



STANDARDS OF COVERAGE 2009



ASHLAND FIRE & RESCUE STANDARDS OF COVERAGE

INTRODUCTION

This document examines Ashland Fire & Rescue's ability to respond to and mitigate emergency incidents created by natural or human-made disasters. It differs from the Ashland's Emergency Management Program and Emergency Management Plan because it provides overall planning and coordination for emergencies, and it is a comprehensive analysis of detailed Fire, EMS, and Rescue systems.

The format of this document is based on the State of Oregon's Standards of Response Coverage, a critical element of the accreditation process of the Commission on Fire Accreditation International (CFAI). "Standards of Response Coverage" are those written procedures that determine the distribution and concentration of the fixed and mobile resources of a Fire and EMS organization. A systems approach to deployment, rather than a one-size-fits-all prescriptive formula, allows for local determination of the level of deployment to meet the risks presented in each community. In this comprehensive approach, each agency can match local need (risks and expectations) with the costs of various levels of service. In an informed public policy debate, a City Council "purchases" the Fire, Rescue, and EMS service levels (insurance) the community needs and can afford.

The Standards of Coverage are developed through the evaluation of Ashland Fire & Rescues present practices, regulatory requirements, historical response data, and a comprehensive risk analysis. The response analysis will help the City Council and the community, visualize what the current, or a possible, response system can and cannot deliver.

**** Printing of this document was done in black and white as a cost savings measure. A color version is available via electronic medium on request.**

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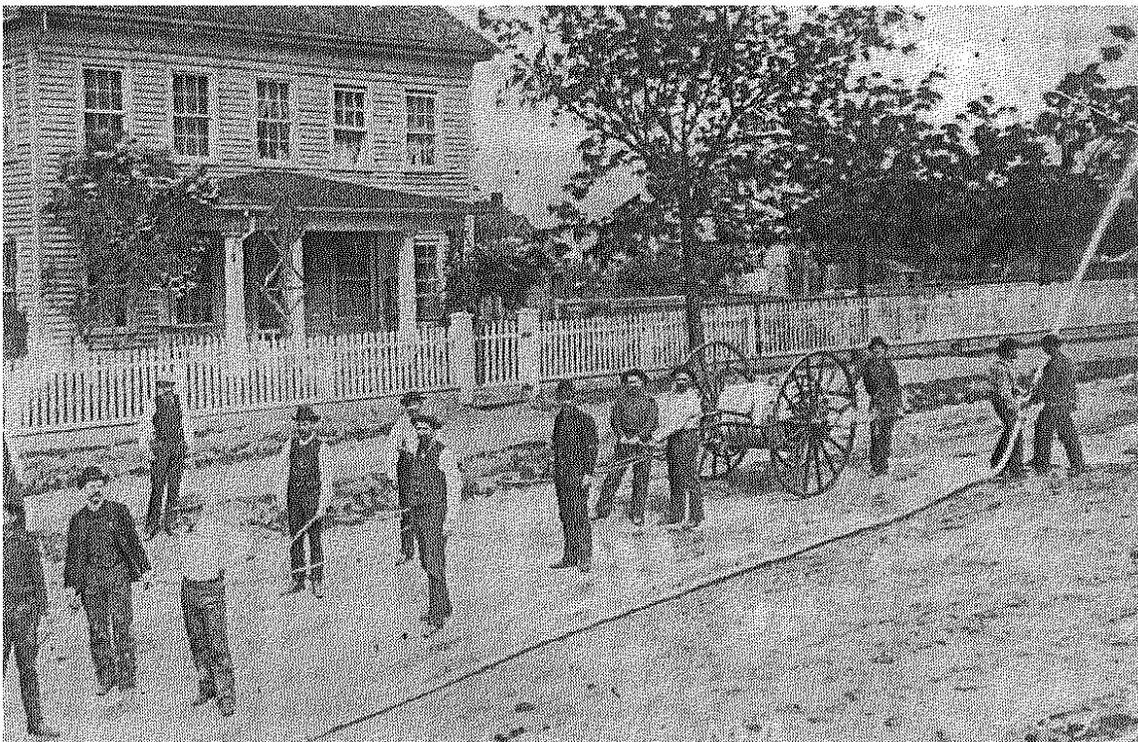
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SECTION ONE: COMMUNITY BASELINES

A. History of Ashland Fire & Rescue

Like many towns across America, Ashland has literally been shaped by fire. On March 11, 1879, a devastating fire that began in a blacksmith's shop destroyed many of the businesses on the west side of the plaza. Many of the masonry structures that replaced the wooden buildings are still standing today.



Ashland Hose Company No. 1, East Main Street, 1887

On August 3, 1885 the “Ashland Fire Committee” was formed under City Council ordinance No. 14. In 1891, the City Council passed Ordinance No. 105 establishing the Ashland Fire Department, consisting of two hose companies. The first Fire Chief was appointed in 1913. Today, Ashland Fire & Rescue (hereafter referred to as “AF&R”) is organized as a municipal service department

B. Governance

The City of Ashland operates under the strong Mayor – Council form of government with the Mayor elected for a four year term and six Council Members elected, at-large, for four-year overlapping terms. Day-to-day operational activities are overseen by a City Administrator who coordinates the duties and

responsibilities of eight Department Directors including the Fire Chief. The budget process, organized under Oregon budget law, utilizes seven citizens as lay members of the city budget committee, who are joined by the Mayor and Council. The Budget Committee approves the budget, which is the annual spending plan for the City. The City Council adopts the budget following a public hearing. The adopted budget for AF&R in 2009 was approximately 5 million dollars. AF&R generates over 700,000 dollars of revenue which accrues in the General Fund.

C. Geography

Urban Growth Boundary: The emergency medical services and fire suppression auto/mutual aid boundaries of Ashland Fire & Rescue extend beyond the Urban Growth Boundary of the City. The City Urban Growth Boundary is as follows:

- | | |
|-------------------|---|
| Northern Boundary | - Jackson Rd. @ Hwy 99 North, Bear Creek, East Main St. |
| Eastern Boundary | - Dead Indian Memorial Rd., Tolman Creek |
| Southern Boundary | - Upper Strawberry Lane, Pinecrest Terrace, Green Meadows Way |
| Western Boundary | - Ashland Mine Rd. |

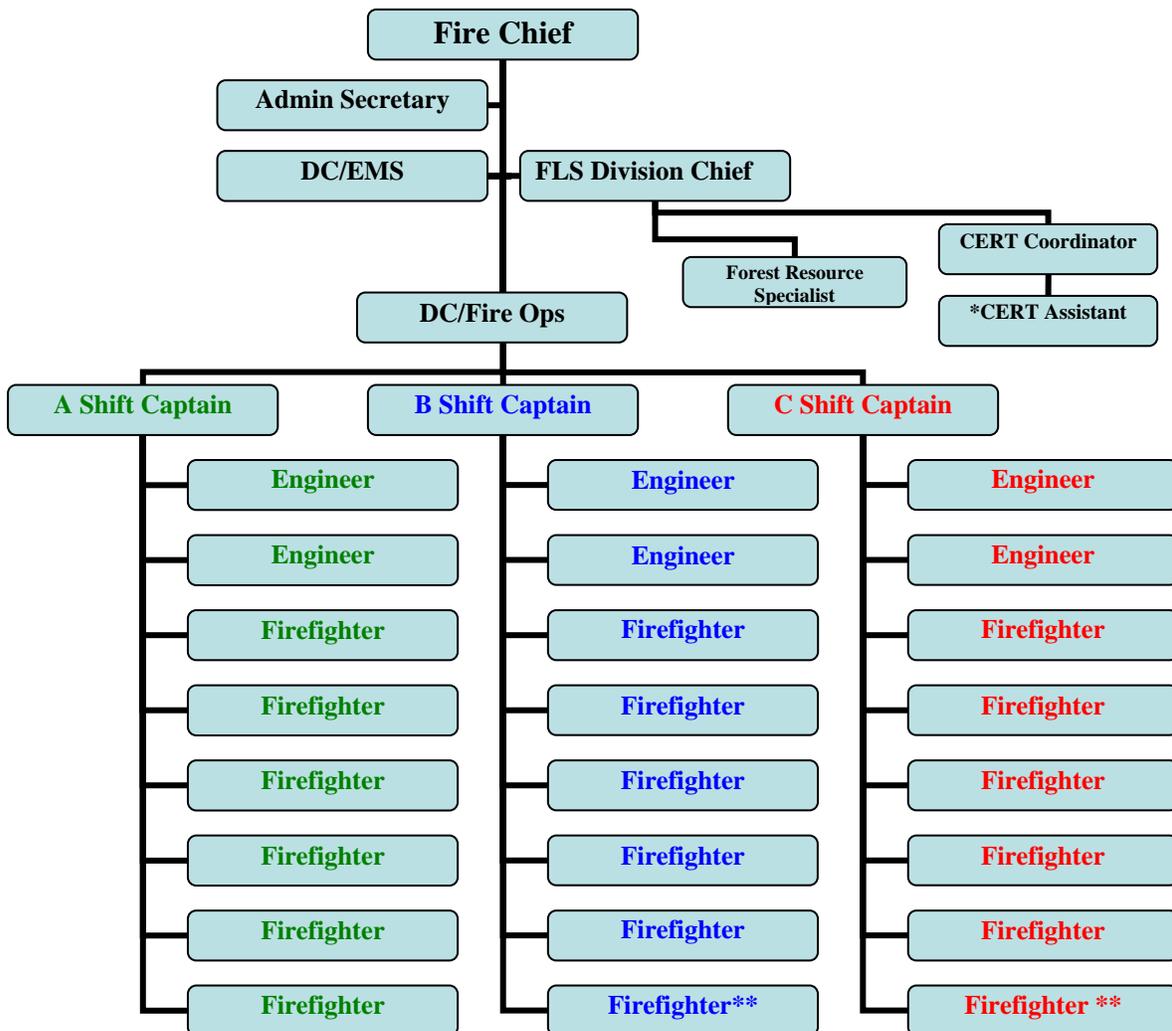
Primary topography: Ashland's elevations vary from 1,760 – 3,560 feet above sea level, and are located on the edge of the eastern foothills of the Siskiyou Mountain Range. The surrounding lands are a combination of livestock grazing lands and pasture lands and forested mountainous terrain. The valley floor consists mostly of farmland and pastureland, while the mountain slopes and mid to higher elevations are forested.

The City is bordered to the east by Neil Creek, to the north by Bear Creek. and to the west by Wright's Creek. To the south lies the Ashland Creek watershed, source of the city's drinking water. All drainages ultimately run into the Rogue River. The Talent Irrigation District maintains a major canal which runs from southeast to northwest through the city, continuing into rural farmland.

Weather: Summer months have typically very low humidity, often less than 20%. High temperatures range between 80 and 105 degrees Fahrenheit from June through September. These conditions create extreme fire conditions during most fire seasons. Winter months have typically moderate temperatures of 40 to 60 degrees with occasional lows in the teens and twenties. In addition, winters usually bring snow, ice and wind. This is particularly true for elevations above the valley floor.

D. Existing Fire Deployment

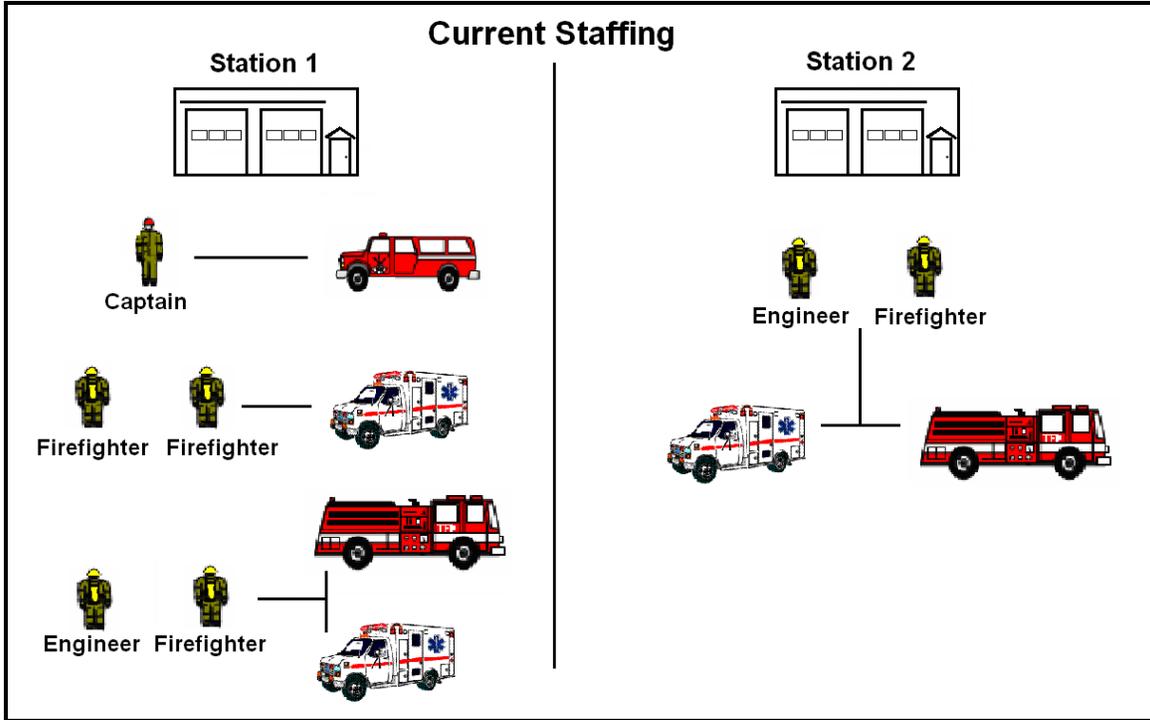
Ashland Fire & Rescue employs thirty-four full time personnel (Two positions are currently unfilled due to budget short falls). There are 6 Firefighters, 2 Engineers and 1 Captain on each shift. There are three emergency response shifts. Each shift works a 24 hour day, rotating days on and days off during a nine day cycle. Each of the three shifts is under the command of the shift Captain. While each shift is comprised of 9 personnel, the minimum daily required staffing is 7 personnel (1 Captain, 2 Engineers, and 4 Firefighters). These 7 - 9 personnel operate out of the City's two fire stations. Fire Station No. 1 is also utilized for administrative offices. The administrative staff includes the Fire Chief, Operations Division Chief, EMS Division Chief, Fire & Life Safety (FLS) Division Chief and Secretary. The following is the department's organizational chart:

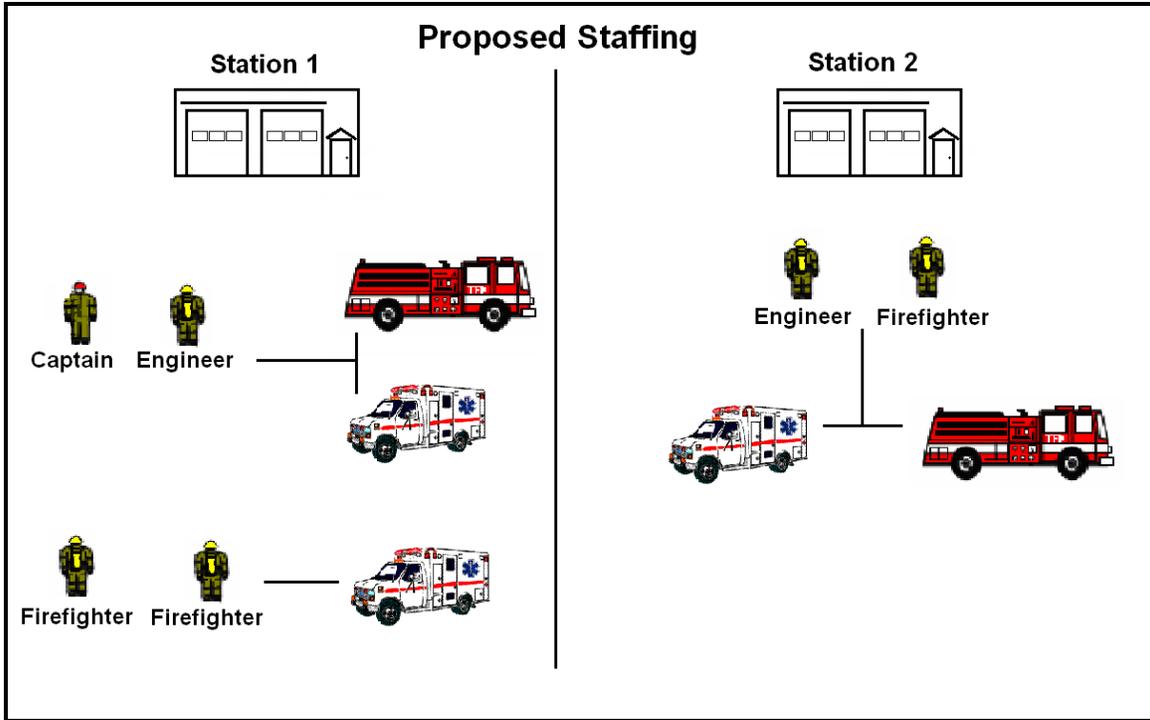


**indicates part time position funded by grant funds*

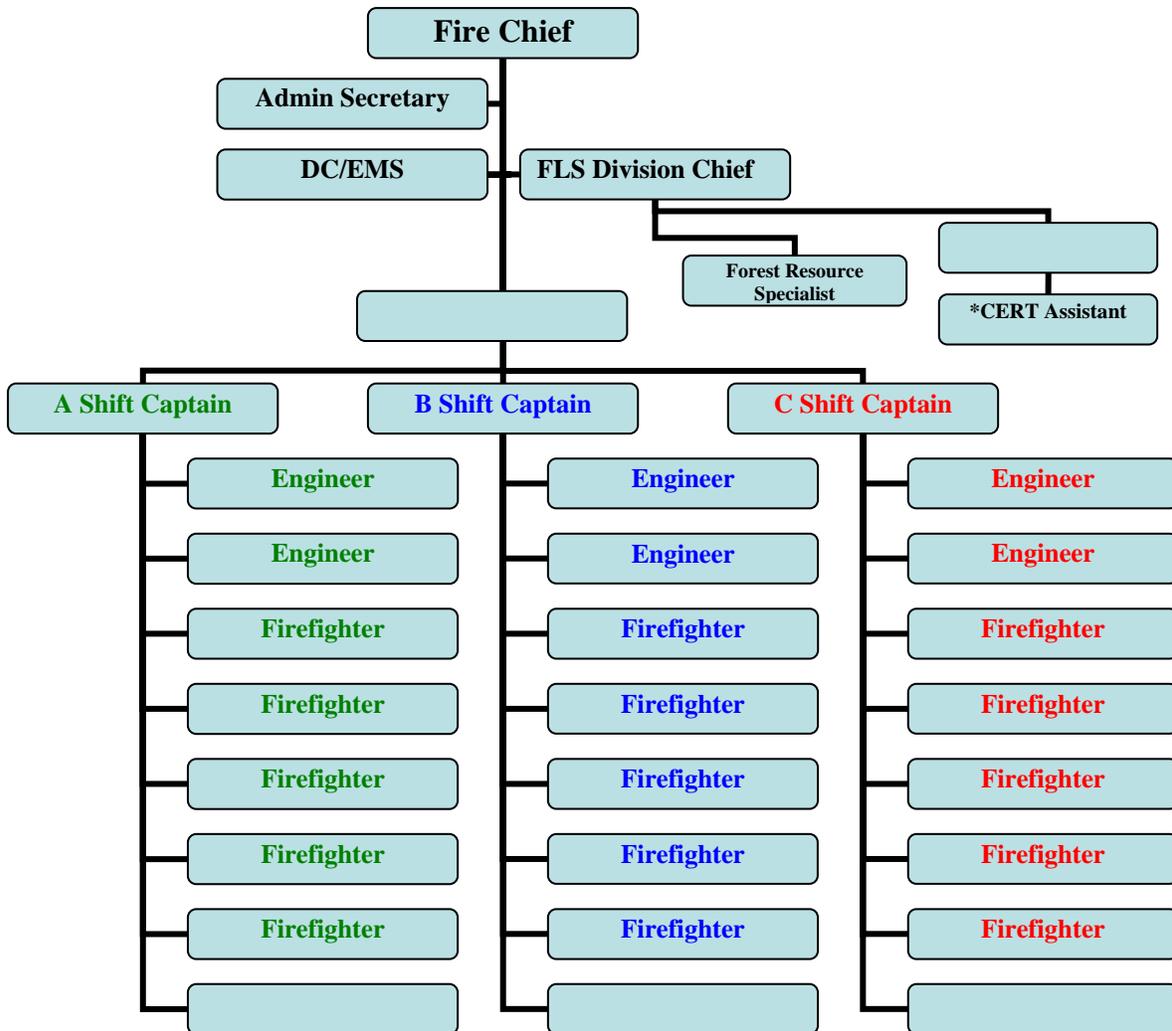
**** indicates positions that have not been filled due to lack of funding in the current 2008-2009 budget year.**

Minimum Daily Staffing





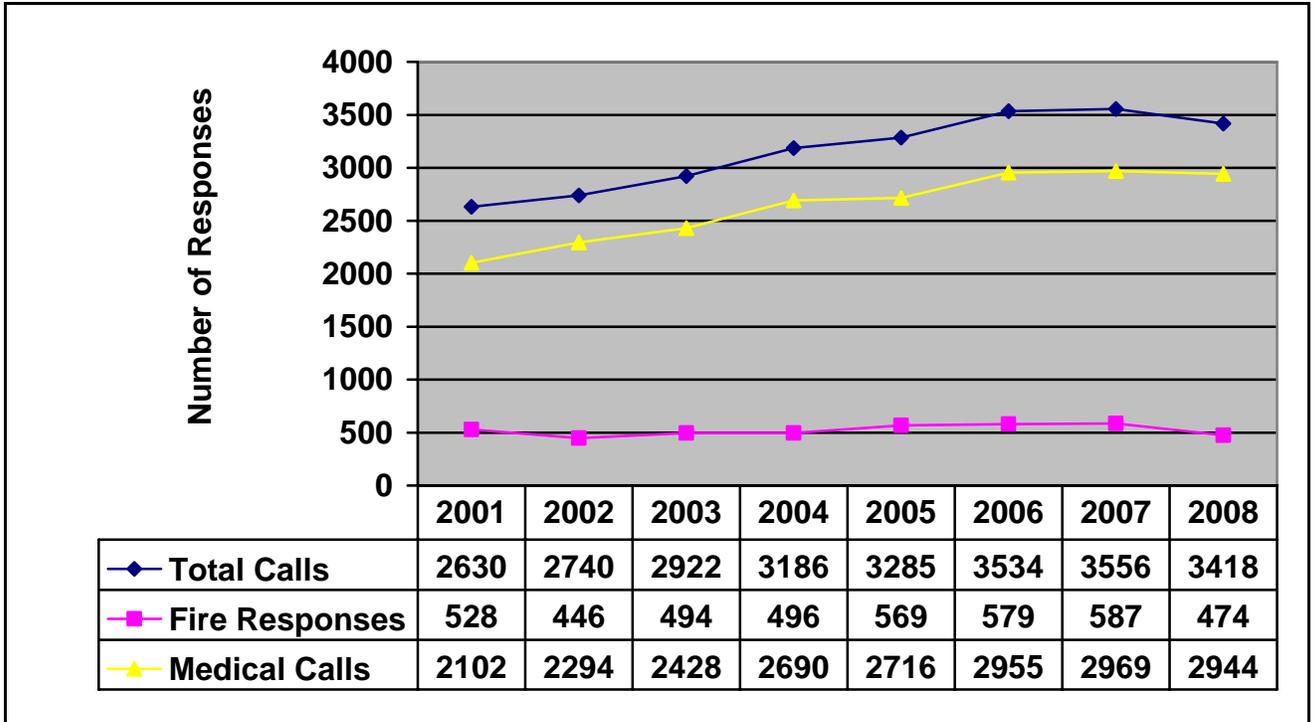
The following will be the department's organizational chart with the proposed budget cuts scheduled to take effect July 1, 2009 for the 2009-2010 budget year). Full time staff will decrease to twenty-nine personnel (Down from thirty two full time funded positions). In addition to the two firefighter positions that have not been filled, the department would need to cut another two firefighters and the C.E.R.T. coordinator. The Operations Division Chief position would be left vacant and that individual placed on a shift to augment line staff. Minimum daily staffing would then be reduced to 6 firefighters (3 Firefighters, 2 Engineers, and 1 Captain).



**indicates part time position funded by grant funds*

Calls for service

During the 2008 calendar year, Ashland Fire & Rescue responded to 3,418 calls for service. Of these requests for service, 86% were related to Emergency Medical Services, 14% were Fire related emergencies.

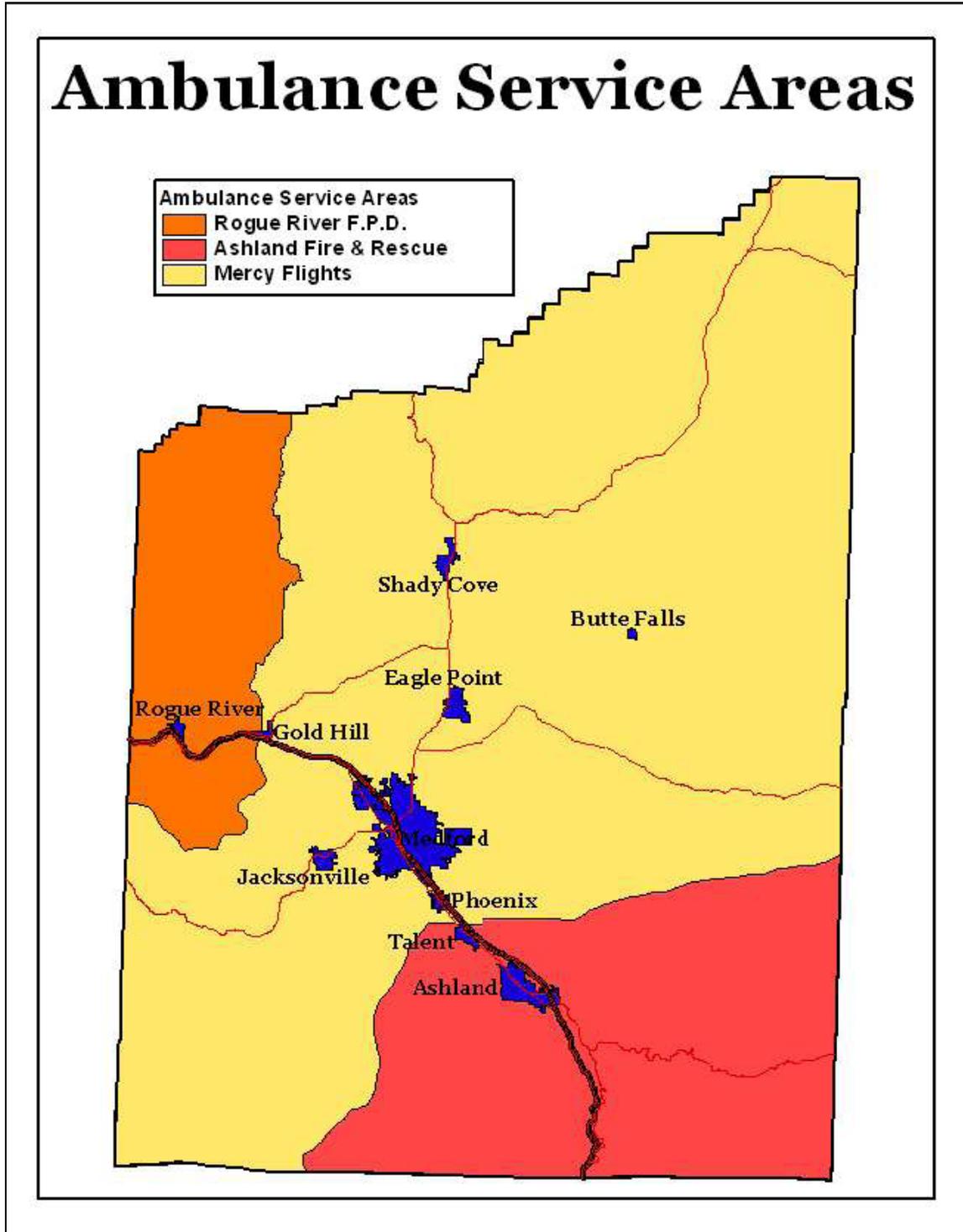


❖ **Note – While multiple units may respond on an emergency response, it is only counted one (1) time for statistical purposes.**

Fire Response numbers include the following:

- Structure Fires
- Brush Fires
- Car Fires
- Fire Alarms Sounding
- Ruptured Gas Lines
- Smoke Detector/CO Alarms
- Power Line Hazards
- Rescue Situations
- Lift Assists to the Disabled
- Miscellaneous Other

The following map shows AF&R's ambulance response area outside of the city limits.



SECTION TWO: RISK ASSESSMENT

A. Risk Assessment Model

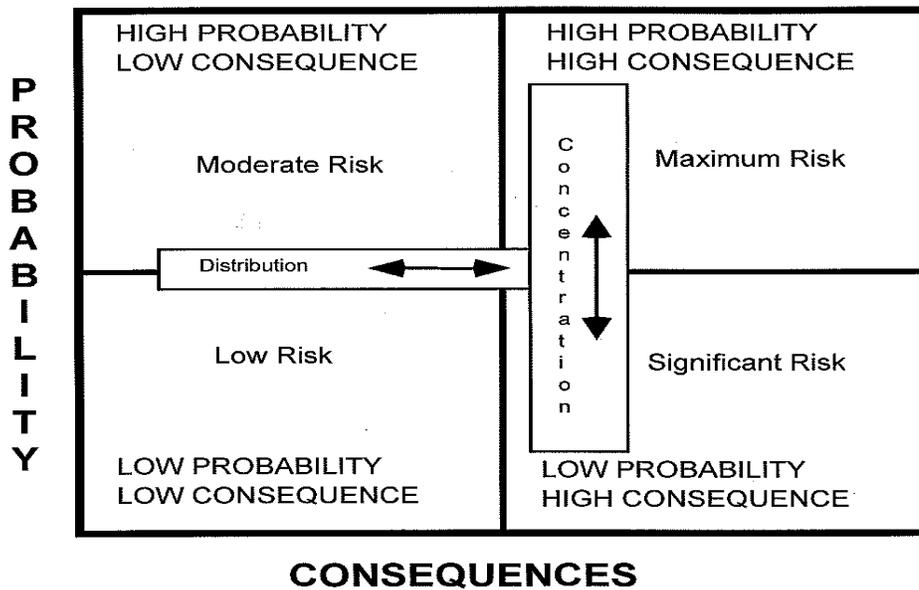
The City of Ashland must assess risks based upon the potential frequency (probability of an incident occurring) and consequence (potential damage should an event occur). For example, a terrorist act has a low probability; however, if a terrorist act occurs, the damage and the psychological impact are potentially very high. This same outlook regarding risk assessment can also be applied to natural disasters. For example, an earthquake generally does not hit the same community every year; but if it does strike, the damage can be great. Conversely, medical emergencies happen every day. The overall potential damage from medical emergencies to the community as a whole is not nearly as significant as that from an earthquake or other natural disaster though these individual incidents greatly affect those requiring the service. To design future deployment strategies, the department must be able to compare the potential frequency and potential damage of events that may affect the community and service area.

Risk management is the analysis of the chance of an event occurring and the resulting damage that could occur as a result of the event.

For example: structure fires are relatively infrequent in comparison to medical incidents in the City of Ashland and its service areas; however, the loss of subsequent dollars, loss of irreplaceable items, and loss of business or jobs make the consequences of such fires high; activation of automatic fire alarms is high probability with low consequence; earthquakes or a large hazmat incident may be infrequent but represent a large potential loss to life and property. Comparatively, a dumpster fire may be a high probability but have little consequence outside of the fire response. With an understanding of the different levels of probability and consequences, proper strategic planning in respect to risk management and resource deployment can take place.

The challenge in community risk management does not lie solely in the work necessary to assess the probabilities of an emergency event in a community, but in the political arena as well. It is the policy makers who will determine the level of service to be delivered to the area being served.

The following Risk Matrix helps identify the elements that must be considered when assessing community risk. Each of the four categories represents a specific level of risk based on the probability of that risk occurring and ties the probability to the consequences that will be experienced if the risk occurs. Each risk that a community faces can be identified and categorized using this measurement of probability/consequences. As the level of risk increases, a different commitment of fire resources is needed to keep the risk from escalating.



1. Maximum Risk: Maximum risk includes a high probability and maximum consequence. This level of risk has the potential for a high level of life and property loss as well as significant property damage across the entire geographic area. Maximum risks will certainly have a devastating impact on the community's ability to maintain its commercial, residential and industrial tax base. An event of this magnitude would severely impact the community in multiple ways and challenge the community's ability to recover. An event of this nature would most likely include a disaster declaration by the Governor and/or the President of the United States. An example of a Maximum Risk event would be Hurricane Katrina, the Loma Prieta Earthquake, the Oakland Hills Fire or the bombing of the World Trade Center in New York.

2. Significant Risk: Significant risk level has a low probability of occurrence and a high level of consequences. This risk level has the potential for high to moderate life and property loss. A significant risk may vary in magnitude and may create varying threats to those people in the immediate area of impact. Significant risks can also impact those in close proximity to the immediate threat zone. The financial impact related to a significant risk is usually high by threatening the community's economic and social structures. A significant risk will require an extended recovery period but a community that has prepared can recover within a reasonable period of time.

3. Moderate Risk: Moderate risk has a high probability of occurrence and a low level of consequence. This level of risk can present a potential for life and property loss but these are usually limited to only those areas, properties and residents in the immediate threat zone. A moderate risk usually has an impact both financially and socially but is limited to specific areas unless the community has allocated adequate resources to respond to a risk of this level. Inadequate

resource allocations for moderate risk incidents can cause them to escalate to a significant level of risk requiring additional resources and the possibility for increased life and property loss. Recovery from a moderate risk is usually completed within a brief period of time. Moderate risk incidents seldom require assistance from outside the jurisdictional area.

4. Low Risk: Low risk has a low probability of occurrence and a low level of consequence. This risk level presents little threat to the community's ability to function unless the community does not have adequate resources allocated to handle this level of risk. The occurrence of this type of event is infrequent and presents little, if any, potential for significant life and property loss or damage.

The relationships between probability and consequence and the community's adopted service level goals determine the needed concentration and distribution of resources. Distribution is the location of resources throughout the city. Concentration is the number of resources needed in a given area within the city. This varies depending on many factors including the number of events (calls for service); the risk factors of the area; the availability, reliability, and time of arrival of secondary responding units; etc. A challenge will be to find the proper balance for the distribution and concentration of resources needed to meet the service level goals today and in the future as the city and the department service areas continue to grow.

Distribution: The term distribution is used in the fire service to describe the location of fire department emergency response resources in an effort to ensure their availability to provide intervention for all risk levels. Because of the cost related to the allocation of fire resources, fire departments use a static response system. A static response system is a system in which fire stations are strategically located in designated response areas across the community, or coverage area. This allows fire department units to travel from one point to another in a pre-designated period of time known as response times or performance objectives.

A key component to a static response system is to ensure fire department resources are properly placed based on current and future growth. Properly spaced fire stations are needed to assure a rapid deployment of emergency resources in order to respond to and mitigate average, or routine, emergency calls for service in a timely manner.

Concentration: The term concentration is used to describe the spacing of multiple fire department resources so a fire department can assemble an "effective response force" at the scene of an emergency incident. An effective response force is that which will most likely stop the escalation of the emergency incident as it is categorized in each risk type. Differing incident types require different levels of initial and secondary staffing based on the nature of the

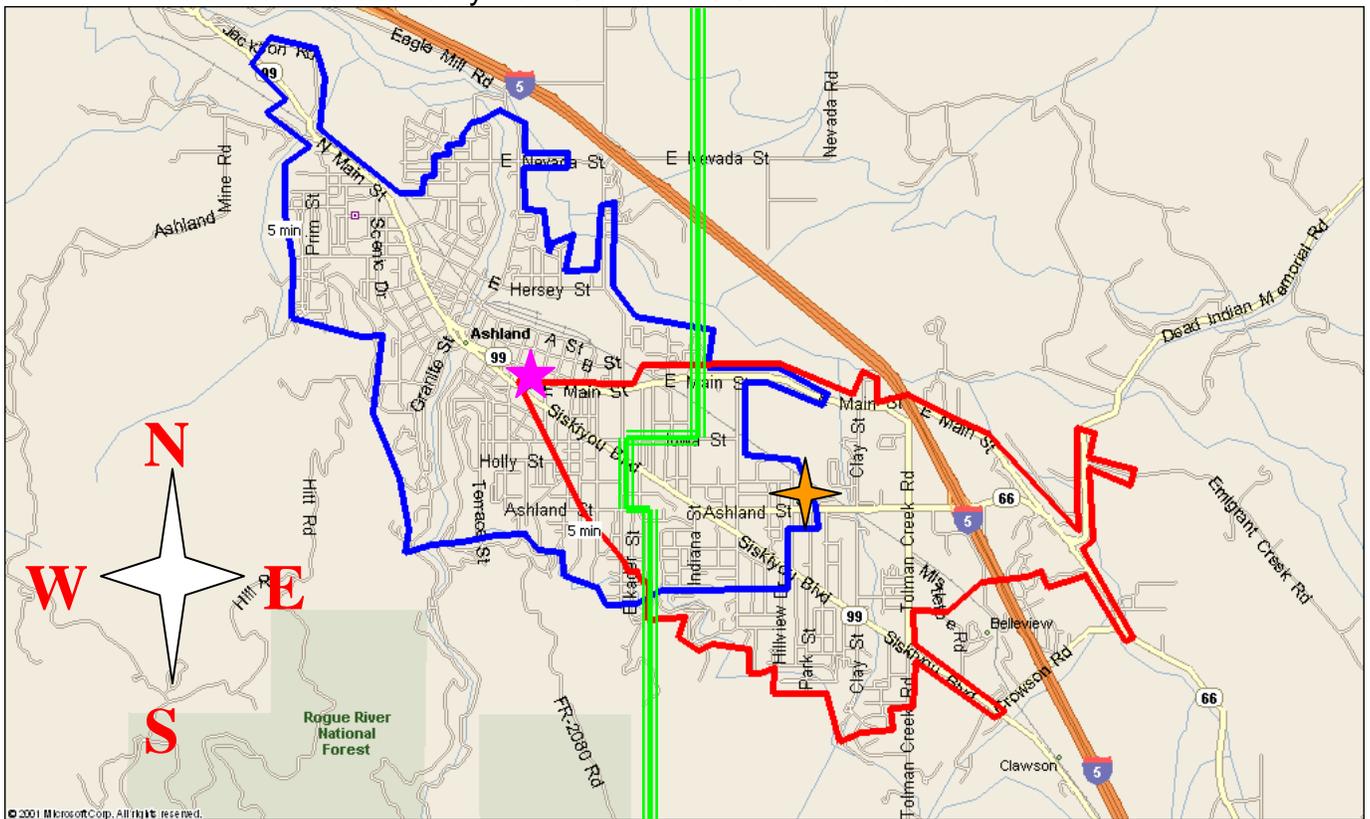
incident. These incident specific resource requirements are called critical tasking and are explained in detail later in this document.

It is a critical factor for fire departments to develop specific service level objectives to address the concentration of resources for each risk area.

★ **Fire Station #1** is located at 455 Siskiyou Boulevard. Current minimum staffing is 1 Captain, 1 Engineer and 3 Firefighters who staff one command vehicle, one engine and one ambulance. The station also houses an unstaffed backup ambulance, engine, brush truck and wildland urban interface engine. Personnel can be moved off one type of equipment and onto another to better respond to emergency needs. Station 1's first in response area is that part of the city to the west of the triple green line.

★ **Station #2** is located at 1860 Ashland Street. Current minimum staffing is 1 Engineer and 1 Firefighter who will respond in an engine or ambulance depending on the type of call. Station 2 houses backup ambulances, a brush truck and a technical rescue response trailer. Station 2's first in response area is east of the triple green line.

The blue line shows the boundary for a 5 minute drive time from Station 1. The 5 minute drive time boundary from Station 2 is shown in red.



❖ It should be noted that those areas outside of the blue & red lines have a drive time greater than 5 minutes

B. Risk Type

Understanding community risk is important when conducting a fire department response coverage assessment. Each risk presents the need for varying fire resources. Based on the potential posed, each risk type may require an increased number of fire department personnel, apparatus, equipment, and water supply to keep a potential event from escalating beyond the department's mitigation capabilities. This section explains the various risk types in the community.

The potential risks include the following categories; Structure Fires, Emergency Medical Services, Wildland Fires, and Technical Rescue.

1. Structure Fire Risk

A building categorized as Maximum Risk will be significant in size, absent of automatic fire protection and alarm systems, require a large amount of water to contain a fire and have a potential for a high life loss due to existing and non-conforming exiting. These buildings will have an irreplaceable or a major financial or social impact on the community if lost. A key factor that places a building in this category is inadequate water availability for fire suppression operations at the site of this building. An example of a building categorized as Maximum would be as follows: An older, multi-story, non-reinforced masonry building considered to have historical significance. This building would have no fire protection or alarm systems, poor exiting, and a marginal water supply for firefighting operations.

A building categorized as Significant Risk will be substantial in size and have the potential for life and property loss. The potential for life loss varies between those occupants in the immediate area to threatening the lives of all of the people in the building. The financial impact to the community created by this level can be high due to loss of jobs and/or loss of tax revenue. These buildings usually have automatic fire protection and alarm systems. Examples of Significant buildings include common hallway apartments, warehouses, office complexes, moderate to large sized retail stores, hospitals, medical buildings, and older downtown buildings that have retrofitted their buildings with fire protection systems.

Buildings categorized as Moderate Risk are average in size and can present a potential for a high life loss but are usually limited to threatening only the immediate occupants of the structure. The financial impact due to the loss of this structure has an impact on the occupants or owners, but not the surrounding properties. Examples of these buildings vary widely with the most typical in this class being a single family residence. Smaller apartment buildings and smaller businesses are also included in this category.

Buildings categorized as Low Risk have a very limited exposure. They are small structures that are not normally occupied by people. They also generally have a reduced amount of fire load, require small amounts of water to extinguish, have limited potential to spread to other buildings, and have little financial impact to the owners or the community. An example of a building in the Low Risk category would be a carport, shed, or out-building with limited potential for spreading to nearby buildings.

The table below illustrates the types and numbers of building occupancies that can be found within the City of Ashland.

CLASSIFICATION	# of BUILDINGS
Single Family Residential	7,800
Multi- Family Residential	258
Offices/Mercantile/Assembly	338
Educational Facilities	28
Fabrication & Manufacturing	27
Hazardous Materials	65
Health Care Facilities	4
Stand Alone Large Mercantile	28
Storage	6
Totals	8,554

**** There are 1770 businesses that operate in the City of Ashland**

**** It is important to note that the above table shows buildings only. There are many structures that have multiple businesses within them.**

2. Emergency Medical Services (EMS) Risk

Routine, single patient emergency medical service incidents in the Fire Department's coverage area can be considered "Low" to "Moderate" risk. These types of incidents have a very high probability of occurring but their consequences only affect the patient and their immediate family. EMS incidents with multiple patients, also known as Mass Casualty Incidents (MCI's) can be considered "Moderate" to "Significant" risks. These call types occur less frequently but have the potential to affect a greater number of people.

Emergency Medical Service (EMS) incidents make up the largest percentage of responses for AF&R. This fact is also true for the fire service nationwide. During the past 15-20 years fire departments across the country have taken a lead role in providing basic and advanced life support services in their protection areas in an effort to provide comprehensive pre-hospital care for the citizens they protect. Nationally, EMS calls for service make up approximately 70% of any fire department's overall emergency call volume

Assessing the risk related to the EMS system involves understanding the history and types of EMS calls being responded to as well as the location in which those calls are occurring. As the population in the United States ages, calls for emergency medical service are certain to increase. During difficult economic times, fire departments experience an increase in calls for EMS service.

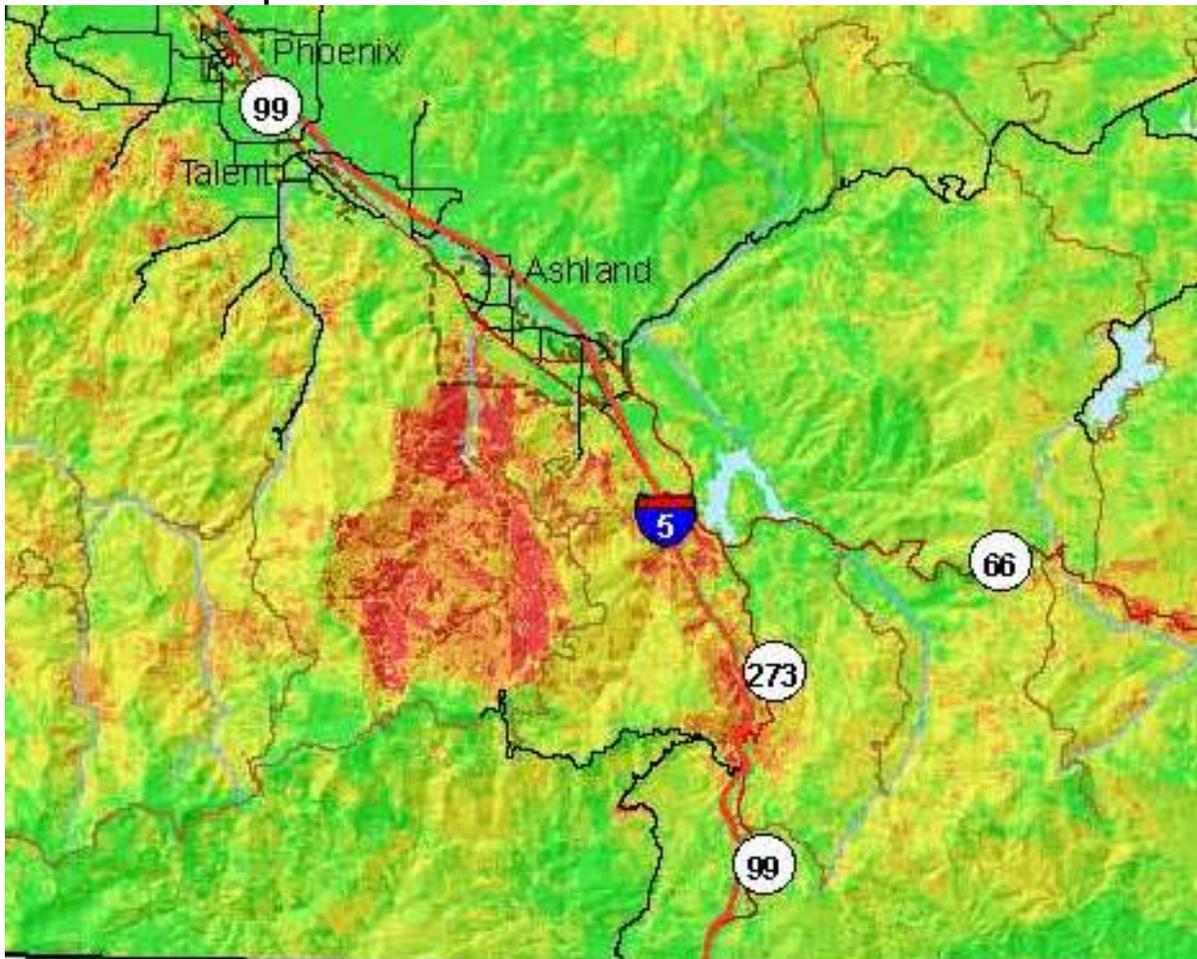
Emergency Medical Service (EMS) responses are the most prevalent incident type for AF&R. During FY 07/08 the Fire Department responded to 3,418 calls for emergency service. Of those calls, 86% were calls related to emergency medical services. The most typical types of patient symptoms generating EMS calls were altered level of consciousness, cardiac arrest, chest pains, shortness of breath, falls and seizures.

3. Wildland Fire Risk

Assessing Ashland's Wildfire Risk

Wildland fire risk and hazards have been documented as "High" (High is the highest rating) in both the primary and mutual aid response areas of Ashland Fire & Rescue. The State of Oregon and Jackson County wildfire risk assessments rate the Ashland wildland urban interface (WUI) as among the most hazardous in the State and the highest ranked community in Jackson County (State of Oregon Wildfire Risk Assessment 2005, Jackson County Integrated Fire Plan, 2005). The primary factors used for assessing a community's wildfire risk are the vegetation types (fuels), steepness of the topography, housing density, fire starts, and protection capabilities. The key factors that lead to Ashland's high rating are the fuel loads that surround Ashland, the density of homes in the WUI zone, and the upslope Ashland Municipal Watershed.

*** Ashland Municipal Code refers to this area as The Wildfire Hazard Area.**



Composite Wildfire Assessment Map, Jackson County Integrated Fire Plan (2005). Red is high risk.

Wildfire Behavior and Suppression

Wildland fire behavior is driven by three primary factors: fuel, weather, and topography. All three factors combine in the Ashland WUI to create potentially extremely hazardous wildfires. The intensity and rate of spread (together referred to as behavior) of a wildfire determine what suppression tactics will be effective. Flame heights over 4 feet dictate the use of fire engines and bulldozers in a direct or indirect attack strategy and flames over 8 feet dictate the use of aerial resources and construction of firelines well away from the fire front.

Wildfire Fuel Conditions

The fuel (vegetation) in and around Ashland is often heavy although a significant area of fuels has been modified through an ongoing AF&R fuels reduction program. According to a City commissioned study in 2002, just over 80% of the WUI area is either Extreme or High hazard vegetation types (not including Federal lands), meaning flame



lengths of at least 4 feet and more likely 8 feet and greater over a larger proportion of the protection area. The fuels reduction program has decreased the potential fire behavior and increased potential suppression effectiveness on 1,431 acres of City and private land since 2002. However, without regular maintenance these acres will revert back to pre-2002 conditions. The Forest Resource Specialist is a staff position dedicated to wildland fire prevention and fuels mitigation.

Structure Vulnerability

An important unknown factor is the flammability of homes. As explained above the wildfire risk is well quantified, but each individual home has its own hazard rating depending on the construction and the immediate 100 foot area, often called the “defensible space” zone, surrounding the home. There are 1,879 structures (2008) in the Ashland WUI zone, but it is unknown how many have adequate defensible space for effective fire protection. Looking at WUI wildfires in similar communities across the West, the prognosis for structure survival during a major wildfire in Ashland looks grim. Factors include high housing density, narrow and winding streets, a finite water supply (no water in many rural portions in the mutual aid area), commonly hot and dry days, steep topography, and highly flammable vegetation surrounding the community all spell out a potentially challenging and hazardous environment for firefighting with limited

chances for avoiding home loss. Outreach and education efforts continue by AF&R to encourage homeowner preparations, but the loss of the City's Code Compliance Officer (2008-2009) increases difficulty in code enforcement when hazardous situations are identified by AF&R. This decreases the effectiveness of suppression and home protection actions and increases the risk to firefighter's safety.

4. Technical Rescue Risk

In general, technical rescue is the application of special knowledge, skills and equipment to safely resolve unique and/or complex rescue situations.

For a wide variety of reasons, victims become stranded and/or injured in the areas in and around our city. Easy access to hiking and biking trails along with extremes in the geography create technical rescue situations each year.

Furthermore, vaults, tanks, tunnels and trenches spread throughout the City pose a risk to the employees who work in them and the citizens who might become trapped in them. Maintaining a rescue response is not only mandated by OSHA but is the prudent approach to these threats.

Rope Rescue

Rope rescue is defined as any rescue attempt that requires rope and related equipment to safely gain access to, and remove victims from, hazardous geographic areas with limited access such as slopes, cliffs, and buildings, above or below grade structures, by means of rope systems. Rope rescues are divided into two general categories, low/steep angle and high angle.



Toothpick Trail Rescue - 2002

Both of these categories exist in and around the City. Each year AF&R is called to treat and rescue injured victims from our watershed, park lands and frontier areas we serve. Many of these victims are located in remote regions accessible only by 4x4 vehicles, by foot, and in some cases helicopter. These calls for service range from litter carry outs to technical rescues involving multiple agencies and extended times to accomplish the mission.

Confined Space/Trench Rescue Risk

Confined spaces exist in the City in a variety of forms. Federal OSHA regulations define a confined space as a space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit; and
- Is not designed for continuous employee occupancy.



Examples of confined spaces in Ashland include:

- Sewers and sewer facilities (throughout city and at the waste water treatment plant)
- Storm drains
- Electrical and communication vaults (serviced by Ashland Electric and AFN)
- Tanks (fixed and mobile)
- Manholes
- Trenches and excavations (City Streets, Water and Electric departments and private contractors)
- Tunnels (SOU)

Confined space rescue represents one of the most challenging and dangerous operations undertaken by fire departments in America today. Nearly 60% of all confined space deaths are would-be rescuers associated with secondary entries. This includes fellow employees, bystanders and untrained or poorly trained responders.

SECTION THREE: CRITICAL TASK ANALYSIS OF AF&R

In order to provide life safety and emergency mitigation efforts in an effective manner it is imperative that firefighters respond to emergencies in a timely manner and with enough trained firefighters to safely mitigate the emergency. Critical tasks are those duties that must be conducted by firefighters in order to safely control emergency incidents.

In order to effectively determine AF&R's ability to ensure effective service delivery while maintaining a safe working environment the department must conduct a critical task analysis. The critical task analysis is the process of matching AF&R's resource deployment to each type of risk. A critical task analysis identifies the necessary staffing level required to safely perform each task and successfully mitigate each risk. A critical task analysis was conducted for the following risk types:

- **Structure Fires**
- **Emergency Medical Calls**
- **Wildland Fires**
- **Technical Rescues**



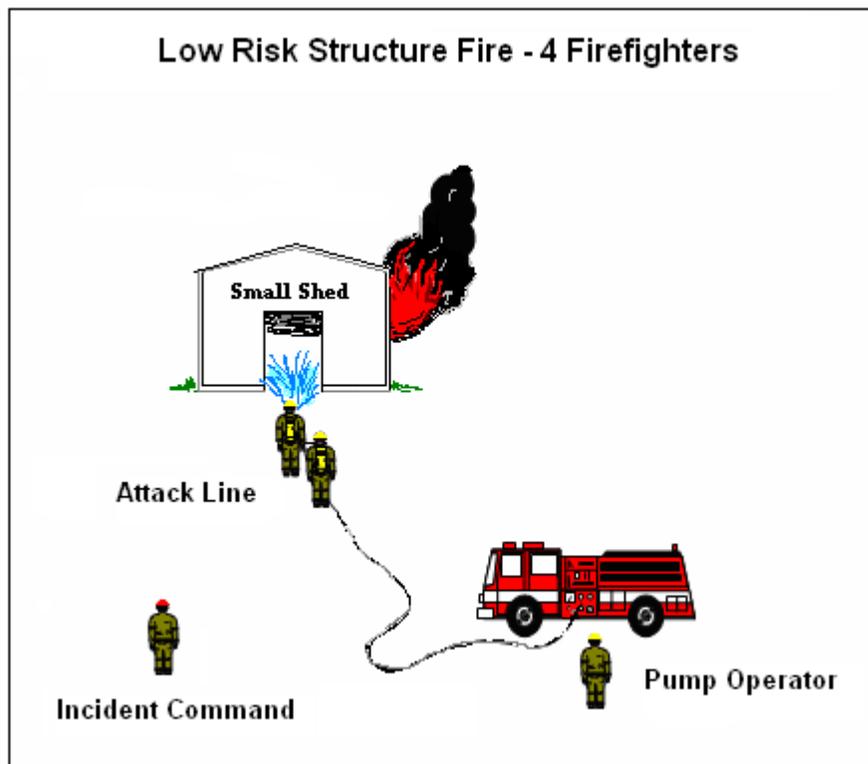
A. Structure Fires

Low Risk Fires

The following table provides a task analysis for Low Risk structure fires and/or incidents like rubbish fires, small grass fires, vehicle fires and incidents that involve a light fire load. The example also takes into consideration that the potential for injury or loss of life is non-existent and that the potential for exposure issues related to adjacent properties is non-existent.

CRITICAL TASK	PERSONNEL
Command / Safety	1
Pump Operator	1
Attack Line	2
Total Number of Firefighters	4

Low risk fires are normally handled by one fire unit and 4 firefighters as demonstrated in the following diagram:

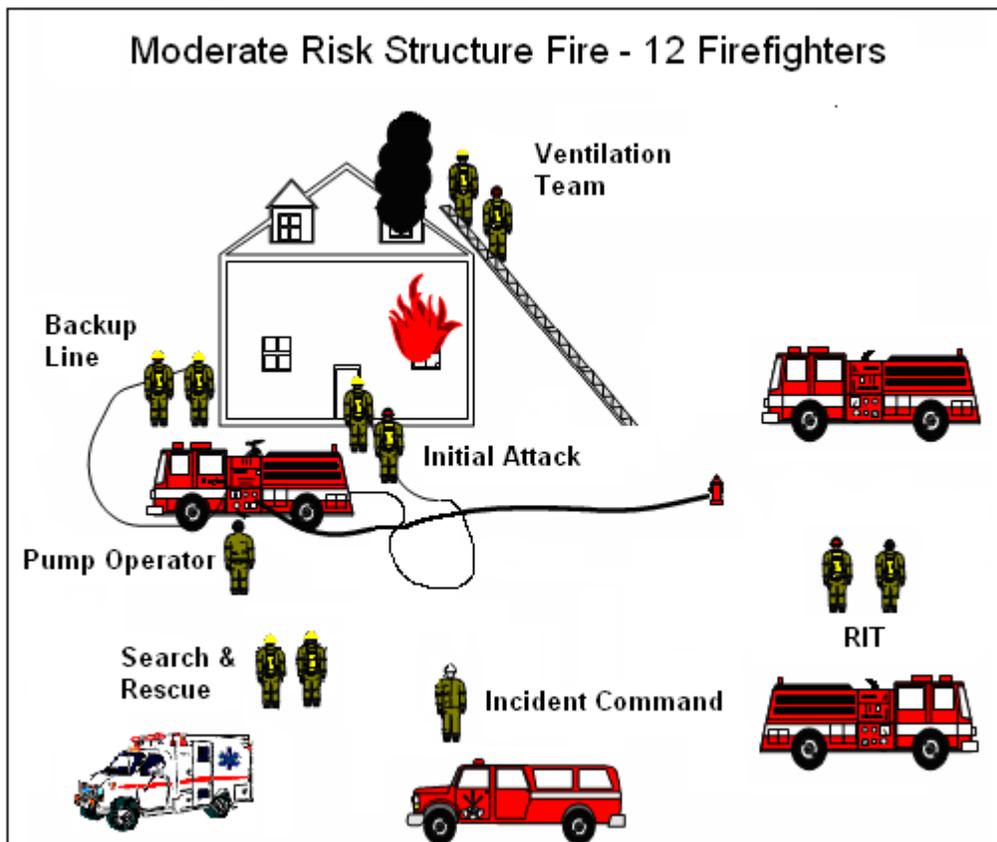


Moderate Risk Fires

The following table and diagram represent the critical task assignments and personnel requirements for an initial alarm assignment at a “Moderate Risk” structure fire.

CRITICAL TASK	PERSONNEL
Command / Safety	1
Pump Operator	1
Attack Line	2
Back-up Line *	2
Support / Search and Rescue	2
Ventilation	2
RIT **	2
Total Number of Firefighters	12

- * **Back-up Line is required to meet OSHA’s 2-IN / 2-OUT Policy.**
- ** **Rapid Intervention Team (RIT).** A dedicated crew of firefighters who are assigned for rapid deployment to rescue lost or trapped members.



- ❖ **NFPA recommends a minimum of 14 firefighters for initial response on these types of fires**
- ❖ **Currently, at minimum staffing, AF&R is able to deploy 7 firefighters, plus an additional 2 firefighters from Jackson County Fire Dist. #5 for a total of 9 firefighters. Therefore, fire attack and rescue often cannot be conducted simultaneously.**
- ❖ **After July 2009, we will be able to deploy 6 firefighters, plus 2 additional firefighters from Jackson County Fire Dist. #5 for a total of 8 firefighters.**
- ❖ **AF&R must at times operate in split or less than ideal modes on the fire ground until sufficient staffing is on scene.**
- ❖ **Equipment and personnel responding may be reduced because of multiple emergencies or extenuating circumstances.**

Significant and Maximum Risk Fires

Fire departments should maintain the capability to provide additional alarm assignments when situations are beyond the capacity of the initial first alarm assignment. The National Fire Protection Agency (NFPA) standard recommends when an incident escalates beyond an initial full alarm assignment, or when a significant risk is presented, the Incident Commander (IC) upgrade the number of resources at the incident scene to provide for the increase of the Rapid Intervention Team (RIT) from a partial crew of 2 firefighters to a full Rapid Intervention Crew of 4 firefighters. NFPA further recommends that the IC also deploy a safety officer.

CRITICAL TASK	PERSONNEL
Command / Safety	4
Pump Operators	2
Attack Lines	4
Back-up Lines	4
Search and Rescue	4
Ventilation	4
RIT	4
Total Number of Firefighters	26

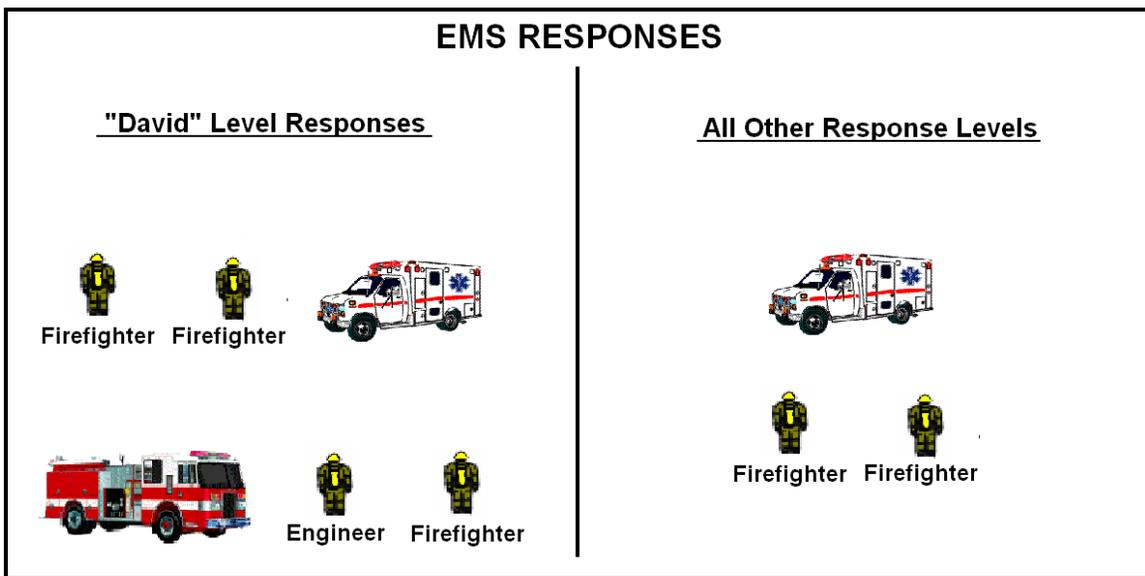
- ❖ **Equipment and personnel responding may be reduced because of multiple emergencies or extenuating circumstances.**

B. Emergency Medical Services

Routine, Single Patient EMS Incident

AF&R has determined that 2 Firefighter/Paramedics are able to provide the necessary EMS care for the majority of EMS Responses. In those cases where a significant life threatening emergency has been identified by the dispatch center, 2 more personnel are dispatched to the scene to assist with the additional critical tasks that these kinds of calls generate. These calls are coded a “David” response.

The following illustration shows the resources needed at most medical emergencies.



- ❖ **Equipment and personnel responding may be reduced because of multiple emergencies or extenuating circumstances.**
- ❖ **Motor vehicle accidents and airplane incidents both start at the “David” level response on first alarms.**

“David” responses can be defined as those types of medical emergencies which are immediately life threatening and will require more than 2 personnel to help mitigate the crisis.

Mass Casualty Incident



To provide the resources needed to handle the needs during a mass casualty incident that goes beyond the capability of local resources, Jackson County has implemented the Ambulance Resource Management System (A.R.M.S.). The A.R.M.S. allows one strategic dispatch to utilize all ambulance resources available to respond to emergencies.

C. Wildland Fires

During peak fire season AF&R units respond to multiple wildland incidents both inside and outside of the primary boundaries of our response area. AF&R's primary responsibility is protection of life including evacuation of residents from the fire area. Secondary to life, property protection is prioritized, meaning that the advance of the fire may continue until protection of both life and property are addressed. Mutual aid from Jackson County District #5, Oregon Department of Forestry (ODF), and the U.S. Forest Service is absolutely critical to address potentially overwhelming demands for protection of life and property, and to suppress the wildfire itself if AF&R units are fulfilling primary goals first.

Small Wildland Fire



Two acre fire in Lithia Park

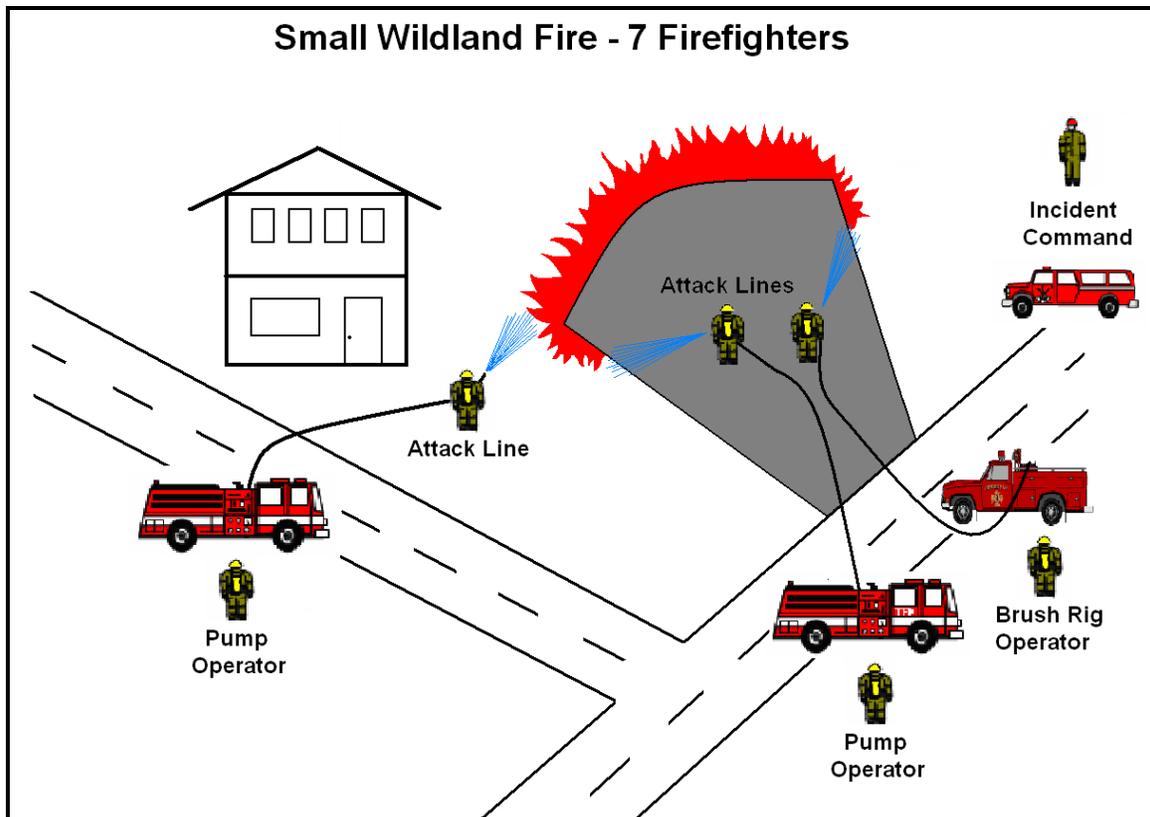
Because wildland fires could have such a disastrous effect upon the City, AF&R has placed a significant interest in extinguishing any small brush/grass fires as quickly as possible. Initial alarm assignments have all available personnel responding to the scene. The fire pictured above occurred in Lithia Park in late July. The mitigating factors that stopped the fire from spreading to upslope homes and toward the watershed were a rapid response from fire crews and the fuels reduction program, which had eliminated ladder fuels from the area.

The following chart shows the initial alarm assignment for any wildland fire that occurs within the City.

Small Wildland Fires (less than one acre)

CRITICAL TASK	PERSONNEL
Command/Safety	1
Pump Operators	2
Attack Lines	3
Brush Rig Operator	1
TOTAL	7

- ❖ At minimum staffing, the above numbers do not leave any personnel available to staff an ambulance
- ❖ During the fire season AF&R will also receive assistance from ODF and the U.S. Forest Service, including helicopter and fixed wing aerial resources.
- ❖ Equipment and personnel responding may be reduced because of multiple emergencies or extenuating circumstances.



Large Wildland Fire

When wildland fires escalate beyond a first alarm assignment, additional resources must be requested through additional alarms. Additionally, Strike Teams and Task Forces may be requested from Jackson and Josephine Counties. Further escalation of the incident or the potential for serious impacts to the community can necessitate declaration of a conflagration in order to mobilize State-wide resources. Typical critical tasks required during a large wildland fire are listed below:

- ❖ Establish a Unified Incident Command Structure
- ❖ Provide an Incident Safety Officer

- ❖ Evacuate residents as needed
- ❖ Delegate Division and Group Supervisor responsibility
- ❖ Request and direct fire control activities using air tankers and helicopters
- ❖ Fire control/structure protection with engines
- ❖ Fire control with dozers
- ❖ Fire control with hand crews
- ❖ Provide mobile water supply
- ❖ Tactical planning including structure triage and GIS mapping

D. Technical Rescue

The following graph indicates the minimum number and type of responders needed to perform a Technical Rescue. At this time, because of the elimination of the training funds for Technical Rescue, there is no actual “Team”. As it stands, there are several individuals on each shift who have a basic understanding of various rescue disciplines. In cases where we need additional expertise or services, AF&R might be able to utilize outside organizations for assistance with a significant delay.

Incident type	Technical Rescue Trained Firefighters	Firefighters	Total
Reach and Treat Medical	1	3	4
Low Angle	1	6	7
High Angle	9	6	15
Confined Space (no rigging)	6	4	10
Confined Space (with rigging)	9	6	15

SECTION FOUR: ESTABLISHING OBJECTIVES

This section discusses the basis for fire department response objectives. Fire department response objectives are typically based on:

1. The dynamics of fire growth.
2. The events involved in a life threatening emergency medical incident.

These two types of emergency responses have extensive scientific information available thus making them quantifiable. This section provides the definitions of

response times, a discussion on each of the above items, and the associated department goals.

A. The Elements of Response Time

Response times are a critical component in the control and mitigation of an emergency incident. Understanding the standardized elements of response time is important in order for a fire department to measure its response effectiveness.

The National Fire Protection Association definitions concerning fire responses are as follows:

Dispatch Time - The point of receipt of the emergency alarm at the public safety answering point to the point where sufficient information is known to the dispatcher and applicable units are notified of the emergency.

Turnout Time – The time beginning when units acknowledge notification of the emergency to the beginning point of response time.

Response Time – The travel time that begins when units are en route to the emergency incident and ends when units arrive on scene.

Jackson County Ambulance Service Plan defines ambulance response times as follows:

Notification Time - The length of time between the initial receipt of the request for EMS by either a provider or an emergency dispatch center (911) and the notification of the ASA provider.

Response Time - The length of time between the notification of each provider and the arrival of each provider's emergency medical service unit(s) at the incident scene or at the end of an ambulance access point.

On-Scene Time - The point at which the responding unit arrives on the scene of the emergency.

System Response Time - The elapsed time from when the Public Safety Answering Point receives the call until the arrival of the appropriate provider unit(s) on scene.

B. Dynamics of Fire Growth and Flashover

In order for firefighters to provide the most effective service, and to significantly reduce the risk of life and property loss, they must arrive at a structure fire in a short period of time with adequate resources. Matching the arrival of resources with a specific point in the fire's growth is one of the greatest challenges for a fire department. Finding the specific point in a fire's growth can be accomplished by identifying the stages of a fire.

Stages of a Fire

Regardless of the speed of growth, or length of burn time, all fires inside a compartment or building go through the same stages. A fire in a compartment begins with the "Ignition" stage and when left unaddressed will develop through the Growth, Flashover, Fully Developed, and Decay stages. One particular stage emerges as being very significant because it marks a critical change in conditions. This phase is called the "Flashover" phase.

The following provides a brief overview of the stages of fire within a compartment:

Ignition Stage – Ignition describes the period when a heat source is applied to a combustible fuel package, in the presence of oxygen, and a continuous chemical chain reaction known as combustion begins. At this point the fire is small and generally confined to the material (fuel) first ignited.

Growth Stage – During this stage, the combustion process continues to release increased levels of heat while nearby objects reach their ignition temperature, and begin to burn. Superheated gases rise to the ceiling, spread outward and begin to bank down the walls of the enclosure consuming all available oxygen in the room and raising the heat levels to reach the next stage.

Flashover Stage – Flashover is the transition between the growth and the fully developed fire stages. During flashover, the conditions in the compartment change very rapidly, and the fire changes from one that is dominated by the burning material first ignited, to one that involves all of the exposed combustible surfaces within the compartment.

Fully Developed Stage – The fully developed fire stage occurs when all combustible materials in a compartment are involved in fire. During this period of time, the burning fuels in the compartment are releasing the maximum amount of heat possible for the available materials, and producing large volumes of fire gasses. A fire at this stage requires significantly more resources (water, hoses, and personnel) to control, due to the massive amount of heat energy involved. Also, during this stage, hot unburned fire gasses are likely to begin flowing from the compartment of origin into adjacent spaces or compartments. These gasses

ignite as they enter a space where air is more abundant, causing the fire to spread further.

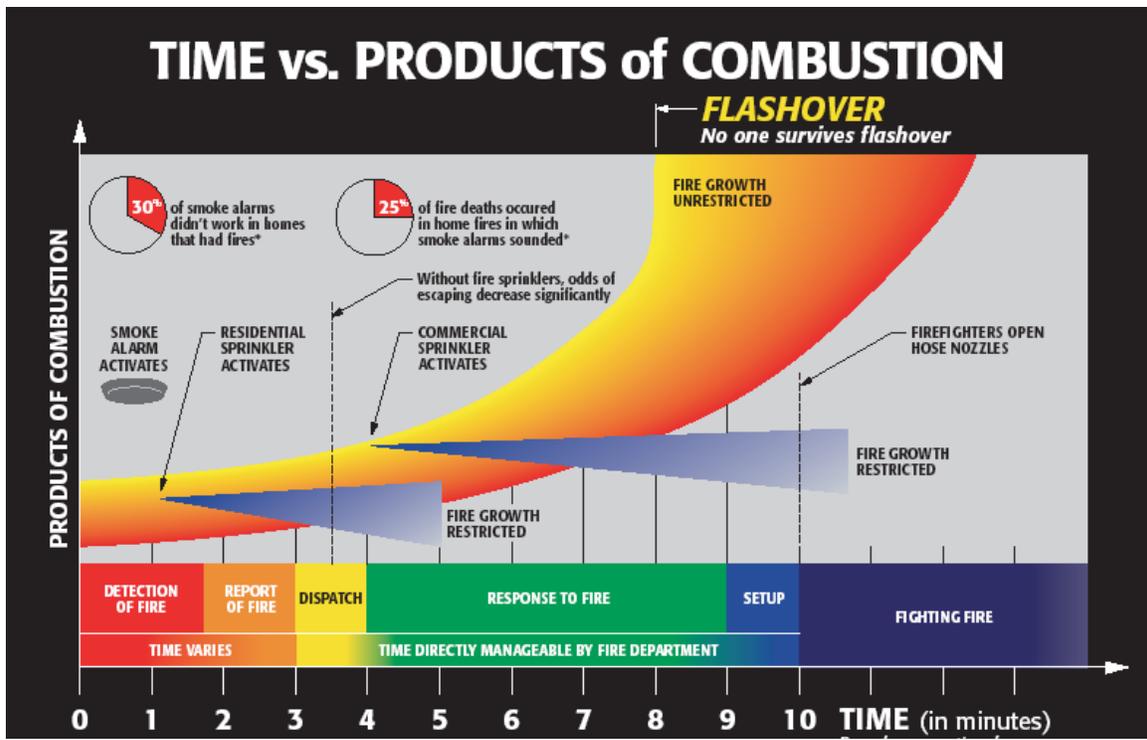


Decay Stage – During this stage, the fire diminishes and temperatures begin to decline because the fire has already consumed the available fuels in the compartment.

Flashover

“Flashover” is a critical stage of fire growth for various reasons. The predominate reasons that this phenomenon is so critical is that no living thing can survive in the flashover room, and that it creates a rapid increase in the rate of combustion which requires a greater amount of water to reduce the burning material below their ignition temperature. After flashover has occurred the fire burns much hotter and spreads at a much more significant pace. Once flashover has occurred search and rescue efforts become more difficult in the remainder of the building. Also, the occurrence of flashover causes an increased need for fire suppression personnel to mitigate the incident in a timely manner.

The following graph represents the stages of fire growth. This graph also identifies the time elements involved in flashover such as the detection and reporting of the fire, dispatch processing time, and the fire department’s response time.



The following table compares pre and post flashover conditions:

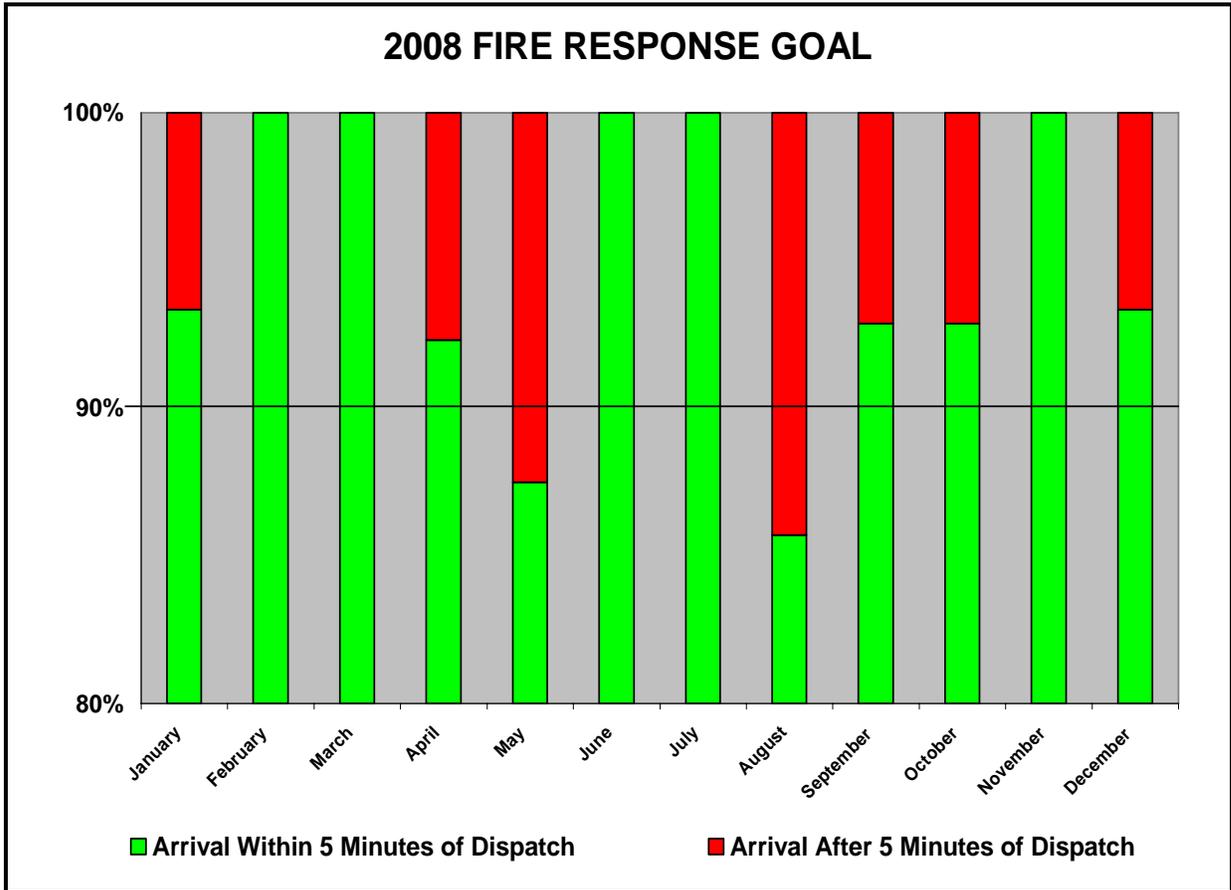
Before Flashover	After Flashover
Limited to one room	May spread beyond one room
Requires smaller attack lines	Requires more, and larger attack lines
Search and Rescue is easier/safer	Compounds Search and Rescue
Initial assignment can handle	Requires additional companies

Staffing and equipment needs can be reasonably predicted for different risk levels and fire stages. The correlation of staffing and equipment needs with fires according to their stage of growth is the basis for response coverage. The goal is to maintain and strategically locate enough firefighters and equipment so a minimum acceptable response force can reach a reasonable number of fire scenes before flashover occurs.

To minimize risk, the department strives to extinguish small fires quickly before they reach flashover potential to minimize risk. As flashover is such a significant fire event, preventing this stage of fire behavior is imperative. Time is a key factor in this effort. Once flashover potential is reached, an exponential increase occurs not only in the rate of combustion, but in the amount of resources necessary to mitigate the fire emergency. For these reasons Ashland Fire & Rescue has established the following goal:

Goal #1

AF&R will respond to 90% of all fire suppression calls inside the City of Ashland with a response time of 5 minutes or less. * AF&R will use the NFPA established measuring criteria concerning emergency fire response times.



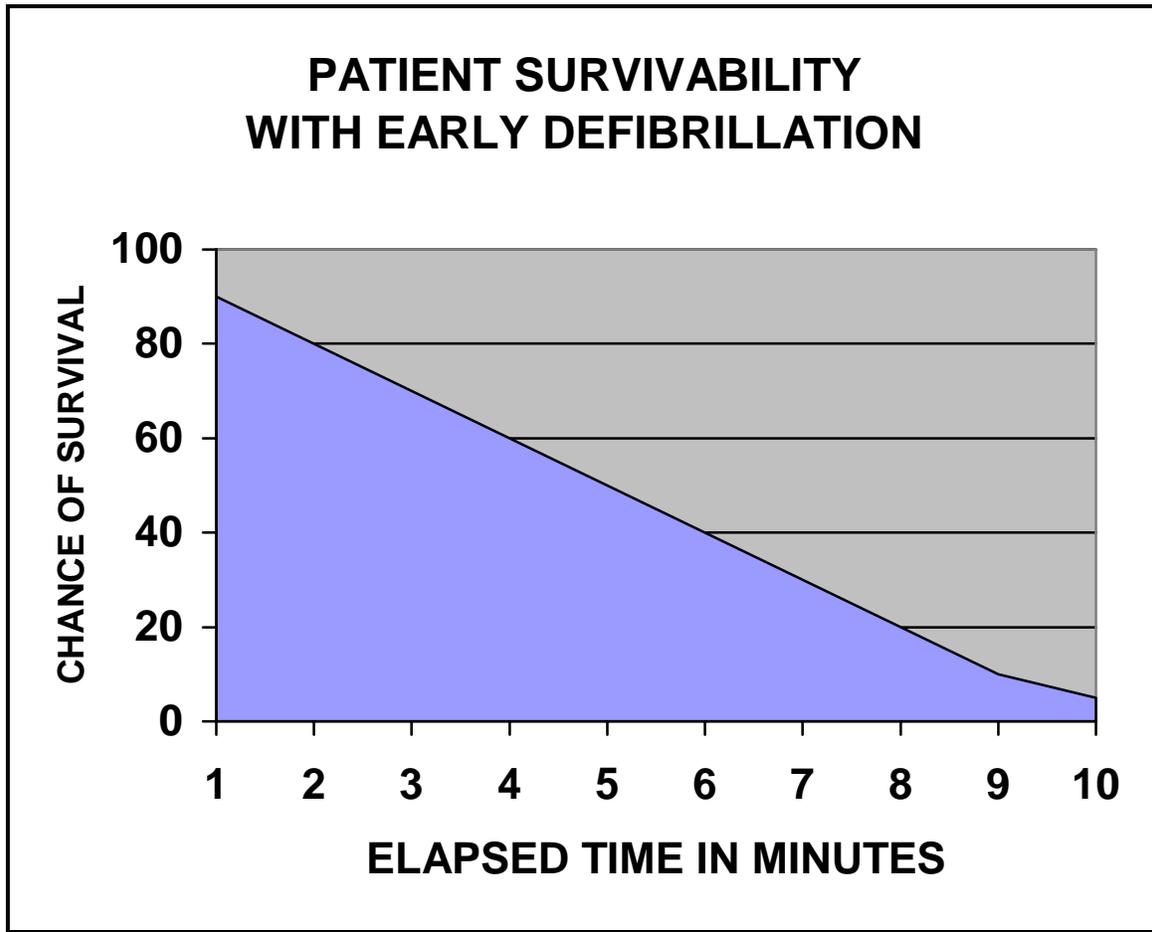
- ❖ Fire suppression calls include: Structure Fires, Wildland Fires, Vehicle Fires, and Fire Alarm Sounding calls.

C. Emergency Medical Services Benchmarks and Expectations

Life Threatening Medical Emergencies – Basis for Response Objectives

Using life threatening medical emergencies as a basis for setting EMS response time performance objectives has become a fire and EMS industry norm. The American Heart Association has shown that the likelihood of a patient surviving a

life threatening medical emergency is improved if CPR and defibrillation are initiated within 4 minutes of the onset of the medical emergency.



From an emergency medical perspective, the service-level objective typically is to provide medical intervention within a six-minute timeframe, as brain damage is very likely at six minutes without oxygen. However, in a cardiac arrest situation, survivability dramatically decreased beyond four minutes without appropriate intervention. Intervention includes early recognition and bystander CPR.

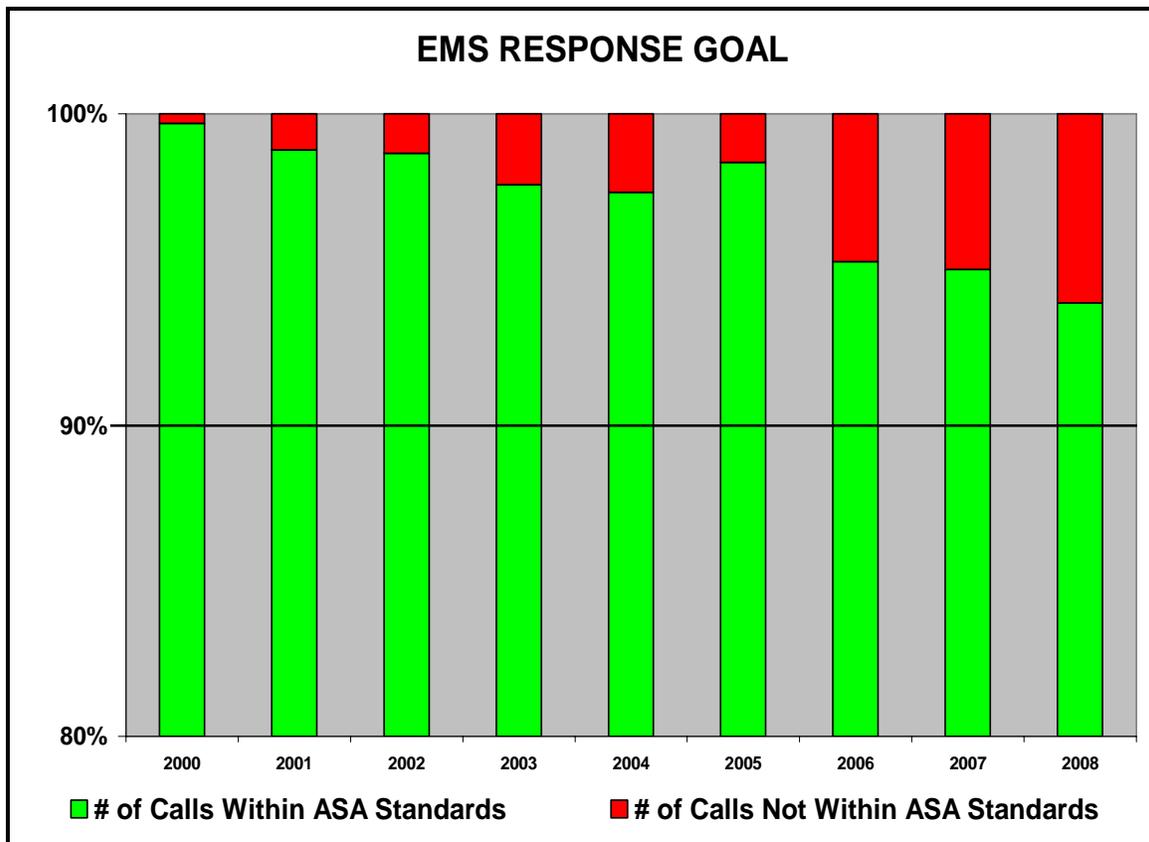
Early defibrillation is often called the critical link in the chain of survival because it is the only way to successfully treat most sudden cardiac arrests. When cardiac arrest occurs, the heart starts to beat chaotically (fibrillation) and cannot pump blood efficiently. Time is critical. If a normal heart rhythm is not restored in minutes, the person will die. In fact, for every minute without defibrillation, the odds of survival drop seven to ten percent. A sudden cardiac arrest victim who is not defibrillated within eight to ten minutes has virtually no chance of survival. The shortest possible response times create the highest probabilities of

resuscitation. For these reasons Ashland Fire & Rescue has established the following goal:

Goal #2

AF&R will provide emergency medical services to 90% of patients within ASA time standards.

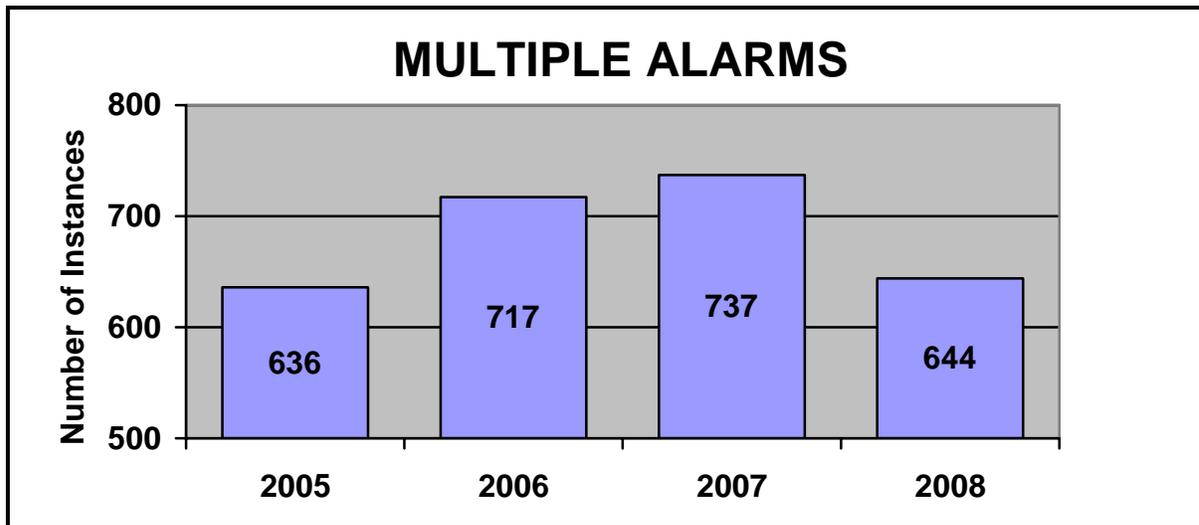
ZONE	STANDARD
Urban	8 minutes
Suburban	15 minutes
Rural	45 minutes
Frontier	2 Hours



SECTION FIVE: RESPONSE RELIABILITY

Response reliability addresses the probability that the required amount of staffing and apparatus will be available when a fire or other emergency call is received. If

every piece of apparatus in each station were available every time a fire call was received, the response reliability for each station would be 100%. As the number of calls per day increases, and line staffing decreases, the likelihood that a needed piece of equipment and/or personnel will already be busy with an existing incident will increase. For example, in January of this year there were 27 times when two overlapping emergency responses occurred, 8 times when three overlapping emergency responses occurred and 3 times when four overlapping emergency responses occurred. Consequently, during these times, AF&R's response reliability decreases. The following chart shows the number of times there have been multiple alarms occurring at the same time:



While AF&R utilizes mutual aid agreements to receive equipment and manpower from neighboring departments, response times will be longer than those recommended by NFPA and ASA standards. The following steps have been taken to help with low staffing levels and multiple alarms:

- 1) All firefighting personnel have been issued a pager and are encouraged to return to duty when a "call-back" for personnel is initiated.
- 2) An Automatic and Mutual Aid Agreement is maintained with all fire and ambulance agencies in Jackson and Josephine Counties.
- 3) Automatic Aid is pre-programmed through six alarm assignments, providing a systematic method to bring additional resources to the incident as needed.
- 4) AF&R maintains Automatic and Mutual Aid Agreements with the Oregon Department of Forestry and the United States Forest Service for grass, brush and forest fires.

SECTION SIX: CONCLUSION

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 describes what an optimal fire department emergency response would be, to safely and efficiently handle different types of emergencies. Although AF&R is unable to meet these standards at this time, AF&R will continue to use NFPA 1710 standard as a goal for improvement in the future. AF&R will continue its efforts to meet the community's needs for fire protection, emergency medical services, response to hazardous conditions, community emergency preparedness, plans review, interface fuel reduction and planning with the available resources.