



Introduction and Intent

The Safety Element focuses on safety issues that need to be considered when planning for growth and development. Of significant importance is protection from previously identified hazards, both natural and man-made.

The Safety Element is required by state law and is consistent with other chapters of the General Plan. The intent of this element is to identify and respond to potential hazards due to seismic activity, flooding, etc. The Safety Element establishes goals, objectives, policies, and actions to direct local government in making decisions relating to the safety of the community.

In addition, this Element includes policies that foster coordination between local, state, and federal agencies charged with insuring the safety of the community.

Setting

Hazards refer to natural or manmade conditions which have the potential to threaten life, cause injury, or cause property damage. Disasters refer to specific events that occur due to the interaction between hazards and human populations. Through investigation of hazard risks and prudent land use planning to reduce or restrict development in areas with the highest risks, the potential for disaster can be reduced.

Through sensible design of new development and emergency preparedness, risks from these hazards or their effects can also be reduced.

Goals and Policies

Goal 9.1	Protect the Gustine Community from Hazards Associated with the Natural Environment
Policy 9.1.1	Minimize risks of personal injury and property damage associated with natural hazards
9.1.1.a	Educate the community on procedures regarding preparedness and response to natural disasters, providing information describing procedures and evacuation routes to be followed in the event of a disaster.
9.1.1.b	Address the need for future evacuation routes as a component of the street construction and improvement programs of the City and other relevant agencies.
Policy 9.1.2	Mitigate potential adverse impacts of geologic and seismic hazards.
9.1.2.a	Require the underground utilities be designed to withstand seismic forces



Goal 9.2	Protection of the public and environments from exposure to hazardous materials and hazardous waste.
Policy 9.2.1	Assess risks involving the disposal, transport, manufacture, storage, and handling of hazardous materials at all levels of planning in the City of Gustine
9.2.1.a	Coordinate with Merced County and Merced County Association of Governments to provide educational opportunities for generators of small quantity, household and agricultural waste products regarding their responsibilities for source reduction and proper and safe hazardous waste management.
9.2.1.b	Adopt current versions of the Uniform Fire code to regulate the storage of hazardous substances
9.2.1.c	Identify potential users and producers of hazardous materials at the time of permit application and mitigate dangers associated with these materials.

“Earthquakes are a part of California’s heritage and we all must learn to live with them, but the dangers involved are more a result of man’s ignorance than of nature’s destructive force.”

—Robert Lacopi

Seismic Safety

Earthquakes

The State of California has a long history of seismic activity. Faulting and associated earthquakes have played an active role in the development of California’s landscape through geologic time. The earliest known account of seismic activity during recorded history dates back to the late 1700’s. In 1769, the expedition of Gaspar de Portola was violently shaken by a large earthquake while camped on the Santa Ana River near the present town of Olive. The heavy shaking reportedly threw the river out of its channel, and many men and horses were knocked to the ground.

If in the future an earthquake of significant magnitude should occur, it could cause casualties and extensive property damage in Gustine. Fire is a secondary effect that could add to the turmoil.

In the Loma Prieta Earthquake (1989), much of the personal economic hardship realized may have been avoided if the individuals affected had properly prepared for such an event. Most of the deaths, however, were beyond the scope of personal preparedness. In Santa Cruz, several died when adjacent buildings collapsed onto their buildings. In San Francisco, a double-decked freeway collapsed killing many commuters.

An earthquake is a perceptible trembling to violent shaking of the ground produced by the sudden displacement of rocks below the earth’s surface. 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.

California receives thousands of shocks each year, and of these approximately 500 are large enough to be felt by many people. Many areas seem to experience “cycles” of earthquakes where large quakes may not be felt for a matter of time, and then several may occur in a relatively short period of time. In the greater Bay Area, for example, where fault activity is frequent enough to reveal a possible cycle, there were 18 medium to large earthquakes between 1836 and 1911, no medium to large quakes from 1911 to 1979, and in the 16 years since 1979, four medium to large quakes have occurred.



The Telsa-Ortugalita Fault has not been historically active, but there is no assurance that it will not become active in the future. It is unlikely that Gustine will ever be an earthquake epicenter, however, earthquakes originating elsewhere will continue to shake the City and, as the population grows, more people will be subject to these impacts.

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 (i.e., buildings of essentially equivalent construction will be more severely damaged if they are on filled or unconsolidated ground with a water table within 50 feet of the surface; (3) type of construction (e.g., precast concrete, unreinforced masonry, reinforced concrete frame, and older types of construction along with inflexible pipes and tubing generally are more severely damaged by earth shaking); and, (4) the duration of the shaking.

Liquefaction & Tectonic Subsidence

The potential for liquefaction decreases as the groundwater depth decreases, and is considered to be unlikely where the groundwater depth exceeds 30 feet. As mentioned earlier, ground shaking can result in soil settlement or sinking. If the sediments, which compact during an earthquake are saturated, water within the soil is forced to the surface, where it emerges in the form of mud spouts or sand boils. If the soil liquefies in this manner (liquefaction), it loses its ability to support structures causing them to sink into the earth. The degree of settlement damage can vary from minor to total collapse. Soil types such as Agnal and Kesterson are potentially dangerous because of wetness and ponding. The City is interested in minimizing property losses resulting from liquefaction. One of the ways it has done this is by creating a planning boundary (SOI) which directs urban development away from liquefaction prone soils.

Hazardous Buildings

The State Division of Mines and Geology has designated the Gustine area with a Maximum Expectable Earthquake Intensity of "High Severity Major Probable Damage". These "intensity zones" identify the severity of damage expected should an earthquake occur. New development will be required to comply with current building standards for seismic safety. Older buildings will be rehabilitated as an ongoing program for improving the City's housing stock.

Potential Dam Failure

Gustine will be unaffected by Dam failure unless significant growth were to occur further to the east, which is unlikely. The Federal government has made substantial improvements to the O'Neill Dam which further reduces the dam inundation potential to areas in the vicinity of Gustine.

The City coordinates with the local branch of the State OES for an early warning system which diverts east bound traffic in the event of Dam failures.

Flooding

Most floods in Merced County are produced by extended periods of rainfall during the winter months. This is the time of year when an adequate surface drainage system is critical. Further development will contribute to the surface drainage problem, therefore the City plans to minimize the potential for flooding and flood damage. (See Flood Control, Open Space/Conservation Element).



The extent of future development being proposed in this update will increase the amount of storm water run off and necessitate a Storm Drain Master Plan and negotiations with the Central California Irrigation District (CCID) to accept storm water as required. CCID has indicated that they will review a master plan proposed by the City and work cooperatively to accomplish mutual goals. The City will continue to require development to provide storm drain storage and pumping facilities. Facilities should include conventional, motorized back-up pumps in cases of power failure during storms.

Aquatic Insect Problem

The expansion of the Wastewater Treatment Plant (Alternative IIAI) will retain additional seasonal waters and when combined with increased residential development there will be a potential for mosquito nuisance and related health problems.

The City will develop a management strategy to respond to residential complaints regarding mosquito problems in cooperation with the Merced County Mosquito Abatement District, U.S. Fish and Wildlife Service, California Department of Fish and Game and the Grasslands Water District.

Circulation Safety

As growth occurs and vehicle trips increase, the potential for traffic accidents and injury will also increase. The City will need to coordinate with the County and State to create effective road systems and transitions.

Safe travel will continue to be provided for vehicles and pedestrians. Cross walks will provide access across busy Highways 33 and 140, as well as, major arterials and into public facilities such as schools. Elementary schools will render additional pedestrian safety by providing crossing guards for children. A pedestrian overpass over State Highway 33 is also being contemplated.

Canals and Drainage Ponds

Canals and drainage ponds throughout the City will continue to be a safety risk. This risk may increase with the location of bike trails on canal rights-of-way and the adoption of mixed-use drainage basins/parks.

If pedestrian/bike trails are established adjacent to canals the potential for hazard will increase and fences will be located to separate the trails from the canal waterway. Also if a joint use for drainage basins and parks is implemented basins will be required to be much more shallow, therefore reducing the threat of drowning.

Emergency Plan

In the future the Emergency Plan area will include the expansion of the City's Sphere of Influence.

Currently, an Emergency Plan needs to be completed. The updated Emergency Operations Plan should reflect current OES requirements and be consistent with the County "Multi-Hazard Functional Plan". As Gustine's Sphere of Influence expands, the plan will be revised to include boundary expansions.

Urban & Wildland Fires

As the Gustine Planning Area and population expand, more volunteer fire fighters will be required. The City will endeavor to maintain an ISO rating of 4 or better as new development occurs.



The continued growth of Gustine as a whole, the increased use of hazardous materials, geographic constraints such as creeks, the condition of older buildings in downtown Gustine, 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 Mitigation

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

Personal Safety Practices

Gustine's current number one cause of residential fires is cooking. Kitchen safety revolves mainly around an individual's safety practices. For this reason, the Fire Department will develop public education programs. These programs stress emphasis on children and senior citizens who have been identified by the National Fire Protection Agency as high-risk groups for fire death and injuries.

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, the UBC regulates new construction and the UFC covers the maintenance of the construction. Each year the Fire Prevention Bureau and engine companies conduct inspections and eliminate Uniform Fire Code violations that could attribute to the cause and severity of a fire. The inspection program primarily targets the high and medium hazard occupancies identified in the "Land Use" section on the following pages. To provide effective fire prevention activities for low hazard land uses, the City of Gustine conducts 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 Gustine currently has a weed control program that requires weed abatement during the year. Each property within the City is served annually each spring with a notice sent for removal of weeds, etc. The City Police Department also picks up abandoned vehicles, and a "Spring Clean-up" conducted annually allows people to have bulky refuse picked up without charge.

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

Gustine 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, 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). Gustine's current policy is to provide emergency response within 4 to 6 minutes and to provide adequate resources to combat fires in these occupancies. The target of this response is to place a fire unit on scene at 95 percent of incidents in five minutes. Therefore, it is important that those industries using hazardous materials, large facilities, or requiring special fire hazard considerations going into new areas of the City not currently occupied by these types of businesses be accompanied by additional fire department equipment and/or personnel.

Wildland Fires

Wildland fire hazards exist in varying degrees over approximately 90 percent of Merced County, mostly outside urban areas. The Valley's long, dry summers and extensive vegetation makes for a fire season that extends from late spring to early fall. Approximately fifty to one hundred wildland fires can occur in Merced County in any one year. Irrigated agricultural land, however, is less susceptible to wildland fires than grazing areas.

As the City has increasingly annexed large blocks of undeveloped land, the potential for wildland fires (mainly grassland fires) within the City has increased.

The Fire Department is also frequently called to provide mutual aid to the County for grassland fires in the wider Merced area due to increasingly strained fire-fighting resources within the County over the last few years.

Peak load Water Supply Requirements

The total water storage required is the amount needed to fight a fire at the flow rate of 2,000 gpm for 2 hours plus the 24 hour maximum domestic consumption of the City. As was mentioned in the Circulation Chapter, the combined capacity of the City's wells is 2,700 gallons per minute. As population increases this demand deficit will also grow unless new wells and/or storage facilities are provided.

Access

Access, as it relates to urban fires, is promoted or restricted based on three factors: (1) the geographical proximity of the proper equipment, (2) the location of physical boundaries in relationship to the station and fire, and (3) the road system. The proximity of the proper equipment is discussed in the land use portion of the "Risks Factors and Mitigation" section of this chapter.

A well-defined system of local streets and roads is also important to provide emergency access for fire fighting equipment and evacuation routes for the public. The circulation system is a critical part of the Fire Department's ability to maintain a desired response time of four to six minutes to any area of the City. To provide adequate access and room for fire fighting operations, the National Fire Protection Association recommends minimum roadway widths of 28 feet with parking on one side only and 36 feet if parking is allowed on both sides. Provision of bridges over



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creeks and grade separated railroad crossings are also critical elements in meeting response times.

The access system will also serve as an evacuation route for the population in the event of a hazardous materials incident, flood, or other disaster.

At present, the Merced Fire Department currently holds a Class 4 ISO rating. This rating schedule is used by the Insurance Service Office (ISO) to establish insurance rates for commercial and residential properties. The fire department has eighteen volunteer fire fighters.

Water Supply

The ability to provide an adequate water supply during peak load hours is critical for fire fighting operations. This is especially important in large commercial and industrial buildings. The water supply system currently consists of four wells and one storage tank that holds 75,000 gallons of water. The water that is released from the water tank releases water at 50-55 psi water pressure. The City is required to meet State Health pressure requirements, which call for a minimum of 20 psi at every service connection under the annual peak hour condition and maintaining the annual average day demand plus fire flow. Through a Capital Improvement Program, the City plans to increase water wells to match the requirements of development.

The importance of expanding the water supply and distribution system increases greatly as the City expands. In addition to providing water supplies for fire suppression forces, the effectiveness of automatic fire sprinkler systems is dependent upon the water service. Fire sprinkler systems are designed based on pressures and water flow from the public water main. If the minimum required pressure and available water supply are not maintained, the sprinkler system will not operate properly. The City contracts its water services who maintain a computer model to assist in the analysis of water system changes, so that production facilities in the most appropriate locations, identify system improvements needed to support specific development projects, and improve maintenance and reconstruction techniques could be added if necessary.

The City of Gustine Fire Department has a mutual aid agreement with the City of Newman in Stanislaus County and the Merced County Fire Department. This agreement enables the different jurisdictions to request aid from another when necessary.

Evacuation Routes

Evacuation routes have been discussed for particular hazards under each of the previous hazard response sections, but some general items must be noted. Earthquakes, fires, and flooding can all necessitate evacuation. However, it is not possible to know with certainty how many people will actually need to be evacuated in any given situation. Similarly, the rate at which people will evacuate and their specific routes of travel and ultimate destinations are subject to wide variation. Therefore, in the case of an emergency, it is necessary to evaluate each situation on an individual basis and respond accordingly.

Crime

There are many different causes of crime, requiring many different approaches. Continuing crime prevention programs in Gustine include educational outreach, the Explorers program, and data tracking to identify high-crime areas, traffic problems,



and service requirements of various neighborhoods. In 1999, the Gustine Police Department had 8 sworn officers, 1 non-sworn positions, and 3 reserves.

By the year 2010 it is expected that 16 new officers will be required totaling 22, as well as 8 additional fully marked cars. This will continue to insure a low crime rate within the City.

Hazardous 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. More than 10 million tons of hazardous waste are generated in California each year. In 1986, 4.3 tons were generated in Merced County alone.

In 1986, the California legislature passed legislation requiring each county to develop a hazardous waste management plan and requiring all cities to either adopt the County plan by reference in their general plans or adopt their own plan. In January 1989, the Merced County Board of Supervisors and adopted the Merced 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 Merced 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. Cleanup of sites that exceed State standards for contamination by toxic materials is required prior to development or reuse of the site. The State Department of Health Services monitors the cleanup process.

The Gustine Fire Department and Environmental Health Division work with the County to prevent the uncontrolled release of toxic substances into the environment by conducting inspections of toxic materials facilities, enforcing storage and use requirements, and educating local businesses on proper storage and handling of hazardous materials. The Gustine Fire Department responds to uncontrolled releases within the City limits, identifies the category of chemicals involved, contains the spill if possible, oversees cleanup activities, and makes sure that the site is safe to be occupied again.

The County Hazardous Waste Management Plan deals with detailed emergency response procedures under various conditions for hazardous materials spills. The City also works with the State Department of Health Services to establish cleanup plans and to monitor the cleanup of known hazardous waste sites within the City.

Areas within the Gustine SOI which have a greater potential for being affected by hazardous materials are sites near existing underground storage tanks, the Highway 33 and 140 corridors, and areas adjacent to gas lines. The most common type of hazardous problem in Gustine is related to underground storage tanks that have leaks. At the present time 14 locations have been identified as hazardous waste sites. For this county, agricultural chemicals, which are routinely stored and transported, are

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the most common types of hazardous materials. Earthquakes increase the risk of hazardous material spills.

The City will routinely require development to strictly adhere to UBC requirements for the construction of storage facilities and will also develop a local emergency response plan for spills. As a matter of policy the city will require Hazardous Material disclosure from all commercial and industrial developments. There are nineteen such disclosures on file with Merced County Environmental Health.

Safety Prevention

Residents pride themselves in the safe living environment that prevails in the Gustine community. The City will continue to provide adequate levels of fire and police services necessary to maintain this environment.

