

# 2011

April 1, 2011

## Sunriver Service District and the Sunriver Fire Department



# STANDARDS OF COVER

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## **About this Document**

This document establishes Sunriver Fire Department's Standards of Cover for the Sunriver community and adjacent areas served by the Sunriver Fire Department. An analysis of response resources, deployment strategies, operational elements, and community risks has been included within this document. It identifies response time goals and standards for measuring the effectiveness of resources within the department and the deployment of those resources.

At the outset, certain assumptions had to be made regarding community expectations. Those assumptions were made based upon a variety of considerations which included longstanding practices, existing policies and Standard Operational Procedures, department funding history, and historical documents. It is not a rewrite or an update; it is a current study of the department's service demands, response capabilities, and resource deployment strategies.

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## INTRODUCTION

Historically, one of the issues the fire service has faced is how to define the levels of service for the community it serves. A variety of methodologies were employed leading to varying levels of success. As the Sunriver Fire Department (SFD) proceeded to establish its service level goals, it did so based on national standards such as National Fire Protection Association (NFPA) Standard 1710, the Oregon Occupational Safety and Health Administration (OR-OSHA) requirements, and the Commission on Fire Accreditation International (CFAI) accreditation model.

A Standards of Cover (SOC) is defined as “Those written procedures that determine the distribution and concentration of fixed and mobile resources of an organization,”<sup>1</sup> and this document is designed to provide officials and residents with information on fire department operations and integrated risk management planning. It is not intended to be a stand-alone document but is to be used in conjunction with the Sunriver Service District (SSD) five-year strategic plan. While this SOC provides an overview of risk assessment, deployment of resources, and an analysis of current performance, the strategic plan outlines the resources needed to address current challenges and future service demands.

## BACKGROUND

This SOC study is a rational and systematic method of examining the basic service provided by the Sunriver Fire Department. The purpose of the SOC document is to provide a system which will assist with:

- Assessing community fire and non-fire risks
- Defining baseline and benchmark emergency response performance standards
- Determining apparatus and staffing patterns
- Measuring service delivery performance
- Supporting strategic planning and policy development relative to resource procurement and deployment

The key elements in the development of this SOC include:

- A community risk assessment identifying the fire and non-fire risk common and/or unique to the agency completing the process
- A determination of levels of service to be provided within the area served
- An analysis of the agency’s current response capability in terms of time and on-scene performance for personnel and equipment
- A development of standards describing how the agency resources will be allocated and deployed to maximize emergency response effectiveness throughout the area served

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<sup>1</sup> Fire and Emergency Services Self-Assessment Manual, pg. 47, 7<sup>th</sup> Edition, 2006

## SECTION I: COMMUNITY BASELINES

### A. Community Overview

The community of Sunriver, Oregon is located in central Oregon, on the east side of the Cascade mountains, 15 miles south of Bend in Deschutes County. Sunriver lies just west of US Highway 97, a major transportation route through the state. Sunriver is accessed from Cottonwood Drive at the north end of the property and from South Century Drive at the south end. Developed in 1968 as a destination resort community, Sunriver is now home to approximately 1,700 full time residents, with a population of up to 20,000 visitors per day during peak recreation months. Sunriver is known for its outstanding recreational opportunities and scenic beauty with year-round recreation activities available.

There are 4,012 residential structures in Sunriver.<sup>2</sup> Other facilities include the 240 unit Sunriver Lodge, swimming pools, golf courses, riding stables, a marina, and a very active airport. A significant number of retail facilities are located in the Sunriver Village mall with others in various locations including a convenience store/gas station on Cottonwood Drive.

The elevation in Sunriver is 4100 feet and the dominant topography is flat meadow areas and heavily forested rolling terrain. The climate in Sunriver is typical of the east slopes of the Cascade Mountains, with most of the annual precipitation coming as winter snow or fall and spring rains. Summers are dry and prone to frequent thunderstorms. These thunderstorms frequently cause multiple fire ignitions.

Sunriver's transportation systems include a network of roundabouts, a system of interconnecting arterials, looped streets, and dead-ends. Approximately ten miles of US Highway 97 lies within the SFD Ambulance Service Area (ASA). A railroad freight line runs north and south immediately adjacent to the Sunriver eastern boundary and the Deschutes River flows from the south at the western boundary of the fire district. There is an extensive system of bicycle paths that interrelate throughout Sunriver.

Challenges to typical emergency response include:

- ❖ Inability to predictably engage in initial (reserves) and regularly scheduled, ongoing training in critical structural fireground tasks (live-fire suppression tactics; vertical ventilation; search and rescue). The SSD Board has committed to working with the fire department to find a resolution to this problem.
- ❖ Narrow roadways throughout Sunriver that can be temporarily obstructed by disabled vehicles and further narrowed by accumulated snowfall.
- ❖ Only two entrances/exits into and out of Sunriver.
- ❖ Limited access to railroad track.

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<sup>2</sup> Sunriver Owners Association 2009 Annual Statistics and Inventory for Sunriver, Oregon, p.6

Challenges previously identified that have been remedied:

- ❖ Deschutes County 911 dispatch now provides geocoding capability and mobile data terminals (MDT) have been placed on four pieces of SFD apparatus along with supporting software programs. Two of these systems were purchased with grant funds obtained from the US Department of Homeland Security.
- ❖ SFD will take possession of a specialized aircraft crash/firefighting apparatus in 2011 that is being acquired from Redmond Fire & Rescue for no cost. Accepting delivery of this piece of apparatus is contingent upon the Sunriver airport providing housing for it at the airport. That effort is ongoing at this time.

The Sunriver Fire Department was established in 1968 by the Sunriver Resort Corporation and homeowners. The fire department was formed out of the need for structural and natural ground cover fire protection. At that time the department was an all volunteer force and the first set of volunteers were recruited and trained to the basic firefighter level by members of the City of Bend Fire Department.

In 1970 the fire department purchased an additional fire engine from the San Jose, California Fire Department. This 1945 American LaFrance was designated as a second-out engine. Sometime around this era the fire department combined with the Sunriver Emergency Medical Service into a single agency. In 1972, a 1958 Ford station wagon was purchased to be a medical response vehicle. This vehicle was replaced in 1974 with a 1972 Dodge ½ ton van. In 1975 a new Ford pickup was purchased to be used as a Fire Chief vehicle as well as a light brush engine. Three years later a new Chevy Blazer was purchased to be a replacement for the medical response vehicle. In 1979 the department took delivery of a new Seagrave structural fire engine which replaced the 1945 engine.

Over the ensuing decade, the department hired its first paramedic who was charged with the responsibility of emergency medical services in Sunriver. This paramedic was the first to be employed in central Oregon. Sunriver improved its insurance rating with the Insurance Services Office (ISO) from a 7 to a 5. In August of 1984, a used 1954, 65-foot aerial ladder truck was purchased from the Portland Fire Department. The first used ambulance was purchased in 1985 eliminating the need for an ambulance from Bend or La Pine to transport Sunriver patients. In the late 1980's, the fire department hired its first three shift personnel to provide a better twenty-four hour, seven day per week operation. The personnel were assigned one per shift with a schedule of 24 hours on and 48 hours off. During this time the department, as an entity, ceased being part of the Sunriver Resort's operation and became a part of the Sunriver Owners Association's (SROA) operation. The department took delivery of a new 1989 Ford ambulance to replace the used ambulance purchased in 1985.

In the early 1990's, three new personnel were hired for shift work. Each shift now consisted of a Captain/Paramedic and a Firefighter/Paramedic. In 1990 the department purchased a new Pierce 50-foot Telesqurt® to replace the 65 foot ladder truck. This enabled the 1968 Western States structural engine to then be used as a heavy brush engine and provided for two engines to respond to fires.

In 1995, a new fire station was built near the south RV storage area. It is still in use by SFD and is leased by the SSD from SROA. During this same year, SFD's only ambulance was involved in a head on collision on Highway 97 that totaled the vehicle. Though no SFD members were injured, the department was left without an ambulance to provide service. An ambulance was borrowed from the La Pine Rural Fire Protection District (LPRFPD) while the purchase of a new ambulance took place. This situation prompted the SROA Board to approve the purchase of a second ambulance. A used 1982 Ford ambulance was purchased from the City of Bend Fire Department to bring the department up to a two ambulance service. Additionally, in 1995, ISO conducted another survey of Sunriver which resulted in an improvement in its rating from 5 to 3. Sunriver was evaluated again in 2009 and, though ISO evaluation standards had increased significantly since the 1995 evaluation, Sunriver was able to maintain a 3 rating after a few operational adjustments.

In 1996, both the heavy and light brush apparatus were replaced. Due to a 1995 federally mandated requirement called the "two in/two out" rule, SFD hired one additional Firefighter/Paramedic for each shift. This brought each shift to a staffing level of three career members: Captain/Paramedic, Engineer/Paramedic and a Firefighter/Paramedic which is still in effect today. This helped greatly to facilitate compliance with two in/two out. The department's current reserve program enables SFD to provide two in/two out on structure fires. The reserve roster is authorized by the SSD Board for up to twenty reserves. That number has recently been reached, but a roster ranging from 10 to 18 is typical. Reserves are not volunteers; they are part-time, on-call employees who are assigned, as equally as practical, among the three shifts.

In 2000, the department purchased a new structural fire engine to replace the 1979 Seagrave. In 2003, the department purchased a new 2004 Ford Ambulance and in 2008 replaced both the light and heavy brush engines. The most recent apparatus replacement took place in 2009 with the purchase of 75' aerial ladder truck replacing the department's 19-year-old Pierce Telesqurt® which has been placed in reserve. The department's fleet also includes two command vehicles and a support vehicle. The current inventory of department apparatus consists of:

Medic 271 (M-271)	Brush 241 (B-241)	Support 293 (S-293)
Medic 272 (M-272)	Brush 242 (B-242)	Engine 223 (E-223/Reserve)
Engine 221 (E-221)	Command 292 (C-292)	
Truck 251 (T-251)	Command 291 (C-291)	

B. Services provided by SFD are wide-ranging and include:

#### Emergency Medical

- ❖ Basic Life Support (BLS)
- ❖ Advanced Life Support (ALS)
- ❖ Ambulance transport
- ❖ Motor vehicle rescue/extrication
- ❖ Multi-patient/Mass-casualty response

Fire Suppression

- ❖ Structural (commercial and residential)
- ❖ Motor vehicle fire control
- ❖ Wildland
- ❖ Aircraft rescue & firefighting (ARFF)

Hazardous Materials

- ❖ Operations Level response<sup>3</sup>

Special Services

- ❖ Power and other public utility hazards/emergencies
- ❖ Natural disasters (snow, flood, wind, etc.)
- ❖ Man-made disasters

Non-emergency services

- ❖ Fire Code inspections
- ❖ Fire Code enforcement
- ❖ Public education
- ❖ Public information
- ❖ Blood pressure checks and other walk-in services
- ❖ Variety of community events

In November of 2002, the department transitioned from a private fire department to a public special service district. The newly created district consists of both the fire department and the police department. While both departments are managed by the same service district managing board (DMB), they remain two separate departments. Managing Board directors are selected by SROA and appointed by the Deschutes County Board of Commissioners. The county commission is the governing body for the SSD.

Sunriver Fire Department is a signatory to and participant in the Central Oregon Mutual Aid Agreement.<sup>4</sup> This formalized intergovernmental agreement provides for interagency cooperation in providing resources to agencies in need of additional equipment or staffing when an incident, or multiple incidents, overwhelms an agency's ability to provide an effective response to calls for service. This agreement includes fire departments and fire districts in the tri-county area as well as the United States Forest Service (USFS) and the Oregon Department of Forestry (ODF) for wildland fire protection.

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<sup>3</sup> This operations-level response for HazMat is mandated and provides the tools needed to protect responder health and safety while covering basic defensive actions, personal protective equipment, hazard recognition and identification, pre-incident planning and scene management.

<sup>4</sup> Central Oregon Mutual Aid Agreement



In addition, SFD works cooperatively with these same agencies in non-emergency functions such as, Central Oregon Fire Prevention Co-Op, Central Oregon Fire Instructors Association, Central Oregon Fire Chiefs Association, East Cascades Emergency Medical Services, and others. The SFD also works closely with the Sunriver Police Department, the SROA, and the Sunriver Resort.

In order to establish baseline performance of the current service delivery system, an SOC study must review historical data. This begins with an overview of the delivery system which includes:

- ❖ Points of service delivery (stations)
- ❖ Resources deployed from each station
- ❖ Staffing capabilities of each resource
- ❖ First-due areas for each resource (areas in a particular resource would be the first to be deployed)

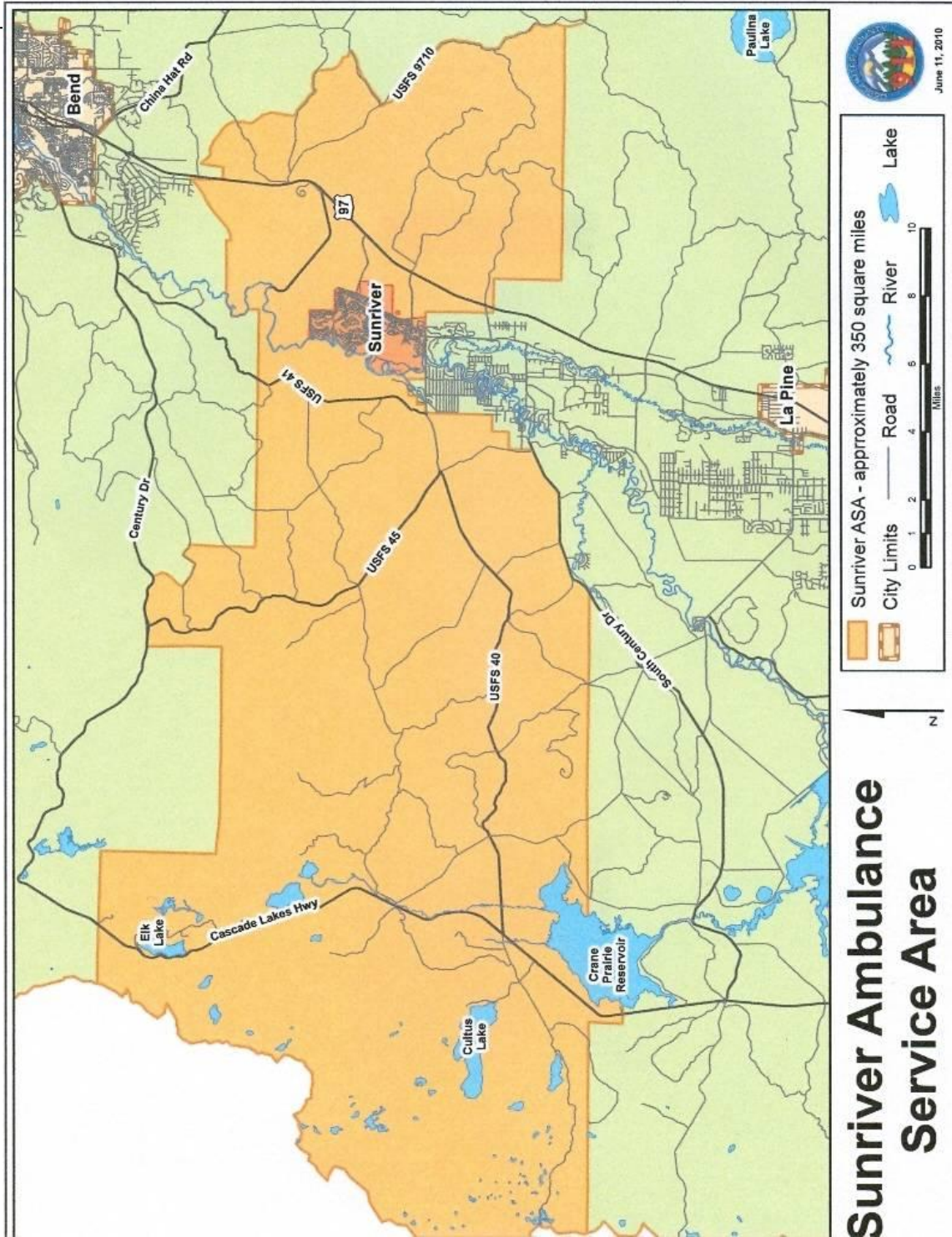
This portion of the process is simplified due to SFD being a single station department. This means there is a single point of service delivery; all resources are deployed from that single point of delivery; staffing capabilities vary only by the number of personnel present in that station (as earlier described); the first-due areas include the entire response area for all resources based upon type of call – specifically, fire, or EMS.

It is important here to distinguish between the “first-due” areas with regard to call types vis-à-vis fire and EMS. For purposes of this SOC study, the “first-due” area for structural fire response – Sunriver proper – will hereafter be referred to as the fire district. The “first-due” area for EMS will be referred to as the Ambulance Service Area or ASA. The fire district, in which the fire station is located, is 5.1 square miles. The ASA is approximately 350 square miles; the fire district lies within and is included in the ASA. The map on the following page illustrates the ASA and the location of the fire district within the ASA.

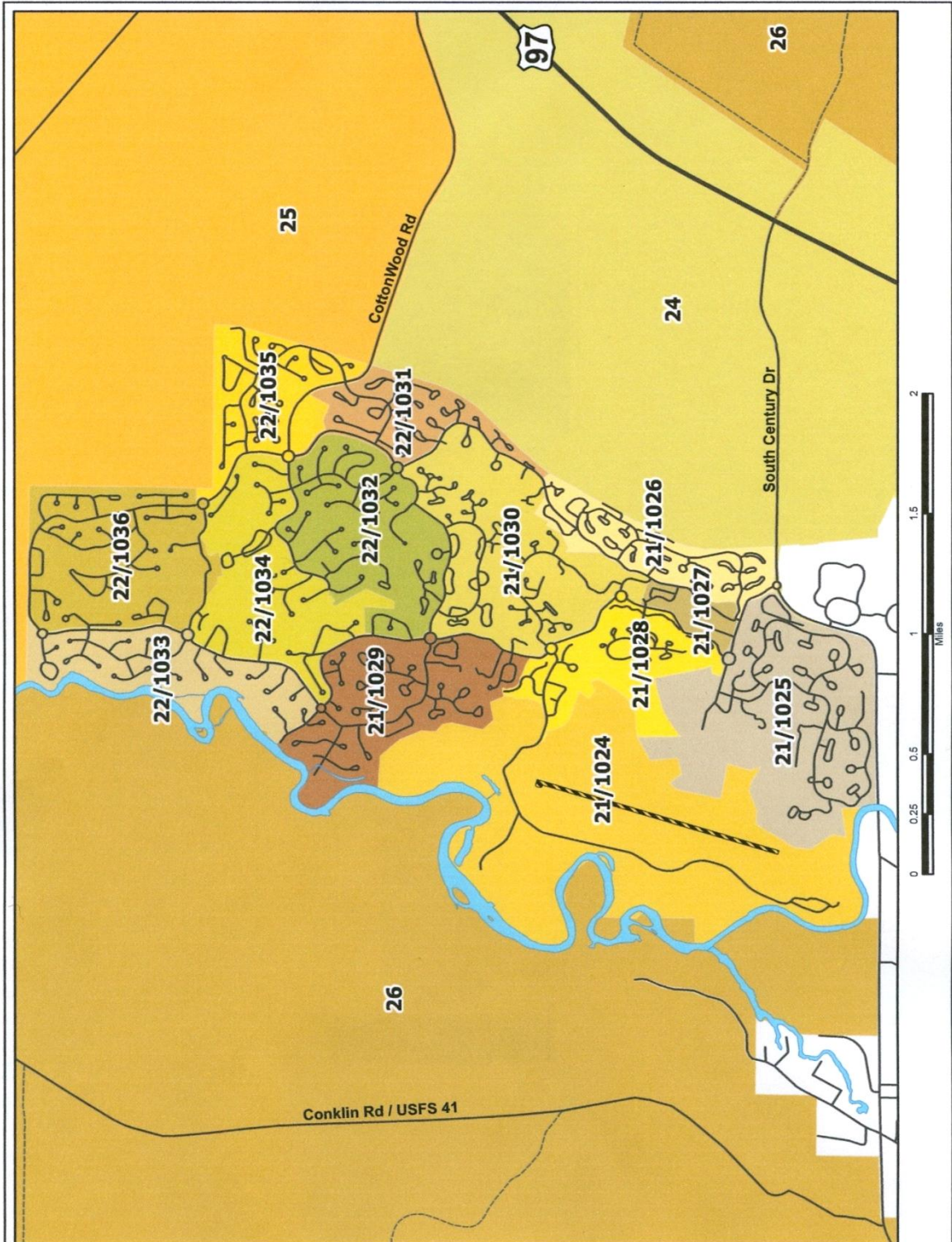
For purposes of apparatus response programming and statistical data collection, the fire district and the ASA are subdivided into six geographic areas. Areas 21 and 22 make up the total area of the fire district (Sunriver proper). Areas 23 through 26 designate specific areas of the ASA. Maps of these areas can be seen on pages 7 and 9 respectively.

**AREA 21:** Areas within the fire district that include the main resort, multifamily rental units, residential property, and mercantile areas. It accounts for 47 percent of total calls for 2009.

**AREA 22:** Areas within the fire district consisting mostly of owner occupied single family dwellings and large rental residential dwellings that can accommodate up to 12-plus occupants. Other facilities in this area include the north golf course and swimming pool, store, a service station, and some residential/rental condominiums. Calls for service in this area accounted for 16.5 percent of total calls for 2009.



# Sunriver Fire Department Areas and Districts



**AREA 23:** A small area east of Sunriver and south of Area 24 including Hwy 97 from milepost 154 to 156. This is the smallest of the six designated areas. This is a dual response area with the La Pine Rural Fire Protection District.

**AREA 24:** An area that lies immediately east of Sunriver. The TransCanada Natural Gas pipeline runs through this area. This area is mostly undeveloped.

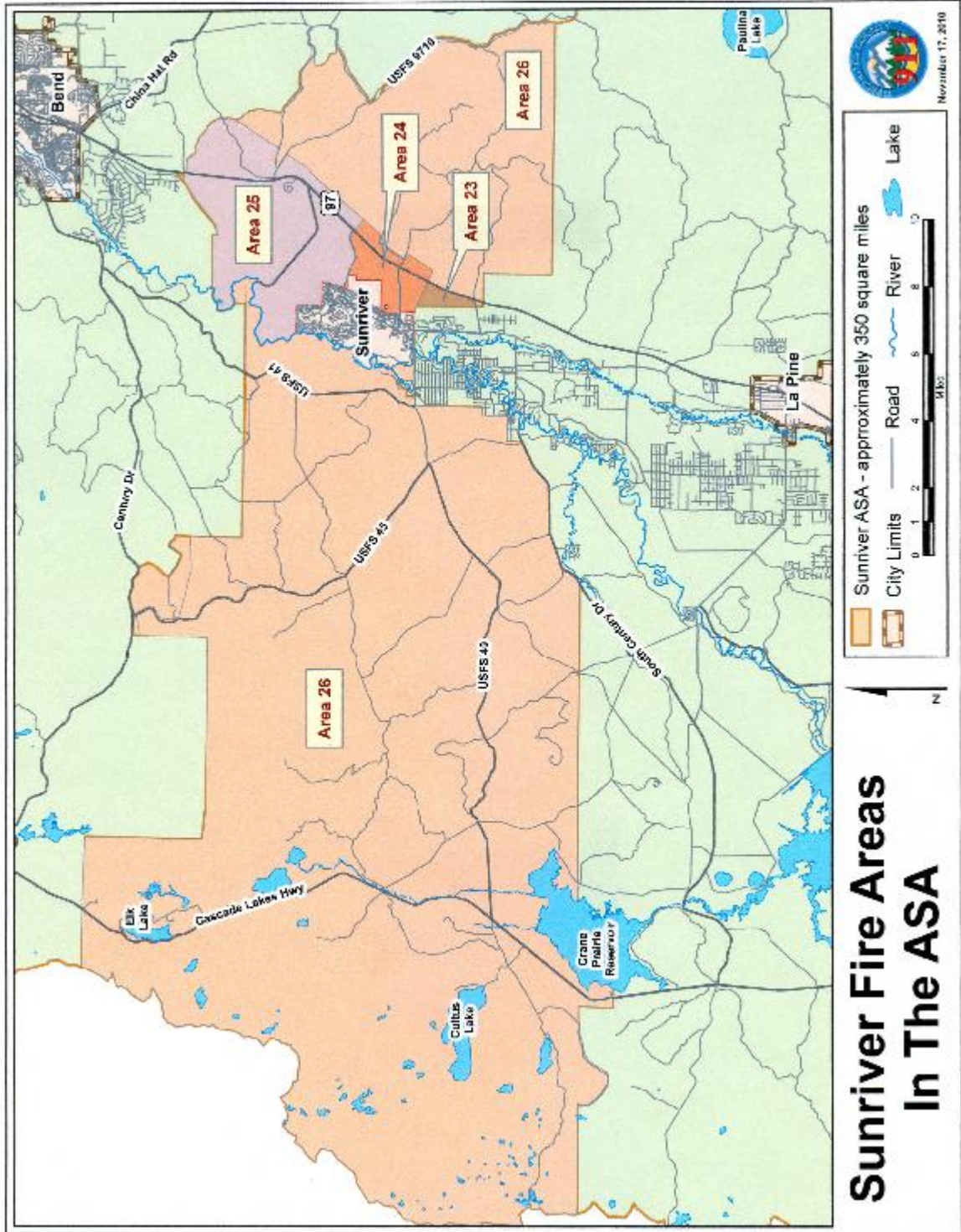
**AREA 25:** This area is north of Area 24 and includes Hwy 97 from the Cottonwood intersection north to the ASA boundary. Area 25 is similar to Area 24 in composition. The Lava Lands Visitor Center and Lava River Cave are located in this area and the TransCanada Natural Gas pipeline runs through this area. Area 25 is a dual response area with Bend Fire Department for wildland fires and for traffic accidents on Hwy 97 between Baker Road to the north and the Cottonwood exit to the south. Below is a map of the entire Sunriver ASA.

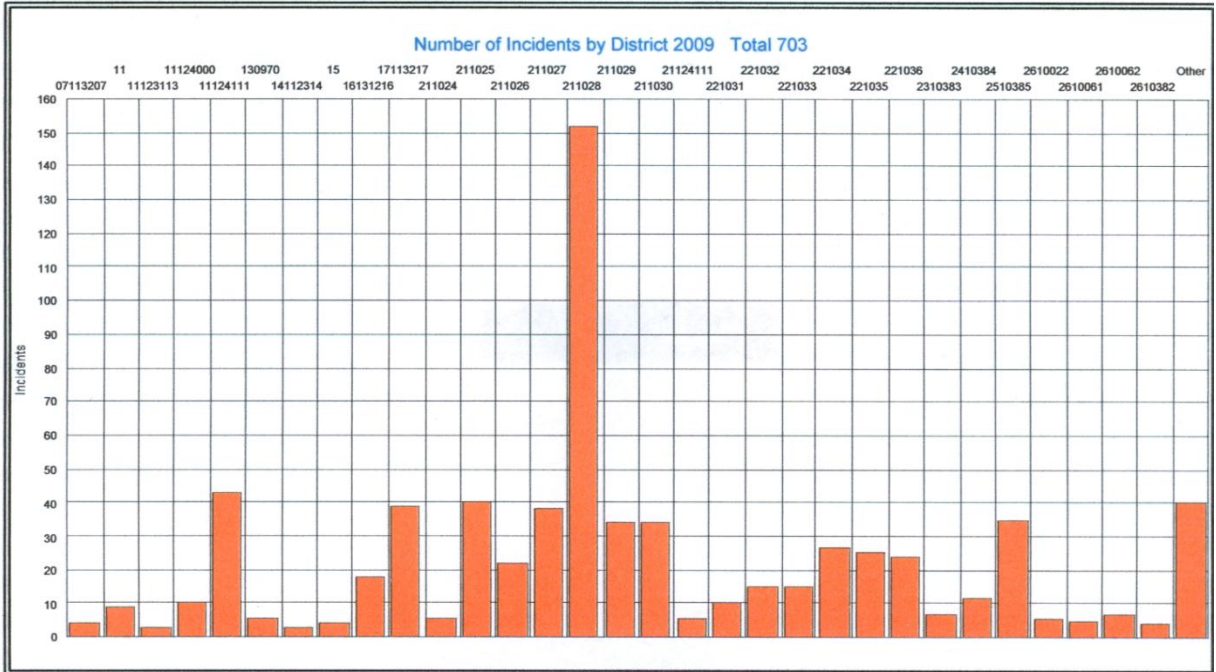
**AREA 26:** A divided area that contains all the remaining territory within the Sunriver ASA east of Areas 23, 24, and 25, and west of Sunriver extending to the Deschutes County line. Area 26 is the largest area composed mostly of forest land with limited paved roads and a network of dirt forest service roads. The main roads provide access to the Central Oregon Cascades recreation areas including various lakeside resorts and snowmobile recreation areas. In 2009, Areas 23, 24, 25, and 26 combined to account for 10.8 percent of calls for service.

Mutual aid responses accounted for 19.7 percent of SFD responses in 2009. These include calls for assistance to LPRFPD, Bend Fire Department, ODF and others. The majority of these are responses to the LPRFPD with approximately 90 percent of those being for medical emergencies. Less than 1 percent of total call volume could not be identified due to Deschutes County 911's Computer Aided Dispatch (CAD) errors and those data are unavailable.

The graph on page 12 illustrates incident distribution for 2009 as discussed above. As previously noted, areas beginning with "21" and "22" lie within Sunriver proper (fire district); numbers otherwise beginning with "2" lie within the Sunriver ASA. Those beginning with 0 or 1 represent mutual aid responses. The Sunriver fire station – which is the sole deployment point for SFD resources – lies immediately adjacent to area 211028. This is the area with the greatest number of calls.

Area 21, in its entirety, accounts for 47 percent of total calls and Areas 21 and 22 together (Sunriver proper) accounts for 63.5 percent of total call volume. It would be difficult to identify a more advantageous location for the fire station. These data strongly suggest that the current fire station is very well located and suggest no need for additional deployment points now or in the foreseeable future.





07113207	4
11	9
11123113	3
11124000	10
11124111	43
130970	6
14112314	3
15	4
16131216	18
17113217	39
211024	6
211025	40
211026	22
211027	38
211028	152
211029	34
211030	34
21124111	6
221031	10
221032	15
221033	15
221034	27
221035	25
221036	24
2310383	7
2410384	12
2510385	35
2610022	6
2610061	5
2610062	7
2610382	4
Other	40

Another critical consideration in the description of current service baselines is the types of calls to which the SFD responds. The graph on the following page summarizes calls for service by type for the three-year period 2007 – 2009 and makes immediately apparent two things: 1) the types of calls to which SFD responds remain relatively constant over time, and 2) EMS calls – not including motor vehicle rescues – remain, by a considerable margin, the most frequently needed service. The core emergencies for SFD, as made apparent in the graph, are fires, medical emergencies, and rescue (motor vehicle) incidents.

Finally, response times complete the analysis of current service delivery. Total response time is comprised of three components:

- ❖ **Call receipt and processing time** – the interval between receipt of the emergency alarm at the public safety answering point – here, Deschutes County 911 – to the moment where sufficient information is known to the dispatcher and applicable units are notified of the emergency.
- ❖ **Turnout time** – the interval between acknowledgement of notification of the emergency by the units to the beginning point of response time.
- ❖ **Response time** – the time that begins when units are en-route to the emergency incident (wheels rolling) and ends when units arrive on scene (wheels stopped at the address). This time component has in the past been referred to as "travel time."

### C. Community Expectations

Throughout its history, the Sunriver community's performance expectations of the SFD has been inculcated in traditional practices and, more recently, expressed in documentary form. These documents include the Sunriver Service District 2005 – 2010 Strategic Plan<sup>5</sup> and the Sunriver Service District Strategic Plan 2010 – 2015.<sup>6</sup> The 2005 – 2010 version of the Strategic Plan called for the development of an SOC study in order to develop a more specific and measureable set of performance standards based upon risks, hazards, and response capabilities. This need was again identified during the process of creating the 2010 – 2015 Strategic Plan and resulted in this SOC study document.

Historically, policies and practices have sought to achieve the following:

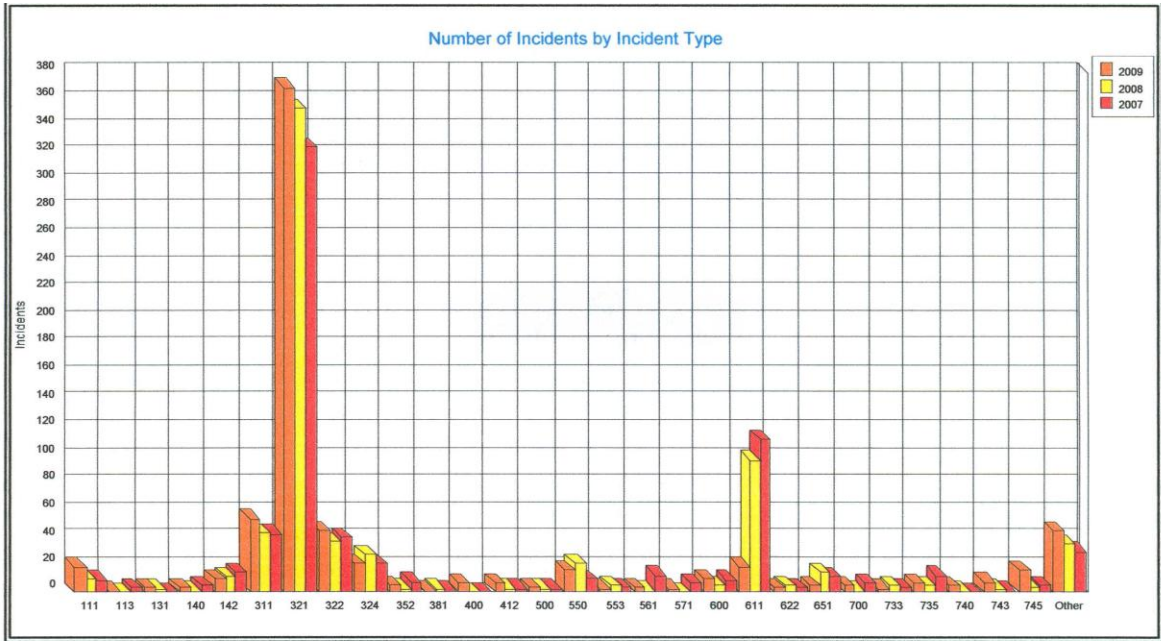
The overall performance goal is to:

*Limit the risk to people and the community from fire, injury, death, and property damage associated with fire, accidents, and other natural and manmade emergency situations.*

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<sup>5</sup> Sunriver Service District Strategic Plan 2005 – 2010, p.22, 23

<sup>6</sup> Sunriver Service District Strategic Plan 2010 – 2015, p. 22, 23



	2009	2008	2007	Subtotal
111 Building fire	19	10	9	38
113 Cooking fire, confined to container	2	1	4	7
131 Passenger vehicle fire	4	3	1	8
140 Natural vegetation fire, other	4	2	5	11
142 Brush, or brush and grass mixture fire	11	12	15	38
311 Medical assist, assist EMS crew	54	44	43	141
321 EMS call, excluding vehicle accident with inj	369	354	326	1,049
322 Vehicle accident with injuries	45	37	41	123
324 Motor vehicle accident no injuries	21	28	22	71
352 Extrication of victim(s) from vehicle	6	3	8	17
381 Rescue or EMS standby	2	3	2	7
400 Hazardous condition, other	7	1		8
412 Gas leak (natural gas or LPG)	7	3	3	13
500 Service Call, other	4	3	3	10
550 Public service assistance, other	16	22	11	49
553 Public service	3	5	4	12
561 Unauthorized burning	4	2	13	19
571 Cover assignment, standby, moveup	3	1	7	11
600 Good intent call, other	10	6	9	25
611 Dispatched & canceled en route	19	97	112	228
622 No incident found on arrival of incident addr	4	5	4	13
651 Smoke scare, odor of smoke	5	15	12	32
700 False alarm or false call, other	5	2	7	14
733 Smoke detector activation due to malfunction	3	5	4	12
735 Alarm system sounded due to malfunction	7	6	13	26
740 Unintentional transmission of alarm, other	6	2	1	9
743 Smoke detector activation, no fire - unintent	8	3	2	13
745 Alarm system sounded, no fire - unintention	16	4	5	25
Other	45	36	30	111
<b>Totals</b>	<b>709</b>	<b>715</b>	<b>716</b>	<b>2,140</b>



Based on this general goal the following risk specific objectives are identified:

Fire:

For all incidents within the fire district, SFD will arrive in a timely manner with sufficient resources to stop the escalation of the fire and keep the fire to the area of involvement upon arrival.

Fire:

For ninety percent of all fire incidents within the fire district, the first unit will arrive on scene with a response time (turnout time + travel time) of eight minutes and twenty seconds. On-scene staffing shall be sufficient to initiate a basic single-line interior attack.

For fire incidents outside the fire district, but within the ASA, SFD will arrive on scene within a time frame consistent with travel distance and available staffing. On-scene staffing will initiate a level of suppression activity that is consistent with safety standards and regulations for the situation.

Medical:

For all emergency medical incidents within the fire district, SFD will arrive in a timely manner with sufficiently trained and equipped personnel, in accordance with Deschutes County Service Area standards, to provide medical services that will stabilize the situation, provide care and support to the victim, and provide transportation of the victim to an appropriate medical facility.

EMS:

For ninety percent of all medical incidents within the fire district, SFD will arrive on scene with a response time (turnout time + travel time) of eight minutes and twenty seconds. Level of care and personnel standards will be provided as set forth in the Deschutes County Ambulance Service Areas Plan in Section 5.1, 5.2, and 5.3.

These statements of emergency response expectations for SFD's core emergencies are referred to as "service level objectives." These service level objectives identify and describe community expectations. It is assumed that, going into the development of the 2010 SOC, these expectations remain unchanged as they have been continuously supported through district budgets and fire department policies. These service level objectives are determined, in part, by the category of the community being served. Applying the definitions detailed in both the Commission on Fire Accreditation International (CFAI) standards of cover manual<sup>7</sup> and the Deschutes County Ambulance Service Areas Plan,<sup>8</sup> the Sunriver fire district is categorized as

<sup>7</sup> CFAI: Standards of Cover, 5<sup>th</sup> Edition, p.20, 21

<sup>8</sup> Deschutes County Ambulance Service Areas Plan, p.7, 8

suburban and the ASA outside Sunriver proper is categorized as rural and frontier. The current Deschutes County ASA Plan standards for EMS response times for ninety percent of calls are:<sup>9</sup>

Urban	6 minutes
Suburban	15 minutes
Rural	45 minutes
Frontier	4 hours & 30 minutes

While the Deschutes County ASA Plan calls for a fifteen minute (maximum) response time for ninety percent of EMS calls in the suburban environment, SFD's performance standard, as stated above, is eight minutes, twenty seconds for ninety percent of EMS calls. A review of response time records for EMS calls in the fire district for the three-year period 2007 – 2009 is:

2007 – 8 minutes 20 seconds for 95% of calls
2008 – 8 minutes 20 seconds for 92.6% of calls
2009 – 8 minutes 20 seconds for 97.5% of calls

SFD's current EMS deployment clearly meets or exceeds standards and expectations.

## SECTION II: RISK ASSESSMENT

### A. Community Risk Assessment

A critical element to the development of an SOC is a risk assessment. The factors used as input in the risk assessment process are both physical and theoretical. Everything begins with the description of the community risk. The key factors considered in assessing community risk are:

#### ❖ Geospatial Characteristics

- Political Boundaries – *Areas served or underserved due to different level of government and/or laws.* There are no overlapping political boundaries that affect fire protection services within the SSD.
- Growth Boundaries – *Areas where new services will be required due to growth.* Growth is not a serious concern absent a major annexation. Sunriver is nearing complete build out with only two new homes built in 2009. Commercial construction, however, hit its highest number ever recorded, but driven primarily by Village Mall projects.<sup>10</sup>
- Construction Limitations – *Limitations (or the lack thereof) on the size, height, or complexity of new development.* Restriction on new construction is driven by building codes, zoning restrictions, and SROA Design Committee rules and regulations.

<sup>9</sup> Deschutes County Ambulance Service Areas Plan, p.14

<sup>10</sup> Sunriver Owners Association 2009 Annual Statistics and Inventory for Sunriver, Oregon, p.3

- Infrastructure Limitations – *The ability of water, power, sewer, streets, and other infrastructure to support the service area currently and with new development.* Water supply has been identified as limited for some larger buildings near the airport. Water supply is evaluated for all new commercial construction to ensure adequate fire flow. Where necessary, built-in fire protection systems such as sprinkler systems and firewalls are required to reduce flow requirements for such structures.
- ❖ Topography
- Response Barriers – *Areas not easily accessed due to a lack of connectivity. This may be due to absence of streets, streets that are not yet completed, or natural features such as waterways or mountains, which may block access or delay response.* The dominant topography is flat meadow areas and heavily forested rolling terrain. Typical response may be hindered by severe weather conditions such as heavy snow accumulation, ice, or downed trees.
  - Elevation Changes – *Areas where grade differential requires steep roads, multi-tiered structures, extreme changes in water pressure, or narrow/windy roadways.* The elevation in Sunriver is 4100 feet and is without significant variations within the fire district. There are steep changes on portions of Hwy 97 that can be affected by winter weather conditions.
- ❖ Transportation Network
- Roads – *Roads and vehicles are sources of incidents within the service area. These service demands come in the form of accidents, medical calls, and fires.* Motor vehicle accidents are one of SFD’s core emergencies.
  - Rail Lines – *Virtually every commodity used in life today is carried on rail lines. The locations, usage, and nature of the rail lines will dictate the level of risk.* A railroad freight line runs north and south immediately adjacent to the Sunriver eastern boundary.
  - Waterways – *Like other transportation features, waterways increase exposure to incidents.* The Deschutes River flows from the south at the western boundary of the fire district. Its use is primarily for recreation.
  - Airports – *Most aircraft incidents occur during takeoff and landing phases of air travel. Thus, the areas around airports will have increased risk of this hazard. As with rail lines, the activity levels of the airport will have a significant impact on the level of risk.* Sunriver’s airport is one of the busiest private airports in the western United States. SFD’s personnel have been trained to the level of National Fire Protection Association (NFPA)

Airport Firefighter. A piece of specialized aircraft rescue, and firefighting (ARFF) equipment is planned to be acquired in 2011 from the city of Redmond.

❖ Climatic Impact

- The effect of weather on risk and response reliability has been discussed above.

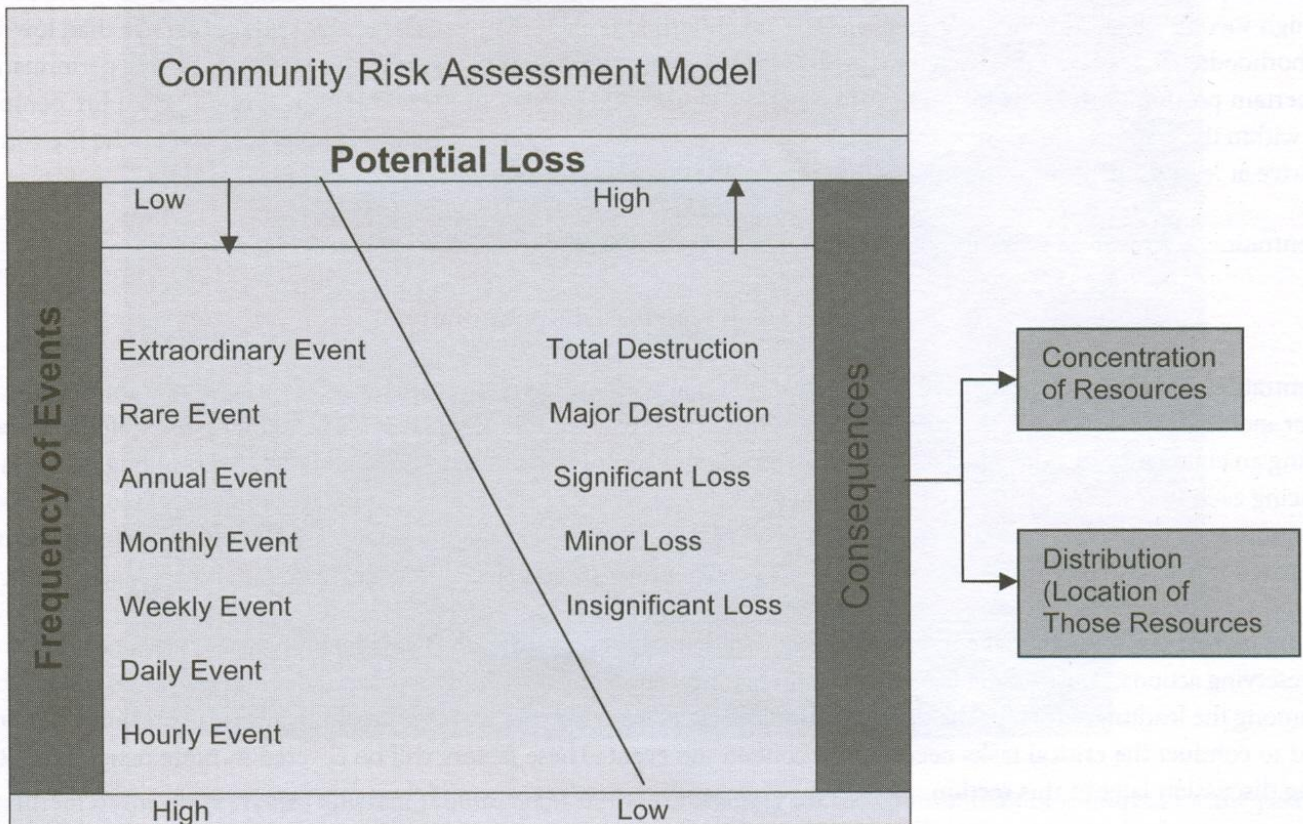
❖ Disaster Exposure

- Potential Risks include:
  - Earthquakes
  - Floods
  - Wildland Interface Fires
  - Wind Events
  - Critical Infrastructure
- The Draft Emergency Operations Plan (EOP) addresses disaster response in great detail. The projected date for finalization and adoption of that plan is March 2011.
- The problem of Wildland Interface Fires is addressed in great detail in the 2010 Sunriver Community Wildfire Protection Plan (SRCWPP).

B. Probability/Consequence

Two risk assessments have been conducted for Sunriver in 2010 that deal with the probability of an event occurring and the potential consequences of such events. One was conducted by the committee made up of representatives of the SSD (Fire and Police), the Sunriver Resort, and SROA Public Works and Environmental departments for the purpose of the development of the Sunriver EOP. The other was for the development of the SRCWPP which was a collaborative effort between SROA, SFD, and various state and federal agencies. These risk assessments analyzed the potential for various events and the consequences of those events.

For purposes of the SOC, these assessments are used to determine, not just probability and potential consequences, but distribution and concentration of resources. Though, historically, the probability of such an event is low, a fire in a large commercial structure, for example, requires a greater number of resources (concentration) to safely and effectively suppress that fire than would a single family dwelling. In addition, the location of the highest probability of an event typically dictates location of resources (distribution) in order to reduce response times. (See illustration next page.)



The CFAI has identified risk classifications for fires that include Low, Moderate, High, and Special risk.

- ❖ Low – Areas with a predominate risk of mobile property, outbuildings, and uninhabitable structures.
- ❖ Moderate – Areas with a predominate risk of single-use occupancy structures with fire flow requirements up to 3000 gpm.
- ❖ High – Areas with a predominate risk of multi-occupancy structures with fire flow above 3000 gpm but less than 4000 gpm and less than seven stories in height.
- ❖ Special – High-rise, target hazards and/or special building construction/use requiring additional resources or a needed fire flow of 4000 gpm or greater.

Single family dwellings are generally considered moderate risks. Structures such as the Great Hall or the Sunriver Lodge, while being high risk occupancies, would also be considered special risk occupancies due to their historical, cultural, and/or economic value to the community. The Village Mall and a number of multi-unit rental and dwelling units would fall into the high risk category.

C. Critical Task Analysis

Critical tasks are those tasks which must be performed during structural fire suppression operations to bring the event under control. CFAI developed a critical tasking analysis matrix that identifies the number of fire suppression personnel required to safely and effectively perform those tasks based upon the various levels of risk.<sup>11</sup> For example, for a room and contents fire, it recommends the following personnel assignments:

TASK.....	FIREFIGHTERS
Attack line	2
Pump Operator	1
Water Supply	1
Back-up line	2
Rapid Intervention Team (RIT)	2
Command/Safety	1
Search & Rescue	2
Ventilation	2
Utilities/Exposures	2
<u>TOTAL</u>	<u>15</u>

For high risk structures that number increases exponentially while for low risk fire situations three to four personnel are required. It must be recognized that in the absence of sufficient resources being assembled within a time frame to perform these tasks simultaneously, the Incident Commander must prioritize these tasks based upon existing fire conditions and resources immediately available. Since the establishment of OSHA 29 CFR 1910 (the 2/in-2/out standard), a minimum of four (4) firefighters must be on-scene and appropriately trained and equipped to perform interior firefighting before interior firefighting activities may be initiated. Depth of resources is provided through mutual aid companies and personnel call-backs.

Personnel call-backs (recalling off-duty personnel) were initiated twelve times during 2007 – 2009, four of which were for building fires and three for brush/wildland fires. During that period, SFD responded to 2140 calls. This indicates that call-stacking (calls for service when no resources are available) is not an ongoing problem with current staffing because, on those infrequent occasions when call-backs are sounded, it is most often for additional resources to combat fires, not to respond to concurrent calls for service.

Current staffing levels consist of three career personnel per shift, augmented with reserves whose numbers vary from day to day. Current staffing levels are described in the 2010 – 2015 SSD Strategic Plan as:

*There are 3 rotating shifts with 3 career personnel on duty at all times and 1 to 4 reserve firefighters typically providing supplemental staffing on each shift. Additionally, the Assistant Chief and Fire Chief trade duty weeks and respond to major incidents in the community while off-duty.<sup>12</sup>*

<sup>11</sup> CFAI: Standards of Cover, 5<sup>th</sup> Edition, p. 43

<sup>12</sup> SSD Strategic Plan 2010 – 2015, p. 22

Moreover, consistent with the 2010 – 2015 Strategic Plan, the aforementioned staffing scheme is designed to maintain sufficient on-duty resources to manage two simultaneous medical calls of a non-critical nature. In addition, this staffing level allows for on-duty resources to manage low risk types of fire incidents, and provide for 2-in/2-out to initiate interior firefighting operations in moderate risk type structures when sufficient reserve personnel are on duty. It is essential to acknowledge that this staffing plan is dependent upon a robust reserve program in order to reliably provide for these staffing levels. It is equally important that all personnel receive adequate, relevant training in order to maintain the current service level objectives. Having sufficient numbers of firefighters on-scene must be understood to mean sufficient numbers of properly trained and equipped firefighters. This is also essential in maintaining mutual aid agreements with partner agencies which SFD will continue to rely upon to provide resource depth for high and moderate risk fires.<sup>13</sup>

### SECTION III: COMMUNITY SERVICE LEVEL OBJECTIVES

#### A. Service Level Objectives

The CFAI manual points out that, “Setting specific service level objectives after risks have been identified is part art, part science, and part politics. Once a thorough evaluation and categorization of risks have been completed, it is expected the fire department will start reviewing emergency outcomes.”<sup>14</sup>

A review of the three-year period 2007 – 2009 shows that the average turnout time for all calls is 1 minute, 38 seconds. The target turnout time is 2 minutes. The average total response time (turnout time + travel time) for all calls is 5 minutes, 12 seconds. However, most modern fire departments no longer refer to average response times. Instead, a fractile measure such as eighty percent, or whatever has been set by local policy as a response time goal, is used.<sup>15</sup>

For example, this Draft SOC study recommends:

*For 80 percent of all fire incidents within the fire district, the first unit will arrive on scene with a response time (turnout time + travel time) of 8 minutes and 30 seconds. On-scene staffing shall be sufficient to initiate a basic single-line interior attack.*<sup>16</sup>

Likewise, for EMS responses:

*For 90 percent of all medical incidents within the fire district, SFD will arrive on scene with a response time (turnout time + travel time) of 8 minutes and 20 seconds.*<sup>17</sup>

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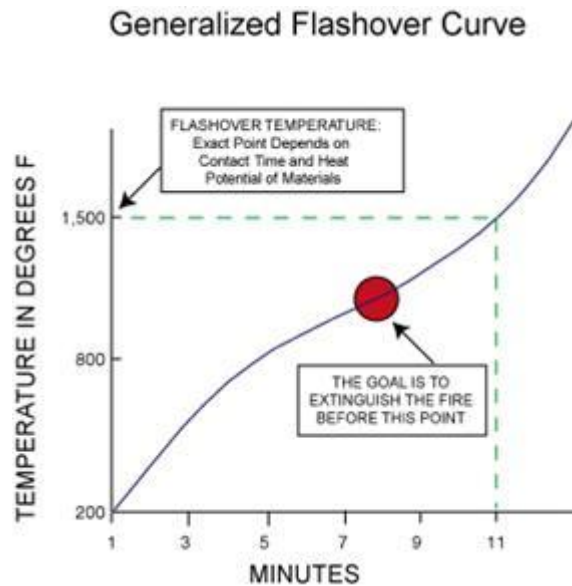
<sup>13</sup> 2009 Central Oregon Mutual Aid Agreement, 5.0; Attachment A.2.A

<sup>14</sup> CFAI: Standards of Cover, 5<sup>th</sup> Edition, p. 48

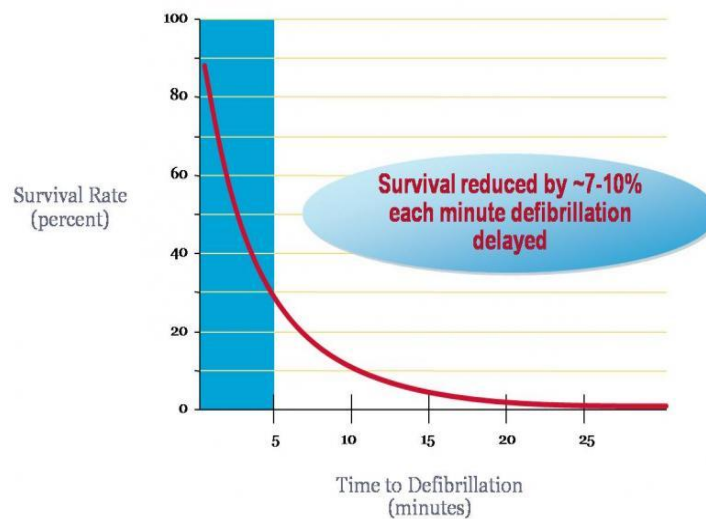
<sup>15</sup> Ibid, p. 51

<sup>16</sup> 2011 Draft Standards of Cover, p. 22

Two critical timelines drive response time needs. They are the flashover point for a structure fire and the point of brain death for cardiac arrest patients. Flashover, being the most significant threat to life and property, is that which the service level is intended to mitigate prior to occurrence. Based upon national averages, flashover can be expected to occur within the 8 to 10 minute timeframe. From the emergency medical perspective, the 8 to 10 minutes represents the timeframe in which biological death (as distinguished from “clinical death”) becomes irreversible.



A thorough explanation of the flashover phenomenon can be found in the CFAI SOC manual.



A review of response times for 2007 – 2009 shows that all current performance goals are being reached with the exception of total response time for structure fires. The target goal, as

<sup>17</sup> Ibid



noted above, assumes that the first arriving unit will be on scene within 8 minutes, 20 seconds for 90 percent of all fires within the fire district. Statistical analysis shows that, for the 38 structure fire alarms to which SFD responded within the fire district during 2007 – 2009, the first arriving unit was on scene within 8 minutes 20 seconds 78 percent of the time. The first arriving unit, however, was on-scene within 9 minutes 90 percent of the time.

The overall performance is affected by 9 of the 38 structure fire responses measured. Because firefighters are cross-trained as paramedics, these longer total response times may be attributed to personnel not being available – instead of units being unavailable – and being committed to, or clearing from, other calls (some of which may have required returning to the station to leave the medic unit and mount and respond in an engine at the time of receipt of the structure fire call). Also, driving conditions made hazardous by snow or ice may have had an impact as well. The exact reason for the longer responses in those incidents is not immediately available.

#### B. Performance Measures

In the development of the following objectives several factors were used:

- ❖ Historical performance
- ❖ Current capabilities/critical tasking
- ❖ Risk analysis/risk exposure
- ❖ System demand
- ❖ Community expectations

Based upon these factors, the following risk-specific performance objectives are identified:

The overall deployment goal is to:

*Minimize the risk to people and the community from fire, injury, death, and property damage associated with fire, accidents, and other emergency situations.*

#### Fire:

*For all incidents within the fire district, SFD will arrive in a timely manner with sufficient resources to stop the escalation of the fire and keep the fire to the area of involvement upon arrival.*

#### Fire:

*For 80 percent of all fire incidents within the fire district, the first unit will arrive on scene with a response time (turnout time + travel time) of eight minutes and 30 seconds. On-scene staffing shall be sufficient to initiate a basic single-line interior attack.*

*For fire incidents outside the fire district, but within the ASA, SFD will arrive on scene within a time frame consistent with travel distance and available staffing. On-scene staffing will initiate a level of suppression activity that is consistent with safety standards and regulations for the situation.<sup>18</sup>*

#### Medical:

*For all emergency medical incidents within the fire district, SFD will arrive in a timely manner with sufficiently trained and equipped personnel in accordance with Deschutes County Service Area standards to provide medical services that will stabilize the situation, provide care and support to the victim, and provide transportation of victim to the appropriate medical facility.*

#### EMS:

*For 90 percent of all medical incidents within the fire district, SFD will arrive on scene with a response time (turnout time + travel time) of eight minutes and 20 seconds. Level of care and personnel standards will be provided as set forth in the Deschutes County Ambulance Service Areas Plan in Section 5.1, 5.2, and 5.3.*

#### Special Hazards:

##### Wildfire:

*For 80 percent of all outdoor and natural cover fire incidents within the fire district, the first unit will arrive on-scene within eight minutes, 30 seconds (turnout time + travel time). On-scene staffing will be sufficient and appropriately trained to initiate a direct or indirect attack as appropriate and order additional resources as needed.*

*For all outdoor and natural cover fire incidents occurring outside the fire district, but within the ASA, SFD will respond within a time frame consistent with travel distance and available staffing. On-scene staffing will initiate a level of suppression activity that is consistent with safety standards and regulations for the situation.*

##### Hazardous Materials:

*For 80 percent of hazardous material incidents occurring within the fire district, the first unit will arrive on-scene within eight minutes, 30 seconds (turnout + travel time). On-scene staffing will be capable of functioning at the state recognized operations level.*

*For hazardous material incidents occurring outside the fire district, but within the ASA, SFD will respond within a time frame consistent with travel distance and*

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<sup>18</sup> This standard is in reference to mutual aid agreements.

*available staffing. On-scene staffing will initiate a level of activity that is consistent with safety standards and regulations for the situation and certification levels of personnel.*

## CONCLUSION

Standards of Cover (SOC) is a system for analyzing resource deployment and determining whether a fire department is properly deployed to meet the community's risks and expectations. SOC's are practical and effective tools for all fire departments and districts – career and volunteer, large and small. However, there is no “one size fits all” SOC. The SOC must take into account factors unique to the community the department serves and detail agency-specific performance goals against which actual performance can be compared in order to measure the effectiveness of the fire department or district.

The key elements of this SOC are:

- Community Baselines (Overview, Services, and Expectations)
- Risk Assessment (Risks, Probabilities and Consequences, and Community Expectations)
- Community Service Level Objectives (Service Level Objectives and Performance Measures)

What the study shows is that the Sunriver Fire Department's ability to deal with identified risks and meet community expectations is reliable and effective but not without limitations. For the overwhelming number of calls for service the initial response force is effective. This is, to a great extent, owing to a robust Reserve program.

For larger, more complex, or greater-alarm calls (2<sup>nd</sup> alarm, 3<sup>rd</sup> alarm, etc.), initial deployments are augmented by mutual-aid resources and off-duty personnel call-backs. Though response times for mutual aid responses and call-backs can be lengthy when compared with initial response times due to travel distances, they do provide depth when dealing with larger or longer term events. In addition, they provide district coverage and responses to subsequent calls for service when on-duty crews are already committed. The following bullet points specify what is necessary to sustain current service levels.

- Maintain current staffing minimums
- Maintain sound Reserve program
- Develop and implement plan to provide training for critical fireground tasks
- Monitor and evaluate performance against performance goals for compliance and trends