Lewis & Clark County and City of Helena

Fire Protection Service Review

August 2006

Emergency Services Consulting inc.

Lewis & Clark County
City of Helena

Fire Protection Service Review - 2006

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Responsibilities and Lines of Authority

The Helena Fire Department (HFD) is a department of the City of Helena, Montana, a governmental entity under the laws of the State of Montana and granted authority to levy taxes for the purposes of providing fire protection and emergency medical services. The department's jurisdiction encompasses all areas within the city limits of Helena and the Westside FSA (Fire Service Area) contract area. The response area is primarily (75 percent) urban within the city limits of Helena and mostly suburban in the Westside FSA.[1] The classification for the remainder of the service area is urban wildland interface and open spaces.

Present population served is approximately 33,000, with 28,000 in the city and 5,000 in the Westside FSA. The city population has increased from the U.S. Census figure for 2000 of 25,780 over 2,000. The service area is approximately ten square miles within the city and four square miles in Westside FSA contracted area. The community is home to Carroll College. Carroll College reported a student enrollment of 3,000 full and part-time students for the 2003-04 school year. Emergency service is provided from two stations within the jurisdiction city limits. The department maintains a modern fleet of vehicles that will be discussed later in this report. The department does not perform medical transport services.

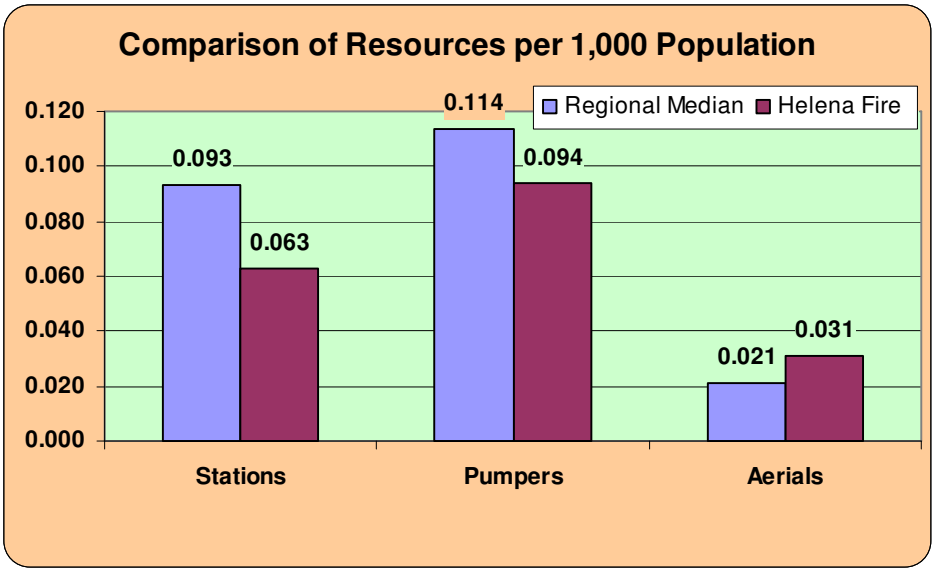
Staffing of the department involves 36 individuals, including 30 operational personnel, to deliver fire suppression and emergency services to meet the needs of the community. A fire chief, two assistant chiefs, and one administrative assistant manage the department. Volunteer firefighters are not used and the fire department has no plans to modify this practice.

The following figure (Figure 1) provided by the US Fire Administration and National Fire Protection Association joint study shows Helena FD's 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] The comparison shows fewer fire stations and pumpers than other communities

[1] The City of Helena Fire Department provides fire and EMS services under contract to Westside Fire Service Area and automatic aid to the Veterans Administration facilities.
[2] FEMA/NFPA, "*A Needs Assessment of the U.S. Fire Service*", FA-240/December 2004.

that serve a similar population base. The benchmark comparison for aerial apparatus is slightly higher, but the building construction, multi-floor structures, and government buildings of Helena dictates the need for an aerial device.

Figure 1: Comparison of Resources per 1,000 Population



The department provides a variety of services to the community including fire suppression, emergency medical assistance, victim rescue, technician-level hazardous materials response, fire prevention activities including, fire code enforcement and public safety education, wildland fire response, and various specialty rescue services.

The Helena Fire Department has achieved a current score of Class 4 on the Insurance Services Offices (ISO) Community Fire Protection Rating System (CFPRS). The CFPRS is used to determine fire insurances rates that are applied to many residential and commercial structures. The most recent full survey conducted by ISO was completed for the department in 1999. A Class 9 ISO rating applies to the contracted Westside FSA.

Foundational Policy

The City of Helena has operated under a Commission-Management form of government since 1953. A new self-government City Charter, continuing the Commission-Management form of government was adopted by a vote of the citizens of Helena in 1976. The main features of the Commission-Manager plan are:

- The unification of authority and political responsibility in the elected commission, and
- Centralization of administrative responsibility in an administrator appointed by the commission.

The Commission determines municipal policies that are not set forth in the charter itself, adopts ordinances, appropriates funds, and appoints a city administrator (the city manager) who serves at the pleasure of the Commission. The elected officials typically maintain strictly policy-level involvement, avoiding direct management and hands-on task assignment.

The Commission is provided the authority to levy taxes for operating a fire protection system. Every city in the State of Montana having a population of 10,000 or greater is a city of the first class.[3] The City of Helena is classified as a first class city. As established by State law for first class cities (those with a population over 10,000, are required by law to have a paid fire department), the city has a paid career staff for the fire department.[4]

The city manager appoints the fire chief. The present chief is Steve Larson, a 24-year veteran of the department. Chief Larson was appointed to the fire chief position in 1998. He does not have a personal services or employment contract, thus there is no fixed term to his position of chief. The fire chief has regular meetings with the city manager and is provided with an annual evaluation of his performance. The chief's authority is defined in state law, the Uniform Fire Code, and Helena City Ordinances.

Organizational Structure

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.

A comprehensive set of department operating rules and guidelines should contain at least two primary sections: administrative rules and standard operating guidelines. The following format is suggested:

1. **Administrative Rules** – Administrative rules should contain what organizational rules personnel are required to comply with at all times. By definition, administrative rules require certain actions or behaviors in all situations. The city commission should adopt or approve the administrative rules since department heads, including the fire chief are subject to them. However, officials should then delegate authority to the chief for their enforcement on department personnel. Administrative rules

[3] Montana Code Annotated (7-1-4111. Classification of municipalities)
[4] Montana Code Annotated, (7-33-4101.Fire department authorized and required). In every city and town of this state there must be a fire department…

should govern all members of the department. Specifically the administrative rules should contain sections that address:

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

2. **Standard Operating Procedures (Helena)** – Standard operating procedures should contain street-level operational standards of practice for personnel of the department. SOPs are different from administrative rules in that variances are allowed in unique or unusual circumstances where strict application of the SOP would be less effective. SOPs should provide for a program of regular, systematic updating to assure that they remain current, practical, and relevant. SOPs should be developed, approved, and enforced under the direction of the fire chief.

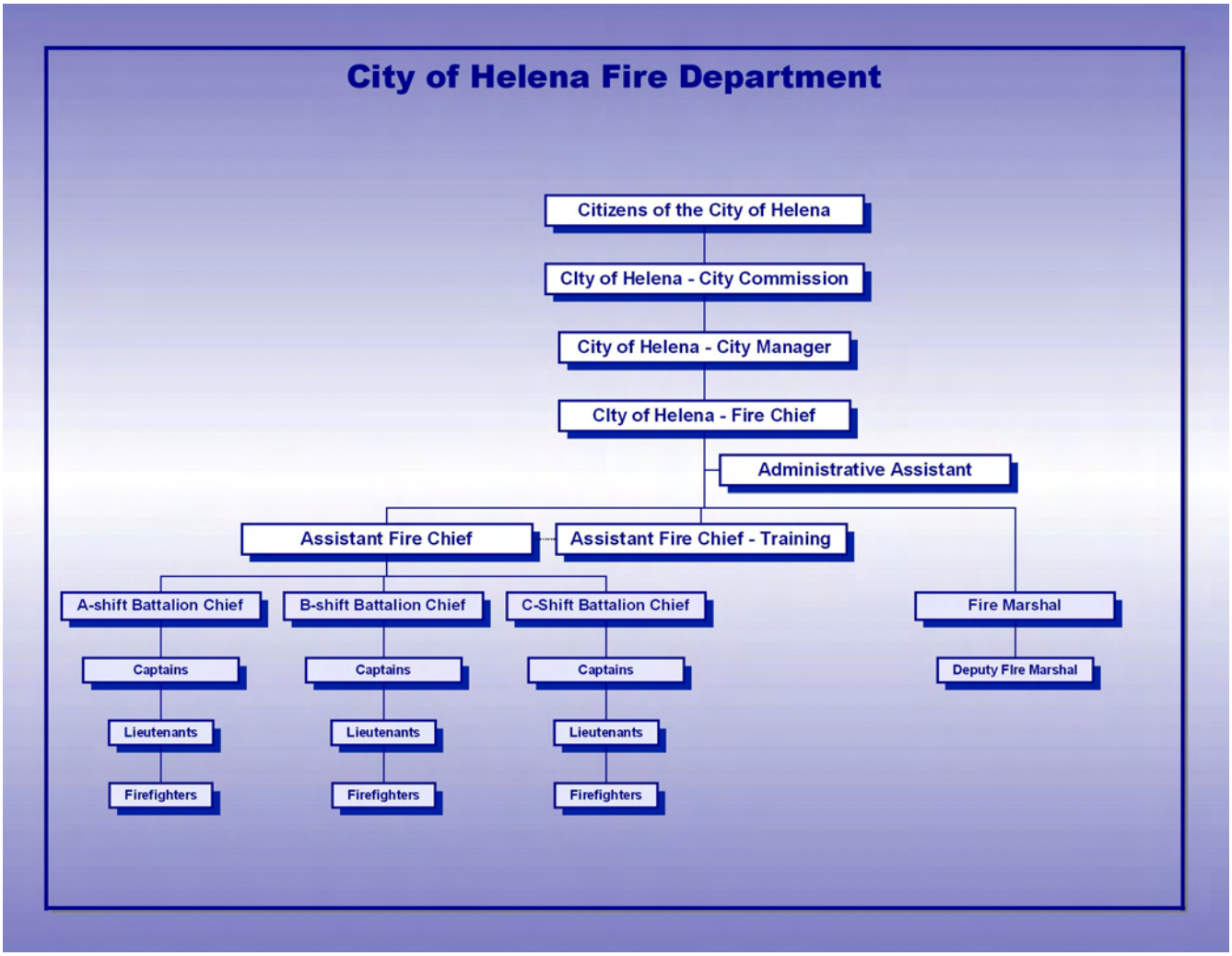
The Helena FD maintains a set of SOPs, and requires the signature of the employee certifying they received the documents. These SOPs make up the primary policy manuals that govern the fire department personnel. In addition, the department has a collective bargaining agreement with International Association of Fire Fighters (IAFF) Local 448 that applies to those employees covered by the agreement.

Presently, a collective bargaining agreement is in place with Local 448. The agreement covers a term of three years. The agreement, among other things, clarifies the salaries, benefits, and many of the working conditions under which the employees in specific classifications operate. The collective bargaining agreement covers all personnel of the department with the exception of the fire chief, the two assistant chiefs, and an administrative assistant position.

Responsibility for updating the document rests with the city or fire administration. Our review of documents indicates that a comprehensive periodic review is conducted on existing SOPs, policies, and procedures.

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 simply clarify accountability, coordination, and supervision. Thorough job descriptions should provide the details of each position and ensure that each individual's specific role is clear and centered on the overall mission of the organization.

Figure 2: City of Helena Fire Department - Organizational Chart



A review of the HFD organizational chart (Figure 2 above) shows that it is organized in a typical top-down hierarchy. The chain of command is well defined with responsibilities and authority distributed in a reasonable fashion.

Maintenance of History

The Helena Fire Department was formed in the 1860s. The department proudly maintains historical documents and photographs from the past. No specific person within the department has been assigned as department historian and to maintain the valuable historical record.

Appropriate records of all municipal meetings are maintained by the city in accordance with the laws of the state governing various types of public meetings and decisions involving public funds. Minutes of the governing body's activities are recorded and are made available to the community at city offices or via the internet after approval.

Fiscal Management

Overview

The City of Helena was incorporated March 7, 1881. The Helena Fire Department operates under the aegis of the City of Helena in accordance with Montana Code Annotated (MCA) Title 7, Chapter 33 Part 41 - Municipal Fire Departments. The City of Helena adopted a charter form of government in 1977. The Helena City Charter authorized "home rule" or self-government powers for the city. A city with self-government powers may exercise any powers not specifically prohibited by the Montana State legislature or prohibited by the City Charter.

> *"The annual budget serves as the foundation for the City of Helena's financial planning and control. All departments of the city submit budget proposals to the city budget office in March of each year. The budget manager uses these requests as the starting point for the development of the next fiscal year's budget."*[5]

The city manager has the oversight responsibility for preparation of the annual city budget and presenting it to the city commission for their consideration. The city commissioners then hold public hearings on the proposed budget. The Commission modifies and/or approves the budget and adopts it by resolution no later than the second Monday in August or within 45 calendar days of receiving certified taxable values from the department of revenue.

The City of Helena Budget and Administration Division of the Administrative Services Department is responsible for coordinating the development and monitoring of the city's annual operating and comprehensive capital improvement programs. Budget activities include review of departmental

[5] Source: Comprehensive Annual Financial Report, Fiscal Year 2005, City of Helena, Montana, July 1, 2004 – June 30, 2005, page vii

requests, revenue and expenditure forecasting, budget monitoring, budget amendments, and budget report preparation.

The city uses a one-year budget cycle to prepare the annual operating budget and capital improvement plan based on a July through June fiscal year. Taxes received for the fiscal year beginning in July are based on assessed values of the preceding year as certified by the Montana Department of Revenue.

Each year, the city conducts an audit and publishes a Comprehensive Annual Financial Report (CAFR). The report is prepared using financial reporting requirements in accordance with the Governmental Accounting Standards Board (GASB) Statement No. 34, Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments.

The Government Finance Officers Association (GFOA) awarded a Certificate of Excellence in Financial Reporting to the City of Helena in recognition of the CAFR for the fiscal year ending June 30, 2004. The Certificate Program, which was established in 1945, is designed to recognize and encourage excellence in financial reporting by state and local governments.[6]

As a recipient of state and federal financial assistance, the city is required to undertake a Single Audit performed by an independent audit firm. The standards governing Single Audit engagements require that the independent auditor report not only on the fair presentation of the financial statement, but also on the audited government's internal controls and compliance with legal requirements, giving special emphasis to internal controls and legal requirements involving the administration of federal awards. The results of the city's Single Audit for the fiscal year ending June 30, 2005, noted no material weaknesses in the framework of internal controls or significant violations of applicable laws and regulations.[7]

The City of Helena uses modified accrual as its basis of accounting. Under the modified accrual basis of accounting, revenues and other financial resources are recognized as accrued when they become both measurable and available to finance expenditures of the current period. Expenditures are

[6] Government Finance Officers Association, Certificate of Achievement for Excellence in Financial Reporting (CAFR Program), Award Winners For Fiscal Years Ended In 2004.
[7] Independent Auditors' Report on the Basic Financial Statements, Supplemental Information, and Supplementary Schedule of Expenditures of Federal Awards, Galusha, Higgins and Galusha, PC, Certified Public Accountants and Advisors, November 14, 2005.

recognized when the fund liability is incurred with certain exceptions. The city budget and administration division is responsible for managing all financial activities and oversees the city's revenues, expenditures, investments, accounting, and debt.

Property taxes provide a major part of the revenues to the city; however, Senate Bill 195 passed by the State Legislature in 1997 placed sizeable limits on the growth of property tax revenue. Under the limitation, only new construction or newly annexed areas can significantly increase taxable valuation. The issue was readdressed by the 1999 Legislature, which made numerous changes to the way in which property is valued and taxed in Montana. In addition to the limit on assessed value, MCA 15-10-420 prevents governments from assessing property taxes that generate more money than during the prior year plus one-half of the average rates of inflation rate during the previous three years.

An inventory of the municipal infrastructure and an assessment of condition allow the city to develop prioritized lists of Capital Improvement Projects. A CIP (Capital Improvement Plan) identifies what capital projects are needed, and when they are needed. The city performs a constant analysis of operational and capital project efficiencies to avoid unnecessary costs in providing essential services.

After inventory, assessment of condition, and prioritization of capital projects, the city then completes a CCIP (Comprehensive Capital Improvement Program) by doing a thorough analysis of CIP funding feasibility and options. This is typically a ten-year projection of the CCIP, operation, and maintenance costs, and debt service costs compared to practical funding.

The major CCIPs are annually updated and presented to the city commission. In a public forum, the city commission reviews the CCIPs and sets priorities and policies for the implementation of current and long-term capital projects. Fleet equipment for the fire department is included within this plan.

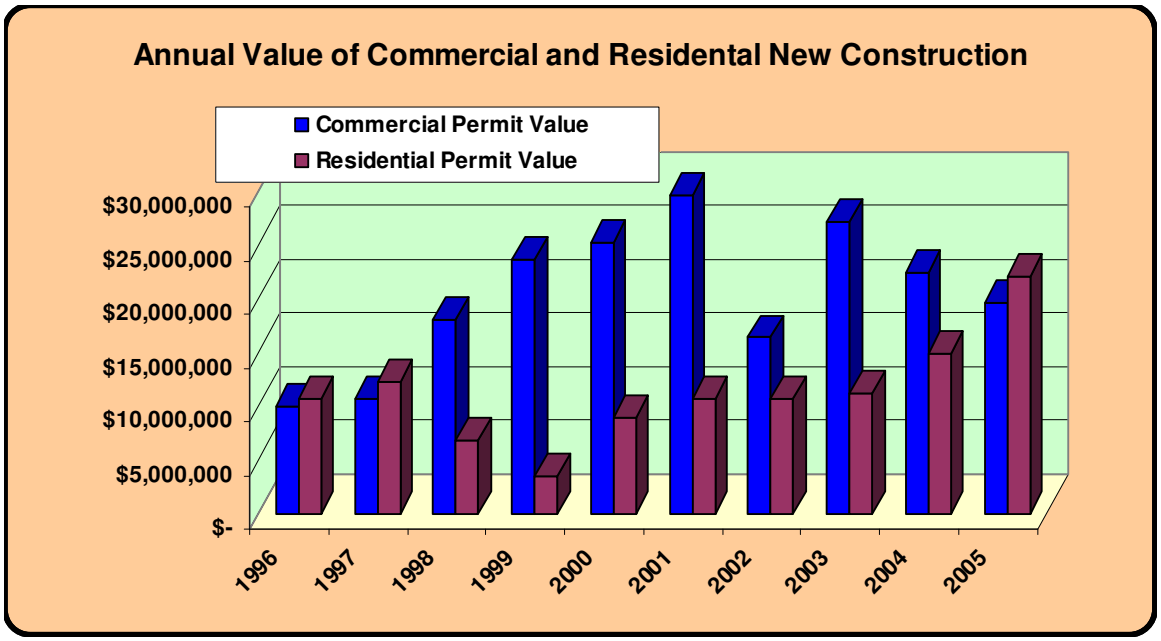
Starting in 2001, the City of Helena embarked on an aggressive annexation plan of wholly surrounded properties that were already receiving city services, and for new subdivisions. A major incentive for annexations is that many areas in the surrounding Helena Valley are experiencing ground water shortages and contamination due to high population density.

Under the Work Plan for Annexation adopted by the city commission in July 2001, annexation will continue with careful review of infrastructure needs and costs — "*The City is striving to balance the needs of a growing city with those of established neighborhoods in order to preserve community.*"[8]

The city has annexed contiguous areas in recent years that are of an urban nature. These annexations expanded the tax base, and to some degree increased city costs. The city maintains plans to annex other contiguous urban and suburban territory eventually. For example, during a single city commission meeting the city annexed three properties for a total area of 126 acres.[9]

Aggressive annexation adding new territory to the city is accompanied by new construction. Figure 3 shows the value of commercial and residential new construction for the fiscal ten-year period from 1996 to 2005.

Figure 3: Value of New Commercial and Residential Property 1996 – 2005



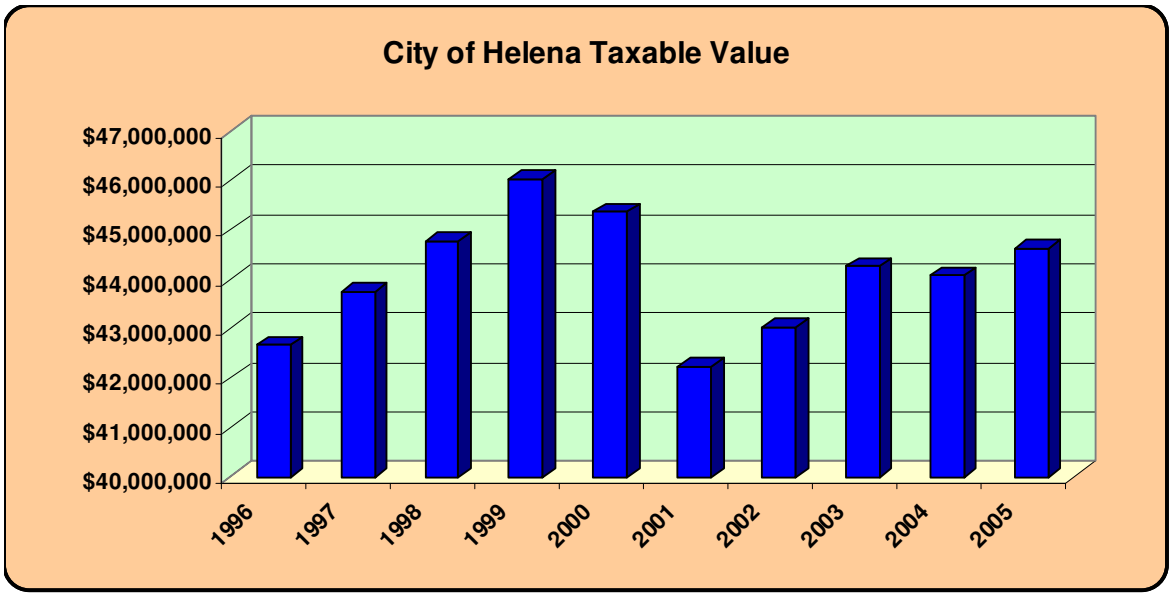
For the fiscal years 1996 to 2005, the number of permits for new commercial and residential properties averaged 31 and 87 respectively.

Due to the property tax limits of MCA 25-10-401 through 425, the growth of Helena's assessed value (and consequently, the growth of tax revenue) is almost entirely dependent on new construction and

[8] Source: *Comprehensive Annual Financial Report, Fiscal Year 2005, City of Helena, Montana*, *July 1, 2004 – June 30, 2005*, page ix.
[9] Source: City Commission Minutes, City of Helena, Montana, Regular City Commission Meeting, September 12, 2005

annexations. When inflation and the general appreciation of housing prices are factored out of the equation, the increase of assessed value usually parallels an increase in population. The chart (Figure 4) below shows the change of Helena assessed value between 1996 and 2005.[10]

Figure 4: City of Helena Historical Taxable Value 1996 – 2005

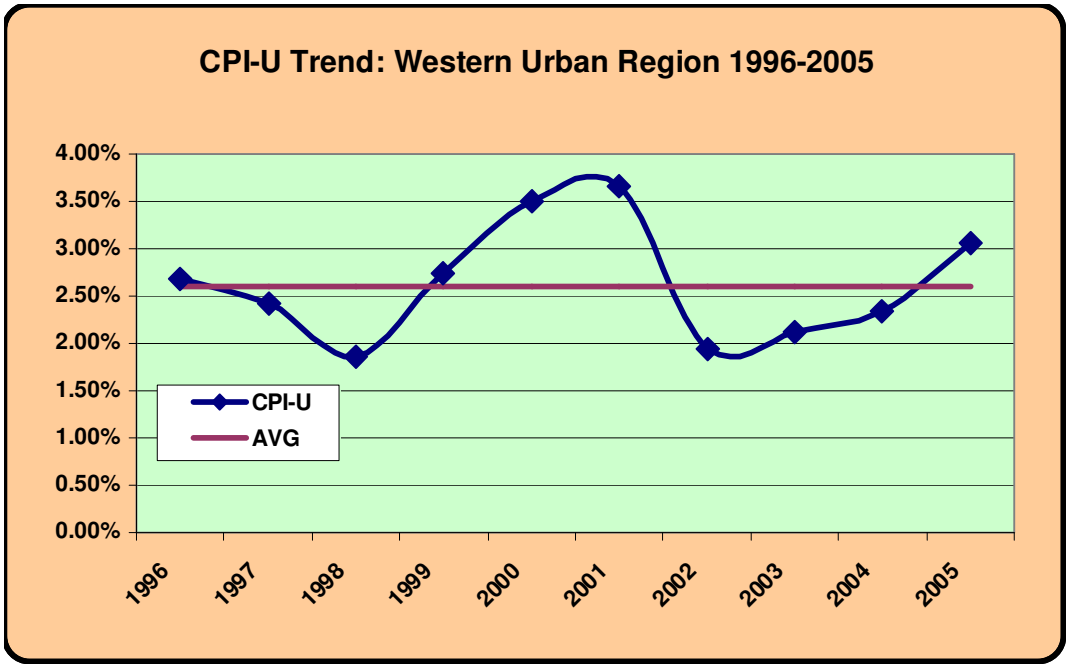


Besides property taxes, the city's revenue stream outside of the General Fund (GF) includes revenue in the form of bond proceeds, grants, intergovernmental revenue, fees for service, and other proceeds.

Inflation is a significant economic factor that not only affects individuals, but also may cause problems for municipalities. Historically, inflation in Montana has seen brief upswings in the CPI-U (consumer price index for all urban consumers) during a 12-year period (see figure below), but has shown stability overall. Although still relatively steady, there has been recent upward pressure on the CPI-U for the region. As of October 2005, the increase in the western urban region CPI-U is trending at about 2.9 percent for the year — about a half-point about the average over the last 12-years.[11]

[10] Source: *Comprehensive Annual Financial Report, Fiscal Year 2005, City of Helena, Montana, July 1, 2004 – June 30, 2005*, page I-4.
[11] United States Department of Labor, Bureau of Labor Statistics, Consumer Price Indexes.

Figure 5: CPI-U Trend: Western Urban Region 1996 – 2005



Determining the Cost of Fire and Emergency Medical Service

Establishing the cost of fire protection in a community is an important part of evaluating the feasibility of other delivery strategies. By knowing the cost of the service as it exists, and predicting the cost of that service after organizational changes are made, alternative fire protection models may be judged more fairly.

As a part of the current systems evaluation of the Helena Fire Department, we developed a computer-driven model to estimate the public cost of fire and emergency medical service. This baseline estimate is expressed in dollars and in terms of an equivalent millage rate that, when applied to the assessed value of the city, will produce revenue necessary to support the service. The estimate provides a scale by which to measure the status quo against any proposed system change.

The adaptation of the fire department's budget to estimate public cost requires certain conventions and assumptions. Specifically, the current budget of the agency is reformatted, often combining line item expenditures of different governmental funds to reflect total public service cost. The process groups all expenses into three major classifications: personal services, materials/services, and capital outlay – those classifications are then subdivided to permit the tracking of a program cost (such as: fringe benefits, maintenance, and indirect charges). The cost of each job in the department is adjusted to reflect units of fulltime equivalency (FTE); and annual salaries are calculated based on all sources of income (such as premium pay, bonuses, allowances, and stipends). Last, an estimate is

made and added to budget requirements of the tax needed to retire outstanding general obligation debt related to the fire department.

Non-tax revenues specific to the fire department (such as fees for service) are identified. Revenue is corrected to allow for accumulation (or expenditure) of cash, and for the averaged expenditure of contingencies, if any.[12] Adjusted revenues are subtracted from expenditures to yield an estimate of general operating tax requirements. The resultant sum represents the amount of public tax support required to sustain the given level of fire and emergency medical services, regardless of the source of the tax revenues.

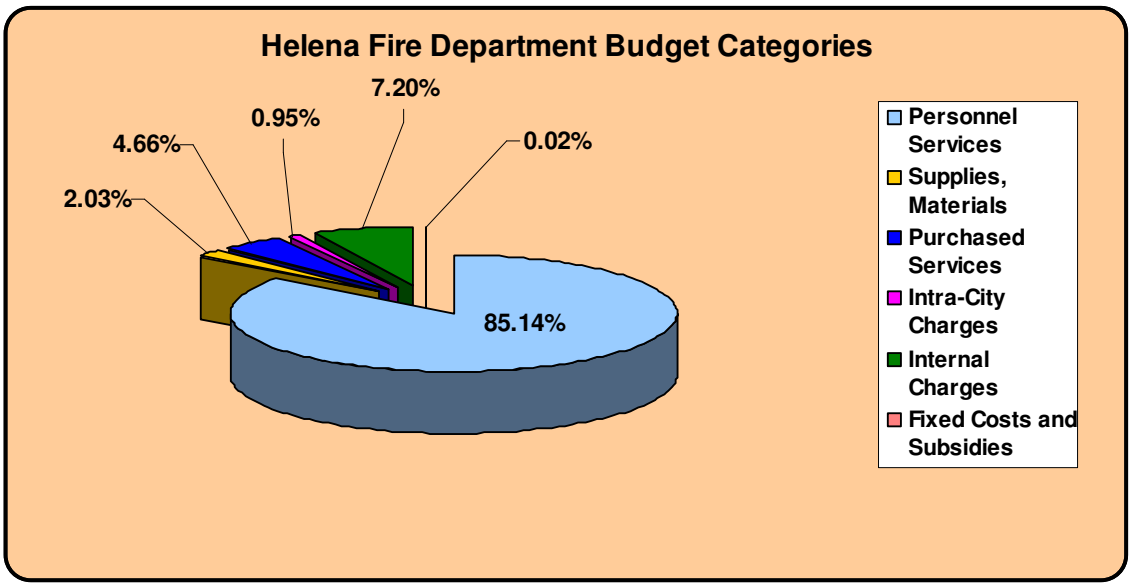
One point is emphasized. This analysis provides a "snapshot" estimate of the public tax cost for the current budgetary year. Many forces may act to change the level of tax support in the future including changes in law, revenue, politics, or contracts. The process uses current revenue and appropriation to generate an estimate of the amount of tax support relative to existing levels of fire and medical services. The analysis allows comparison with the predicted cost service; it does not predict actual tax rate, current or future.

The fire department's operating budget is funded primarily from the city's GF (general fund). Fire department operating expenses are included in this tax rate and are part of the city's general fund. The total general fund operating budget for the fire department for fiscal year 2006 (July 1, 2005 to June 30, 2006) is $3,046,802. There is no emergency medical service (EMS) property tax levy and the department has no other tax levy incurred by the city on its behalf.

The following chart is consistent with other emergency service providers, where personnel services are the major expenditure within the budget.

[12] The appropriation of cash lowers the tax needed to balance a budget; the accumulation of cash raises it. We negate the effect of cash accrual or expenditure to show the true level of community tax support required to maintain a given service level.

Figure 6: Helena FD - Budget by Category

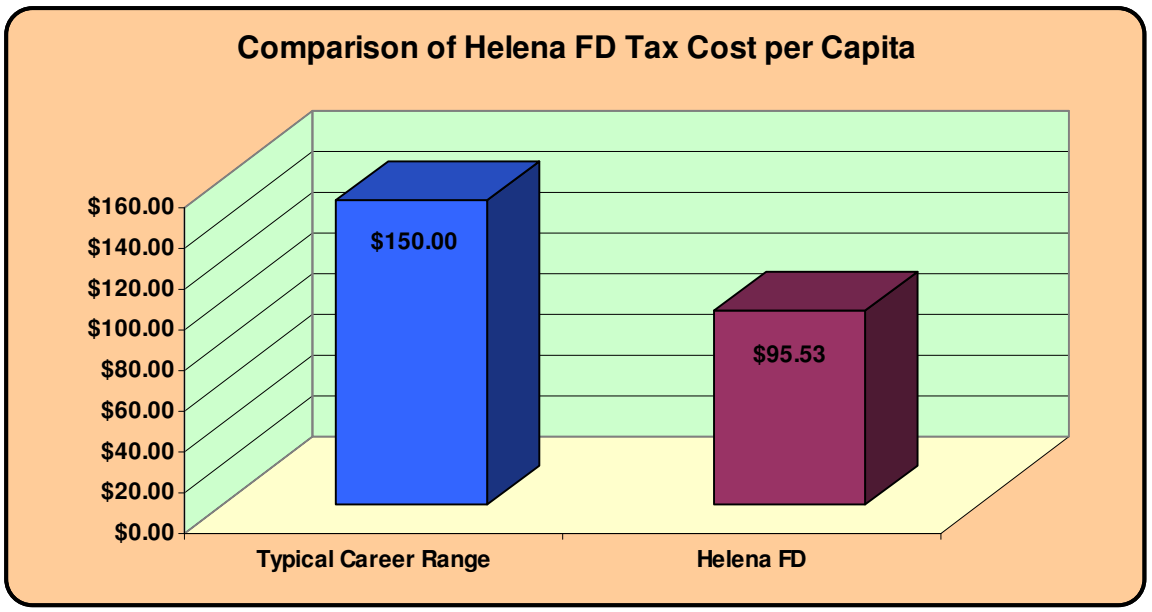


As is the case with all career-based fire departments, personnel costs make up the major portion of the fire department allocations. Salaries, overtime, and personnel benefits equal 85.14 percent of the total. Uniformed fire personnel are subject to a state retirement plan that is funded from a combination of employee, city, and state contributions. The city currently pays at a rate of 14.20 percent of the employee's salary, and the state contributes an additional 32.61 percent. Other employer benefit contributions such as, health insurance, worker compensation insurance, and unemployment insurance act to push the total cost of the employee benefit package to approximately 29 percent of salaries.

Experience has shown that, it is very common for the cost of fire protection to exceed $100 per capita in urban settings, trending up to about $150 in most cases.[13] The higher cost of fire service in an urbanized zone is usually a function of the level of sophistication required by that system (i.e. career staffing, paramedic services, and fully staffed fire prevention bureaus). The national average cost per capita is considered about $93, but that can vary dependent on region. Costs usually trend downward as one compares an urban fire system to suburban and rural settings. Rural fire systems staffed only by volunteers tend to cost from $15 to $60 per resident. Similar systems that employ only a full-time chief administrator usually cost from $40 to $80.

[13] Sometimes, the per capita costs of certain urban fire protection systems trend very much higher than $150 per resident. This is usually due to special circumstances such as a high level of emergency medical service commitment, or a very low ratio of residential population to property risk.

Figure 7: Comparison of Helena FD Tax Cost per Capita



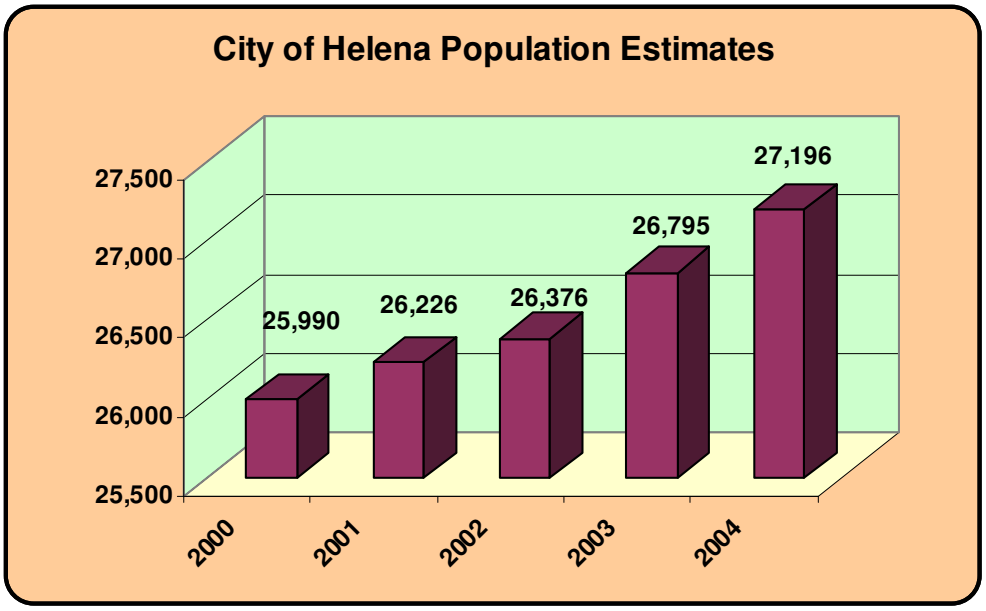
Helena FD cost per capita of $95.53 (Figure 7 above), including a bond payment for station improvements and a ladder truck make the sum near what would be expected.

Population

The fire department provides direct emergency services to a population estimated to be approximately 28,000 in the city with another 4,000 citizens residing in the Westside FSA (Fire Service Area).[14] Figure 8 shows the historical population for the City of Helena over a five-year period from 2000 through 2004. During that period, the population in the city increased 4.64 percent. Future increases are expected to rise more dramatically as the city annexes existing, new, and proposed developments.

[14] US Census Bureau, population estimates, July 1, 2005, National Characteristics Population.

Figure 8: City of Helena - Historical Population Estimates

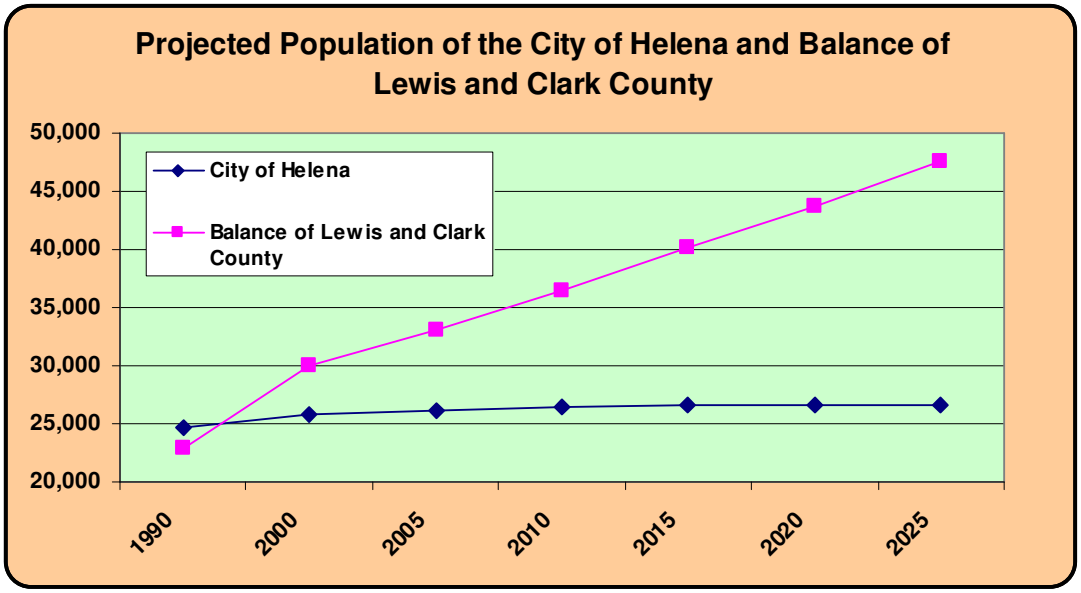


The City of Helena Community Development Department estimates that between 8,000 to 10,000 people living outside the city commute to Helena for work each day. An increase of human activity during the day can result in additional emergency responses. The five largest employers in the city are; State of Montana, Helena School District, Blue Cross/Blue Shield, Carroll College, and University of Montana, Helena.[15]

Figures from the City of Helena Community Growth Plan offer a conservative estimate of the projected population growth in the city and the balance of Lewis and Clark County (Figure 9 below).[16]

[15] Information supplied by the City of Helena, Community Development Department.
[16] Source: *Growth Policy Plan, City of Helena, Montana*, Chapter 4 pages 9 and 10, 2001 Update.

Figure 9: Projected Population for the City of Helena and Balance of the County



The reasons cited in the plan for the projected growth rate in the City of Helena were:

- Births are expected to increase as the cohort of the baby boom shadow reaches childbearing age.
- Deaths are expected to increase (particularly after 2012) when a large proportion of the baby boom cohort will be older.
- The rate of net migration typically constitutes the largest share of population growth, but predicting it is much less certain.

One uncertainty noted in the growth plan that could have the largest impact on the population projection are the "*public policies concerning annexation and land use controls, as well as financial capacity to build and maintain infrastructure, (may) limit overall population density and help determine whether future growth will be in- or outside of city limits*."

Figure 10 shows the increase in housing that occurred in the City of Helena from 1990 to 2000.[17]

Figure 10: Housing Information 1990 – 2000

Selected Housing Information - City of Helena 1990 – 2000 Housing Units	
2000	12,133
1990	11,053
Change	**9.77 %**

[17] US Census Bureau, 2000 and 1990 decennial census, housing characteristics

Cost Recovery Efforts

ESCi has reviewed documents and past efforts by the Helena FD and the City of Helena to develop a comprehensive cost recovery process for all non-tax paying institutions and properties.

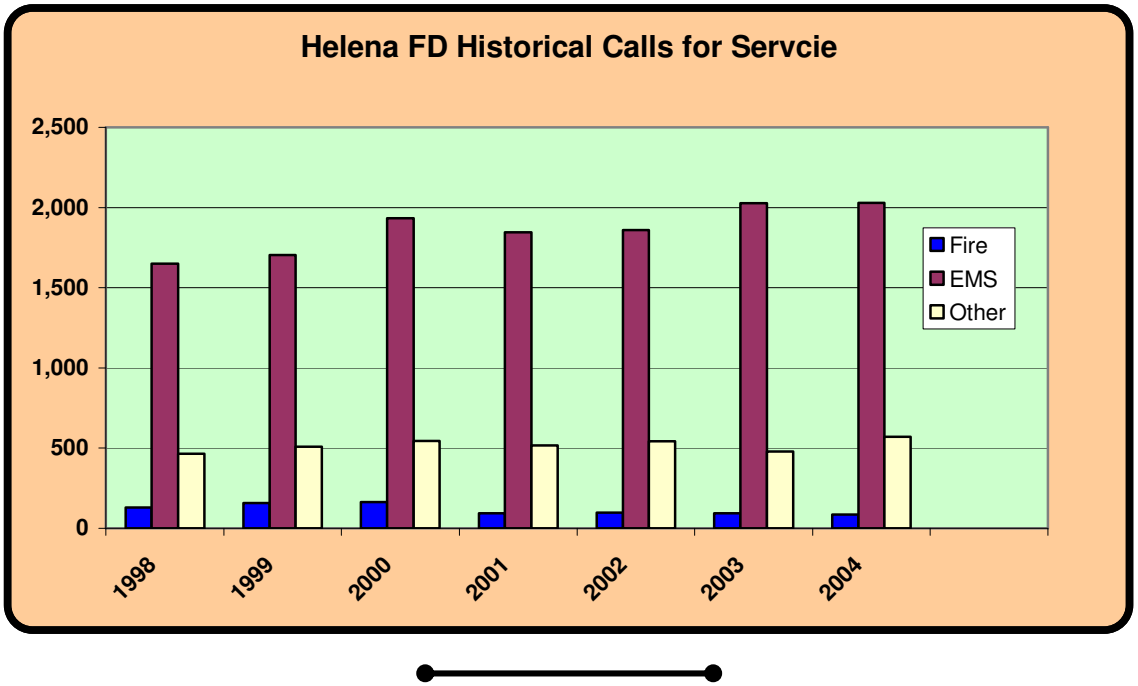
A discussion on cost recovery (Impact Fee Discussion and Analysis) is included in Appendix: A, of this report.

Alarms

HFD responded to 2,687 emergency and non-emergency calls in 2004. Call volume by category includes 2,025 EMS emergencies, 662 fires, and other requests for assistance.

The following chart (Figure 11) illustrates a seven-year record of calls for service. As shown, HFD has experienced a steady increase in EMS calls — by far the largest workload of the department. Fire related calls have remained relatively flat, showing a slight decrease in recent years. With expected increases in population of the city and an aging populace, the upward trend of the EMS workload is likely to continue.

Figure 11: Helena FD Historical Calls for Service[18]



[18] Data supplied by City of Helena Fire Department.

Objective Two – Organizational Management

As with most emergency service agencies, the Helena Fire Department faces challenges in planning organizational growth and management. In addition, to the continued growth of the community and workload, the management of personnel always presents unique issues to assure; consistent and adequate emergency response, continuance of personnel skill and competency, mentoring future leadership, and the recruitment of a future workforce. This section of the report examines the department's efforts in this area and its preparations for the future health of the organization.

Mission, Vision, Strategic Planning, Goals, and Objectives

The HFD has developed a mission statement that has become ingrained in the culture and fabric of the organization. The statement speaks of the identity, heart, and core of the city, which is affectionately referred to as "*The Gulch.*"

> *"We, the members of the Helena Fire Department, proudly continue our tradition as Guardians of the Gulch, by professionally providing a quality, effective, skillful, safe, and caring service to protect our community whenever and wherever needed."*

Members of the department have created a document to memorialize their vision as a pledge titled, *Strategic Responsibilities of the Individual Members*. Pillars of the document are centered in the department's guiding principles. Within the principles are the traits of character, behavior, and the expectations of the individual that serve as a code of ethics.

Availability of SOPs, Rules, Regulations, and Policies

City of Helena rules, regulations, and policies are provided to all members of the fire department. Additionally, more specific guidelines and policies for the fire department are readily available in a policy manual. They are incorporated in selective training activities, solidifying their importance and value to the organization.

Department members indicated that administrative policies, rules, and regulations are distributed and available in the workplace. A distribution system is in place to confirm the receipt of revisions or additions to the documents at the two fire stations at the company level. While it was affirmed rules, regulations, and policies are updated as needed, a few were dated as early as 1987. Regardless of the quality or condition, their availability and familiarity to workers is critical.

Critical Issues and Future Challenges

It is extremely important that there be a clear understanding of critical issues facing the fire department. Without this understanding, fire department and city leadership cannot or will not be prepared to face the issues. In addition, communicating critical issues to everyone in the department increases their awareness of the organization's priorities and assists them in becoming focused on solutions.

A further exploration of critical issues will be completed during the partnering processes, but for now, the following issues should be given serious consideration for inclusion in the final list. These items have been identified, through interviews with department members as issues with significant potential for affecting the success of the organization and the effectiveness of its service.

Critical issues include:

- Funding issues, general fund structure, and possible FSA structure for fire department
- Staffing and workload at all levels throughout the department
- Facility (fire stations, training grounds) needs, both current and future

It is important for any agency to have an appropriate level of future thinking. This permits an agency to identify the external challenges that may present themselves to the organization in the coming years. This awareness of future challenges helps ensure that the department does not miss out on opportunities or blindly stumble into crisis unprepared.

Again, further exploration of future challenges should be part of a complete strategic planning process, but the following items have been identified by interviewing members of the department. Identified external challenges likely to be faced by the agency in the coming few years are:

- Financial limitations (non-payers). Personal income from state, federal, local, and military government employers amounted to about 35 percent of all wage income in the county in 1998.[19] For a city the size and character of Helena, a larger than normal percentage of property value and workload of the fire department is directly linked to publicly owned (federal and state) facilities in the city. Overall, there was an 18 percent growth of personal income from government employment in the period 1990 to 1998.

[19] *Growth Policy Plan, City of Helena, Montana, Economic Conditions* – Chapter 5, page 5-6, 2001 – update.

- A major challenge to the department will be to operate more *regionally*. How will anticipated annexations by the city affect other emergency service agencies and the relationship with the Helena Fire Department?

Internal and External Communications

Quality communications is an achievable goal for any organization, but one that always seems to be for the most part elusive and difficult to achieve; however, good communication is extremely important. To its credit, there are established communication processes within HFD that provide opportunities for all department personnel to be heard and involved.

Regular staff meetings, that include staff and chief officers, are held on Monday mornings. Meetings involving line officers of the department are held consistently on a monthly basis. These meetings encourage the sharing of ideas, issues and concerns, and support a teamwork approach to overall department management. This further encourages internal communications and permits members to share ideas on issues affecting the departmental, enhancing a sense of empowerment among personnel.

Traditionally in the fire service, written formal memorandums have been used to disseminate information. This is being replaced in many organizations with e-mail. As a process for distribution of information, ensuring that all members receive critical data in an organized and consistent fashion, e-mail is both versatile and reliable. This process also provides a critical record of internal communications that are important to organizational efficiency.

The HFD has issued departmental business e-mail addresses to all personnel, offering an efficient and verifiable method of information distribution. When critical information or policies are released, they are routed through the e-mail system. This system provides a confirmation that the information was received and improves accountability.

The two fire stations and administrative office have individual member mailboxes or station/shift mailboxes used to exchange important hard-copy documents and thwart missing or misplaced documents. Voicemail is provided by the city permitting HFD members or the public to leave personal contact messages. Departmental bulletin boards are adequately controlled and organized, with information being sorted and updated regularly.

The HFD follows city policy for handling complaints from the public, and is intended to make certain such complaints are handled consistently, quickly, and with due process.

An active, useful, and recently updated municipal website is maintained by the city at http://www.ci.helena.mt.us. This provides the fire department an additional means of distributing information and communicating with the public. The site is kept up-to-date and provides contact information for major programs operated by the fire department.

Other methods to communicate with the public involve fire department newsletters and the use of surveys. Newsletters can be used to offer a glimpse inside the fire service, seasonal fire safety tips, solicit public input, and as a technique for keeping the fire department's message in front of the public. A public survey or questionnaire is intended to provide customer feedback on service priorities, quality issues, or performance efforts. These surveys, when used appropriately, can provide valuable input for organizational planning. The HFD does not currently employ the use of newsletters or surveys.

HFD on occasion, has effectively used a citizen's advisory group to provide assistance in determining program and project needs and getting out information on a bond measure. In one instance, knowledgeable and influential community leaders served on an advisory committee and assisted the department in securing an aerial ladder truck. Engaging citizens groups encourages a close connection between the department and the consumer and informs citizens of offered services and issues facing the department.

Document Control and Security

Records management is a critical function to any organization. A variety of uses are made of written records and, therefore, their integrity must be protected. State law requires public access to certain fire and EMS department documents and data. The city has clear written procedures in place to provide for public records access through fire department or city staff as appropriate.

Paper records (hard copy files) are adequately secured with passage and/or container locks with limited access. Important computer files are backed-up to multiple secure data locations in the city on a regular and consistent basis. Department computers are programmed with password security on sensitive file access and software to provide an additional level of security and data integrity. Firewall protection is in place for computers accessing the internet and other outside servers. The protection is sufficiently up-to-date and capable of preventing most unauthorized network intrusions. Up-to-date

virus protection software is used on all incoming email, and files. The operating systems on PCs are regularly scanned for undetected virus infection.

The department has a significant investment in facilities, apparatus, equipment, and other items, along with its financial assets. The fiduciary responsibility of department personnel to protect these assets is very important. Fire stations are reported to be consistently locked and secure from unauthorized entry. Public access to buildings is limited to business areas or in other areas when accompanied by an employee. Locks or locking codes are changed, at least occasionally, to prevent orphan keys and unauthorized entry. Fire Station 1 is protected by an intrusion alarm system, Fire Station 2 is not. The addition of an intrusion alarm system to Station 2 is recommended.

The city has formal purchasing policies and procedures in effect. City policy requires that departments maintain a current inventory of capital asset items with an individual value of $5,000 or more. The citywide process is in place to maintain this inventory and new assets are logged and recorded at the time of purchase. No credit cards have been issued to fire department members. The city and fire department maintain strict procurement controls, which include fraud protection measures.

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 fire department has procedures in place to secure all sensitive records of employees, EMS patients, and the agency.

Reporting and Records

The department uses a PC-based computer system, with Windows as its primary operating system, and all computers within the agency and city are networked.

The department uses an up-to-date RMS (Record Management System) to enter and store incident information. The software is compliant with NFIRS (National Fire Incident Reporting System) standards and incidents are entered quickly and accurately. The department uses electronic and hardcopy backup systems for critical data and files.

The department uses the RMS for incident reports, patient care reports, exposure records, SCBA (Self-Contained Breathing Apparatus) testing, hose, fire pump, and ladder annual tests, breathing air, vehicle maintenance, and fire prevention records. Maintenance of records electronically permits easy

retrieval of accurate records for reports and analysis. An example is the use of the RMS to track compliance of training attendance, certification status, and by individual subject area.

The fire department reports that some reporting and records are not accurate, because of software problems. This has lead to duplicated efforts for data entry. One example is the entry of training records. Training records are initially recorded in a Microsoft™ Word table and then transferred into an Access database program. We recommend that efforts be directed at applying the use of the RMS more efficiently.

City and department records are maintained on employment history, discipline, commendations, work assignments, injuries, exposures, and leave time. Personnel records are complete and up-to-date, and maintained in a manner that protects the confidentiality of employee personal data and private medical information.

Objective Three – Planning for Fire and Emergency Medical Protection

The fire and rescue service exists in a rapidly changing environment. Along with improvements in tools and methods used to provide service come increased regulations of activities, new risks to protect, and other challenges that can quickly catch the unwary off guard. Only through continuous internal and external environmental and periodic course corrections can an organization stay on the leading edge.

Technological changes are altering the way fire departments do business now and in the future. These advances include the information superhighway, digital radios, GIS (geographic information systems), computerized training, laptop and notebook computers, sophisticated fire protection systems, and national response teams. Modern construction techniques often require a different approach to fire tactics. For example, most new roofs today are supported by lightweight trusses which can collapse incredibly fast when exposed to fire conditions. Trusses now routinely support even the floors of many newly constructed buildings. To remain on the cusp of progress involves planning, innovation, and adaptability.

HFD recognizes the need for a stronger planning effort to look outward and forward. This study is but a first step following that recognition. As indicated earlier, a complete Customer Centered Strategic Planning process should be considered after the completion of this report. This is particularly true if further cooperative service ventures between the fire agencies in Lewis and Clark County are not formalized in the near future.

Many of the planning issues facing the HFD would receive additional considerations in such a process. In order to do a better job with available resources, each organization must focus effort to improve services while identifying programs or activities that may no longer serve the changing needs of customer groups. The soundness and accuracy of the planning function determines the success of any organization.

Long-Range Planning Elements

The HFD does not presently conduct long-range master and strategic planning. The planning process adopted by the HFD is considered short-term and involves the annual budgeting process, and planning for day-to-day activities. The fire department is actively involved in all phases of city financial planning.

The City of Helena has a CIP (Capital Improvement Plan) initiated by the city council. The CIP outlines continuing support for police and fire operations, and lists the department's priorities for the 2004/05 budget objectives.

Recognizing that planning is continuous, an unpredictable world will require on-going corrections to remain up-to-date. To assemble the data for scrutiny requires accurate, current data. The RMS of the city and the department is capable (and improving) of capturing this data.

Helena FD is developing the capability to conduct qualitative and quantitative analysis of level and quality of their services. The department is developing measurable performance objectives upon which to assess the level of administrative or operational services. These performance objectives should be based on NFPA (National Fire Protection Association), ISO (Insurance Services Office), and local standards.

Long-term performance measures should include EMS patient intervention benchmarks, response time performance, incident staffing performance, incident rate trends, administrative duties, goals and responsibilities, and data analysis.

GIS (Geographic Information System) data is available from either the City or Lewis and Clark County for analyzing workload and incident data. GIS allows for the linking of non-spatial data, such as fire cause, occupant age, or smoke detector performance to spatial data, such as the incident address or fire management zone. This process should enable the department to conduct precise analysis of event history and outcomes and, thus, conduct pinpoint service planning in areas ranging from operations and deployment to public education. To date, a formal planning group has not been assembled whose responsibility would to be to drive the internal planning process for HFD.

Pre-Incident and Tactical Planning

A firefighter's typical work area may be alien and inherently dangerous. Often, a firefighter's first visit to a building is when the structure is involved in a fire or during an EMS emergency. Frequently, the internal environment of the building may be extremely hazardous. Contrary to Hollywood's portrayal of the inside of a burning building, smoke obscures everything. A lack of familiarity with the internal layout of a building can easily lead to disorientation and/or injury of emergency workers. It is important that firefighters and command staff have accurate information at hand to identify hazards, direct tactical operations, and use built-in fire resistive features. This can only be accomplished by

regular building familiarization tours, the development of pre-incident plans, and through practicing either on-site or tabletop tactical exercises.

An ideal pre-incident planning program uses specific forms and protocols for collecting the data, as well as a specific and consistent format for presenting the data in a manner that permits the incident commander or responding crews to find the critical information quickly and easily. This requires the use of consistent methods for site plan drawings, including a standardized set of symbols and designations. The most successful programs use pre-incident planning software to assemble the data, create plan documents and quick-data forms, and store information for easy retrieval. Above all, the program cannot be successful without thorough use of the plan documents in training exercises and area familiarization by field personnel.

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

- Building construction
- Occupant load
- Fire protection systems
- Water supply
- Exposure hazards
- Firefighter hazards

The HFD conducts tactical planning using pre-fire incident planning, hazardous materials planning, and is moving toward implementation of specific hazard planning. Pre-incident planning is described as a high priority at the HFD; however, workload may be hindering progress. It is important that departments, like HFD, who are experiencing rapid growth and development, continue with efforts to maintain up-to-date pre-incident plans.

Once pre-fire plans are developed, regular training should be provided to all personnel who may respond to an incident at these locations. Copies of pre-incident plans and drawings should be available on each responding apparatus, regardless of home jurisdiction, and to mutual aid response partners.

We recommend that a single pre-incident planning process be followed on a countywide basis (Lewis and Clark County). The National Fire Protection Association (NFPA) Standard 1620 provides

excellent information on the development and use of pre-incident plans and should be used as a reference.[20] This document provides criteria for evaluating the protection, construction, and operational features of specific occupancies to develop a pre-incident plan that should be used by responding personnel to manage fires and other emergencies in such occupancies using the available resources.

Response Planning

The HFD operates in an environment that should support a cooperative effort of automatic and mutual agency assistance. However, response planning is not formally coordinated among the area's agencies. Some mutual aid and automatic aid agreements exist in Lewis and Clark County. One example of automatic aid is the agreement between Lewis and Clark County Volunteer FD and the West Helena Valley FD. The two agencies respond on the initial call without regard for jurisdictional borders.

Computer aided dispatch (CAD) does not dispatch by specific apparatus or call type; rather, the on-duty battalion chief (or other officer) determines apparatus response at the time requests for assistance are transmitted and received at fire stations. This practice is a hindrance to rapid response. We recommend that formal response procedures be developed for each emergency type and response area — including recommended apparatus and personnel assignments. Under such procedures, the commanding officer still has the option of modifying a response based on unique circumstance.

Disaster and emergency services is a joint city/county effort between the City of Helena and Lewis and Clark County (the coordinator is also the county floodplain administrator). The adopted mission statement, "*is to protect lives and property through the four phases of emergency management: Preparedness, Response, Mitigation, and Recovery*." This shared program is but one of the many positive cooperative efforts between the city and county.

Formal regional disaster management plans have been developed, including a Pre-Disaster Mitigation Plan. The county fire chiefs plan, organize, and carry out regular interagency training and exercises of emergency plans to ensure coordinated efforts during a disaster.

[20] *NFPA 1620: Recommended Practice for Pre-Incident Planning*, National Fire Protection Association, 2003.

The Superfund Amendment and Reauthorization Act, found in Title III of the Federal Code (SARA Title III), defined the requirements for tracking hazardous materials used in fixed facilities, and established requirements for emergency response planning. A regional, Local Emergency Planning Committee (LEPC) has been established and serves the city and county.

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 that industries that use over a threshold limit of certain highly hazardous materials (extremely hazardous substance facilities – 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 city should continue to ensure that any EHS facility within its service delivery area has been identified. Further, the fire department should confirm the facility's local plan has been developed and that operations have been coordinated with it.

Objective Four - Risk Management

The responsibility of a manager to safeguard the assets of their organization is just as applicable to a fire department as to any business. Although their mission is to manage community risk, fire departments must also be concerned with risk to themselves. These risks can keep the organization from successfully carrying out it mission. The fire department is open to a variety of risk similar to those faced by every private organization.

There are interesting parallels between the 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 company can perform its mission.

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

The city provides the risk management function for HFD. The city documents the frequency and nature of injuries of department members. This information can allow targeted injury prevention and reduction education and workplace modifications to be developed and delivered as a loss reduction strategy. As with most fire agencies, there is limited interaction between fire department managers and risk managers. A suggested listing of the kind of regular interaction that should occur between risk managers and fire departments include:

- Periodic safety and risk inspections of fire department facilities
- Review of fire department rules, regulations, and procedures for potential risk exposure
- Review of contracts and all agreements entered into by the fire department for potential risk exposure
- Training of fire officers on emerging risk such as national liability claim trends, injury prevention, and potential exposure areas
- Periodic review with the fire chief of risk coverage issues

Liability and Property Coverage

Insurance declarations currently in effect for the city and HFD detail their risk and property casualty transfer arrangement from the Montana Municipal Insurance Authority (MMIA). A review of

declarations provided by HFD indicates comprehensive coverage with adequate limits and sub limits of liability.

Health and Safety

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

Information provided by HFD for this report indicates that there were four open fire department claims for workers compensation in 2005.

NFPA Standard 1500 recommends and the HFD has an active safety committee that meets on a regular basis. The composition of the safety committee, the mission, and guidelines of the committee are outlined in the collective bargaining agreement.[21] Membership, as defined in the bargaining agreement, consists of four members — one from each of the three shifts, and one member from the prevention bureau. The committee's charge is to "*work with the employer toward the implementation of safe working conditions using guidelines such as NFPA 1500 standard on fire department safety and health program;*" however, the city is not legally bound by the standard. The committee also makes written recommendations to the fire chief. If the chief does not reply within 45 days, the committee can submit a written report to the city manager.

In addition to NFPA Standard 1500, it is suggested that the safety committee should (at a minimum), be involved in the following:

- Reviewing safety complaints
- Conduct safety inspections of facilities, apparatus, and equipment and make corrective recommendations
- Review all accidents and make recommendations to prevent future occurrences
- Assist in development of safety procedures
- Assist in researching new equipment to improve safety
- Develop and encourage work force adherence to safety in the workplace

[21] *Agreement between the City of Helena and the International Association of Firefighter Local #448*, July 1, 2004 – June 30, 2007, Section 10, page 7, Safety and Health.

- Assist in development of meaningful training programs designed to inform and limit risk exposure of department members
- Document and distribute minutes and maintain records of activities and findings

Objective Five - Human Resources 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

Authority for the city to establish rules governing employment is found in the Montana Code and details the laws governing municipal authority.[22]

> *"The city councils or commissioners of cities of the first and second class shall have power to establish and promulgate rules governing the employment of the members or employees of their respective fire departments."*

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, a human resource department typically handles this function. Staff within such a department handles questions, issues, and tasks related to appointment, benefits, performance, disciplines, promotion, or termination of employees.

The city has established a human resource department.

> *"The City of Helena Human Resource office provides programs, consultation, information and options that support and empower managers, in order to attract, train, motivate, retain, and reward a workforce which can provide efficient, cost effective services to the citizens."*

The human resource department is under the management of Harry "Salty" Payne, Human Resource Manager. In addition, the fire chief and an assistant fire chief manage internal personnel issues and provide a point of contact for members when it comes to questions regarding their employment or membership.

Written policies are in place that adequately describe the appointment of employees, the salary and benefits to which they are entitled, the conditions under which leave time may be used, systems to rate personnel performance, processes, and qualifications for promotion to higher positions, and

[22] Montana Code Annotated (7-33-4121. *Rules governing employment in fire departments*).

systems for grievance. These policies are part of the city's *Personnel Policies Manual*, which is made available to each member upon hiring. Policies are reviewed and updated on a regular basis, at least annually and are historically dated. The most recent revision of the *Personnel Policies Manual* occurred in March 2004.

Compensation, Point System, and Benefits

HFD uses career staffing to carry out its functions. All administrative, support, and response personnel are full-time career staff.

Typical forms of compensation are provided to full-time staff members, including salary, comprehensive medical/dental insurance, deferred compensation, life insurance, and retirement pension. For general purposes, a full-time firefighter will receive an annual salary of approximately $43,658 plus overtime, along with a variety of compensated leave time. Furthermore, firefighters may receive additional pay for an EMT (emergency medical technician) certification with endorsements, serving on the hazardous materials team, as emergency medical director, or as the department mechanic.

The purpose of this study was not to be a thorough compensation analysis. Thus, this evaluation did not attempt to perform in-depth comparisons with other agencies of similar type and makeup. However, it is important that, within the context of this emergency services evaluation, we determine whether the salary and benefit packages seem a strength or a weakness of the organization as it affects employee morale, loyalty, and turnover.

Benefit packages for represented members were developed through years of bargaining and appear to be reasonably competitive when compared to other similar organizations. Benefit packages for non-represented members also looks to be reasonably competitive. Furthermore, it appears that the benefit packages provided by the city do not present a significant 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. The city human resources (HR) department maintains adequate written and computerized records of HFD 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 are kept organized and updated. Forms or other documentation pertaining to member performance are retained by the HR department for an appropriate period. Reports describing details of accidents or other injuries or injury-related incidents are maintained for future reference and cumulative evaluation or analysis.

The EMS director acts as the alternate infectious control officer and assists the HR department in assuring that all records of health evaluations, exposures to hazardous substances or contagious diseases, and other medical records are thorough and complete. All medical-related records, protected under federal privacy laws, are kept separate from routine personnel records and access is strictly limited.

The personnel records of all personnel are maintained at the city HR office. Some duplication of records is also maintained in the fire chief's office. The responsibility for maintaining and updating these records is somewhat split between the HR manager and fire chief.

Disciplinary Process

A formal progressive disciplinary process for personnel is adequately identified in written policies and collective bargaining agreements. Corrective action practices are very straightforward and conform to accepted practices and State of Montana laws.

Counseling Services

Emergency services bring otherwise ordinary people into life and death situations that sometimes 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. Critical incident stress is a very real condition that affects all emergency service workers to some degree or another. It is how emergency workers deal with that stress that makes the difference. The trigger for significant psychological trauma may be a single event, or a chain 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. HFD can call upon the services of trained personnel to conduct critical incident stress debriefings and defusing through a community based program. Services are provided by the Lewis and Clark County CISD (critical incident stress debriefing) team.

Critical incident stress interventions by this group are a short-term process only. Though normally sufficient to help emergency personnel cope with the event, on occasion longer-term support is needed. Failure to provide that support can ultimately lead to the loss of a very valuable member.

An Employee Assistance Program (EAP) has been made available to personnel of the department as a long-term stress intervention tool. It provides additional support for other life problems that may affect a member's motivation and work quality such as substance abuse, marital difficulties, financial complications, and the like. The EAP is provided by the city for all municipal employees as one part of a comprehensive medical, dental, disability, and vision program.

Helena FD and IAFF Local 448 have co-sponsored an informal mentoring program for new members. The program has proved successful in assisting new hires through the rigors of training and adjusting to the work requirements.

Application and Recruitment Process

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

The American's 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 career positions in emergency response with HFD are subjected to a formal physical ability test (IAFF and CPAT - candidate physical ability test) to measure the applicant's ability to perform critical physical tasks and functions.

Modern firefighting and medical response also require extensive technical training, much of which is presented at the college level. Career applicants must demonstrate their aptitude to learn and perform the necessary mental skills to perform the work through a written aptitude test and proof of high school graduation.

As a condition of employment, applicants are required to pass a pre-employment physical and two interviews. The examination is appropriately required after a contingent offer of employment.

Presently, the Helena Police Department runs a motor vehicle check records check on candidates; however, a comprehensive background check is not conducted. The city is attempting to find a company to conduct background checks.

Helena participates in the Montana Firefighter Testing Consortium. Typically, the joint testing process is conducted every year during June for development of a list of qualified candidates for the position of entry-level firefighter. Statewide recruitment is conducted; applicants are given one aptitude test followed by pass/fail physical agility, (IAFF, CPAT). The process followed by the Consortium meets or exceeds all applicable laws and guidelines. Participating in the process with the City of Helena are the Montana fire departments of Billings, Bozeman, Great Falls, Miles City, Kalispell, Butte, Missoula, and Missoula Rural and Lockwood fire districts.

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 person's ability to perform their responsibilities and provides valuable input into the training and education development process. HFD does not provide for on-going competency evaluations or physical agility testing. The lack of such a program may lead to decreased emergency scene performance as member's age and/or become less active. We recommend that the department consider conducting skill competency evaluations.

Most employees and members sincerely wish to perform well and to be a contributing part of their organization. This desire to succeed is best cultivated when effective feedback allows a member to know what he/she is doing well, or what needs improvement. The honest and effective presentation of this feedback encourages the member to reinforce those talents and abilities they already excel in and to work harder to improve the areas where they fail to perform as desired.

A regular scheduled written performance evaluation system is applied to all employees of the department. HFD recognizes that evaluating and providing and feedback to its personnel is critical to behavior modification and improvement.

HFD does not conduct on-going physical capacity testing.[23] Physical capacity testing is the recording of a broad sampling of the many medical, strength and fitness factors that relate to an individual's physical capacity in order to perform the physical requirements of their job. Physical capacity testing should be conducted at least annually. The evaluation can mirror the entry-level physical capacity test, but should give some consideration of an individual's age within limits.

Physical capacity testing cannot detect all potential limiting conditions of an individual's health and fitness levels. A periodic medical examination is necessary. National standards for firefighters recommend a regular medical examination — for emergency workers involved in hazardous materials for those. Currently, HFD requires an entry-level medical for new personnel and annual physicals thereafter.

The medical/physical 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. HFD requires a minimum OSHA baseline physical, annual medical evaluation, and an annual respiratory test, which became mandatory in 2005. Medical evaluations, for members of the department, are based on recommended NFPA and OSHA standards.

HFD does not currently have a formalized physical fitness program, but maintains one that is centered on voluntary employee participation. The department has committed time and equipment along with a Peer Fitness Trainer to encourage members to maintain their physical fitness. It is not necessary for formalization of a program that is important, but the effort and intended outcome. We believe that a departments approach should be positive and encourage employees to participate because they want to, not because they have to.

Since an on-going fitness program is an important aspect of an overall firefighter training and performance system. NFPA Standard 1583 provides excellent guidance to the development of a comprehensive fitness screening, improvement, and maintenance program.[24] Another good source of guidance for ongoing fitness programs is the Wellness/Fitness Initiative jointly produced by the International Association of Fire Chiefs (IAFC) and the International Association of Firefighters.

[23] NFPA 1582: *Standard on Comprehensive, Occupational Medical Program for Fire Departments*, 2003.
[24] NFPA 1583: *Standard on Health-Related Fitness Programs for Fire Fighters*, 2000.

NFPA Standard 1500 recommends a fire department have an active safety committee that meets regularly. The city has an established Safety Committee. The citywide committee meets once each quarter. The fire department safety committee meetings are described as occurring sporadically.

Objective Six - Staffing

The Helena Fire Department uses career personnel to accomplish its mission and responsibilities to the City of Helena. Administrative functions are generally the responsibility of staff officers with support functions provided by a senior administrative assistant. Staffing for emergency response to fire, emergency medical and related incidents is provided by career personnel on a 24 hour on and 48 hour off, three platoon schedule.

Administration and Clerical Staff

One of the primary responsibilities of the department administration and support staff is to ensure that the operational entities of the organization have the ability and means to accomplish their responsibilities on the emergency incident. Efficient and effective administration and support are critical to the success of the department. Without sufficient oversight, planning, documentation, training, and maintenance, the operational entities of the HFD will find it difficult to operate efficiently. Additionally, like any other part of the department, administration and support require appropriate resources to function properly.

Analyzing the ratio of administrative 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 critical to the success of the department's mission and responsibilities. The administration and support complement of the HFD is comprised of two major divisions and the fire chief's office. The following figure summarizes the personnel FTEs (fulltime equivalents) assigned to administration and management.

For purposes of analysis and comparison, administrative and support personnel are typically identified as including job functions that are intended to ensure the success of those personnel providing emergency services. Field personnel are considered as operational in that they are delivering direct customer services in emergencies. When a position involves both support and operational functions, ESCi considers the primary purpose of the position in defining its role as support or operations.

Figure 12: Helena FD Administrative/Support Personnel

Administrative/Support Personnel	
Position Title	**Number (FTE)**
Fire Chief	1
Assistant Fire Chief	2
Fire Marshal	1
Fire Inspector (Firefighter)	1
Senior Administrative Assistant	1
Total administrative and support	**6**
Percent administrative & support to total personnel	**16.66%**

The administration and support staff for the HFD is comprised of six FTEs. Statistically, the department maintains a ratio of 16.66 percent of administration and support staff to the total number of FTE positions in the department. Based on our experience with similar organizations, we have determined emergency services departments usually enjoy a 10 to 20 percent ratio of administration and support staff of operational personnel. HFD administrative and support staffing level is normal and what is expected based on work to be accomplished and program management needs. Each organization should determine, as a policy, the proper ratio of administration and support staff dependent upon local and organizational need.

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 in mitigating emergencies. Insufficient staffing at an operational scene decreases the effectiveness of the response and increases the risk of injury to all individuals involved. Inadequate staffing has predictable outcomes over time. The following figure summarizes the personnel assigned to street-level service delivery.

Figure 13: Field Operations Staffing Summary

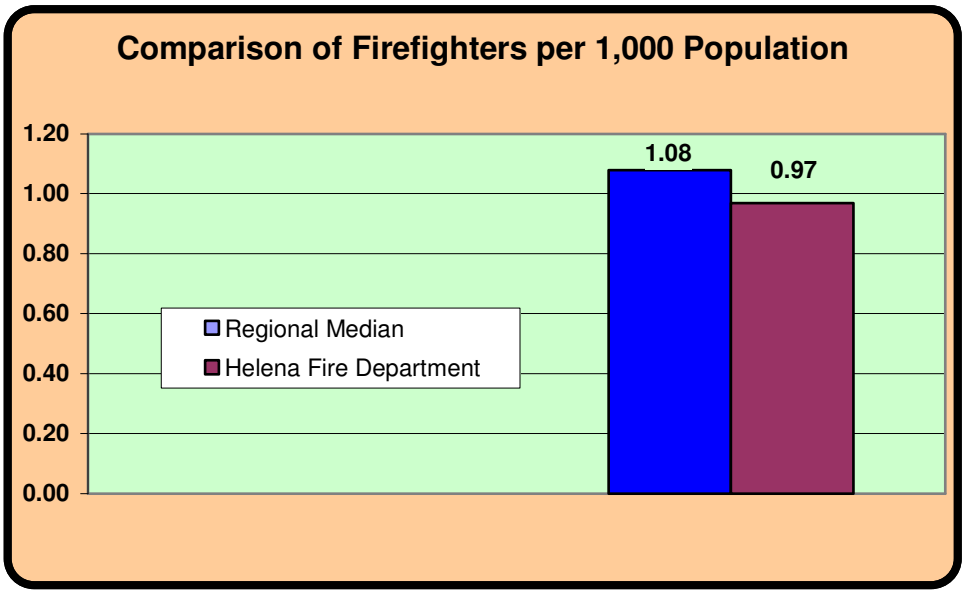
Operational Staffing	
Position Title	**Number (FTE)**
Battalion Chief	3
Captain	6
Lieutenant	6
Firefighter/EMS Coordinator	15
Total operational staff	**30**
Percent of operational officers to firefighters	**50.00%**

Looking at Figure 13, the 50 percent ratio between operational officers and firefighters appears to be on the high side from what we typically encounter. Most systems the size and character of HFD do not employ battalion chief (BC) positions, but rather staff a captain or lieutenant position at each station. Systems that do use on duty BCs tend to use the positions to augment the administrative capacity of department, along with operational response duties. HFD battalion chiefs generally do not

respond in a command vehicle, and may or may not respond depending on the type of call. As is the case in most departments with BCs, HFD BCs have responsibility for all of the emergency operations of the department and for staff assignments.

An analysis of emergency service staffing begins with comparison of available emergency personnel to other communities of similar size and organization. The number of operational personnel maintained by a fire department provides some measure of the ability of the agency to assemble emergency workers to respond to request for assistance. The following chart shows the number of career personnel maintained by HFD per 1,000 residents, and compares that benchmark to the Western United States median for agencies serving similar communities serving a residential population between 25,000 and 49,999. While we believe that a regional U.S. comparison is appropriate, Appendix B also provides a comparison of Helena to other similar Montana communities.

Figure 14: Comparison of Firefighters per 1,000 Population[25]



As Figure 14 illustrates, HFD has slightly fewer firefighters per 1,000 residents than do other communities of similar size. This does not take into consideration community fire risk and other factors that may require more firefighter resources.

Regardless of the raw number of personnel available to the department, what matters most is the actual number of emergency responders the agency is able to produce at an emergency scene. This

[25] Source – NFPA, Michael J. Carter Jr., *"U. S. Fire Department Profile through 2003."*

usually relates to the actual number of emergency responders available for immediate deployment. While Helena's career staffing system distributes up to nine personnel on each of three platoons, it is important to note that this number is not necessarily reflective of the actual number of personnel on-duty. Due to sick leave, vacation, injuries, training, and other circumstances, the actual number of on-duty personnel is often well below the number of persons who are assigned to each platoon. HFD policy allows the shift staffing to fall to a minimum of seven on-duty personnel.

The fire chief establishes minimum staffing; the number is not an official minimum set by the city commission or city manager. The City of Helena should officially formulate deployment standards and standards of cover for the fire department, and thereby establish an adopted staffing level. Analysis later in this report is intended to provide city administrators with information about recommend staffing levels.

Assignment of Responsibilities

In previous and subsequent sections of the report, the need for adequate levels of management and administrative support and staffing are discussed. One thing is clear, departments the size of Helena cannot always adhere to job duties and tasks outlined in the formalized job descriptions. With limited numbers of personnel, both administrative and operational, it is essential that personnel are flexible in their view of job duties, and do what is necessary to support the mission of the department.

Discussions and observations between ESCi and HFD staff, acknowledge that job duties and responsibilities "creep" into areas that may not be part of the formal job description. This practice is not unique to HFD, but indicates that job duties and descriptions must be frequently reviewed for accuracy, and strategies developed to maintain sufficient resources to meet the administrative and operational missions of the department.

Analysis of the department's current staffing performance will determine where recommendations for improvement may be indicated. Objective Eight – Service Delivery includes a detailed discussion.

Objective Seven - Capital Assets and Resources

Fire departments need a balance of three basic resources to carry out their emergency mission successfully — i.e. personnel, equipment, and facilities. Because firefighting is an extremely physical pursuit, the adequacy of personnel resources is a primary concern. Nevertheless, no matter how competent the firefighters are, the department will fail to achieve its mission if it lacks sufficient strategic locations and adequate apparatus distributed efficiently.

Facilities

Many questions face a department that has outgrown its capital facilities. Fire stations are complex structures even without the considerations of staffing, equipping, and strategically positioning for long-term use. Basic issues must be addressed for each fire station including distribution to account for the department's response standard and adequate structural space for the effective, safe, and secure housing of personnel, apparatus, and equipment. The distribution, staffing, and equipping of fire department facilities must always balance a city's fire protection goals with the city's fire protection risk and the ability fund the capital need.

Consideration should be given to the ability of the facilities to support the goals of the department (including standards of coverage) as it may exist today and to continue to support future need. The primary functions that should take place within the fire station environment should be closely examined. Adequate and efficient space for all functions should include:

- Space for properly housing and maintaining apparatus and equipment
- Gender compatible quarters for on-duty crew members
- Administrative office functions
- Space for firefighter training
- Space for firefighter fitness
- Adequate and appropriate storage for hazardous and non-hazardous supplies

Figure 15: Facility Overview and Condition Summary

Station Number	Year Built	Square Foot of Building	Condition	General Appearance
Headquarters, Fire Station 1	1938	10,000 (est.)	Fair to good depending on location of remodels	Good
Fire Station 2	1979	4,000 (est.)	Good	Good

Figure 16: City of Helena - Fire Station 1

Helena Headquarters/ Fire Station 1
300 Neill Avenue

Built in 1938, this 10,000 square foot facility consists of three apparatus bays. This station is headquarters for Helena Fire Department including fire operations, administration, training, and fire prevention.

Station 1 is a facility that has undergone multiple remodels and upgrades. Crowding in the station is evident and is decreasing the building's usefulness. The facility is difficult to access for the public, public entrances are not easily visible, and parking is very limited or frequently not available.

Concerns related to maintenance, public access, staff facilities, safety, and efficiency would need attention for future efficiency. Any specific problems, concerns, or features with this facility can be classified into the following seven categories:

Design:	The integration with the community center is a nice fit for the city, but may be less efficient for fire department operations. This facility underwent construction of an addition in 1978 and a remodel/upgrade in 2002. Issues with the original construction from 1938 are evident as indicated below. Public access is difficult due to a lack of parking and immediate access to the administrative offices.
Construction:	The sections of the facility that have been remodeled tend to be more efficient than the original 1938 construction. Maintenance and operating costs for this facility are high.
Safety:	There facility lacks a fixed fire protection system. The station is located in the busy downtown area, increasing traffic make entering and exiting difficult.
Environment:	Crowding is evident in the administrative office space and apparatus bays. The renovation of the crew quarters provided for an efficient, gender-neutral living environment.
Code Compliance:	Building is not ADA compliant and has no handicap public access. The building appears to comply with fire and life safety codes appropriate at the time of construction and the various remodels and upgrades.
Staff Facilities:	This facility is adequate for up to six personnel on a 24-hour shift cycle basis. This facility combines operations and administrative staff personnel and is at a growth point that will require expansion to continue to operate efficiently over time. The facilities have individual sleeping rooms, with nicely appointed living quarters.
Efficiency:	Storage and office space is at a critical point for continued efficiency. Any future additions to the station should include specified storage areas and additional workspace to increase efficiency and safety.

Figure 17: City of Helena - Fire Station 2

Helena Fire Station 2
650 North Hannaford

Built in 1979, this 4,000 square foot satellite neighborhood facility consists of two double deep apparatus bays and living quarters for up to four personnel.

The department has outgrown the station. The station is showing evidence of crowding that has decreased the building's usefulness. It should be remodeled to increase the life expectancy and provide adequate room for daily operations. Concerns related to maintenance, public access, staff facilities, safety, and efficiency are apparent.

Specific problems, concerns, or features with this facility were classified into the following seven categories:

Design:	This station is aesthetically designed to fit the surrounding community structures. The station is located between two major arterial streets running north and south, and has good Interstate 15 access.
Construction:	The building is brick construction and is well maintained. Age and construction-type have led to reasonable maintenance costs.
Safety:	Lack of storage space is causing materials to encroach into the living and apparatus bay areas. Many trip and collision hazards are present. Turnout gear is in the apparatus bay and subject to contamination. The station lacks a designated infection control and contamination clean up area.
Environment:	This station does not have separate sleeping quarters. Gender specific issues are accomplished through door locks only. There is no separation between the living and sleeping quarters. Future expansion should address these issues.
Code Compliance:	Building is ADA compliant with the exception of the racquetball court and appears to comply with fire and life safety codes appropriate at the time of construction.
Staff Facilities:	This facility needs to be remodeled to provide for adequate sleeping separation from living areas, individual sleeping areas, and provide M/F bathroom and shower facilities to current ADA specifications. The kitchen and dayroom areas are in need of upgrading with new appliances. The watch room/office space is over crowded and is in need of expansion.
Efficiency:	While once functional, storage, living quarters and office space is at a critical point. Any future additions to the station should include ventilated, warm storage areas.

This section of the report deals only with analysis of current facilities. However, the department should consider development of a long-range facilities management plan, as well as specific plans to address any current issues. A long-range facilities management plan should include a variety of items, such as:

- Location, distribution, and cost of any new facilities
- Identified long-term maintenance needs for existing facilities
- On-going funding plan

Apparatus

The department maintains a fleet of response vehicles that is generally well maintained. Overall condition is considered good. The department needs to continue to make apparatus replacement a priority in both the short and long term to ensure continued reliability of the fleet for emergency service delivery.

The following table (Figure 18) lists the primary heavy apparatus and frontline vehicles used by HFD. The table includes the current age, estimated life expectancy, and estimated replacement funding requirements. The current funding mechanism for the replacement of primary apparatus indicates that apparatus purchases are made through an equipment reserve fund. Future growth of the city should be considered in this regard, and increases in the contributions placed into the equipment reserve account adjusted accordingly. This is especially true if any fire stations are added that will increase the number of apparatus in the firefighting fleet.

While this table does not attempt to apply an inflationary factor, due attention should be given to accurately project the full replacement costs for the class of vehicle under consideration. To reflect a true replacement value accurately, an annual inflationary factor should be added each year as appropriate. In addition, a factor for the residual value of the vehicles is not used in the table, but could be a factor to help recover some of the costs of maintaining the fleet. Residual values vary greatly, and should not be depended on for future fleet purchases. The service life values listed in the third column are those used in the fire department's replacement schedule and are very realistic for the vehicle type and volume of use that they will receive in Helena. The column *Equipment Replacement Account Requirement* indicates a relative value that should be set aside on an annual basis to allow purchase of the vehicle class, at the end of its life cycle.

Figure 18: Apparatus Replacement Funding Tables

Unit	Year	Life[26]	Replacement Cost	Year of Replacement	Years of Accrual	Annual Equipment Replacement Account Requirement
Engine 1	1999	20	$375,000	2019	14	$26,780
Engine 2	2005	20	$375,000	2025	20	$18,750
Engine 3	1986	20	$375,000	2006	1	$375,000
Truck 1	2002	25	$650,000	2027	21	$31,000
Rescue 1	1995	10	$110,000	2005	0	$110,000
Rescue 2	2000	10	$85,000	2010	5	$17,000
Hazmat 1	2005	10	$110,000	2015	15	$7,400
Wildland 1	2005	10	$110,000	2015	15	$7,400

The equipment reserve account should be evaluated to determine if it would fully fund replacement of the fire department fleet. This table shows that Rescue 1 is due for replacement this year (2005), and Engine 3 is due for replacement in 2006. The immediate need (2005/06) for fleet replacement is approx. $485,000. If these two vehicles are replaced, the annual contribution for fire department fleet replacement (firefighting vehicles only), including putting the two replaced vehicles back into the schedule at the 10-year and 20-year replacement cycles respectively, would be in the range of $135,000. The city made a 2005 contribution to the citywide equipment reserve account of $210,000 for all heavy equipment. This level of contribution should be evaluated to determine if it would cover all city vehicles including the needs of the fire department.

Catching up funding with need in an equipment reserve account can be a difficult proposition during tough fiscal times. The current need for reserve fund assets is extremely high because two of the vehicles in the fleet are scheduled for replacement in the next two years. Other apparatus are well into their lifecycle; consequently, there is limited time to accumulate the capital funds necessary for purchase on schedule. If fully funded, this amount would provide for continued support of the city's current fire department fleet needs, assuring funds are available for purchase at the time of scheduled replacement. In the case of Helena, the fire department fleet requirements must be considered in combination with all other city departments with similar need.

This is not meant to exclude other funding options from consideration. For instance, during times when the market enjoys low interest rates, municipal lease-purchase programs can be financially attractive. However, it does require firm commitment on the part of the elected officials toward a

[26] Refers to the anticipated life expectancy or usefulness as a frontline apparatus. Use as a reserve may extend this life expectancy.

scheduled apparatus replacement program. When faced with a large capital purchase that competes with other community needs, it is common for cities to delay or defer purchases to the point where efficiency or safety may be compromised. Helena can avoid such conditions by remaining firmly committed to a reasonable equipment reserve account for fire apparatus replacement. Consideration for a revenue mechanism that is consistent from year to year may be more palatable than one that requires large, one-time expenditures.

The frontline apparatus of HFD were reviewed, and a basic inspection was performed to determine general condition and life expectancy. The following terms and definitions are used to determine the condition and safety status of the fire apparatus.

Figure 19: Apparatus Condition Rating Definitions

Excellent:	Like new condition. No body or paint defects. Clean compartments. 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 compartments 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 compartments 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 compartments 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 compartments is impeded with significant corrosion and rust-through. Interior cab is in rough condition with defects impeding safe and proper use. Non-repairable 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.

Each heavy piece of fire apparatus was given a basic review for condition and safety. The following paragraphs describe any notations made during this review.

	**Engine 1** **1999 E One Pumper** **750 gallon tank** **1500 GPM pump** **Five-person cab** **Condition: Good** **NFPA Compliant: Yes**
• **Remarks:**	All safety equipment is in place and in good working order. Equipment in compartments should be secured.

	**Engine 2** **2005 American LaFrance Pumper** **750 gallon tank** **1500 GPM pump** **Condition: New** **NFPA Compliant: Yes**
• **Remarks:**	Use of plastic fuel cans should be discontinued. Equipment in compartments should be secured.

	**Engine 3** **1986 Sutphen Pumper** **500 gallon tank** **1250 GPM pump** **Five-person cab** **Condition: Fair** **NFPA Compliant: At time of original construction**
• **Remarks:**	Misc. paint defects, some rust, and missing screws in body. Use of plastic fuel cans should be avoided. Equipment in compartments and cab should be secured.

	**Truck 1** **2002 American LaFrance** **100' Aerial Tower** **Condition: Excellent** **NFPA Compliant: Yes**
• **Remarks:**	Use of plastic fuel cans should be discontinued. Equipment in compartments should be secured.

	**Rescue 1** **1994 Chevy 3500/Becker** **250 gallon tank** **Condition: Good** **NFPA Compliant: Yes**
• **Remarks:**	Use of plastic fuel cans should be discontinued. Equipment in compartments should be secured.

	**Rescue 2** **2000 Ford F550** **Box Van** **Condition: Good** **NFPA Compliant: Yes**
• **Remarks:**	Equipment in compartments should be secured.

	**Hazmat 1** **2005 Ford F550** **Type 6 Pumper** **250 gallon tank** **Unrated pump** **Condition: New** **NFPA Compliant: Yes**
• **Remarks:**	Equipment in compartments should be secured.

	**Wildland 1** **2005 Ford F550** **Type 6 Pumper** **250 gallon tank** **Unrated pump** **Condition: New** **NFPA Compliant: Yes**
• **Remarks:**	Under final assembly at time of inspection. Unit has a CAF (Compressed Air Foam) System.

Support and Small Equipment

Small tools and equipment are a substantial part of any fire departments annual expenditure. These devices have become an integral part of a department's daily operation and have added training and maintenance challenges as well. As these devices can be quite expensive, the capital required for their continued procurement and maintenance should be included in the department's equipment

replacement planning. The plan, like facilities and apparatus, should include a schedule of equipment covered, estimated life expectancy, replacement cost, and a funding mechanism to ensure replacement at the required intervals. It is recommended that all equipment with a value of more than $5,000, as well as groups of equipment with an aggregate value of more than $5,000, be included in the plan. The department currently budgets replacement of individual items with a capital value less that $25,000 in the year of projected replacement. Currently, no budgeting mechanism sets aside money in an equipment reserve account for items of this sort. Examples of tools in this category include:

- Heart monitor/defibrillators
- Portable and mobile radios
- Computer equipment and systems
- Computer software (major systems)
- Shop diagnostic and maintenance equipment
- Breathing apparatus
- Thermal imaging cameras
- Survey meters

Maintenance

Apparatus Maintenance

A HFD assistant chief oversees the fleet management and the vehicle maintenance programs. A department mechanic in conjunction with the city shop and other local commercial shops coordinate routine maintenance. The assistant chief has overall responsibility for vehicle procurement, vehicle maintenance, small equipment maintenance, and station maintenance activities. The fire department mechanic performs some of the light vehicle maintenance. Heavy mechanical work is performed at the city shop, or alternatively, such work may be contracted out to local shops. On-duty firefighters conduct at least some of the minimal fire department vehicle and equipment repairs as well as daily routine checks of the frontline equipment.

The department maintains a fleet of approximately 20 vehicles and hundreds of pieces of small equipment items. We examined the practices used by HFD in maintaining and repairing its firefighting equipment and found that the department performed adequate routine checks of its firefighting apparatus and that the preventive maintenance program is well supported. We also found that the department's RMS (Record Management System) was reliable for tracking repair and maintenance schedules, costs, and for determining whether maintenance tasks are performed in a timely and cost-effective manner.

The assistant chief is responsible for maintaining all vehicles, small tools, and equipment for the emergency operations, training, administration, and fire prevention divisions. Apparatus includes:

- Two frontline engines
- One reserve engine
- One aerial ladder
- Three wildland/rescue units
- Thirteen miscellaneous (support vehicles, trailers, utility, hazardous materials, etc.)

The department has implemented a Preventive Maintenance (PM) Program. The goal of the program is to have all major vehicles in the inventory receive preventative maintenance service at a 200-hour service interval, which averages approximately every three to four months. Staff vehicles are on a 3,000-mile service interval. In addition, specific standards have been implemented detailing turnaround time for PM completion based on vehicle type. All service records are maintained by the department mechanic and are current and easily assessable.

Two necessary procedures that must be performed and documented annually are pump testing and hose testing.

Hose Testing

The life expectancy of a section of fire hose is determined by the care it receives. Hose is susceptible to mechanical injury, heat and fire, mold and mildew, and damage due to chemical contact and excessive pressures. An inventory of all fire hose should be recorded along with a history of each section of hose. After reviewing the hose procedures, it appears the department has done an excellent job in hose testing and retention of these records.

Pump Testing

Fire pumps are one of the most important and expensive parts of any fire apparatus. The care and routine check of a fire pump is a daily necessity and is performed in the department by the on-duty personnel. Part of the preventive maintenance program requires that all fire pumps be serviced annually. This test includes drain and refill of the fluids in the transfer case, grease to the bearings, and lubrication of ball valves, linkage, drain valves, and pressure relief valves. In addition to the above checks, the booster tank water level gauge is also inspected along with all other gauges, and pump panel lights. After reviewing the pump test procedures, it appears the department has done an excellent job of pump testing and recordkeeping.

Turnout Gear Maintenance Program

As previously stated, a fire department's most valuable and expensive asset is its personnel. In any hazardous environment in which the employee is expected to perform, suitable PPE (personnel protective equipment: i.e. firefighting turnout gear) is essential. Proper care of PPE is paramount. Residential washers and dryers will not clean turnout gear properly. Many fire departments purchase extractors, which are designed for cleaning turnout gear. Less sophisticated cleaning methods will remove dirt and perspiration, but will not remove severe contaminates or hydrocarbons. The HFD has the ability for cleaning PPE in-house using an extractor that is located at Fire Station 1.

In the latest revisions to NFPA Standards 1500, 1581, and 1971, the fire service has addressed the health and safety risks associated with contaminated turnout gear by requiring that PPE be cleaned at least once every six months. With the new NFPA standards, fire departments across the country are trying to find inexpensive ways to comply effectively with these standards. The life expectancy of turnout gear depends on the type of department, number and type of fires fought, and the aggressiveness of the firefighters. Proper care will enable fire departments to lengthen the replacement cycle for new turnout gear and reduce the capital expenditures required for replacement.

Many fire departments have realized significant savings by having PPE professionally cleaned, evaluated, and (if necessary) repaired by a manufacturer's recognized repair facility.

Anytime the department does significant renovation or new construction at a fire station, it should consider including an enclosed storage for firefighter PPE with a separate ventilation system. Currently, the department has no separate, enclosed, vented PPE storage rooms at either of its fire stations. Turnouts are subjected to contamination each day from exposure in the apparatus bays. However, we praise the department for planning the inclusion of a separately ventilated PPE storeroom in the remodel at Fire Station 2.

Objective Eight - Service Delivery

The most visible and valued of the services provided by the department is the response to, and control of emergency events. The department provides a variety of emergency response services that include:

- Fire suppression
- Emergency medical services (non-transport)
- Hazardous materials emergency management
- Vehicle rescue
- Limited capabilities for specialty rescues (rope rescue, over the side rescue, high/low angle)
- Public assistance
- Wildland firefighting

Notification System (Dispatch)

Dispatch service for HFD is provided by the Joint City and County Dispatch Center. Administration of the center is under the administration of the Helena Police Department, with Lieutenant Corey Livesay serving as the current director. During our review of the dispatch facility, it was noted that the center is fully staffed to authorized levels and appears to be a professionally managed emergency communications center.

The center has a fully integrated computer aided dispatch (CAD) system that includes a records management system (RMS). The RMS is capable of automated time capture for incident benchmarking and the capacity to track the ring and call hold times. All appropriate call and response time information is captured and available to HFD for analysis. We recommend that the dispatch center formally adopt 9-1-1 time standards for emergency call answering and dispatch.

The method to notify emergency personnel is by Z-Tron™ tone generation. While all fire department personnel have department issued personnel pagers for off-duty notification, not all carry them on a routine basis. This would indicate that the department might have limited capabilities in recalling personnel for larger scale and during multiple emergency events.

The dispatch center operates one primary dispatch channel and one tactical channel with other channels available by patch. Back-up power is in available for power interruptions and failures; however, an operational functionally redundant dispatch site is not available. We recommend that a secondary or backup dispatch center be established.

Emergency Response Resources

HFD provides service to the community using a totally career personnel model. The two fire stations are staffed continuously. The department covers ten square miles encompassing the City of Helena, and four square miles in the Westside FSA, which is under contract for protection from HFD. The following map (Figure 20) shows the HFD fire stations.

Figure 20: Coverage area of Helena FD

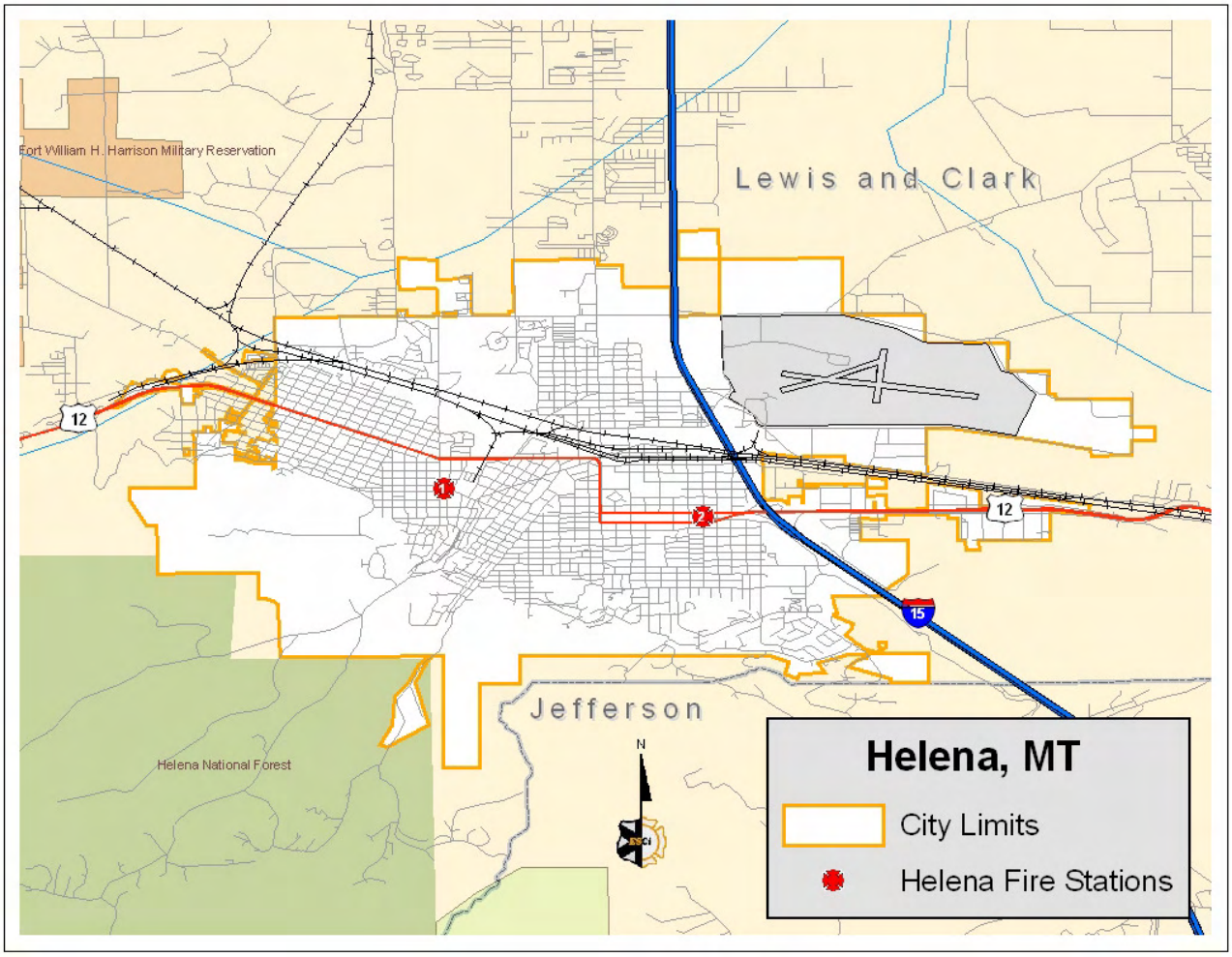


Figure 21 details the number of on-duty personnel available at each HFD station.

Figure 21: Helena FD Resource and Staffing Availability

Career Stations	Minimum On-duty Staffing
Station 1	4
Station 2	3
Total On-Duty Staffing	**7**

While the maximum number of on-duty personnel available for emergency response can be as high as nine, the department more often than not operates with fewer. With scheduled vacation, illness, injury, training, and other leaves, the daily on-duty career staffing is frequently at the minimum level established by the fire chief (seven persons). The City of Helena has no adopted policy of minimum staffing. We recommend that the city adopt a minimum staffing policy as part of the overall development of a document establishing standards of response for the City of Helena.

Response Activity

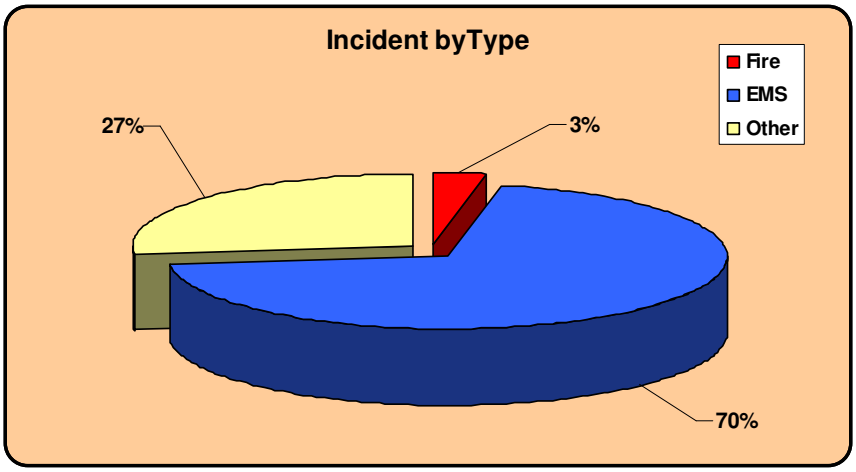
Responses occurring during calendar year 2004 were evaluated to determine workload and performance. The following details the results of this analysis

Incident types

Emergency medical related activity is the majority of the department's response workload at 70 percent. This is typical for most agencies providing emergency medical first response. Fire related calls account for only three percent of the entire workload. This too is typical, as most communities are experiencing fewer fires due to many factors such as improvements in building construction, public education, and installation of internal fire protection systems in commercial and residential structures.

The following figure (Figure 22) below shows the percentage breakdown of the three main categories of call types for calendar year 2004.

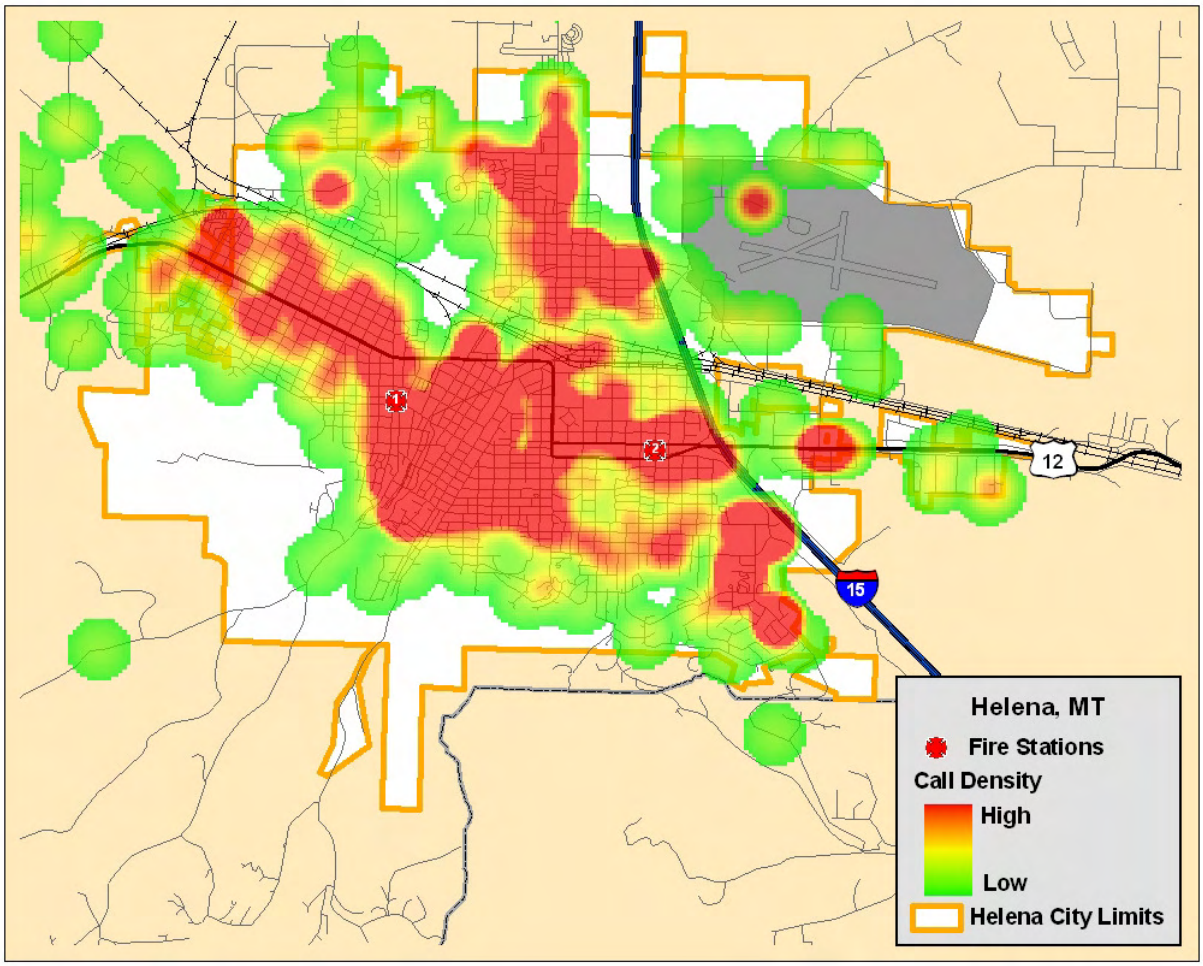
Figure 22: Incident by Type



Geographic Distribution

Emergencies occur most frequently in the more populated portions of the service area. This is expected, since it is human activity, not just population numbers that will dictate emergency response. Over 70 percent of all fires as reported by NFPA occur because of human behavior, either the inappropriate use of heat or the failure to maintain equipment along with other factors. The map below shows the geographic density of responses during the study year.

Figure 23: Call Volume Density

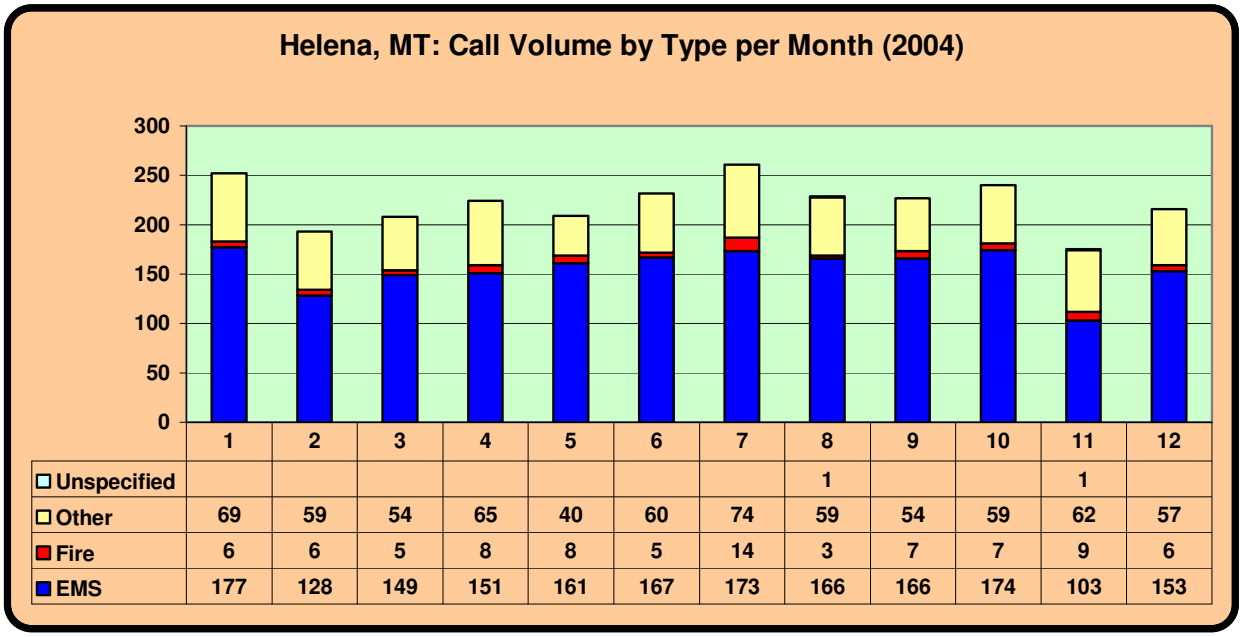


Temporal Variations

Response activity can be highly variable over the course of a day, week, season, and year. Knowledge of the variations can be useful when planning the assignment of response resources. There is some noteworthy variation in department's response workload, illustrated by the following charts.

Figure 24 shows total responses by type each month that occurred during the study period. An increase in incident activity is noted during January and the summer months. July indicates an elevated fire related call response, due primarily to wildland fire related incidents.

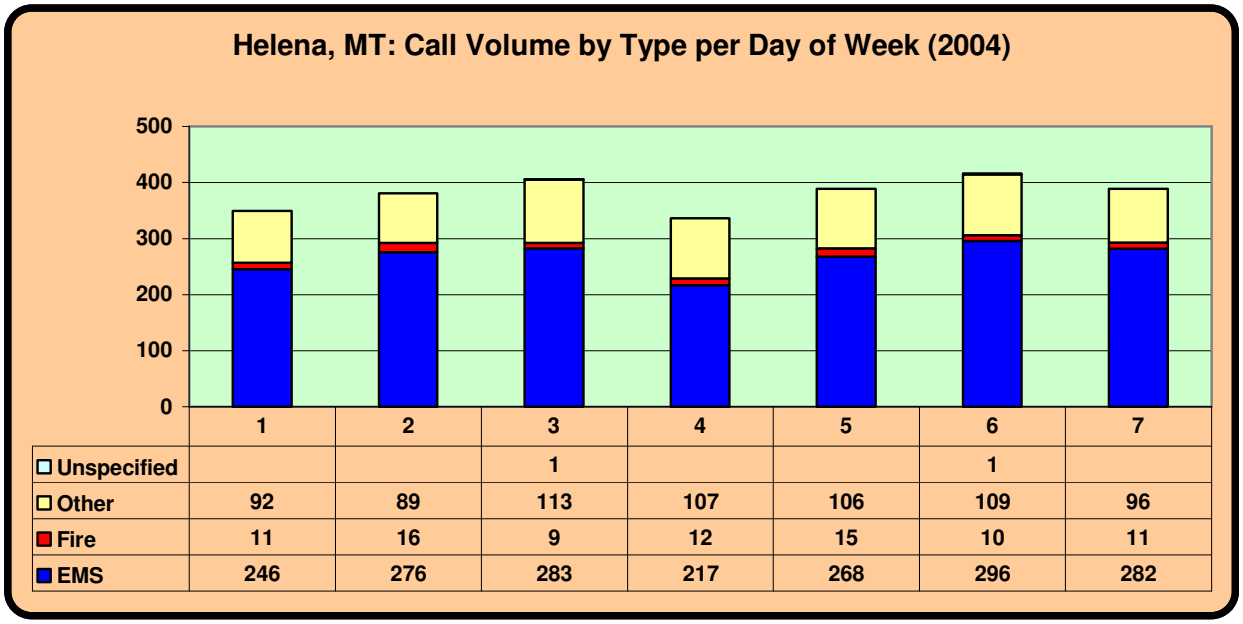
Figure 24: Call Volume by Type per Month (2004)



	1	2	3	4	5	6	7	8	9	10	11	12
Unspecified								1			1	
Other	69	59	54	65	40	60	74	59	54	59	62	57
Fire	6	6	5	8	8	5	14	3	7	7	9	6
EMS	177	128	149	151	161	167	173	166	166	174	103	153

Figure 25 shows responses during the study period of 2004 by day of week. The most active day indicated is Friday, followed closely by Tuesday. Overall, the variation between the days is considered statistically insignificant.

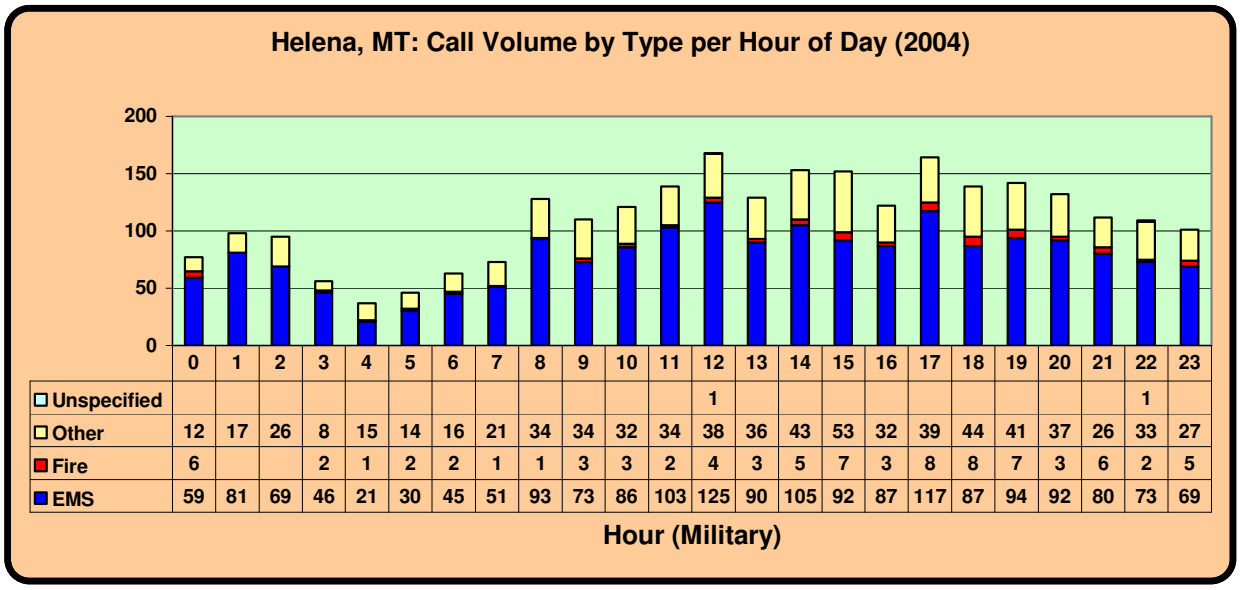
Figure 25: Call Volume by Type per Day of Week (2004)



	1	2	3	4	5	6	7
Unspecified			1			1	
Other	92	89	113	107	106	109	96
Fire	11	16	9	12	15	10	11
EMS	246	276	283	217	268	296	282

Figure 26 illustrates the number of responses by hour of day. As would be expected, there is a high degree of variability between daytime and nighttime hours.

Figure 26: Call Volume by Type per Hour of Day (2004)



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Unspecified													1										1	
Other	12	17	26	8	15	14	16	21	34	34	32	34	38	36	43	53	32	39	44	41	37	26	33	27
Fire	6			2	1	2	2	1	1	3	3	2	4	3	5	7	3	8	8	7	3	6	2	5
EMS	59	81	69	46	21	30	45	51	93	73	86	103	125	90	105	92	87	117	87	94	92	80	73	69

HFD's peak activity period is between the 0800 and 1800 hours with approximately 140 calls (plus or minus) for service occurring in each of the hours. This is mostly due to human activities like transit, industry, and commerce.

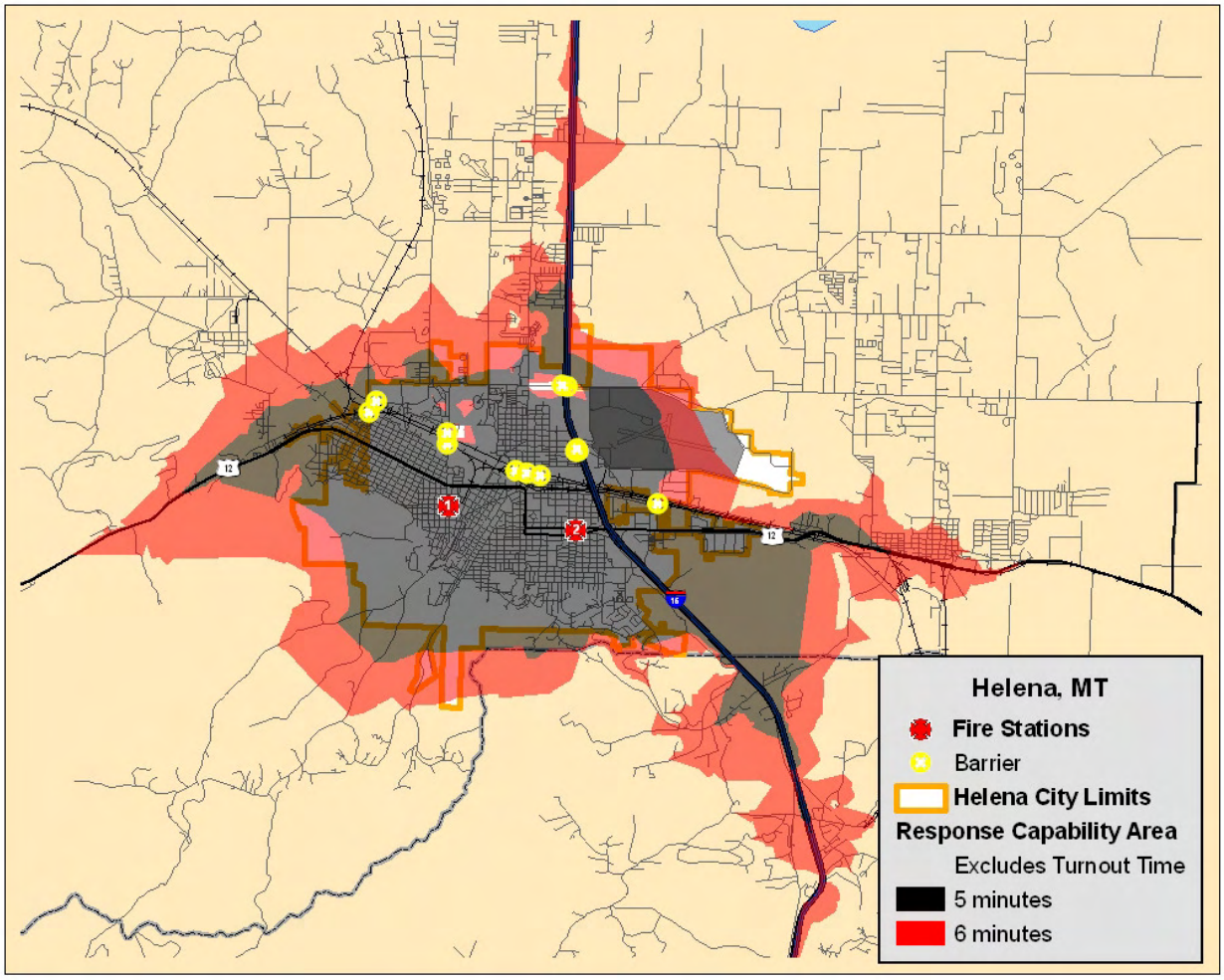
The department should use this information to ensure that personnel are readily available to respond during these peak times. Activities (such as training or inspections) that may take a unit out of position or subject it to a delayed response should be avoided during this period, or reliable backup should be assured from other emergency providers.

Response Practices

HFD assigns apparatus and personnel to respond to incidents based on both the location of the event and the type of event occurring. The officer in charge (OIC) makes this determination and has wide flexibility making these determinations.

The following map shows the service areas of each of HFD's two stations. Figure 27 depicts five-minute and a six-minute travel from each station within the respective fire districts (excluding turnout and dispatch processing). Overlap between response zones identifies potential redundant coverage. Redundant coverage can be advantageous in areas with a higher service demand, as it places more apparatus within proximity and helps in meeting response time objectives when concurrent calls take place. On the other hand, overlap in low risk/demand areas can lead to inefficiencies if other (higher risk/demand) areas are left underserved.

Figure 27: Helena FD Travel Area Capability



Overlap exists between Fire Stations 1 and 2 which (as stated previously) is an area of high service demand and therefore, not of much concern. Evaluations of existing gaps in coverage appear minimal. However, the area around the airport and any future annexations to the city in that area (the northeast) will be outside the current six-minute travel time. The need for an additional fire station in this area would then be necessary.

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 and to minimize the impacts of the emergency. This need applies to fires, medical emergencies, and any other emergency to which the fire department responds. Before discussing the department's current performance, it is important to gain an understanding of the dynamics of fire and medical emergencies.

Dynamics of Fire in Buildings

Most fires in 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 at the ceiling ignite leading to the ignition of 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.

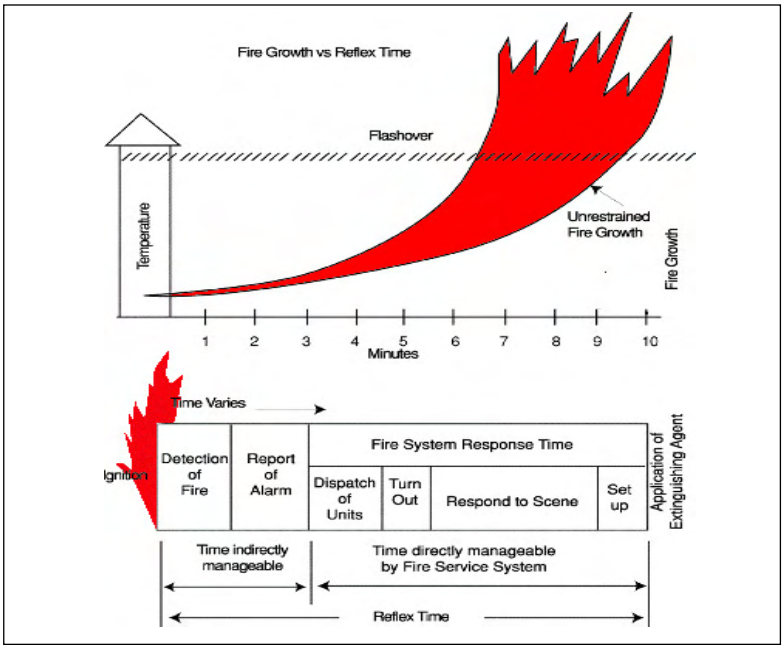
Flashover usually happens about five to eight minutes from the appearance of flame in typically furnished and ventilated buildings. Since flashover has such a dramatic influence on the outcome of a fire event, the goal of any fire agency is to apply water to a fire before flashover takes place.

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 control a fire effectively. 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 28: 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. Another significant impact to response time is simultaneous alarms. When simultaneous calls for service occur, apparatus and personnel are out of position or already engaged. The recourse is to call back for additional personnel, or call for mutual aid. In either case, response to the alarm will be delayed. The quality and connectivity of streets, traffic, driver training, geography, and environmental conditions may also be 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

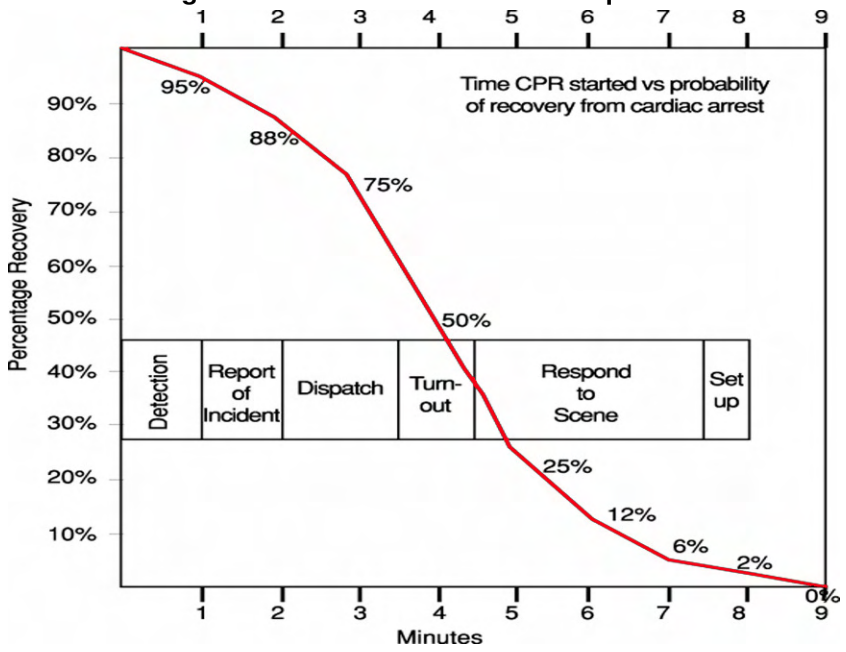
Cardiac arrest is the most significant life threatening medical event. A victim of cardiac arrest has mere minutes in which to receive definitive lifesaving care if there is to be any hope for resuscitation.

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 29: 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 patient's 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. The arrival of one person with a portable radio does not provide fire intervention capability and should not be counted as "arrival" by the fire department.

In order to enter a building legally 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.

<u>These tasks include:</u>

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

The Commission on Fire Accreditation International (CFAI) of the International Association of Fire Chiefs has produced benchmarks for the number of personnel required on scene for various levels of risk. This information is shown in the following table.

Figure 30: Minimum Firefighting Personnel Needed Based Upon Level of Risk

Minimum Firefighting Personnel Needed Based On Level of Risk				
Task[27]	**Max. Risk**	**High Risk**	**Mod. Risk**	**Low Risk**
Attack line	4	4	2	2
Search and rescue	4	2	2	
Ventilation	4	2	2	
Backup line/rapid intervention	4	3	2	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	1**			
Communication	1			
Chief's aide	1	1		
Operations section chief	1			
Logistics	1			
Planning	1**			
Staging	1**			
Rehabilitation	1			
Division/group supervisors	2**			
High-rise evacuation	10**			
Stairwell support	10**			
Total	**49**	**17**	**13**	**6**

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

The following definitions apply to the above table (Figure 30):

- **Low Risk** – 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** – 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** – Fires involving larger commercial properties with sustained attack fire flows between 1,000 gallons per minute and 2,500 gallons per minute
- **Maximum Risk** – 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.

[27] All tasks may be functional during the early moments of firefighting, but sometimes certain duties take place in sequence depending on the situation, thus reducing the total number of people needed.

Response Performance Objectives

Emergency service agencies should have clearly defined response performance objectives established to allow evaluation of capability and service delivery. An organization's 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. For example:

- 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, 90 percent of the time.
  Current: 5 minutes Target: 5 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, 90 percent of the time.
  Current: 6 minutes Target: 5 minutes

With 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.

HFD has not formally adopted response performance objectives. There is an informal desire to achieve an average response time of five minutes for all emergency incidents. Since no standard has been formally adopted, there is no consensus on what should be the performance benchmark. This analysis will compare HFD's performance against its informal performance objective of a five-minute average response time and with other nationally recognized standards, specifically NFPA Standard 1710.

NFPA 1710

The National Fire Protection Association has issued a response performance standard for all or mostly career staffed fire departments. This standard, among other things, identifies a response time performance objective for fire departments and a target-staffing standard for structure fires. Though NFPA 1710 is not a legal mandate, the standard does provide a useful benchmark against which to measure the fire department's performance.

NFPA 1710 contains time performance standards for structure fire response as well as emergency medical response. Each will be discussed individually.

Structure Fire Response

NFPA 1710 recommends that the first company arrive at the scene of a structure fire within five minutes of dispatch, 90 percent of the time. NFPA uses the 90th percentile rather than average. This allows an evaluation of a department's performance on the vast majority of its incidents.

The standard establishes that a response company consists of four personnel. The standard does not require that all four be on the same vehicle, but does expect that the four will operate as a single functioning unit once on scene. The NFPA 1710 response time standard also requires that all four personnel be on scene within the recommended five minutes, 90 percent of the time. HFD informal performance objective does not include this staffing component. Thus, there is no way to determine if sufficient resources are on-scene to initiate effective fire suppression operations.

There is another reason the arrival of four personnel is critical for structure fires. As mentioned earlier, current safety regulations require that before personnel can enter a building to extinguish a fire at least two personnel must be on scene and assigned to conduct search and rescue in case the fire attack crew becomes trapped. This is referred to as the *two-in, two out* rule. The only exception to this regulation is if it is known that victims trapped are inside the building.

Given the departments typical staffing of engines, the time it takes for the second engine to arrive becomes very important to achieve the four-person company as stated in the NFPA Standard. Using maximum staffing, HFD never reaches NFPA 1710 Standard and only meets the CFAI benchmark for the low risk fire as shown in Figure 30. If additional resources are a considerable time away or there is a simultaneous call for service, a fire will continue to grow, contributing to a significant increase in fire loss and a negative outcome.

Finally, the NFPA standard calls for the arrival of the entire initial assignment (sufficient apparatus and personnel to combat a fire based on the level of risk) within nine-minutes of dispatch, 90 percent of the time. This is to ensure that enough people and equipment arrive soon enough to be effective in controlling a fire before substantial damage occurs.[28]

[28] See previous discussion about the time/temperature curve and the effects of flashover.

NFPA 1710 describes the following performance as meeting the structure fire response criteria of the standard:

- *Turnout time within one minute, 90 percent of the time*
- *Arrival of the first company within five minutes of dispatch, 90 percent of the time,* ***or***
- *Arrival of the entire initial response assignment (all units assigned to the call) within nine minutes of dispatch, 90 percent of the time*

Emergency Medical Response

There are three time standards for emergency medical responses. They are:

- *Turnout time within one minute, 90 percent of the time*
- *Arrival of a unit with first responder or higher level of capability (basic life support) within five minutes of dispatch, 90 percent of the time*
- *Arrival of an advanced life support unit, where this service is provided by the fire department, within nine minutes of dispatch, 90 percent of the time*

HFD provides basic and to a lesser amount advanced life support components of emergency medical response. HFD also provides limited support at entrapment rescue incidents. A hospital-based ambulance provides ambulance transportation service at the advanced life support level and may be assisted by fire department personnel.

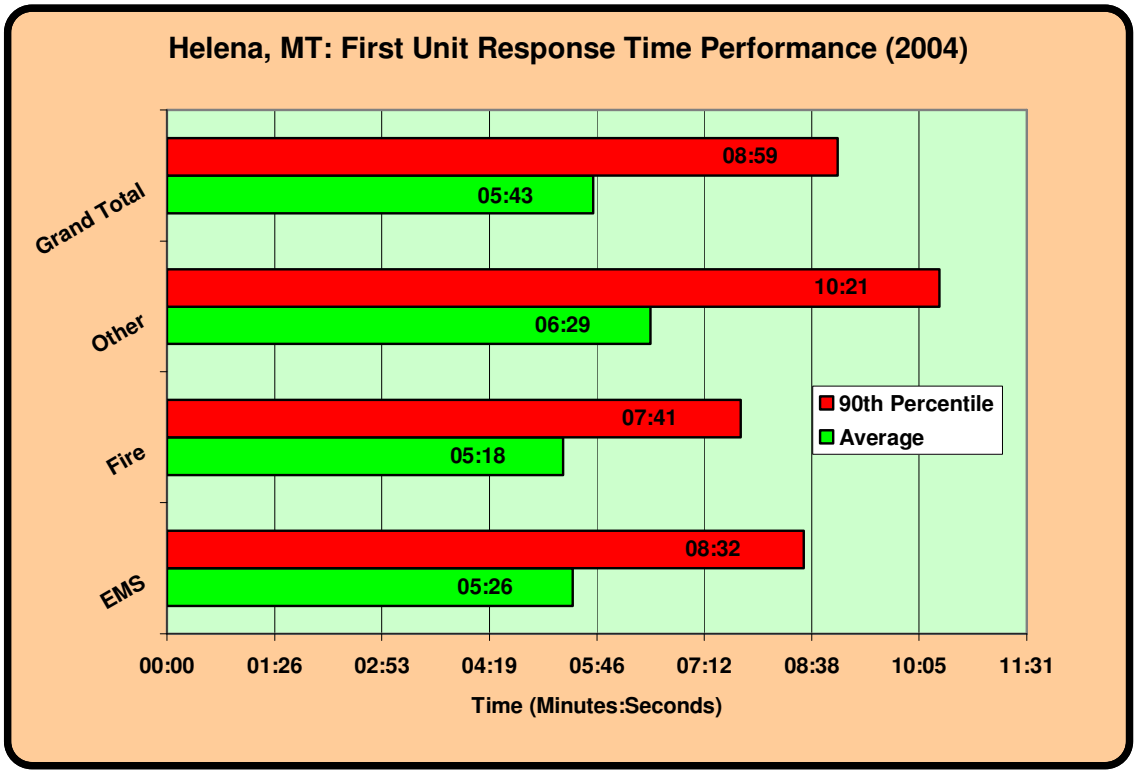
Helena FD Response Performance

The goal of emergency services is to get sufficient personnel and equipment to an incident quickly enough to be effective. The discussion that follows reviews Helena FD's current performance against this goal. This analysis will compare the department's performance with their informal objective of five minutes on the average, and a response time objective of first unit arrival within five minutes of dispatch, 90 percent of the time. Data is not available to determine when the NFPA 1710 expectation of the first company arrival (four personnel and a fire engine) occurs, thus only first unit arrival will be evaluated.

First Unit Response Time Performance

Figure 31 shows response time performance for the first arriving unit for the entire service area, differentiated by type of incident (fire, EMS, other, and total).

Figure 31: First Unit Response Time Performance (2004) [29]



HFD is not meeting the NFPA response performance targets, or its internal informal objective of five-minute average response times to all types of calls. The department responded in less than a five-minute total response time to 46 percent of its calls in 2004.

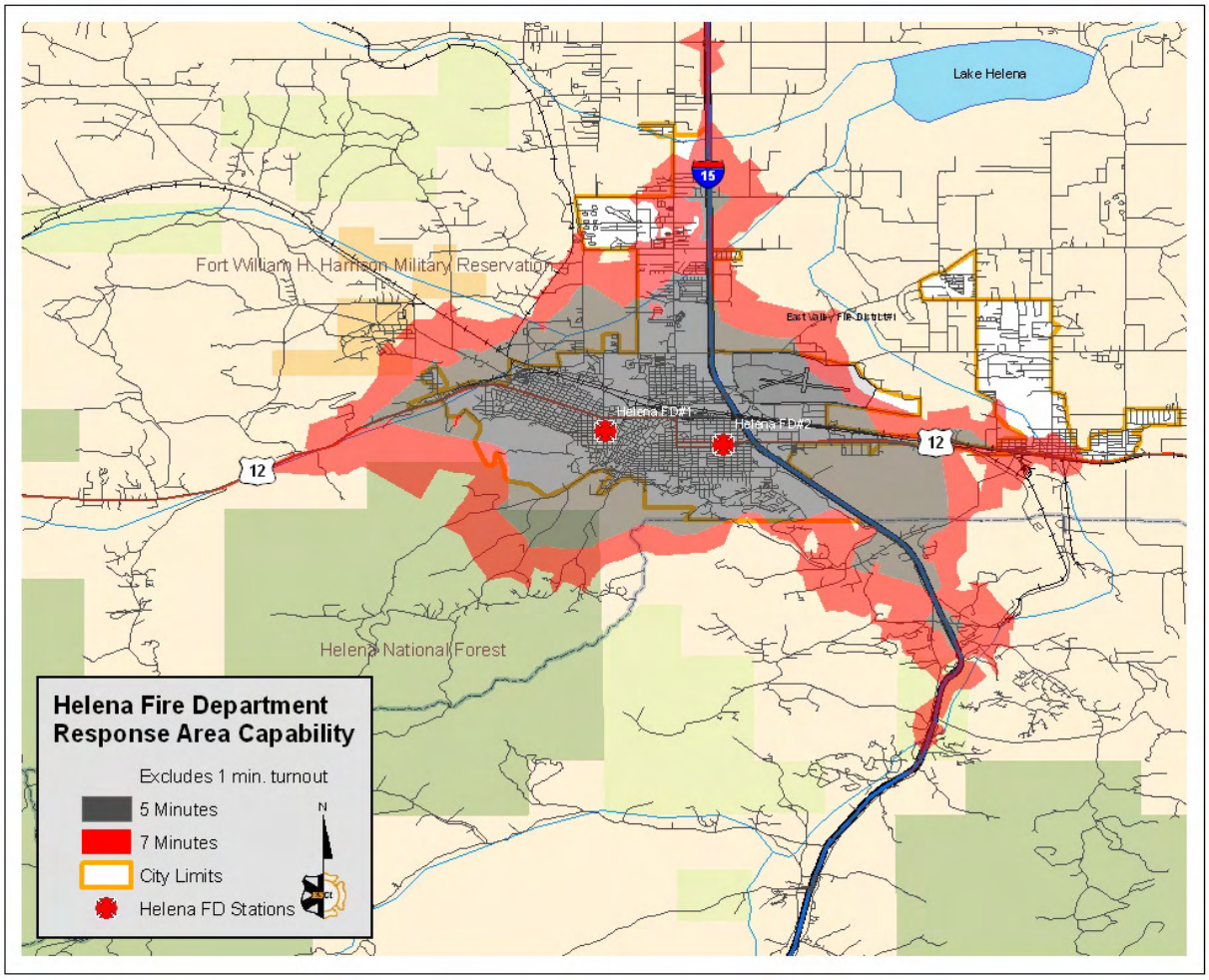
Response Time Factors

Response time is the combination of turnout time and travel time. Data is not captured in the fire incident reporting system to evaluate each of these components separately.

Geography is a significant factor in a fire department's ability to achieve a response time objective. The following map shows the city, its two fire stations, and the area that can be reached in five and seven-minutes of travel time from a fire station. These travel times are exclusive of turnout time.

[29] Source – Helena Fire Department response data.

Figure 32: Helena FD Response Capability – Five and Seven Minute Travel Time



The basis for the data for the HFD response capability indicates fair coverage for the city within a seven-minute travel time, excluding turnout time; a limited area in the north portion of the city and near the airport are not captured in the seven minute time. With the five-minute response time overlay, a significant area is not covered.

We anticipate that the department for the most part would not actually be capable of meeting the illustrated response time. The basis for travel speed is taken from the U.S. Census Bureau's Census Feature Class Codes (CFCC). The CFCC provides information on the classification of a feature and were used in the geographic data sets.

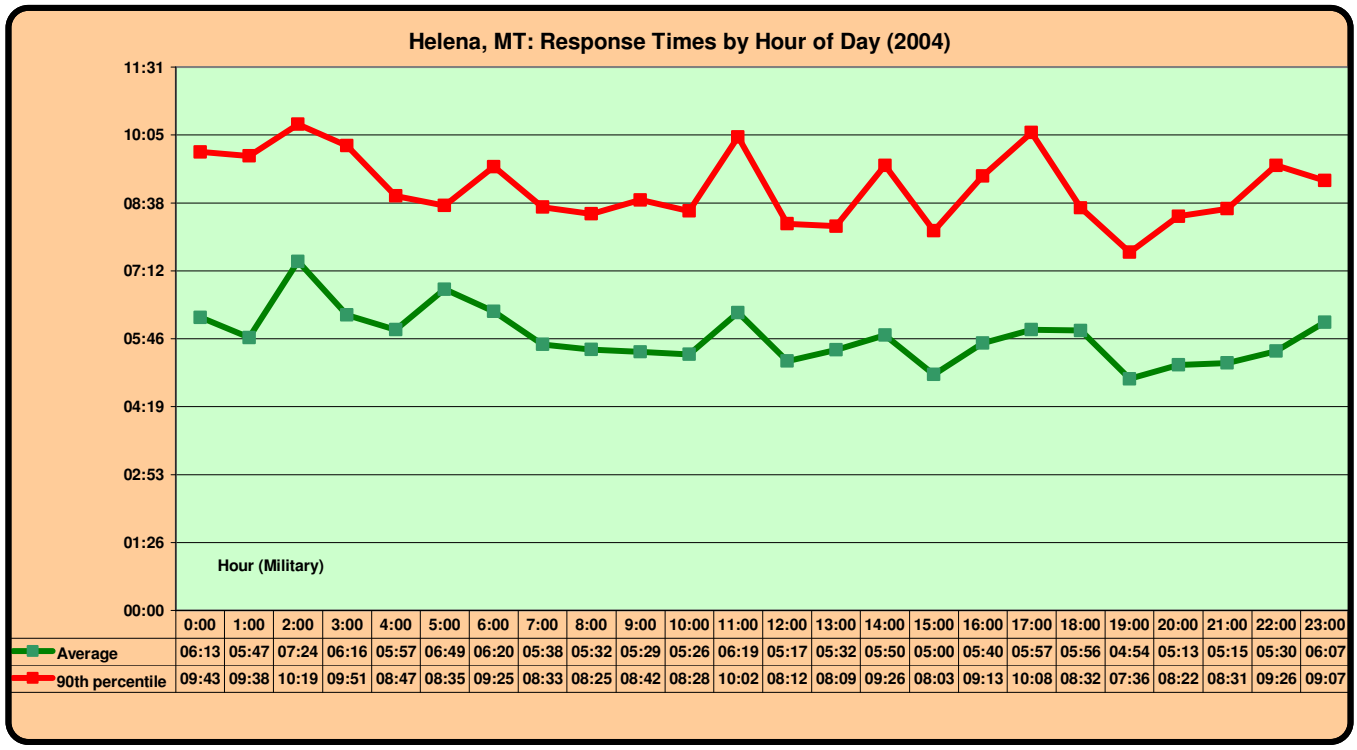
The GEO coded overlays supplied by the City of Helena factor in the CFCC that includes, corners, and other actual response reducing factors (penalties). Factors that influence the response time model but *not included* in the GEO coded overlays are; weather, traffic load factors, emergency response vehicle type, narrow streets, turnarounds, traffic signals, stop signs, availability of

Opticom™ (Priority Traffic Control Systems), speed bumps, road or utility construction, and traffic calming devices. If these dynamic and static penalties were included in the overlay, we anticipate that the footprint of coverage would shrink significantly.

Of all of the things affecting travel time, traffic-calming devices are considered by some to have the greatest consequences to emergency traffic. Traffic calming devices intended to slow cars also slow emergency vehicles — only more so. Because emergency apparatus have a longer wheelbase, stiffer suspension, and a high vehicle weight, drivers must slow almost to a stop to negotiate some devices safely.

The following chart (Figure 33) shows response time performance by hour of day for priority incidents. The red-colored line indicates the 90th percentile and the green-colored line shows average response time.

Figure 33: Response Times by Hour of Day (2004)[30]



	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Average	06:13	05:47	07:24	06:16	05:57	06:49	06:20	05:38	05:32	05:29	05:26	06:19	05:17	05:32	05:50	05:00	05:40	05:57	05:56	04:54	05:13	05:15	05:30	06:07
90th percentile	09:43	09:38	10:19	09:51	08:47	08:35	09:25	08:33	08:25	08:42	08:28	10:02	08:12	08:09	09:26	08:03	09:13	10:08	08:32	07:36	08:22	08:31	09:26	09:07

[30] Source – Helena Fire Department response data

Response times vary during the course of the day. Some possible causes include; weather, traffic load factors, emergency response vehicle type, narrow streets, turnarounds, traffic signals, stop signs, availability of Opticom™ (Priority Traffic Control Systems), speed bumps, road or utility construction, traffic calming devices, and added turnout times during night time hours. All causes that may delay response can certainly become a critical issue for the department and should be carefully evaluated as the department further develops its emergency response system.

Incident Staffing

Delivering sufficient numbers of personnel to the scene to accomplish all the various tasks that are required to effective control an emergency is essential. HFD has personnel available to staff emergency medical and other non-emergency incidents routinely with sufficient personnel.

The most labor-intensive incidents are structure fires. National criteria recommend at least 13 personnel be on scene of a fire in a single-family dwelling. This can be misleading, since many new single-family residences can range from 3,000 to over 5,000 square feet, or equivalent to the size of most small or moderate commercial structures. More personnel may be necessary as the size of the structures increase, as the risk to life increases, or when special hazards exist.

At full staffing, (best case scenario) HFD has nine personnel available to respond to structure fires.[31] At minimum staffing that number of personnel drops to seven. The minimum staffing level of seven is just slightly more that the recommended requirement for a low risk incident. As incidents increase in risk, without a substantial mutual aid response and or a call back of Helena's off duty personnel, the department has insufficient staffing to handle greater risk incidents.

As the community grows, simultaneous calls for service will be more common, thus exacerbating the current problem of an inadequate number of readily available staffing resources.

Need for Additional Resources

In this evaluation section (Objective Eight – Service Delivery), it was previously established that the Helena FD lacks sufficient internal resources to meet the minimum number of firefighting personnel for a medium risk incident based on the recommended requirements.[32] During concurrent calls, with

[31] HFD reports that nine personnel are only available approximately 35 days a year when allowing for vacations, sick leave out of town training, and other personnel leaves.
[32] The Commission on Fire Accreditation International (CFAI) of the International Association of Fire Chiefs benchmarks for the number of personnel required on scene for various levels of risk.

only one Helena fire unit committed, the department lacks a depth of resources to meet the minimum staffing for a low risk incident. Additional resources require paging for off-duty Helena personnel to report back or requesting mutual aid.

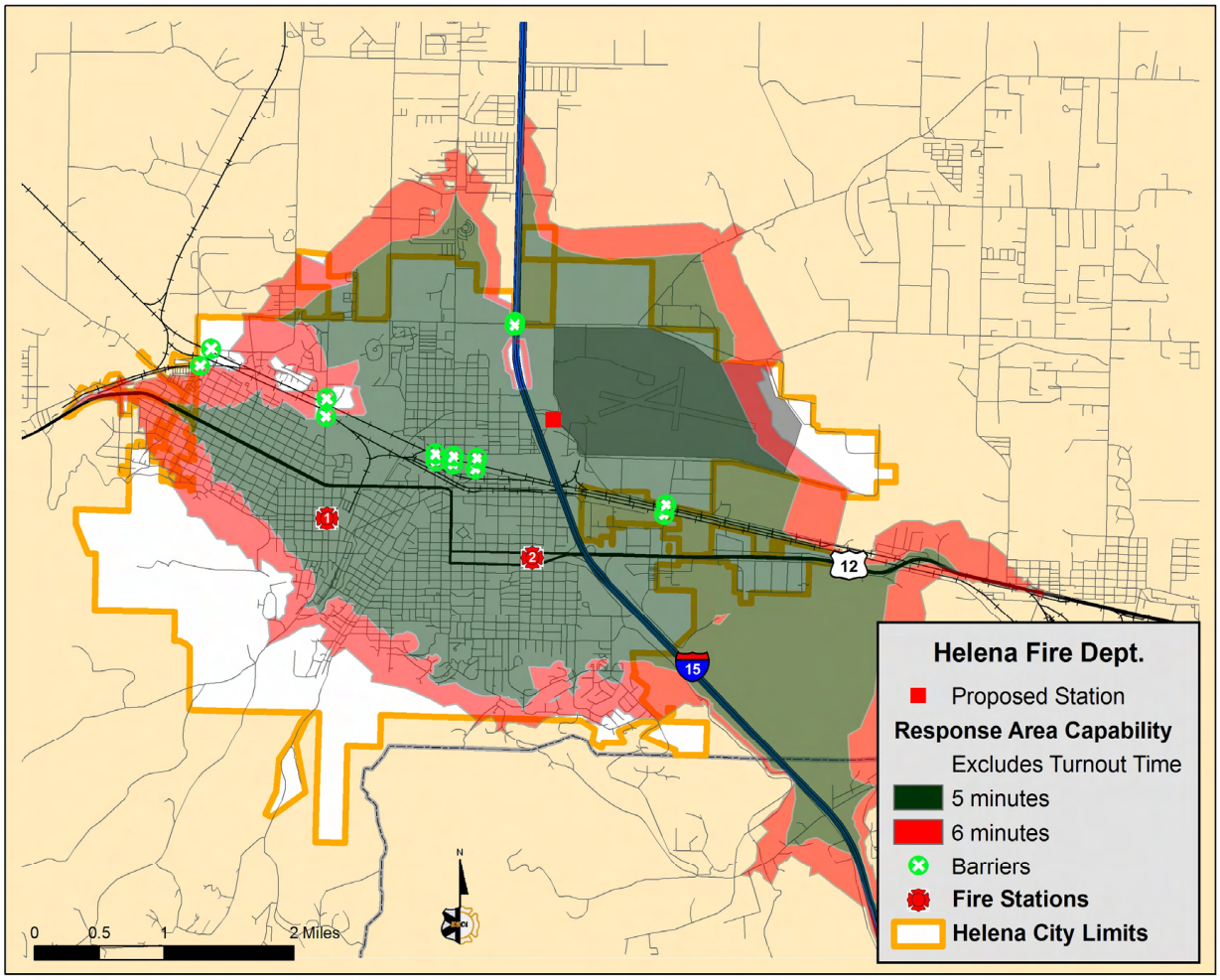
Coupled with the department not meeting response performance targets, the case for a third fire station in the city is valid. We recommend that the Helena FD add a third fire station and sufficient personnel to provide 24-hour coverage. We further recommend that the station be located at or near the Helena Regional Airport. Consideration should be given to existing facilities at the airport — that can either be modified, altered, or replaced to meet Helena Regional Airport and Helena FD needs.

This rationale is based upon the Helena FD's current limited number of personnel, apparatus, equipment, and potential success in;

- Developing a shared cost agreement between the City of Helena and the Helena Regional Airport; to cost share a staffing a fire station that will meet the current and future needs of the city and the airport,
- Ability to site the station with access points and airport response capabilities to meet FAA requirements,
- Securing adequately sized property for a fire station,
- A location that would provide increased travel area capability and improved access to portions of the city with limited or reduced access, and
- Potential for improved performance outcomes.

A potential location for the third fire station and the response area capability for that facility is shown in Figure 34 below.

Figure 34: Potential Location for a Third Fire Station with Projected Response Area Capability



The Helena Fire Department should develop a plan to ensure that adequate staffing is available to meet those low to high-risk incidents that occur in the City of Helena. The department should develop a deployment plan to add staffing in a sufficient number to provide for an initial response to a moderate risk incident. Automatic aid agreements between the fire agencies in Lewis and Clark County may assist in augmenting personnel, apparatus, and equipment resources for high risk and greater incidents.

Analysis of Outcomes

Monetary loss data to property because of structure fires is captured and maintained by HFD. This ability provides information needed to track trends occurring within the city. Fire loss data can be linked directly to response time factors including simultaneous calls for service.

Mutual and Automatic Aid

Helena FD has mutual aid agreements with all surrounding fire departments with oversight provided by the organization known collectively as the Rural Fire Council. Through these agreements, HFD can expect additional responders and apparatus from predominately-volunteer fire agencies within a 20-minute period. HFD reciprocates with its neighboring departments. We recommend that the Helena FD participate with the Rural Fire Council in the development of automatic aid agreements between all Helena Valley fire departments.

While mutual- or automatic-aid agreements can be used to help meet the requirements of NFPA 1710 and 1720, it is anticipated that without the addition of other resources in the City of Helena (stations, equipment, and personnel) there will likely be a continued increase in the HFD emergency response times, and corresponding degradation in service levels.

Insurance Services Office

The Insurance Services Office (ISO) last rated the department in 1999. The ISO assigned the city a Class 4/9. A Class 4 rating for all properties within 1,000 feet of a fire hydrant and Class 9 for all other properties.

The ISO uses a 1 to 10 rating scale with Class 1 enjoying the best level of service (lowest fire insurance premium) and Class 10 with 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 percent) – This evaluates the function and reliability of the dispatch service. The department received 8.25 percent out of a possible 10 percent in this category.

Water Supply (40 percent) – This evaluates the community's ability to deliver firefighting water in sufficient volumes to combat fires in buildings. The city received 35.54 percent out of a possible 40 percent.

Fire Department (50 percent) – This evaluates the capability of the fire department to effectively respond to and extinguish a fire. Items reviewed include apparatus, staffing, training, and station locations. The city received 25.27 percent out of a possible 50 percent available. The primary area of deficiency included insufficient on-duty staffing.

The total percentage credit received was 61.40 percent.[33] In order to reach the next lower rating, the city would need at least 70 percentage points of credit. This may be achievable due to water distribution improvements, along with staffing and distribution improvements.

The ISO rating is important to a community. Many property insurance companies base the fire risk portion of property insurance premiums on the community's ISO rating. The charts below show two examples of how fire insurance rates for homes change based on the ISO rating assigned.

Figure 35: Fire Department Protection Class versus Insurance Premium Cost Example

Fire Department Protection Class Versus Insurance Premium Cost Annual fire insurance premiums based on home value (source: Oregon premium survey)				
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

Figure 36: Example Premiums Based on ISO Ratings

FIRE DEPARTMENT CLASS RATE VERSUS INSURANCE PREMIUM COSTS								
Fire Rating	Annual Premiums based on home value (home values in thousand dollars) (source: Survey of insurance companies in southeast United States)							
	100	150	200	250	300	350	400	500
10	894	1358	1856	2341	2826	3311	3844	4918
9	806	1224	1674	2112	2549	2986	3468	4436
7	430	652	892	1125	1359	1592	1848	2365
6	399	607	829	1046	1262	1479	1717	2196
5	373	566	774	976	1179	1380	1603	2051
4	373	566	774	976	1179	1380	1603	2051
3	373	566	774	976	1179	1380	1603	2051

As the ISO class improves, fire insurance rates decrease dramatically until Class 5 for homes. Businesses generally benefit from further reductions down to Class 1.[34]

[33] ISO subtracts points when the quality of the fire department and the quality of the water system are significantly different (divergence). In the 1998 survey, 7.66 percent was subtracted for divergence.

[34] A similar chart is not available for commercial properties. Property use affects the premium and many commercial properties are individually rated.

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 9). 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 (portable reservoirs), refinement of response practices to ensure prompt response by water tenders, and perhaps additional water tenders.

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. Figure 37 lists a number of these standards.

Figure 37: Table of Benchmark Comparisons

National Standard or Comparison	Organization	Current Helena FD Standard
Minimum effective company staffing is four firefighters	Dallas Fire Dept. Study, Seattle Fire Dept. Study, NFPA Standards., Federal OSHA	Current staffing levels for engines is three firefighters, four-person company assembled at scene
Engine company within 1.5 miles of built upon areas	Insurance Services Office (ISO)	Met
Ladder truck within 2.5 miles of built upon areas	Insurance Services Office (ISO)	Not met
Staffed ladder truck if five or more buildings exceed 35' high	Insurance Services Office (ISO)	Not met
Average fireground staffing to be 15 firefighters (up to 53 at mall, high-rise, etc.)	Commission on Fire Accreditation International (International Association of Fire Chiefs)	Unknown. Data are not available to evaluate total fireground staffing. [35]
National average of on-duty personnel = .48 per 1,000 population	International City/County Management Association (ICMA)	Current strength is .33 per 1,000 population
National average total uniformed, full-time personnel = 1.59 per 1,000	International City/County Management Association (ICMA)	Current strength is .94 per 1,000 population
Arrive at structure fire prior to flashover (typically 5 to 7 minutes from ignition)	FEMA, National Fire Academy	Not met
Arrive at EMS call within 4 to 6 minutes of cardiac or respiratory arrest	American Red Cross	Not met

[35] The benchmark would not be met by on-duty staff alone. Sufficient data were not available to determine the average off-duty or paid-on-call staffing that typically supplements on duty staff.

Objective Nine - Training

Providing for a safe and effective fire and emergency medical services delivery system requires a well-trained response force. The International Fire Service Training Association (IFSTA) states that "*regardless of the particular system used, an effective training program will include: (1) the continuous training of all levels of personnel in the department; (2) a master outline or plan; (3) a system for evaluating the scope, depth, and effectiveness of the program: and (4) revising the program, as required, to include advances in equipment, products, and techniques*." Without a high quality, comprehensive training program, emergency outcomes are compromised, departmental personnel are at risk, and the department and city may be held liable for the actions of its employees. Training and education of department personnel are critical functions for the department.

General Training Competencies

Quality training should be based on established standards of practice.[36] There are multiple sources available from which fire training standards may be obtained. The HFD has selected the IFSTA and the NFPA as a source of standards and materials. Both are considered industry standards within the fire service. The department assistant fire chief/training officer (AC/TO), generally using these standards, provides training to department members in several categories including entry level, on-the-job (continuing education), and specialized services. IFSTA and NFPA are the basis for the department's training manual that is currently under development.

The AC/TO commits the greatest amount of effort at the on-the-job or in-service training level. This level of training runs the range of job skills with which a firefighter (general term) must be proficient in order to be effective. It includes all ranks in the department from firefighter to fire chief.

Hazardous materials training is delivered at the operations level to department personnel. A fewer number of personnel are certified to the more specialized hazardous materials (HM) technician level. The HM technicians respond as a regional component of a statewide hazardous materials response system. The HFD assistant fire chief/training officer responds with the hazardous materials team and operates as the team leader for the Helena Regional Hazardous Materials Team.

[36] Standards of practice are what are accepted as norm — a level of quality or excellence that is accepted as the norm or by which actual attainments are judged.

The department, through AC/TO oversight, is currently evaluating and considering enhancements to the training program. This program should include (1) provision for a standard basis of fire department operations, (2) a long-range training plan, and (3) development of a department training manual.

Training Facilities

HFD Headquarters/Station 1 was remodeled. The building includes a classroom training facility designed to provide an efficient training environment with audiovisual equipment and computer projection capability. While space is limited, the training room is adequate for the current operations of the department. A cooperative agreement with the Helena Regional Airport allows for use of a two-story smoke building, an aircraft CFR (Crash Fire Rescue) trainer, and a driving track. Providing quality training props and tools to support the departments training goals should continue as a priority.

Office space for the AC/TO is limited, as is the space available for the administration and support staff. Additional room in the form of a new facility, or addition should be considered to provide sufficient office for current and future needs for training, administration, and support staff. As noted above, and the training room is adequate, but at capacity. Plans for acquiring additional space for training should be considered.

Training Staff

The International Fire Service Training Association (IFSTA) states that "*the training program must be organized, supervised, and conducted by individuals who are knowledgeable in this profession*."[37] The department training division consists of one FTE- the assistant chief/training officer (AC/TO). The size and organization of the department allows for the AC/TO taking a hands-on approach to training program delivery. This system appears to work very well for the current staffing level of the department and the training program is well suited to the needs of the city.

There are currently no specific requirements or competencies for the position of AC/TO. Assistant Chief Ross is highly qualified for the position of AC/TO and is motivated to produce the results needed in the training program. However, we recommend that the department develop a job description specific to the position of AC/TO.

[37] The International Fire Service Training Association (IFSTA) was established in 1934. The mission of IFSTA is to identify areas of need for training materials and foster the development and validation of training materials for the fire service and related areas.

It is important to note that a well-developed, progressive training program must bridge the gap that exists between planning and execution. The key to a successful training program lies with the training officer and the instructor base within the organization. A training officer that is able to devote time to the training delivery system planning role will often have a larger impact on the overall level of the department's response effectiveness. A training officer can also effect the personal growth of other department members by involving them in the instructional delivery of the courses and programs. More proficient methods of operation are often devised when multiple ideas are considered. In the case of HFD, the need to continue the work started in the training procedures manual will support this concept. Completion of the upgrades should be a high priority.

A basic principle, that should govern the training program for HFD, is that all activities of the training division should be integrated into departmental goals. Currently, the goals and objectives for the training program are clear and well defined, and support the department goals well.

Entry Level Training

Prior to being considered for full-time employment by the HFD, applicants must meet the minimum training requirements prescribed by the job description for firefighter. Successful candidates complete the HFD probationary firefighter training during a 12-month schedule of activities. The 12-month program consists of a five-week New Hire Training Program, a probationary standards manual check-off, a shift mentor program, meeting street and address testing requirements, and NFPA essentials testing.

Ongoing Skills Maintenance Training

Once assigned to a response unit, personnel must continually be provided with on-the-job, in-service refresher training to avoid degradation of skills learned during entry-level training. In addition, training must be provided to deal with emerging risks and service demands.

Firefighter I and II (FF I and II) are self-paced programs that are completed by the new employee after confirmation, and upon being assigned to a full time shift position. A recent change to the FF I and II program was the addition of a task performance evaluation to document required competencies of the F/F I and II levels. Contractual incentives are attached to these levels of certification. Criteria for the fire department incentive program, including performance standard descriptions, are contained in new Appendix B of the labor agreement.

Career Development Training

The Fire Officer I and II career development package is available to employees with instruction provided by in-house instructors. The department is working on expanding its (self-described) limited effectiveness in the career development arena. A higher level of emphasis placed in this area will yield long-term dividends to the department. Budgeting additional out-of-area training and educational opportunities should be considered.

Training Program Planning

Like any other activity, training and education of personnel should be conducted under a comprehensive plan. The training program is then a direct reflection of the long-range goals of the department. The training program plan should include a clear reflection of the goals and objectives of the training division, and how they relate to overall department goals.

The assistant chief/training officer does not currently use a fire department training committee to assist with identification of training program needs. A departmental training committee could help formulate the training plan, providing the additional benefit of employee buy-in to the training program, and broadening the information base from which the program is developed.

Ideally, a comprehensive training plan includes:

- Identification of performance standards for all personnel
- Provisions for periodic review of individual and company level performance
- Scheduled training to prevent skills degradation
- Scheduled skills improvement training (manipulative or hands-on training)
- Comprehensive training objectives for each training session presented
- Process for evaluating the amount of learning that occurred
- Scheduled outside training opportunities

Multi-agency drills were not noted as a common practice of HFD. More emphasis on developing operational efficiency with other fire service agencies in the Helena area is critical and should be a high priority. The level of risk in the city is quite high and the depth of resources must include the surrounding agencies in a comprehensive response plan that would include regular joint training. It is also important for the local fire service to be involved with emergency management planning and periodic exercises. The primary source of regional emergency management exercises was noted to be an annual exercise with the Helena Regional Airport. The department should consider expanding its role in city, regional, state, and federal governmental trainings and exercises.

Competency-Based Training

On-going training should follow an identified plan based on demonstrated training needs. Such a plan is best developed from a periodic evaluation of the current skill levels of employees (competency-based training).

Under a competency-based system, an evaluation of skill performance is conducted at scheduled intervals to determine if the individual being evaluated can perform the task in accordance with pre-determined standards. Skills performed satisfactorily require no additional training; skills not performed satisfactorily are practiced until the standard is met.

This approach maximizes the time used for training. Further, it ensures that personnel are performing at a level that has been established by the department. Specialty skills can be evaluated in the same manner with further training provided as needed. Ideally, the competency based training approach is used on a routine, ongoing basis. For example, each quarter different skills can be evaluated on an individual-by-individual basis.

To institute a competency-based approach to training, all of the needed skills must be documented describing the standard of performance expected. This would include all skills including hose handling, apparatus operation, EMS procedures, use of equipment and tools, forcible entry, ventilation, tactics and strategy, among others. These areas of competency would be incorporated into the department training manual during development.

To operate a training program effectively (under the competency-based approach) sufficient resources must be available to conduct skill evaluations and to assist with performance improvement training. The department should consider developing in-house trainers to assist the AC/TO with training delivery and competency based evaluations.

Training Records and Reports

Training records are an excellent resource for the department to assist in developing long-range training and education plans as well as a resource to query activity that is useful in departmental reports. At the HFD, Individual training records are completed at the end of each work shift. The training records were current and assessable.

Training records are initially recorded in a Microsoft Word™ table and then transferred into an Access™ database program capable of categorizing by individual, course, hours, and instructor.

Objective Ten - Fire Prevention

An aggressive fire and accidental injury risk management program, through active prevention efforts, provides a fire department's 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:

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

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.

Background

As a legally constituted municipality in the State of Montana, the Helena has adopted the following codes and standards:

- *2003 NFPA 1/UFC State Fire Code (with local amendments)*
  - Adopted under the City of Helena Ordinance No. 3014
- *2003 International Building Code (with local amendments)*
  - Adopted under the City of Helena Ordinance No. 2261

Local amendments to the fire code include special requirements for storage and handling of explosives and bulk quantities of hazardous materials; special requirements for parade floats; permits for blasting; and a total prohibition on sale, possession, and use of consumer fireworks within the city.

A potentially serious disconnect exists between the adopted building code and adopted fire code, because each is drawn from a different family of codes. Correlation between the building code and fire code is critical, if no gaps are to be left unresolved. Drawing the building code and the fire code from the same family of codes assures that proper correlation exists in the basic code documents. Experience has shown that correlating a fire code from one code family and a building code from another, requires an extremely extensive and time-consuming review of both, along with literally hundreds of amendments in order to assure a comprehensive fire and life safety package. Statewide,

this review and amendment correlation process has not occurred and significant gaps and potential conflicts most certainly exist.

As provided for in Helena Ordinance No. 3014;

> *"The uniform fire code is enforced by the Helena Fire Department. The chief of the fire department may detail such members of the fire department as are necessary to ensure the functioning and operation for fire prevention and investigation."*

The chief has authorized two individuals to enforce the fire code in the city: The fire marshal and one firefighter/inspector. The fire marshal is assigned to work a typical 8 a.m. to 5 p.m. 40-hour week. The inspector is assigned to work a like schedule. Six engine company captains are being trained for fire inspection work, and will perform those duties as their shift schedules permit. When available for that duty, the firefighter/inspector will fill in on the engine company the captain is detailed away from. If no captain is available for fire inspection work, the firefighter/inspector will perform fire inspection duties.

New Construction Review

A review of new construction plans for fire and life safety considerations is required by the city. The fire marshal participates in a pre-application meeting every-other-Monday with other city department heads to review new construction proposals before permits are actually drawn. The fire marshal devotes about 40 percent of his time to fire and life safety plans review for fire code compliance.

The fire marshal and/or the fire chief, in collaboration with the building official, can approve exceptions or waivers based on alternate methods and materials. A file of previously approved waivers exists, but may not be complete. Documentation that is more accurate is now being maintained.

The prevention division and fire suppression company officers inspect fire suppression systems. With the increasing complexity of such systems, it will become increasingly more difficult for the officers to gain the knowledge level required to inspect these systems. The result, officers are now only doing the most basic inspections; technical inspections are conducted by fire prevention personnel.

Presently, the fire department charges no fees for new construction related work including plan review and new construction inspections. The fire marshal believes that if fees for these services were implemented, the revenue could be dedicated to staffing for these activities.

Figure 38: HFD Fire Prevention Division General Activity Summary

Helena Fire Department – Fire Prevention Bureau Activity New Construction Plan Review			
	CY - 2002	**CY - 2003**	**CY - 2004**
Building Plan Reviews	158	190	160
System Plan Reviews	22	21	33
System Tests	37	35	35

Fire Safety Inspections

Periodic inspection of existing occupancies to find and eliminate potential fire hazards is an important part of the overall fire protection system. The health, safety, and welfare of citizens and firefighters are in the balance. Additionally, certain hazardous occupancies and processes require a permit to operate; in compliance with the applicable fire code and thus the need for an inspection to ensure a minimum degree of safety.

The recommended frequency for fire safety inspections varies by the type of occupancy. Generally, they are classified by degree of hazard. The fire marshal has proposed the fire inspection cycles shown in the following chart.

Figure 39: Proposed Inspection Frequency

Example Facilities	Proposed Inspection Frequency
Educational facilities, hazardous occupancies, public assemblies	**Annual**
Institutional facilities, manufacturing, residential with occupant load >50	**Bi-annual**
Business, mercantile, storage and residential with occupant load <50	**Tri-Annual**

Currently, the fire marshal is not able to determine accurately the number of occupancies in the city requiring inspection. An effort is presently under way to incorporate city business licenses to update and facilitate inspection tracking. However, it is known that there are unlicensed businesses in the city, in addition to state and federal facilities that require no license. Best records at this time (which are three to four years old) indicate the existence of 1,265 buildings requiring code enforcement. How much occupancy is contained within these buildings is not known. What is known is that there is presently no routine program for inspection of existing occupancies, except for those requesting an inspection for purposes of state required licensing.

There is no program of routine maintenance inspection of occupancies within the city. The fire marshal has limited time for such activities, and is only able to respond to specific requests for inspection. This includes inspection of facilities that require a state license predicated on passing a routine fire inspection. It should be noted, that if an inspection fee were implemented for facilities that require fire inspection for licensing reasons, that revenue could also be used to support staffing needs within the fire prevention bureau.

The following table identifies the HFD fire prevention bureau code enforcement and inspection activity for the past three calendar years.

Figure 40: Fire Inspection Activity Summary

Helena Fire Department – Fire Prevention Bureau Activity Code Enforcement & Inspections			
	CY - 2002	**CY - 2003**	**CY - 2004**
Code Enforcement	164	185	275
Follow-up Inspections	132	103	264
Orders/Memos Issued	1	2	6
Site Inspection	74	93	82
Approval of Permits	7	4	8

The absence of a comprehensive, on-going program leading to a fire safety inspection, of commercial occupancies at least annually, creates a significant liability for the department and the city. This also subjects to considerable risk, that could otherwise be avoided, both the firefighters who would have to respond to fires in these structures and the public that will occupy them. Such inspections can be accomplished through a combination of assigned fire code certified fire prevention staff, engine company inspections (provided at least one member of the engine company is fire code certified), and self-inspection by business owners in selected low-hazard occupancies. The department is taking steps to increase the level of fire prevention inspection activity, but the deficiency still exists at this time.

Furthermore, there is concern for the petroleum bulk plants located just outside the city on Highway 12 East. While they are not in the city, they are critical to the economic well-being of the city, and as such need the protection of a comprehensive fire prevention program (at present there is no such program for them). Another concern is the fact that in the event of a major mishap at any of these facilities, the HFD will certainly be responsible for assisting in the provision of providing suppression service. This will place Helena firefighters at risk, and leave Helena residents unprotected or under-protected for the duration of such an event.

Engine company captains are being assigned to accomplish fire code inspections. However, any personnel engaged in fire code enforcement should be fire code certified and that is not anticipated under the current program. This inspection work by engine company personnel could also provide an opportunity to accomplish and/or update pre-incident planning.

In implementing an engine company inspection program, it is essential that the fire marshal/fire chief:

- Clearly identify the number of properties that should be inspected

- Formally establish the frequency at which these properties should be inspected, by level of risk
- Develop a comprehensive records management system (RMS) so that the results of inspections can be recorded, deficiencies tracked for analysis and future inspection dates identified to the inspector
- Explore automation of inspection files
- Explore adding fees-for-service for required fire inspections

Public Fire Safety Education

Providing fire safety education to the public to minimize the occurrence of fire, and train the community in appropriate actions to take when faced with an emergency is a particularly important fire protection strategy. City growth will likely produce longer response times — prevention and education provide the best opportunity for minimizing the effects of a hostile fire in these areas.

Public fire safety education is conducted by the fire prevention bureau on an *as-able* basis, due to workload demands and what is described as insufficient staff resources. Fire station personnel provide station tours by request. Additionally, engine company personnel are heavily involved in Fire Prevention Week activities. Indeed, Fire Prevention Week has become fire prevention *month*. All second grade students in the entire region come to the department for educational presentations during this time.

Educational activities for the fire prevention bureau and engine company personnel include Fire Prevention Week activities, hotel/motel safety classes, food service safety classes, fire extinguisher training, and seasonal public safety announcements. HFD also meets, time permitting, with various civic and community service groups to present information about the fire department and fire safety. Educational brochures are available to the public.

The following chart identifies the fire and life safety data collected by the department's fire prevention bureau.

Figure 41: Fire and Life Safety Education 2004

Helena Fire Department – Fire and Life Safety Education 2004		
Education Activity	**Number of events**	**Total number of contacts**
Fire Prevention Week	39 2nd grade classes	1,677
Sparky in the Schools	26 2nd grade classes	
Station tours - October	22	
Townsend School	3 1st grade classes	

The department received grant funding from the CDC (Centers for Disease Control and Prevention) for a door-to-door smoke alarm campaign that has operated successfully for three years. The grant pays for off-duty personnel to contact residents in their homes, as well as for the smoke alarms themselves. This program has proven to be relatively successful. In the three program years to date, 496 homes have been contacted and 1,916 smoke alarms have been installed. It is still too soon for any trends in residential fires and fire fatalities to be identifiable. No specific saves or potential saves have been identified to-date because of the program.

This program could be expanded significantly by using the existing core of career staff personnel, under the supervision of the fire marshal, to recruit, train, and direct groups of community based volunteers to do the footwork. Civic organizations such as Kiwanis, Rotary, church groups, parent-teacher associations and Boy Scouts and Eagle Scouts could be mobilized to make many more contacts in targeted areas, resulting in far more homes being contacted and protected. (The Oregon Office of State Fire Marshal has developed and delivers such a program and has available a packet of information on how to make this work).

In order to be effective, there should be some way to measure results of these efforts. This would include, among other factors, expanding information tracked on each emergency incident to record whether human behavior was a contributing factor to the emergency and whether citizens present took appropriate action when faced with an emergency.

Juvenile Fire Setter Intervention

Historically, the HFD has had a fairly well developed Juvenile Fire Setter Intervention (JFSI) program. There had been a partnership involving other fire departments from the region, Montana Department of Justice, Montana Child Support Services, local private counselors, a private residential treatment facility, and the Juvenile Probation Department. Using the U.S. Fire Administration forms and the MyFires Program, suspected juvenile fire setters were screened, educated, and/or referred as needed. Because the fire marshal has literally no time to devote to this program, and because most of the cases came from outside the city, the fire prevention bureau has had to stop taking cases. What little JFSI activity now occurs is limited to city residents.

Juvenile firesetter intervention programs are an integral part of a complete fire prevention service. National and state statistics have clearly demonstrated that juvenile fire setting is a growing problem that exists in virtually every community, and that juvenile fire setting is often symptomatic of much

larger problems. We recommend that the HFD assess the need for a juvenile firesetter intervention program.

Fire Investigation

The investigation of fires, explosions, and related emergencies is an integral part of providing life and fire safety to a community.

The HFD Fire Prevention Bureau investigates all fires and related incidents when the incident commander or engine company officer is unable to establish the origin and cause, or has reason to believe the cause may have been intentional. Incident commanders and engine company officers, however, possess limited origin and cause determination training. The fire marshal graduated from the National Fire Academy Fire Investigation Program and has attended several two-day fire investigation courses at the Montana Fire Service Training School.

Fire prevention personnel work closely with the Helena Police Department on fire cause determination. When fire department personnel find that a fire is of incendiary origin, or involves a criminal act, the Helena Police Department is notified. The Helena Fire and Police Department personnel process the case as a team. The decision to prosecute and criminal case management is under the authority of the Lewis and Clark County Attorney.

The following table indicates the types of fire causes for residential properties by year as identified by the HFD fire marshal.

Figure 42: Residential Property Fire Causes 2001 through 2003

Helena Fire Prevention Bureau Activity Residential Property Fire Causes			
	2001	**2002**	**2003**
Heating	5	3	2
Cooking	3	5	9
Electrical	2	1	3
Smoking/Matches	4	2	4
Candles	0	1	2
Incendiary	0	1	2
Gas	1	1	0
Weather	0	0	0
Other	0	1	1
Undetermined	3	4	4
Total	**18**	**19**	**27**

This table clearly indicates that a significant portion of residential fires in Helena are attributable to causes that can be affected by a comprehensive public fire safety education program that extends beyond grade school students and Fire Prevention Week. Well over half of the residential fire causes (during the documented three years) are heating/cooking/smoking and matches/candle related. The undetermined fires may actually have added to that emphasis.

Figure 43 reflects the number of fires by origin type, cause, and the property loss as identified by the HFD fire marshal. As stated earlier in this report (analysis of outcomes), fire loss data can be directly linked to response time factors including simultaneous calls for service.

Figure 43: Investigation Activity Summary by Cause Determination

Helena FD Fire Prevention Bureau Activity Fire Investigation			
	CY - 2001	**CY - 2002**	**CY - 2003**
Incendiary	0	1	2
Accidental	15	14	19
Undetermined	3	4	6
Total	18	19	27
Total Fire Loss	**$713,000**	**$192,350**	**$107,900**
Number of Incidents	**2,456**	**2,500**	**2,588**

Incident Information Analysis

The primary purpose for maintaining a record of emergency responses is to evaluate the effectiveness of fire/rescue prevention and suppression programs and performance. This effort includes deployment strategies, training requirements, and the effectiveness of fire prevention, code enforcement, fire investigation, and life safety education programs.

Recordkeeping for HFD is accomplished at the 9-1-1 center as part of the dispatching software package. At this time, retrieving information from the database is difficult; consequently, any effort to analyze response or to evaluate the effectiveness of HFD operational and fire prevention programs is impractical. This is a serious deficiency. Once a coordinated data collection and analysis process is in place, incident records may be used to continuously monitor what types of emergencies are occurring most frequently, the properties most often involved in fire, causes of ignition, and other factors to assist with managing fire prevention, accident prevention, and to determine HFD resource needs.

Attention should be focused to identify the cause of false alarms, malicious false alarms, and alarm malfunctions. There is often a tendency to misclassify these categories, especially when a good

intent category is not used. When alarms are caused by non-hostile sources such as repair people, burnt food, and/or accidental system damage, the incident might be classified as a system malfunction when the system performed exactly as designed. Actually, such alarms should be classed as "good intent" calls.

As a case in point: Figure 43 above shows that the number of residential fires in Helena that are caused by activities involving cooking increases each year. This indicates that analysis of fire cause is probably not occurring. If it were, the department could address the problem through an aggressive public education and prevention effort.

The fire problem in a community is addressed by a cycle of resources provided by the authority having jurisdiction — in this case, the HFD. These resources include:

- **public education** so the citizen is aware of hazards, how to prevent them, and what to do should they occur,
- **engineering/code enforcement** so fire and life safety is an inherent part of the community infrastructure, and where there is a violation, compliance is achieved,
- **fire suppression** so that when there is a failure in the education, engineering/code enforcement part of the cycle the emergency can be resolved, and
- **fire investigation** where the incident is documented, the cause is determined accidental or intentional, and steps taken so it will not happen again.

SECTION II – Helena FD: Summary Table Organizational Recommendations

What follows is a compilation of recommendations and strategies designed to improve the efficiency and/or effectiveness of the Helena Fire Department during the short to mid-term.[38] The suggestions offered by ESCi associates are derived from our analysis of the existing emergency system as detailed in Section I of this report. Recommendations and comments are based on experience with similar fire and emergency medical agencies, and categorized in accordance with the ten objectives of Section I. This is intended as a management reference to be used by the leaders of the city and fire department to aid in forthcoming planning and management activities. Because of that, the discussion and rationale behind each of the recommendations is not included here; that information may be found in the appropriate chapter of Section I as referenced below. In keeping with the advisory nature of most of these comments, none is listed in order of importance or priority.

Summary Table of Short and Mid-Term Organizational Recommendations		
Objective Reference	**Context Reference**	**Recommendation**
Objective One – Organizational Overview	Maintenance of History, on page 6	Designate a fire department historian. A historian should be specifically charged with documenting "historic" events, activities, personnel changes.
Objective Two – Organizational Management	Rules, Regulations, and Policies, on page 19	Ensure that rules, regulations, and policies are updated at regular intervals. At a minimum, a complete review should be conducted bi-annually.
Objective Two – Organizational Management	Critical Issues and Future Challenges, on page 20	The department should consider conducting a Complete Customer Centered Strategic Planning process.
Objective Two – Organizational Management	Internal and External Communications, on page 21	Develop additional forms of communication to involve the public — for example, a newsletter and customer service survey.
Objective Two – Organizational Management	Document Control and Security, on page 22	Provide an intrusion alarm system for Fire Station 2.
Objective Two – Organizational Management	Reporting and Records, on page 23	Efforts should be directed at applying the use of the RMS more efficiently.

[38] In this context, short and mid-term projects are considered as those executed within an immediate to 18-month window. Long-term recommendations are those with a timeline that may exceed three years.

Summary Table of Short and Mid-Term Organizational Recommendations		
Objective Reference	**Context Reference**	**Recommendation**
Objective Three – Planning for Fire and Emergency Medical Protection	Long-Range Planning Elements, on page 25	The department should conduct long-range master and strategic planning.
Objective Three – Planning for Fire and Emergency Medical Protection	Long-Range Planning Elements, on page 25	Continue the development of performance objectives. Long-term performance measures should include EMS patient intervention benchmarks, response time performance, incident staffing performance, incident rate trends, administrative duties, goals and responsibilities, and data analysis.
Objective Three – Planning for Fire and Emergency Medical Protection	Long-Range Planning Elements, on page 25	Designate a formal planning group whose responsibility would to be to drive the internal planning process for the department.
Objective Three – Planning for Fire and Emergency Medical Protection	Pre-incident and Tactical Planning, on page 26	Develop a single pre-incident planning process on a countywide basis (Lewis and Clark County). Continue conducting internal tactical planning using pre-fire incident planning, hazardous materials planning, and implement implementation of specific hazard planning and provide regular training.
Objective Three – Planning for Fire and Emergency Medical Protection	Response Planning, on page 28	Formally coordinate response planning among the area's (Lewis and Clark County) agencies. Develop formal response procedures for each emergency type and response area—with recommended apparatus and personnel assignments.
Objective Three – Planning for Fire and Emergency Medical Protection	Response Planning, on page 28	The department should ensure that any EHS (extremely hazardous substance facilities – EHS) facility within its service delivery area has been identified.
Objective Five – Human Resources Management	Application and Recruitment Process, on page 38	The city should conduct a comprehensive background check as one element of a condition of employment.
Objective Five – Human Resources Management	Ongoing Competency Evaluation, on page 39	The department should consider conducting on-going skill competency evaluations for personnel who are assigned with emergency response duties.
Objective Five – Human Resources Management	Health and Safety, on page 32	The department should consider conducting annual physical capacity testing.
Objective Five – Human Resources Management	Health and Safety, on page 32	The department should consider adopting a formalized physical fitness program.

Summary Table of Short and Mid-Term Organizational Recommendations		
Objective Reference	**Context Reference**	**Recommendation**
Objective Six - Staffing	Emergency Services Staff, on page 44	The City of Helena should adopt a minimum staffing level. The staffing level would be derived following the development of deployment standards and standards of cover.
Objective Six - Staffing	Assignment of Responsibilities, on page 46	The department should provide for regular review of job duties and descriptions for accuracy.
Objective Seven – Capital Assets and Resources	Fire Station 1, on page 48	Consider for Fire Station 1; the installation of a fixed fire protection system, providing for ADA accessibility to all areas of the facility, relocating administrative functions to a new facility, and developing a facilities (master) plan.
Objective Seven – Capital Assets and Resources	Fire Station 2, on page 49	Consider for Fire Station 2; providing for ADA accessibility to all areas of the facility, remodeling the facility. Provide for relief from general overcrowding, a lack of individual sleeping, locker, bathroom, and toilet facilities.
Objective Seven – Capital Assets and Resources	Turnout Gear Maintenance Program, on page 59	Develop a process for cleaning, repairing, and a schedule for routine maintenance of PPE (Personnel Protective Equipment), turnout gear.
Objective Seven – Capital Assets and Resources	Turnout Gear Maintenance Program, on page 59	Provide for an enclosed, ventilated, separate storage area for PPE.
Objective Eight – Service Delivery	Temporal Variations, on page 64	Use data from "Call Volume by Type per Hour of Day" to ensure that adequate personnel are readily available to respond during peak time periods.
Objective Eight – Service Delivery	Response Performance Objectives, on page 66	Develop response performance objectives as one component of creating deployment standards.
Objective Eight – Service Delivery	Structure Fire Response, on page 75	Determine minimum level of personnel required for maximum, high, medium, and low risk; establish how department will meet deployment standards.
Objective Eight – Service Delivery	Helena FD Response Performance, on page 76	Measure response time performance against department, regional, and national standards.
Objective Eight – Service Delivery	Incident Staffing, page on page 80	The Helena Fire Department should develop a deployment plan to ensure that adequate staffing is available to meet low to high-risk incidents that typically occur in the City of Helena. The department should develop a plan to add staffing in a sufficient number to provide for an initial response to a moderate risk incident.

Summary Table of Short and Mid-Term Organizational Recommendations		
Objective Reference	**Context Reference**	**Recommendation**
Objective Eight – Service Delivery	Need for Additional Resources, page 80	A third fire station in the city is needed. The Helena FD should add the fire station and paid staff at a location near the airport, and; • Develop a shared cost agreement between the City of Helena and the Helena Regional Airport; to cost share a fire station that will meet the current and future needs of the city and the airport, • Site the station with access points and airport response capabilities to meet FAA requirements, • Secure adequate size footprint (property) for a fire station, • At a location that would provide increased travel area capability and improved access to portions areas with limited or reduced access, and • Provide potential for improved response performance outcomes.
Objective Eight – Service Delivery	Mutual and Automatic Aid, on page 83	Develop automatic aid agreements between the fire agencies in Lewis and Clark County may assist in augmenting personnel, apparatus, and equipment resources for high risk and greater incidents.
Objective Nine – Training	General Training Facilities, on page 88	Consider new or additional office space for training and support staff.
Objective Nine - Training	General Training Facilities, 88on page 88	Increase capacity of the training room.
Objective Nine - Training	Training Staff, on page 88	Create specific requirements or competencies for the position of AC/TO.
Objective Nine - Training	Training Staff, on page 88	Continue the work started in the training procedures manual.
Objective Nine - Training	Career Development Training, on page 90	Continue work to expand emphasis on effectiveness in the career development. Consider additional monies to fund out-of-area training and educational opportunities.
Objective Nine - Training	Training Program Planning, on page 90	Consider a departmental training committee to help formulate the training plan.
Objective Nine - Training	Training Program Planning, on page 90	Make multi-agency drills a customary activity.
Objective Nine - Training	Competency Based Testing, on page 91	Conduct periodic evaluation of the skill levels of department members (competency-based training). On-going training should then follow an identified plan based on demonstrated training needs.

Summary Table of Short and Mid-Term Organizational Recommendations		
Objective Reference	**Context Reference**	**Recommendation**
Objective Ten – Fire Prevention	New Construction Review, on page 94	Continue the practice of suppression officers conducting basic fire system inspections. Complex fixed fire protection systems should be inspected by the prevention personnel.
Objective Ten – Fire Prevention	New Construction Review, on page 94	The fire department should evaluate the adoption and implementation of a fee-for-service for plans review and new construction inspections.
Objective Ten – Fire Prevention	Fire Safety Inspections, on page 95	Complete the process of incorporating city business licenses into the fire prevention records. Evaluate the proposal of requiring a clear fire and life safety inspection report prior to the issuance of a new or renewed business license.
Objective Ten – Fire Prevention	Fire Safety Inspections, on page 95	Adopt an inspection frequency schedule and provide for fire and life safety reviews of occupancies requiring periodic inspection.
Objective Ten – Fire Prevention	Fire Safety Inspections, on page 95	Conduct fire and life safety inspections followed an adopted schedule using a combination of fire prevention staff and engine company personnel.
Objective Ten – Fire Prevention	Fire Safety Inspections, on page 95	Implement an engine company fire inspection program. Train and certify an adequate number of suppression personnel to assure that a certified fire inspector is available on each engine company on each shift. In implementing an engine company inspection program, it is essential that the fire marshal/fire chief: • Clearly identify the number of properties that should be inspected • Formally establish the frequency at which these properties should be inspected, by level of risk • Develop a comprehensive records management system so that the results of inspections can be recorded, inspections tracked and next inspection dates identified to the inspector • Explore automation of inspection files • Explore charging fees for required fire inspections
Objective Ten – Fire Prevention	Public Fire Safety Education, on page 97	Expand the department public fire safety education program by using the existing core of career staff, under the supervision of the fire marshal. Recruit, train, and incorporate community based volunteers as an additional resource for fire safety education.
Objective Ten – Fire Prevention	Public Fire Safety Education, on page 97	Expand information tracked on each emergency incident to record whether human behavior was a contributing factor to the emergency and whether citizens present took appropriate action.

Summary Table of Short and Mid-Term Organizational Recommendations		
Objective Reference	**Context Reference**	**Recommendation**
Objective Ten – Fire Prevention	Juvenile Fire Setter Intervention, on page 98	Assess the need for a juvenile firesetter intervention program.
Objective Ten – Fire Prevention	Fire Investigation, on page 99	Provide basic fire cause determination training for incident commanders and engine company officers.
Objective Ten – Fire Prevention	Incident Information Analysis, on page 100	Once a coordinated data collection and analysis process is in place; provide for a continuous analysis of incident records to determine, what types of incidents are occurring frequency, types of properties most often involved, causes of ignition, and other factors to assist with targeting fire prevention, public education efforts and department deployment strategies.
Objective Ten – Fire Prevention	Incident Information Analysis, on page 100	Monitor unintentional false alarms (good intent), malicious false alarms, and alarm malfunctions for patterns.

SECTION III – Opportunities for Cooperative Efforts

Outcome of Stakeholder Interviews

Fire Department Stakeholder Meeting Information

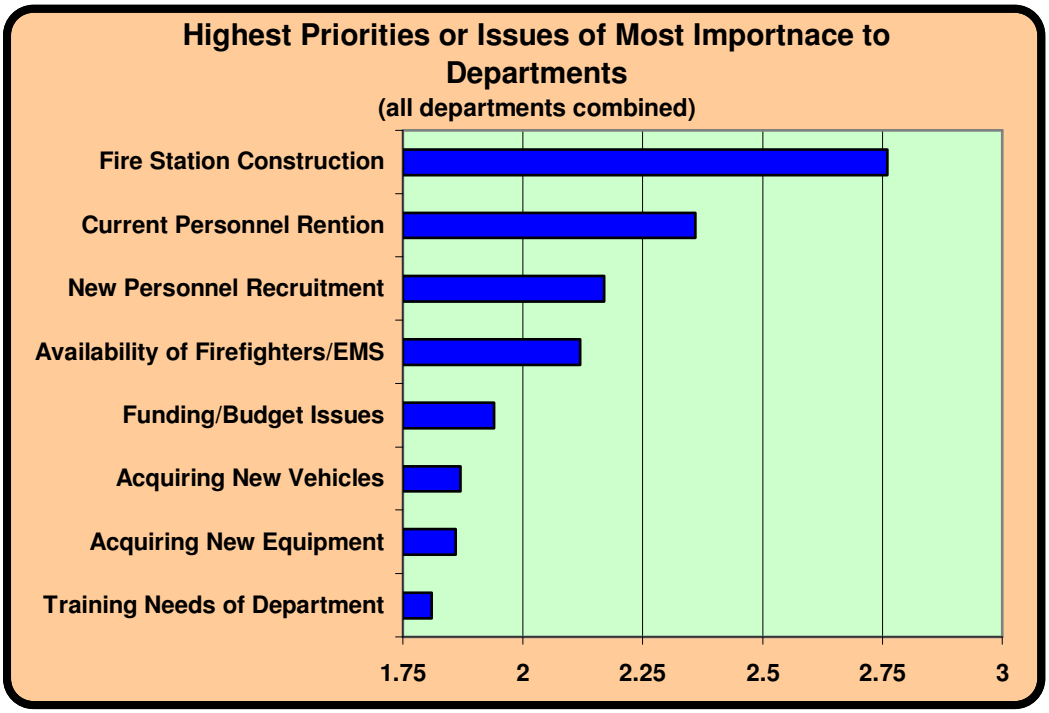
During a series of interviews with fire and emergency services stakeholders in Lewis and Clark County, two specific questions related to cooperative efforts were asked. The first dealt with *obstacles* to enhanced cooperation between the agencies providing emergency services in the county — the second inquired about possible *opportunities* for increased cooperation. What follows is an assemblage of those thoughts as expressed individually and in some instances collectively by the group.

Obstacles to Cooperative Efforts

- All of the rural fire departments identified the difficulty in getting, training, and retaining volunteers.
- Most expressed reluctance upon the part of the City of Helena to call for aid on a regular basis, or early during incidents. When volunteers from the surrounding departments are used in the City of Helena, they are often relegated to a subservient role.
- Perception on the part of the career firefighters that volunteer firefighters are inadequately trained.
- View held by outside fire agencies that self-actualization has not occurred in the Helena FD. The result is that leaders of other fire agencies see no benefit in merging, consolidating, or contracting for services with the Helena FD.
- Even though there are a number of fire departments surrounding the City of Helena with the ability to respond to a request for mutual aid, presently they do not represent a timely source of equipment and emergency workers for the city. A lack of any automatic aid agreement, a limited supply, and steadily declining number of volunteers to staff the rural departments only increases the limited resource dilemma faced by the City of Helena.
- Summed up succinctly; turf, power, and politics is hindering the Helena Valley fire departments from fulfilling a mission of providing the highest level of quality, effective, and safest emergency service possible.

Information gathered during the stakeholder interviews is similar to facts uncovered in the *Analysis of Montana Fire Department 2004 Survey Data* (see table below).[39]

Figure 44: All Montana FD - Priorities of Issues of Most Importance to Departments



Explanation of this graph: A lower numeric number represents a higher priority placed on the particular department issue. Therefore, training needs seems to be the highest overall priority for all departments.

Prospects for Enhanced Cooperative Efforts

- More training together, (between the volunteer departments — training that includes the City of Helena FD, U.S. Forest Service, Montana DNRC, VA Hospital FD, and the Helena Regional Airport ARFF).
- Shared larger training facilities for Lewis and Clark County fire departments.
- Enhanced mutual aid/automatic aid with the City of Helena FD. The preferred method would be the development of a Helena Valley automatic aid agreement in concert with the other recommended partnering recommendations.
- The use of strike teams and task forces.

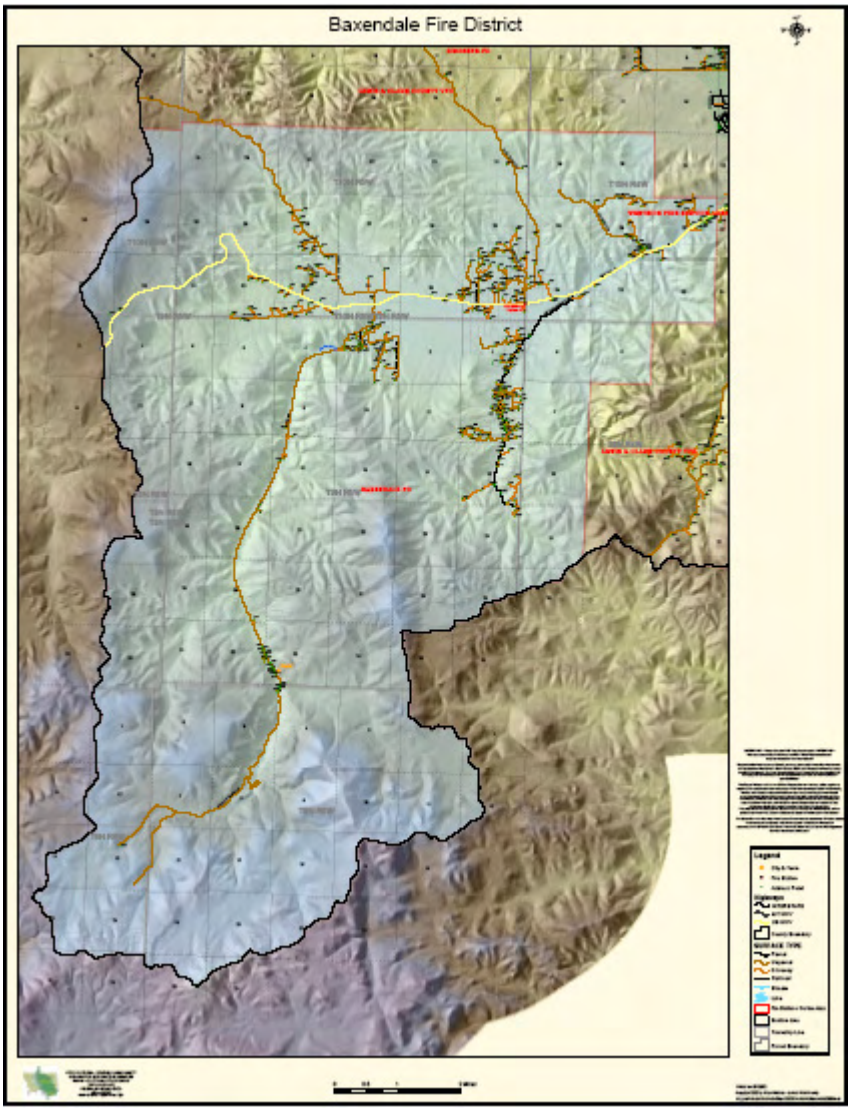
[39] *Analysis of Montana Fire Department 2004 Survey Data,* Developed for the State of Montana Department of Natural Resources and Conservation and The United States Bureau of Land Management, created by Billy R. Preston – April, 2004

- The use of a fire coordinator for the county. It is believed not possible because of department political relations, however, it is described as the right way to administer and provide oversight for all of the fire departments.
- Duty rotation with two chiefs on for a month for the entire county except the City of Helena. When the city was involved, it was thought that they do a good job.
- Joint purchasing.
- Fire Chief Steve Larson of the City of Helena FD was described as "*an ally with the rural fire districts*." He is described alternately as "*a leader"* and "*the leader"* in the Helena area for the fire service.
- The existing "*interconnection and dependency*" of the fire departments, U.S. Fire Service, and Montana DNRC in the greater Helena area. Examples include emergency management, dispatch, EMS, levy, fire prevention, wildland protection, police, and county sheriff.

Agency Profiles

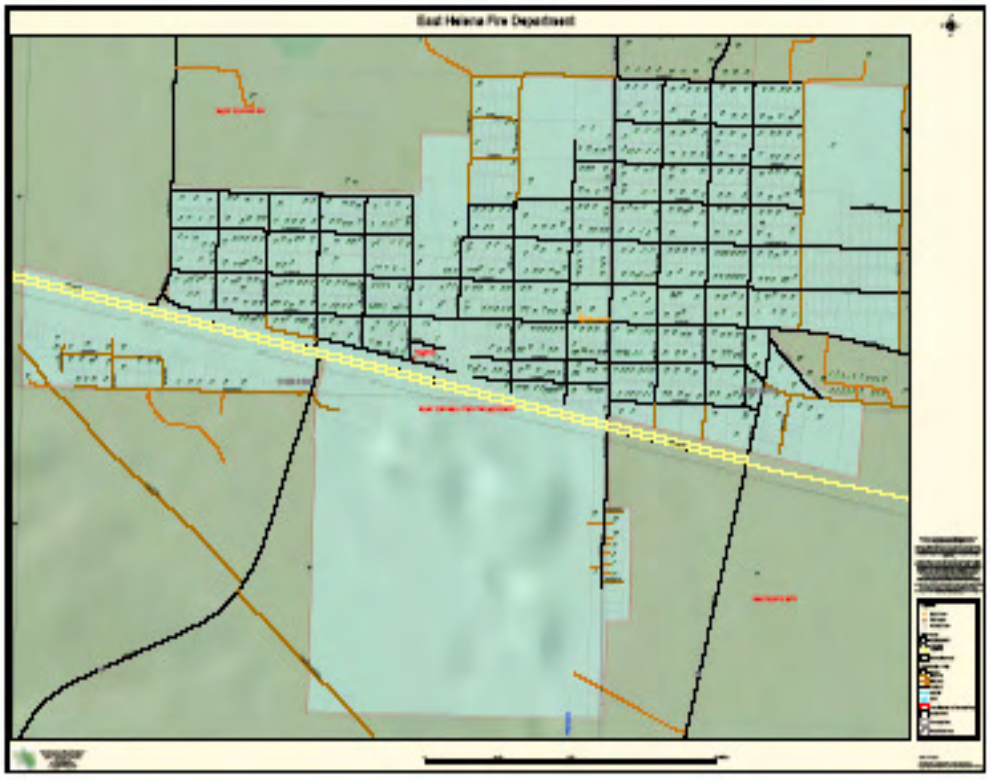
Baxendale Fire District

Baxendale Fire District, an all-volunteer fire department provides fire protection to over 1,500 residents living in an area of approximately 91 square miles. The department operates from one fire station. There are approximately 400 residential houses, several businesses, and a water treatment plant in an urban/wildland setting of ponderosa pine and fine fuels. One major four-lane highway including a steep mountain pass traverses the middle of the district.



Currently the department is rated Class 9 by the ISO. They anticipate a new rating (Class 8) when a new 3,000-gallon water tender enters service.

The department has identified the need for a new facility as the current station is; not on sewer, on leased property, and there is no room for expansion. The City of Helena has offered Baxendale 2½ acres of land at the base hill on Highway 12 near the municipal treatment plant.



City of East Helena Fire Department

The City of East Helena Fire Department, an all-volunteer fire department provides fire protection to over 2,500 residents living in the City of East Helena in area of approximately 2½ square miles. The fire department operates from one station. The city is composed primarily of a residential area with a variety of light commercial businesses, two large industrial complexes and a major four-lane highway passes through the city.

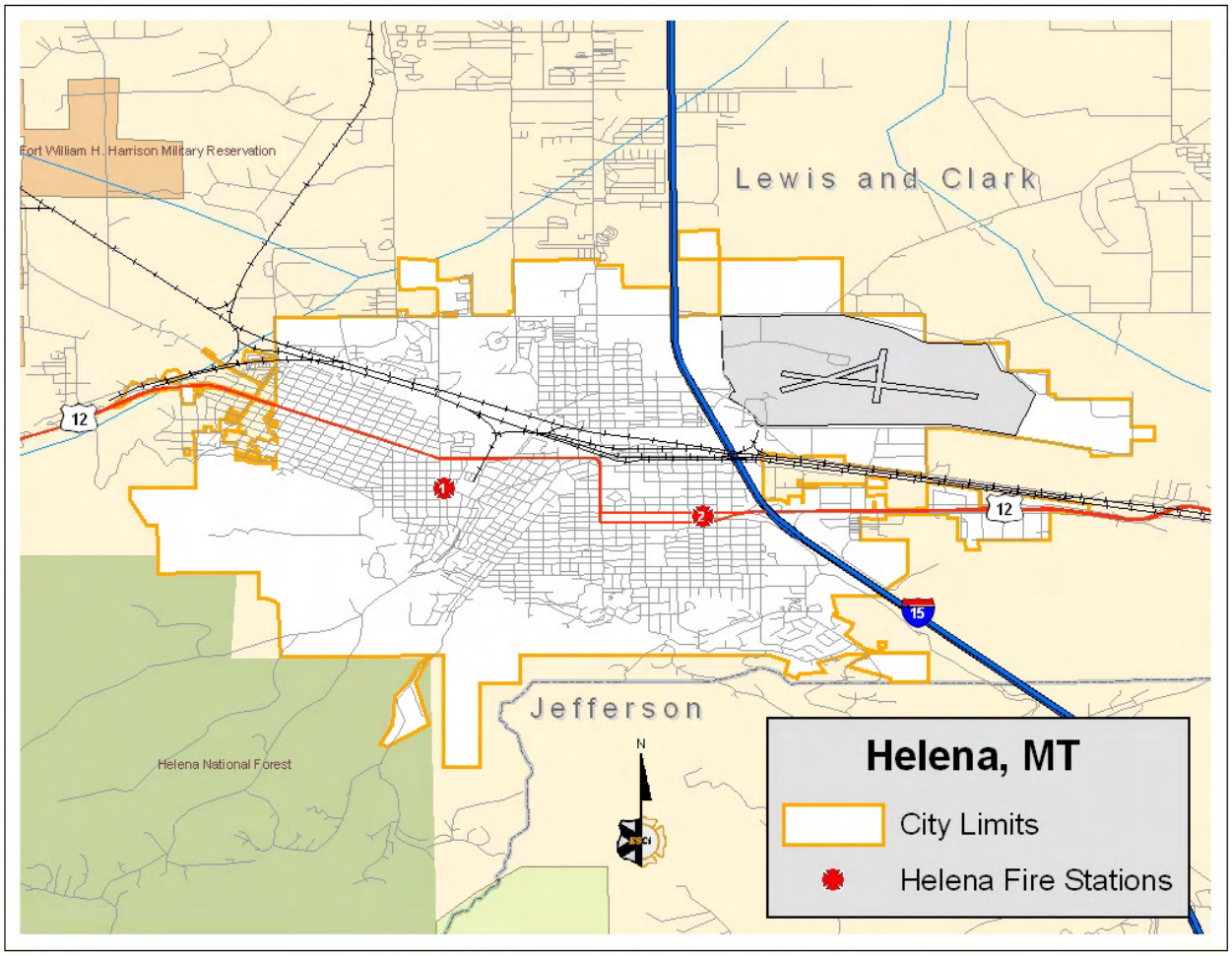
Currently, the department is rated Class 4/9 by the ISO. All of the departments in the Helena Valley area are parties to the Lewis and Clark County Master Mutual Fire Assistance. With just ten volunteer firefighters, the East Helena department has determined that establishing an automatic aid agreement is required. This is being done to better secure an adequate emergency response.

City of Helena Fire Department

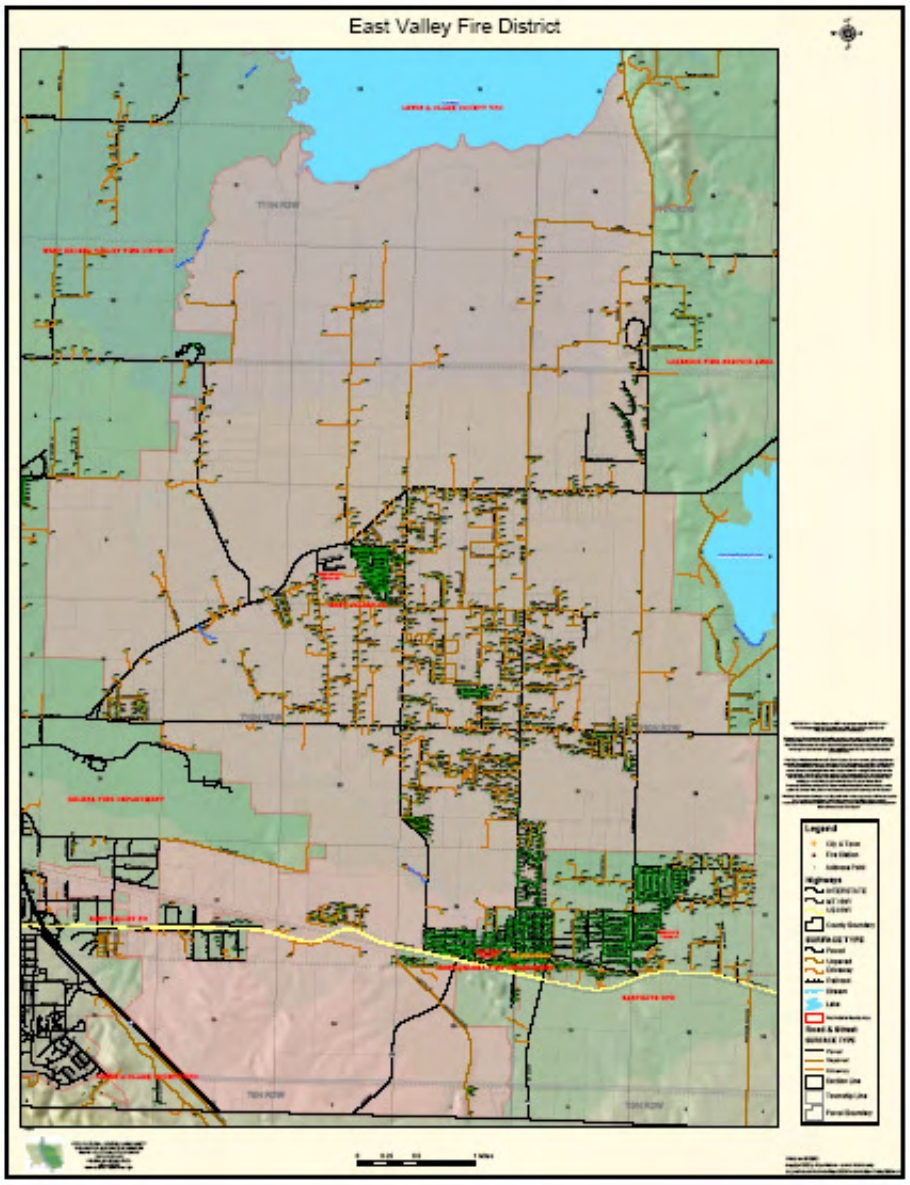
The Helena Fire Department (HFD) is a department of the City of Helena, Montana. The department's jurisdiction encompasses all areas within the city limits of Helena and the Westside FSA contract area. The response area is primarily (75 percent) urban within the city limits of Helena and mostly suburban in the Westside FSA.[40] The classification for the remainder of the service area is urban wild land interface and open spaces.

[40] The City of Helena Fire Department provides fire and EMS services under contract to Westside Fire Service Area.

Present population served is approximately 28,000 (an increase from the U.S. Census for year 2000 of 25,780) in an area of approximately ten square miles within the city and four square miles of Westside FSA (Fire Service Area) contracted area. The community is home to Carroll College with a reported a student population of 1,500 during the 2003-04 school year. Service is provided from two stations distributed within the city limits. The department maintains a modern fleet of vehicles that are discussed later in this report. The department does not perform medical transport services.



Staffing of the department involves 36 individuals (including 30 operational personnel) to deliver fire services to the community. A fire chief, two assistant chiefs, and one administrative assistant manage the department. The department does not use volunteer firefighters, and apparently has no plans to modify this practice.



East Valley Fire District

East Valley Fire District, an all-volunteer fire department provides fire protection to over 8,000 residents living in rapidly growing area of approximately 32 square miles. The department operates from two fire stations with a core group of 24 volunteers.

There is a mix of mainly residential housing, light commercial businesses, with urban/wildland fuels interspersed throughout the district. The department has a Class 7 rating from the ISO.

East Valley is among one of the departments to be the recipient of a FEMA grant. The matching grant was used to secure medical physicals for volunteer staff and purchase exercise equipment; an area in one station has been dedicated to fitness activities.

Fort Harrison - VA Medical Center Fire Department

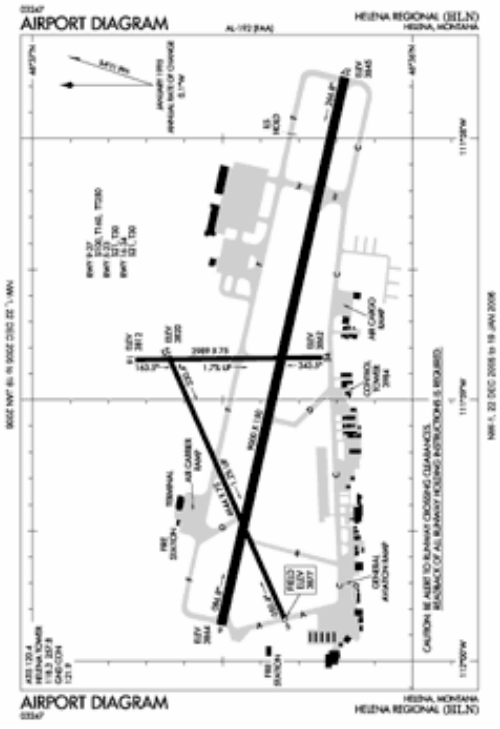
Fort Harrison - VA Medical Center Fire Department, an all paid fire department provides fire protection to a daily population estimated to be 600 staff and patients and 125 to150 during other hours. The department operates from one fire station located in a historic building located on the hospital grounds. The department recently completed a contract to provide emergency fire and EMS services to the facilities, grounds, and personnel of the Montana Army National Guard Base located adjacent to the VA Hospital grounds.

The department is responsible for a variety of duties at the VA hospital complex including the operation, testing, and maintenance of all alarm systems.

A partnership was forged between the VA fire department and the local fire departments in an effort to bolster the fire suppression capabilities at the hospital. The result has been a "win-win" situation for all. The local fire departments receive annual payments and dearly needed surplus fire apparatus and equipment. In return, the VA fire department receives automatic first response.

Helena Regional Airport

Helena Regional Airport is called the "*gateway to Montana's Gold West Country*," the southwestern part of the state that is located between Glacier National Park and Yellowstone National Park. The regional airport located within the City of Helena city limits is located immediately east of Interstate 15. It is served by five airlines that offer regional service to five destinations. A recently completed airport expansion plan has doubled the airport's square footage providing larger baggage claim areas, more rental car counters, and additional space for airlines to conduct baggage operations.



General aviation services available include; aircraft maintenance and repair shop, full service and self-fueling center, charter operation, a flying club, and flying instruction.

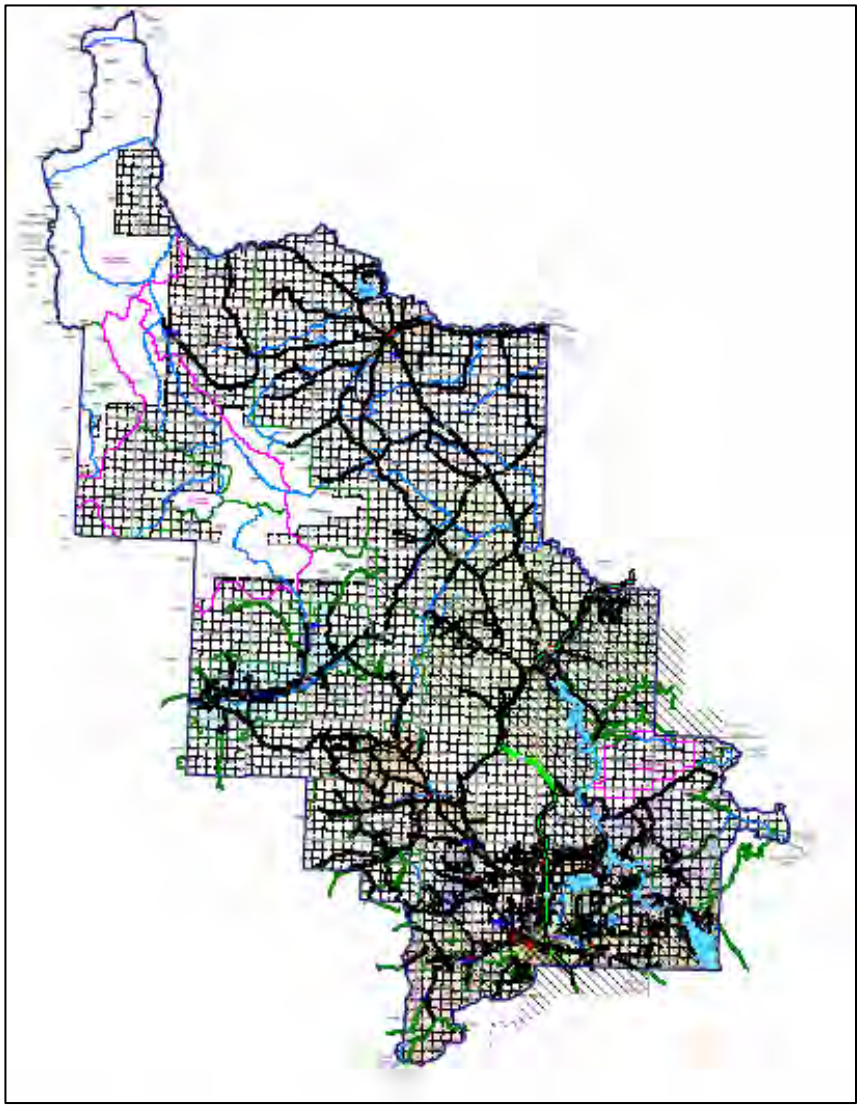
The Helena Airport is also home to the Helena National Forest Supervisor's Office, Immigrations and Naturalization Service, Montana Army National Guard, the Federal Aviation Administration Flight Standards Office and the Airport District Offices. The Montana Army National Guard recently constructed a new armory and aviation support

facility on the north side of the field. The airport is also home to the Rocky Mountain Emergency Services Training Center (RMESTC), which provides realistic aircraft firefighting training is also located at the airport.

Primary ARFF (Aircraft Rescue and Fire Fighting) is under the direction of the airport authority with the City of Helena FD providing secondary protection.

Lewis and Clark County Fire District

Lewis and Clark County Fire District, an all-volunteer fire department provides fire protection to approximately 2,500 residents living in the unincorporated area of the county. Charged with providing fire protection for all areas of the county, which are not covered by other fire jurisdictions, or federal/state protection, the district is composed of nearly 900 square miles. The organizational structure is different from the other jurisdictions in that the fire chief reports to the sheriff of the county. When the department began receiving its own funding, it was required to have a board of trustees. The Lewis and Clark County commissioners act as trustees of the district.



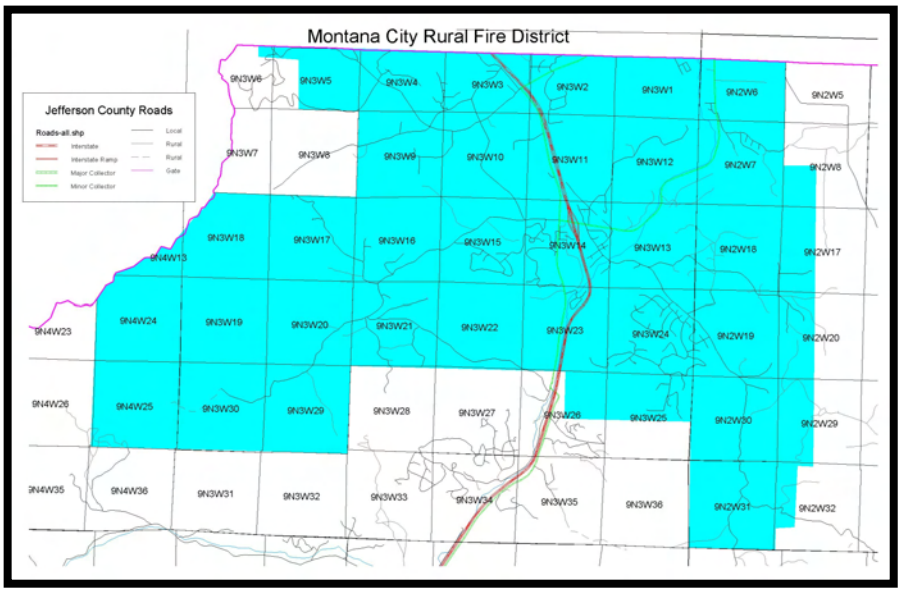
Operating from two fire stations, the group of 13 volunteers is described as exceedingly passionate and dedicated. The Lewis and Clark department now responds simultaneously with the West Helena Valley FD under the terms of an automatic aid agreement. The result has been a dramatic increase in the number of response resources on first alarm assignments. In the year immediately prior to the agreement, Lewis and Clark responded on 65 calls for service. In 2005, the

number was anticipated to exceed 300 responses. Volunteers with the department are heavily involved in training with a reported annual average that exceeds 85 hours per firefighter.

Montana City Volunteer Fire Department

Montana City Volunteer Fire Department, located in Jefferson County is contiguous with the border of the City of Helena. It is ideally situated to share in providing and receiving mutual and automatic aid from the other fire departments in the Helena Valley of Lewis and Clark County.

The department protects 2,000 inhabitants with fire and emergency service that live in its response area of 35 square miles. Operations are based at two fire stations. The area is primarily rural residential with light commercial, and a major interstate highway passing through its boundaries.



The all-volunteer department was formed in 1979 by a group of citizens concerned about fire protection in the growing area.

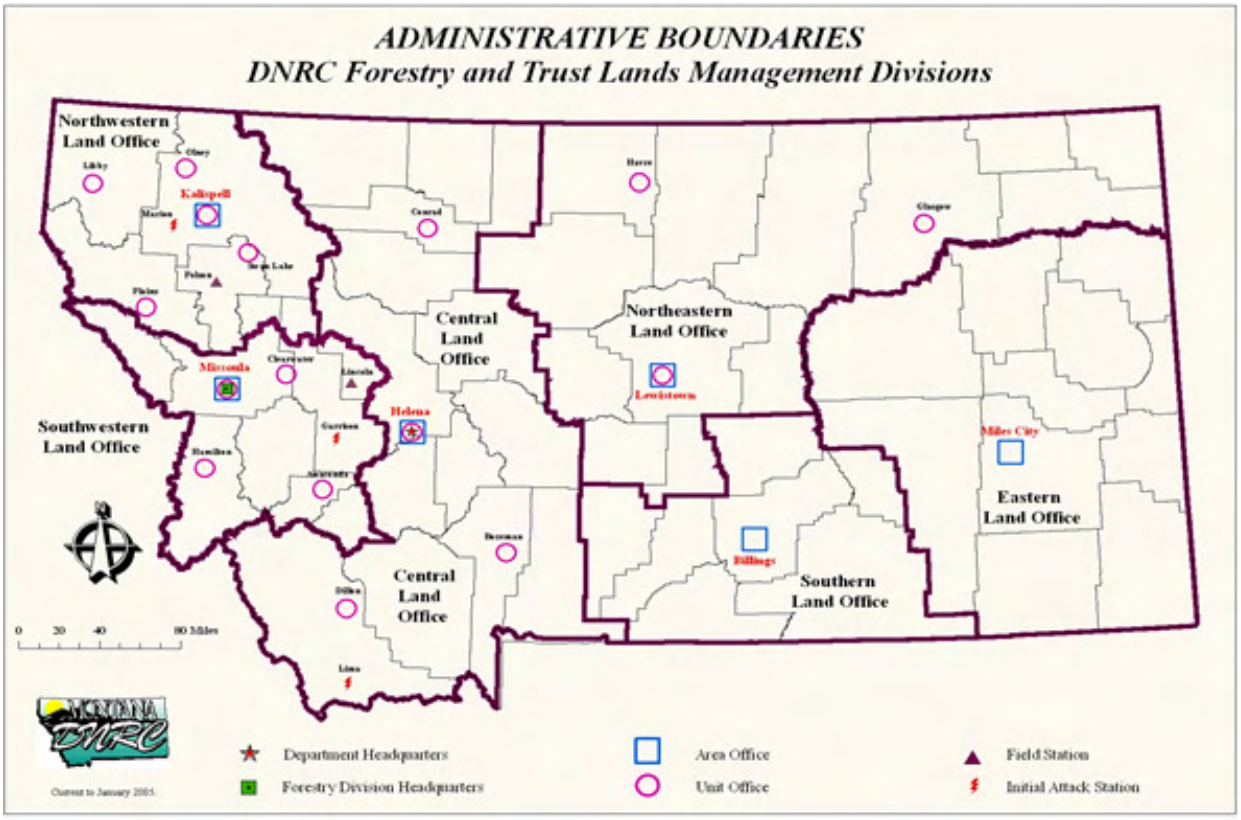
Montana Department of Natural Resources and Conservation

The State of Montana DNRC (Department of Natural Resources and Conservation) under the Fire Suppression Program protects 5,158,942 acres of state, private, and federal lands. Assistance in firefighting is provided to all 56 counties if a fire exceeds local capabilities. The DNRC subcontracts fire protection on 1,744,456 acres of state and private lands to the U.S. Forest Service, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service and the Flathead Tribal Agency of The Bureau of Indian Affairs. DNRC also provides support and assistance to federal fire agencies, project fires and other states when appropriate.

The DNRC is a valuable ally and is resource for the Lewis and Clark County fire departments. DNRC is required by statute to provide training to state firefighters and other cooperators who require training as part of its wildfire management responsibilities. In addition to providing training, DNRC also

maintains records of firefighters' training, experience, qualifications, and certifications, to help ensure that personnel are appropriately trained in wildfire suppression. The agency delivers training courses each year to its own firefighting personnel and to State/County Cooperative Fire Program personnel in every county in the state, offering both national-standard and state-customized training.

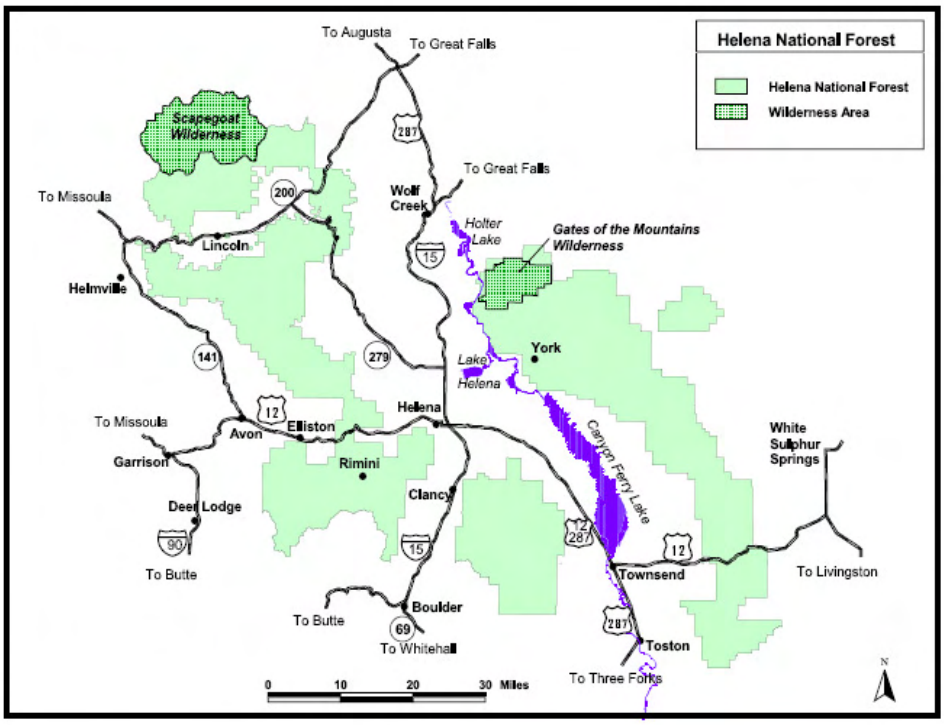
A valuable program administered by the DNRC is the VFA, Title IV, a federal matching funds program with dollars provided through the USDA Forest Service. Title II/IV authorizes the Secretary of Agriculture to provide funds and technical assistance to the Montana DNRC to organize, train and equip local forces for preventing and suppressing wildfires.



A component of the DNRC Forestry Division is the Fire and Aviation Program. The program staffs 65 engines (and water tenders) and five helicopters to provide direct protection of 5.2 million acres. The DNRC firefighting force has engines and air resources are in a state of elevated readiness from June 15 to September 15 annually. Some of these resources are located at the Central Land Office in Helena.

U.S. Forest Service – Helena National Forest

Located in west-central Montana, the Helena National Forest surrounds the City of Helena and is nearly one million acres in size. The Forest is administered by District headquarters in Lincoln, Helena, and Townsend, with the Supervisor's Office located in Helena.

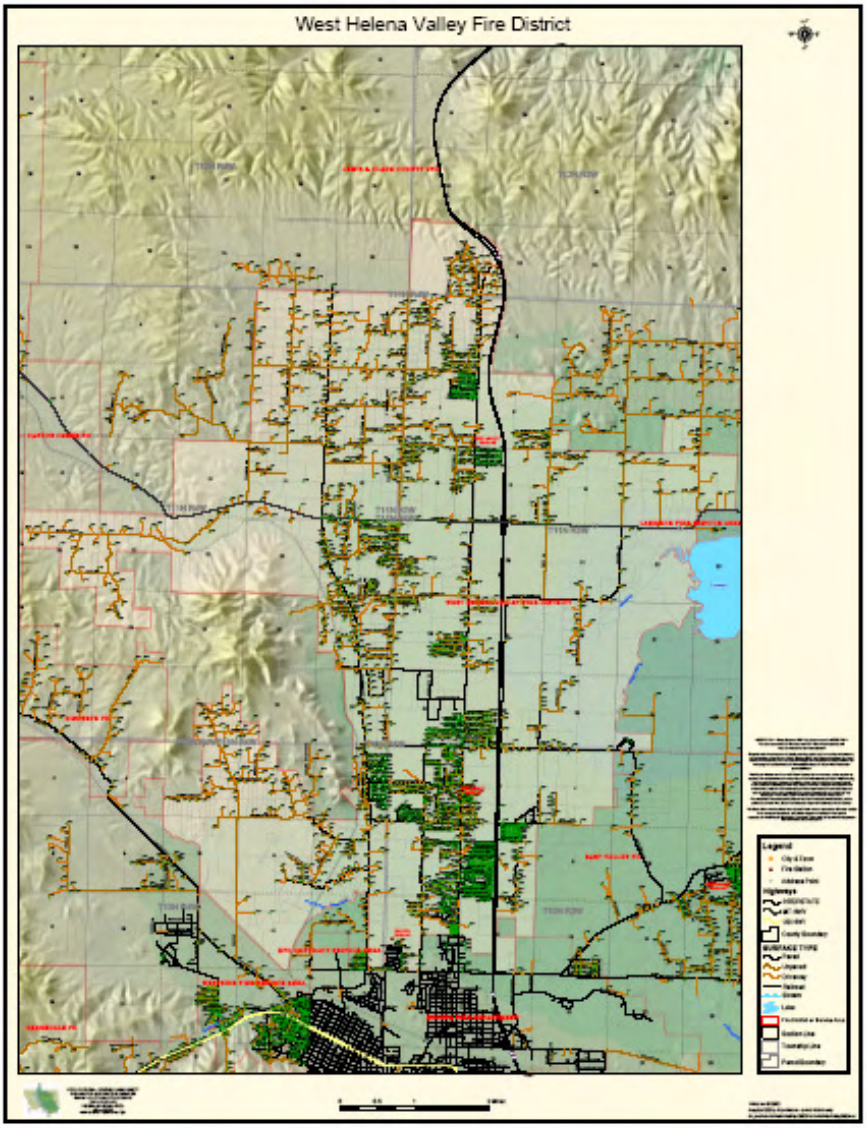


Spanning six counties, the Helena Forest provides significant resources for the region in wildland suppression training, fire prevention, and public education. Forestry employees work with all of the local and regional agencies in support of these activities. The Helena Ranger District is the home of a, 20-person wildland fire crew (Hot Shots).

The Helena Interagency Dispatch Center is located at the Helena Regional Airport in Helena, Montana. The Helena Interagency Dispatch Center provides incident support to the following interagency partners:

- Helena National Forest,
- Department of Natural Resources & Conservation, Central Land Office,
- Bureau of Land Management, and
- Lewis & Clark, Broadwater, Jefferson & Meagher Counties

The Helena Interagency Dispatch Center provides initial attack resources and tactical air support (air tanker, helicopters, and fixed wing aircraft) for initial attack and large incident support to dispatch centers in central and eastern Montana, as well as supporting regional and national requests for resources.



West Helena Valley Fire District

West Helena Valley Fire District, an all-volunteer fire department provides fire protection to over 16,500 residents living in rapidly growing area of approximately 57 square miles. The department operates from two fire stations with a core group of 29 volunteers.

The fire district, located north of the City of Helena is a mix of residential housing, with some light commercial businesses, and urban/wildland interspersed throughout. The department has a Class 6/10 rating from the ISO.

The West Helena Valley department now responds simultaneously with the Lewis and Clark County FD under the terms of an automatic aid agreement. The department has seen only a modest increase in the number of calls for service but a marked increase in the resources available at emergency scenes.

Rural Lewis and Clark County Fire Agencies

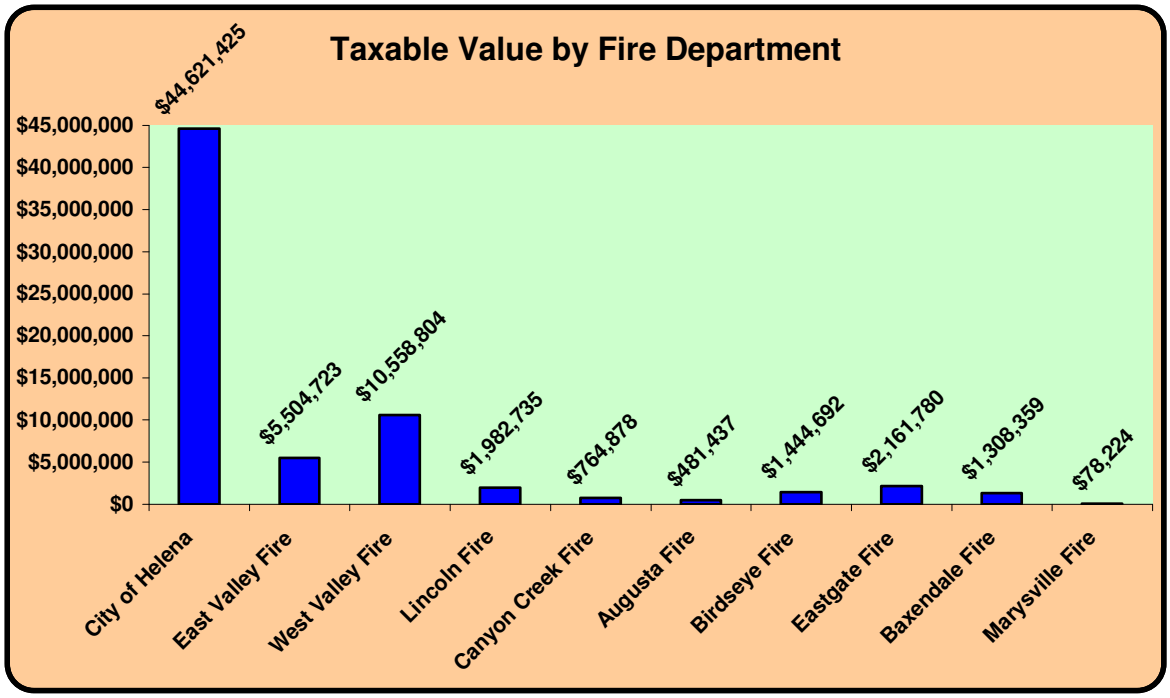
Listed below are the emergency service providers located in Lewis and Clark County outside of the urban area of the City of Helena. While profiles are not included for each of these organizations, it is expected that they would benefit by involvement with the Helena Valley FDs through participation in any number of the cooperative efforts. The departments are:

- Augusta Rural Fire District
- Birdseye Rural Fire Department
- Canyon Creek Fire Service Area

- Canyon Ferry Fire Service Area merged with the Lakeside Fire Service Area
- Eastgate Volunteer Fire Department
- Marysville Volunteer Fire Department
- Wolf Creek-Craig Fire Service Area
- York Volunteer Fire Company
- Lincoln Rural Fire District

To following table contains data supplied by Lewis and Clark County. It is offered as a measure to gain a perspective of the taxable value of the fire departments in the county.[41]

Figure 45: Taxable Value of Lewis and Clark County Fire Departments



To following table contains population data supplied by Lewis and Clark County. It is sourced from the population figures based on 2000 Census Block data and the numbers are approximate. This is one measure to gain a perspective of the population served by the fire departments in the county.

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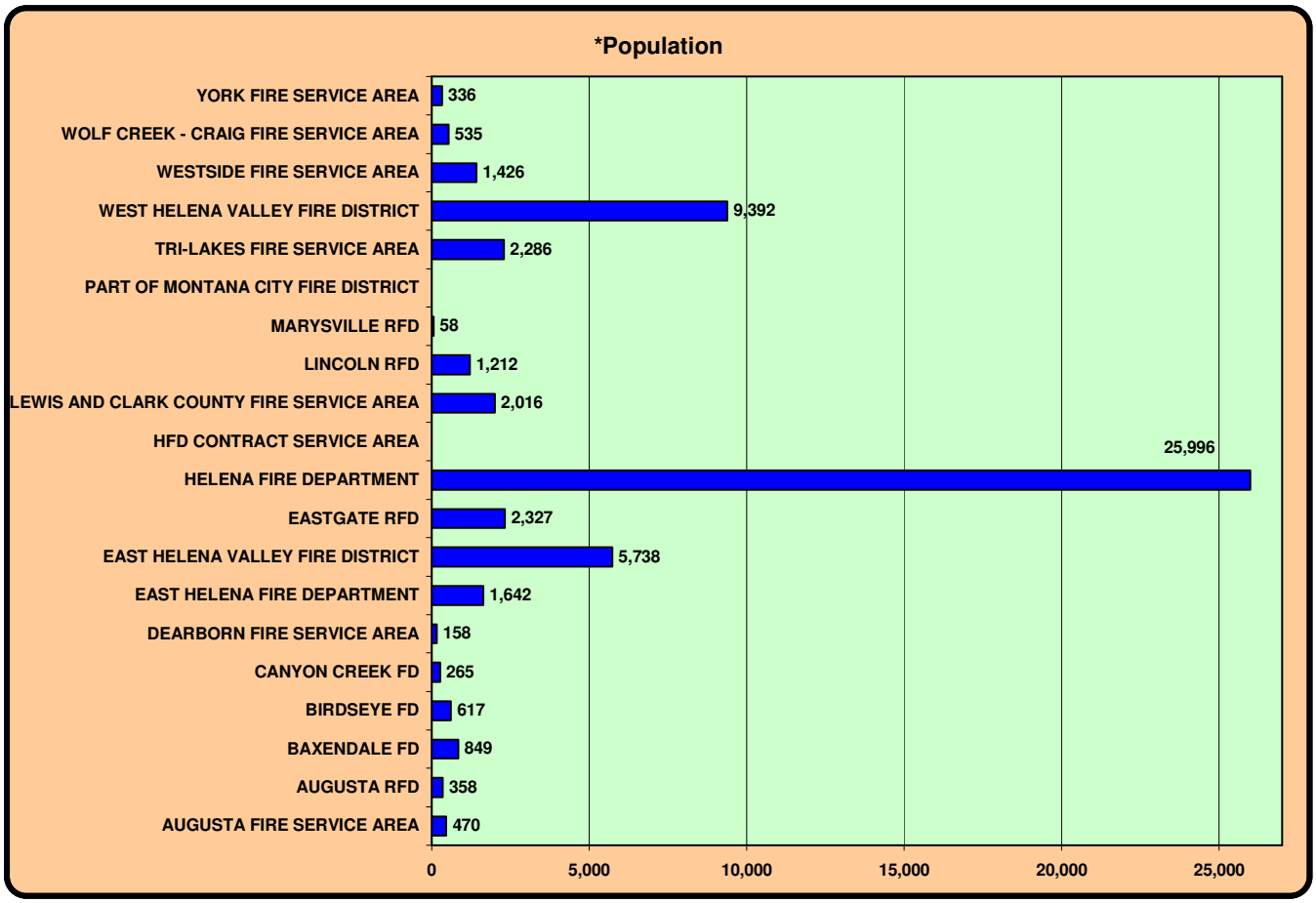
Figure 46: Population served by Fire Departments in Lewis and Clark County



Discussion and Analysis of Opportunities

Presentation of Partnering Strategies

The following report section includes a table summarizing all identified Lewis and Clark County partnering strategies. The summary table includes the strategy name, objective, level-of-cooperation, timeline, principal organizational section of the department involved, and the affected agencies. While the elements of the table are generally intuitive, two columns, (timeline and affected agencies), are more obscure and require a degree of explanation.

Timelines are described as short-, middle, or long-term. Short-term is considered to occur within one year to 18 months; middle term is from one to three-years; and long-term is generally thought of as three to five-years. The timelines are flexible because most partnering strategies are interdependent, which necessitates cross-strategy integration of planning and implementation.

It is important to point out that some agencies are already working to implement select concepts. Regardless of the existing level of implementation, we provide detailed information on all strategies to provide the reader with a complete picture of cooperative potential. For instance, the West Valley Fire District and the Lewis and Clark County Fire Department adopted an automatic aid agreement. This involves a greater degree of commitment and resource sharing than the county mutual aid agreement developed by the Rural Fire Council.

The discussion of each cooperative strategy includes a listing of affected agencies. In some instances, a program that is limited to just a few Lewis and Clark fire departments may influence the programs of others. Consequently, the summary description may indicate bearing on more agencies than would seem intuitive. Case in point: strategy AC – Develop System-Wide Deployment Plan for Paramedics describes providing ambulance transport using fire department paramedics within the entities now served by St. Peter's Hospital ambulance service. While the implementation of strategy AC directly affects a limited number of fire departments, the policy also influences the automatic aid, move-ups, training, incident command, and other operations of the entire region. Thus, strategy AC lists all Lewis and Clark agencies as being influenced by the program.

Summary Table of Partnership Strategies

Partnering Strategy (See page for detail)	Objective(s)	Level of Cooperation	Timeline Short, Mid, Long	Section	Affected Agencies
A – Develop Standard Operating Guidelines See page 135	Provide guidelines for operation during emergencies, emergent and non-emergent incidents.	Functional	Short-term	Emergency Operations	All agencies
Partnering Strategy B – Shared Specialty Teams See page 137	Provide specialty teams in Lewis and Clark County by allocating and distributing resources to achieve minimum cost and maximum operational benefit.	Functional	Middle term	Emergency Operations	All agencies
C – Develop a Joint Support and Logistics Services Division See page 139	Develop a joint Support Services Division that promotes improved operational readiness and that achieves procurement efficiencies by eliminating duplication in the acquisition and distribution of supplies. Create a uniform set of standards for apparatus, small equipment, PPE (personal protective equipment), emergency supplies, and IS/IT services. Develop a joint preventative maintenance and repair program for physical assets, apparatus, small equipment, and IS/IT systems.	Functional	Long-term	Support Services	All agencies

Partnering Strategy (See page for detail)	**Objective(s)**	**Level of Cooperation**	**Timeline Short, Mid, Long**	**Section**	**Affected Agencies**
Partnering Strategy D – Establish a Lewis and Clark County Fire Investigation Team See page 145	Provide fire cause determination through cooperative effort by sharing investigative resources and personnel.	Functional	Short to middle-term	Fire Prevention	All agencies (including law enforcement and district attorney)
E – Develop a Lewis and Clark County Public Fire Safety Education Coalition See page 148	Provide for the cost effective, regional dissemination of public fire safety education.	Functional	Middle term	Fire Prevention	All agencies
F – Develop a Lewis and Clark County Juvenile Fire Setter Intervention Network See page 150	Provide an effective means for intervention in juvenile set/caused fires.	Functional	Short-term	Fire Prevention	All agencies, (including St. Peter's Hospital and City - County Health Department)
G – Create a Unified Occupational Medicine Program See page 152	Provide a fire service-related occupational and health program.	Functional	Middle term	Administration	All agencies

Partnering Strategy (See page for detail)	Objective(s)	Level of Cooperation	Timeline Short, Mid, Long	Section	Affected Agencies
H – Create a Unified Wellness and Fitness Program See page 155	Provide a wellness and fitness program that promotes the improved health and well-being of personnel in all departments, paid and volunteer—at all ranks. Increase fitness levels and decrease injuries. Reduce frequency and number of sick/sick injury incidents. Reduce the number of days used for sick/sick injury leave. Protect the long-term health of paid and volunteer personnel.	Functional	Middle term	Administration	All agencies
I – Adopt and Implement a Regional Computerized Training Records Management System See page 158	Provide a fully integrated comprehensive training records management system (RMS).	Functional	Middle term	Training	All agencies
Partnering Strategy J – Develop and Adopt Common Training Standards See page 161	Adopt uniform training guidelines. Adopt uniform certification standards.	Functional	Short-term	Training	All agencies

Partnering Strategy (See page for detail)	Objective(s)	Level of Cooperation	Timeline Short, Mid, Long	Section	Affected Agencies
K – Develop and Adopt a Lewis and Clark County Training Manual See page 163	Provide consistent, standardized training procedures.	Functional	Short-term	Training	All agencies
L – Investigate Purchasing a Video Conferencing System See page 167	Provide standardized, consistent, and high-quality classroom training. Reduce training staff hours required for curriculum development and delivery. Increase in-service time of emergency response apparatus.	Functional	Short-term	Training	All agencies
Partnering Strategy M – Develop an Annual Lewis and Clark County Training Plan See page 169	Provide standardized and consistent training. Provide a well-trained emergency workforce. Provide long-term vision and direction for training delivery.	Functional	Short-term	Training	All agencies
Partnering Strategy N – Consolidate Training into a Single Lewis and Clark County Training Division See page 172	Eliminate duplicated efforts in training Lewis and Clark County fire department emergency responders. Create a single Lewis and Clark County training division.	Functional	Middle term	Training	All agencies
Partnering Strategy O – Develop Lewis and Clark County Fire and EMS Training Facilities See page 176	Provide training facilities readily available to all Lewis and Clark County fire departments. To train and maintain the skills of Lewis and Clark County emergency services personnel.	Functional	Middle-term	Training	All agencies

Partnering Strategy (See page for detail)	Objective(s)	Level of Cooperation	Timeline Short, Mid, Long	Section	Affected Agencies
P – Develop Mutual Training Strategies See page 179	Provide purpose and direction for training program management and delivery. Combine strengths and resources to: 1) Overcome current training obstacles and deficiencies, 2) Provide a comprehensive, and regionally integrated training structure, 3) Develop a mutually beneficial training program, and 4) Train and certify a cadre of knowledgeable and skilled emergency responders.	Functional	Short to Middle-term	Training	All agencies
Q – Develop Uniform Fees for Service See page 182	Provide Lewis and Clark County fire departments with a uniform schedule of fees for service.	Functional	Middle-term	Administration	All agencies
R – Adopt a Single Lewis and Clark County Fire Code See page 185	Provide for a Uniform Fire Code with a single set of local amendments. Provide local amendments to apply for new construction, remodels, and tenant improvements in Lewis and Clark County.	Functional	Middle-term	Fire Prevention	All agencies (to include community planning departments)
S – Purchase Uniform Emergency Apparatus See page 188	Create a single set of emergency apparatus specifications. Provide single-source uniform emergency apparatus for all Lewis and Clark County fire agencies.	Functional	Long-term	Emergency Operations	All agencies
A – Develop Standard Operating Guidelines See page 193	Provide a single point for recertification of all Lewis and Clark County EMS personnel.	Functional	Short-term	EMS	All agencies

Partnering Strategy (See page for detail)	Objective(s)	Level of Cooperation	Timeline Short, Mid, Long	Section	Affected Agencies
U – Acquire AVL, and MDC or MDT Capabilities See page 196	Provide AVL (Automatic Vehicle Locator) information transmitted to dispatch for use during emergency and non-emergency incidents. Provide standardized MDC/MDT (Mobile Data Computer or Mobile Data Terminal) in emergency apparatus.	Functional	Middle-term	Emergency Operations	All agencies
V – Develop Uniform Pre-Incident Plans See page 201	Provide a system of shared operational plans for use during emergencies and non-emergent incidents.	Functional	Short-term	Emergency Operations	All agencies
W – Provide for Joint Staffing of Stations and Apparatus See page 205	Provide for distribution of facilities and deployment of personnel consistent with a Lewis and Clark County standards of cover.	Functional	Short-term	Emergency Operations	All agencies
X – Provide Lewis and Clark County IC and Operations Supervision See page 209	Provide for IC (Incident Command) supervision of emergency operations. Provide for supervision of paid on-duty and volunteer personnel during routine operations.	Functional	Short-term	Emergency Operations	All agencies
YY – Develop Uniform Incident Reporting Guidelines See page 212	Develop incident-reporting standards for Lewis and Clark County emergency operations. Evaluate performance against standards.	Functional	Short-term	Emergency Operations	All agencies

Partnering Strategy (See page for detail)	Objective(s)	Level of Cooperation	Timeline Short, Mid, Long	Section	Affected Agencies
Z - Provide System-Wide Guidelines for Fire Response See page 215	Define response times including maximum response times and response time definitions so that adequate system planning can take place. Establish parameters for maximum response times on a per-call basis. Develop a system-wide reporting structure to standardize the collection and reporting of response times.	Functional	Short to middle-term	Emergency Operations	All agencies
AA – Implement the Use of Peak Activity Units (PAUs) See page 219	Provide units in areas of high incident activity, coverage for units attending training sessions, and staffing for special events.	Functional	Middle-term	Emergency Operations	All agencies
AB – Create Shared Methods to Provide Ambulance Surge Capacity See page 222	Analyze system demand and system resources to create fire-based ambulance capacity during times of excess demand.	Functional	Middle-term	EMS	All agencies, (including St. Peter's Hospital ambulance service)
AC – Develop System-Wide Deployment Plan for Paramedics See page 225	Provide guidelines for deployment of paramedic resources. Ensure that the closest available paramedic arrives within the time established for emergency response.	Functional	Short-term	EMS	All agencies, (including St. Peter's Hospital ambulance service)

Partnering Strategy (See page for detail)	**Objective(s)**	**Level of Cooperation**	**Timeline Short, Mid, Long**	**Section**	**Affected Agencies**
AD – Provide System-Wide Guidelines for EMS Response See page 228	Define response times so that adequate system planning can take place. Establish parameters for maximum response times including response time definitions on a per-call basis. Develop system-wide reporting structure to standardize collection and reporting of response times.	Functional	Short to middle-term	EMS	All agencies, (including St. Peter's Hospital ambulance service)
AE – Provide Joint EMS Supply Purchasing and Logistics Services See page 233	Standardize supply purchases through group purchasing and standardize supply distribution.	Functional	Short-term	EMS	All agencies, (including St. Peter's Hospital ambulance service)
AF – Undertake the Purchase and Implementation of an Electronic Staffing Program See page 236	Provide a uniform electronic system that combines telephone callback, personnel scheduling, and includes payroll and administrative features.	Functional	Short-term	Administration	All agencies
AG – Develop Deployment Standards See page 239	Develop deployment standards that establish the distribution and concentration of emergency resources, both fixed and mobile.	Functional	Short-term	Emergency Operations	All agencies

Partnering Strategy

A – Develop Standard Operating Guidelines

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Provide guidelines for operation during emergencies, emergent and non-emergent incidents.

Summary

Standard operating guidelines are used at the operations level of the fire department. They are analogous to a playbook, providing direction yet allowing for individualized company officer adjustments to situations. Currently each fire agency in this study is responsible for developing a unique set of standard operating guidelines for their organization.

Discussion

Standard operating guidelines will improve on-scene safety, efficiency, and effectiveness of personnel. With personnel from all agencies trained in using the same procedures, they can approach an incident with an understanding that everyone will proceed in a similar fashion. This will greatly reduce or eliminate the confusion that can lead to delays in the delivery of service.

Guidance

- Keep the guidelines in electronic format for ease of updating.
- Give initial and recurring education to personnel in their use.
- Provide for continual use of the standard operating guidelines during routine incidents and at each training session.
- Provide for a periodic appraisal of the guidelines to maintain currency with changes in tactics, strategy, and equipment.
- Consciously keep guidelines non-specific to allow for adaptation to particular incidents by the supervisor.

Fiscal Considerations

- The elimination of duplicated staff effort in the creation and updating of standard operating guidelines will reduce soft costs.
- Instructional time optimized during multi-agency training sessions by excluding time devoted to adapting to differing procedures.

Partnering Strategy

B – Shared Specialty Teams

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Provide specialty teams in the Lewis and Clark County by allocating and distributing resources to achieve minimum cost and maximum operational benefit.

Summary

Specialty teams are group(s) made up of individuals having areas of expertise in roles outside the level of training considered as normal for fire suppression personnel. Public expectation has increasingly focused on fire departments as the logical source to staff, equip, train, certify, and maintain specialty teams. A specialty team may concentrate on one or more disciplines. Examples of specialty teams include:

- Hazardous materials,
- Technical rescue,
- Confined space/trench rescue,
- Swift water rescue,
- Dive team,
- ICS overhead,
- Rehabilitation,
- Heavy rescue,
- Ladder company,[42]

[42] The deployment of ladder companies is considered an essential component of a suppression response; in this instance, we consider the sharing of this resource to be a fiscally prudent use of resources.

- Honor guard, and
- Chaplaincy

A determination as to the type, level, and number of specialty teams should be based on a strategic plan for the entire region.

Discussion

The ability of every fire department to be fully equipped for every conceivable incident, with all personnel trained and certified to the highest level is impractical; but the reality is that any fire department will occasionally encounter unique incidents that require specialized equipment and personnel. Specialty teams based only in one fire department commonly respond to fewer requests for service, which results in greater cost per incident.

While the cost effectiveness of shared specialty teams is important, keeping skill and interest levels of personnel high is essential. Personnel who train less and who use skills infrequently are arguably at greater risk when working under dangerous conditions. Shared specialty teams are more effectively able to maintain high skill, knowledge, and ability because such teams typically train and respond to emergencies more frequently.

For example, under a shared specialty team strategy a decision could be made to train and certify all firefighting personnel to hazardous materials awareness and operations level, and to subsequently contract for technician level services from a shared source. Similarly, a decision could be made to provide aerial apparatus through a regional partnership.

Guidance

- Determine the need for specialized teams for the entire area.
- Establish a single set of standard operating guidelines. It is very important that all departments operate by the same procedures when using shared resources.

Fiscal Considerations

- The elimination of duplicated effort in equipping, training, and staffing may reduce overall program costs.

Partnering Strategy

C – Develop a Joint Support and Logistics Services Division

Level of Cooperation

- Functional

Timeline for Completion

- Long-term

Section

- Support Services

Affected Stakeholders

- All agencies

Objective

- Develop a joint Support Services Division that promotes improved operational readiness and that achieves procurement efficiencies by eliminating duplication in the acquisition and distribution of supplies.
- Create a uniform set of standards for apparatus, small equipment, PPE (personal protective equipment), emergency supplies, and IS/IT services.
- Develop a joint preventative maintenance and repair service program for physical assets, apparatus, small equipment, and IS/IT systems.

Summary

Throughout nearly every public or private emergency preparedness institution, the state of readiness and effectiveness is highly dependant upon support services. Support services assure the materials necessary to keep an agency operational and functioning. Every Lewis and Clark County fire department (whether large, small, paid, volunteer, city, or district) provides some form of support services within their organization.

Support services offered under a joint support and logistics division can be modular and may include:

- Standardization of apparatus, equipment, and PPE.
- Standardization of fire/EMS/rescue supplies.
- Centralized purchasing and distribution.
- Centralized fleet and equipment maintenance.
- Mobile maintenance services.
- A preventative and safety maintenance program for facilities, apparatus, equipment, and other physical assets.

The purchasing program can create joint bids for supplies and equipment, and can achieve additional benefits such as integrated inventory of supplies that can accommodate lag times in deliveries from manufacturers and suppliers.

Discussion

Support Services Division – At the heart of any emergency fire department are the activities and functions that support the delivery of emergency services. Support services keep agency assets in operational readiness, and insure that enough supplies, tools, and equipment are available for emergency workers to mitigate the emergency. Every agency in this study dedicates a certain level of daily effort in maintaining emergency apparatus and equipment.

Although Lewis and Clark County fire departments are emergency services providers, they also are businesses that spend millions of dollars each year to ensure emergency mission readiness. Like all businesses, fire departments need to be receptive to new practices to maximize the effectiveness of budget dollars. Such practices may take the form of economies of scale, administrative efficiencies, paperwork reduction, technological advances, and innovative cost saving concepts.

Acquiring and maintaining physical assets (facilities and grounds), IS/IT systems, vehicles, equipment, is a labor-intensive process requiring good policies and attention to detail. The procurement and distribution of routine supplies is also an important behind the scenes process that needs hands on work and meticulous recordkeeping. Because of the variety and size of the participating fire departments, a variety of full-time, part-time, and/or suppression employees currently provide these support services. In all cases, filling the demand for support services is a constant necessity in any organization; vital to ensure the operational readiness of the agency.

Key elements of a joint support and logistics services division are:

- Assessment of current assets.
- Assessment of current levels of support service activities.
- Standardization of apparatus, equipment, and supplies.
- Standardizing preventative maintenance programs and recordkeeping.
- Centralization of apparatus and equipment repair and maintenance.
- Provisions for mobile repair and maintenance services during emergency incidents.
- Centralization of supply and equipment acquisition and distribution.
- Development of a facilities and grounds maintenance program.

- Standardization of IS/IT services.

As listed above, a key to realizing the benefits of shared support services is standardization of apparatus, equipment, and supplies. In this exercise alone, standardization assures greater financial and operational efficiency and effectiveness. Fundamentally, this is the most important aspect of forming a joint support division.

Standardizing specifications for the purchase, repair, and maintenance of apparatus, SCBA (self-contained breathing apparatus), communication devices, and miscellaneous equipment often equates to less out-of-service time. Support personnel will need to be certified for repairing and maintaining fewer apparatus and equipment types. Fewer parts need to be stocked for repair and maintenance. Such practices are described as economies of scale.

NFPA 1915 points out that repairs by qualified technicians may provide longer apparatus life, safer operations and the early detection of maintenance and repair problems.[43] The result is often a short- and long-term saving on rolling stock and small equipment. A centralized repair and maintenance facility cooperatively organized as a support services division ensures that routine maintenance and repairs of physical assets are completed in a timely manner. Maintaining public assets in this way is a demonstration of stewardship.

The standardization of apparatus, equipment, and supplies plays strongly into the overall effectiveness and efficiency of daily emergency operations. Standardized support functions are a key part of unified emergency operations and response – especially when equipment from multiple Lewis and Clark County fire departments works together at large-scale emergencies.

Logistics Services – A multi-agency purchasing program could improve management of the agencies' supply chains. In theory, the agencies would collectively create or contract for a logistics center to manage procurement and distribution. The logistics center would work with each of the agencies to standardize supplies and equipment. The program would follow state and organizational purchasing guidelines and make supplies and equipment available to all of the member agencies.

Distribution can be managed internally, or through agreements with suppliers to gain the advantages of collective purchasing and supply: 1) a larger, collective bid process for supplies can achieve lower prices and attract additional competitors; 2) the logistics center can negotiate terms of the conditions

[43] National Fire Protection Association, Standard 1915: *Standard for Fire Apparatus Preventive Maintenance Program*, 2000 Edition

of the sale that might not be available to smaller purchasing centers; and 3) it can conduct collective bidding processes that are applicable to all of the agencies.

Coordination is important to the success of a joint purchasing program. Each of the agencies currently conducts purchasing of virtually all supplies and equipment independently. As such, a joint effort will reduce the work required by any single agency to provide purchase and provide supplies.

Critical Issues

- Coordination issues
    - A cross-functional committee of system purchasing agents and EMS system participants can work together to design purchasing rules for each agency.
    - The committee can provide a standardized equipment list for agencies.
    - The agencies can share bidding processes, so that the bidding procedure used by the purchasing agent can be used by all agencies.
    - Agencies must work closely with the cross-functional committee to ensure that the goods are received and distributed to the appropriate location.
    - Fire agencies should have agreements in place to specify inventory and purchasing plans.
- Receiving and distribution considerations
    - Fire agency partners should design distribution plans to deliver goods directly to the appropriate location. Using a joint purchasing system, the agencies will no longer have to receive goods at the agency; instead, they can receive goods at the appropriate station or ambulance location.
    - The agencies can jointly determine the proper level of inventory to maintain within the system. The use of system-wide inventory planning ensures that the most cost-effective inventory management can be established for the system participants.
- Financial and fiscal considerations
    - Marginal costs of creating system-wide purchasing infrastructure should be compared against the reduced level of effort of individual agencies.
    - Cost saving can be achieved through reducing inventory carrying costs, reducing transaction costs, and achieving economies of scale through larger volume purchasing.
    - The participating agencies should agree on contributions to account for more difficult to discern costs such as freight charges and unit costs for warehousing space.

Guidance

- Develop a system-wide, cross-functional committee to explore a joint purchasing process.
- Work with elected officials to adopt purchasing requirements that help the agencies meet purchasing goals and guidelines.
- Establish standards for fire and EMS system equipment and supplies.

- Establish inventory standards and methods for distributing equipment and supplies.
- Develop specific standards for apparatus, equipment, PPE, SCBA, communication equipment, and supplies.
- Inventory and evaluate current physical assets, apparatus, equipment and operational/facility supplies.
- Contract for or align agencies to provide logistics and supply services.
- Evaluate other cooperative support service programs throughout the area.
- Determine support components that would best benefit all departments immediately and long term for program expansion.
- Evaluate current levels of support functions and identify successful elements to incorporate into the joint program.
- Create prescribed load lists for apparatus.
- Insure that all aspects of a joint support division are based upon recognized local, state, and national standards as well as manufacturers' recommendations for repair and maintenance.
- Determine the most efficient and effective location for support functions. This may include multiple facilities that are strategically located.
- Develop a mobile maintenance/repair program.
- Involve Lewis and Clark County fire agencies, but consider the benefits of expanding program to other local government entities.
- Evaluate value in outsourcing of support services.

Fiscal Considerations

- Financial support may be necessary, as agencies will be required to meet the costs of creating or modifying existing logistics systems.
- The soft cost generated by cross-functional committee meetings necessary to accomplish objectives of the program.
- New or additional FTEs to operate support service functions.
- Incremental costs of transitioning to standard apparatus, PPE, SCBA, and small equipment.
- Conversion of existing facility or acquisition of real property for a logistics, support services, and maintenance center.
- Expected cost savings and operational benefits will result from:
    - Elimination of duplication of services, administration, training, supplies, parts, and equipment.
    - Standardization of equipment, parts and operational/facility supplies.
    - Effective acquisition, accountability, and distribution of supplies and equipment.
    - Bulk purchasing.

- Preventive maintenance of physical assets, apparatus, and equipment for optimum safety and readiness.
- The elimination or reduction of "outside" costs for repair, maintenance, and servicing of physical assets and equipment.

Partnering Strategy

D – Establish a Lewis and Clark County Fire Investigation Team

Level of Cooperation

- Functional

Timeline for Completion

- Short to middle-term

Section

- Fire Prevention

Affected Stakeholders

- All agencies (including law enforcement and district attorney)

Objective

- Provide fire cause determination services through a cooperative effort, sharing resources and personnel to the benefit of all participating agencies.

Summary

Effective fire cause determination provides information that is considered essential in preventing or limiting the damage of fire. Finding the cause of accidental fire allows fire prevention effort to be aimed more clearly at the target and subsequently, assures the wise expenditure of finite public resources.

When fires are intentionally set, establishing cause is a vital element of a successful arson investigation and prosecution. Currently, each Lewis and Clark County fire agency accomplishes the task of determining fire cause independently. However, the limited resources of each agency make it difficult or, in some cases, impossible to maintain enough trained and experienced investigators to assure continuous availability.

Discussion

Many times, the origin of so-called routine fires are easily recognized by the suppression personnel who respond to the emergency. Occasionally though, the scene of the fire yields a complex puzzle that requires specialists with a higher level of training, expertise, and equipment to find the cause. At that point, fire investigation becomes a very technical and labor-intensive specialty requiring exacting standards and attention to detail.

Few, if any, of the Lewis and Clark County fire departments can justify or afford staff positions dedicated solely to fire investigation; consequently, the job tends to become an ancillary function of

other responsibilities. Because of the extreme variability of need over time, most Lewis and Clark County fire departments will find it difficult to assure the continuous availability of trained and experienced investigators.

The creation of a multi-agency Fire Investigation Team (FIT), jointly staffed by personnel from participating agencies would provide the county a pool of fire investigation specialists. The FIT should include persons from fire suppression, fire prevention, Lewis and Clark County Attorney's Office, and local law enforcement. An on-call roster of investigators assures the response of FIT members when any fire exceeds the ability of local officers to establish cause. A prompt response of the FIT may more quickly assure the return to service of on-scene personnel and equipment.

Maintaining a specialized team permits more rigorous investigation training, which increases members' skills and abilities. A formally recognized FIT makes possible the involvement of representatives from local law enforcement including the Lewis and Clark County Sheriffs Office as well as the county attorney's office. Many programs not currently feasible for independent Lewis and Clark County fire departments become possible after the creation of a FIT.

An example of one such successful program is located in Santa Clara County, California. There, an accelerant detection dog was provided through the Flammable Liquid Detection Canine Program, a joint venture with the Bureau of Alcohol, Tobacco, Firearms, and Explosives and the Santa Clara County Fire Department. The Bureau of Alcohol, Tobacco, Firearms, and Explosives certify both the dog and handler. In 1994 within two months of the creation of the program, the dog made possible an arrest for arson.

Consider the case of two defendants charged with murder and arson October 1996. Evidence provided at the trial proved that the stepfather of one of the defendants died in a trailer fire after insurance had been obtained on his life. This local case from nearby Stanford, Montana helps to support the need for well-trained investigators.

Collaboration by Lewis and Clark County agencies to accurately determine the cause of fires may result in more efficient use of resources, and fewer fires of "undetermined" origin. The consequences of early investigative action may lead to greater successes in the prosecution of arson. Active prosecution has proven to be effective in the reduction of the occurrence of arson fires.

There are a number of agencies that provide resources for fire investigation teams. They include:

- International Association of Arson Investigators
- Department of Justice
- State of Montana, Fire Prevention and Investigation Bureau
- Alcohol Tobacco and Firearms Arson and Bomb Unit
- Lewis and Clark County Attorney's Office
- Federal Bureau of Investigation (FBI)
- Immigration and Naturalization Service (INS)
- United States Postal Service (USPS)

Guidance

- When establishing a Lewis and Clark County FIT, acquire information from existing successful model programs.
- Involve associated discipline agencies that have a vested interest in the success of the FIT.
    - Lewis and Clark County City-County Health Department,
    - Lewis and Clark County Attorney's Office,
    - Lewis and Clark County Sheriff's Office,
    - Municipal police departments,
    - Educators,
    - Fire prevention personnel,
    - Fire investigation team members,
    - Fire department administration, and
    - Elected officials.
- Institute a policy of regular meetings with an emphasis on training at each session.
- Budget funds for equipment, education, and specialized training for team members.
- Set as a goal of certification in fire cause determination for team members.
- Develop guidelines for membership and participation in the team.
- Apply for public and private grant funding for personnel training and specialized equipment.

Fiscal Considerations

- Potential for increased training costs and overtime for training.
- Potential overtime or reimbursements for FIT call out.
- Potential for reduction in the length of time required for any given fire investigation because the members work collectively.

Partnering Strategy

E – Develop a Lewis and Clark County Public Fire Safety Education Coalition

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Fire Prevention

Affected Stakeholders

- All agencies

Objective

- Provide for the cost effective, regional dissemination of public fire safety education.

Summary

Preventing fires is known to be far more cost effective than extinguishing them. One widely recognized and very successful method of preventing fires is through a multi-faceted public fire safety education program. The public fire safety education programs currently offered by the Lewis and Clark County fire departments vary from well planned to non-existent.

Discussion

Successful public education programs use a range of communication methods, many of which cannot be limited to a specific geopolitical boundary. Television and radio for instance, are regional media that overarch jurisdictional limits delivering information to citizens in a wide variety of communities. For fire safety campaigns to be most effective each must be designed to target a specific audience and each must be crafted for the means of delivery.

Creation of a Lewis and Clark County public education coalition will help to standardize fire safety messages across the region and work to reach more of the target audience. This, in turn, will allow for reduced cost to each agency through sharing, while improving the quality of programs in those communities with few or no public education resources. Costs can also be reduced through quantity purchasing of handouts and other public education materials. Increased training can be made available to the public education staff, paid, volunteer, and auxiliary personnel, and others to enhance the quality of the fire prevention effort in those communities now lacking such programs.

Guidance

- Formalize the creation of the coalition through a written agreement.
- Involve others from outside the area and from non-traditional groups (insurance industry, educators, State of Montana, Office of the State Fire Marshal, media).
- Create standardized messages that can be used across the Lewis and Clark County region.
- Learn from others. Model the coalition after other successful regional public fire safety education programs.

Fiscal Considerations

- The elimination of duplicated effort in the creation and distribution of public fire safety education messages reduces soft costs.
- Cost savings can be achieved through group purchasing of materials and other media.
- Departments currently without a presence in public education efforts would see a cost increase.

Partnering Strategy

F – Develop a Lewis and Clark County Juvenile Fire Setter Intervention Network

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Fire Prevention

Affected Stakeholders

- All agencies, (including St. Peter's Hospital)

Objective

- Provide an effective means for intervening in juvenile set/caused fires.

Summary

Statistical analysis nationwide clearly demonstrates the growing problem of juvenile fire setting. While fires set by juveniles have always been a problem, fire cause determination and fire data reporting systems have not always been adequate to identify the extent of the phenomenon. Many jurisdictions simply do not realize the extent of juvenile set fires in their community.

The Lewis and Clark County fire agencies, as a group, *do not* support a juvenile fire setter program. A few fire departments currently have no such resources available. The lack of involvement by all fire departments, law enforcement agencies, city-county health, mental health professionals, schools, legal services, and other affected interests in the county limits the effectiveness of existing fire setter programs.

Discussion

Juvenile fire setting occurs in all communities across the boundaries of all the Lewis and Clark County fire agencies. The establishment of an effective, multi-discipline, multi-agency Juvenile Fire Setter Intervention (JFSI) Network will allow shared expertise, services, knowledge, and (most importantly) information to the benefit of all agencies and communities. A network of trained professionals from all the needed disciplines, working together, allows for more accurate assessment of individual fire setters to determine the nature and depth of intervention required.

A Lewis and Clark County program also:

- Allows for sharing the workload between agencies,
- Facilitates appropriate referral to professional services when needed, and
- Makes possible effective prosecution on those few occasions when juvenile set fires are verified as arson.

Guidance

- Consider the formation of a partnership that includes St. Peter's Hospital, or
- Develop a Lewis and Clark County program modeled on already established and successful JFSI networks.
- Include all the needed professional disciplines.
- Provide important, on-going training.
- Involve only those fire agency personnel who desire to participate.
- Formally organize the structure of the network for long-term sustainability.

Fiscal Considerations

- Reduced fire loss to the community through reduction in juvenile caused fires.
- Potential increased training requirement and cost.
- Potential overtime for training and for intervention.

Partnering Strategy

G – Create a Unified Occupational Medicine Program

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Administration

Affected Stakeholders

- All agencies

Objective

- Provide a fire-service related occupational and health program.

Summary

A single method and source for providing occupational and health services may provide savings through economies of scale. NFPA 1500, *Standard on Fire Department Occupational Safety and Health Programs*, provides the minimum requirements for a fire-service related occupational safety and health program.[44] Along with NFPA 1500, NFPA 1582, the *Standard on Comprehensive Occupational Medicine Programs for Fire Departments*, and related documents, provide guidance for the creation of occupational health programs and for establishing medical requirements for current and future firefighters.[45]

Discussion

There is a need for the Lewis and Clark County fire departments to have access to a group of professionals with expertise in the occupational medicine field. Occupational medicine is dedicated to promoting and protecting the health of workers through preventive services, clinical care, research, and educational programs. One aspect of a program is keeping up-to-date with health and safety regulations, standards, and current practices. The occupational medicine specialists would review current practices to see if they meet the new regulations, make modifications if needed, and assist the departments in adopting any changes.

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[44] NFPA 1500, *Standard on Fire Department Occupational Safety and Health Programs,* NFPA, National Fire Protection Association, 2002 Edition.
[45] NFPA 1500, NFPA 1582, the *Standard on Comprehensive Occupational Medicine Programs for Fire Departments,* NFPA, National Fire Protection Association, 2003 Edition.

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

Occupational safety and health programs (sometimes referred to as Industrial Medicine) vary in depth, form, and delivery. A large municipal fire department may employ a physician full-time, contract with a provider organization, or conduct a program part in-house while contracting for the remaining services. Any number of physicians in Helena and the state specialize in occupational medicine and rehabilitative medicine that may meet the needs of the county fire agencies. The St. Peter's Hospital is one local medical purveyor that provides occupational medicine services.

One such occupational medicine program that we are familiar with, uses the fire department wellness coordinator to conduct audiometric, spirometric, and vision screenings before personnel complete their annual physical evaluation. The occupational medicine provider then conducts blood draws at individual fire stations. Consequently, at the time of the medical physical, the physician has at his/her disposal not only the firefighter's historical but current medical screening records.

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

The legal requirements for a fire department occupational safety and health program have been established. How a fire department administers and supports the program determines the success and the resultant benefit. In the example, the department previously had to hire extra staff, or pay employees overtime to take annual medical physicals. Volunteers on the same department had to miss a drill, take time off work, or go on their days off from work. The occupational medical program resulted in the saving of more than fifteen thousand dollars through reduced overtime cost; however, some funding is still required for medical follow-ups and for employees not able to meet the schedule.

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

Guidance

- Determine required and desired specifications for an occupational safety and health program.
- Create a single Lewis and Clark County personnel policy for occupational safety and health.
- Develop an RFP for soliciting vendors to supply occupational safety and health services.
- Conduct baseline testing for firefighters without previous audio and lung function baseline records.

Fiscal Considerations

- Occupational medicine programs are often menu driven. Items selected for inclusion in the program determines the final cost. Additional financial factors involve whether the fire departments elect to exceed mandated requirements, perform some of the occupational medicine functions internally, or consolidate the occupational medicine program with interrelated programs. Interrelating programs that share functions include wellness, infectious disease, FIT testing, EMS, and hazardous materials.

Partnering Strategy

H – Create a Unified Wellness and Fitness Program

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Administration

Affected Stakeholders

- All agencies

Objective

- Provide a wellness and fitness program that promotes the improved health and well-being of personnel in all divisions, paid and volunteer—at all ranks.
- Increase fitness levels and decrease injuries.
- Reduce frequency and number of sick/sick injury incidents.
- Reduce the number of days used for sick/sick injury leave.
- Protect the long-term health of paid and volunteer personnel.

Summary

Wellness and fitness programs have proven beneficial to employers and employees alike. Onsite visits by licensed wellness experts are part of an all-inclusive program.

Services offered under a comprehensive wellness program may include:

- Wellness screening,
- Health coaching,
- Wellness and fitness educational materials,
- Support groups,
- Presentations,
- Fitness evaluations,
- Newsletters,
- Nutritional information,
- Health risk assessment, and
- Fitness training.

Discussion

The benefits of wellness and fitness programs have been quantified anecdotally without specific documentation in some instances. Documented individual incidents and case studies over a longer period have now yielded conclusive data as to their benefits. Two case studies are used here to illustrate this point.

First, during an annual visit for his medical and fitness evaluation, a battalion chief with the Indianapolis, Indiana fire department was found to have an abnormal heart rhythm. He had considered himself to be in excellent condition, competing in track and field events since 1996. He was immediately removed from duty and sent to a cardiologist for a heart catheterization. He was diagnosed with severe blockages in four coronary arteries. Within two days of his medical evaluation, he underwent quadruple bypass surgery. His cardiologist told him he would not have lived another two weeks without intervention.

Remarkably, the battalion chief returned to work and was back exercising within six weeks of surgery. The father of four and grandfather of two is thankful to be alive, attributing his good fortune to the IAFF/IAFC Wellness and Fitness Initiative.

The second example involves a mid-sized fire district employing both career and volunteer personnel. The district was in need of a fitness/wellness program and subsequently contracted with Oregon Health Sciences University to provide an evidence-based program custom tailored for its diverse group of firefighters. The primary goals of the program were to "*increase fitness levels and decrease injuries*."

Results of the study spanning seven years conducted by OHSU Health Management Services included these findings:

- Greater than 30 percent increase in the number of participants,
- A decrease in average total cholesterol,
- A decrease in average LDL cholesterol from 130 to 120,
- Participants with BP in the high normal range or above dropped from 18.3 percent to 8.5 percent,
- Participants with moderate or high coronary risk dropped from 61.7 percent to 35.4 percent,
- Participants with an overall wellness score of good or excellent increased from 41.7 percent to 58.5 percent, and

- Annual number of days lost (workers compensation days) dropped from a high of nearly 300 days to below 50 days. During the study period, the fire district increased the number of career personnel twofold.

Guidance

- Determine the components of a wellness and fitness program that would best benefit all departments.
- Involve a broad cross section of employees in the development process.
- Investigate programs and providers for best fit.
- Coordinate activities with safety committees.
- Train in-house peer fitness trainer/coaches.
- Incorporate wellness and fitness services as an element of recruit academies.
- Include volunteers, staff, and support personnel in wellness and fitness services.
- Provide initial and recurring wellness education to personnel.
- Provide a newsletter (paper or virtual) for all personnel.
- Incorporate wellness in all training sessions.
- Provide for a periodic appraisal of the wellness and fitness program.

Fiscal Considerations

- The cost per employee of a wellness and fitness program can vary widely. An annual per employee cost may be as low as twenty-five dollars to as high as one hundred dollars depending on many factors, such as:
  - Frequency of employee contact,
  - Range of services desired,
  - Equipment need, and
  - Inclusion of ancillary offerings (newsletter, peer fitness coach training).
- The soft cost associated with on duty time required for wellness and fitness instruction needs to be addressed before carrying out a plan.
- Potential cost savings may result from:
  - Reduced work related injury leave days.
  - Reduced sick leave usage.
  - Reduction in medical benefits used.
  - Improvement in employee fitness and morale.

Partnering Strategy

I – Adopt and Implement a Regional Computerized Training Records Management System

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Training

Affected Stakeholders

- All agencies

Objective

- Provide a fully integrated comprehensive training records management system (RMS).

Summary

Computerized RMS provides for ease of data entry, retention, and accessibility. RMS are designed to provide comprehensive information regarding an individual, company, station, shift, and department training status. All RMS are designed to query records and generate a variety of user-defined reports.

Most current RMS are computerized with software produced by a variety of companies. While some departments have computerized RMS, some use only a paper system. Although one department makes good use of their systems' capabilities, no agency takes full advantage of RMS capabilities. NFPA 1401, Recommended Practice for Fire Service Training Reports and Records, provides standards for recordkeeping systems.[46]

Discussion

An assortment of factors including a lack of support, the time to become proficient with, and software problems frustrate and prevent many users in their desire to fully use their individual RMS. The use of a standard RMS in Lewis and Clark County would rectify the ineffectiveness that presently exists.

[46] *NFPA 1401, Recommended Practice for Fire Service Training Reports and Records*, NFPA, National Fire Protection Association, 2006 Edition.

With a single RMS, one specialist or individual with an expertise would work collectively with all users to instruct, maintain, and troubleshoot the system. The ability to use the system to its maximum potential, and to retain and generate meaningful reports is improved. An environment is created for system users to share knowledge, experience, and assist one another in problem resolution.

Vacations, work, rotating shift schedules, family activities, and normal absenteeism make training schedules very difficult to manage. The ability to cooperatively track and assess training information would foster the development of a unified training manual, and an annual training plan. Future enterprises may benefit from a single RMS including recruit training, career development, in-service, officer, and specialized training programs. A RMS for training will aid all departments in budget planning, training delivery, and with resource and risk management.

Guidance

- Establish a work group including at least one training representative from each department.
    - Identify system requirements and needs of involved departments.
    - Evaluate the RMS used by Lewis and Clark County departments, including justification for their use.
    - Evaluate other available RMS systems.
    - Select an RMS that most adequately satisfies mutual requirements, needs, and budget.
- Each department should share in the any cost to administer and manage the training RMS. Including:
    - Training RMS management,
    - Oversight of hardware and software installation, and
    - Providing for the initial and ongoing RMS training for end users.
- Determine server requirements for training RMS.
- Use existing or establish an Intranet or Internet network.
- Provide for RMS maintenance and troubleshooting services.
- Acquire technical assistance for RMS programming.
- Provide for a periodic appraisal of the RMS.

Fiscal Considerations

- A reduction in duplicated effort (reduces soft cost) in acquiring, learning, and maintaining, individual systems.
- Economies of scale in the collective purchase, use, and maintenance of a single RMS.
- Cost to purchase, administer, maintain, or modify existing network.

- Personnel costs associated with RMS committee, training, and implementation.

Partnering Strategy

J – Develop and Adopt Common Training Standards

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Training

Affected Stakeholders

- All agencies

Objective

- Adopt uniform training guidelines.
- Adopt uniform certification standards.

Summary

Training standards provide the benchmark for training. They define and specify the quantity and quality of training for achieving levels of competency and certification. Certain standards are mandated by governing or regulating agencies such as OSHA. Others are considered industry standards developed by organizations like the National Fire Protection Association (NFPA). Occasionally, locally developed standards are adopted to address circumstances unique to that area. Private vendor standards and certifications are often applicable to specialized training.

Lewis and Clark County fire departments primarily adhere to independently developed local training standards. To a lesser degree, the departments apply NFPA and Insurance Services Office (ISO) standards, private vendor and locally developed standards.

Discussion

By primarily adhering to locally developed training standards, the Lewis and Clark County departments are foundationally prepared to adopt the same set of standards. The adoption of standards would provide uniformity throughout the training delivery system and would improve inter-agency compatibility. It would further simplify development of the Lewis and Clark County training manual, annual training plan, and data entry and retrieval of computerized training records. Adoption will provide for uniformly trained and certified responders, and will assure increased emergency scene compatibility, efficiency, effectiveness, personnel confidence, and emergency scene safety.

Guidance

- Establish a work group including at least one training representative from each Lewis and Clark County department.
    - Identify mandated training standards affecting all departments.
    - Assess all other standards used by Lewis and Clark County departments, including rationale for their use.
    - Consider any unique local issues.
    - Develop a process for the adoption and update of training standards.
    - Adopt the training standards to which all Lewis and Clark County departments will adhere.
    - Continuously review and update the Lewis and Clark County training standards
- Educate personnel on the purpose and application of the standards.
- Provide for continual use of training standards throughout the training delivery system.
- Maintain standards in a readily available format.
- Provide for frequent evaluation and updating of training standards.
- Address and resolve personnel certification issues (address through reciprocity) created by new standards and certifications.

Fiscal Considerations

- A reduction in duplicated staff effort (reduces soft costs) and training staff to develop similar but separate programs based on the same or differing standards.
- A potential for reduced specialized training costs through a larger pool of personnel.
- Responders trained to the same standard provide a more cohesive workforce, increasing efficiencies.

Partnering Strategy

K – Develop and Adopt a Lewis and Clark County Training Manual

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Training

Affected Stakeholders

- All agencies

Objective

- Provide consistent, standardized training procedures.

Summary

Fire department instructors use manuals based on national, state, and local standards as a resource to develop lesson plans for classroom and field training. Training sessions provide students with the knowledge, skills, and abilities to perform in emergency and non-emergency situations.

The Lewis and Clark County Fire Departments should cooperatively develop a training manual for adoption by all. The project could be developed in phases with a first phase being firefighter I, then (for example) expands to second and third phases engine operations, wildland, and so on.

Discussion

Until now, each Lewis and Clark County fire departments unilaterally selected training manuals from a variety of options. Not surprisingly, training and performance varied across the county. The creation and use of a standard training manual will provide for training that is more consistent, better on-scene coordination, and improved firefighter safety.

As the firefighters of all Lewis and Clark County agencies area are trained in the same procedures, each can respond to an emergency with the confidence that all responders are prepared to work effectively as a team. This will improve the willingness of firefighters from different departments to work together as a coordinated emergency workforce. Standardized training procedures improve on-scene safety, efficiency, and effectiveness.

Care should be exercised to prevent the training manual development process from taking too long. To expedite progress, we recommend adopting material from existing model training manuals, hose evolutions, and standard operating guidelines will be helpful. A resource for obtaining on hand material can be found through the Western Fire Chiefs Association, National Volunteer Fire Council, U.S. Fire Administration, Fire Services Training School (FSTS), U.S. Forest Service, Sate of Montana Department of Natural Resources and Conservation, National Fire Academy among many others.[47][48]

Model fire department training material is readily available through non-profit organizations and private companies. Sources for commercially available training material include the Fire Department Training Network (FDTN), Thomson DelMar, and Oklahoma State University. The International Fire Service Training Association (through Oklahoma State University) and Fire Protection Publications (FPP) have been longstanding producers of training manuals, course curricula, and audiovisual aids for fire departments.

NFPA recommended practices and standards can also assist with the development of the training manual. Relevant standards include:

- NFPA 1401, Recommended Practice for Fire Service Training Reports and Records,
- NFPA 1403, *Standard on Live Fire Training Evolutions*,
- NFPA 1404, *Standard for Fire Service Respiratory Protection Training*,
- NFPA 1410, *Standard on Training for Initial Emergency Scene Operations*, and
- NFPA 1451, *Standard for a Fire Service Vehicle Operations Training Program*.

The need for training of personnel with specialized duties should be included in the Lewis and Clark County training manual.

Guidance

- Establish and maintain a user group that meets regularly.
    - Include at least one training representative from each department.
- Place the training manual in electronic format for updating and to allow easy access by firefighters.
- Provide for coordinated training of all agencies.

[47] The Fire Services Training School (FSTS) is the state level agency charged with providing professional development for community fire and rescue services. For administrative purposes, the FSTS is attached to the Extension Service of Montana State University.

[48] Western Fire Chiefs Association, National Fire Service Library, www.wfca.com, Department of Homeland Security, Federal Emergency Management Agency, U.S. Fire Administration, National Fire Academy, Training and Education.

- Provide for regularly scheduled multi-agency drills.
- Provide for a regular evaluation and review of the training manual for applicability to pertinent laws, industry standards, and Lewis and Clark County standard operating guidelines.
- Seek out existing procedures for use in development of the Lewis and Clark training manual.

Fiscal Considerations

- The elimination of duplicated staff effort (reduces soft costs) in the selection, development, and updating of separate training manuals.
- Instructional time is likely impacted during multi-agency training sessions by reducing or eliminating the time devoted to adaptive or remedial training.
- An emergency workforce trained under a cooperative system is more efficient and effective in reducing property damage and loss during emergency incidents.
- A workforce trained to operate under universal standards will experience fewer emergency scene injuries.

Partnering Strategy

L – Investigate Purchasing a Video Conferencing System

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Training

Affected Stakeholders

- All agencies

Objectives

- Provide standardized, consistent, and high-quality classroom training.
- Reduce training staff hours required for curriculum development and delivery.
- Increase in-service time of emergency response apparatus.

Summary

The purpose a video conferencing system is to connect the fire stations for interactive training. These type systems are designed to increase training delivery efficiency and shared training capabilities.

Discussion

The training of new employees, continuing education, and the specialized training within each of the Lewis and Clark County fire departments varies considerably; yet, all of the agencies share the same or similar training needs. All must provide for continuing education training on:

- Infectious diseases,
- Blood and airborne pathogens,
- SCBA (self-contained breathing apparatus) and respiratory protection,
- ICS (incident command system),
- Hazardous materials,
- CPR (cardio-pulmonary resuscitation),
- Safety,
- Confined space,
- Wildland refresher training, and

- Harassment.

Review of Lewis and Clark County fire department training programs noted that the delivery, quality, and level to which required training is satisfied vary widely. Factors that influence this include:

- Available training staff,
- Staff time is often divided between job functions, balancing training versus non-training priorities,
- Level of interest and commitment of individual trainers,
- Access to and availability of training facilities and equipment,
- Ability of personnel to attend training sessions,
- Availability of replacement crews for personnel attending training, and
- Interruptions for emergency responses.

The opportunity exists for the Lewis and Clark County fire departments to address many of these issues by securing, implementing, and cooperatively using a video conferencing system. Cooperative use of the system will likely:

- Increase compliance with annual training and competency requirements.
- Improve efficiencies at emergency scenes for individual departments and during multi-agency operations.
- Increase training staff productivity through a reduction in curriculum development and delivery time.

Guidance

- Establish and maintain a user group with one representative from each department.
    - Schedule regular training meetings.
    - Identify common and individual department training needs.
    - Identify and solve mutual training delivery problems.
    - Adopt common training standards.
    - Coordinate the development, distribution, and delivery of training by assigning common training needs.
    - Ensure delivery of mandatory didactic training using the video conferencing system.
    - Provide for periodic review and evaluation of delivered training for compliance with standards.
    - Provide for periodic quality assurance review of delivered training.
- Develop a formula where each department shares cost associated with operation of the video conferencing system.
    - Management of the video conferencing system.

- Completion of installation and operability of video conferencing system.
- Delivery of initial and recurring training to end users.
- Providing maintenance and troubleshooting services.
- Providing system programming services (scheduling, production, editing, and library maintenance).

Fiscal Considerations

- The reduction of duplicated staff effort (reduced soft costs) in the development and delivery of training programs.
- A reduction in material costs associated with duplicated training resources for training delivery.
- A reduction in apparatus fuel costs associated with a reduced travel for training. (This may be offset by travel to attend manipulative training at training facilities. See "training facilities" section.)
- Technical support or personnel costs for services to operate and maintain the video conferencing system.
- Many opportunities abound to secure funding for hardware through grants and in-kind donations.

Partnering Strategy

M – Develop an Annual Lewis and Clark County Training Plan

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Training

Affected Stakeholders

- All agencies

Objectives

- Provide standardized and consistent training.
- Provide a well-trained emergency workforce.
- Provide long-term vision and direction for training delivery.

Summary

The 2002 version of NFPA 1500 states, "*The fire department shall provide training and education for all department members commensurate with the duties and functions that they are expected to perform.*"[49] Largely, the fire departments in Lewis and Clark County address annual planning for fire and EMS training individually and uniquely.[50]

A formalized training plan provides the guidance for meeting training requirements. The plan and subsequent training is used to ensure that firefighters are competent, certified, and possess the ability to safely deal with emergencies. Training priorities are established by evaluating responder competencies to training mandates, requirements, desired training, and with the emergency services being delivered. Contemporary training delivery often revolves around performance or outcome-based training.

[49] NFPA, National Fire Protection Association Standard 1500 *Standard for Fire Department Occupational Safety and Health Programs*, Training and Education, 2002 Edition.

[50] Montana Code Annotated – 2005, 7-33-2313.Powers and duties of chief -- request for assistance – definition, The chief shall devise and formulate or cause to be devised and formulated a course or plan of instruction or training program making available to each regular member of the chief's department not less than 30 hours of instruction each year in matters pertaining to firefighting.

An annual training plan should reflect priorities by identifying the training that will occur. Training topics, general subject matter, required resources, responsible party, tentative schedule, and instructors are all covered in the plan. Rational for why certain topics were chosen (or not chosen) is also included in the plan.

Discussion

Planning is essential to a successful training division, functioning much like the rudder of a ship. To plan the direction of a training program efficiently, complex factors must be considered including training mandates, department type, personnel career development, unanticipated need, priorities, and finite training time. Successfully charting a course through such issues can be a daunting and overwhelming task for the lone training officer.

Currently, each Lewis and Clark County fire department individually deals with the same or similar fire training responsibilities and issues — inefficiencies exist as a result. A single county training plan is an opportunity to combine intellectual resources to exploit the strengths and assets of each department for mutual benefit.

> *"Efficient training systems are those that identify what they do well and take advantage of the opportunities provided by other systems to supplement their efforts. Inefficient systems are those that try to be all things to all people, and in doing so, squander resources.*"[51]

Determining the level of training that will be supported is crucial. Develop the annual training plan accordingly, and deliver the training that directly supports those levels. For example, training could be directed at supporting certifications of Firefighter I, Firefighter II, and Fire Officer. A pool of instructors that are experts in that subject can be developed from those with the interest, qualifications, and expertise.

Developing and carrying through with a well conceived and coordinated training plan can improve on-scene safety, efficiency, and effectiveness of personnel. With personnel from all agencies trained from the same plan, an emergency incident may be attacked with an expectation as to the level of training and skill set of the responders. The training plan will also assist in the planning and tracking of employee development and certifications.

Guidance

- Provide a coordinated training plan including:

[51] Department of Homeland Security, FEMA, U.S. Fire Administration, *The Future of Fire Service Training and Education Professional Status*: Part Two – Training and Education, page 1.

  - All Lewis and Clark County fire agencies.
  - Conduct didactic sessions via a video conferencing system.
  - Plan regular use of training facilities by all departments.
  - Schedule regular single agency manipulative single and multi-company drills.
  - Schedule regular multi-agency, multi-company manipulative drills.
- Establish and maintain a training committee that meets regularly. Include at least one training representative from each department:
  - Develop an annual training plan.
  - Publish, distribute, and implement the plan.
  - Provide an orientation for personnel of each department regarding the plan's purpose and contents.
  - Publish monthly training schedules based on the plan.
- Place the annual plan and monthly schedules in electronic format for distribution and ease of updating.
- Provide for periodic reviews and adjustments to the plan.
- Direct all curricula towards risk management.
- Include all hazards in the training plan rather than solely fire-related incidents. The fire service's response and mitigation missions have expanded greatly over the years and now include all disasters, natural and manmade.

Fiscal Considerations

- An elimination or reduction in duplicated staff effort (reduced soft costs) in the creation and updating of multiple training plans.
- Instructional time is increased during multi-agency training sessions with personnel trained to selected certification levels.
- A reduction in costs through coordination of shared training resources and equipment.

Partnering Strategy

N – Consolidate Training into a Single Lewis and Clark County Training Division

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Training

Affected Stakeholders

- All agencies

Objectives

- Eliminate duplicated efforts in training Lewis and Clark County fire department emergency responders.
- Create a single Lewis and Clark County training division.

Summary

Responsibility for fire department training programs is commonly designated to one person or a small group of people. Two classic forms of providing training are: 1) a training division with assigned personnel or, 2) a company officer is assigned training responsibilities in combination with regular duties. Multiple assignments also tend to underscore the difficulty faced by many officers in trying to balance staff responsibilities.

With the creation of a single Lewis and Clark County training division, we do believe that the personnel used to perform collateral duties will be positively affected. As specialists, it will take fewer individuals to conduct training than is currently required by the fire departments individually.

Historically, the Lewis and Clark training programs have been managed and operated quite independent of one another. Recently however, opportunities have opened new avenues of cooperation, including training prop building at the Helena Regional Airport, Wildland training with State of Montana DNRC, and the U.S. Forest Service and access to the Rocky Mountain Emergency Services Training Center (RMESTC).

Discussion

To varying degrees, all Lewis and Clark County fire department training programs display strengths and weaknesses. The weaknesses largely are a result of two basic problems influencing all training officers — multiple responsibilities and a lack of time to "do it all" appears to create a workload, which at times seems overwhelming.

Lewis and Clark training officers are perceived as capable, conscientious, and dedicated in attempts to fulfill their assigned training responsibilities. Our observation is that training officers have inadequate time to comprehensively administer their training programs. Consequently, planning, curriculum development, program review, and evaluation of training activities are very limited.

Skills and recertification training for emergency medical technicians appears to receive adequate consideration. The focus of other effort by most Lewis and Clark training programs centers on training new recruits and periodic training of basic firefighter skills. One fire chief relayed that "*training new volunteers is like a revolving door that keeps going faster*." His was referencing that difficulty in getting volunteers that can keep up with required training, keep a job, and have time to spend with family.

Advanced levels of education and training for apparatus operators, company officers, and command officers are for the most part not addressed. The departments express a desire to take up these training issues. A lack of time to research, plan, develop, and conduct the training appears to be the common factor. Given the present individual department funding and staffing, it is unlikely that circumstances will change without a collaborative effort.

Within individual departments, training is frequently assigned to personnel with knowledge, skill set, and expertise in the subject area. Course content, quality, and to what level scheduled classes are delivered are predicated on several factors that are generally dependent on the commitment and interest of the person delivering training, department priorities, and chief officer support.

Given the resources and expertise within Lewis and Clark County, there exists an opportunity to eliminate duplicated efforts of individual departments through consolidation of the training into a single training division. The training division's mission would be to coordinate the administration, management, and delivery of the Lewis and Clark County training program. The division, established by combining existing fiscal, material, and personnel resources, would be more efficient. Focused attention on the training requirements by the training division will produce a more efficient training delivery system in Lewis and Clark County.

Multiple methods of creating a cost sharing for operation of a Lewis and Clark County Training Division exist. They include; 1) cost sharing based on the total training division budget divided equally by the number of operational personnel, 2) a base fee per firefighter plus a rate based on contact hours, 3) A fee per operational firefighter based on rank and certification level, and 4) offer classes as required for specialized training by Lewis and Clark County fire departments on a cost recovery basis. Solicit individuals from outside agencies to fill unused capacity based on cost plus.

Guidance

- Of all of the recommended opportunities, this one will need almost universal participation by the Lewis and Clark County fire departments to be successful. If one or more agencies elect not to participate, the geographical and logistical complexities multiply exponentially.
- Establish a single Lewis and Clark County training division.
    - Provide for the administration of training delivery services.
    - Provide opportunities with regular meetings for stakeholder agency representatives to coordinate training activities.
    - Provide for adequate training facilities and office space for training staff.
- Provide for a single training staff, with an administrator (division head) at the chief level.
    - Chief training officer should report to one supervisor.
    - Chief training officer should have overall training program administration, supervision, and management responsibilities.
- Adequate personnel to administer and provide training for:
    - A combined and standardized recruit academy (The potential exists for outsourcing this function).
    - Recurrence training for Firefighter I and II, and Fire Officers.
    - Officer level training and career development.
    - Apparatus operator/engineer skills and engineer development.
    - Administration and coordination of the emergency medical services training and recertification program. Should include St. Peter's Hospital ambulance personnel.
    - An RMS (records management system) for tracking individual, company, and department training.
    - Adequate clerical support staff.

Fiscal Considerations

- Increased efficiencies by eliminating duplicated administrative staff of existing individual department training programs.
- Potential for increased instructional capacity through pooled instructors.

- Cost to develop and or modify existing training facilities.
- Cost of purchasing any additional training aids.
- Personnel costs to staff the training division.
- Maintenance and capital replacement costs.

Partnering Strategy

O – Develop Lewis and Clark County Fire and EMS Training Facilities

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Training

Affected Stakeholders

- All agencies

Objective

- Provide training facilities readily available to all Lewis and Clark County fire departments.
- To develop and maintain the knowledge and skills of Lewis and Clark County Fire emergency services personnel.

Summary

Classroom instruction is an essential component of preparing emergency responders with knowledge and skills. A training facility or drill ground is a second indispensable element. Training facilities provide the controlled and safe environment used to simulate emergencies to develop and test the skill sets of emergency workers. Training involves both individual and group manipulative skills development in the operation of firefighting equipment, and fire apparatus.

NFPA 1402: *Guide to Building Fire Service Training Centers*, is a standard that addresses the design and construction of facilities for fire training.[52] The document covers the features that should be considered when planning a fire training facility.

Of the agencies involved in this project, only one maintains a facility with features that meet current standards. A few fire departments have limited facilities available with some training components. Other Lewis and Clark County fire departments have no training facility, choosing instead to use the training grounds of neighboring fire departments when possible. In a few cases absent the availability of suitable training facilities, some fire departments may forego essential training.

[52] National Fire Protection Association, *Standard 1402 Guide to Building Fire Service Training Centers*, 2002 Edition.

Discussion

Proficient emergency responders have confidence in their own abilities in handling the emergencies they encounter. Best practices suggest that emergency workers have regular access to training grounds for repetitive drills and to develop new skills. Training is identified as a vital part of a fire department's safety and accident prevention program. An effective and continuous training program results in safer, more efficient, and effective emergency operations.

It is financially unrealistic to expect that every Lewis and Clark County fire department will build and maintain an independent training facility. Constructing new or upgrading existing training facilities to comply with industry standards concerning classrooms, practice grounds, training tower, live-fire building, and training props for every department individually *is* fiscally irresponsible. In addition, the ongoing cost of operating and maintaining a training facility further advances the case for joint ownership.

Geography and travel distance may make a single Lewis and Clark County training center impractical. The fire department training facilities now on hand were developed without considering regional use, but an opportunity is at hand to more fully use existing potential through interagency cooperation. That opportunity is to combine resources to develop a minimum of two regional training centers. The facilities should be strategically located to allow reasonable access and to encourage regular use. Properly locating regional training centers would be a difficult part of the collaboration process; but dong so is considered essential to success.

As discussed earlier, the existing training facilities, props, and training grounds are inadequate to meet the current or projected needs of the Lewis and Clark County fire departments. We recommend that a central training center along with multiple satellite locations be develooped. This would be in conjunction with purchasing a video conferencing system to link the far-flung fire stations of the county.

Critical Issues

- Determine the required number and location of Lewis and Clark training facilities. Any property that is a potential site for a training center should have an environment assessment performed.
- Conduct a needs assessment before design and construction of any new training center and/or beginning improvement to existing facilities.
- Consider community and environmental impact of training grounds and training props when determining locations. Pay particular attention to access and egress routes.
- Select an architect, engineer, and vendor familiar with fire department training centers for oversight of the project. A number of companies have extensive knowledge and expertise in

developing complete fire training facilities. Manufacturers of fire training facilities also offer lease packages for financing.

Guidance

- Establish a user group that meets regularly to include at least one training representative from each Lewis and Clark fire department.
- Develop a minimum of one training facility proximate to the Helena urban area and one to the northern rural section of Lewis and Clark County.
- We stress the importance that any site selected be spacious enough to provide adequate classroom and training props to simulate different emergency scenarios.
- We recommend that any new fire-training center be constructed in a manner sensitive to the environment. Provide an adequate buffer between the training grounds and neighborhoods or businesses.
- Assure easy/safe access and egress routes.
- If possible, select a site easily served by existing utilities including electric, water, gas, and sewer.
- Provide a borderless plan for maintaining adequate emergency response coverage for crews attending training.
- Provide for regular scheduled use of the facilities.
- Secure adequate support for facility and grounds maintenance, and improvements.
- Provide adequate training resources and equipment beyond those carried by on-duty apparatus.
- Live fire training is a crucial element when developing plans for fire training facilities.
- Examine gas-fired burn props already in use for applicability.
- In addition to a gas-fired live training prop, we recommend the purchase of a flashover training prop be given strong consideration.
- Establish policies and procedures for safe and effective use of the facilities.
- Consider jointly insuring against accident and liability.

Fiscal Considerations

- Visit fire regional training centers for ideas for the Lewis and Clark County facilities.
- Anticipate an increase in fuel consumption and vehicle maintenance caused by travel to and from the training facilities. Any increase would likely be offset by a comparative reduction in travel after completion of a video conferencing system.
- The cost of new construction or upgrades to any existing facilities.
- The shared costs for the use, support, and maintenance of facilities.

Partnering Strategy

P – Develop Mutual Training Strategies

Level of Cooperation

- Functional

Timeline for Completion

- Short to middle term

Section

- Training

Affected Stakeholders

- All agencies

Objective

- Provide purpose and direction for training program management and delivery.
- Combine strengths and resources to:
  - Overcome current training obstacles and deficiencies,
  - Provide a comprehensive, and regionally integrated training structure,
  - Develop a mutually beneficial training program, and
  - Train and certify a cadre of knowledgeable and skilled emergency responders.

Summary

Agreements between public agencies to functionally consolidate certain programs are becoming increasingly common. Such cooperative initiatives are a means to increase efficiency through reduction or elimination of duplication, something not usually achievable by a single entity. We believe that a mutual training strategy among the Lewis and Clark County fire departments will accomplish that.

Discussion

Certain individuals are assigned responsibility for development and delivery of the department's training program. Each Lewis and Clark County fire department's training program is carried out, in large part, independently, with varying levels of program development, content, and quality. All persons responsible for firefighter training appear to work towards providing comprehensive programs; but not surprisingly, success is inconsistent. Most Lewis and Clark County fire departments experience similar limitations that restrict outcomes.

The geographical proximity of the departments to one another, the resources, and the available expertise provide an opportunity for training collaboration. Sharing such resources is considered a fiscally responsible way to fully reach the full potential of all Lewis and Clark County fire department training programs. Development of a strategic plan for Lewis and Clark County firefighter training is a crucial first step.

A strategic plan for training evaluates current training levels and determines future training goals and objectives. The process includes identifying the existing type and level of emergency services, followed by an audit of the certification and skills of emergency workers. Strategies are created to develop curriculum, obtain resources, and produce a training schedule. Each Lewis and Clark County department adopts the training standards and certification levels for the job classifications supported by the agency. A mutual strategic plan for training provides consistency to the program for all Lewis and Clark County fire departments. All emergency responders are subsequently trained to the certification levels established by the plan and all emergency workers posses the specified skills.

As part of the Lewis and Clark County training strategy, a system of competency-based training and skills evaluation is recommended for all suppression and EMS personnel. Competency-based training helps to establish the achievement and retention of skills for specific jobs. The term "skill" is defined in Merriam-Webster as "*A learned power of doing something competently: and a developed aptitude or ability.*" We recommend that mutual training strategies include at a minimum, annual, or if practical semi-annual evaluation of individual and company proficiency.

Results of the evaluations may then be used to adjust the Lewis and Clark County training strategy over the long term.

Critical Issues

- The variations between current programs used by the Lewis and Clark County fire departments may initially require personnel to receive additional training.
- Continued involvement by those active in the advancing the Lewis and Clark County training manual, should be involved with development of the mutual training strategies.
- Lewis and Clark County fire departments should produce a statement attesting to their commitment of developing mutual training strategies.

Guidance

- Establish a work group to evaluate and develop common training strategies:
    - Identify goals and establish objectives, and
    - Set benchmarks,

- Evaluate the following training sections found in "Partnering Strategies:"
- Video conferencing,
- Annual training plan,
- Lewis and Clark County training manual,
- Training facilities,
- Centralized training,
- Training standards, and
- Recordkeeping.
- Provide for flexibility and openness to apply existing strategies in new and different ways, and for new strategies.
- Provide for a periodic appraisal of strategy use, relevancy, effectiveness, and compatibility with current need.
- Keep strategies in electronic format for ease of updating.

Fiscal Considerations

- No significant financial considerations.

Partnering Strategy

Q – Develop Uniform Fees for Service

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Administration

Affected Stakeholders

- All agencies

Objective

- Provide Lewis and Clark fire departments with a uniform schedule of fees for service.

Summary

Lewis and Clark fire departments have very limited fee for services. Fees for service often include ambulance transport, building plans review, fire safety inspections, enforcement of the building code, and providing staff for special events. The departments also charge fees for non-routine services to recover costs due to extraordinary or unusual events. Examples include response to and standby for hazardous materials incidents, recurring false automatic alarms, confined space incidents, and deployment on wildfires. A single major incident has the potential to deplete a department's entire annual budget.

The departments differ on which services are (or are not) billed. As the Lewis and Clark County fire departments follow a policy of greater interagency cooperation, some of those partnership initiatives will necessitate that the departments also align fee schedules.

Discussion

The cities and fire districts of Lewis and Clark County as a rule *have not* adopted service fee schedules to be applied for various functions and services of the departments. Types of service provided and the rates set for providing services should be consistent.

Fees for service include ambulance transport, building plans review, fire safety inspections, enforcement of the building code, and providing staff for special events. Departments may also charge fees for non-routine services to recover costs due to extraordinary or unusual events.

Examples include response to and standby for hazardous materials incidents, recurring false automatic alarms, confined space incidents, and deployment on wildfires. Below is a description of representative fee types:

- Stand-by Charges – A fee charged for cost necessitated by a one-time or on-gong need for general public safety. For example, a fire department may charge a stand-by fee to post an ambulance at a local sports event.
- User Fee – A fee based on actual cost incurred for any service performed by a fire department where these costs require a recall of fire personnel above normal staffing.
- Charge for Service to Non-Tax Supporting Institutions – A fee for the total cost incurred by a fire department for service provided to any non-tax supporting institution. For example, the City of Bozeman, Montana receives an annual payment from Montana State University in return for fire protection services to their campus.
- Charge for State Mandated Duties – A billing to the Offices of the State of Montana or the federal government for the cost of duties mandated by those offices.
- Ambulance Transport Fee – A fee for emergency ambulance transport, usually based on level of service (ALS – BLS) and supplies, services, and mileage.
- Plan Check Fee – A fee charged to review plans for multiple dwellings, commercial, manufacturing, or public assembly units. The fee can be based on a percentage of the total estimated construction cost per structure. This fee offsets expenses incurred by a fire department during the planning phase of any development or construction.
- Fire Cause Determination Fee – A fee that recovers the fire department's cost of providing service resulting from a violation of the Fire Code.
- Permit Fee – A charge for a fire department permit for special or short-term events.

Other fees for service include agreements where one emergency service provider either wholly or partially supplies services to another.

There are good reasons for developing uniform fees for services; foremost of which is the reduced time, effort, and cost of developing independent fee schedules. Beyond duplicated effort and expense however, a consistent fee schedule across the Lewis and Clark County creates a more coherent public service image to the business and taxpaying communities.

Critical Issues

- Fire agency partners should design a standardized procedure for billing. For example, the process may establish a collection policy for non-payment, billing cycle, recordkeeping, billing service allowance, and oversight rules for the program.
- The agencies should constantly review fees for service for improvements and to capture potential sources of new revenue that may become available.

Guidance

- Evaluate any existing fee for service schedules. If possible, use one as the basis for developing uniform fees for service.
- Determine that all potential sources of revenue are included in the fees for service schedule. While all departments may now be providing the service, this will allow another fire department to provide the service and collect if applicable.
- Format the fees for service schedule for adoption by each organization.
- Investigate using a single source for billing for services. This is a service that may be provided by one of the Lewis and Clark County fire departments with the expertise and internal capacity. If no suitable department is available, develop an RFP.
- It is common to charge a fee for fire inspections. One fire department also uses inspection fees, but with a positive reinforcement twist. The department charges $35 per inspection. However, if the inspected property is found to be in compliance, or complies with fire department instructions before a follow-up visit, the fee is waived. If the occupancy fails to comply, the fee is applied for each fire department visit (usually $105 for three inspections).

Fiscal Considerations

- No significant financial considerations.

Partnering Strategy

R – Adopt a Single Lewis and Clark County Fire Code

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Fire Prevention

Affected Stakeholders

- All agencies, (including planning departments)

Objective

- Provide for a Uniform Fire Code with a single set of local amendments.
- Provide local amendments to apply for new construction, remodels, and tenant improvements in Lewis and Clark County.

Summary

The fire agencies in Lewis and Clark County have adopted a version of the fire code; and in some cases have added local amendments to address issues considered unique to the jurisdiction. Effective April 1, 2004, the State of Montana adopted the most up-to-date edition of NFPA 1: Uniform Fire Code (UFC), the 2003 Uniform Fire Code.

Discussion

One extreme illustration of how a fire code can seriously influence fire loss occurred during the Oakland Hills fire of 1991. Water supply was a major difficulty during most of the incident. Part of the problem is related to the fact that many of the responding emergency units were unable to connect to Oakland fire hydrants. When California adopted a standard two and one-half inch threaded connection for all hydrants, the cities of Oakland and San Francisco opted for three-inch connections while keeping a supply of adapters on hand for mutual aid units.

Minimum requirements for water supply, roadway widths, and access for fire apparatus *have been not been* adopted or *are not* enforced in all of the fire department jurisdictions. What should be of concern is when an area not having minimum requirements is to be annexed or further developed. A new development area can be required to meet current codes, but in most cases, these regulations cannot be enforced retroactively for existing structures.

The climate and geography of Lewis and Clark County make it an ideal place for disastrous wildfires to occur. The Lewis and Clark County fire departments universally share the hazard, which disregards geopolitical boundaries. Development of local amendments and ordinances of the fire code address the abatement of urban interface fire hazards; however, while the fire departments are united on some aspects of the issue, the agencies are independent in others. The wildfire hazard is a shared risk that should be addressed collectively. The Lewis and Clark Rural Fire Council has taken positive steps in adopting mutual aid agreements. These mutual aid agreements reach to other agencies including the State of Montana DNRC and the U.S. Forest Service.

The fire code includes provisions for appealing decisions. Appeals boards are formed to hear and decide appeals of orders, decisions, or determinations made by a code official about the application and interpretation of the fire code. The creation of an appeals board under a Lewis and Clark County fire code would eliminate the need for multiple boards.

Lewis and Clark County fire departments should continually promote fire resistive construction, built-in early warning, and fire suppression systems. Several communities now have exceptional local ordinances addressing construction, early detection, and built-in fire protection. These local ordinances could be used to model local amendments.

During new construction, remodeling, and modifications of existing structures, builders are required to meet fire and life safety codes. The fire code used during initial construction determines the fire protection that will be in place for years, and often decades. If only for this one reason, it is incumbent on the departments to adopt and apply a single up-to-date fire code across Lewis and Clark County.

Critical Issues

- A select committee of elected officials, fire prevention staff, building officials, builders, and fire administrators can work together to design local amendments.

Guidance

- Agencies must work closely with all building officials in the adoption of local amendments.
- Develop a model citation program for local adoption as part of the local amendments.
- Consider adopting the UWI (Urban-Wildland Interface) Code. Regardless of whether the Lewis and Clark County fire departments adopt a single fire code, each jurisdiction, especially those with urban-wildland conditions, should consider adopting the UWI at the local level.

  A positive example of the type of programs available is Project Impact, Helena Montana, offers prescriptive clearing of defensible space around homes, with a cost share approach. Administered by the Tri-County Fire Working Group, homeowners in Wildland Urban Interface areas, identified by fire risk maps in Jefferson, Lewis and

Clark, and Broadwater counties are eligible to participate. The program funded by National Fire Plan grants through USFS, BLM, Montana DNRC, and FEMA hazard mitigation grants.

Fiscal Considerations

- Marginal costs of creating a single fire code should compare favorably against the reduced level of effort required individually by the agencies.

Partnering Strategy

S – Purchase Uniform Emergency Apparatus

Level of Cooperation

- Functional

Timeline for Completion

- Long-term

Section

- Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Create a single set of emergency apparatus specifications.
- Provide uniform emergency apparatus for all Lewis and Clark County fire agencies.

Summary

The Lewis and Clark County fire departments maintain a variety of emergency apparatus types. Among the common types of apparatus, (such as pumpers) each department uses equipment of different makes, models, and configurations. A standard specification and procurement process for each Lewis and Clark County apparatus type would result in lower cost, faster production, and training efficiencies.

Procurement of uniform fire apparatus can translate into lower purchase price, reduction in parts warehousing, and less money, time, and effort spent training drivers and maintenance personnel. Other benefits include greater interoperability, a potential for reduced driver training, and greater confidence and skill among operators.

Discussion

The apparatus fleet of the Lewis and Clark County fire departments is incredibly diverse. Fire apparatus are categorized by function including pumpers, aerial devices, water tenders, wildland units, rescue units, and ambulances. While there is an identifiable need for vehicles from each category in more than one configuration, acquiring and maintaining standard apparatus creates desirable efficiencies. Dissimilar apparatus tends to increase purchase cost, requires additional initial and recurrent training, and results in the need to warehouse a larger parts supply.

The cash price of a pumper frequently exceeds $300,000; the cost of an aerial unit may easily exceed twice that amount. The reasons for such prices are due to customization, add-ons, and options that tend to make each fire apparatus a “one of a kind” vehicle. The cost to equip, maintain, repair, train operators and mechanics, and to warehouse parts only adds to the overall expenditure.

Fire apparatus useful service life varies generally depending on the rate of use, the environment, operating conditions, and the frequency and level of preventive maintenance. A fire pumper with average to heavy use can reasonably be expected to have a ten to fifteen year service life. With light to very light use, service life can reach twenty years and beyond; very heavy use may reduce service life to as few as ten years. Aerial devices are often operated less frequently and have a useful life of between fifteen and twenty years. Technology and economics also influence apparatus service life. At some point, the cost to operate and maintain a fire apparatus exceeds the economics of rehabilitation, refurbishment, or replacement.

The two pumpers in the figure below are operated by different fire departments. Both are similar units, but each has unique features that can add to the overall cost of operation. Some of the distinctive features of each includes manufacturer of the chassis and body, compartment door styles, and engine exhaust brake versus transmission output retarder.

Figure 47: Fire Apparatus Illustration

Manufacturer	KME
Build Date	05-99
Miles	49,973
Hours	4,403
Chassis	KME
Foam system	Hale Foam Master w/ 2-20 gallon A & B foam cells
Condition	Good
Value	$166,000
Comments: Transmission output retarder. 4" LD intake front bumper & 4" LD discharge right pump panel. Honda portable generator 2,500 watts.	

Manufacturer	Saulsbury
Build Date	12-03
Miles	5,953
Hours	229
Chassis	Spartan
Foam system	Hale foam system w/ Pneumax CAFS 40-gallon A & 20-gallon B" foam cells.
Condition	Excellent
Value	$328,000.00
Comments: Jake Brake. 4" LD intake front bumper & rear body. 4" LD discharge left & right pump panel. Honda portable generator 2,500 watts. Extrication tools.	

We use these three differences in the apparatus to illustrate how each may influence apparatus operational costs and efficiencies.

Figure 48: Impact from Apparatus Differences

Jacob's and engine exhaust brake	Roll up and conventional compartment doors	Different manufacturers
Method of operation	Initial cost difference	Method of operation
Training of operators and maintenance personnel	Different storage layout for equipment	Training of operators and maintenance personnel
Reoccurring training	Parts for maintenance and repair	Reoccurring training
Parts for maintenance and repair		Parts for maintenance and repair

A trend is developing within the fire apparatus manufacturing industry. Several manufacturers now offer a line of stock fire apparatus built on custom chassis in addition to a more traditional line of fully custom units. The cost savings of purchasing a stock unit is often twenty percent or more when compared to a custom unit.

Some fire departments use the option of lease purchasing to fill emergency apparatus need. Some of the benefits associated with leasing are:

- Leasing may provide a cost advantage over conventional financing by transferring tax incentives (accelerated depreciation) associated with the equipment ownership from the Lessor (the owner) to the Lessee (the user) in the form of lower lease payments.
- Leasing can provide one hundred percent financing, conserving cash.
- Leasing can provide a close matching of the lease term and payments to the revenue available to the fire department.

Safety should always be the main consideration when purchasing and operating emergency fire apparatus. When developing emergency fire apparatus specifications and operational procedures, NFPA and other industry standards should be used. Additional guidance on fire apparatus safety devices, response, and training can be found in the *Emergency Vehicle Safety Initiative*.[53]

Guidance

- Assemble data all apparatus including age, mileage, operating hours, maintenance costs, cumulative down time, and annual test results. Use the information to create an apparatus replacement schedule.
- Determine the replacement interval and projected life expectancy of each apparatus.
- Examine the merits of extending the useful service life of apparatus through rehabilitation and refurbishment.
- Consider the option of purchasing all categories of fire apparatus from a sole source.
- Develop an emergency apparatus prescribed load list for use by all Lewis and Clark County fire agencies.

Mark apparatus in a standard format with striping, decals, and department name following NFPA standards and recommendations from the *Emergency Vehicle Safety Initiative*.[54]

- Develop a mobile apparatus repair and service response unit(s).
- Develop central facilities(s) for maintenance and repairs for all emergency apparatus.
- Create Standard Operating Guidelines for the operation, maintenance, and recordkeeping of apparatus. A resource for obtaining sample documents may be found at the National Fire Service Library website.[55]
- Outfit reserve apparatus with the same compliment of equipment as frontline units.

[53] Department of Homeland Security, FEMA, U.S. Fire Administration, *Emergency Vehicle Safety Initiative.FA-272*, August 2004, pages iii, iv.
[54] Ibid.
[55] Western Fire Chiefs Association, National Fire Service Library, www.wfca.com

Fiscal Considerations

- Time and effort savings by preparing fewer bid specifications.
- The prospective for conducting fewer bid processes.
- Investigate the letting of apparatus bids for periods longer than one year.
- Cost savings in acquiring emergency fire apparatus.
- Consider the purchase of stock versus custom apparatus.
- Consideration of lease versus outright purchase of emergency apparatus.

Partnering Strategy

T – Develop Uniform EMS Recertification Training and EMS Supervision

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- EMS

Affected Stakeholders

- All agencies

Objective

- Provide a single point for recertification of all Lewis and Clark County EMS personnel.

Summary

The EMS system of Lewis and Clark County consists of a number of fire first response agencies, all providing similar first response services, albeit at either the ALS or the BLS levels. ALS transport in the county is provided by the hospital ambulance service based at St. Peter's Hospital in Helena. Lincoln FD and Augusta FD have BLS transport service in addition to first response EMS.

Each agency requires some form of EMS training and EMS certification. Generally, the EMS training is based on the certification requirements. Each of the agencies has some form of system; either formal or informal, to oversee performance and provide a certain level of effort managing EMS personnel.

At present, EMS management and training capacity is fragmented because each agency in general only oversees that agency. The ability to manage the system using a joint management structure for EMS will reduce that fragmentation, and at the same time, ensure a single method of overseeing and managing the personnel in the EMS system.

Discussion

Creating one Lewis and Clark County EMS training and management oversight process would allow the fire service to maximize the supervisory capability of local fire service agencies. A single EMS management and training structure promotes enhanced coordination of resources and expanded abilities to standardize quality and levels of care. Agencies presently without adequate structure for managing emergency medical service can benefit from oversight that is supported by all of the

agencies. This allows the Lewis and Clark fire agencies to maintain a unified coordinating point for the county's EMS functions, which permits the agencies to be more credible in making proposed improvements.

Yet, a single EMS management structure is not without challenges. Some agency personnel will have multiple reporting structures. Some of the staff of the hospital ambulance are also paid career or volunteer firefighters. Using an EMS management structure in addition to a standard fire agency structure could create confusion for field personnel. Further, the structure of a multi-agency EMS system will create oversight issues for the management team. The agency managers (fire chiefs, boards, councils, and commissioners) will have to agree on such issues as personnel issues, cost distribution, roles and responsibilities, and how the EMS infrastructure will be managed.

Critical Issues

- Training issues
    - The personnel used to provide ALS management must be cross-trained to understand the management structures and oversight capabilities of each of the host agencies. Included with this would be the ability to work in the NIMS system.
    - Each agency will have to coordinate to ensure that appropriate training is provided to EMS personnel
    - The agencies in the system must have a method to ensure that the EMS management structure will be used appropriately by the oversight agency during EMS events.
- Roles and responsibilities
    - Fire agency partners should clearly define the roles and responsibilities of the EMS structure in the system.
    - The roles and responsibilities should be clearly communicated to all personnel.
    - The EMS management structure should continue to be coordinated with the Lewis and Clark County and City of Helena Ambulance Board.
    - Fire agencies should investigate integrated electronic reporting mechanisms for patient care reports.
    - Quality assurance methods should be structured to ensure an integrated method of overseeing quality assurance can be accomplished.
- Financial and fiscal considerations
    - Personnel needed for oversight of the system should have the appropriate rank to manage the system.
    - An integrated patient care reporting structure should be in place. Electronic reporting hardware and software should be integrated. Purchasing an electronic system may be needed.

- Marginal costs of deploying additional EMS personnel will be determined based on the agency, and on volunteer recruitment or in the case of career staff, personnel costs.

Guidance

- Develop a system-wide, cross-functional committee to explore an EMS oversight process.
- Establish standards for EMS system quality assurance and reporting.
- Establish standards and methods for overseeing the day-to-day operations of the EMS system.
- Align agencies to provide EMS oversight.
- Ensure agency support for standardized EMS services. The agency support will be based on the roles and responsibilities established by the cross functional team.
- The agencies must determine whether they should provide support 24 hours per day, 40 hours per week, or in combination with another position.

Fiscal Considerations

- Financial support will be necessary to provide 24-hour coverage and a different level of support will be required for 40-hour EMS oversight. An option is to incorporate this function with a current position.
- The agencies must determine whether and what type of hardware and software will be needed for patient records.

Partnering Strategy

U – Acquire AVL, and MDC or MDT Capabilities

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Provide AVL (Automatic Vehicle Locator) information transmitted to dispatch for use during emergency and non-emergency incidents.
- Provide standardized MDC/MDT (Mobile Data Computer or Mobile Data Terminal) in emergency apparatus.

Summary

Automatic Vehicle Location (AVL) provides real-time location information for apparatus. An AVL system consists of a GPS receiver on the apparatus, a communications link between the unit and a dispatch center, and pc-based tracking software for dispatch. The communication system is usually based on a network similar to those used by cellular phone systems.

Mobile data terminals (MDT) permit communication between dispatchers and fire apparatus without reliance on voice radio. A digital display on the vehicular MDT shows short messages. Dedicated keys and a touch screen permit an officer to issue commands and status reports quickly. MDTs also function as the communication link between the AVL, and CAD software.

Like MDTs, mobile data computers (MDCs) permit instantaneous communication between dispatchers and fire apparatus without the need for voice radios. MDCs can also be used for messaging, electronic dispatching, and vehicle monitoring. The units are available with GPS capability. The major difference between an MDT and an MDC is that the latter include all of the hardware and software abilities of a traditional laptop computer. MDTs on the other hand, merely function as a link to a larger computer server usually located in the dispatch center.

Discussion

AVL – The Global Positioning System (GPS) provides the backbone for AVL. GPS is funded by and controlled by the U. S. Department of Defense (DOD). While there are many thousands of civil users of GPS worldwide, the system was designed for and is operated by the U. S. military. GPS provides specially coded satellite signals that can be processed in a GPS receiver, enabling the receiving unit to compute position, velocity, and time. Four GPS satellite signals are used to compute positions in three dimensions and the time offset in the receiver clock.[56]

GPS provides the location of a vehicle with accuracies of about 25 to 30 feet. A geographic location is logged into the vehicle's GPS unit and transmitted along with the unit identification to dispatch. Information displayed may include time, unit speed, and heading. The frequency of updating vehicle information can be set for any variable of seconds or minutes.

If cellular coverage is inadequate, an alternative satellite communications network may be available for certain areas. The communication satellite receives location information from the AVL's satellite transmitter and forwards it to the dispatch center. The dispatch software shows vehicle locations in relation to streets and intersections. Most AVL systems have a feature for two-way mobile messaging that allows e-mail messaging to and from the apparatus over a wireless internet link.

Additional options and features that can be added to AVL include:

- Display vehicle position, speed, heading
- Display dispatch addresses and routing suggestions
- Provide visible and audible alerts to crews
- Replay vehicle activity with user defined date and time
- Create unit reports
- Display vehicle status

Benefits of AVL include:

- Display precise location and status of emergency apparatus
- Enhance the ability of commanders to control emergency resources
- Increases apparatus operator safety
- Ability to locate and dispatch the nearest emergency response unit

[56] Peter H. Dana, *The Geographer's Craft Project*, Department of Geography, The University of Colorado at Boulder.

- Reduces response times
- Uses current investment in GIS data
- Increase in number of units dispatchers can manage appropriately
- Tracking report documentation

MDC/MDT – Mobile data computers and mobile data terminals are computerized devices used to communicate between emergency vehicles and dispatch. MDTs feature a screen on which to view information and a keyboard or keypad for entering information. The terminal may be connected to various peripheral devices. With MDC/MDTs, fire and EMS agencies are more likely to work with up-to-date information. The devices are used during emergency response to locate addresses, anticipate what will be encountered on-scene, receive updated call information, for recordkeeping, and to gather data used to show trends and patterns.[57]

Prior to electronic media, most information was gathered by officers in the field and was subsequently transmitted to others verbally, or via hand written notes and reports. Raw statistical information was usually stored as written documents, a form not well suited to analysis. Now, of course, the computer has taken over most data collection, transmission, dissemination, compilation, and storage.

One school of thought is that MDTs are better suited for fire and EMS service, yet many fire administrators argue that MDCs are superior. A list of some of the perceived attributes of each is listed in the figure below.

Figure 49: Comparison of Features - MDT versus MDC

MDT	MDC
Longer life expectancy	Shorter life expectancy and need for frequent repairs
Brighter screen	Units not bright enough
Less likely to be stolen	May be stolen
No mobility	May be used out of vehicle as a laptop
Durability	Less durable
Difficult to upgrade	Easily upgradeable
Lower initial cost	High initial cost
Detachable keyboard	Non-detachable keyboard

Critical Issues

- Using a cost-benefit analysis determine which systems (AVL, MDT, and/or MDC) are financially viable for use by the Lewis and Clark County fire departments. A cost-benefit analysis can be used to estimate the total capital investment represented by the purchase of the equipment, and then establishing if the expenditure is justified by the gains in dispatch, response, and incident command.

[57] Public Safety Mobile Data Systems, www.911dispatch.com/information/mobiledata.html, October 2004.

- Include in the analysis the cost to train emergency communications and fire department personnel.

Guidance

- Strongly consider the incorporation of AVL technology into a MDC/MDT system versus a standalone AVL.
- In a white paper report published in June 2005, the author lists five reasons mobile technology projects fail.[58] They are:
  - The complexity of the mobile deployment is underestimated
  - Solutions are built upon flawed assumptions
  - Business (operations, dispatch) and IT priorities are misaligned
  - Hardware-dependent approaches are doomed to failure
  - Losing sight of the end result during deployment of mobile solutions
- Anticipate the useful life expectancy of the system and consider leasing or funding replacement
- Determine time savings for automatic data entry versus manual
- Security and access issues should be addressed prior to system design
- Are adequate radio frequencies/channels available for MDT/MDC
- Determine interoperability prior to system purchase
- Exercise caution in the selection process for equipment size and the ability to mount hardware in vehicles. Concern for safety of personnel
- Involve staff, operations, dispatch, and other key individuals in system design and development
- Develop operational policy

Fiscal Considerations

The costs to install a stand-alone AVL system are dependent on its level of sophistication, and the included components. A system can range from those with basic features to very comprehensive systems. Be mindful that there are significant costs for the dispatch center equipment and software. While hardware costs for a very basic AVL system can begin as low as $350 per vehicle plus installation and software, total system cost per unit may realistically exceed $20,000. An option is to outsource the installation, integration, and maintenance of AVL and MDC/MDT systems.

- Procurement costs to install equipment and software both in fire apparatus and at the dispatch center.
- Labor cost to maintain vehicular and dispatch AVL, MDC/MDT equipment, the time required to train workers on the new systems, and for any additional IT staff.

[58] *The Top 5 Reasons Why Mobile Projects Fail – And What You Can Do About It*, June 2005, Addesso Systems.

- Cost of system is highly variable dependent on selection of AVL and/or MDC/MDT, or a combined system.

Partnering Strategy

V – Develop Uniform Pre-Incident Plans

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Provide a system of shared operational plans for use during emergencies and non-emergency incidents.

Summary

Pre-incident plans are an important part of the emergency response system to provide essential information on specific structures and processes. Through timely planning, strategy and tactics can be developed before an emergency occurs. Pre-incident planning involves evaluating protection systems, building construction, contents, and operating procedures that may affect emergency operations.

Pre-incident plans should be kept up to date. The plans should be used in company training, and should be distributed to all mutual/automatic aid partners. The standards set fourth in NFPA 1620, *Recommended Practices for Pre-Incident Planning* should be followed to guide in the development of a regional pre-incident planning system.[59]

Discussion

A firefighter typically works in an alien environment of heat, darkness, confusion, and extreme danger. Often, a firefighter's first visit to a building is when he or she is summoned to an emergency at the facility; the very time that the internal environment of the structure may be at its worst. Contrary to Hollywood's portrayal of the inside of a building on fire, visibility is likely to be nearly zero due to smoke. A lack of familiarity with the layout of a structure can easily cause a firefighter to become disoriented and subsequently suffer injury.

[59] NFPA, National Fire Protection Association, *NFPA 1620 Recommended Practices for Pre-Incident Planning*, 2003 Edition.

It is important that firefighters and command staff have accurate information readily at hand to identify hazards, direct tactical operations, and understand the proper use of built in fire resistive features of some structures. This can be accomplished by touring structures, developing pre-incident plans, and conducting tactical exercises — either on-site or tabletop.

An ideal pre-incident planning system uses standard forms and protocols. Data are collected in a consistent format. Information is presented in a manner that permits commanders and emergency workers to retrieve it quickly and easily. All require the use of consistent methods for collection, verification, storage, presentation, and update of emergency plans.

The most successful programs use pre-incident planning software to assemble the data, create plan documents and "quick data" forms, and store the information for easy retrieval. Above all, no program is successful without thorough incorporation of the pre-incident plans in frequent classroom and on-site training exercises.

The evaluation phase of this process identified that completion of pre-incident plans should given high priority. For the most part, Lewis and Clark County fire departments now complete pre-incident plans on only a limited number of target hazards within individual response areas. Process and plan consistency is essentially non-existent. The plans that are completed are not typically distributed to mutual aid departments.

Operational, management, and city/county IS/IT staff should assist in making software and formatting decisions. Goals for the identification and development of target hazard pre-incident plans should be established. The uniform pre-incident planning program should be reviewed at least annually to assure the accomplishment of goals, the improvement of the program, and the appropriate entry of new target hazards. Properties that should have pre-incident plans include those having:

- A potential for large occupant load
- Occupants that are incapable of self rescue
- Structure size larger than 12,000 feet
- Facilities that process or store hazardous materials and/or equipment
- Buildings with built-in fire protection systems
- Wildland hazards

Pre-incident plans should be a quick and easy reference tool, for company officers and command staff. The plans should be formatted for easy adaptation to electronic media. At a minimum, a pre-incident plan should include information on, but not be limited to:

- Building construction type
- Occupant load
- Fire protection systems
- Water supply
- Exposure hazards
- Firefighter hazards
- Utility location and shutoffs
- Emergency contact information

NFPA 1620 provides excellent information on the development and use of pre-incident plans and should be used as a reference. NFPA 1620 addresses the protection, construction, and operational features of specific occupancies to develop pre-incident plans.

Personnel should receive regular familiarization training using the completed pre-incident plans. The plans must be made available on all emergency apparatus, regardless of jurisdiction. Routine use of pre-incident plans by all responders will assure that the plans are correctly used at major emergencies.

Guidance

- Inventory current pre-incident plan hardware, software, format, and level of development of each fire department.
- Evaluate commonality between current systems of pre-incident planning.
- Consider the establishment of a steering committee to develop building criteria and data for inclusion in pre-incident plans.
- Develop a timeline for the implementation, completion, and review of pre-incident plans.

Fiscal Considerations

The cost to each fire department for developing uniform pre-incident plans will be predicated on:

- Current hardware and software assets
- Cost to upgrade or purchase hardware and software
- Number of facilities/buildings with existing pre-incident plans versus those to develop
- The pace of new development requiring pre-incident plans

- Personnel costs to gather and assemble plans
- Personnel soft costs of on-duty and volunteer staff assigned pre-incident planning tasks
- Unquantifiable potential for prevention of injury or death to emergency responders and the public

Diagramming software programs designed specifically for drawing pre-fire plans starts around four hundred dollars. More advance versions with 3D capability increases the initial software cost to seven hundred dollars. Versions that integrate with a pocket PC would add an additional three hundred dollars. This and other diagramming software programs are made to be added onto existing fire prevention/inspection programs.

Partnering Strategy

W – Provide for Joint Staffing of Stations and Apparatus

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Emergency Operations

Affected Stakeholders

- All agencies

Objectives

- Provide for distribution of facilities and deployment of personnel consistent with a Lewis and Clark County standards of cover.
- Provide consistent fire and emergency services within areas efficiently before, during, and after development.

Summary

Practicality and external influences seldom allow fire station placement to match perfectly with a fire department's deployment strategy. Reasons include the availability of property, land use laws, roadway infrastructure, construction cost, traffic patterns, geography, and projected station workload. Given that the area protected by a fire department may change through annexation, merger, and contracted protection, a perfect station location today may be a poor location in the future. Because of these and other factors, it is virtually impossible to place fire stations in an ideal location and not overlap the response zones of other fire stations or departments. Jointly staffed stations and/or response units create more alternatives for fire departments studying the deployment of emergency resources.

Fire departments often know how many firefighters are needed for the best possible protection; however, departments are infrequently able to afford to staff at such levels. Sharing personnel from different agencies can help to bring staffing levels closer to the optimum.

If the Lewis and Clark County fire departments create a single training division, some provision is needed to offer response area coverage while other emergency units travel to a training center. Jointly staffing a PAU (Peak Activity Unit) with multi-agency personnel could protect vacant response zones during those times. Jointly staffing fire apparatus can also be a very practical option for

providing resources from a fire station located in an area able to serve more than one jurisdiction. Last, cooperatively providing specialty apparatus used for infrequent (but often high-risk) emergencies is an effective means to distribute the cost of such apparatus over a wider financing base.

Discussion

The NFPA recently published a state-by-state study of the needs of the U.S. fire service. The Montana version of the June 2004 report, *A Needs Assessment of the Fire Service – Montana*, states: that while statistics specific to Montana have not been developed:

> *"Using maximum response distance guidelines from the Insurance Services Office and simple models of response distance as a function of community area and number of fire stations, developed by the Rand Corporation, it is estimated that three-fifths to three-fourths of fire departments nationally have too few fire stations to meet the guidelines. Statistics specific to Montana have not been developed."*

Lewis and Clark County fire departments now rely on each other for resources during routine and non-routine emergencies. Without question, if facilities are distributed and personnel deployed regardless of jurisdictional boundaries (and consistent with a Lewis and Clark County standard of cover) the likelihood of those resources being located where needed most increases. The crucial question is how to pay for shared resources in a manner that assures equity for all taxpayers.

The funding of jointly staffed fire stations and apparatus should be based on local law, authority, and policy. There are many examples of innovative cooperative agreements between jurisdictions that maximize the value of emergency resources. For instance, the Cities of Portland and Gresham, Oregon jointly staff a fire station that is located to respond efficiently to emergencies in both cities. For the first five months of each year, a three-person ALS fire company is housed and supported in the station by the City of Gresham. During the remaining seven months of the year, a Portland Fire and Rescue four-person ALS engine responds from the station. As change occurs in the protected area, the two cities can easily adjust liability by altering the time each operates the station. The agreement assures timely and effective emergency response while a financial balance is maintained that benefits the taxpayers of both cities.

Examples of methods used to jointly staff stations and apparatus include:

- Combined personnel from different fire departments staff a station.
    - Such as – One fire department supplies a firefighter for each shift and another fire department contributes an apparatus operator/engineer and an officer. The workforce is made up each day of personnel from both fire departments.
- Personnel from different fire departments staff a station on a set schedule.

  - Such as – One fire department staffs the station on two of three shifts. The other department staffs the station on the third shift.

- Fire departments apportion responsibility for staffing and support of a station for a given number of months.
  - Such as – One fire department staffs and supports the station for a given number of months each year. During the remaining months, the other fire department provides staff and support.
- Two fire departments jointly staff a fire station with personnel from both fire departments, and operate more than one piece of emergency apparatus.
  - Such as – One fire department staffs a fire engine and the other department staffs a medic unit in the same station.
- One fire department staffs a fire station but extends first alarm response from that station to another jurisdiction. The second fire department compensates the first based on an agreed cost/benefit formula.
- Two fire departments exchange in-kind first alarm response.
  - Such as – One fire department provides first alarm response into another fire department's area in exchange for like service from that agency.

Guidance

- Training issues
  - The personnel used for joint staffing of stations and apparatus should be trained to provide a service level (including EMS) equal to or greater than that of the cooperating fire departments.
- Deployment considerations
  - Deployment standards for the partnering Lewis and Clark County agencies should be developed and adopted.
  - The fire departments should execute deployment plans between the agencies prior to entering joint staffing agreements.
  - Provide a Lewis and Clark County IC (Incident Command) for supervision of emergency operations and for oversight of on-duty and volunteer personnel during routine operations.
- Financial considerations
  - Marginal costs of deploying personnel in joint staffing ventures will be determined based on the agency, and on personnel costs.
  - Startup costs may include additional training as well as the supplies and equipment needed to support the stations and fire response units. A portion of the cost for additional training and equipment could be immaterial, if as part of the cooperative initiatives the Lewis and Clark County fire departments also adopt deployment standards, training standards, and a joint purchasing program.

Fiscal Considerations

- Joint staffing provides fire departments with a way to meet deployment standards when:

  - It is not economically feasible for a fire department to staff a station or fire apparatus independently.
  - Fire departments have common borders and underserved territories.

- Joint staffing provides the political entities with an emergency service exit strategy where future annexation may remove or transfer territorial responsibility.

Partnering Strategy

X – Provide Lewis and Clark County IC and Operations Supervision

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- EMS and Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Provide for IC (Incident Command) supervision of emergency operations.
- Provide for supervision of on-duty and volunteer personnel during routine operations.

Summary

Battalion chiefs (BCs, sometimes also referred to as incident commanders or shift supervisors) routinely have authority and responsibility for all aspects of day-to-day operations and personnel management of the fire department. BCs assume command of emergency incidents and may be assigned for the management of various fire department programs.

The Helena FD currently uses BCs to provide supervision of daily operations, shift personnel, and incident command. The other fire departments in Lewis and Clark County rely on the fire chief, a designated officer, or do not have an officer assigned as the incident commander.

Discussion

Authority for creating shared IC and operations supervision is granted under Montana Code. Cities and fire protection districts may enter into a contract for services or adopt mutual aid agreements.[60]

> *"A mutual aid agreement is an agreement for protection against natural disasters, incidents, or emergencies or disasters, incidents, or emergencies caused by persons."*

[60] Montana Code Annotated – 2005, **7**-33-4112. Mutual aid agreements -- request if no agreement exists – definitions, 7-33-2107. Contracts for fire protection services, 7-33-2108. Mutual aid agreements -- request if no agreement exists – definitions.

Battalion chiefs typically provide administrative oversight, supervision, and leadership to the operations personnel of the fire department. The work of the BC is performed under the direction of the fire chief, assistant fire chief, or division chief; but considerable latitude is usually granted to BCs to initiate action and exercise independent judgment. Battalion chiefs assigned to shift work and duty chiefs (on-call of duty battalion chief coverage is common in volunteer organizations) are usually responsible for management of emergencies, personnel, stations, apparatus, equipment, training functions, and related activities. Other programs commonly administered by battalion chiefs include oversight of training, fire prevention, or administrative divisions.

Most fire departments maintain a span of control of five or six stations per battalion chief. Occasionally, BCs may oversee as many as eight fire stations. The total number of units, personnel, and emergency responses usually determines the reasonableness of the span of control. The more stations, units, and personnel under the BC's supervision, usually reduces their ability to conduct activities outside of incident command, and may negatively impact response times to emergencies. A point is reached where proper battalion chief supervision cannot be accomplished with large spans of control. In that case, some tasks will be overlooked or work will not be completed.

A BC usually responds as incident commander to emergencies requiring multiple fire department units, hazardous materials incidents, or emergencies involving special circumstances. The incident commander is responsible for all aspects of the response including the development of incident objectives and management of all incident operations. The three command-level positions directly under supervision of the incident commander are the safety officer, information officer, and liaison officer.

The role of the safety officer is to develop and recommend actions to assure the health and safety of emergency workers. The role of the information officer is to develop and release incident information to the media, incident personnel, and appropriate agencies and organizations. The role of the liaison officer is to serve as the point of contact for coordinating activities between the various agencies and groups that may be involved in an incident.

The general staff under the incident commander includes operations, planning, logistics, and finance. These responsibilities (as with those of the command staff) remain with the incident commander until such time that they may be assigned to another qualified individual.

Benchmarks

Assembling an effective response force on the scene of an emergency incident in a timely manner will often lead to a successful outcome. To assemble enough personnel to complete the tasks of extinguishing a moderate-risk structural fire may require fifteen fire suppression personnel. One of those tasks is command. A BC in the command role is the officer assigned to remain outside of the structure to coordinate the attack, evaluate results and redirect the attack, arrange for more resources, and monitor conditions that might jeopardize crew safety.

In lieu of unification between all Lewis and Clark County fire departments, an agreement to share incident command staff across the region could result in efficiencies not possible individually.

Guidance

- Use standards of coverage and deployment documents to determine an appropriate level and number of incident commanders for the Lewis and Clark County.
- Create a formula for allocating the cost of a regional incident command program. Examples of factors for costing include; population, incidents, valuation, and coverage desired.
- Develop a job description for the position of incident commander/battalion chief for that includes duties and responsibilities for all Lewis and Clark County fire departments.

Partnering Strategy

Y – Develop Uniform Incident Reporting Guidelines

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- EMS and Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Develop incident reporting standards for Lewis and Clark County emergency operations.
- Evaluate performance against standards.

Summary

This partnering strategy is directly related to the strategies "Z – Provide Guidelines for Fire Response," and "AD – Provide Guidelines for EMS Response"

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Title 50, Chapter 3 of the Montana Code Annotated authorizes the fire prevention and investigation program. One function of the State Fire Marshal's is to manage the National Fire Incident Reporting System (NFIRS) for Montana. The fire marshal's office collects data in National Fire Incident Reporting System (NFIRS) format. It was not determined how many and to what extent the Lewis and Clark County fire departments are reporting data to the state fire marshal. To evaluate performance against standards, all fire departments in the Lewis and Clark County must use standardized incident reporting guidelines.

Discussion

The problem of reporting uniformly is not unique to the Lewis and Clark County. Commonly, a problem occurs when fire departments use different timeframes in collecting and reporting response time statistics. For example, if a department does not include alarm processing or turnout time in its definition of response, that department's response statistics may be unfairly weighted because only travel time to the emergency is measured and reported. On the other hand, a department that does include alarm time and processing time in its collection of data may be compared unfavorably to a department that does not.

The NFRIS handbook provides this definition for alarm time:

> *"The actual month, day, year, and time of day (hour, minute, and (optional in on-line entry) seconds) when the alarm was received by the fire department."*

The definition for arrival time is:

> *"The actual month, day, year, and time of day when the first responding unit arrived at the incident scene. This is not an elapsed time."*

For purposes of a comprehensive response analysis, these definitions would be inadequate without each of the Lewis and Clark County fire departments creating and using uniform incident reporting guidelines. Likewise, analysis of accurate statistical data can be used to improve fire department operations. Using uniform incident reporting guidelines, Lewis and Clark County agencies would have access to a larger sample of information on which to draw conclusions and develop strategies for reducing firefighter and civilian injury.

Critical Issues

- Data issues
  - An integrated fire advisory committee may define data points to be used to capture and report on response performance.
  - The fire departments should collaborate with the dispatch center to ensure that the data points can be captured by the dispatch center.
  - The dispatch center should develop continue to report on response performance using industry standard fractal reporting methods.
- Performance considerations
  - Fire agency partners should design standard guidelines for response performance. For example, response zones for urban, suburban, and rural deployment areas may be defined to reflect performance variances based on the population density of the communities being served.
  - The agencies should determine valid and reliable performance reporting methods for response performance.
  - The agencies should constantly make improvements to response methods to maximize performance given the available resources in the communities.
- Financial and fiscal considerations
  - Marginal costs of providing committee work and coordination with the county will detract from other services.
  - Reporting will require additional resources from the fire agencies and from dispatch.
  - Only limited out-of-pocket costs will be required, possibly for software and training.

Guidance

- Establish a technical advisory committee to provide design and development of appropriate data points and reporting methods.
- Create response standards.
- Create standards of reporting for the system.
- Determine the type of incident report forms to be used. Examples of forms that correspond to NFIR include:

  Incident Report – short form used each time a fire service unit moves in response to an alarm of any type.

  Incident Report – long form used for responses that involved death or injury to a civilian or firefighter, and fires involving loss of property, such as a structure or mobile property.

  Hazardous Materials Incident Report – used for a hazardous materials incident.

  Civilian Casualty Report – used in the event of a civilian injury or casualty. An incident report long form must accompany this document.

  Fire Service Casualty Report – used in the event of a firefighter injury or fatality.
- Implement data capture and reporting on a system-wide basis.
- Develop a single policy with instructions for completing incident reports. At a minimum it should establish:

  Individual responsible for completing documentation.

  Type of forms to be used on incidents.

  Action to take with completed forms.

  Process to provide for a review of incident reports.

Fiscal Considerations

- No significant financial considerations.

Partnering Strategy

Z - Provide System-Wide Guidelines for Fire Response

Level of Cooperation

- Functional

Timeline for Completion

- Short to middle term

Section

- EMS and Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Define response times including maximum response times and response time definitions so that adequate system planning can take place. Establish parameters for maximum response times on a per-call basis. Develop a system-wide reporting structure to standardize the collection and reporting of response times.

Summary

This partnering strategy is directly related to the strategy "AD – Provide System-Wide Guidelines for EMS Response." Dependent on the partnering strategies that are chosen for implementation, the two may be developed simultaneously or independently.

Response times are one of the most frequently used methods of measuring system performance. Fire agencies and policymakers require a gauge by which to measure the effectiveness of the system, and a method by which to make decisions. Because the economic cost of fire protection is highly sensitive to response times, a small change in response time requirements may cause a significant change in cost. Policymakers must therefore carefully consider the balance between the economic cost, fire risk, and the highest savings of life and property at the least cost.

Discussion

In conducting research for the Commission on Fire Accreditation International, Inc. (CFAI), members of the initial task force spent considerable effort toward examining the factors that make up the time required to be notified of and respond to a fire emergency. A thorough understanding of the relationship of time and the progression of an emergency was fundamental to defining optimum service levels. In the process of this work, the task force noted that many fire departments are

collecting data on emergency response, but are not necessarily using that data to measure performance.[61]

Commonly, a problem occurs when fire departments use different timeframes in collecting and reporting response time statistics. For example, if a department does not include alarm processing or turnout time in its definition of response, the department's response statistics may be unfairly weighted because only travel time to the emergency is measured and reported. On the other hand, a department that does include alarm time and processing time in its collection of data may be compared unfavorably to a department that does not.

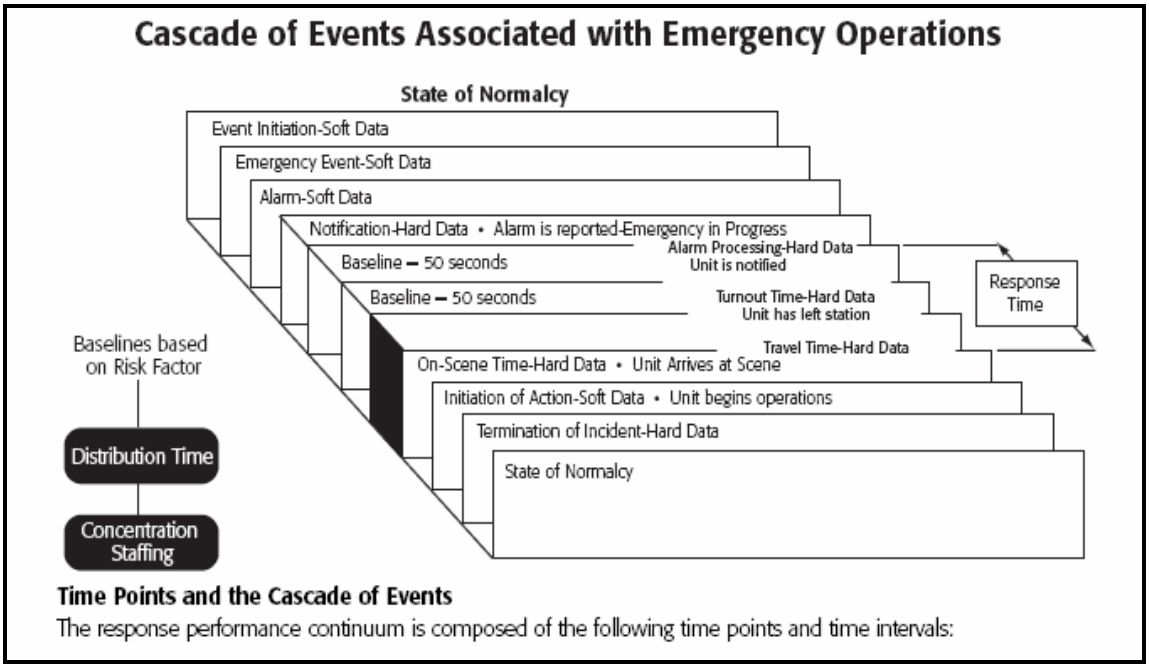
Fire emergency response times are not well defined in Lewis and Clark County. Consequently, it is unclear which standards the agencies use to determine if response requirements are met. We recommend that appropriate Lewis and Clark County fire response intervals be defined and adopted. Definitions should include the time to be measured, including at least the following:

- **Total response time** — the time required for response, measured as the time between when the emergency responder is notified of an incident by the dispatch agency and when the responder's vehicle comes to a complete stop at the scene (or staging area).
- **Turnout time** — the time measured between when the emergency responder is first notified of an incident by the dispatch agency and when the responder's vehicle begins moving toward the incident.
- **Travel time** — the time measured between when the emergency responder's vehicle begins moving toward the incident and when that the vehicle comes to a complete stop at the scene (or staging area).

The International Association of Fire Chiefs (IAFC) makes recommendations for response times and has established a "Cascade of Events" to assist responders in understanding response intervals for emergency operations. Irrespective of the standard used, system regulators establish an appropriate response time reporting method for their local communities. While the IAFC method includes dispatch-processing time as a component of response time, we elect not to use that method because responders rarely have control over the dispatch center to the extent that they can influence those times. Regardless, the dispatch processing times should also be monitored by the system and standards for dispatch established.

[61] *Creating & Evaluating Standards of Response Cover for Fire Departments*, Fourth edition, Chapter 2, Page 1, Commission on Fire Accreditation International, Inc, 2003, Chantilly, VA.

Figure 50: Emergency Operations - Cascade of Events



Response intervals for emergency services are not standardized for different demographic regions in Lewis and Clark County. The agencies should therefore, have a universal method to both capture and report on response times.

Critical Issues

- Data issues
    - An integrated, inclusive emergency operations and/or EMS advisory committee may define data points that will be used in the system to capture and report on response performance.
    - The fire departments should collaborate with the dispatch center to ensure that the data points can be captured by the center.
    - The dispatch center should develop methods to report on the response performance using industry standard fractal reporting methods.
- Performance considerations
    - Fire agency partners should design standard guidelines for response performance. For example, response zones for urban, suburban, and rural deployment areas may be defined to reflect performance variances based on the population density of the communities being served.
    - The agencies should determine valid and reliable performance reporting methods for response performance.
    - The agencies should constantly make improvements to response methods to maximize performance given the available resources in the communities.
- Financial and fiscal considerations
    - Marginal costs of providing committee work.

- Reporting will require additional resources from the fire agencies and from dispatch.
- Only limited out-of-pocket costs will be required, possibly for software and training.

Guidance

- Establish a technical advisory committee to provide design and development of appropriate data points and reporting methods.
- Create response standards.
- Create standards for reporting for the system.
- Implement data capture and reporting on a system-wide basis.

Fiscal Considerations

- No significant financial considerations.

Partnering Strategy

AA – Implement the Use of Peak Activity Units (PAUs)

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- EMS, Emergency Operations, and Training

Affected Stakeholders

- All agencies

Objective

- Provide special response units in areas of high incident activity and for replacement of units attending training sessions or called to cover special events.

Summary

As part of collaborative efforts, Lewis and Clark County fire departments may enter into agreements such as training, dispatching, occupational medicine, public education, and standards of response for deploying resources. Maintaining adequate emergency capability during these and other activities may require the use of non-traditional staffing strategies.

One such method is to staff additional emergency response units as needed. These units are sometimes referred to as Peak Activity Units (PAUs). A PAU (i.e. pumper, medic, ambulance, squad, or aerial device) can be staffed for a scheduled event, for periods of peak demand, or to cover a response zone while other fire personnel attend training. Adding PAUs as an adjunct to current staffing patterns adds flexibility to fire department emergency operations.

Discussion

A traditional fire company is staffed by three or four personnel and is continuously available hours to respond to emergencies. Move-ups, or the repositioning of a fire company to cover understaffed response zones due to emergencies or training has been a long-standing practice of many fire departments. Only recently as a result of more powerful analytical tools, have some fire departments become more aggressive with move-ups spawning such terms as “dynamic redeployment,” “system status management,” and PAUs.

For the purpose of this discussion, we assume that a PAU would be operated by three personnel and would be made available for special circumstances as situations require. A PAU can be activated for a scheduled event, for periods of peak demand, or to cover a response zone while other fire personnel attend training. Adding PAUs as an adjunct to staffing patterns adds flexibility to fire department emergency operations.

For instance, this method of staffing could be applied to the VA fire department. A PAU could be assigned to the VA station allowing a unit from the VA to attend training at one of the fire districts or in the city.

Other possible configurations for staffing PAUs include but are not limited to;

- Staff a PAU with overtime/callback or volunteer personnel to meet individual situations. Training sessions, fire prevention activities, special community events, and anticipated peak activity periods.
- Staff an engine with three personnel available 12 hours per day, seven days each week. The staffed hours would be adapted to cover the time when the greatest number of calls for service typically occurs.
- Staff a medic or ambulance with two personnel available 12 hours per day, seven days each week. The staffed hours would be adapted to cover the time when the greatest number of calls for service typically occurs.
- Staff a PAU with personnel eight hours per day, five days each week.
- Staff a PAU 24 hours per day, seven days each week and make it available to post in areas experiencing high call volume.

Critical Issues

- Discussions involving any changes to work schedules and or working conditions must be conducted with representatives of the respective firefighter association.
- Training issues
    - The personnel used to provide PAUs will need to be included in on-going training activities.
    - The personnel on PAUs must be cross-trained to understand the management structures and oversight capabilities of each host agency.
- Roles and responsibilities
    - Lewis and Clark County agency partners should clearly define roles and responsibilities of the personnel on PAUs. The roles and responsibilities should be clearly communicated to all personnel and not limited to those assigned to a PAU.
    - Fire agencies should have integrated electronic reporting mechanisms for incident reports. Personnel that staff PAUs should not have to learn multiple reporting methods based on where they happen to be temporarily assigned.

  - Lines of supervision for PAUs must be clearly defined.

- Financial and fiscal considerations
  - Agencies will need to determine how the cost of PAUs will be allocated if personnel staffing PAUs are shared.
  - If a PAU has EMS responsibilities it may be necessary for some agencies to purchase integrated patient care reporting systems so that personnel can provide patient care reports irrespective of where they are assigned.

Guidance

- Do not limit potential options for non-traditional staffing.
- Develop guidelines for uniform incident reporting guidelines.
- Establish standards for fire and EMS electronic reporting and integrate those standards across the system.
- Establish standards for deploying personnel between agencies
- Align agencies to provide appropriate oversight irrespective of where the personnel are assigned.
- Ensure agency support for standardized personnel services.

Fiscal Considerations

- Financial support will be necessary, and a process for allocating costs between agencies will be required.
- The agencies must determine whether and what type of hardware and software will be needed for incident reports.

Partnering Strategy

AB – Create Shared Methods to Provide Ambulance Surge Capacity

Level of Cooperation

- Functional

Timeline for Completion

- Middle term

Section

- EMS and Emergency Operations

Affected Stakeholders

- All agencies, (including St. Peter's Hospital ambulance service)

Objective

- Analyze system demand and system resources and create shared methods to provide fire-based ambulance capacity during times of excess demand on the system.

Summary

The EMS system of Lewis and Clark County consists of a limited number of ambulance resources as well as a number of fire first response agencies, some with paramedic first response and ambulance capability. Because of the relatively small number of ambulances deployed in the system, there are times when transport resources are not available to respond to emergencies. Currently, additional capacity is supplied through callback of ambulance personnel and mutual aid from outside the Lewis and Clark County area. Providing local capacity during surges in demand (called "surge capacity") by using fire resources may ensure adequate response during disasters, multiple-patient emergencies, and mass casualty incidents.

Discussion

Making fire service providers available to provide surge capacity allows the fire service to maximize the multiple-role capabilities of fire personnel. Further, deploying ALS fire personnel to emergency medical events allows the EMS system to achieve "economies of scope," improving system efficiencies by broadening the scope of fire agency personnel.

Without a plan to ensure ambulance surge capacity, performance inequities will exist within the system. The system participants can establish partnerships to ensure that capacity is available throughout the system by creating a higher level of operational readiness on the part of those agencies providing ALS services, or by improving the capabilities of those agencies that do not

provide ALS or that cannot provide 24-hour service, and by establishing changes to the regional mutual aid plan to ensure that ALS ambulance capacity is available throughout the service area.

The system participants will be required to structure methods to fund the system improvements. Some of the funding could come from ambulance service cost savings, but some contribution by the fire agencies may be necessary.

Providing ambulance resources necessarily takes away from other capabilities. Making use of fire agencies for surge capacity in the EMS system redirects those resources from other duties. Therefore, simply redirecting current resources may not provide the availability of surge capacity required by the system.

Critical Issues

- Training issues
    - The personnel used to provide ambulance surge capacity must be cross-trained to at least the same level as the ambulance provider. Training in hospital locations, hospital specialty capabilities, route selection, and other ambulance specific criteria must be provided to all fire department ambulance personnel.
    - Dispatchers must be trained in the additional capabilities of fire agency provided surge capacity.
- Deployment considerations
    - Fire agency partners should design deployment alternatives based on the ambulance resource. For example, when ambulance resources decline to "Level 1." one of the fire agency ambulance services should deploy to a specified location (most likely a fire station). At Level 0, additional fire agency resources could be deployed as determined by the fire agency partners.
    - Positioning of fire agency resources should be predetermined based on the ambulance level and the location of the demand.
    - Fire agencies should have agreements in place to specify deployment plans.
- Financial and fiscal considerations
    - Marginal costs of deploying additional EMS personnel will be determined based on the agency, and on personnel costs.
    - Cost recovery could be achieved through an agreement with the ambulance service.
    - Ambulance reimbursement for some patients may be possible.

Guidance

- Develop relationships with St. Peter's Hospital ambulance that allow for the option of providing backup ambulance service.

- Work with elected officials to identify the goals of the agencies to meet NFPA 1710 and NFPA 1720 compliance standards.[62]
- Establish a workgroup of representatives of each Lewis and Clark County fire departments and St. Peter's Hospital to review the issues related to the development of ambulance surge capacity within the fire agencies.
    - Establish standards for ambulance service by Lewis and Clark County.
    - Evaluate current fire agency capabilities.
    - Establish plans for improvement based on the capabilities of agencies and the "gap analysis" established above.
- Establish a systematic plan to improve services, including deployment of paramedic resources, and providing appropriate deployment and equipment standards.

Fiscal Considerations

- Cross use of ambulance personnel as firefighters reduces ambulance system cost. Subsequently, such cost is allocated to the fire agency.
- Allocation of firefighter marginal cost to the fire agency reduces ambulance system cost by about 45 percent and increases fire service cost by about the same amount.

[62] NFPA, National Fire Protection Association, *NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2004 Edition, *NFPA 1720: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2004 Edition.

Partnering Strategy

AC – Develop System-Wide Deployment Plan for Paramedics

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- EMS and Emergency Operations

Affected Stakeholders

- All agencies, (including St. Peter's Hospital ambulance service)

Objectives

- Provide guidelines for deployment of paramedic resources.
- Ensure that the closest available paramedic arrives within the established system response parameters.

Summary

The Lewis and Clark County fire agencies provide ALS first response on a very limited basis. Therefore, there is no guarantee of a paramedic response, nor can it be guaranteed that each patient will receive an ALS ambulance response. From a system perspective, patients may receive less than optimal medical care if the ambulance response time is inordinately long. The fire agencies may improve patient care and patient outcomes if they can guarantee a paramedic first response, especially if the paramedic responds within a plan that includes the response from ambulances.

Discussion

An ALS delivery model may provide additional opportunities for making progress toward integrating the EMS system.[63] The system could make better use of fire agency ALS services where available and eliminate the need for paramedics on an ambulance when an ALS first response agency is available. For example, the Helena Fire Department is currently licensed by the State of Montana at the Advanced Life Support EMT-Intermediate level.

This system structure would provide opportunities for fire agencies with ALS first response to enhance their participation in the EMS system and at the same time improve service delivery. It also provides

[63] For this strategy, ALS would be considered at a minimum of personnel licensed at the "EMT-Intermediate" level, to provide defibrillation, endotracheal intubation, and intravenous therapy.

for the option of additional transport resources from the ambulance provider. The system can consider the value of requiring system standards for fire first responders in the context of meeting standards for the ambulance provider. The suggestions developed for system improvement should be considered as part of an overall system design plan rather than a focused plan for any individual agency.

In developing a long-term plan for EMS service delivery, the designers should consider how the ALS fire agencies will provide operational support to the system and how the system can more adequately provide financial support to the fire agency responders. Guidance for license types and levels, standard of care, and related articles is found in the Administrative Rules of Montana.[64]

Critical Issues

- Training issues
    - The personnel used to provide ALS intervention must be trained to at least the same level as the ambulance provider.
    - Dispatchers must be trained in the capabilities of fire agency provided ALS services.
    - Using fire personnel for ALS services means that agencies must train for operational considerations. Because fire personnel will be used to provide ALS intervention, they may not be available for other uses on the scenes of emergencies. Agencies must plan and train for how the personnel will be used.
- Deployment considerations
    - Fire agency partners should design deployment alternatives so that a paramedic arrives on the scene whether it is an ALS fire or ambulance resource. For example, when resources should be deployed between fire stations to maximize the distribution of resources.
    - Positioning of fire agency resources could be changed to predetermined locations based on the ambulance level and the system demand.
    - Fire agencies should have agreements in place to specify deployment plans between agencies.
- Financial and fiscal considerations
    - Marginal costs of deploying additional ALS personnel will be determined based on the agency, and on personnel costs.
    - Startup costs will include additional training as well as the supplies and equipment needed to equip the appropriate number of ALS fire response units.

[64] Administrative Rules of Montana – 12/31/05, *Department of Public Health and Human Services, Chapter 104, Emergency Medical Services, Subchapter 1, General Provisions*.

- Cost recovery may be achieved through a cooperative agreement with the St. Peter's Hospital ambulance service.
- First response reimbursement for some patients may be possible.

Guidance

- Map out the current staffing models for each of the fire agencies.
- Determine attrition and negative employment turnover rates for field employees.
- Identify through gap analysis the need for paramedic resources at each fire agency.
- Plan for paramedic hiring through attrition for career-staffed positions.

Partnering Strategy

AD – Provide System-Wide Guidelines for EMS Response

Level of Cooperation

- Functional

Timeline for Completion

- Short to middle term

Section

- EMS and Emergency Operations

Affected Stakeholders

- All agencies, (including St. Peter's Hospital ambulance service)

Objective

- Define response times so that adequate system planning can take place. Establish parameters for maximum response times including response time definitions on a per-call basis. Develop system-wide reporting structure to standardize collection and reporting of response times.

Summary

This partnering strategy is directly related to the strategy "Z – Provide System-Wide Guidelines for Fire Response." Dependent on the partnering strategies that are chosen for implementation, the two may be developed simultaneously or independently.

Response times are one of the most frequently used methods of measuring system performance. Fire agencies, policymakers, and physicians require a gauge by which to measure the effectiveness of the system, and a method by which to make decisions. Unfortunately, very little medical research exists to support one response time over another. Further, because economic costs are highly sensitive to response times, a small change in response time requirements may cause a significant change in cost; therefore, policymakers must carefully weigh the balance between cost (economic, medical, and social) and benefit. Response time requirements and reporting must be crafted to ensure that the agencies meet medically appropriate response times and are able to document performance according to those requirements.

Discussion

The American Heart Association considers critical components of EMS systems to include appropriate

access by citizens as well as timely dispatch of responders.[65] According to the Heart Association,

> *"Passage of time drives all aspects of emergency cardiac care and determines patient outcomes."*

That is why it is essential that patients are able to access the 9-1-1 system as quickly as possible and that responders are immediately dispatched to the scene with appropriate pre-arrival information.

Medical studies on response times are not consistent, nor do they suggest an optimal response interval. Several medical studies suggest that shorter response times lead to improved outcomes in cardiac arrest. A Scottish study noted that reducing response times from 15 minutes to eight minutes (with 90 percent reliability) would increase the predicted cardiac arrest survival from about six percent to eight percent.[66] Improving response times to five minutes would provide for expected survival rates in the range of ten to 11 percent; however, other studies are less optimistic. For example, Blackwell and Kaufman discovered that reducing response times to less than eight minutes had little effect unless those times were reduced to less than five minutes.[67]

While the studies are not consistent in their conclusions, one thing is consistent — the studies focus on the most critical one or two percent of the patients. They do not focus on the more common emergencies (i.e. chest pain, diabetic coma, stroke, and respiratory events) at which advanced personnel can have an impact on patient outcomes. Very little reliable scientific data is available to support any response time requirement in these cases. Yet despite the confusing nature of the studies, intuitively we believe that delivering faster emergency services will have an effect on patient satisfaction, it will improve 9-1-1 use in emergency events, and it will improve patient outcomes.

EMS response times are not well defined in Lewis and Clark County. Consequently, it is unclear which standards the agencies use to determine if response requirements are met. We recommend that appropriate Lewis and Clark County EMS response intervals be defined and adopted. Definitions should include the time to be measured, including at least the following:

- **Total response time** — the time required for response, measured as the time between when the emergency responder is first notified of an incident by the dispatch agency and when the responder's vehicle comes to a complete stop at the scene (or staging area).

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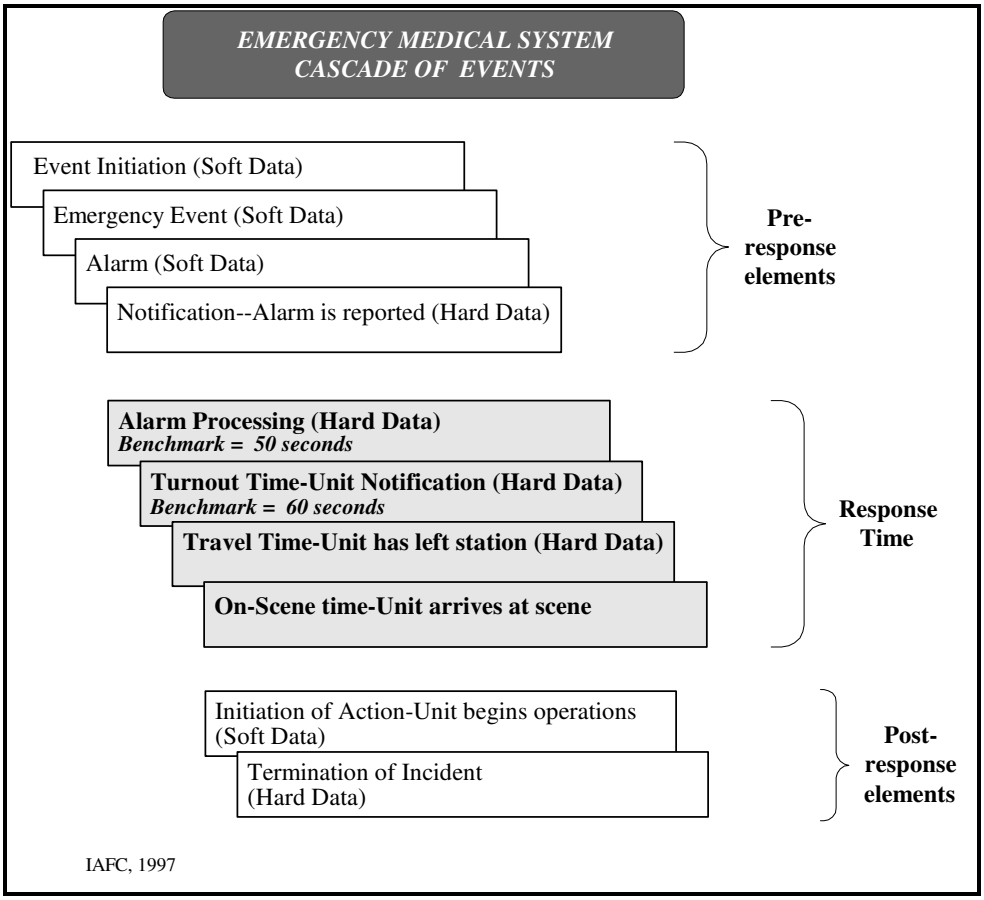
[65] *Advanced Cardiac Life Support, American Heart Association, 1997.*
[66] *Effect of reducing ambulance response times on deaths from out of hospital cardiac arrest: cohort study*. Pell JP, Sirel JM, Marsden AK, Ford I, Cobbe SM. BMJ. 2001 Jun 9;322(7299):1385-8.
[67] *Response time effectiveness: comparison of response time and survival in an urban emergency medical services system*. Blackwell TH, Kaufman JS., Acad Emerg Med. 2002 Apr, 9(4)320-1.

- **Turnout time** — the time measured between when the emergency responder is first notified of an incident by the dispatch agency and when the responder's vehicle begins moving toward the incident.
- **Travel time** — the time measured between when the emergency responder's vehicle begins moving toward the incident and when that the vehicle comes to a complete stop at the scene (or staging area).

The International Association of Fire Chiefs (IAFC) makes recommendations for response times and has established a "Cascade of Events" to assist responders in understanding response intervals in the EMS system. Irrespective of the standard used, system regulators establish an appropriate response time reporting method for their local communities. While the IAFC method includes dispatch-processing time as a component of response time, we elect not to use that technique because responders rarely have control over the dispatch center to the extent that they can influence those times. Regardless, dispatch-processing times should also be monitored and standards for dispatch established.

Figure 51: Emergency Medical System - Cascade of Events



Response intervals for emergency services are not standardized for different demographic regions in the Lewis and Clark County. The agencies should therefore, have a universal method to both capture and report on response times. Currently, neither the county nor the EMS system participants have

any way of knowing whether the system is performing with any degree of reliability. We recommend that the county EMS providers establish a reporting method for response times that is more than merely reporting on the exceptions. A fractile response time report is much more valuable to the agencies than the current reporting method.[68]

Critical Issues

- Data issues
    - An integrated, inclusive EMS advisory committee may define data points that will be used in the system to capture and report on response performance.
    - The agencies should collaborate with the dispatch center to ensure that the data points can be captured by the dispatch center.
    - The dispatch center should develop methods to report on the response performance using industry standard fractal reporting methods.
- Performance considerations
    - Fire agency partners and the St. Peter's ambulance service should design standard guidelines for response performance. For example, response zones for urban, suburban, and rural deployment areas may be defined to reflect performance variances based on the population density of the communities being served.
    - The agencies should determine valid and reliable performance reporting methods for response performance.
    - The agencies should constantly make improvements to response methods to maximize performance given the available resources in the communities.
- Financial and fiscal considerations
    - Marginal costs of providing committee work and coordination may detract from other services.
    - Reporting will require additional resources from the fire agencies, ambulance service, and from dispatch.
    - Only limited out-of-pocket costs will be required, possibly for software and training.

Guidance

- Establish a technical advisory committee to provide design and development of appropriate data points and reporting methods.
- Create response standards.
- Create standards for reporting for the system.
- Implement data capture and reporting on a system-wide basis.

[68] Fractile: Let _ be between 0 and 1. In a set of observations of a variable the _ fractile is the number for a fraction _ of the observations is less than this number. The fraction is often given in percent; the term percentile may then be used.

Fiscal Considerations

- No significant financial considerations.

Partnering Strategy

AE – Provide Joint EMS Supply Purchasing and Logistics Services

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- EMS

Affected Stakeholders

- All agencies, (including St. Peter's Hospital ambulance service)

Objective

- Standardize supply purchases through group purchasing and standardize supply distribution.

Summary

Collaborating for supply and logistics in an EMS system allows agencies to achieve "right-column" pricing on EMS supplies and equipment, to reduce average transaction costs, and to gain the benefits of standardizing equipment. The agencies can work together to create a joint purchasing and logistics program. The purchasing program can create joint bids for supplies and equipment, and can achieve additional benefits such as integrated inventory of supplies that can accommodate lag times in deliveries from manufacturers and suppliers.

Discussion

A multi-agency purchasing program could improve the management of the agencies' supply chains. In theory, the agencies would collectively create or contract for a logistics center to manage the purchasing process. The logistics center would work with each of the agencies to standardize supplies and equipment. It would follow state and organizational purchasing guidelines to conduct bids for products and then make those products available to all of the agencies.

Distribution can be managed internally, or through agreements with suppliers to gain the advantages of collective purchasing and supply: 1) a larger, collective bid process for supplies can achieve lower prices and attract additional competitors; 2) the logistics center can negotiate terms of the conditions of the sale that might not be available to smaller purchasing centers; and 3) it can conduct collective bidding processes that are applicable to all of the agencies.

Coordination of activities is critical to the success of a joint purchasing program. With few exceptions, each of the agencies currently conducts purchasing of EMS supplies and equipment independently. As such, any joint efforts will reduce the level of effort required by each agency to provide joint purchasing services.

Critical Issues

- Coordination issues
    - A cross-functional committee of system purchasing agents and EMS system participants can work together to design purchasing rules for each agency.
    - The committee can provide a standardized equipment list for agencies.
    - The agencies can share bidding processes, so that the bidding procedure used by the purchasing agent can be used by all agencies.
    - Agencies must work closely with the cross-functional committee to ensure that the goods are received and distributed to the appropriate location.
    - Fire agencies should have agreements in place to specify inventory and purchasing plans.
- Receiving and distribution considerations
    - Fire agency partners should design distribution plans to deliver goods directly to the appropriate location. Using a joint purchasing system, the agencies will no longer have to receive goods at the agency; instead, they can receive goods at the appropriate station.
    - The agencies can jointly determine the proper level of inventory to maintain within the system. The use of system-wide inventory planning ensures that the most cost-effective inventory management can be established for the system participants.
- Financial and fiscal considerations
    - Marginal costs of creating system-wide purchasing infrastructure should be compared against the reduced level of effort of individual agencies.
    - Cost saving can be achieved through reducing inventory carrying costs, reducing transaction costs, and achieving economies of scale through larger volume purchasing.
    - The participating agencies should agree on contributions to account for more difficult to discern costs such as freight charges and unit costs for warehousing space.

Guidance

- Develop a system-wide, cross-functional committee to explore a joint purchasing process.
- Work with elected officials to adopt purchasing requirements that help the agencies meet purchasing goals and guidelines.
- Establish standards for EMS system equipment and supplies.
- Establish inventory standards and methods for distributing equipment and supplies.
- Contract for or align agencies to provide logistics and supply services.

Fiscal Considerations

- Financial support will be necessary, as agencies will be required to meet the costs of creating or modifying existing logistics systems.

Partnering Strategy

AF – Undertake the Purchase and Implementation of an Electronic Staffing Program

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- Administration and Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Provide a uniform electronic system that combines telephone callback, notification, personnel scheduling, and includes payroll and administrative features.

Summary

The fire departments in Lewis and Clark County contact personnel for regular staffing and initiating callbacks in a variety of ways. The task of non-emergency notification and has traditionally been done via telephone, with someone having to make personal contact. A key feature of these systems is that using a touch-tone phone or computer, employees and volunteers can access the system using a secure ID and password. Supervisors have the advantage of an automated system for personnel management.

Discussion

In 1998, the Long Beach Fire Department made the decision to purchase an electronic staffing program with automated telephone callback system that combines scheduling at the fire station level, payroll, and administrative functions.[69] Evidence of the benefits described by Long Beach and other fire departments provide testimony to the rapid recovery of the initial cost of acquiring this type of software. Some of those benefits of a staffing program include:

- Automatically identify and contact replacement personnel
- Notify personnel of an emergency recall

[69] JEMS, *Innovation in Action, Workforce Wonder*, December 1999, Vol.24, No.12.

- Automatically notify personnel of training, meetings, or organizational events
- An accurate system for compiling and tracking a daily, weekly, monthly, or quarterly roster
- Ensure equality in overtime distribution following labor rules and FLSA guidelines
- Eliminate dependency on a single person(s) for staffing
- Individual is personally responsible for their own calendar
- Automatically populate data fields in other RMS programs

Selecting a single electronic staffing program is one aspect in efficient coordination of the managing personnel resources in Lewis and Clark County. The scheduling of training, personnel notification, unit staffing, and administrative assignments, along with the development of many other initiatives in this report will benefit from the use of one electronic staffing program.

One product on the market is PDSI TeleStaff. The TeleStaff software was designed to be accessible with or without a computer network, and will accept requests and make contact with staff members by telephone. The program is capable of placing outbound phone calls, or delivering messages by pager, fax, or e-mail. The software can make multiple phone calls simultaneously, and is considered a solution for emergency and other staffing recalls.

Guidance

- Involve human resources personnel, payroll, training, and labor in the development of specifications and the purchase of an electronic staffing program
- Train key personnel in the use and maintenance of the software program.
- Network with other fire departments that have been successful in deploying an electronic staffing program.
- Create a staffing policy to accommodate management, labor, and legal requirements.
- Provide personnel with initial instruction and ongoing support. For example, one larger fire district has assigned the task of providing the instruction, support, and maintenance of the staffing program to the personnel at one station with a lower call volume.
- Make available pocket size how-to-use cards for personnel.
- Work to implement the entire staffing program at the same time. Experience has shown that fire departments implementing the system all at once realize the full potential of the system more quickly and experience fewer administrative problems overall.
- Explore options for integrating the electronic staffing program with other software programs including fire and EMS RMS, payroll, electronic logbook, and CAD.

Fiscal Considerations

- The cost of the system depends on the type of hardware requirements and software purchased.
- Annual maintenance agreement cost.

- Personnel costs for deployment of software and training.
- Reduction in management time spent on staffing.
- Potential savings in overtime costs from staffing errors.
- Accurate recordkeeping of volunteer and paid personnel activities and data;
    - Responses
    - Drill attendance
    - Meeting attendance
    - Personal information
    - Licenses
- Accurate payroll records.

Partnering Strategy

AG – Develop Deployment Standards

Level of Cooperation

- Functional

Timeline for Completion

- Short-term

Section

- EMS and Emergency Operations

Affected Stakeholders

- All agencies

Objective

- Develop deployment standards that establish the distribution and concentration of emergency resources, both fixed and mobile.

Summary

All agencies have policies for deploying resources, albeit at times informal and undocumented. Developing standards for response and coverage will formally define the distribution and concentration of the fixed and mobile assets of an emergency organization. The process of standards development includes reviewing community expectations, setting response goals, and establishing a system of measuring performance. The resulting plan includes all aspects of the community and organization that are required to create response standards and to determine the ideal use of resources.

Discussion

The information contained in this partnership opportunity is extracted from *Creating & Evaluating Standards of Response Cover for Fire Departments*.[70] This excerpt is from the Introduction and Chapter 1.

> *"The material was originally designed as an assignment to the accreditation task force of the International Association of Fire Chiefs (IAFC). When the task force was turned into a commission, the Commission on Fire Accreditation International, Inc. (CFAI) it was included in the accreditation manual Fire and Emergency Service Self-Assessment Manual.*

[70] *Creating & Evaluating Standards of Response Cover for Fire Departments*, Fourth edition, Introduction, Commission on Fire Accreditation International, Inc, 2003, Chantilly, VA.

All agencies have an existing policy (for deploying resources), even if it is undocumented or adopted by the locally responsible elected officials. Originally, stations and equipment were situated to achieve certain expectations. How and why they were sited needs to be historically understood, described, and contrasted to proposed changes.

This process uses a systems approach to deployment rather than a one-size-fits-all prescriptive formula. In a comprehensive approach, each agency should be able to match local need (risks and expectations) with the costs of various levels of service. In an informed public policy debate, each city council or governing board 'purchases' the fire and EMS protection (insurance) the community needs and can afford.

There are usually three reasons to redo or challenge existing levels of service – expansion, contraction of service areas and change in risk expectations. Contraction is typically the result of a reduction in service area, a decline in risk or value, or a decline in available fire protection funding. Regardless of the reasons, elected officials should base changes in levels of service on empirical evidence and rational discussion leading to effective, informed policy choices. The purpose of the standards of response coverage process is to prepare fire service leaders to conduct just such an analysis and then lead an informed policy discussion.

The Standards of Cover systems approach consists of the following eight components:

- *Existing deployment*
- *Risk identification*
- *Risk expectations*
- *Service level objectives*
- *Distribution*
- *Concentration*
- *Performance and reliability*
- *Overall evaluation.*

Standards of response coverage are defined as those written procedures that determine the distribution and concentration of fixed and mobile resources of an organization. The process includes reviewing community expectations, setting response goals and establishing a system of measuring performance. This plan encompasses everything an agency should understand to prepare and determine resource deployment.

If resources arrive too late or are under staffed, the emergency will continue to escalate drawing more of the agency's resources into a losing battle. What fire companies must do, if they are to save lives and limit property damage, is arrive within a short period of time with adequate resources to do the job. To control a fire before it has reached its maximum intensity requires geographic dispersion (distribution) of technical expertise and cost effective clustering (concentration) of apparatus for maximum effectiveness against the greatest number and types of risk. Matching arrival of resources with a specific point of fire growth or medical problem severity is one of the toughest challenges for chief fire officers today.

Some medical emergencies such as multiple car collisions or industrial accident rescues require speedy arrival of multiple crews to control the scene, perform rescue operations, and provide medical care. A high-risk area requires timely arrival of fire companies for several reasons. More resources are required to rescue people trapped in a high-risk building with a high occupancy load than in a low-risk building with a low occupancy load. More resources are required to control fires in large, heavily loaded structures than are needed for fires in small buildings with limited contents.

Most emergency medical incidents require the quick response of single fire crews to limit suffering and to rapidly intervene in life-threatening emergencies. Small, incipient fires need the prompt response of a local fire company to mitigate and terminate the emergency quickly without additional help. For these typical, daily situations, all areas of the city with similar hazards and risks should receive equal service. This is why distribution planning strives for equity and timely service objectives.

Therefore, creating a standards of response coverage plan consists of decisions made regarding distribution and concentration of field resources in relation to the potential demand placed on them by the type of risk and historical need in the community. Furthermore, if a standards of cover is to be meaningful to the community, the outcomes must demonstrate that lives are saved and property is protected.

To clearly define standards of response coverage, agencies should have a policy statement regarding how risks are categorized within the context of their own jurisdiction. Because of the wide range of complex issues for which individual agencies are held accountable, it is necessary that there is a method for identifying risks and expected outcomes. Based upon that risk assessment and anticipated workload, a standard of response coverage is developed for fire fighting and EMS functions. It is recognized within the fire service profession that this evaluation must take into account both the frequency and severity of the most common types of incidents."

Critical Issues

- Exercise caution when developing a standards of cover. Even minor changes when setting service level objectives can have broad impact.

Guidance

- When developing a standard of cover, reference *Creating & Evaluating Standards of Response Cover for Fire Departments*.[71]
- Review existing Lewis and Clark County standard of cover documents, deployment standards, and response time standards. Use the opportunity to learn from those who have already developed a standard of cover.
- Prior to developing or modifying standards of cover, elected officials, administration, and staff should be educated on and have a clear understanding of the process.
- Lewis and Clark County fire departments should develop standards of cover collectively and have agreements in place to specify deployment plans.

[71] Ibid

- When evaluating capabilities and setting performance standards for a community, size and population density often place direct demand upon the department with respect to community expectations. Different expectations are often found in urban, suburban, rural, and frontier communities.

- Developing a standard of cover is a loop process. For example, if after establishing risk category expectations the resultant response plan is found to be too expensive, the facilitator of the process might re-challenge the community's elected leaders to lower service expectations, or to find additional funding.

Fiscal Considerations

- Change, however minor, in current service level goals may result in dramatic change to the deployment and distribution. A change in service level goals may require:
    - New facilities or modifications to existing ones.
    - New apparatus.
    - Additional personnel.
- Marginal cost of staff time to develop a standard of cover.

Appendices

Appendix: A – Impact Fee Discussion and Analysis

ESCi's contract for services does not call for creation of a new funding mechanism for the city to address the above referenced issue. Rather, ESCi is assisting the city to develop a master plan for the fire department and making recommendations that will assist the department to carry out that plan.

The evaluation of the funding needs issue is not intended to be a full assessment of the history of the matter dating from the mid 1990s. Nor is the project intended to be a legal assessment of the present opportunities within the State of Montana for Helena to move forward with a new fee that meets with the approval of the Attorney General. The city has competent legal staff within the City Attorney's Office, who since the 1995 opinion, surely has been tracking the actions of the State Legislature, opinions of the Attorney General, and the success or failure of other cities in Montana and other states which have attempted to create fire service area fees.

ESCi's task was to review the past efforts and suggest a way or ways that the city might employ to move some, or all, of the tax-exempt property owners into at least discussions and recognition of the city's concerns, limitations, needs, and opportunities. The product that follows suggests ways that the city can be the initiator of a process, which could position those who take part in the work to more efficiently protect resources, deliver efficient service to the public, and be ready to jointly take advantage of funding opportunities that arise.

Present Situation – The city continues to have many tax-exempt properties within the city limits for which the city fire department provides fire protection. As the capital city of Montana, Helena is home to the State Capitol Building and the many nearby state office buildings that house state agencies. Federal offices, hospitals, and churches have a major presence in the community as well as the University of Montana and private and public schools up including college facilities. The Helena airport, military installations, and other non-profit tax-exempt facilities are here.

In 1994, the city calculated that 750 tax-exempt properties were within the city. Several, such as the Capitol area, universities, and airport are very substantial in size and the number of people and vehicles coming and going from them each day.

The city calculated in 1994 that the total square footage of structures within the city was as follows:

- Residential – 21.217 million square feet
- Commercial – 11.310 million square feet
- Tax Exempt – 5.190 million square feet

Tax-exempt property represented about 13.76 percent of all structures within the city.

No updated information has been presented to ESCi; however, the assumption is that the impact on the city has not lessened. The information developed in 1994 did not mention land area, another significant factor. The larger tax-exempt facilities have significant land holdings, which also place demands on service and are not being taxed. (It should be noted that some federal facilities, as part of the federal government's Payment In Lieu of Taxes (PILT) program, do make payments to communities that support federally owned lands and the agencies that manage them. It is not known to ESCi whether Helena receives any funding from this program.)

In 1999, Representative Ron Erickson introduced House Bill No. 634 in an effort to require the Montana Department of Administration to prepare a budget for fire protection or security for state-owned buildings, and require the agency to contract with cities to provide the needed services, if funding was available. This bill would have allowed for the payment of funds in lieu of taxes to cities like Helena. The bill was not adopted after being tabled in the State Administration Committee; it missed the deadline for general bill transmittal.

Cities in Montana continue to have a need for funding. Billings' effort in 1998 was not successful, apparently. The materials generated by Billings provide a good picture of the issue, both in Montana and throughout the country. The report noted that general fund revenues (those that fund the major portion of fire services) were not growing at the same rate as increasing population and associated demand for services. Projected shortfalls in revenue were forcing communities to look for alternative funding. Billings apparently did not take all the steps necessary to implement the fire service fee for which it devoted significant effort to prepare background materials. The city went to great lengths to develop a fee formula with a methodology, which it hoped would pass the scrutiny of the Attorney General. Instead, it passed a public safety levy in 2004 that has allowed it to fund personnel to catch up with increasing demands.

While the authority to impose a fee in the manner attempted by Helena was not acceptable, and as cities like Billings determined that voter acceptance of new fees was risky politically, taxpayers throughout the country have called for reduced taxes and more reliance on user fees. At the same

time, more people have been developing urban style homes in unincorporated areas and are resisting annexation (and the prospect of paying city taxes for urban services), while they often generate a need for urban level fire protection in an area served by a rural, often volunteer, agency. It falls on the city agency, in many cases, to provide support to such rural agencies, thus placing even more pressure on the resources of the city agency.

On top of this, the events of September 11, 2001, have created even greater demand for fire and police protection while the funding for necessary enhancements is not always available.

Options Available – The city has charter authority to create a fire service area; however, in so doing it must create a fee that is based upon the fire protection requirements and services provided. The approaches evaluated by the city have run into difficulties with the state, and likely various factions of the voting public, as well as other now exempt property operators. It is obvious that the city cannot be successful without the cooperation and input of the other affected parties – namely the owners and operators of the tax-exempt properties. Other options are listed first below, but the option suggested calls for a visioning process with regular coordination sessions, joint capital facility plan formation, training coordination, joint grant applications, and joint celebration of successes, along with positive press releases that illustrate the results of this more efficient approach.

The options are:

- **Fire service fee:** Continued efforts to develop an acceptable fire service fee – some communities in the country have been successful setting up a fire service area. As the Billings report mentioned, Tallahassee, Florida had a successful fire protection fee system that was being implemented in other Florida communities. This occurred in the 1990's. Given the setbacks that have taken place with Helena's ordinance, and the Attorney General's opinion, a legislative fix is probably a course needed to make a local fee workable. To continue to press for state legislation is a good idea, the need will not go away under the present tax structure. However, Helena has needs now that require attention, so at least an interim process is needed. Perhaps a successful interim step could even enhance the chance that a legislative solution could follow.

- **Payment in lieu of taxes:** State funding of a voluntary state contribution – in 1996 the state was having discussions with the city to negotiate a fee for fire protection services at the Capitol. An issue paper dated May 1996 indicates that the legislature provided a line item appropriation for fire protection of $60,000 per year in the General Services Division budget. The state agency recognized the need to continue to have a good working relationship with

the fire department, and it desired to have additional services from the department. The paper noted some of the service enhancements that were desired, like more inspections and fire planning for state buildings, assistance in fire evacuation planning, semiannual meetings to discuss fire safety specific to the state complex, and relief from future fines for false alarms generated form the complex. The idea to meet and work together was encouraging. There are many examples around the United States where universities, large non-profits, and churches have recognized the need for coordination and have made voluntary annual payments. For example, Yale University pays the city of New Haven over $2 million annually. It started paying the city in 1991, mostly to cover fire services. Princeton University makes voluntary contributions to the borough in which it is located, through an annual unrestricted cash contribution and by making gifts to special projects (like the purchase of a rescue vehicle in 2001, and other emergency services, fire and first aid improvements).

- **Impact fees:** Fees generated from new development can pay for capital facilities, and such fees can be applied to tax-exempt properties. State law could be modified to list fire services as eligible for impact fees assessed on new development. State law at this time, as in most states, does not include fire facilities on the list of development impacts for which a fee is charged to new development. In 2004, the City of Albuquerque, New Mexico performed an analysis to create a Public Safety Impact Fee. Impact fees have been the subject of litigation throughout the United States, thus any such fee requires a solid methodology and linkage of the fees charged to the actual new facilities that will be needed to serve the new development. Capital facility plans must be linked to these fees. Such impact fees generally can only pay for the facilities needed to serve new development, not correct the deficiencies that might already exist in the community. In some cases, impact fee authority can be derived from a state's growth management act, such as in the State of Washington. There is some difficulty, however, developing a fee that distributes the cost in a defensible manner.

- **Voluntary participation by affected parties in a department visioning program and resulting funding:** A visioning process and planning for long term improvements to fire service delivery, involving key tax exempt users of services has potential to lead to voluntary financial assistance. The payment in lieu of tax made by universities such as Princeton and Yale are not unique. Universities in many communities have recognized that the impact that they have on a community can be far-reaching, many times straining relationships. It would not be surprising to find that many such payments originated from a time of stress, but have now evolved into an expected annual contribution. Such payments may be to pay for a piece of equipment needed to serve a new facility at the university (for instance, the university's

science building which may be the tallest building in the city), or for riot gear (in case of a major demonstration), or hazardous material handling equipment (again, the science building), or training for fire personnel who will be responsible for design review or inspection of state-of-the-art laboratories or other facilities that the department otherwise will not require the expertise.

The option that is suggested as an interim measure is the voluntary participation in a visioning program for the fire department, coupled with a coordinated funding approach. The fire department is currently engaged in the master planning process, the perfect time for the major parties of interest to become more engaged in planning for the future fire service that serves the community. However, with limitations on resources a reality likely to be present for some time, the department needs help prioritizing capital decisions and identifying funding — before getting to such decisions, relationships need to be built, trust developed, and commitments made. The following is a preliminary outline of an approach that the department might use to address the present need.

Proposed Process: The visioning process is an interactive process facilitated by the department to identify the challenges, opportunities, and limitations that face the department as it plans to deliver fire services to the entire community, within both the existing boundaries and the future city limits. A planning horizon of twenty years can be selected, or some other period. To be successful, the department will need the participation of all agencies and groups that are factors in the department's present success or failure as well as future. At a minimum, these groups should take part:

- State of Montana Department of Administration
- Montana Capitol facilities staff
- United States Government – representing federal offices in Helena
- United States Military – representing bases close by
- University of Montana
- Other universities and private schools in Helena
- Helena School System
- Helena Airport
- Churches – a representative of the Inter-Faith Council
- Hospitals – and nursing homes, medical centers
- Other tax exempt entities, if any such as cemeteries, public housing, non-profit agencies which operate half way houses or treatment facilities in the city

An initial meeting should be held to bring the parties together for an introduction to the process, after the fire chief or a high-ranking officer (who will be an active and highly visible participant in the process) makes personal invitations. At the initial meeting, the facilitator should identify the successes that the department has had as it has evolved along with the community. He or she should also mention (where appropriate) the contribution that the group members and their predecessors have made to the development of Helena as the State capital, and to the outstanding community that it is. The tone should be upbeat with the participants recognizing that the department is doing an outstanding job with the resources available to it, but it can do much more, in a more efficient manner, if it has access to more funding.

The facilitator should invite the participants to take part in a coordinated vision planning process that will take several weeks or months to complete. Emphasis should be placed on involvement, sharing ideas, needs, and concerns, and openness to the need to be innovative in developing solutions. Before the first meeting is completed, each participant should be given the opportunity to introduce the challenges that the organization he or she represents faces, now and over the visioning period. The facilitator should not try to deny that the department will be looking for help to address the financial challenges to be able to carry out the vision. However, the facilitator should deal with this by challenging the group to work with the department to find ways to maximize the effectiveness of the community to fund needed improvements, advancements, and growth. The facilitator could lead a brainstorming session to identify funding solutions, with the following as a sample of ideas that could be expected at the first meeting:

- New legislation to give the city authority to tax property now tax exempt
- New impact fee authority to charge new development for impacts created by them
- Public safety bond – with identified projects and facilities
- Public safety operating levy
- Payment in lieu of taxes – voluntarily negotiated with each entity
- Coordinated capital facility planning by the department and one or more of the entities
- Coordinated training of fire department and entity (state, university, school) staff specifically addressing fire safety at the entity's facilities
- Applying together (two or more entities including the department) for funding from:
    - Federal government
    - State government
    - Foundations
    - Major industries
    - Other sources

- Joint funding of a staff member, a major purchase of a piece of equipment, purchase of land, training materials
- Joint funding of an analysis which later could lead to a purchase
- Development of a demonstration program that will bring positive results for the community
- Jointly seeking a new industry for the community which will complement the vision of the community and contribute to the tax base
- Proposing capital improvements for the department which can be supported by the group when the department submits requests to the city budget

The result of the initial meeting should be a commitment from the participants at the very least to take part in exploring how the needs of the community can be best addressed through a visioning process, rather than by uncoordinated decision-making. Of course, the community has many examples of the participants in the group having worked together successfully to resolve issues, and to make progress. The department cannot give the impression that it is the first to come up with the idea of a vision. Instead, it should demonstrate that it is willing to share all information available to it to make the community better. It needs to be willing to give a little and support the needs of other entities while in return expecting similar support. Together the participants need to trust that the process can work, and that future decision makers will give credit to the group for making the effort to develop the vision and the relationships.

The vision document, the plans, the goals for funding improvements, and a strategy for enhancing the financing of the department, as well as the participating entities are only some of the anticipated results of the process. The development of a more efficient cooperating group is equally as important. A desired outcome of the vision process as an ongoing group that:

- Gives input into the budget of each entity
- Supports each entity in its fund raising efforts
- Creates joint funding applications which are more attractive to funding agencies because of the obvious community support of such an application
- Can gain community support for bond levies, operating levies, fund raising campaigns, and donations from philanthropists
- Celebrates positive achievements together
- Demonstrates to the community that tax dollars are being wisely spent and that duplication of effort and the perceived waste that results are outdated.

Recommendation: The recommendation proposed is an interim step as the likelihood of new legislation may be unrealistic. Through the process of developing a vision, another outcome could be

demonstration to the legislature that Helena has tried every conceivable way to address its funding needs, including bringing all of the large presently tax exempt parties into discussions about the department and its excellent service delivery and ongoing funding needs. A better-educated public, particularly the major entities that the department relies on for information and support, could be the deciding factor when the question of future legislation comes before the legislature. The legislature could even pass demonstration legislation that allows Helena ability to implement new legislation with the promise that if results are positive here, the authority could expand in future years to allow other Montana cities to use the legislation.

Appendix: B – Montana Comparables

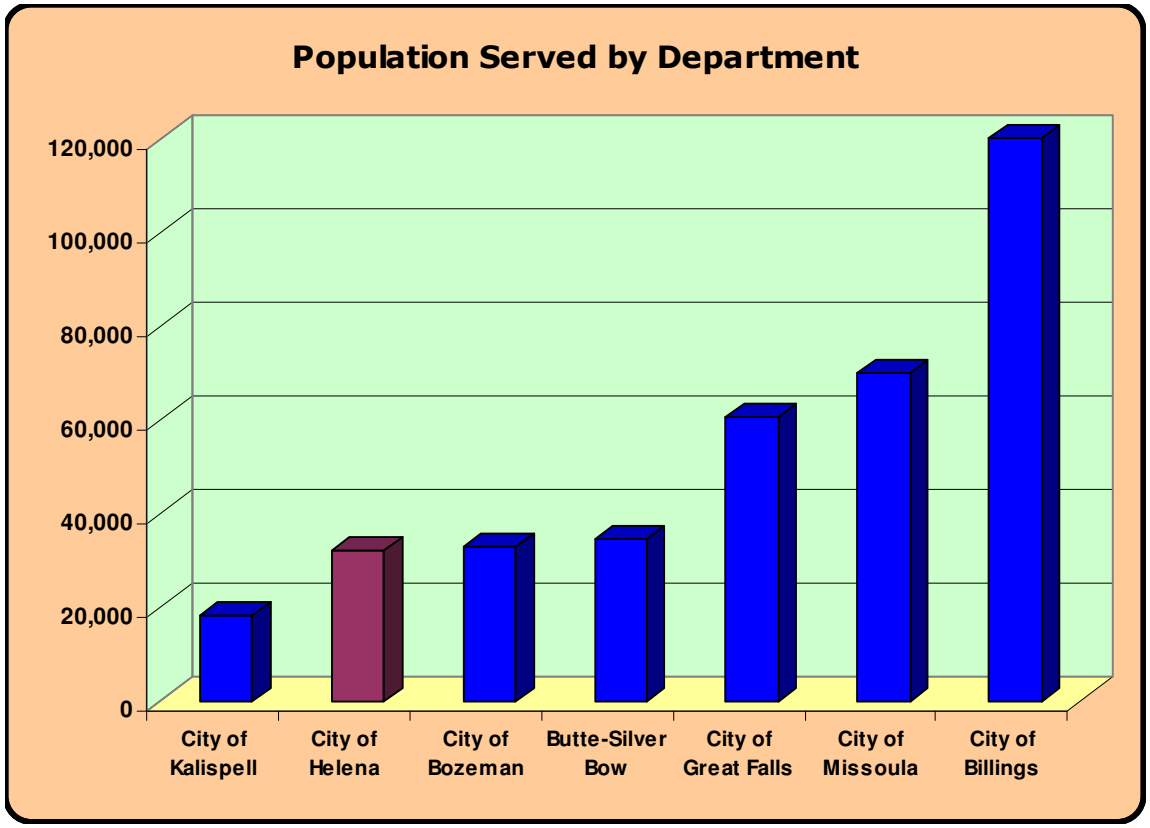
The cities in the State of Montana share many similar traits and characteristics. There is also a shared uniqueness not found among many other communities in the country. For example, in the State of Montana, cities of a certain size are required under Montana Code to have a fire department with paid firefighters.[72]

The information included in this appendix was designed to assist the reader be to compare some basic facts about the career fire departments in Montana. To capture this information a survey was sent to the larger municipal fire departments in the state. Six fire departments responded to the request for information. Those departments were; Butte-Silver Bow, City of Billings, City of Bozeman, City of Great Falls, City of Kalispell, and the City of Missoula. We are grateful and appreciate their participation.

In Figure 52 below, the population served by each fire department in the survey is shown. It should be noted however, that in nearly every instance the population, and area served, is larger than the city jurisdictional limits. For instance, outside the City of Great Falls, the city serves a population of 4,000.

[72] Montana Code Annotated, (7-33-4101.Fire department authorized and required). In every city and town of this state there must be a fire department…

Figure 52: Population Served by Department



In Figure 53 below, the area served by the fire department is shown. Again as in Figure 52 above, in nearly every instance the area served is larger than the city limits.

Figure 53: Area Served by Fire Department

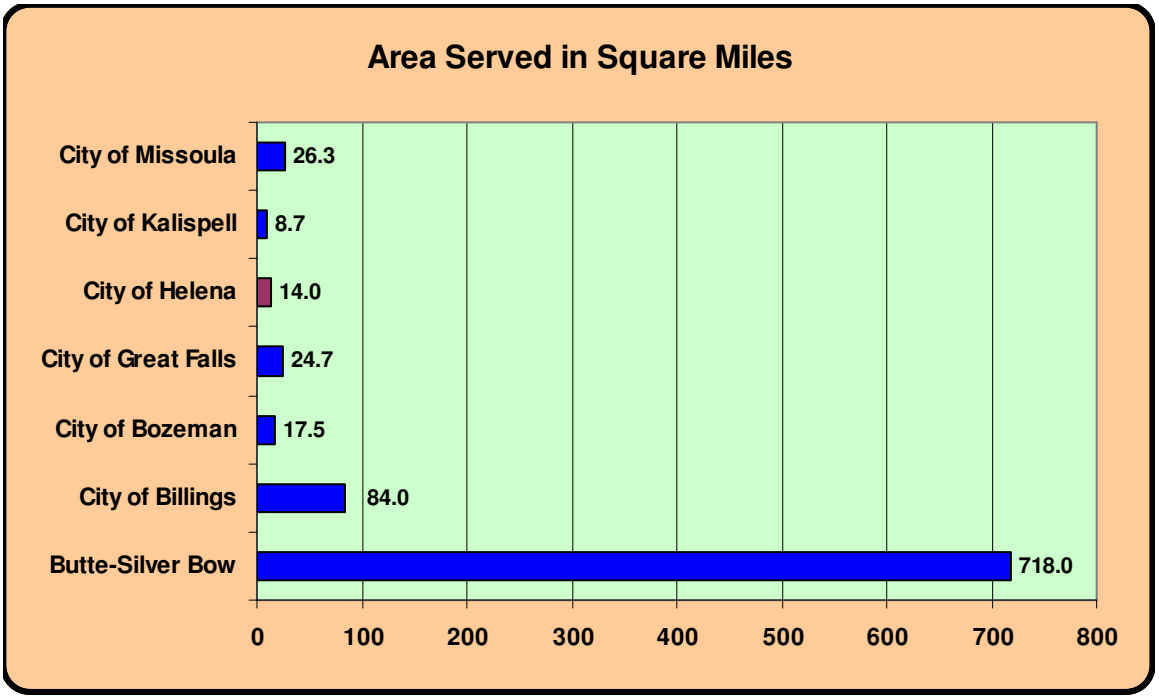
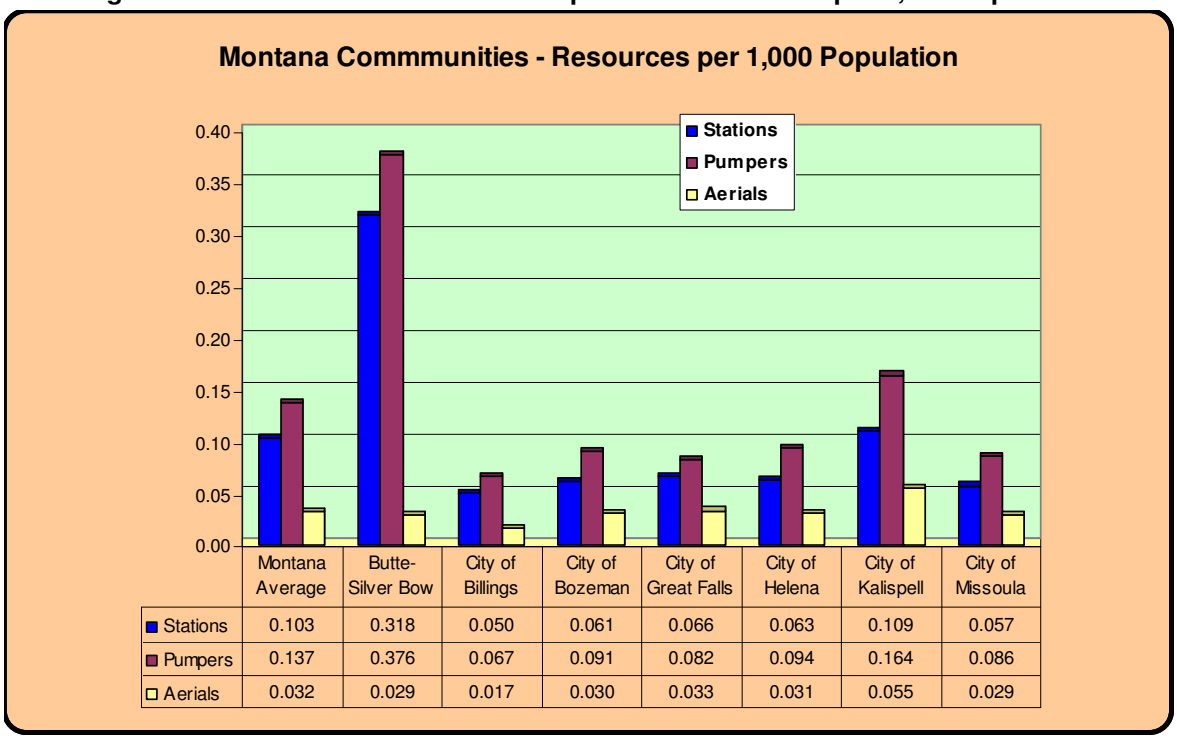


Figure 54 compares the City of Helena FD's fire suppression resources and shows in comparison with the resource allocation of the other survey communities, as well as the average of all seven fire departments.

Figure 54: Montana Communities Comparison - Resources per 1,000 Population



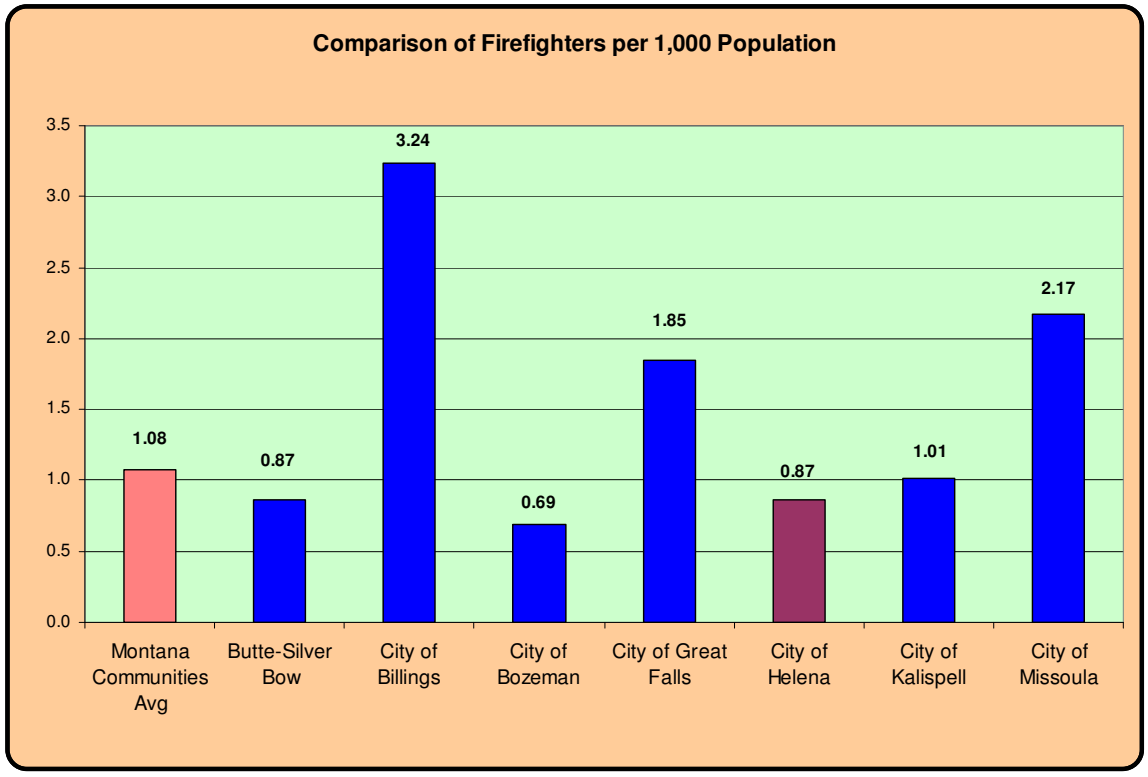
	Montana Average	Butte-Silver Bow	City of Billings	City of Bozeman	City of Great Falls	City of Helena	City of Kalispell	City of Missoula
Stations	0.103	0.318	0.050	0.061	0.066	0.063	0.109	0.057
Pumpers	0.137	0.376	0.067	0.091	0.082	0.094	0.164	0.086
Aerials	0.032	0.029	0.017	0.030	0.033	0.031	0.055	0.029

The comparison in Figure 54 shows that Helena FD has fewer fire stations per 1,000 residents than all departments — except for the cities of Billings, Bozeman, and Missoula. It should be noted however, that the City of Missoula is in the process of adding a fire station this fiscal year. In another master plan conducted by ESCi, for the City of Bozeman, the city is now in the planning process that may that may result in the addition of up to four new fire stations.

When comparing the number of fire pumpers, only two cities have more per 1,000 residents than Helena FD. In the category of aerial devices per 1,000 population, the City of Helena is about average among the seven departments with one.

As discussed in the staffing objective of this report, the number of operational personnel maintained by a fire department provides some measure of the ability of the agency to assemble emergency workers to respond to request for assistance. The following chart (Figure 55) shows the number of career personnel maintained by Helena FD per 1,000 residents, and compares that with the other six departments. It should be noted here that not all of the fire departments serve communities with similar populations, or use paid career personnel exclusively.

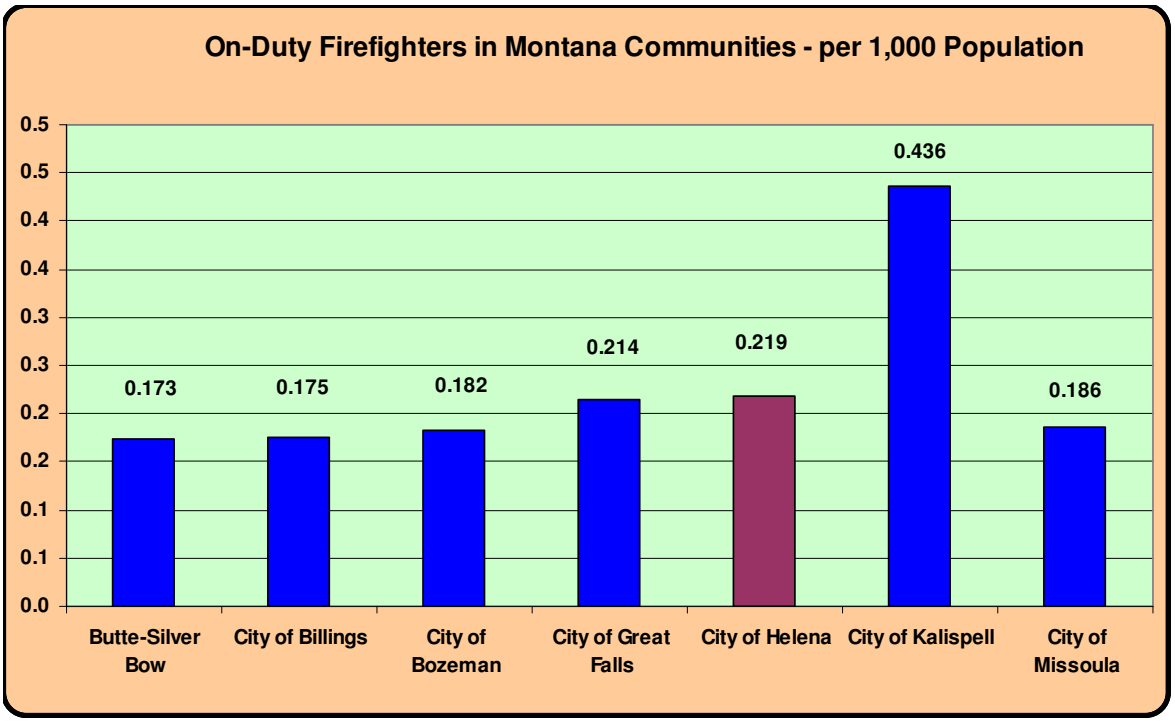
Figure 55: Comparison of Firefighters per 1,000 Population



As this chart shows (Figure 55 above), Helena FD has slightly fewer firefighters per 1,000 population than every department with one exception, Bozeman FD. This does not take into consideration community fire risk and other factors that may require more firefighter resources.

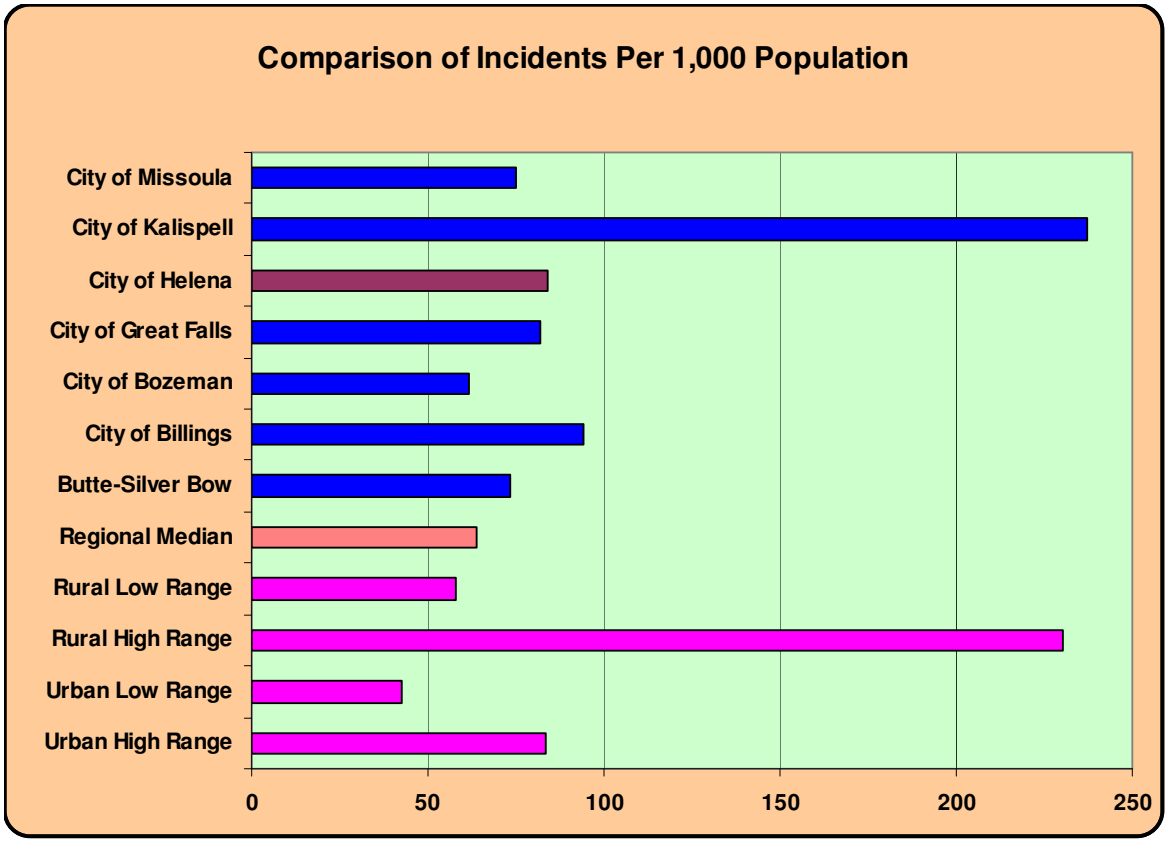
Regardless of the raw number of personnel available to the department, what matters most is the actual number of emergency responders the agency is able to produce at an emergency scene. Figure 56 below compares the minimum staffing levels per 1,000 population for each of the departments.

Figure 56: Comparison of Minimum Staffing per 1,000 Population



The chart below (Figure 57) shows the emergency response totals for each department for the previous calendar year.

Figure 57: Total Calls for Service – per 1,000 Population



As shown in Figure 57 above, requests for service occur at a higher rate per 1,000 population in the rural area. Another factor affected the incident rate is that departments in the survey provide deferring levels of service — for instance, Kalispell Fire Department provides EMS transport services.

Each of the departments was asked if they have and had officially adopted response time standards; and if yes, what percent are they currently meeting? The results are shown in the table (Figure 58) below.

Figure 58: Response Time Standard

Fire Department	Do you have an official response time standard?	Accepted response time standard	Current percentile
Butte-Silver Bow	Unofficial only	5:00 minutes	5:06 minutes, average
City of Billings	Yes	Less than 8:00 – 90 percent of the time	Less than 8:00 – 90 percent of the time
City of Bozeman	Yes	Not reported	Not reported
City of Great Falls	Not reported	N/A	N/A
City of Helena	**None adopted**	**N/A**	**N/A**
City of Kalispell	Yes	Turnout time is 60 seconds or less, 90 percent of the time. Response time is 240 seconds or less, 90 percent of the time.	91.5 percent
City of Missoula	Yes	Provide initial resources on scene within 6-minutes or less, 90 percent of the time. The 6-minute goal includes a 1-minute dispatch time, a 1-minute turnout time, and a 4-minute travel time.	equal 8:00 minutes 90 percent of the time

Appendix: C – Response Time Thresholds and Triggers

Introduction

When a community creates a fire department and builds its first fire station, a response time criterion is usually established. This response time anticipates that it applies to 100 percent of the area covered by the boundaries of that fire station. This is especially true when there is only one fire station and a small area to cover. Simply speaking, a central fire station is among the first public buildings created in most communities, no matter how small. As the community grows away from that station in incremental steps, the expectation is that the original fire station will still provide adequate coverage.

However, that expectation is fraught with many problems. In the simplest of terms, the total area covered by a fire department may or may not be highly developed initially; and even if a crew from the fire station responds, it may not do so in a timely manner. Most fire departments begin as volunteer. They usually are operated with this staffing pattern for economic reasons. When population and service area increases, there is often pressure to add full time staff and to consider adding additional stations.

In fact, there are many variations on this theme. Older, established cities tended to be denser and smaller in dimension, but they often annexed new areas. Newer communities may be created from a much larger area than the first fire station can cover. Urban sprawl, which is a currently an active discussion in other areas of public policy, has resulted in the timing of additional fire station construction and staffing being a topic of concern.

Station Siting

Usually when a fire department constructs its first fire station in the area, the values at risk and hazards to be protected are within a close driving distance. In effect, the first fire station in a community is a *centroid*. That is, the local fire station is the center of the response capacity of the jurisdiction. Earlier in the 20th century, fire stations were often characterized on maps by having a circle drawn around the station with an l.5 mile radius. This was sometimes used to describe the area of coverage. However, fire apparatus responds using the roadbed that consists of angles and distances that did not result in the circle being the true description of the coverage. Not only that, but one cannot place fire stations exactly three miles apart and have the two circles overlap. When they are placed closer together than the 1.5 radius, there is not only overlap, but also gaps where there does not appear to be coverage.

Later, the circle was replaced by diamond-shaped templates that could be overlaid over the station and rotated to estimate the relative advantage of road distances. The contemporary method used to evaluate fire stations is based on using the actual road-network in a computer model. This system uses time and distance to create a network that more closely represents how far the company can respond from its fire station, using the adopted time standard. A few years ago, the method that was in vogue was called FLAME. This is an acronym for Fire Station Location and Mapping Environment. From the time the first station is built, it creates an expectation that the facility can and will provide a timely response to calls for service in an area surrounding that facility.

When the original criterion was set for response time from that facility, there is an immediate *location – allocation* created by that station. The station provides a response to a given area within a reasonable time in a pattern that essentially is an overlay on the streets and highways that radiate outward from that location. Even before any incidents occur in a community, the road-network geography and the topographical attributes of a community create a *dynamic segmentation* that results in the ability of fire professionals to predict what areas can be protected reasonably and those that will not be covered. Today the preferred tool for conducting this type of analysis is through Geographical Information Systems (GIS).

Many infrastructure components have an effect upon the *location allocation* concept. Among these are road and highways networks, impedance factors such as traffic patterns and processes (stoplights and signs), and turn impedance, i.e. roadbed configuration and elevation impedance (slope). It is axiomatic that there is an inverse distance-weighting factor that results in longer response times to areas further away from the centroid of the station. This is called distance *decay*. The manner and means of response involve the use of the roadbed, but also involve dealing with differences in elevation and competing vehicles on the roadbed. In short, the further away from the location of an incident and the higher the impedance for response, the less effective any specific resource is in dealing with the initial stages of an emergency event as you move away from the station's location.

The use of the concept of using *travel time* itself is not exactly new. However, for many years the basic criterion was road mileage only. The standard that was normally applied was that a fire station was expected to be able to reach any incident within 1.5 miles of the station within five-minutes of driving time. Time was a secondary consideration. That standard was based upon data from the 1940s with respect to road conditions and traffic patterns. A lot has changed since then. For decades, the Insurance Services Office (ISO) has based fire station locations on a 1.5-mile

separation. In general, this has served as *rule of thumb*, but it does not deal with the vagaries of physical response (such as geography, transportation, and weather). Secondarily, it does not place any emphasis on response needed for emergency medical service (EMS) incidents, such as basic life support (BLS) or advanced life support (ALS).

The concept of using actual travel time today is based upon a more accurate representation of the level of service for an all-risk approach. It is more performance-based. Today most fire agencies set a time standard that includes three elements, two of which were missing from the strict use of mileage for station location; specifically, alarm processing time and turnout time. The actual time of road travel has often been used to set the communities expectation of performance.

Using this approach, stations are seldom located in a linear fashion. This concept is based on the time intervals identified in the Standards of Response Coverage section of the *Self Assessment Manual* published by the Commission on Fire Accreditation International. This process leads to the development of a standard of response cover, or a time and level of staffing designed to control an emergency at a minimum level of loss. The process is however, a policy choice based on risk and local conditions.

The basic performance standards for time goals are based on the rapid speed of fire growth and consequences of emergency medical situations over a short time frame. It has been determined that both fires and medical emergencies can gain a foothold that result in excessive losses when the times are excessive. The most common benchmark time standards used are:

- **Alarm processing time** — 60 seconds
- **Turnout time** — 60 seconds
- Travel time
    - Fire response — five minutes, 90 percent of the time
    - BLS response — five minutes, 90 percent of the time
    - ALS response — eight minutes, 90 percent of the time

The contemporary method of measuring performance looks at response time on incidents as an indicator of levels of service. The way this is done is two-fold. The first is to measure the actual performance during emergencies; the second is to monitor the system to determine when the system fails to achieve the performance goals.

One point of caution — Response time criterion should only be applied to calls that are emergency calls. When incidents are analyzed, the data should be reviewed to assure that non-emergency calls

are not used when calculating performance. There are many calls for service that fire departments log as incidents that are non-threatening scenarios and the responding companies will handle them on an as–needed basis. To include these times in the analysis of emergency services tends to skew the outcome, leading to a false service indicator.

Response Failure

To understand when response failure occurs, we must define first what is being measured and how we measure the performance goal. For example, a basic question to be answered is whether a department is protecting the dirt or the incidents. Are we going to measure percentage of performance by first-due district, or department wide? Generally, fire protection practitioners try to position stations to cover 90 percent of the ground in each first-due district, to provide overlap for concentration, redundancy for multiple calls, and for equity of access for customer service. It is economically impossible to cover 100 percent of the ground. Based on actual call loading, we could strive for 80 to 90 percent of the calls within first-due and concentration total reflex measures.

If the measure for either area or incidents is set at 80 to 90 percent effectiveness, how much *slop* over the performance measure is acceptable? For example, if an historical incident measure is at the 85 percentile, BUT the other five percent are covered in the next 60 seconds, is that acceptable?

Maybe yes, maybe no — it is important to understand that values at risk, type of unmet calls and the total number of calls can combine to create a need. If the deficiency is only five percent or 25 calls out 500, depending on the size of the measurement area the gap may or may not be significant.

For example, if the performance requirement was to arrive at the scene of an emergency within five minutes of travel time, 90 percent of the time, this criterion could be applied to one year of response data to see if the goal was achieved. It should be noted that this criterion **allows** for ten percent of the calls to be beyond the five minutes traveling time over a given reporting period. This provides flexibility in the assessment of coverage to cope with anomalies such as extra-ordinary response conditions such responding from out of district, or for delays caused by simultaneous alarms.

This raises an additional question. Of the ten percent overage, how many of the incidents are covered within the next 30 to 60 seconds?

The first indication of a problem of providing service is when a number of alarms that exceed the performance standard are documented. This may or may not be function of new growth. It could be

the result of in-fill that causes a higher number of alarms for the company than it can service. This is especially true when alarms come in simultaneously.

Moreover, when areas are being developed that begin to extend travel times they do not automatically become the source of new alarms. In fact, new construction often has a period of several years before adding to fire service demand. The same is not necessarily true from the perspective of emergency medical service.

When a New Station is Needed

The question that many communities have to address is when is a second or third fire station required to meet time goals? Obviously, this has been answered in any community that has more than one fire station. The problem comes in finding a quantifiable threshold to determine that point for each specific situation because it varies from community to community and even within a specific jurisdiction. The overall answer is part financial and part professional judgment. In fact, in the literature of the fire service today, there is very little definitive guidance on how this should be accomplished.

There are several steps that can be identified. They consist of:

- Identifying areas with minimum coverage
- Identifying feasible locations for a new facility
- Evaluating those locations using specific criterion

The description in this document is based upon a growing body of knowledge aimed at quantifying this process. What is unfortunate is that there is no universally acceptable algorithm. The fire protection planning process does allow for an evaluation of potential loss as a result of deteriorating response times. One form of measurement is to assess the road and transportation network to ascertain the percentage of road mileage that theoretically is covered by the time criterion. This is done using computer-based modeling that will create a polygon that describes the *areas of coverage*. In fact, this process will also identify gaps and deficiencies where response time is not adequate.

It should be noted that as long as a department operates a volunteer-only force, the time established as a turnout time is a factor. Volunteers usually take more time to get out of a station than a permanent crew does. This statement does not place any prejudice on the use of volunteers. It is mentioned only to remind the readers that total response time must be considered when evaluating alternatives.

As growth and development extends beyond the range of travel time of one station, the percentage of calls that exceed the performance requirement should begin to increase. It should be noted that growth, in and of itself, does not create an instantaneous demand. New construction has the advantage of better codes, a higher level of owner interest, and limited deterioration of fire-breeding conditions.

A more subtle difference in today's fire service is the fact that community demand for medical services is almost from day one of occupancy. In short, this means that new construction may place more values and lives at risk, but the demand for service will be incremental. When demand for service does begin, it will be based upon two factors - nature of the occupancy and hazards that are present.

Incident increase may first appear as a change in the performance of an existing company in the annual analysis of emergency calls. For example, if a station has 1,000 alarms and a 90 percent compliance rate with the response standard, there would be about 100 alarms per year that were beyond the goal. This would be the baseline for existing response performance. If the following year, the number of alarms was 1,200 and percentage dropped to 85 percent, this would indicate that the department is losing ground on response performance. If the change in the number of alarms had merely increased because of more calls in the same area, the response time percentage should have remained similar. (One exception to this rule is when a single company has such a high call volume that it cannot handle all calls without queuing.)

However, since the alarm rate went up and the performance went down, the failure threshold may be approaching. The change in alarms that were not met may now go to 180 (15 percent of the overall). As stated earlier, analysis needs to be performed on the deficiency to determine how many of those incidents were handled in the increment of 60 seconds beyond the performance time.

Based upon actual response time analysis, one threshold that needs to be considered is the increase in alarms and the percent of calls handled under the criterion adopted. Anything more than a ten percent increase in call and a ten percent reduction in performance is a signal to evaluate the level of service being provided.

In larger departments, most practitioners are factoring out non-emergency calls and for actual incident performance, only looking at *core emergencies*. The definition of core can be made locally based on risk and importance to the community, but they are usually structure fires and moderate to severe status EMS calls.

In general, if more than one measure must be slipping, an evaluation of all Standards of Coverage factors, along with the reason why the data is slipping, is required. A one-year snapshot may not be valid **if** the agency had a big storm event, a catastrophic weather event, major wildland fire, and stacked a bunch of calls for just a month or the year.

Incident analysis approach depends upon having emergencies, which does not address what is at risk. That is where the mapping technology applies. As structures and different types of fire problems are constructed on the ground, they may represent additional lives and property that are at risk that deserve equity in protection. One of the elements for creating a governmental entity is to control land use and to create mechanisms for collecting taxes and determining ownership. Furthermore, these same individuals and properties are paying the taxes, fees, and permits for the level of service being provided. In one sense when growth occurs, the new properties are usually safer than the older part of the community because they are constructed to a higher standard.

What is clear to almost any community is that being slightly out of the response standard range does not trigger a new facility.

Assessed valuation or increased revenues in the form of benefit assessment or mitigation fees provide incentive for new fire stations to be constructed and staffed when the fire agency can afford them. One threshold that needs to be carefully monitored is the revenue stream that accrues from development. That revenue stream should provide a threshold when different elements of future fire stations can be determined. For example, it takes several years to evolve a location into a fire station site. As the revenue stream proceeds, funds could be available for site acquisition, initial plans and specifications, site treatment, and construction. This may be a multi-year process.

The threshold for construction should be to provide a new fire station into any zone in the city or jurisdiction that has more than 35 to 50 percent of its parcels developed. Some of the secondary measures currently being used are 300 to 500 calls for service for any individual fire company or a service population of 10,000 to justify a full-time paid company. The following criterion grid illustrates a series of measures that may be useful deciding when a new fire station should be deployed within a city. Similar grids could be developed to help establish triggers for the deployment of additional emergency equipment and personnel.

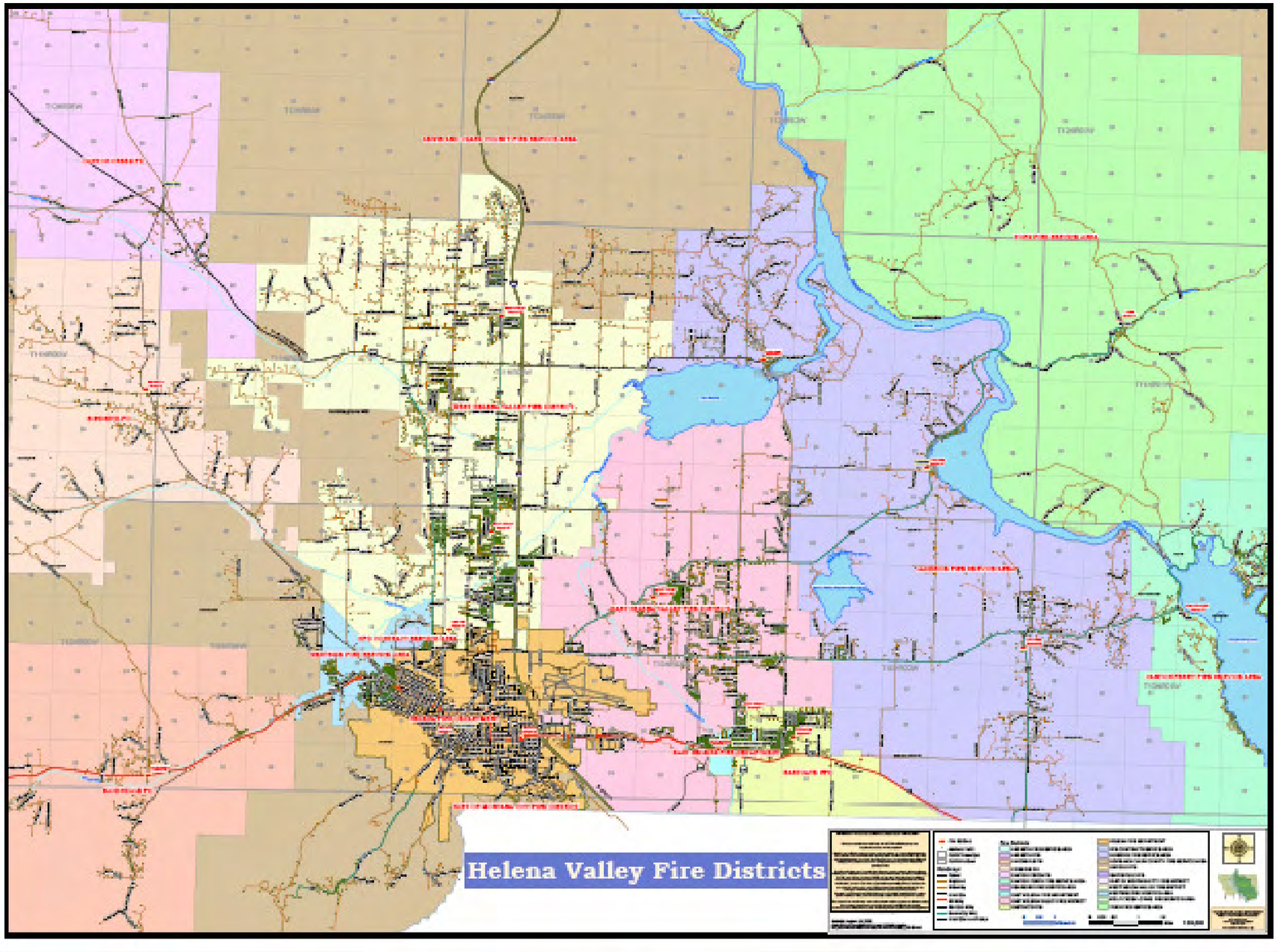
Figure 59: Criterion Table to Determine When a New Station is Needed

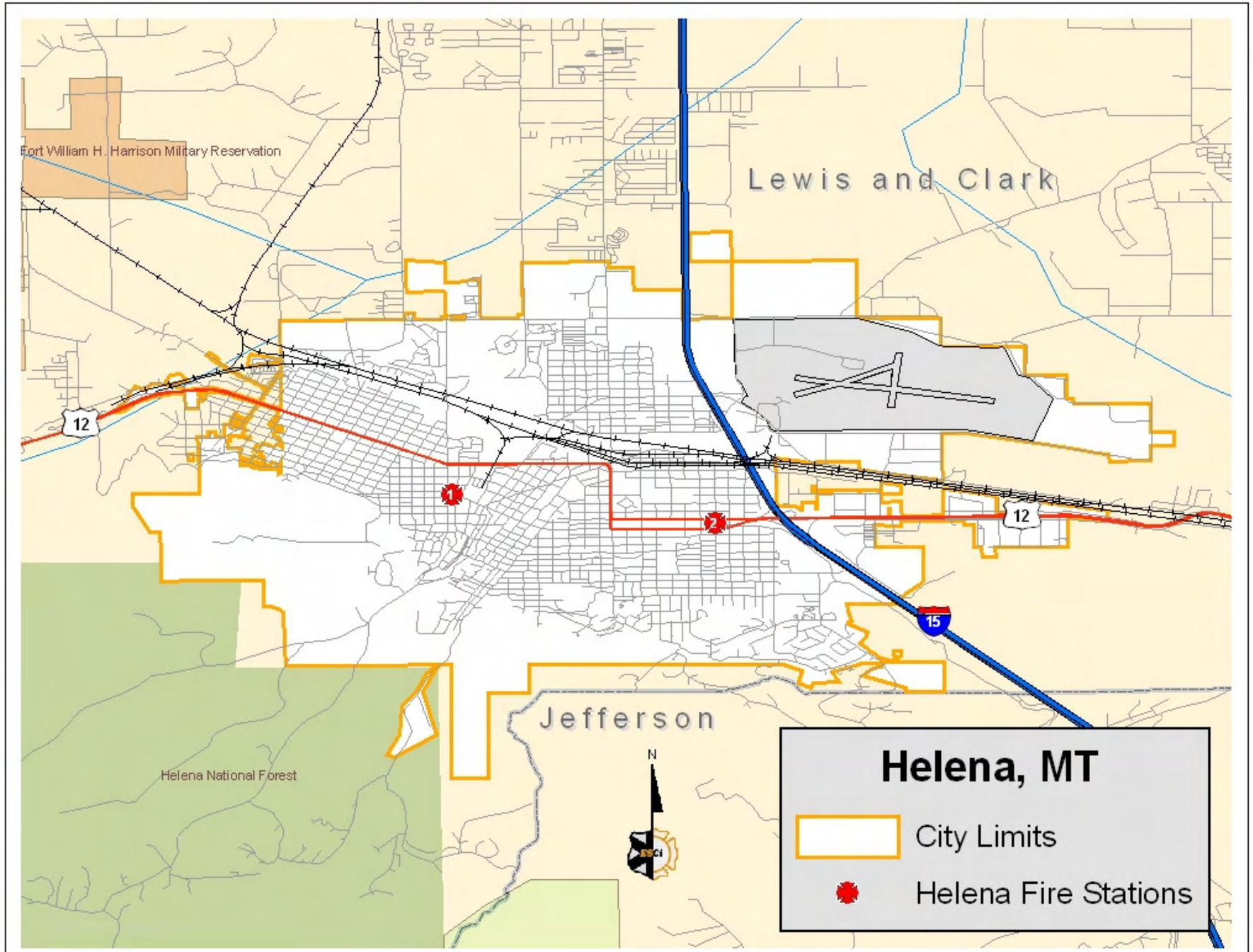
Criterion Grid to Determine When a New Station is Needed				
Action Choices	**Travel Distance**	**Criterion**		
		Response Time Parameter	**Out of Area Calls**	**Building/Risk Inventory**
Maintain status quo	*Enter local information*	**1st due company** *Enter local response time*	*Enter existing out of area calls*	*Enter local building/risk inventory*
Temporary facilities and minimal staffing	Risks 1.5 to 3.0 miles from existing station	**1st due company** Exceeds 5-minutes travel time 10 percent of the time, but never exceeds 8 minutes.	More than 10 percent of calls are in adjacent area	New area has 25 percent of same risk distribution as in initial area
Permanent station needed	Risk locations exceeding 4.0 miles from the station	**1st due company** Exceeds 5-minutes travel time 20-25 percent of the time. Some calls greater than 8:00 Minutes.	More than 20-25 percent of calls are in outlying area	New area has 35 percent of same risk distribution as in initial area of coverage
Permanent station essential	Outlying risk locations exceeding 5.0 miles from the 1st station	**1st due company** Exceeds 5-minutes travel time 30 percent of the time. Some calls greater than 10 minutes.	More than 30 percent of calls are in outlying area	New area has 50 percent of same risk distribution as in initial area

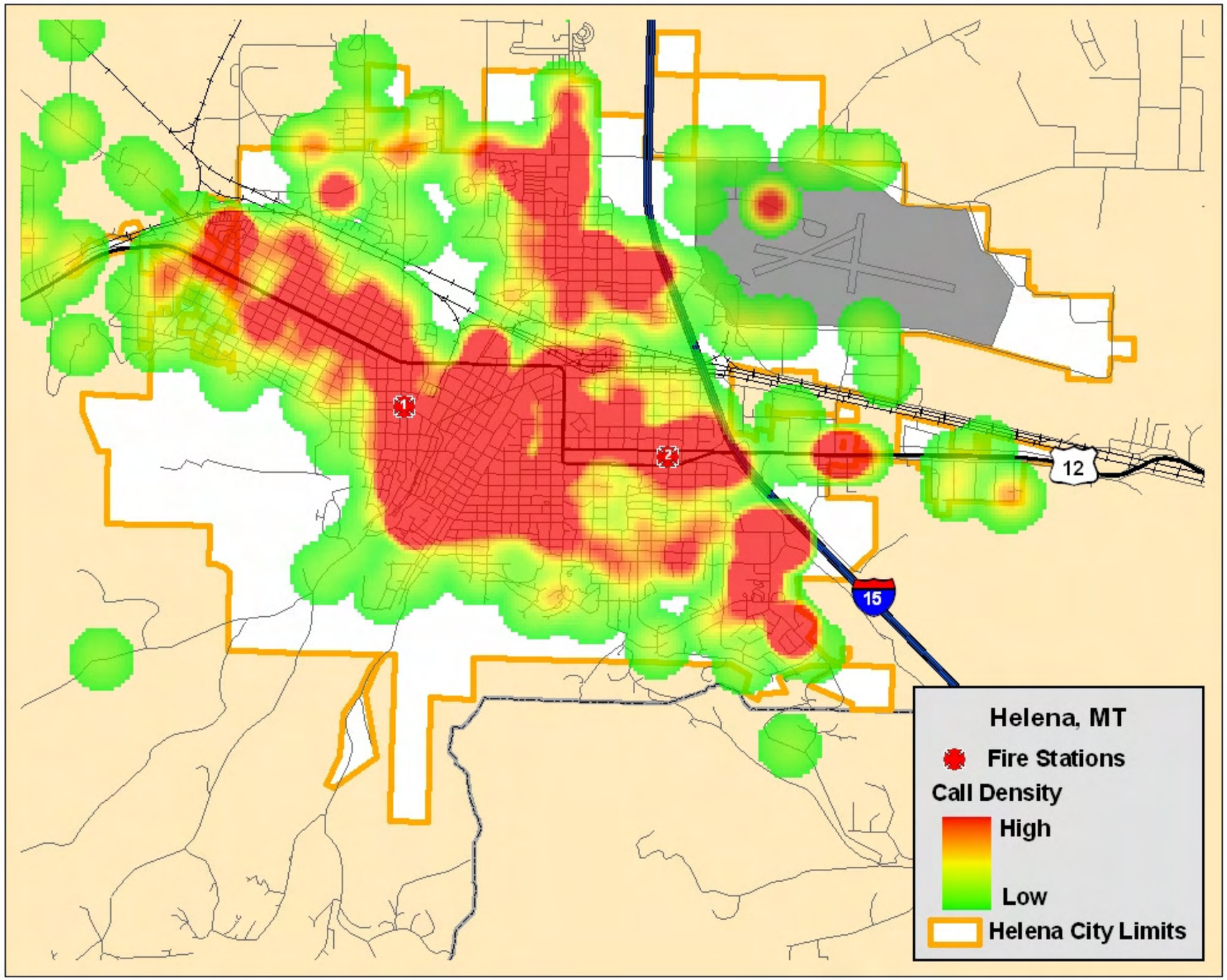
The decision process has to be placed into the context of staffing pattern decisions. It is not uncommon to have a station constructed, and have the staffing pattern evolve over years from one system to another. In the case of a station under consideration, it should be anticipated that a policy decision needs to be made with respect to the staffing system to be used as soon as possible. It is anticipated that a completely volunteer system would not be viable for this type of facility. Conversely, a fully staffed paid company has a significant price tag to it. A combination staffing system would seem to be the most practical for the first five years of consideration. These are the staffing configurations used in the matrices developed to describe thresholds and triggers that should be evaluated in the future.

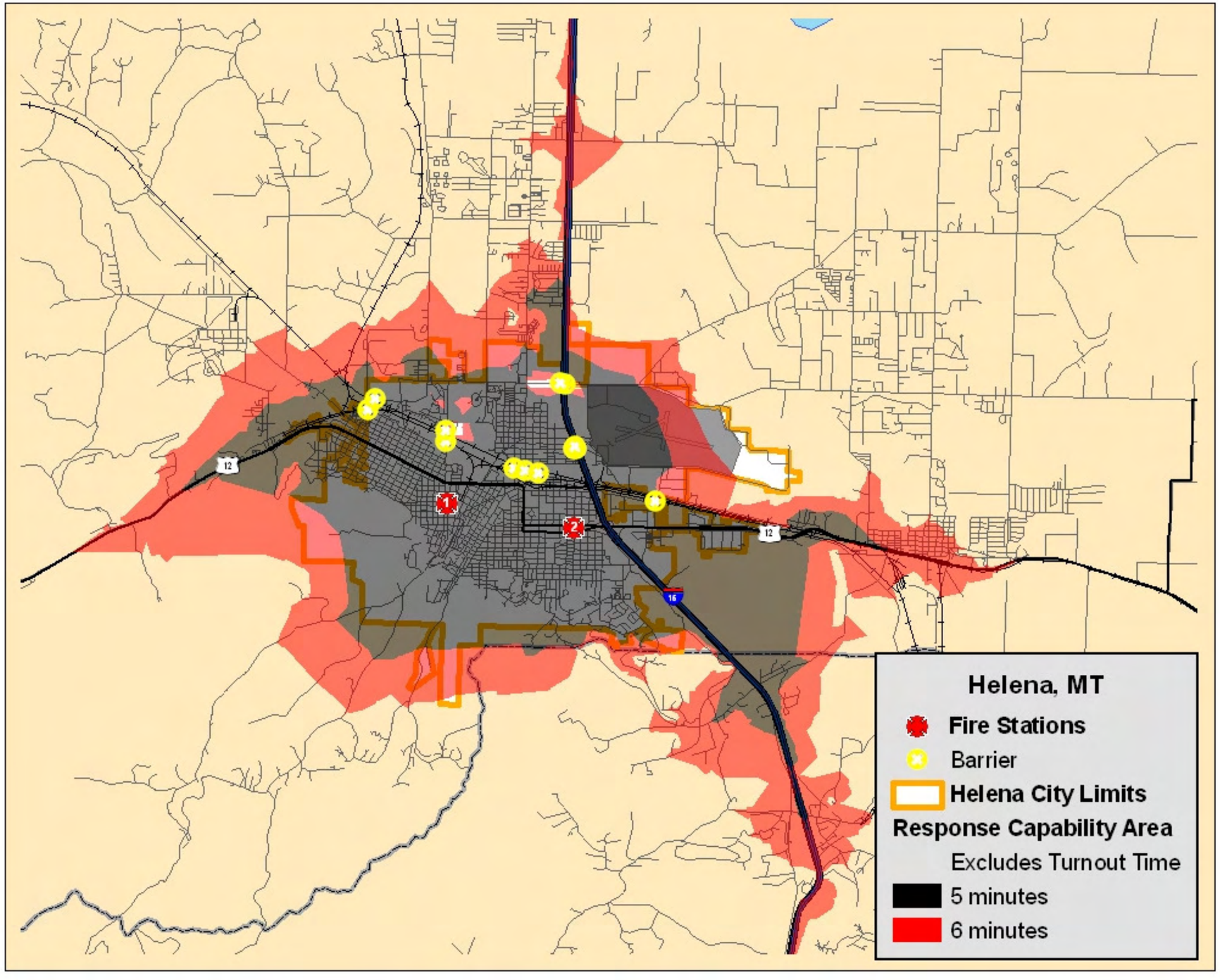
This observer's experience has been that it takes a multiple elements of the standards of coverage to be out-of-balance along with having additional economic resources to justify an additional paid company or staffing increase on one or more companies.

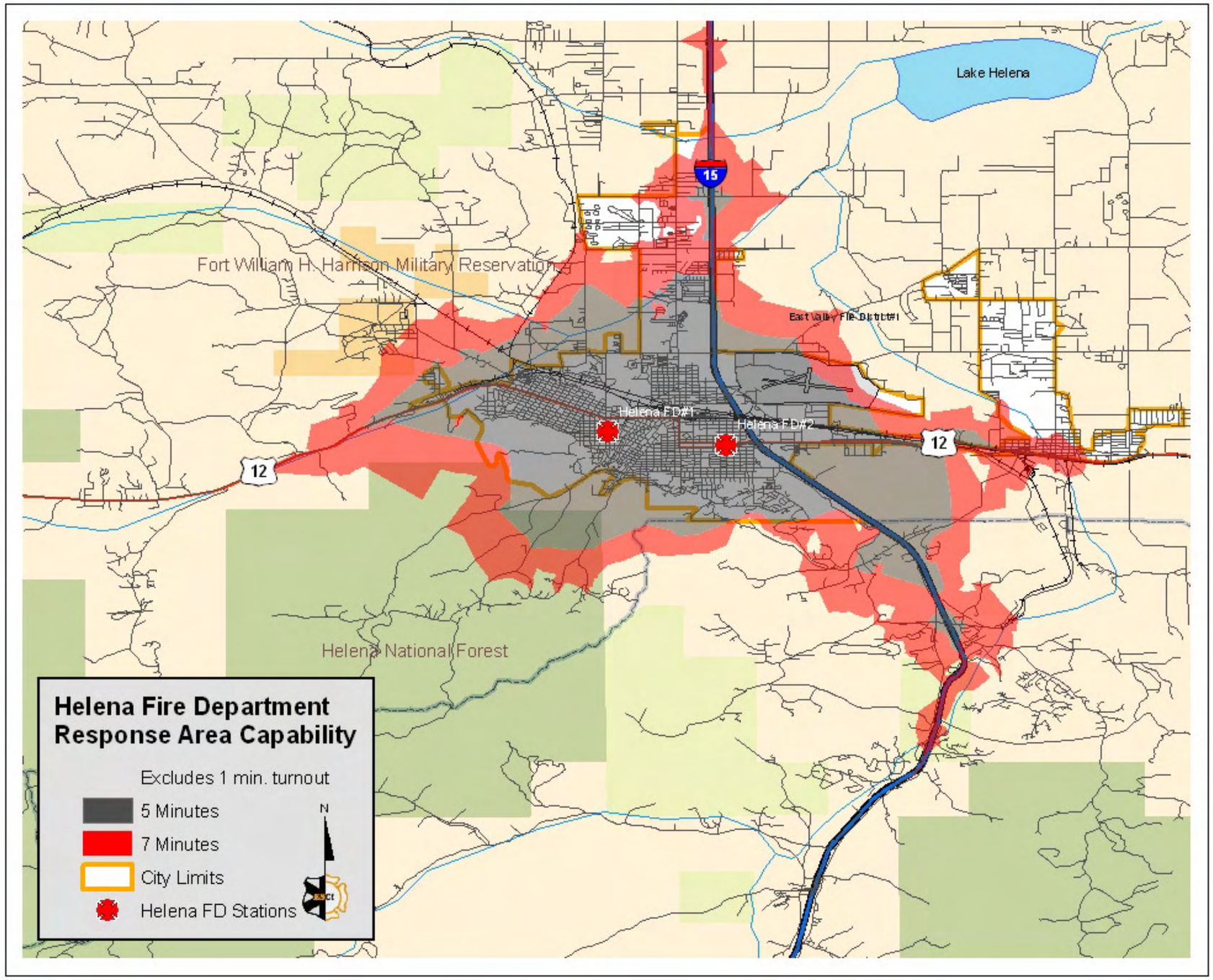
Appendix: D – Maps

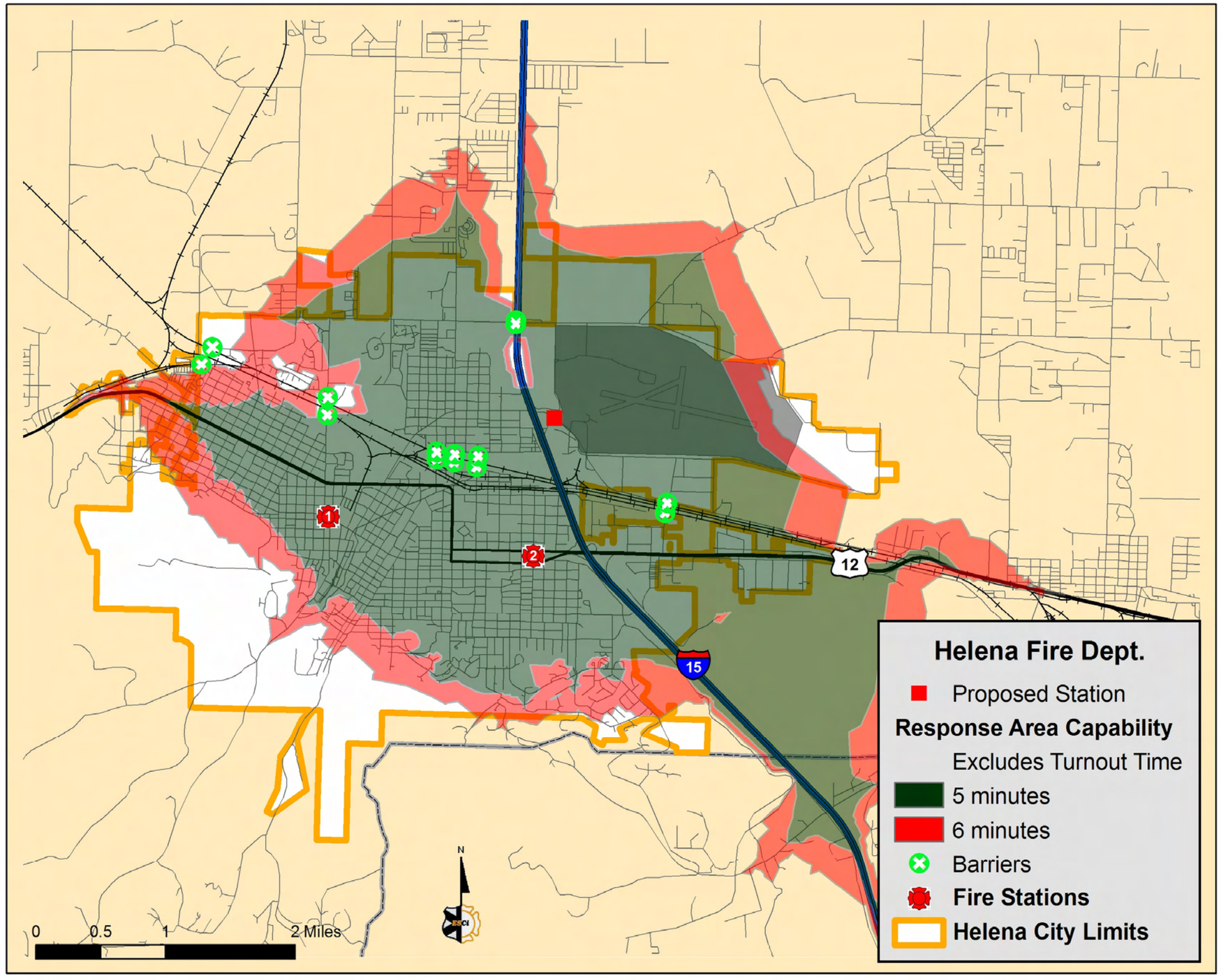



Fort William H. Harrison Military Reservation
Lewis and Clark
12
1
2
12
15
Jefferson
Helena National Forest
N
Helena, MT
City Limits
Helena Fire Stations


1
2
12
15
Helena, MT
Fire Stations
Call Density
High
Low
Helena City Limits


12
12
16
1
2
Helena, MT
Fire Stations
Barrier
Helena City Limits
Response Capability Area
Excludes Turnout Time
5 minutes
6 minutes


Lake Helena
15
Fort William H. Harrison Military Reservation
East Valley Fire District
Helena FD#1
Helena FD#2
12
12
Helena National Forest
Helena Fire Department
Response Area Capability
Excludes 1 min. turnout
5 Minutes
7 Minutes
City Limits
Helena FD Stations
N


12
15
1
2
N
0
0.5
1
2 Miles
Helena Fire Dept.
Proposed Station
Response Area Capability
Excludes Turnout Time
5 minutes
6 minutes
Barriers
Fire Stations
Helena City Limits