

## 9 SAFETY ELEMENT

Natural and man-made hazards exist throughout California, including in the Town of Truckee. The Safety Element of the General Plan seeks to protect the community to the extent possible against risks to life and property from local environmental hazards, and to empower local residents to be ready and responsive in the event of a natural disaster.

The Safety Element is among the seven General Plan elements required by State law. It identifies and evaluates the complete range of natural and human-made hazards present in Truckee, and establishes goals, policies and actions to reduce those hazards to an acceptable level. Topics addressed by this element include:

- ◆ Geologic hazards, including seismically induced surface rupture, ground shaking, ground failure and subsidence, and slope instability.
- ◆ Flooding and seiche.
- ◆ Wildland and urban fires.
- ◆ Snow avalanches.
- ◆ Hazardous materials.
- ◆ Airport and aviation safety.

This element also addresses more general issues of public education and emergency preparedness, emphasizing proactive measures that can be taken to minimize exposure to hazards, and to ensure effective response and recovery.

### *A. Background Information*

This section briefly summarizes conditions relating to hazards that are present in Truckee, as background to the goals, actions and policies described in sections that follow.

### Safety Element Guiding Principles

- ❖ Minimize the potential risk to life and property from natural and induced hazards in the Town of Truckee.
- ❖ Ensure the on-going safety of operations at the Truckee-Tahoe Airport.
- ❖ Ensure that Truckee’s residents and emergency services providers are adequately prepared to respond to emergency situations.

#### Geology and Seismic Hazards

Geologic hazards present within the Truckee Town limits are primarily associated with seismic activity, and with steep slope areas that may be subject to landslides in conjunction with seismic activity and/or weak soils.

#### Seismic Hazards

As with most places in California, Truckee is subject to some hazard from seismic activity, although this risk is relatively low compared to other places in the State. Faults located near Truckee include the Mohawk Valley Fault, the southern section of which lies approximately 20 miles northwest of Truckee in Sierra County, and the Dog Valley Fault, which extends in from Dog Valley (approximately 20 miles northeast of Truckee) southwest to near Donner Lake. Several small trace faults are also located within the Town limits. None of these faults are designated as Alquist-Priolo Special Study Zones, which identify fault areas considered to be of greatest risk in the state. A 1986 study by the California Bureau of Reclamation concluded that the Dog Valley Fault and Mohawk Valley Faults could result in a maximum credible earthquake of 6.75 and 7.0 magnitude respectively.

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*A magnitude 7.0 earthquake could potentially cause major damage over a wide area; however the precise impacts of such an event could vary greatly depending on distance, local soil conditions, and building construction, among other factors.*

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There has been seismic activity felt in Truckee in recent years, including a magnitude 6+ earthquake in 1966, a magnitude 3.6 earthquake in 1998, and a magnitude 4.5 earthquake, centered six miles south of Truckee, in June, 2004<sup>1</sup>. Figure SAF-1 shows the location of known earthquake faults and epicenters in Nevada County.

#### Steep Slopes

Steep slopes (thirty percent or greater), limit development in several areas of Town, including some places along the Truckee River, the ridges and hillsides north and west of Downtown, the ridges north of Gateway and north and west of Donner Lake, and areas around Alder Hill. These steep slope areas, particularly where they occur in conjunction with weak soils, may present a significant hazard in Truckee, although no detailed study has been completed for landslide hazard in Nevada County.

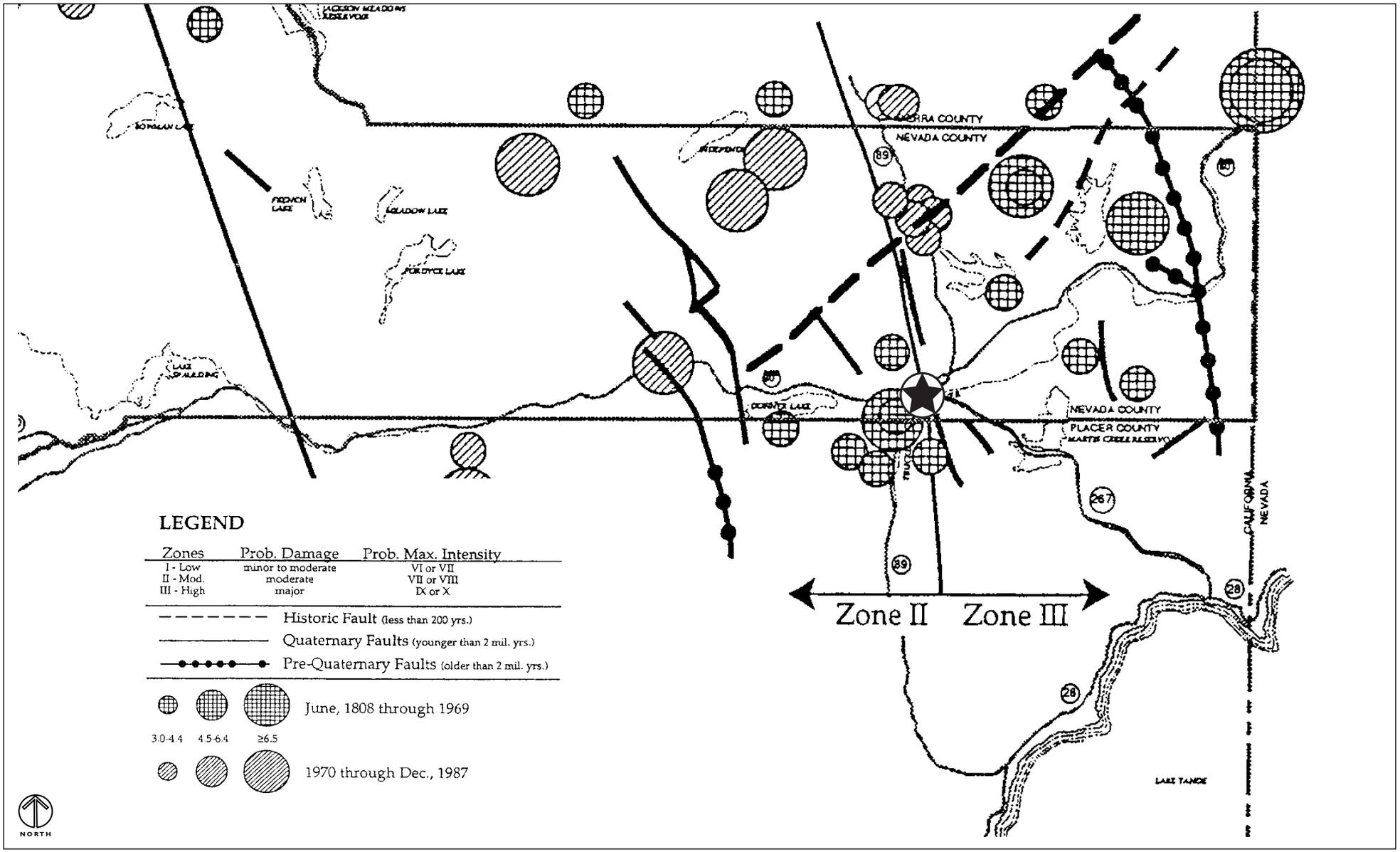
#### **Hydrology and Flooding**

Flooding is a serious concern in several parts of Truckee, particularly within those areas identified as falling within Federal Emergency Management Agency (FEMA) 100-year flood zones. These include areas around the Donner Lake shore, along Donner Creek, lower Trout Creek, and Cold Creek, and along the Truckee River. Along the Truckee River, the 100-year flood zone extends as far as 300 feet from the banks of the river. Areas of Truckee within these flood zones are shown in Figure SAF-2.

Three dams, located at Prosser Reservoir, Boca Reservoir and Stampede Reservoir, are located just north of Truckee. A smaller dam is also located at Donner Lake, and another at Martis Creek Lake, south of the town. While each of these dams has the potential to fail and to release a volume of water that could result in severe short-term flooding, Truckee would not be significantly affected by potential inundation. Based on recent modeling completed by the US Bureau of Reclamation, maximum outflow from a failure of the Prosser, Boca and Stampede dams would back-flow upstream into the

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<sup>1</sup>California Integrated Seismic Network

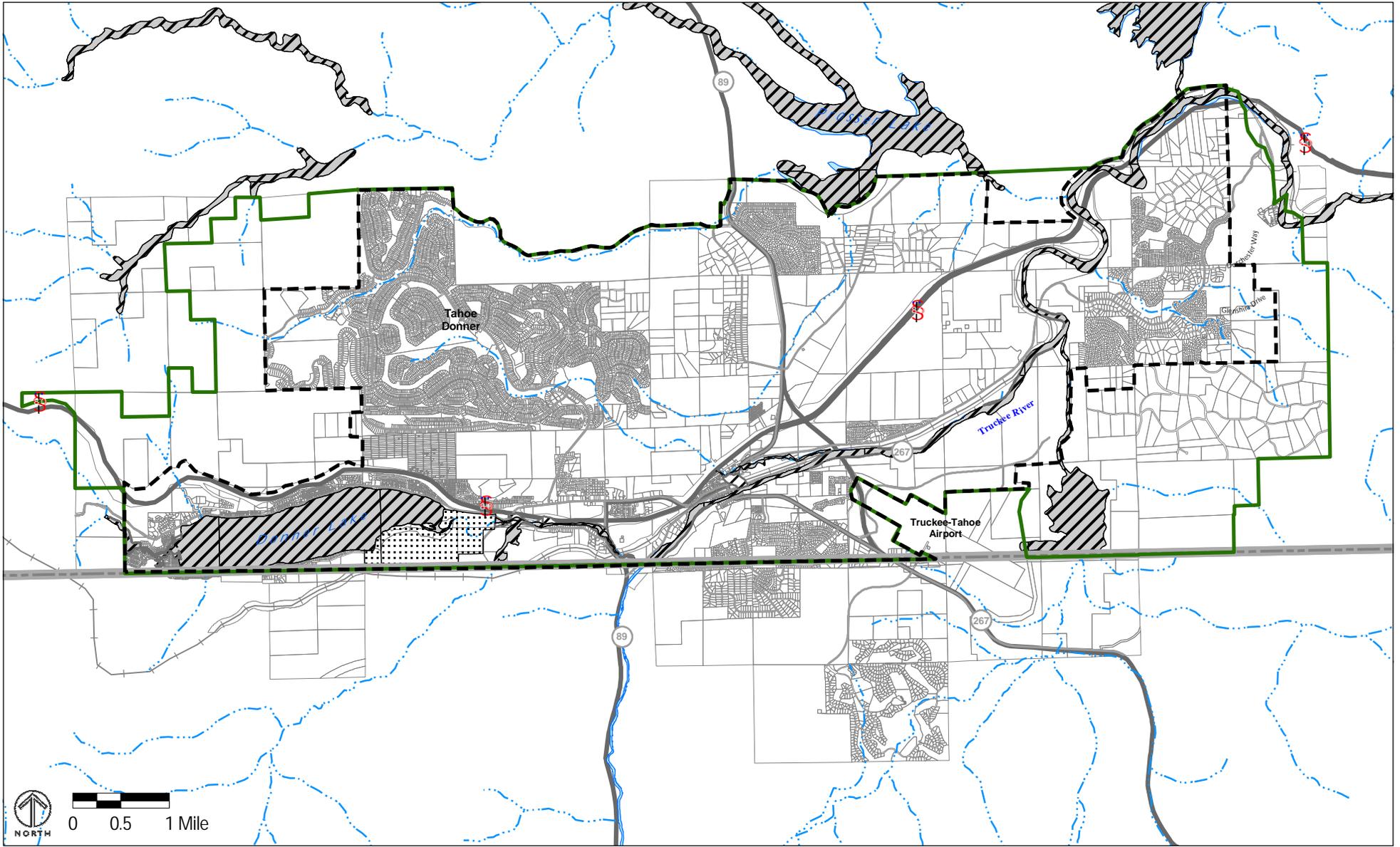


Source: Nevada County General Plan Master Environmental Assessment

FIGURE SAF-1



**EARTHQUAKE FAULTS AND SEISMIC ACTIVITY IN NEVADA COUNTY**



Source: Federal Emergency Management Agency, 1998 Note: This figure includes flood hazard mapping for Nevada County only

FIGURE SAF-2

-  Truckee Town Limits
-  Proposed Sphere of Influence
-  Creek or other Drainage

FEMA FLOOD HAZARD ZONES

-  Zone A: Subject to 100-Year Flood. Base Elevation Undetermined. Annual probability of flooding of 1% or greater.
-  Zone X500: Area between the limit of the 100-year and 500-year flood; or certain areas subject to 100-year flood with average depths of less than one foot. Annual Probability of Flooding 0.2% to 1%
-  Zone D: Unstudied Area: Flood Hazards Undetermined
-  Zone X: Areas Outside of 500-year floodplain

AREAS SUBJECT TO FLOODING

Truckee River about two miles from their associated confluences, and would be contained in the main channel of the Truckee River between three and five miles from their source, depending on which dam provides the source. Failure of the Prosser Dam would result in backflow to about half a mile downstream of the Truckee sewage plant (about 3.5 miles from Downtown Truckee). It is anticipated that a segment of I-80 and the railroad, near the confluence of Prosser Creek in the Truckee River Canyon would be inundated by such a failure. Failure of the Stampede Dam or Boca Dam would result in backflow to the confluence of Prosser Creek, about five miles south of Downtown.<sup>2</sup>

Inundation from dam failure at Donner Lake is not considered to pose a serious threat to Truckee, given the relatively small volume of water contained in Donner Lake (approximately 9,500 acre feet, compared to about 41,000 acre feet in Boca Reservoir alone). The California Department of Water Resources is undertaking improvements to the Donner Lake Dam, which should provide additional safeguards against seismically-induced failure.

A seiche is a stationary wave, associated with a lake or semi-enclosed body of water usually caused by strong winds and/or changes in barometric pressure. Although Donner Lake is located in Truckee, and a number of reservoirs are nearby, the risk of flooding associated with seiche is considered minimal, due to the relatively low levels of seismic activity locally, and the small size of these water bodies.

### **Snow Avalanche**

The degree of potential hazard from snow avalanche in Truckee is related to a number of localized conditions, including steepness of slope, exposure, snow pack composition, recent weather factors such as wind, temperature, and rate of snowfall and other interacting factors. Three avalanche hazard areas

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<sup>2</sup> Personal communication, Mike Larson, US Bureau of Reclamation, Lahontan Basin Area Office, August 10, 2004.

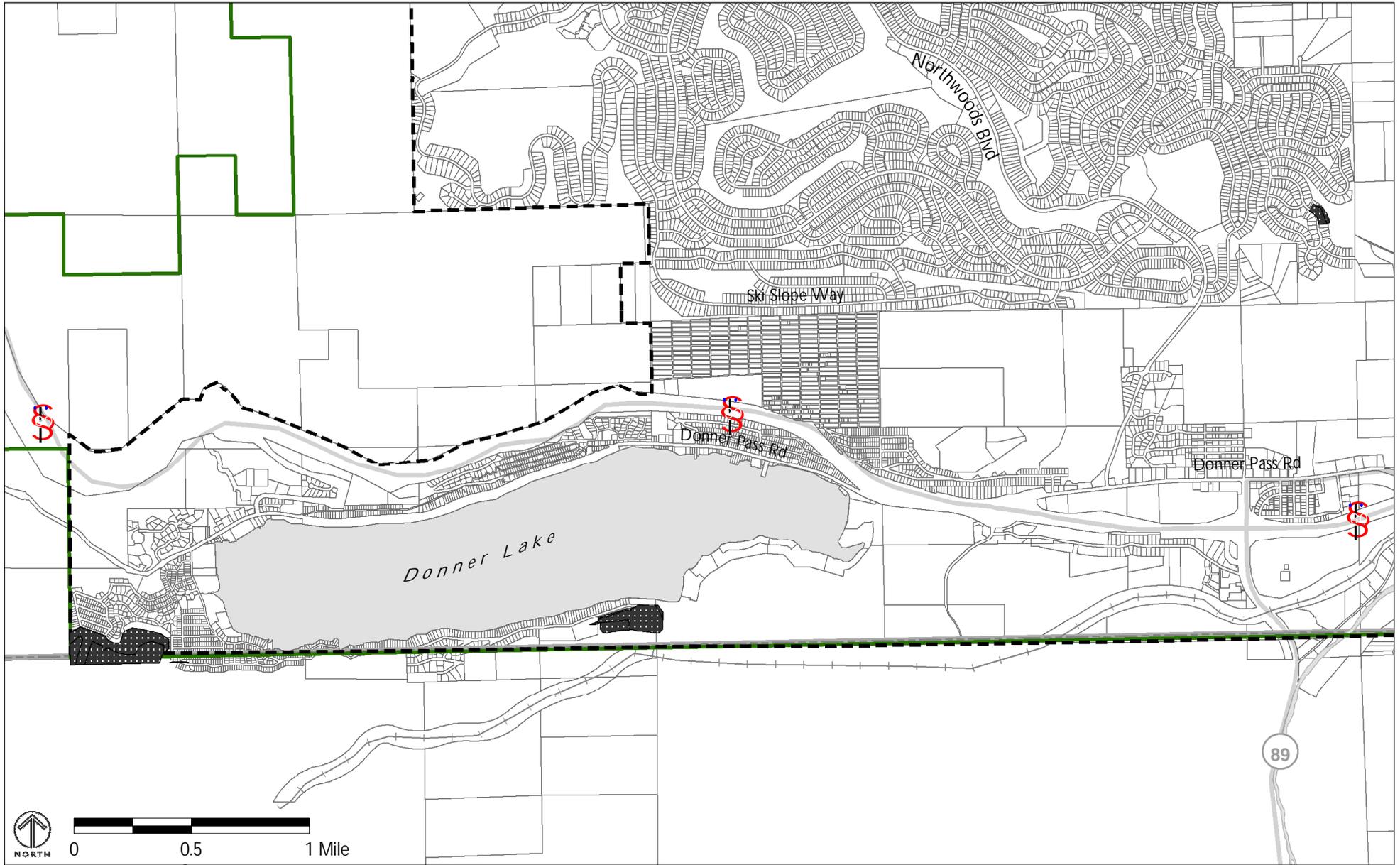
are mapped in Truckee; these are shown in Figure SAF-3. They include an area at the west end of Donner Lake, and another south of the lake just west of the Donner Memorial State Park, as well as a smaller area at the southeast edge of Tahoe Donner.

### Wildfire

The entire Truckee area is considered to be in a high fire hazard severity zone, as defined by the California Department of Forestry (CDF), although risks are particularly pronounced in certain parts of the community, particularly where homes are located within areas of dense vegetation and forest land, and where steep slopes and other similar conditions exist. Calculation of threat from wildfire hazard is based on a number of combining factors including fuel loading (vegetation), topography, and climatic conditions such as winds, humidity and temperature. Figure SAF-4 shows areas of potential risk from wildland fire, based on the proximity of population density to those areas most likely to be at risk due to prevailing physical and climatic conditions.



*The 2001 Martis Fire burned over 14,000 acres east of Truckee  
Photo: Truckee Fire Protection District*

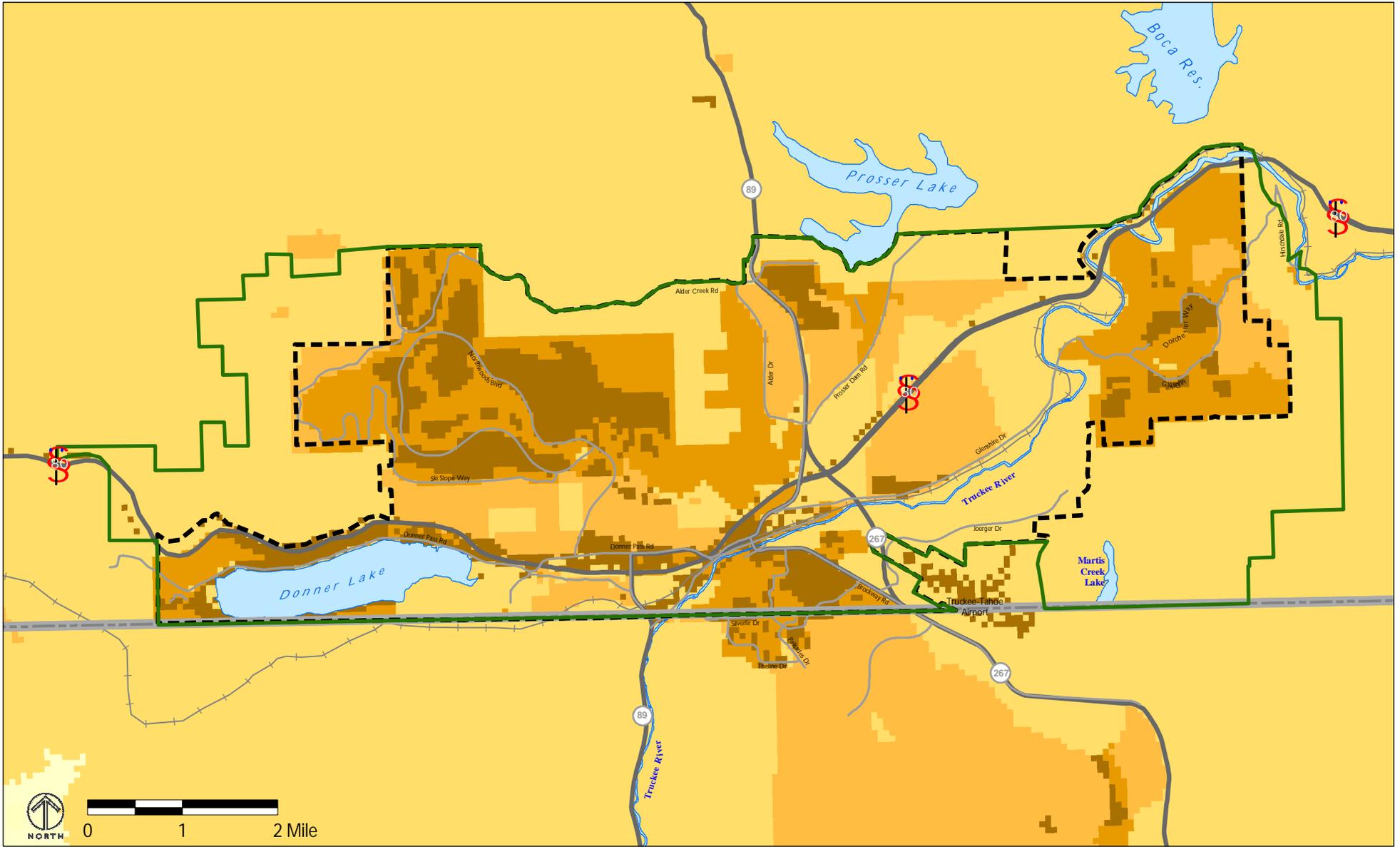


Source: Town of Truckee

FIGURE SAF-3

-  Potential Snow Avalanche Area
-  Truckee Town Limits
-  Proposed Sphere of Influence
-  County Boundary

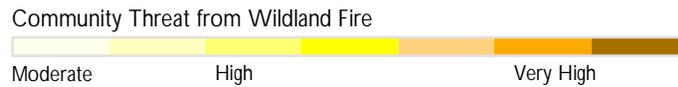
AVALANCHE HAZARD AREAS



Source: California Department of Forestry and Fire Protection, 2003

FIGURE SAF-4

-  Truckee Town Limits
-  Proposed Sphere of Influence



Notes: CDF wildland/urban interface threat mapping reflects relative risk to areas of population density from wildfire. Risk is expressed in terms of a "Threat to Community" value, with potential values ranging from -14 (Little or no Threat to community areas with average density of 1 housing unit per 20 acres or less) to +44 (Extreme Threat to community areas with average density of 1 unit per acre or more). Threat values in the Truckee area range from 14 to 34, which are all between the Moderate and Very High level, with most places classified as High or Very High threat.

COMMUNITY AREAS AT RISK FROM WILDLAND FIRE

Residents of Truckee's rural residential areas may be at greater risk from wildland fire hazard due to access difficulties for fire-fighting equipment and personnel in more remote areas, narrow rural roads, and hilly terrain.

The Truckee Fire Protection District was an active participant in the development of the Nevada County Fire Plan, which was accepted in May 2005. The Fire Plan includes an extensive series of recommendations aimed at reducing wildland fire risk in the County, including fuel management and defensible space enforcement strategies, public education, infrastructure improvements to increase fire-fighting capacity, and coordination with local fire agencies in ensuring consistent and effective wildland fire mitigation efforts.

#### **Hazardous Materials**

Hazardous materials include a wide variety of substances commonly used in households and businesses. Used motor oil, paint, solvents, lawn care and gardening products, household cleaners, gasoline and refrigerants are among the diverse range of substances classified as hazardous materials. Nearly all businesses and residences generate some amount of hazardous waste; certain businesses and industries generate larger amounts of such substances, including gas stations, automotive service and repair shops, printers, dry cleaners and photo processors. Hospitals, clinics and laboratories generate medical waste, which is also potentially hazardous.

Use, storage and transportation of hazardous wastes is heavily regulated by federal, State and local agencies, including the California Department of Toxic Substances Control, which is authorized to implement the regulations of the Federal Environmental Protection Agency. The Nevada County Environmental Health Department monitors commercial storage and use of hazardous materials, including issuing permits for use and storage of significant quantities of hazardous materials or substances.

#### **Airport Safety**

The Truckee-Tahoe Airport, which is owned and operated by the Truckee Tahoe Airport District, is located outside of Truckee Town limits, straddling

the boundary between Nevada and Placer Counties. It is a General Aviation facility that serves as a regional center for private and charter aviation activity. As with all airports built in proximity to urbanized areas, maintaining land uses compatible with safe airport operations is an important consideration.

The Foothill Airport Land Use Commission adopted an updated Comprehensive Land Use Plan (CLUP) in December, 2004. The CLUP describes a series of land use safety and compatibility zones and associated guidelines for development around the Truckee Tahoe Airport that are intended to safeguard against development that is incompatible with airport operations. As noted elsewhere in this General Plan, Public Utilities Code Section 21676 requires Truckee's General Plan to be in conformance with the land use plan and policies of an adopted CLUP, unless the Town Council makes specific findings to overrule the CLUP or portions of it.

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*The CLUP is titled the Airport Land Use Compatibility Plan.*

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**B. Goals, Policies and Actions**

<p><b>Goal SAF-1 Reduce the risk of injury, loss of life and property damage from earthquakes, landslides and other geologic hazards.</b></p>
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Policies

- P1.1 Group and locate new residential development in such a way as to avoid areas of hazard including steep slopes and areas of unstable soils.
- P1.2 Encourage retrofitting of structures, particularly older buildings, to withstand earthquake shaking and landslides. Ensure that new development incorporates design and engineering that minimizes the risk of damage from seismic events and land sliding.

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*All construction in Truckee (with limited exceptions) must comply with the Uniform Building Code (UBC), which specifies requirements for seismic design, foundations and drainage systems, among other aspects.*

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- P1.3 Require soils reports for new development in areas where geologic risks are known to exist. Such reports should include recommendations for appropriate engineering and other measures to address identified risks.

Actions

- A1.1 Amend the Development Code to include reference to cliff edges and escarpments in standards and guidelines concerning steep slopes, ridges and hillsides.

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*The Town's participation in the FEMA-run National Flood Insurance Program involves implementing land use, zoning and building regulations to minimize local flooding risk. As residents of a participating community, Truckee property-owners and renters are entitled to purchase flood insurance at reduced cost through the federally-sponsored program.*

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**Goal SAF-2 Reduce hazards associated with flooding.**

Policies

- P2.1 Continue to work with appropriate local, State and federal agencies (particularly FEMA) to maintain the most current flood hazard and floodplain information and use it as a basis for project review and to guide development in accordance with federal, State and local standards.
- P2.2 Continue to participate in the National Flood Insurance Program (NFIP).
- P2.3 Incorporate stormwater drainage systems in development projects to effectively control the rate and amount of runoff, so as to prevent increases in downstream flooding potential.
- P2.4 Discourage development within the Truckee River floodplain and adjacent to other waterways to minimize risks associated with flooding.

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*Policies and actions under Goal COS-2 in the Conservation and Open Space Element, concerning setbacks from the Truckee River and other waterways, also support Goal SAF-2.*

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**Goal SAF-3 Reduce risks associated with avalanche hazards.**

Policies

- P3.1 Locate new buildings associated with new discretionary development outside of avalanche hazard areas.
- P3.2 Continue to identify avalanche hazard areas, and to enforce special standards for construction in avalanche hazard areas.

Actions

- A3.1 Update avalanche zoning studies and modify the Development Code as necessary to respond to updated avalanche information.

**Goal SAF-4 Protect lives and property from risks associated with wildland and urban fire.**

Policies

- P4.1 Continue to cooperate with the Truckee Fire Protection District, the California Department of Forestry, and the U.S. Forest Service in creating and promoting fire prevention education programs.
- P4.2 Continue to cooperate with the Fire Protection District to implement fire safety ordinances to minimize wildland fire hazards, including incorporation of fire resistant building and roofing materials, and attainment and maintenance of “defensible space.” Defensible space may include revegetation with less flammable species, such as fire resistant native and adapted species, and the use of mulch to prevent erosion on bare soil.

- P4.3 Promote fire hazard reduction through cooperative fuel management activities in association with the Truckee Fire Protection District, the California Department of Forestry and the U.S. Forest Service. Such strategies may include identifying and implementing opportunities for fuel breaks in very high fire hazard severity zones, and ensuring that fire breaks are provided where necessary and appropriate.
- P4.4 Require new development to incorporate adequate emergency water flow, emergency vehicle access and evacuation routes.
- P4.5 Continue to support the mitigation fee program for the Fire Protection District, to ensure that the District is able to meet the future fire protection needs of the community as it grows.
- P4.6 Support, as appropriate, efforts to implement the recommendations of the 2005 Nevada County Fire Plan, and programs of Fire Safe Nevada County.
- P4.7 Ensure that the development review process addresses wildland fire risk, including assessment of both construction- and project related fire risks particularly in areas of the Town most susceptible to fire hazards. Cooperate with the TFFPD in reviewing fire safety plans and provisions in new development, including aspects such as emergency access, site design for maintenance of defensible space, and use of non-combustible materials.

**Goal SAF-5 Protect the community from the harmful effects of hazardous materials.**

Policies

- P5.1 Continue to coordinate with the Nevada County Environmental Health Department in the review of all projects which require

the use, storage or transport of hazardous waste to ensure necessary measures are taken to protect public health and safety.

- P5.2 Continue to cooperate with Tahoe Truckee Sierra Disposal to facilitate opportunities for safe disposal of household hazardous waste.
- P5.3 Support efforts to identify and remediate soils and groundwater contaminated with toxic materials, and to identify and eliminate sources contributing to such contamination.

**Goal SAF-6 Minimize risks associated with operations at the Truckee-Tahoe Airport.**

Policies

- P6.1 Maintain land use and development patterns in the vicinity of the Truckee-Tahoe Airport that are consistent with the adopted Comprehensive Airport Land Use Plan, including setbacks and height requirements.

Actions

- A6.1 Amend the Development Code to reflect revised airport safety areas established in the adopted Comprehensive Land Use Plan for the Truckee-Tahoe Airport

**Goal SAF-7 Prepare Truckee residents to respond to emergency situations.**

Policies

- P7.1 Work with Caltrans to coordinate establishment of appropriate emergency access routes through the Town when closure of Interstate 80 is necessitated by weather-related or other emergencies.
- P7.2 Support the efforts of the Department of Homeland Security, Truckee Fire Protection District, Nevada County Office of Emergency Services, and other agencies to educate the public about emergency preparedness and response.

Actions

- A7.1 Coordinate with other emergency response agencies to develop and implement an Emergency Response Plan for Truckee including measures for response to fire, earthquake, blizzard, hazardous materials spills and other disasters.
- A7.2 Create and maintain a web page on the Town website that includes a list of agencies and contacts for emergency situations, information about emergency preparedness, and links to useful resources.