



Waterford

Vision 2025

General Plan

Chapter 12 Safety

2025 Safety Vision: A community that promotes and provides a safe and healthy environment for its residents and visitors.

or hydro-compaction. All other hazards relevant to Waterford, however, are addressed in more detail in this element.

12.0. INTRODUCTION

The main purpose of the Safety Element is to provide policies and implementing actions aimed at reducing injuries, death, property damage, and the economic and social dislocation resulting from natural hazards. The Safety Element is based on an analysis of geologic and other hazards relevant to Waterford and on ways of protecting the community from any unreasonable risk associated with such hazards.

As provided by state law, the *Waterford Safety Element* is a supplement to the *Stanislaus County General Plan Safety Element* that addresses issues such as seismic and geologic hazards, flood hazards, fire hazards, and hazardous materials on a county-wide basis including the City of Waterford and its future urban expansion area. The *Stanislaus County General Plan Safety Element* is incorporated into the *Waterford Safety Element* by reference in fulfillment of state requirements regarding these issues.

12.1. SCOPE OF THE SAFETY ELEMENT

The Safety Element provides a systematic approach for responding to hazards relevant to the City of Waterford through a set of goals, policies, and actions designed to deal with those hazards. This report recognizes that hazards are an unavoidable aspect of society and that, therefore, some degree of risk is inherent in everyday life.

As with the *Stanislaus County Safety Element*, the City of Waterford has adopted an *Emergency Operations Plan*. This Plan accomplishes the following:

The Waterford City planning area has no known history or known geographical conditions for surface rupture, tsunamis,

- x Establishes the emergency management organization required to mitigate any significant emergency or disaster affecting the City of Waterford,
- x Identifies the policies, responsibilities and procedures required to protect the health and safety of the City of Waterford, public and private property, and

Waterford Vision 2025 General Plan
Safety Chapter

the environmental effects of natural and technological emergencies and disasters,

x Establishes the operation concepts and procedures associated with initial response operations (field response) to emergencies, the extended response operations (City and County Emergency Operations Center (EOC) activities) and the recovery process.

The *Waterford Emergency Operations Plan* is prepared and maintained in accordance with federal and state law and periodically is reviewed and updated to reflect changes in circumstances with respect to disaster relief, response, and clean-up procedures.

The purpose of the *Emergency Operations Plan* is to provide emergency planning/organization and response. The document deals with emergency management, law enforcement, traffic control, fire, medical, rescue, and radiological material, shelter, with respect to support and resources.

The Construction and Engineering section deals basically with emergency repairs, route recovery, and post-event inspection of facilities; and the Movement section deals with evacuation procedures. The plan is designed to prepare the community for responding to an emergency situation in a highly organized and efficient way so that chaotic situations are avoided.

Like the *Stanislaus County General Plan Safety Element*, the *Waterford Emergency Operations Plan* is adopted by reference as a supplemental document

to this Safety Element to meet state requirements with respect to emergency response operations and procedures.

12.2 RELEVANT SAFETY ISSUES

Seismically induced ground shaking, ground failure, dam failure/seiche, flooding, and urban wild-land fires, and hazardous materials are considered the relevant hazards to the City of Waterford. Other hazards such as surface rupture, tsunami, or hydro-compaction are briefly described in the Technical Appendices since the Waterford Planning Area has no geographical conditions nor history for such hazards.

12.2.1 Seismically Induced Ground Shaking

Seismic safety has traditionally been looked at as an individual/family responsibility; however, because we are spending increasing amounts of time in public areas and because of our increased reliance on public services, our personal safety in an earthquake may depend in large part on what our City, employer, or local merchant has done to prepare.

Earthquake activity can include severe ground settling, dam failure, and landslides, but most people equate earthquakes with the movement of the earth along a fault or fracture zone. Waterford is vulnerable to possible earthquake damage from earthquake epicenters in other portions of the state, earthquakes on “nearby” faults, and earthquakes on what are now undiscovered faults within the Central Valley.

Waterford Vision 2025 General Plan
Safety Chapter

Historically, Waterford has received several jolts a year from earthquakes in surrounding parts of the state. Typically, it has been the larger earthquakes from these areas that cause damage. Because earthquakes run in “cycles of frequency and intensity” where a period of long inactivity is followed by several medium and large quakes which end in a “big one,” it is theorized that Waterford, along with the rest of California, may experience rising earthquake risks. A more detailed discussion of these risks, historic seismic activity, and intensity of ground shaking can be found in the Technical Data Appendix of the *Stanislaus County General Plan Safety Element* (Chapter 5).

The amount of damage to structures from an earthquake is determined by several factors: (1) Distance from the earthquake epicenter; (2) nature of the ground; (3) type of construction; and (4) the duration of the shaking.

The Distance From the Epicenter

Waterford is vulnerable to shaking from a number of faults that run through the mountains to our east and west. These have shaken Waterford in the past. Of most notoriety is the San Andreas Fault. There are, however, four active faults closer to Waterford than the San Andreas.

The Nature of The Ground

Earthquake shockwaves are “carried” by the relatively loose, wet soils that exist in and around Waterford. For this reason, Waterford is somewhat more likely to experience heavy shaking from surrounding parts of the state than some of its neighbors. Areas of Waterford with high water tables and loose soils are

likely to experience more damage than their counterparts in other areas of the City because of the shockwave- carrying ability of the ground and liquefaction. Ground failure along the Tuolumne River bluff areas may result from a substantial earthquake. Next to damage from ground shaking, liquefaction is the most serious earthquake hazard.

The Type of Construction Used

Typically, buildings designed and constructed since the mid-1970’s and according to modern codes, have generally performed very well during earthquakes. However, the following construction types have garnered some concern within the seismologist community regarding their safety in earthquakes:

a. Concrete-Frame Structures Built Before 1976

Although Waterford has relatively few buildings of this type, the cost of strengthening the necessary connections is a relatively inexpensive procedure, while potential benefit is great. These buildings generally house commercial activities and their collapse could cause severe economic loss and possibly result in harm to visitors to the downtown commercial district.

It has also been determined that an earthquake of 5.0 magnitude or greater on any of the surrounding faults could definitely damage numerous downtown buildings and subject the general public to potential life-threatening concerns.

b. Un-braced _____ Parapets _____ and Architectural Trim

Waterford Vision 2025 General Plan
Safety Chapter

Although a particular building may be structurally sound enough to withstand a particular earthquake, its architectural trim may prove hazardous if not adequately braced or secured.

12.2.2 Ground Failure

Ground failure can be a significant concern under seismic conditions. The shaking of an earthquake may cause relatively loose soil to compact, creating depressions which may cause a myriad of pipeline, septic system, well, and foundation problems. If the loose soil happens to be saturated with water, the water could be squeezed to the surface where it interacts with the top layers to produce a weak gelatin-like substance of dirt and water. This mixture lends no supporting capability to the buildings that stand on it and is known as liquefaction. Likewise, seismic activity may be the impetus for landslides in those areas with unstable slopes where retaining barriers are destroyed in the ground shaking, or where liquefaction occurs on what would otherwise be stable slopes.

Differential settlement, resulting in the compaction of loose, less cohesive soils, may be caused by earthquakes and could occur in parts of Waterford. The most likely areas are those in which the groundwater surface is deep (otherwise liquefaction would be more likely), the soils are loose to medium-dense, and the soil profile includes strata of loose and uniformly graded sand. The potential for ground subsidence due to earthquake motion is largely dependent on the magnitude, duration, and frequency of the earthquake waves.

Although no liquefaction hazard areas have been identified to date in the planning area, the future potential of liquefaction is recognized because unconsolidated sediments and a high water table do coincide in many areas of the region.

The California Office of Emergency Services has indicated that those areas at the time of an earthquake with the combination of fine-grain, sandy soils, and perched or a water table at a depth of 25 feet or less, may experience liquefaction providing that the shaking is of a magnitude and duration that would collapse the ground and the water is able to percolate to the upper soil levels. A deep, thick, unbroken hardpan may prohibit the necessary percolation, and thus prevent liquefaction from occurring where other conditions are present.

Seismic activity, however, is not the only cause of ground failure. Subsidence, land and mud slides, and hydro-compaction all have non-seismic causes.

Unlike tectonic or seismically stimulated subsidence which occurs suddenly, most of the various cases of subsidence happen slowly over a long period of time. The west side of the San Joaquin Valley has been recognized as the world's largest area of subsidence due to groundwater withdrawal.

Approximately 423 square miles have settled more than one foot since the 1950's. No known subsidence has occurred in the Waterford planning area or has accompanied our groundwater withdrawal as yet.

Waterford Vision 2025 General Plan
Safety Chapter

A landslide is the downhill movement of masses of earth material under the force of gravity. Movement may be very rapid, or so slow that a change of position can be noted only over a period of weeks or years. The size of a landslide can range from several square feet to several square miles.

Landslides generally occur on slopes of 15 percent or greater. The planning area's topography, particularly along the Tuolumne River and Dry Creek, exhibit steep slopes that are extremely vulnerable to landslides. These slopes are considered sufficient to produce other than sliding associated with seismic activity.

12.2.3 Dam Failure/Seiche

Dam failures can result from a number of natural or man-made causes such as earthquakes, erosion, improper siting, rapidly rising flood waters, and structural/design flaws.

There are three general types of dams: earth and rockfill, concrete arch or hydraulic fill, and concrete gravity. Each of these types of dams has different failure characteristics. Waterford is presently in the inundation area of the Lake Don Pedro Dam. This dam is earthen-fill which makes it more flexible and, therefore, more earthquake resistant. However, these types of dams are more likely to fail if over-topped.

An earthen dam will fail gradually due to erosion of the breach created during the over-topping; the flood wave will build gradually to peak and then decline until the reservoir is empty. A dam failure can cause loss of life, damage to property, and other ensuing hazards, as well as

displacement of residents, the loss or partial loss of critical mass care facilities, and the destruction of bridges (evacuation routes) in the inundation path.

The effects of a possible dam failure on Waterford, and the ability of the local community to respond, seem to vary greatly by which dam would fail. Lake Don Pedro's inundation area covers a relatively large portion of the City's planning area along the Tuolumne River corridor, an area that contains Highway 132, a major east-west transportation corridor through the region. The area is developed with a mixture of residential, commercial, and industrial uses as well.

The inundation area of the Don Pedro Dam is depicted in the *Stanislaus County Safety Element*.



12.2.4 Flooding

Flooding continues to be the most widespread weather-related safety hazard in the United States, and accounts for greater average annual property losses than any other single hazard. Flooding can be especially troublesome in the Central Valley because it is a natural event. The valley is a drainage basin for thousands of acres of Sierra and Diablo foothill and mountain land, and the

Waterford Vision 2025 General Plan
Safety Chapter

frequent dry spells lead people to think that flooding cannot occur where they live. In 1861, 1938, 1950, 1955, and 1969, in Stanislaus County experienced significant flooding.

According to the Flood Insurance Rate maps (F.I.R.M.) for the area, only a few narrow bands of land along the Tuolumne River corridor are identified as flood-prone areas which were required to be recognized by the Federal Flood Disaster Protection Act. These maps are the source of more detailed flood information for the planning area, and are periodically updated to reflect new information.

Changes in land use from agriculture to urban have profound effects on runoff and erosion of the land surface. Urbanization is commonly accompanied by paved and other impervious surfaces, and the construction of storm sewers which collect runoff and usually discharge it directly into stream channels. Impervious surfaces and storm drains increase the frequency of floods and the size of flood peaks. The volume of runoff from new urban areas is far greater than under pre-existing conditions. Most floods in Waterford are produced by extended periods of rainfall during the winter months.

12.2.5 Urban Fires & Wildland Fires

The continued growth of Waterford as a whole, the increased use of hazardous materials, geographic constraints such as creeks, the condition of older buildings in downtown Waterford, and the extensive use of shake shingle roofs create a wide spectrum of fire safety concerns. When planning for urban fire protection, fire risk factors and their

mitigation, as well as hazard response factors must be considered.

Risk Factors and Mitigations

Urban fire risks include personal safety practices, construction materials and methods, built-in fire protection systems, site planning, and overall land use.

Construction Materials, Methods and Site Planning

The Uniform Building Code (UBC) and the Uniform Fire Code (UFC) work together as companion documents to regulate building construction and related items such as the care of vacant lots and the storage of flammable liquids.

Generally speaking, the UBC regulates new construction and the UFC covers the maintenance of the construction. The City and the Stanislaus Consolidated Fire District's inspection programs primarily target the high and medium hazard occupancies. To the same degree, these two public agencies provide effective fire prevention activities for low hazard land uses and conduct year-round hazard removal programs (primarily weed abatement).

Vacant Lots

Vacant lots that are overgrown with weeds or allow the buildup of refuse are a fire hazard, especially during the hot, dry summer season. The City of Waterford currently has a weed control program which requires weed abatement during the year. The City also abates abandoned vehicles, and regularly conducts a "Spring Clean-up" that allows people to have bulky refuse disposed of without charge.

Waterford Vision 2025 General Plan
Safety Chapter

Naturally, the use of built-in protection such as fire resistant materials and automatic sprinklers in all structures above that required by the Uniform Building and Fire codes significantly reduces the risk of urban fires and may reduce the City's reliance upon fire suppression crews.



Land Use

Waterford has a variety of land use types. Many of these require tailored fire protection considerations. These land uses are included as follows:

High-Hazard Occupancies

(schools, hospitals, nursing homes, and other high life hazard or large fire potential occupancies)

Medium-Hazard Occupancies

(apartments, offices, mercantile and industrial occupancies)

Low-Hazard Occupancies

(one-, two-, or three-family dwellings and scattered small businesses)

Rural Operations

(scattered dwellings, outbuildings, vacant lots)

Each of these land use types requires somewhat different fire suppression resources (e.g., emergency medical services, hazardous materials response, and heavy rescue).

Wild Land Fires

Wild land fire hazards exist in varying degrees over large areas of Stanislaus County, mostly outside urban areas in the foothills and areas used for livestock grazing. Wild land fire hazards exist to the east of Waterford.

The valley's long, dry summers and extensive vegetation makes for a fire season that extends from late spring to early fall. Irrigated agricultural land, which typically exists in the areas surrounding Waterford, are less susceptible to wild land fires than grazing areas.

Hazard Response--Wildland Fires

The City's response to fighting wild land fires is much the same as the response to urban fires. Typically, the Fire Department will dispatch one truck to such fires and evaluate whether there is a need for additional apparatus, especially if there is a threat to nearby structures. The Fire Department is also in the process of redesigning their fire apparatus (adding larger water tanks, adding four-wheel drive, etc.) in order to better combat grassland fires, where water supply can be limited and off-road response may be necessary. Most wild land fires outside the City limits are

Waterford Vision 2025 General Plan
Safety Chapter

responded to by Stanislaus County or the California Department of Forestry and Fire Protection (CDF) although the City Fire Department is often called upon to provide mutual aid when needed.

In order to prevent wild land fires before they start, the City's weed abatement program requires that vegetation on vacant lots be plowed under or mowed down if it is not irrigated agricultural land. The Police, Fire, and Inspection Services Departments combine to make sure that abandoned vehicles or buildings (potential fire hazards) are removed.

12.2.6 Hazardous Materials & Waste

California's economic well-being and quality of life depend in many ways on the production and use of manufactured goods. However, manufacturing often requires large volumes of chemicals and generates hazardous waste. Hazardous waste ranges from familiar substances, such as solvents and waste oil, to sophisticated compounds such as polychlorinated biphenyls and dioxins. Millions of tons of hazardous waste is generated in California each year.

California law requires that each county develop a hazardous waste management plan and requires all cities to either adopt the County plan by reference in their general plans or adopt their own plan.

The Stanislaus County Board of Supervisors and Waterford City Council have adopted the *Stanislaus County Hazardous Waste Management Plan*.

The plan addresses waste reduction and onsite treatment, the siting of off-site hazardous waste facilities, public and industry education, transportation of hazardous wastes, cleanup of contaminated sites, and emergency response procedures. The plan also recommends a series of goals, policies, and implementation actions to deal with hazardous waste throughout the County.

The Stanislaus County Environmental Health Division, which oversees the enforcement of the plan, maintains an up-to-date list of known hazardous waste sites within the County. In 2004, there were 2 known hazardous waste sites within the City of Waterford. These sites were associated with existing or abandoned liquid petroleum storage facilities.

Cleanup of sites that exceed state standards for contamination by toxic materials is required prior to development or reuse of the site. The cleanup process is monitored by the State Department of Health Services.

12.3 SAFETY GOALS, POLICIES, AND IMPLEMENTING ACTIONS

GoalArea 1: Disaster Preparedness

GOALS

~ General Disaster Preparedness.

POLICIES

S-1.1 Develop and maintain emergency preparedness procedures for the City.

Policy S-1.1

Develop and maintain emergency preparedness procedures for the City.

Implementing Actions:

1.1 .a Maintain the City's Emergency Operations Plan in accordance with state & federal rules and regulations.

1.1 .b Review all new annexation areas with respect to consistency with the City's Emergency Operations Plan and require the annexed territory to compensate the City for the cost of updating the Plan if required prior of City annexation approval.

GoalArea 2: Seismic Safety

GOALS

~ Reasonable Safety for City Residents from the Hazards of Earthquake and Other Geologic Activity.

POLICIES

S-2.1 Reduce the potential danger from earthquake and seismic-related activity from existing buildings where necessary.

S-2.2 Encourage the improvement of all public facilities and infrastructure such as natural gas, fuel, sewer, water, and electrical lines and equipment with up-to-date seismic safety features.

S-2.3 Restrict urban development in all areas with potential ground failure characteristics.

Policy S-2.1

Reduce the Potential Danger from Earthquake and Seismic-Related Activity from Existing Buildings Where Necessary.

Implementing Actions:

2.1 .a Evaluate the need for and the cost of setting up an enforcement program for eliminating any unreasonable risk associated with seismically unsafe buildings through reinforcement or removal where necessary.

2.1.b Study the possibility of obtaining State Historic Preservation, Community Development Block Grant, Redevelopment, or other available money to assist with repairs of unsafe buildings.

2.1.c Pursue uniform infrastructure, building, and land use requirements and policies regarding disaster avoidance within the City's urban boundaries.

2.1.d Review all possible new additions to the City's building and fire codes based on up-

to-date technology.

- 2.1.g** Continue to implement state law requiring seismic retrofitting of existing buildings when there is a change of use, additions, or remodeling that affects non-reinforced masonry portions of the structure.

Policy S-2.2

Encourage the Improvement of All Public Facilities and Infrastructure, Such as Natural Gas, Fuel, Sewer, Water, Electrical Lines and Equipment with Up-To-Date Seismic Safety Features.

Implementing Actions:

- 2.2.a** Work with Caltrans and the County of Stanislaus to review and, where possible, increase the earthquake stability of grade-separated transportation structures, such as highway bridges, within the City's planning area.
- 2.2.b** Require adequate storage facilities to insure an adequate supply of water in the event of seismic activity. An evaluation of the seismic safety of the water system should be completed as part of any update of the City's Water Master Plan.

Policy S-2.3

Restrict Urban Development in All Areas with Potential Ground Failure Characteristics.

Implementing Actions:

- 2.3.a** Investigate the feasibility of performing an inventory of areas with generally unstable ground within the City's Urban Expansion area and work with the County to restrict or prohibit their development.

GoalArea 3: Flooding

GOALS

- A City Free From Other Than Street Flooding.**

POLICIES

- S-3.1** Endeavor to maintain the existing City and the Urban Growth Area out of the 100-year floodplain.
- S-3.2** Maintain essential City services in the event of flooding or dam failure.

Policy S-3.1

Endeavor to Maintain the Existing City, and the Urban Growth Area Out of the 100-Year Floodplain.

Implementing Actions:

- 3.1.a** Review all development proposals to assure compliance with flood prone area regulations and limit annexation of such areas, except open space areas, from being considered for annexation to the City.

Policy S-4.2

Maintain Essential City Services in the Event of Flooding or Dam Failure.

Implementing Actions:

- 3.2.a** Continue to build all pump stations (both sewer and water) entryways at one (1) foot above the 100-year flood elevation, where practical, and consider additional standards to address flooding due to dam failure.
- 3.2.b** Continue the "flood-proofing" of high-value or important City infrastructure, such as lift stations and signal control functions.

GoalArea 4: Fire Protection

GOALS

- ~ Fire and Hazardous Material Safety for the Residents of the City and For Those Working in Fire Suppression.**

POLICIES

- S-4.1** In cooperation with the Consolidated Fire Protection District, promote the concept of fire protection master planning with fire safety goals, missions, and supporting objectives for the community.
- S-4.2** Work with the Consolidated Fire Protection District to maintain a reasonable level of accessibility and infrastructure support for fire suppression, disaster, and other emergency services.

Policy S-4.1

In Cooperation with the Consolidated Fire Protection District, Promote the Concept of Fire Protection Master Planning with Fire Safety Goals, Missions, and Supporting Objectives for the Community.

Implementing Actions:

- 4.1 .a** Work with the Consolidated Fire Protection District to identify potential additional fire station locations as expansion of the City occurs in order to maintain a response objective of 4 to 6 minutes citywide.
- 4.1 .b** Work with the Consolidated Fire Protection District to identify areas within the City that will require specialized manpower and equipment, such as businesses that use hazardous materials, and request that land uses or structures with similar needs be confined to these areas.

Policy S-4.2

Maintain a Reasonable Level of Accessibility and Infrastructure Support for Fire Suppression, Disaster, and Other Emergency Services.

Implementing Actions:

- 4.2.a** Continue to use 8-inch or larger pipe in high-value districts. In residential districts, additional "looping" or completion of water main grids shall continue to be provided where, possible, so that lengths of 6-inch pipe on the long side of the block will not exceed 600 feet.
- 4.2.b** Maintain current standards defined in the Uniform Fire Code and City Standards for the spacing of fire hydrants. In general, these standards call for 500-foot spacing in residential areas and 300-foot spacing in commercial and industrial areas.
- 4.2.c** Continue to provide fire prevention and disaster preparedness information through the schools, public interest groups, and other facilities and people.
- 4.2.d** Expand the inspection program to include the following recommendations by the Insurance Services Office of California:
 - a. Perform fire prevention inspections of all buildings other than dwellings once a year, except hazardous occupancies which should be inspected twice a year.
 - b. Establish a program of adequate re-inspection of electrical wiring and equipment.
- 4.2.e** Expand the present nuisance abatement program to include a height limit on weeds during the dry season (mid-April through mid-November) in both vacant and developed lots, abandoned vehicles, and vacant buildings.

GoalArea 5: Crime

GOALS

Reduced Criminal Activity and An Increased Feeling of Safety and Security in the Community.

POLICIES

S-5.1 Provide superior community-based police services.

S-5.2 Provide services and personnel necessary to maintain community order and public safety.

Policy S-5.1

Provide Superior Community-Based Police Services.

Implementing Actions:

- 5.1.a** Continue programs, such as "Neighborhood Watch" which increase residents' involvement in, and ownership of, police operations.
- 5.1.b** Continue to direct services and outreach programs towards youths in the community.
- 5.1.c** Locate future police facilities to enhance the "community policing" concept through the expansion of existing or the addition of new police service districts as the City

grows.

Policy S-5.2

Provide Services and Personnel Necessary to Maintain Community Order and Public Safety.

Implementing Actions:

- 5.2.a** Maintain a police force sufficiently staffed and deployed to ensure quick response times to emergency calls.
- 5.2.b** Require that crime prevention to be designed into new buildings and subdivisions (CPTED).
- 5.2.c** Identify changes to current laws and ordinances or create new ones to help carry out crime prevention strategies.

GoalArea 6: Hazardous Materials

GOALS

- **Hazardous Materials Safety for City Residents.**

POLICIES

- S-6.1** Prevent injuries and environmental contamination due to the uncontrolled release of hazardous materials.
- S-6.2** Ensure that hazardous materials are cleaned up before a property is developed or redeveloped.

Policy S-6.1

Prevent Injuries and Environmental Contamination Due to the Uncontrolled Release of Hazardous Materials.

Implementing Actions:

- 6.1.a** Support Stanislaus County in carrying out and enforcing the Stanislaus County Hazardous Waste Management Plan.
- 6.1.b** Continue to update and enforce local ordinances regulating the permitted use and storage of hazardous gases, liquids, and solids.
- 6.1.c** Continue to make sure underground storage tanks containing hazardous materials are properly installed, used, and removed.
- 6.1.d** Provide continuing training for hazardous materials enforcement and response personnel.

Policy S-67.2

Ensure that Hazardous Materials are Cleaned Up Before a Property is Developed or Redeveloped.

Implementing Actions:

- 6.2.a** Request an assessment of the past use of hazardous materials and soils analysis on proposed development sites.
- 6.2.b** Continue to work with the State Department of Health Services and Stanislaus County in developing cleanup programs for known hazardous waste sites within the Waterford planning area.