of current performance is not possible due to a lack of electronic data.

- *Provide for the arrival of adequate resources to initiate basic emergency medical services at the scene of any medical emergency within "X" minutes following dispatch, 80 percent of the time.*

  Current performance: 7-8 minutes Target performance: 7 minutes

- *Provide for the arrival of adequate resources to initiate interior fire suppression operations at the scene of any fire within "X" minutes following dispatch, 80 percent of the time.*

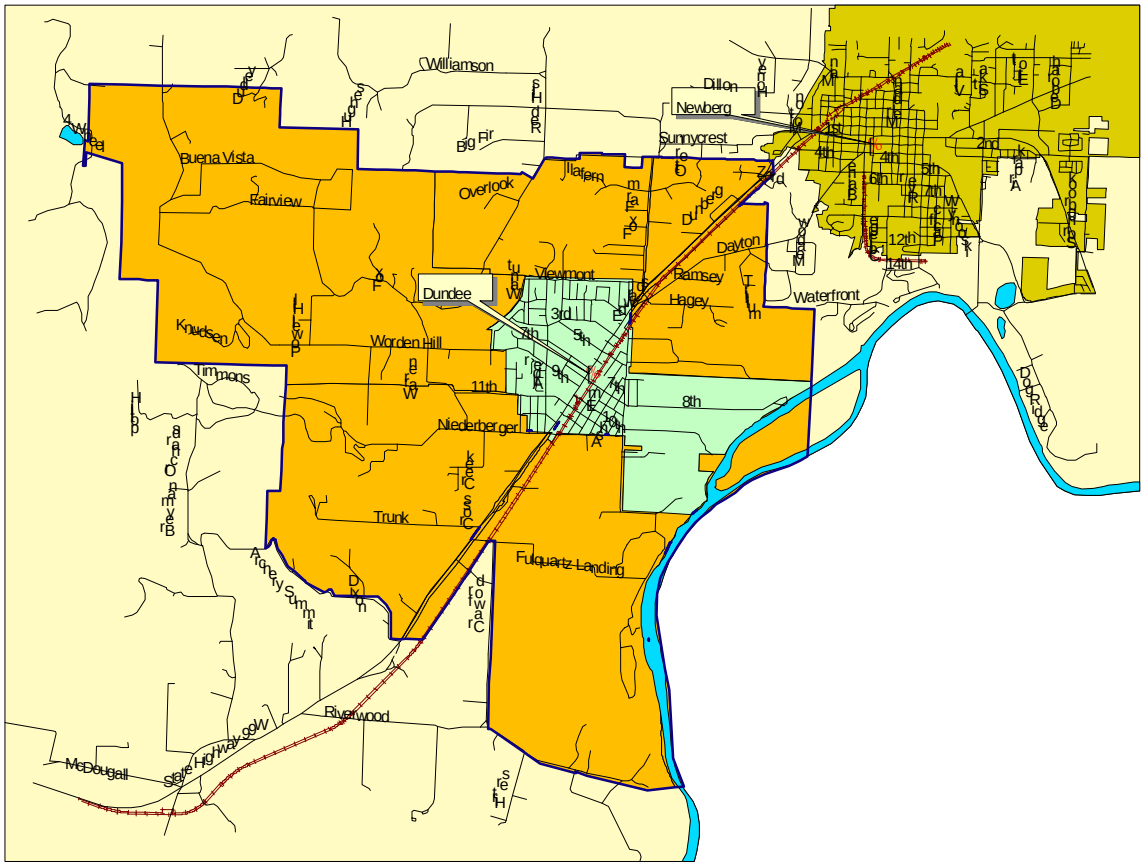
  Current performance: 10 minutes Target performance: 10 minutes

With these specific performance criteria, a fire department can develop deployment methodologies to achieve desired levels of performance, and can quickly identify when conditions in the environment degrade performance.

Current Deployment and Coverage

The Dundee Fire Department is providing services from one location. The following map displays the location of the Department fire station.

Figure 14: Dundee Fire Department Service Area



There are several ways to approach fire station deployment analysis. The Insurance Services Office (ISO) defines ideal coverage as having a fire engine within one and one-half miles of any built-upon area. In addition, the ISO standards consider any developed area greater than five miles from a fire station as being unprotected. Such areas are often subjected to a Class 10 insurance rating, making insurance difficult or expensive to obtain. ESCi began this analysis by examining the area to confirm that there are no road segments greater than five miles from the existing fire station and, thus, subject to an unprotected classification and fire insurance rating.

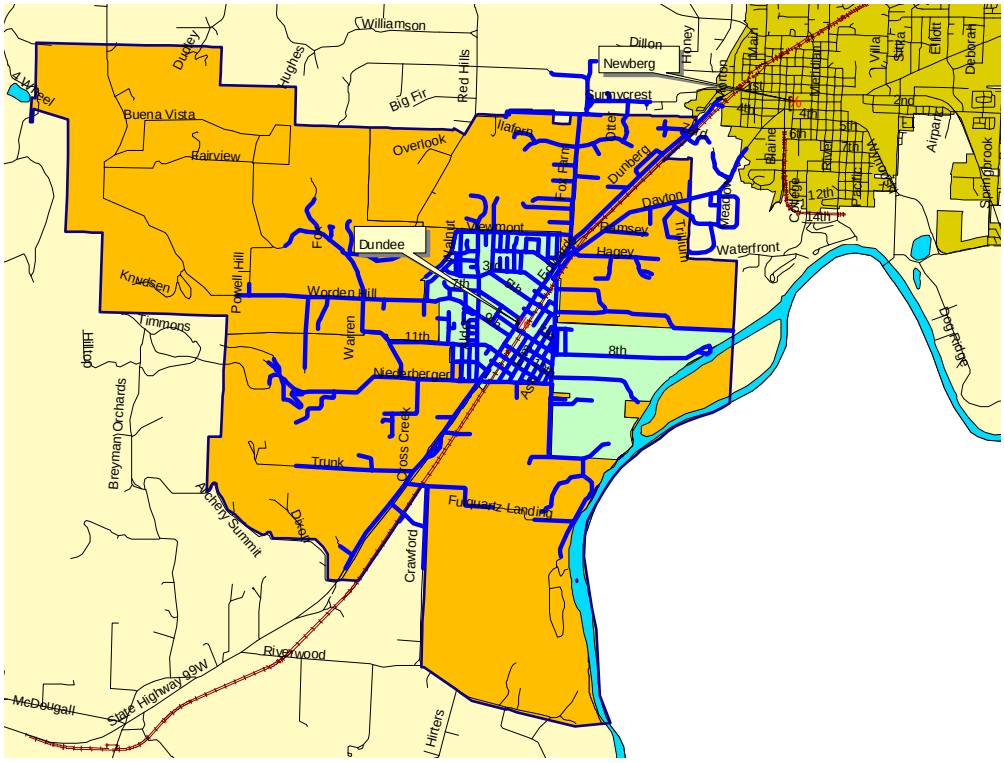
With that established, the analysis of the DFDôs facility deployment for fire and emergency medical response was conducted. The Department desires to achieve the following response time objective:

Provide for the arrival of adequate resources to initiate basic emergency medical services at the scene of any medical emergency within seven minutes following dispatch, 80 percent of the time.

The Department's fire chief reports that the time required to assemble personnel on response apparatus and initiate response is approximately three minutes[9]. Thus, to achieve a seven-minute response time, only four minutes may be allowed for travel time. At an average response speed of 30 MPH, which compensates for starts, stops, intersection turns, and other road impedance, the incident can be no further than two miles from a response unit.

The map in the following figure demonstrates the current geographic-based coverage of DFD's fire station by plotting the four-minute travel time footprint for the existing station. Streets segments within two miles of the fire station are highlighted in blue.

Figure 15: Dundee Fire Department Four-minute Travel Coverage



[9] Based on a recent review of incident records, three minutes or less turnout times were achieved 70 percent of the time.

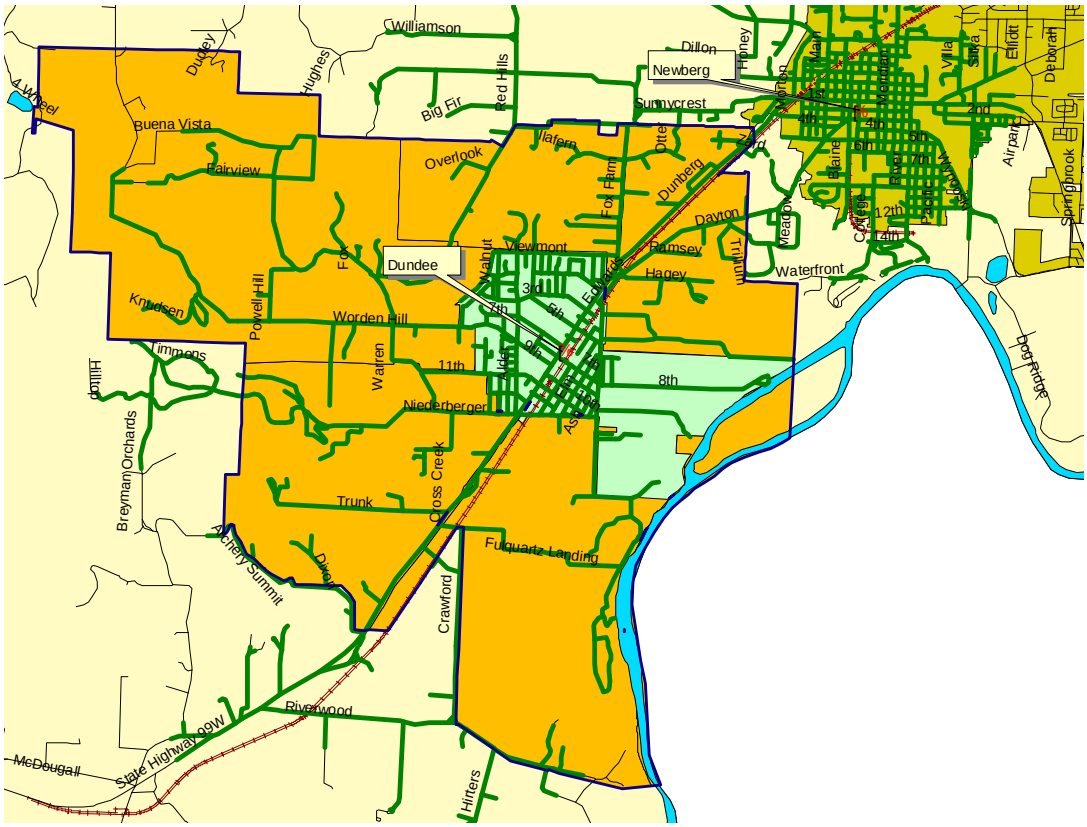
Though the more populated area is within the target coverage, the northwest quarter of the department lies outside the desired level of coverage.

DFD defined its desired performance for fire incidents as follows:

> *Provide for the arrival of adequate resources to initiate interior fire suppression operations at the scene of any fire within ten minutes following dispatch, 80 percent of the time.*

Given the same three-minute allowance for assembling personnel on apparatus and initiating response, the travel distance allowable is 3.5 miles, or seven minutes of travel time. The following map illustrates coverage provided by the current fire station for this scenario. Street segments within 3.5 miles of the fire station are highlighted in green.

Figure 16: Dundee Fire Department Seven-minute Travel Coverage



Nearly complete coverage of the departmentôs service area is available based on this performance objective. However, in order for the department to achieve its objectives, the time to assemble personnel on response apparatus may not exceed three minutes. As noted earlier, the three-minute turnout time is achieved only 70 percent of the time, as opposed to the 80 percent defined in both performance objectives. Developing the capability to initiate response quickly and consistently will be an important component to service delivery improvement.

This objective also has a resource component. To conform to national standards, in order to initiate interior firefighting operations at least four trained and equipped personnel must be on scene. This federal and state mandate, know as two-in/two-out, stipulates that two personnel, at a minimum, may enter the burning building and two additional personnel must be outside the building ready to initiate rescue should the interior firefighters become trapped or injured.

During the weekday, the Department reports that four personnel are generally available including the fire chief, part-time employee, and two personnel from the City Public Works Department. An additional one to two volunteer firefighters may also be available, though not reliably so. During evenings and weekends public works staff are not available, but more Department volunteer firefighters normally are. Automatic aid from Newberg and other surrounding departments augments fire response staffing. Thus, the required four personnel should be available within the response objective identified above.

Mutual and Automatic Aid

DFD is a signer on the Yamhill County Fire Defense Board mutual aid agreement. Automatic response is in place with the surrounding fire departments - the City of Newberg and the Dayton Rural Fire District. The distance to dependable automatic aid resources is within five minutes.

Insurance Services Office

The Insurance Services Office last rated the City in 1998/2000. The ISO assigned the City a Class 4 rating for all properties within 1,000 feet of a fire hydrant, and Class 8 for all other properties.

The ISO uses a 1 ï 10 rating scale with class 1 being the best level of service (and lowest fire insurance premium cost) and class 10 being no service at all. The ISO reviews fire protection in

three major categories. These categories, and the credit received for the city rating, are shown below.

- ***Communication (10%)*** ï This evaluates the function and reliability of the dispatch service. The Newberg Dispatch Center received 10 percent out of a possible 10 percent in this category.
- ***Water Supply (40%)*** ï This evaluates the communityôs ability to deliver firefighting water in sufficient volumes to combat fires in buildings. The Dundee Water Department received 30.13 percent out of a possible 40 percent.
- ***Fire Department – (50%)*** ï This evaluates the capability of the fire department to respond to and extinguish a fire. Areas evaluated include apparatus, staffing, training, and station locations. The Department received 29.30 percent out of a possible 50 percent. The primary areas of deficiency included insufficient ladder service (ground ladders and aerial device apparatus) and insufficient response personnel. In addition, the ISO recommended improvements in the Departmentôs training program and facilities.

The total percentage credit received was 66.08 percent[10]. In order to achieve the next lower rating, the City would need, at a minimum, 6.08 percentage points of credit.

Additional points could be accumulated by adding response personnel. At the time of the rating, one additional career person would add one percentage point to the total. In addition, an increase in the average response by one volunteer member per company would increase the credit by 0.33 percent. An expansion of the current training program and the addition of training props or a facility could yield additional points.

The ISO rating is important to a community. As the ISO class improves, fire insurance rates decrease dramatically until Class 6 for single-family residences. Businesses generally benefit from further reductions down to Class 1[11]. Many property insurance companies base the fire risk portion of property insurance premiums on the communityôs ISO rating. The chart below

[10] ISO subtracts points when the quality of the fire department and the quality of the water system are significantly different (divergence). In the 1998/2000 survey, 2.55 percent was subtracted for divergence.
[11] A similar chart is not available for commercial properties. Property use affects the premium and many are individually rated.

provides an example of how fire insurance rates change for single-family residences based on the ISO rating assigned.

Figure 17: Example Premiums Based on ISO Ratings

Fire Department Protection Class Versus Insurance Premium Cost				
Annual fire insurance premiums based on home value				
Amount of Coverage	Protection Class			
	2-6	7-8	9	10
$100,000	$322	$435	$885	$1,046
$150,000	$416	$562	$1,144	$1,352
$200,000	$549	$740	$1,509	$1,782
$250,000	$691	$934	$1,901	$2,247

While there is little to be gained in insurance premium savings for homeowners by improving the rating within areas served by fire hydrants (currently Class 4), there is substantial opportunity for savings to property owners in areas that are not served by fire hydrants (currently Class 8). If the Department can demonstrate its ability to deliver sufficient volumes of water by truck to areas not served by fire hydrants, it can lower the ISO rating in those areas. This will require training, equipment (water tender and portable reservoirs), and refinement of response practices to ensure prompt response by water supply companies.

Emergency Medical Transportation Response

Emergency medical transportation response is provided by the Newberg Fire Department ambulance at the advanced life support (ALS) level.

The Newberg Fire Department ambulance operational area includes the entire DFD service area. Newberg Fire Department was not asked to provide the data necessary to conduct a performance analysis on EMS incidents. However, the response performance criterion for operation in Yamhill County is arrival within 15 minutes or less, 90 percent of the time.

DFD currently supports Newberg Fire Department ambulance by responding to all medical calls within the DFD service area.

National Benchmarks and Comparables

There are a variety of other standards and performance criteria developed by various organizations with an interest in fire and emergency services. The chart that follows lists a number of these.

Figure 18: Table of Benchmark Comparisons

National Standard or Comparison	*Organization*
Minimum effective company staffing is four firefighters	Dallas Fire Dept. Study, Seattle Fire Dept. Study, NFPA Standards, Federal OSHA
Engine company within 1.5 miles of built upon areas	Insurance Services Office
Ladder truck within 2.5 miles of built upon areas	Insurance Services Office
Staffed ladder truck if 5 or more buildings exceed 35ôhigh	Insurance Services Office
Average fire ground staffing to be 15 firefighters (up to 53 at mall, high-rise, etc.)	Commission on Fire Accreditation International
National average of on-duty personnel = .48 per 1,000 population	International City/County Management Association
National average total uniformed, full-time personnel = 1.59 per 1,000	International City/County Management Association
Arrive at structure fire prior to flashover (typically five to seven minutes from ignition)	United States National Fire Academy
Arrive at EMS call within four to six minutes of cardiac or respiratory arrest	American Red Cross

Service Delivery Observations and Conclusions

A number of conclusions can be reached from the preceding analysis. It will be very important for DFD to be mindful of these as it moves forward with the development of its long-range plan of action.

1. Improvements need to be made to collection and analysis of incident data. The Department should begin capturing incident data in electronic format, using software that is NFIRS 5.0 compliant. Additional information should be captured that will allow a precise analysis of the various elements of response time and the analysis of event outcomes. Given the Departmentôs recent acquisition of mobile data computers,

accurate data will be available. Storing that information in a computerized incident record database will be of great benefit to DFD.

2. Growth of the community, both in terms of population and geography, will eventually affect the Departmentôs ability to deliver effective services with currently available resources. Additional resources and facilities will be needed in the future, and are recommended in the long-term strategy section of this report.
3. A concerted effort to ensure the time required to assemble personnel and initiate response does not exceed three minutes will be important to maintaining and improving service levels.
4. Half of all calls for service occur during the time period when volunteer personnel are least available. The Department should explore options to improve daytime staffing levels including:
    - Additional full time staffing
    - Recruitment of volunteer firefighters who are available during weekday hours
    - Work with local businesses to recruit personnel who can be released from work
    - Intern programs with community college fire science students

Training

Overview

An important factor in the successful delivery of emergency services is the level and type of training an organization invests in. The function of a training program is not merely imparting knowledge and technical skills to an individual. Training must go beyond that.

In order for an emergency services training program to be effective, it must help the individual develop the self-confidence to perform correctly under stressful and hostile conditions. Training programs must be systematic, objective-driven, competency-based, evaluative, and provide feedback to the trainee. The training goals should focus on performance and content, and not the number of hours spent. Additionally, a successful training program serves personnel in all positions and levels, both staff and response personnel.

In volunteer fire departments, an effective, aggressive training program provides motivation, self-confidence, and camaraderie among its members who, on the average, do not respond to incidents often enough to maintain their skills. One of the most de-motivating things a volunteer fire department can do is to waste a member's time on poorly organized training sessions when the member has just put in a full workday and is volunteering time at the fire station.

The average firefighter spends five percent or less of active time on emergency incidents. A training program must also provide skills and education for non-emergency periods. Vehicle and equipment maintenance, computer skills, advanced education, inter-personal dynamics, conflict resolution, leadership, counseling, and motivation are also requirements for a well-rounded member.

Key fire department training program elements include:

- Training division administration
- Training schedules
- Training program goals & objectives
- Methodology used for training
- Safety evaluation
- Types of reinforcement used
- Skilled training personnel
- Adequate training facilities
- Motivation for training
- Competency & performance
- Personnel targeted for training

Minimum Training and Certification Requirements

Organizations are obligated to provide the appropriate skills for a member to perform their duties in a safe, effective, and competent manner. Minimum training and certification requirements should be:

- Relative to the duties which must be performed
- Codified by the organization
- Reviewed periodically for accuracy
- The very basis for which a training program is developed

Minimum training requirements should be engineered into an aggressive, objective-based training program. Periodic training cycles for each standard or certification ensures regular exposure and drills to meet those requirements.

Dundee Fire Department training program is accredited by the State of Oregon Department of Public Safety Standards and Training (DPSST) in the following subject NFPA areas: Fire Fighter I & II, Pump Operator, Wildland Apparatus Operator, Mobile Water Supply Operator, and Driver. DPSST also accredits Hazardous Materials First Responder and Fire Ground Leader training by DFD.

Training Program Planning and Objectives

A training program should be based upon a comprehensive training plan. Planning for a training program requires the organization to effectively use the limited amount of time; they have with members to maximize the objectives of the program.

Training objectives must be tied directly to the training requirements established for the organization, and it must be maximized for types and frequency of exposure to hazards their members must face. NFPA Standard 1500[12] provides that fire personnel must be trained for the hazards they may potentially be exposed to at an emergency scene. Thus, the training program and training objectives should be a balanced program where fire personnel are trained and tested in the competencies specific to dangers they may face.

[12] National Fire Protection Association, *NFPA 1500: Standard on Fire Department Occupational Safety and Health Program*, 2002, Quincy, MA.

While the department has an annual training schedule, the planning process and execution of the training program is only partially objective-based.

Competency-based Training

Competency-based training is the most effective and efficient training model for today's emergency services. Under a competency-based training program, an evaluation of skill performance is conducted at scheduled intervals to determine if the person being evaluated can perform the task in accordance with pre-determined standards. Skills that are performed appropriately require no additional training. Skills that are not performed well are practiced until the standard is met. Successful competency-based training programs require that the educational material and the expected performance by validated by the personnel that must perform the skill.

Ideally, the competency-based training approach is used on an on-going basis. For example, each quarter different skills are evaluated on an individual-by-individual or company-by-company basis.

A competency-based training program requires the identification and documentation of the skills and expected performance of the member. This would include all necessary and expected skills for each position or level of certification within the department.

The majority of the training conducted in Dundee is based on hourly requirements or a set number of classes each firefighter must attend. Chief Stock considers the needs of all personnel when designing training activities.

Trainers and Instructional Cadre

Emergency service organizations should develop a cadre of trainers and instructors that are certified to instruct in the emergency services. State and national standards define the necessary training and skills one must obtain to be a certified instructor.

In addition to the obvious training benefits of an instructor who has been trained to organize and perform classes and courses, a fire department may improve levels of individual skills by assigning training classes and drills to teams or members on a regular basis. Not only is this a

benefit is sharing the burden of training, but individual instructors or trainers become very proficient in their assigned topic in order to deliver a successful class.

Providing incentives, rewards, and recognition to instructors is very valuable, especially in the volunteer setting. Successful fire departments provide such amenities to the instructor cadre and other members who invest personal time to become certified in their particular skill, and perfect their training delivery system for the rest of the organization. This also provides opportunity for the individual and/or team to teach or instruct outside of their organization, which promotes a high level of personal satisfaction while honing their skills for instruction at home.

Currently, three members of DFD are instructor certified. This would indicate that a small portion of in service training is provided in-house by individuals not trained as instructors.

Special Hazards Training Competencies

National standards require that all members of the fire department be adequately trained in all hazards they may face. Further requirements are placed upon each member to be trained and certified at a minimum level for

- Hazardous materials
- Blood borne pathogens
- Nuclear, chemical and biological hazards
- Special hazards

This training is often provided by outside instructors trained to teach and certify firefighters in these disciplines.

In most volunteer fire departments, there is minimal time to expand training beyond the necessary hours to receive basic training and maintain skills. However, fire departments must train their personnel to an awareness level on these special hazards. The training schedule must include opportunities for fire personnel to receive refresher training and some skills testing on these subjects.

During the evaluation of DFDôs training program, it was noted that awareness level training for hazardous materials is provided to new members. On-going refresher training for hazardous

materials and initial training for other special hazards or conditions is preformed on an annual basis.

On-going Skills Maintenance

There is a variety of guidance available on the amount of time that a firefighter/rescuer should spend training each year including ISO, NFPA, and DPSST standards. DPSST recommends that 80 hours a year is the minimum needed to ensure firefighter proficiency and prevent degradation of skills. Additional hours are needed for training in special skills and special hazards. The best tool for establishing standards for on-going training is to provide competency-based classes and exercises.

There is evidence that on-going training is being conducted, though minimal. DFD training records indicate general topics are scheduled, but there is no further data to indicate what percent of the training is for on-going skills maintenance.

Safety Training

Firefighting is one of the most hazardous occupations in the nation. Consequently, training programs must go beyond the requirement for manipulative skills maintenance and training. A safety element must be contained in every aspect of a fire department training program. Everyday training operations should have a safety message, as should all manipulative drills.

While there is generally an initial safety training opportunity for the incoming rookie firefighter in most organizations, safety must be regularly reinforced in all venues. National statistics consistently indicate that the veteran population of the fire service sustains the majority of deaths and injuries, thus emphasizing an on-going necessity for safety training.

Safety training is provided for new members, and there is evidence that there is on-going safety emphasis or education occurring at DFD.

Career Development Training

National standards recommend that personnel demonstrate the skills and knowledge required for a position prior to being appointed or promoted. National standards such as NFPA Fire

Officer I and II[13] provide the basis of most organizationôs education requirements. Preparatory training is often provided in fire departments to ensure that candidates for promotion meet minimum education and skill requirements for the position.

Career development should not be reserved for leadership positions. Other levels of certification, qualification, and expertise can be considered career tracks as well, especially in a volunteer department. Positions such as emergency medical technician, paramedic, apparatus operator, aerial apparatus operator, rescue technician, hazardous materials technician, or instructors all have their own place as career tracks of an organization. Diverse career tracks improve the organizationôs competency and provide incentive, motivation, and longevity to members who desire to excel and gain recognition in their craft.

The Department does not maintain a clear set of career requirements or tracks for its positions.

Training Facilities

At the heart of any training program are adequate facilities for the delivery of the program. While there is value in fire department training and exercising in and around the commercial buildings and sites that they protect in their community, many of the drills and exercises require dedicated facilities and props for training.

Successful training programs throughout the United States have invested in state-of-the-art training facilities and props to ensure that the skills and competencies of their personnel are kept at the highest level. Facilities should include classrooms with interactive audio-visual equipment and internet access, training towers, burn buildings, extrication pads, flammable gas props, roof props, and large driving surfaces. Facilities such as these are usually unaffordable for smaller jurisdictions, but can be obtained collectively when several departments share the cost.

DFDôs current facilities are limited to adequate classroom space and remote shared sites (streets and parking lots).

[13] National Fire Protection Association, *NFPA 1021: Standard for Fire Officer Professional Qualifications*, 2003, NFPA, Quincy, MA.

Training Staff

The education and training of an emergency service organization is a critical function. Consequently, the organization must dedicate adequate leadership, management, and support to enable a successful program. The safest and most successful departments place significant emphasis on training programs, and have appointed a person that is trained and responsible for the training function. In some instances, the training and safety functions have been integrated into one division.

The concept that an organization is only as good as its leadership also applies to the training function. Excited, creative, and aggressive training leadership reflects significantly on the performance and attitudes of the fire departmentôs members.

In Dundee, the fire chief, in addition to his other duties, has retained the training function responsibility. He is supported by one of the lieutenants. Other limited support for the training function is provided by DPSST and other Department members.

Fire Prevention

Of all of the disciplines within the scope of fire department activities, none has as great a financial impact on a city than the prevention of fires. An aggressive fire, medical, and accident risk management program, through active prevention efforts, is a fire departmentôs best opportunity to minimize the losses and human trauma associated with fire and medical emergency events. The International Association of Fire Chiefs has defined proactive emergency services as:

> ñé embracing new, proven technology and built-in protection, like automatic fire sprinkler and early detection systems, combined with aggressive code enforcement and strong public education programs.ò

A fire department should actively promote fire resistive construction, built-in early warning and suppression systems, and an educated public that is trained to minimize their risk to fires, accidents, and medical emergencies.

Typically, the relationship between community development, planning, construction codes, and fire prevention is a tenuous one. The burden and cost of fire mitigation has typically been borne by the community and the taxpayer, rather than the developer who grows and expands the city for profit. Fire protection impact fees are not currently assessed to the developer by the City to help ease the burden the community must bear to protect new development.

Depending upon council and staffôs philosophy toward fire protection, the growth, expansion, and delivery systems of the fire department can be controlled. Operational capital costs can be reduced through an ambitious philosophy of placing the burden of fire prevention and fire protection on the developer and building owner.

Dundee has an enviable opportunity to re-think their philosophy for controlling the cost of fire protection before more growth occurs and the buildings are built. This philosophy could be realized through zoning, utility requirements, and construction codes.

Community Planning

It is at the community planning and futuristic level of city government where the philosophy toward fire protection is played out. In the same manner as community planners establish the zoning overlays for population density, construction, and land uses, the opportunity exists for communities to manage their risk of fire, disaster services, and use/location of hazardous materials and operations. Additionally, zoning for fire hazards and fire protection can control the growth and demands of the fire department in both short and long-term venues.

As with most city governments, DFD has minimal involvement in community development, community master plans, and zoning issues. A review of the Department's involvement in community planning activities indicates that the Department and/or fire protection issues are a part of the community planning or community zoning process. Both short and long-term development standards take consideration for fire protection requirements based on the International Building Code and International Fire Code.

Fire and Life Safety Codes

Building codes, fire codes, and life safety standards are the minimum performance standards for construction and maintenance of properties, buildings, and processes. The development, updating, and adoption of new codes are designed to keep a jurisdiction's building standards abreast of technology and updated construction practices. However, the process of developing these codes is heavily influenced by persons and groups who may be more concerned with profit than protection. Building, life safety, and fire codes are minimum standards that have broad and universal application, which may leave weaknesses in a city's enforcement policy.

A city's fire protection philosophy may be reflected in a more thoughtful and complete manner by including standards that are specific to the jurisdiction. It is common for municipalities to add additional standards and requirements, or modify current adopted standards with more restrictive language to reflect the philosophy of the governing body.

Dundee has adopted the 2000 edition of the International Building Code and the International Fire Code as adopted by the State of Oregon in their entirety without local changes.

New Construction and Development Review

Most jurisdictions provide a pre-application and pre-construction conference with perspective developers. The purpose of these conferences is to discuss zoning, site, and code requirements for the project. The conferences are an effort for better communication among city staff and the developer. The conference should include a representative of each discipline of city government that has an opportunity to review the project. During the conference, the respective codes and standards are discussed, and all communications and requirements are recorded in document form for the developer. The most successful jurisdictions provide an opportunity for all departments of the jurisdiction to have representation.

The City conducts pre-construction conferences for future projects. The ESCi evaluation found that DFD did regularly attend and become a part of this process. Additionally, the Department is part of the approval process for construction projects, developments, and occupancy permits.

Fire and Life Safety Code Enforcement

On-going fire and life safety inspections have multiple benefits for the fire department and community. Code enforcement helps to ensure the safety of occupancies thereby protecting employees and customers. In addition, the cityôs economic base is protected against catastrophic loss. A serious fire can mean the loss of life, business, jobs, and revenue to the city.

The consistent and professional process of fire safety inspections in multi-family and commercial occupancies provides the opportunity to ensure fire and life safety code compliance, build community relations, provide fire prevention education, and is an excellent training tool for firefighters.

Figure 19: Recommended Inspection Frequency

Recommended Inspection Frequency		
Hazard Classification	**Example Facilities**	**Recommended Frequency**
Low	Apartment common areas, small stores and offices, medical offices, and storage	**Annual**
Moderate	Gas stations, large stores and offices, restaurants, schools, hospitals, light manufacturing and industrial, auto repair shops, and combustible or flammable material storage	**Semi-annual**
High	Nursing homes, hazardous materials, heavy industrial with high process hazards, bulk flammable liquid storage, and a facility classified as extremely hazardous substance (EHS) facility by federal regulations	**Quarterly**

Source: National Fire Protection Association

Organizational philosophy is important in the development and successful execution of this program. The adoption of fire and life safety codes allows a fire department to assess multi-family and commercial occupancy and impose compliance with said codes. Code enforcement inspections can appear to be heavy handed, which will put a business owner on the defense and damage the fire department's public image. From an educational standpoint, regular visits to commercial occupancies by fire personnel keeps combat firefighters up-to-date on changes, dangers, and processes they may encounter in an emergency. Additionally, they provide opportunity to keep pre-incident plans up-to-date response personnel.

Unless requested by a business owner or occupant, the Dundee Fire Department does not conduct fire prevention inspections, keep occupancy records, or participate in fire and life safety code enforcement. Due to the lack of resources, the current staff is unable to engage in a code enforcement program.

Pre-Incident Surveys

An on-going and integral part of a fire prevention program is the development and maintenance of pre-incident surveys. Pre-incident planning is essential to safe and successful emergency operations in commercial and industrial occupancies. A regular regimen of periodic visits for updating pre-incident drawings, pictures, and plans is essential from a safety, training, and command standpoint.

A lack of resources and staffing has impacted the Departmentôs ability to have a pre-incident survey or plan program.

Public Safety Education

An important link to public safety and public relations is executed through a public safety education program. Traditional fire departments provide minimal public education services to their community through an exclusive effort. The most successful public education programs combine the efforts and successes of crime prevention, injury prevention, citizen emergency response teams (CERT), and fire prevention. The combination of resources broadens the scope and sphere of prevention and education opportunities for better public access, better use of resources, and a more comprehensive approach to reducing the demand for public safety services.

While evaluating the department, ESCi discovered that minimal public safety and education efforts were provided. Again, this is due to a lack of resources.

Fire Investigation

An integral part of fire prevention is a consistent, tenacious, and aggressive fire investigation program. Fire cause determination is important from a property standpoint, and the determination of fire cause and origin greatly enhances a fire departmentôs understanding of their local fire problem. Fire cause then becomes the basis of the public education effort.

Fire codes and standards require that all fires be investigated for determination of fire cause and origin. Further, state and federal laws require that fires with a suspicious origin, or are known to be arson, must be investigated by a law enforcement agency.

Arson is an event that can terrorize whole communities. The careful and consistent investigation and arrest of perpetrators is a deterrent to others. Arson investigation is also the basis for determining patterns and styles in the event a serial arsonist is at work in the community.

Fire investigation is carried out under various models and methods. The most successful programs are those formed as a joint effort or task force between law enforcement and fire

investigation personnel. In addition, all emergency response personnel must be trained in the basic level of observation and preservation of evidence.

The fire chief and DFD personnel trained in fire investigation take the lead investigating all fires. The Newberg Fire Department (fire marshal) is available to assist when needed. Complicated and large loss incidents are investigated by the county Fire Investigation Team, (FIT) consisting of local and state fire and law enforcement personnel.

Record Keeping

Record keeping is critical to all public agencies. Complete and accurate records of fire prevention activities, premise information, inspections, code violations, code enforcement, notices, and permits are crucial to a good fire prevention program. Policy makers and department administration usually rely on historical data. Staff relies on current information and future scheduling of events, activities, and inspections.

It is vital that fire departments connect to state and federal information centers to report their activity and fire problems. Oregon and the United States Fire Administration require the reporting of fire incident information in order to be eligible for federal grant funds.

Dundee does not use a computer-based reporting system. The use an off-the-shelf version of FireHouse® software would be adequate for the Departmentôs current needs and can be upgraded in the future.

Section II - Financial Analysis

Overview

The City of Dundee derives its operating revenue from a wide variety of sources. In fiscal year 2005-2006, property taxes account for only nine percent of the total all-funds budget revenue of $3,857,170. The Department receives $47,893.00 per year from the fire protection agreement with the Dundee Rural Fire District (District). These funds are included in the general fund for the Department. Property tax revenue accounts for 46 percent of current general fund requirements.

There is a disparity between the amount paid by city taxpayers and by district taxpayers for fire services. City taxpayers pay nearly 1.5 times more for service than do district taxpayers. However, the only fire station is located in the city where response times will naturally be shorter than responses to the district. The city also produces the largest service demand given its higher development density.

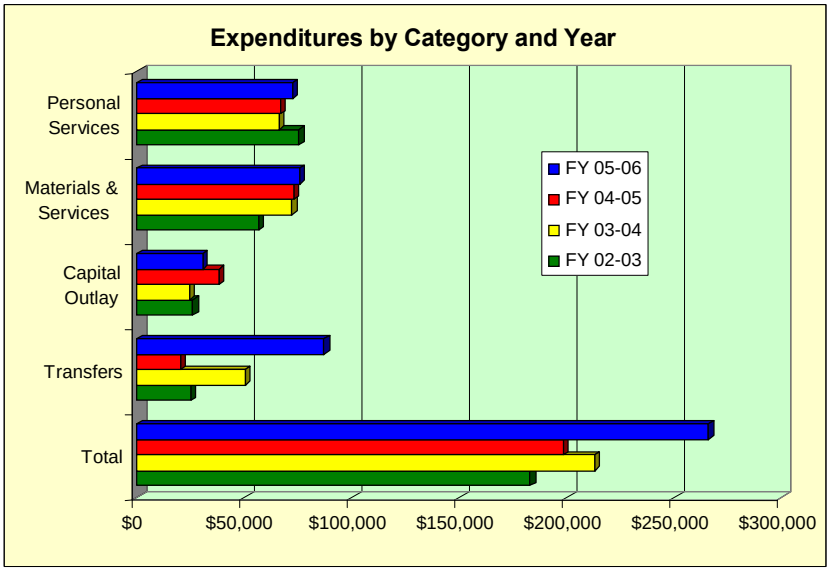
Property tax revenues have grown an average of 5.7 percent per year for the past four years. New development within the community accounts for revenue growth above the statutory limit of 3%. The City faces the potential for a revenue short fall as it approaches full build-out. When that might occur should be the subject of a comprehensive long-range financial plan.

DFDôs budget for 2005-2006 is $267,560 including transfers of $87,188 to the SAFER grant fund; contribution from the District of $47,893.00, apparatus reserve funds, and an operating contingency of $2,000. Bonded debt service for the purchase of fire apparatus and equipment is paid out of separate City accounts.

The Rural Districtôs permanent tax rate is $0.5580 per $1,000 assessed valuation. In fiscal year 05/06, the District collected $62,211.33. Amounts in excess of the city contract go directly to funding rural capital reserve fund, volunteer recognition and awards, EMT training, and various annual maintenance and repairs.

General uses of funds by the City are shown in the following chart.

Figure 20: Expenditures by Category and Year



Notes to chart:

1. FY 02-03 capital outlay total does not include $312,625 for the purchase of apparatus
2. FY 05-06 transfers includes $23,295 for the SAFER grant

Cost Recovery Efforts

As the cost of providing fire and emergency medical services rises, fire agencies throughout the United States are looking for ways to recover, in part, the cost of these services. For most emergency service systems, major cost recovery options are limited primarily to emergency medical services, where health insurance providers and/or Medicare underwrite costs. Additional possibilities exist in the area of hazardous materials response, fire suppression response, and code enforcement.

DFD does charge a fee for responses to transportation route emergencies. This program, authorized by Oregon statute, has generated as much as $7,000 in prior years and is budgeted to generate $2,000 during the current fiscal year. Transportation route emergencies include any response to a road, railroad, navigable waterway, or aircraft incident.

A potential cost recovery source is the response to hazardous materials (hazmat) incidents. The State of Oregon has implemented laws that require reimbursement for response and mitigation efforts. The cost recovery is typically limited to actual documented expenditures and, with the exception of very busy hazmat teams, provides little in the way of a predictable revenue stream.

Code enforcement and inspection fees have the potential to be a reliable, consistent, and predictable source of revenue. Many communities have established a fee ordinance for their code enforcement division that initiates billing for everything from routine inspections to licenses and plan review. Code enforcement fees can be based on occupancy type (reflecting the relative complexity of the inspection), while plan review fees are often based on the value of the structure reviewed. Depending on the fee structure, the revenue potential is great enough to partly or wholly fund the cost of providing the service.

Future Organization Alternatives

Various options are available to the City and District when considering a new operational and/or financial model.

New Fire District

Casual conversations have occurred between members of the City of Dundee and the Dundee Rural Fire Protection District concerning the feasibility of creating a new fire district consisting of the current city and Rural Fire Protection District. Under this arrangement, the new district would become the entity responsible for the delivery of fire and emergency services. The new district's permanent rate would be applied to property within the boundaries of the new district. The amount of revenue produced under this model would be determined by the permanent rate approved by voters when creating the new district. This model would provide the greatest flexibility in funding for services required.

Annexation

The District and the City could choose to annex the City into the existing Rural Fire Protection District. This model would generate approximately $160,000.00 in revenue based on 2005/2006 assessed valuations and permanent rate of .5580. This model would fall short in funding by approximately $100,000.00 based on current requirements. Under this model, the District would be responsible for delivery of services.

Contract for Service

Currently, the District contracts for service from the City. The City has experience with contracting out to the City of Newberg for law enforcement services. Another consideration for providing fire services is to examine the cost and service delivery available from the City of Newberg and potentially others. Under this model, the District should also consider its options. The cost of this model to the City would be determined by negotiations.

Local Option Levy

Under this model, the relationship between the City and the District would remain the same. Either or both jurisdictions could seek approval from its voters for an operational local option levy. A local option levy would provide additional funding for operations on a five-year basis, and must be renewed to maintain revenue. The funding reliability of this model is based on continued voter approval.

Future Steps

Successfully created new districts, merged, and/or consolidated fire protection agencies exist throughout Oregon. Creation of a new district, annexation, merger, or consolidation should be approached methodically. Agencies that are interested in these efforts must plan thoroughly and seek the assistance of facilitators and experts that can guide them through an appropriate process.

ESCi recommends that the Dundee City Council and the Dundee Rural Fire Protection District Board of Directors meet to discuss these concepts. This discussion should focus on whether these options provide improved service to the greater community.

The various options and financial iterations could be developed and presented to the community for comment. Strong community support for change must be developed before the political bodies should consider moving forward with any of the models.

ESCi further recommends that the City Council take immediate steps to improve staffing levels during the hours that volunteers are not available for emergency response.

Section III - Short and Mid-Term Strategies

In order to assist the Dundee Fire Department with preparations for future growth and change, ESCi performed an in-depth evaluation of the current fire service delivery system. Section I of this report describes the evaluation process. The outcome of the evaluation is the following section that outlines the short and mid-term strategies that are offered as recommendations for improving the current system.

The following list will appear daunting at first and could lead one to believe that there are serious defects in the current system. This is not the case. On the contrary, the Dundee Fire Department and, specifically, Fire Chief John Stock have performed steadily and provided good service with available resources for a long time and should be commended. Tomorrowôs service delivery system will be very different from today. These recommendations, if followed, will help to set the stage for future success.

Policy Level Strategies

Noticeably absent are clearly defined definitions of the quality of service expected of the Department by its policy makers (Dundee City Council and the Dundee Rural Fire Protection District Board of Directors). The fire chief has given some thought to defining level of service in the two response performance objectives identified in the Service Delivery section of this report. However, these have not been endorsed and adopted by the council or board. Nor are they a complete definition of ñquality of serviceò necessary to move the organization forward.

Development and adoption of service level definitions should be accomplished in the very near term. These definitions will be instrumental to determining the need for additional resources. The following service level definitions (performance objectives) should be considered.

Example Performance Objectives and Targets

1. Provide for the arrival of adequate resources to initiate basic emergency medical services at the scene of any medical emergency within ñXò minutes following dispatch, 90% of the time.

   Current: minutes Target: minutes

2. Provide for the arrival of adequate resources to initiate interior fire suppression operations at the scene of any fire within ñXò minutes following dispatch, 90 percent of the time.

   Current: minutes Target: minutes

3. Property loss due to building fires shall not exceed $X per $1,000 involved.

   Current: $X Target: $X

4. The number of building fire incidents shall not exceed ñXò per 1,000 buildings.

   Residential Current: Target: X

   Commercial Current: Target: X

5. Percentage of citizens surveyed rating the Departmentõs performance satisfactory or better shall be ñXò

   Current: X% Target: X%

6. Effective citizen intervention shall occur on at least X% of emergency incidents.

   Current: X% Target: X%

To implement this performance objective, development process, the Department will need to determine its current performance for each objective. That will be difficult for several reasons because data does not exist to determine current performance. The fire chief should develop realistic recommendations for target performance. Finally, the council and board will need to determine desired performance (target). Any objective in which current performance is less than target performance is an opportunity for improvement and an identification of where new resources should be focused.

Achieving target performance may be either a short term or long-term effort. It is clear from this analysis that additional services or improved service levels will require new resources. Determining when resources will be available and prioritizing improvements should be the focus of a strategic planning effort.

The following recommendations should be considered during the planning effort. These are ESCiôs recommendations based on its observations during the preparation of this report. The degree to which they are implemented will be based on the results of the performance objective setting process just described. There is no question that implementation of many of these recommendations will require new resources.

Administrative and Management Strategies

The following short and mid-term strategies are offered as recommendations for improving the administration and management functions of the agency. Individual narrative text describing the issues associated with these recommendations may be found in the appropriate sections of this report.

Administration

- The City and District should begin serious discussions to determine if additional resources can be obtained to improve the quality of fire and emergency services. This may include a variety of options such as:
    - Local option levy
    - Service delivery fees and charges
    - Annexation of the City into the District, or both into an adjacent district
- The Department should periodically review and adjust the organizationôs structure to ensure established performance objectives can be achieved.
- The City should develop an employment agreement for the fire chief consistent with fire chief agreements of similar communities in Oregon.
- The City should provide additional administrative and support personnel to ensure established performance objectives can be achieved.
- The City should continue to review and revise the existing administrative rules.

- The Department should seek to enhance its ability to capture incident data in computer format. ESCi recommends using OAIR, provided free by the Oregon State Fire Marshalôs Office, as the electronic database.
- The Department should completely review, revise, and implement the draft procedures manual.

Planning

- The City and District should engage in a strategic planning process to prepare short-term growth plans and to evaluate regionalization of services.
- The Department should establish a survey instrument to measure customer satisfaction, quality, and performance.

Communication

- The Department uses an informal system of memorandums for the dissemination of critical and important information. ESCi recommends that a formal systematic method for the distribution of written communication be established.
- The Department does keep minutes of all staff meetings. ESCi recommends that copies be distributed to all members.
- The Department should establish a system for the distribution of critical memos and information that verifies the distribution to all personnel.
- The Department should create an internal newsletter for the distribution of news and information about the organization to its members.
- The Department should expand its presence on the City website.
- The Department should continue to produce an annual report that describes the Departmentôs activities for the past year, alarm statistics, number of personnel, budget, and other pertinent information. ESCi recommends that the report be distributed community wide as an annual newsletter.
- E-mail accounts for all members should be considered to facilitate communications.
- The Department should maintain a scrapbook containing articles, pictures, documents, and other items of historical interest to support the future ability to maintain a historical review of the organization.

Risk Management

- The Department should engage in a member driven wellness/fitness initiative that helps members stay fit and healthy for emergency response.
- The Department has established a department safety committee that meets monthly. ESCi recommends that the committee follow the standards listed in NFPA 1500 and the requirements of Oregon OSHA.
- The Department should have full blood-born pathogen exposure protection available to its members ï masks, eyewear, and gown.
- The Department should purchase and have available eye protection for members using power tools. Helmet face shields are not sufficient for this purpose.
- The Department should conduct driving and background checks on all new members, and random driving checks on current members.
- The City should require that all Department members attend an employment orientation training session and require a signature acknowledging the receipt of training and copies of the personnel handbook, discrimination policy, sexual harassment policy, and SOGs.
- The Department should replace the current station keyed passage locks with a punch code, lock mechanism for access to the fire apparatus and common station areas.
- The Department should install a fire and burglar alarm system in the current fire station and all future fire facilities.

Human Resources

- The Department should review the current entry physical ability test for relevancy and check entrance-testing materials for adequacy.
- The Departmentôs job descriptions should be completely updated to reflect the most current activities, critical tasks, and necessary skills of each position, as it exists today. This process should be conducted at intervals no greater than five years.

Capital Asset Strategies

The following short and mid-term strategies are offered as recommendations on issues related to the capital assets of the Department. Individual narrative text describing the issues associated with these recommendations may be found in the appropriate sections of this report.

- The City and Department should develop a full long-range facilities management plan, as well as specific plans to address the current problems in the existing station.
- Initiate efforts to correct existing deficiencies as indicated in the fire station evaluation.
- The Department should provide for automatic exhaust removal system at in the current fire station and in all new stations.
- The City and District should develop and fund an apparatus replacement program that anticipates replacement schedules and builds the necessary funding to spread costs over multiple years.
- The Department should review additional cost recovery options for potential revenue generation.
- The District and City should continue to develop and fund a small equipment replacement program that anticipates replacement schedules and builds necessary funding in order to spread cost over multiple years. Turnout gear should be included in this fund.

Emergency Service Delivery Strategies

The following short and mid-term strategies are offered as recommendations on issues related to the delivery of emergency services by the Department. Individual narrative text describing the issues associated with these recommendations may be found in the appropriate sections of this report.

- Aggressive recruitment of new volunteers should be a priority.
- The Department should consider recruiting volunteers who are not expected to perform interior firefighting. Volunteer positions should be considered for people who wish to do only emergency medical response, outside scene support activities, public fire safety education, and similar tasks.
- To improve volunteer turnout times, the Department should survey the members to determine when they are available and recruit additional members that are available during poor turnout times.
- Minimum participation standards should be adopted for Department volunteers. These would include the minimum percentage of responses that must be attained and the minimum number of training sessions that must be attended during a certain time period.

- ESCi suggests that the Department focus turnout gear purchases with attention to stress reduction, while increasing firefighter mobility and comfort.
- The City needs to work with the City of Newberg to ensure that a back-up dispatch center is in place.
- The Department should establish response protocols based on critical tasking for different incident types.
- The Department should develop a pre-incident survey program that develops and maintains premise information and maps.
- Pre-Incident plans should be kept in all apparatus including command vehicles. The pre-incident material should include aerial photographs of complex or high hazard occupancies.
- All emergency personnel should regularly conduct walk-through training exercises and multi-company exercises on target hazard premises using the pre-Incident plans.
- The dispatch center and the City's emergency operations center should be provided with copies of pre-incident plans.
- The Department should prepare to make future improvements in the collection of incident data (automatic download to the Department data system from the computer aided dispatch system).

Training Program Strategies

The following short and mid-term strategies are offered as recommendations on issues related to the training programs of the Department. Individual narrative text describing the issues associated with these recommendations may be found in the appropriate sections of this report.

- The Department currently is following Oregon DPSST voluntary standards. ESCi recommends that minimum education and certification standards for all positions in the organization be identified.
- The Department should appoint a training officer to oversee the training function.
- The Department should establish a training committee of members from all levels or the organization that is tasked with advising the training officer and providing recommendations, goals, and objectives for the training program.
- The Department should establish a comprehensive training plan based on the training and education requirements of the department.

- The Department should ensure that all training classes and activities contain elements and exercises that require the participant to demonstrate specific competencies.
- The Department should regularly assign members to assist instructors in the preparation and execution of training classes and drills.
- The Department should provide instructional materials, programs, internet access, and other resources to the instructorôs cadre to ensure the most modern, updated, and aggressive instructional and training tools are available to them.
- The Department should conduct a jurisdiction risk assessment to identify the potential special hazards that responders could face. Based upon this information, training standards and skills requirements should be identified.
- The Department should adopt minimum training standards and requirements, for initial, annual, and periodic training in hazardous materials, pathogens, nuclear/biological /chemical, electrical, and other special hazards
- The Department should integrate special hazards training into the regular training schedule.
- The Department should develop minimum on-going skills maintenance standards to which all personnel must comply.
- The training officer or training committee should periodically evaluate these standards to ensure they are up-to-date and pertinent.
- Members who take extended leaves of absence and return should be evaluated and required to demonstrate competent skills in the standards adopted prior to returning to duty.
- The Department should host or provide opportunity for additional members to attend and receive certification in the NFPA Incident Safety Officers course.
- The Department Safety Committee should advise the training office regarding minimum training standards.
- The Department should integrate safety training and education into the training schedule.
- The Department should appoint safety officers at drills and exercises when necessary.
- The Department should provide career tracks for all of the identified positions so that a member may follow a successful path of training and certification to attain their desired certification or position.

- The Department should provide opportunities and incentives for its members to attain certification and training in each position.
- The Department should conduct a comprehensive needs assessment for training facilities and equipment based upon their standards and requirements for training.
- The Department should continue to develop plans for acquiring training props and facilities that are centrally located, and should investigate opportunities for regional share of the facilities.
- The Department should inventory the training library and implement a formal process whereby members may checkout materials.
- Expand attendance opportunities at the National Fire Academy throughout the officer ranks and for those developing their officer skills.

Fire Prevention Strategies

The following short and mid-term strategies are offered as recommendations on issues related to the fire prevention programs of the agency. Individual narrative text describing the issues associated with these recommendations may be found in the appropriate sections of this report.

- The City should review its development code to ensure the impact of new development on fire protection is minimized.
- The City is encouraged to allow participation in the process by the DFD when adopting or updating zoning and community planning standards.
- The City should adopt a formal pre-construction review process for new construction and development that includes all stakeholders.
- The Department should review and inspect all new commercial and multi-family residential construction to ensure compliance with fire safety requirements and be signatory to all certificates of occupancy.
- The Department should evaluate whether it should become involved in fire code inspection of commercial properties or whether the services provided by the State Fire Marshal's Office provide an adequate level of fire safety.
- The City should provide adequate, dedicated staffing to develop and consistently execute the fire prevention program.

- The Department should develop a cooperative, comprehensive, and aggressive public safety education program collaborating with city departments, and other public and private organizations.
- The Department should coordinate regularly scheduled public safety classes and courses for businesses and the public. The courses could include:
    - CPR
    - Basic first aid
    - AEDs
    - Fire prevention
    - Bicycle safety and helmet safety
    - Exit drills in the home (EDITH)
- The Department should consider establishing a regular, all hazards based school curriculum for ages K-6 in the school district that includes education programs from both fire and police venues.
- The Department should immediately provide training to all of its members in basic fire cause and origin determination and the preservation of evidence.
- The Department should develop SOGs regarding the consistent investigation of all fires.
- The Department should establish SOGs for accurate and up-to-date reporting of all of its functions.

Methods for Prioritization of Recommendations

While it may seem as if this list of recommendations is long, the content of the recommendations varies from rather insignificant issues that are quickly and easily dealt with to major organizational changes that will take some time to accomplish. A system of prioritizing the various recommendations found in this report may be useful.

ESCi suggest the following criteria be used by the Department to rate the priority and relative significance of the recommendations when setting timetables for change. Priorities are listed from greatest to least.

1. Immediate internal safety

   This objective deals with an improvement or initiative that solves an issue affecting the safety of firefighters and/or other department personnel. These are not matters that simply

make it easier to do a particular function, but in fact make a currently unsafe situation, safe. ESCi did not note any significant recommendations dealing with immediate safety issues within this study. DFD is to be commended for this finding.

2. Legal or financial exposure

   The objective resolves a situation that is creating, or is likely to create, the opportunity for legal action against the department or its members. It may be a situation that could subject the Department to significant expense.

3. Corrects a service delivery issue

   The objective addresses a service delivery situation that, while it does not create an immediate safety risk to personnel or the public, does affect the department's ability to deliver service in accordance with its standards of performance. For example, adding a response unit to compensate for a growing response workload, or delivering training needed to allow personnel to deal effectively with emergency responses already being encountered.

4. Enhances the delivery of a service

   This objective improves the delivery of a particular service. For example, relocating a fire station to improve response times to a particular part of town, or adding a piece of equipment that will improve the delivery of a service.

5. A good thing to do

   The objective does not fit within any of the above priorities, but is still worth doing.

Section IV - Recommended Long-Term Strategy

A fire protection evaluation provides an opportunity to develop recommendations that are intended to provide strategies that are both short and long-term in nature. The purpose of this evaluation was to identify the most critical issues the agency will face and suggest solutions and action paths to address them. ESCi initiated that process in the previous sections of this report with short and mid-term recommendations.

ESCi has identified the following five critical issues that need to be addressed as long-term strategies for the Department. Recommendations for implementation are also provided.

Issue 1 - Funding capability will need to be developed to achieve the Department's adopted performance objectives.

The amount of new funding needed will be based on the gap between current performance and target performance as defined in the Departmentôs performance objectives. A number of funding options are described previously.

If the City and the District were to agree on formation of a new fire district, which would include the existing City and District, a permanent tax rate could be established that would balance taxpayers cost per thousand. Resent information from the State Revenue Department indicates that a new permanent rate could be presented to the voters for approval, along with the request to form a new fire district. If a new, permanent rate was not established, additional revenue would be necessary to support the targeted performance standards.

Recommendation: The City of Dundee and the Dundee Rural Fire Protection District should consider establishing a task force to review all options available for increasing funding based on established performance standards. The task force should seriously consider the formation of a new rural fire district encompassing the existing service area of the City and Dundee Rural Fire Protection District.

Issue 2 - The Department's current administrative capability is challenged to meet existing organizational demands.

Though support service is provided by other City departments, such as accounting, payroll, risk management services, and the like, much of the management and administrative services are provided by the fire chief. Personnel management, training development and administration, community risk reduction efforts, facilities and apparatus maintenance, compliance with legal mandates such as OSHA regulations, and other responsibilities are simply more than can be effectively handled by a single individual.

Though some responsibilities can be delegated to volunteer personnel, this is not a good long-term strategy. Assigning additional work to volunteers may be an unreasonable burden that has negative consequences such as increased turnover.

The City is responsible for providing an effectively managed organization. It will need to determine what administrative and support functions will be done by Department personnel and what will be done by other City departments. Once that is determined, those activities will need to be staffed to ensure effectiveness. ESCi believes this process will result in the addition of a full-time employee to the Department to support organizational management and administration.

Recommendation: Conduct an analysis to determine which administrative and support functions will be the responsibility of Department staff, and which will be the responsibility of other City departments. Provide staff to ensure effective performance of these responsibilities.

Issue 3 - The fire prevention, training, and safety functions do not receive the level of support typically provided in a pro-active community.

This issue is closely related to the discussion regarding administrative and support functions. The resolution is also directly tied to the development of performance objectives defining the level of service desired by the community.

Within the suggested performance objectives, are two that relate directly to the fire prevention function. One defines the number of fires that will occur each year and the other defines how well the public will react to an emergency. The first is controlled by activities such as fire code enforcement inspections, fire department involvement in new construction review, and public education. The second is controlled almost exclusively by public education.

Training and safety are critical activities that directly affect the Departmentôs ability to provide effective emergency services. Training requirements, even for volunteers, have and will continue to increase. Safety regulations and the need to protect personnel from harm requires close monitoring of activities.

Like the issue above, the City is responsible for ensuring the Department has the resources it needs to be successful. Defining what determines success through the adoption of performance objectives is the first step. Providing the resources to be successful is the next.

Recommendation: Evaluate staffing needs following adoption of performance objectives defining desired level of service. Provide staff to ensure effective achievement of this level.

Issue 4 - The Department's fire station is currently inadequate to handle additional personnel and equipment. The structural soundness is also questionable.

The fire station is well located based on currently defined response objectives. That may change as the desired level of service becomes more clearly defined. Regardless of this, the fire station is the central base of operations, must be sized and maintained to perform its function, and should be safe. Its seismic strength should be considered as well, given the earthquake risk present within this region.

Recommendation: Following adoption of response performance objectives, the Department should develop a comprehensive facilities plan. This plan may include relocating the existing station, adding stations, or both. Conducting a space needs analysis will ensure new fire stations are sized and designed to be effective bases of operation. If the existing station is to remain in use, the Department will need to conduct a thorough facilities analysis to identify needed structural improvements, and to identify if expansion is needed.

Issue 5 - The Department's current staffing level will be inadequate as community growth creates additional workload.

Last year, the Dundee Fire Department responded to 479 calls for service. By the year 2025, if response activity increases as it has during the past four years, calls for service will more than double. Given the impact of additional community development and population growth, this growth in workload will most likely be realized.

Most responses occur during weekday hours when volunteer personnel are least available. Growth in the Department's response workload will exacerbate this problem. As response workload increases, it will be more and more likely that simultaneously occurring calls for service will be more common.

Again, developing a clear definition of desired level of service through the adoption of performance objectives will allow the Department to identify resources necessary to achieve this level of service. Solutions may include expanded use of public works employees during the day in a manner that makes them a more reliable resource. It may include recruiting volunteer firefighters who are available during the day. It may require, and at some point likely will require, the addition of full-time personnel to ensure an effective response at all times of the day.

Recommendation: Develop a clear definition of desired response performance through the adoption of performance objectives. Use this definition to identify needed resources now, and as departmental workload increases into the future.

Appendix I - Apparatus Condition Chart

Excellent:	Like new condition. No body or paint defects. Clean compartmentation. Interior cab complete and in full working order with no modifications. No significant defect history. Age is less than 25 percent of life expectancy.
Good:	Body and cab have good appearance with no rust and only minor cosmetic defects or dents. Clean compartmentation with no visible rust or corrosion. Interior cab is in full working order and good appearance. Normal maintenance history with no significant defects or high downtime. Age is less than 75 percent of life expectancy.
Fair:	Body and cab have weathered appearance with minor surface rust and some cosmetic defects or dents. Unimpeded compartmentation with only surface rust or corrosion. Interior cab is in reasonable working order and appearance. Only repairable tank or plumbing leakage. Showing increasing age-related maintenance, but with no major defects or unreasonable downtime. Age is less than 100 percent of life expectancy.
Serviceable:	Body and cab have weathered appearance with surface corrosion, cosmetic defects or dents, and minor rust-through of non-structural metals (body panels). Unimpeded compartmentation with significant surface rust or corrosion and/or minor rust-through (not affecting use). Interior cab is in rough, but working order, often with local repairs or modifications to compensate for problems. Occasional or intermittent tank or plumbing leakage. Showing increasing age-related maintenance, but with no major defects or unreasonable downtime. Most service parts still available. Age is greater than 100 percent of life expectancy.
Poor:	Body and cab have weathered appearance with surface corrosion, cosmetic defects or dents, and visible rust-through of non-structural metals (body panels). Significant rust or corrosion is present in structural or support members. Use of compartmentation is impeded with significant corrosion and rust-through. Interior cab is in rough condition with defects impeding safe and proper use. Unrepairable tank or plumbing leakage. Problematic age-related maintenance, major defects, or unreasonable downtime are evident. Service parts difficult or impossible to obtain. Age is greater than 100 percent of life expectancy. Vehicle exceeds its GVWR.

Appendix II: Dynamics of Emergency Response

Most fires within buildings develop in a predictable fashion, unless influenced by highly flammable material. Ignition, or the beginning of a fire, starts the sequence of events. It may take some minutes or even hours from the time of ignition until flame is visible. This smoldering stage is very dangerous, especially during times when people are sleeping, since large amounts of highly toxic smoke may be generated during early phases.

Once flames do appear, the sequence continues rapidly. Combustible material adjacent to the flame heats and ignites which in turn heats and ignites other adjacent materials if sufficient oxygen is present. As the objects burn, heated gases accumulate at the ceiling of the room. Some of the gases are flammable and highly toxic.

The spread of the fire continues quickly. Soon the flammable gases at the ceiling reach ignition temperature. At that point, an event termed *flashover* takes place; the gases ignite, which in turn ignites everything in the room. Once flashover occurs, damage caused by the fire is significant and the environment within the room can no longer support human life.

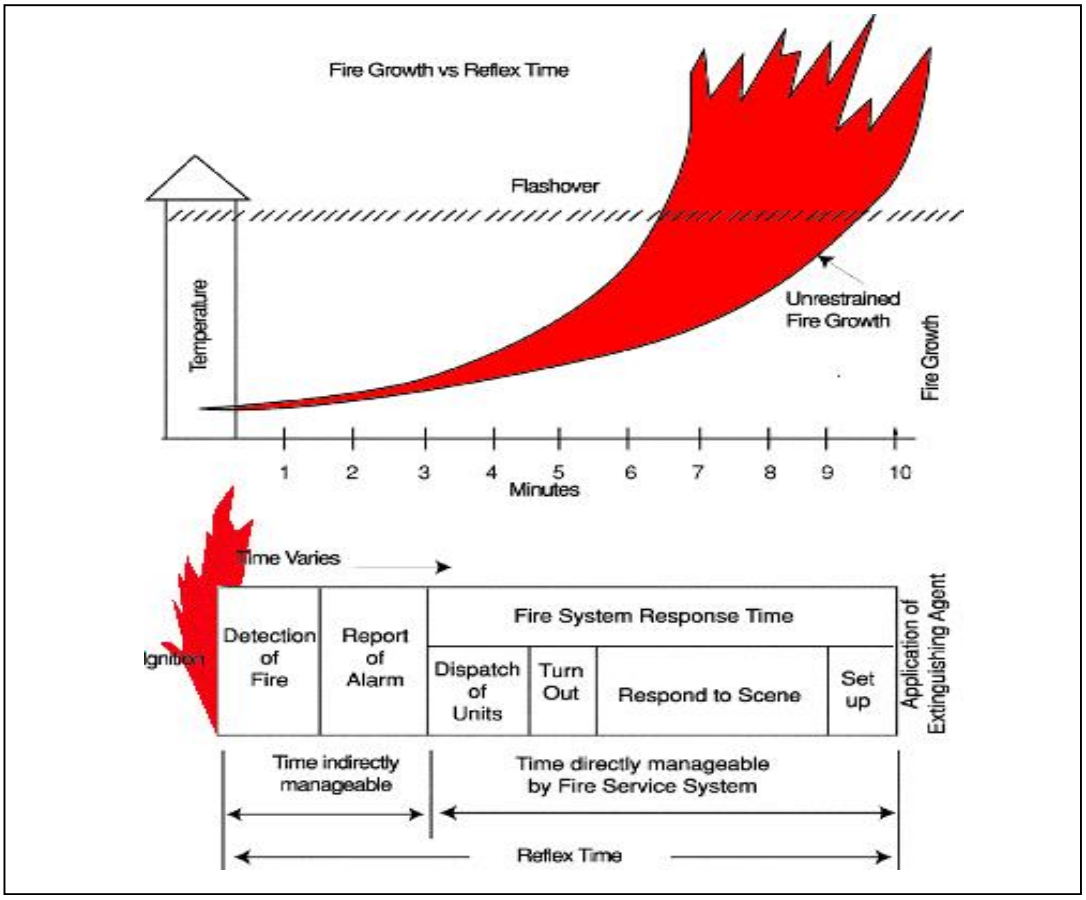
Flashover usually happens about five to eight minutes from the appearance of flame in typically furnished and ventilated buildings. Since flashover has such a dramatic influence on the outcome of a fire event, the goal of any fire agency is to apply water to a fire before flashover takes place.

Perhaps as important as preventing flashover is the need to control a fire before it does damage to the structural framing of a building. Materials used to construct buildings today are often less fire resistive than the heavy structural skeletons of older frame buildings. Roof trusses and floor joists are commonly made with lighter materials more easily weakened by the effects of fire. Lightweight roof trusses fail after five to seven minutes of direct flame impingement. Plywood I-beam joists can fail after as little as three minutes of flame contact. This creates a very dangerous environment for firefighters.

In addition, the contents of buildings today have a much greater potential for heat production than in the past. The widespread use of plastics in furnishings and other building contents rapidly accelerate fire spread and increase the amount of water needed to effectively control a fire. All of these factors make the need for early application of water essential to a successful fire outcome.

A number of things must happen quickly to make it possible to achieve fire suppression prior to flashover. The figure below illustrates the sequence of events.

Figure 21: Fire Growth vs. Reflex Time



The reflex time continuum consists of six steps, beginning with ignition and concluding with the application of (usually) water. The time required for each of the six components varies. The policies and practices of the fire department directly influence four of the steps, but two are only indirectly manageable. The six parts of the continuum are:

1. **Detection**: The detection of a fire may occur immediately if someone happens to be present or if an automatic system is functioning. Otherwise, detection may be delayed, sometimes for a considerable period.
2. **Report**: Today most fires are reported by telephone to the 9-1-1 center. Call takers must quickly elicit accurate information about the nature and location of the fire from persons who are apt to be excited. A citizen well trained in how to report emergencies can reduce the time required for this phase.
3. **Dispatch**: The dispatcher must identify the correct fire units, subsequently dispatch them to the emergency, and continue to update information about the emergency while the units respond. This step offers a number of technological opportunities to speed the process including computer aided dispatch and global positioning systems.
4. **Turnout**: Firefighters must don firefighting equipment, assemble on the response vehicle, and begin travel to the fire. Good training and proper fire station design can minimize the time required for this step.
5. **Response**: This is potentially the longest phase of the continuum. The distance between the fire station and the location of the emergency influences reflex time the most. The quality and connectivity of streets, traffic, driver training, geography, and environmental conditions are also a factor.
6. **Set up**: Last, once firefighters arrive on the scene of a fire emergency, fire apparatus are positioned, hose lines stretched out, additional equipment assembled, and certain preliminary tasks performed (such as rescue) before entry is made to the structure and water is applied to the fire.

As is apparent by this description of the sequence of events, application of water in time to prevent flashover is a serious challenge for any fire department. It is reasonable though, to use the continuum as a tool for designing the emergency response system.

Emergency Medical Event Sequence

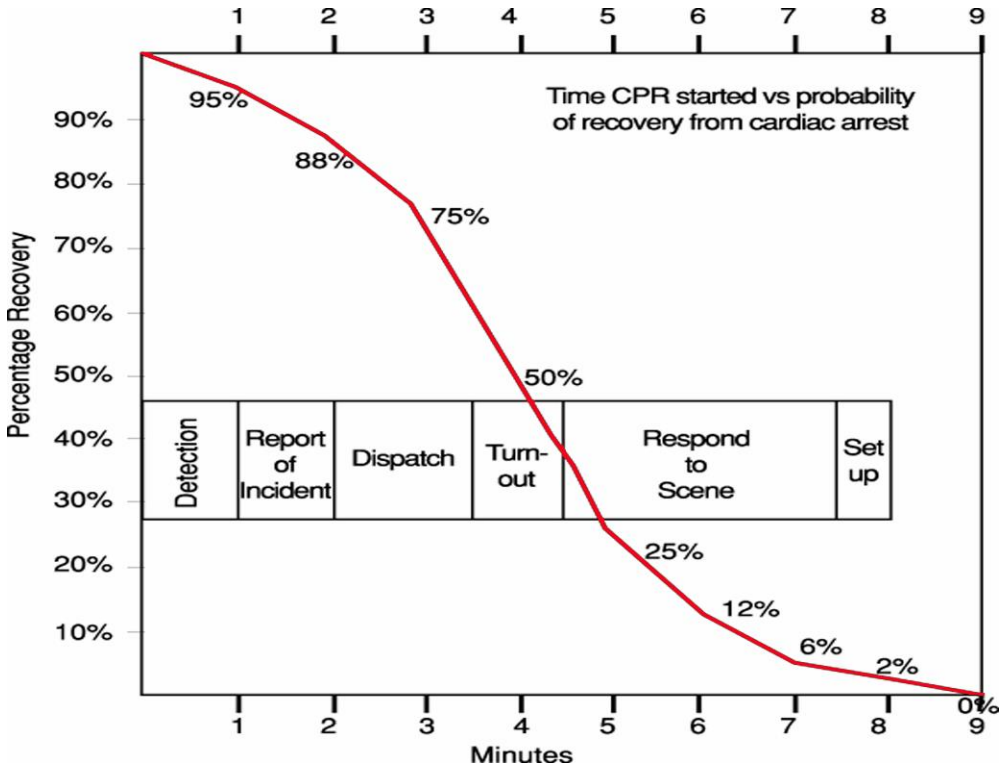
Cardiac arrest is the most significant life threatening medical event. A victim of cardiac arrest has mere minutes in which to receive definitive lifesaving care if there is to be any hope for resuscitation.

Recently, the American Heart Association (AHA) issued a new set of cardiopulmonary resuscitation guidelines designed to streamline emergency procedures for heart attack victims, and to increase the likelihood of survival. The AHA guidelines include new goals for the application of cardiac defibrillation to cardiac arrest victims.

Heart attack survival chances fall by seven to ten percent for every minute between collapse and defibrillation. Consequently, the AHA now recommends cardiac defibrillation within five minutes of cardiac arrest.

As with fires, the sequence of events that lead to emergency cardiac care can be visually shown, as in the following figure.

Figure 22: Cardiac Arrest Event Sequence



The percentage of opportunity for recovery from cardiac arrest drops quickly as time progresses. The stages of medical response are very similar to the components described for a fire response. Recent research stresses the importance of rapid cardiac defibrillation and

administration of certain drugs as a means of improving the opportunity for successful resuscitation and survival. An Oregon fire department recently studied the effect of time on cardiac arrest resuscitation and found that nearly all of their *saves* were within one and one-half miles of a fire station, underscoring the importance of quick response.

People, Tools, and Time

Time matters a great deal in the achievement of an effective outcome to an emergency event. Time, however, is not the only factor. Delivering sufficient numbers of properly trained, appropriately equipped, personnel within the critical time period completes the equation.

For medical emergencies, this can vary based on the nature of the emergency. Many medical emergencies are not time critical. However, for serious trauma, cardiac arrest, or conditions that may lead to cardiac arrest, response time is very critical.

Equally critical is delivering enough personnel to the scene to perform all of the concurrent tasks required to deliver quality emergency care. For a cardiac arrest this can be up to six personnel; two to perform CPR, two to set up and operate advanced medical equipment, one to record the actions taken by emergency care workers, and one to direct patient care.

Thus, for a medical emergency the real test of performance is the time it takes to provide the personnel and equipment needed to deal effectively with the patientôs condition, not necessarily the time it takes for the first person to arrive.

Fire emergencies are even more resource critical. Again, the true test of performance is the time it takes to deliver sufficient personnel to initiate application of water on the fire. This is the only practical method to reverse the continuing internal temperature increases and ultimately prevent flashover. One person arriving on scene, with a portable radio, does not provide fire intervention capability and should not be counted as *arrival* by the fire department.

In order to legally enter a building to conduct interior firefighting operations at least four personnel must be on scene. The initial arrival of effective resources should be measured at the point in time when at least four personnel, properly trained and equipped, have assembled at the fire.

Effective operations at the scene of fire emergencies also depend on the arrival of enough trained personnel to perform all of the duties and tasks required to control a fire event. Tasks that must be performed can be broken down into two key components - life safety and fire flow.

Life safety tasks are based on the number of building occupants, their location, status, and ability to take self-preservation action. Life safety tasks involve the search, rescue, and evacuation of victims. The fire flow component involves delivering sufficient quantities of water to extinguish the fire, and creating an environment within the building that allows entry by firefighters.

The number and types of tasks needing simultaneous action will dictate the minimum number of firefighters required to combat different types of fires. In the absence of adequate personnel to perform concurrent action, the command officer must prioritize the tasks, completing some in chronological order rather than at the same time, reducing overall fire emergency effectiveness. These tasks include:

command	***scene safety***	***search and rescue***
fire attack	***water supply***	***pump operation***
ventilation	***back-up***	

The following chart illustrates the fire ground staffing recommendations of the Commission on Fire Accreditation International.

Figure 23: Minimum Firefighting Personnel Needed Based Upon Level of Risk

Task	Maximum Risk	High Risk	Moderate Risk	Low Risk
Attack Line	4	4	2	2
Search and Rescue	4	2	2	
Ventilation	4	2	2	
Back-Up Line/Rapid Intervention	8	6	4	2
Pump Operator	1	1	1	1
Water Supply	1	1	1	
Utilities Support	1	1	1	
Command/Safety	2	2	2	1#
Forcible Entry	*			
Salvage	*			
Overhaul	*			
Communication	1*			
Operations Section Chief	1			
Logistics	1			
Planning	1*			
Staging	1*			
Rehabilitation	1			
Division/Group Supervisors	2*			
High Rise Evacuation	10*			
Stairwell Support	10*			
Totals:	53	19	15	6

Can often be handled by the first due officer.
* At maximum and high-risk fires, additional personnel may be needed.

The following definitions apply to the chart:

Low Risk ï Fires involving small sheds and other outbuildings, larger vehicles, and similar. Characterized by sustained attack fire flows typically less than 250 gallons per minute.

Moderate Risk ï Fires involving single-family dwellings and equivalently sized commercial office properties. Sustained attack fire flows range between 250 gallons per minute to 1,000 gallons per minute.

High Risk ï Fires involving larger commercial properties with sustained attack fire flows between 1,000 gallons per minute and 2,500 gallons per minute

Maximum Risk ï Fires in buildings with unusual hazards such as high-rise buildings, hazardous materials facilities, very large buildings, and high life risk properties (nursing homes, hospitals, etc.). Though they may not require large sustained attack fire flows they do require more personnel to perform tasks required for effective control.