7 SAFETY ELEMENT

The Safety Element provides information about risks in Vacaville due to natural and human-made hazards. It addresses the protection of the community from any unreasonable risks associated with the effects of:

- Geologic hazards, including earthquakes, ground failure, and slope instability
- Flooding and dam failure
- Wildland fires
- Hazardous materials and waste
- Climate change

This Element also contains information and policies regarding general emergency preparedness.

The Safety Element establishes mechanisms to reduce death, injuries, and damage to property, and to address the negative effects of public safety hazards like flooding, fires, and seismic events. Hazards are an unavoidable aspect of life, and although the Safety Element cannot eliminate risk completely, it contains policies to minimize risk exposure.

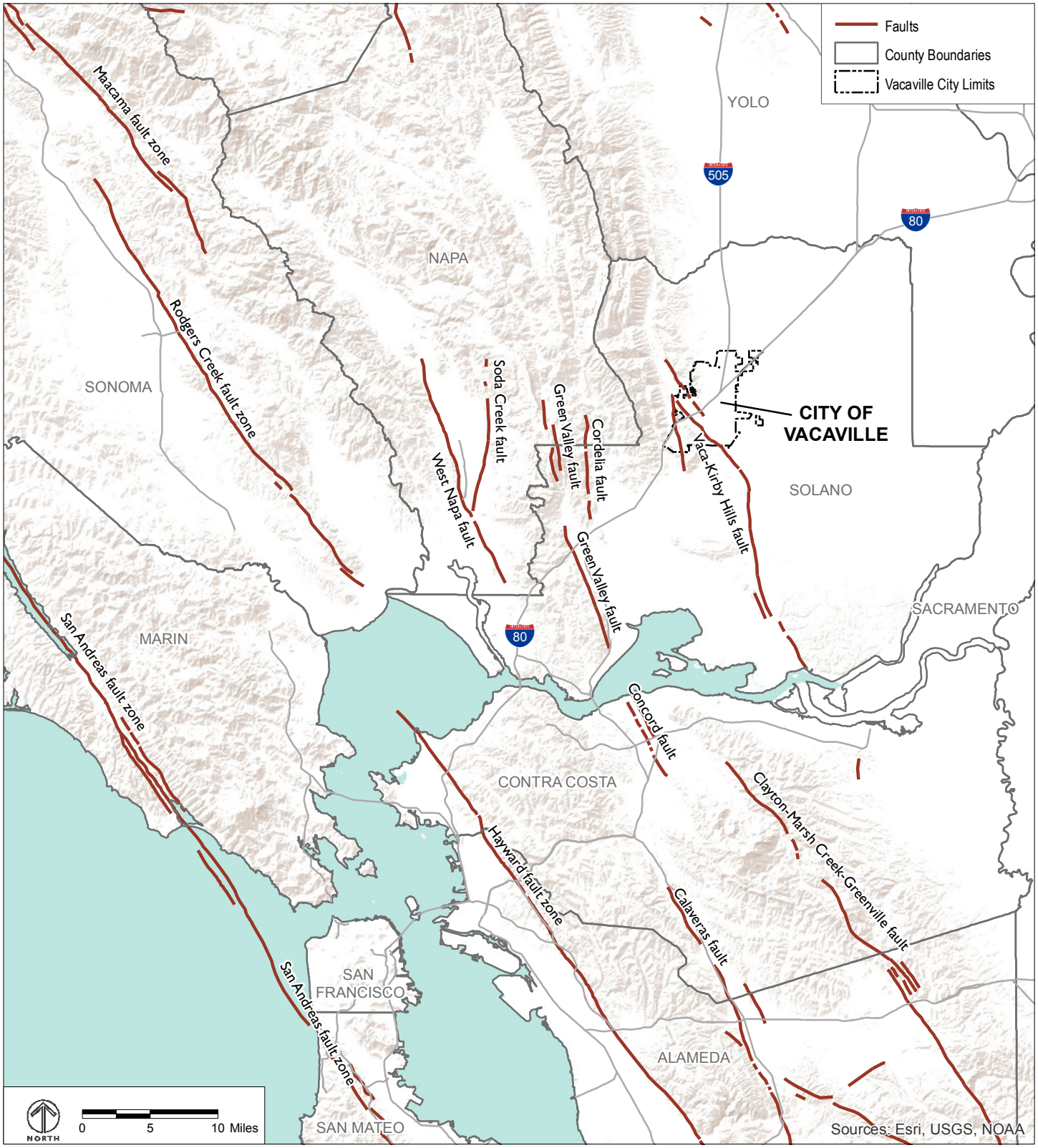
Geologic and Seismic Hazards

Background Information

Earthquake Hazards

The law requires the California Geological Survey (CGS) to establish regulatory zones (known as Earthquake Fault Zones or Alquist-Priolo Zones) around the surface traces of active faults and to issue maps to all affected cities, counties, and State agencies for use in planning and controlling development. Figure SAF-1 shows the approximate location of the major fault zones in the Vacaville region.

The Vaca-Kirby Hills Fault system is the only fault system that passes through the Vacaville Planning Area. The Vaca Fault has not experienced displacement within the past 11,700 years, and there is no evidence for displacement along the Kirby Hills Fault during the last 700,000 years. The Green Valley Fault system, which lies 12 miles to the southwest of Vacaville, has been active within the past 200 years. While more likely than either of the two previous faults to have seismic impacts on Vacaville, the ***United States Geological Survey (USGS)***, a federal science organization that examines natural resources, natural hazards, and our environment, estimates the probability of a magnitude 6.7 or greater earthquake along this fault prior to 2036



Source: Solano County, 2008, U.S. and Califonia Geological Surveys and City of Vacaville, 2010.

FIGURE SAF-1
REGIONAL FAULTS

to be only 3 percent. The Rogers Creek Fault, part of the Hayward Fault System, lies roughly roughly 24 miles to the southwest of Vacaville and has an estimated 16 percent probability of producing a magnitude 6.7 or greater earthquake prior to 2036.[1]

Ground Shaking

Vacaville is located within a seismically active region and earthquakes have the potential to cause ground shaking of significant magnitude. Any slip along all or part of a fault surface releases accumulated energy that radiates in all directions away from the source. This occurs in the form of earthquake waves. The intensity of the ground shaking varies depending on the severity of earthquake activity, proximity to that activity, and local soil and geological conditions.

Liquefaction

Liquefaction occurs when loosely packed sandy or silty materials saturated with water are shaken hard enough to lose strength and stiffness. Liquefied soils behave like a liquid and are responsible for tremendous damage in an earthquake. For example, it can cause buildings to collapse, pipes to leak, and roads to buckle.

As shown in Figure SAF-2, Vacaville is generally characterized by areas of very low, low, and moderate risk of liquefaction. However, there are some areas with a high and very high risk of liquefaction in Vacaville due to the underlying soil types or other geologic features. For example, areas along and adjacent to Vacaville's major water ways, Ulatis and Alamo Creeks, feature high and very high levels of liquefaction susceptibility. These creek corridors cross through the community and include central areas of the city.

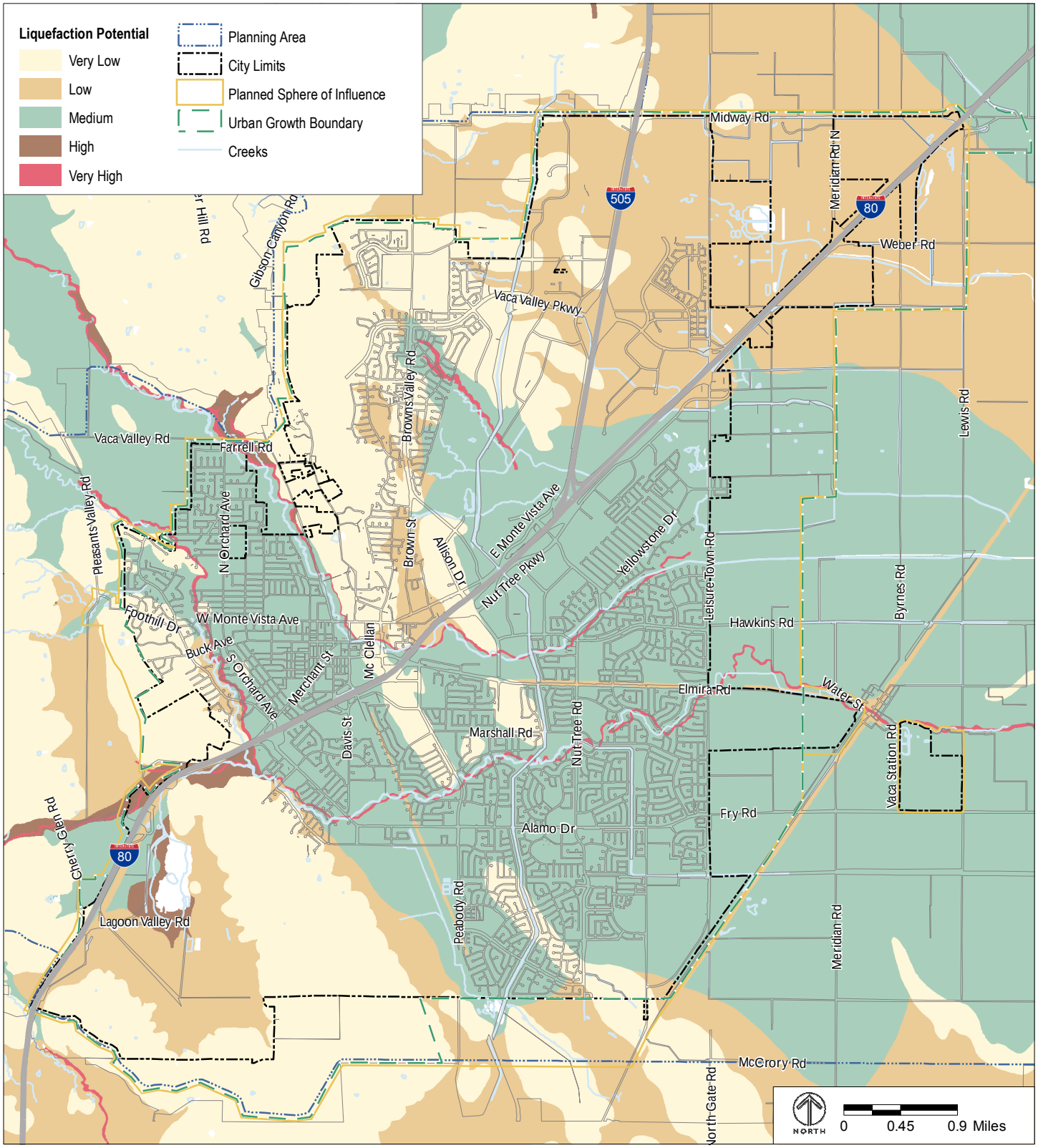
Landslides and Ground Failure

Landslides and slope instability are characterized by the movement of soils and bedrock down steep slopes. This movement results from wet weather, seismic shaking, and/or improper construction, grading, and drainage. Because portions of western Vacaville include the foothills of the Vaca Mountains, there is a potential for landslides throughout this area.

As shown in Figure SAF-3, the vast majority of Vacaville's area is described as flatland by the USGS with some sloped areas having had small scattered landslides. Very small areas on the northern and western edges of the city limit have had mapped landslides; however, these areas are sparsely developed.

Figure SAF-4 shows slopes in Vacaville. Areas with steeper slopes, in combination with other factors described above, are more susceptible to landslides than areas on shallow slopes.

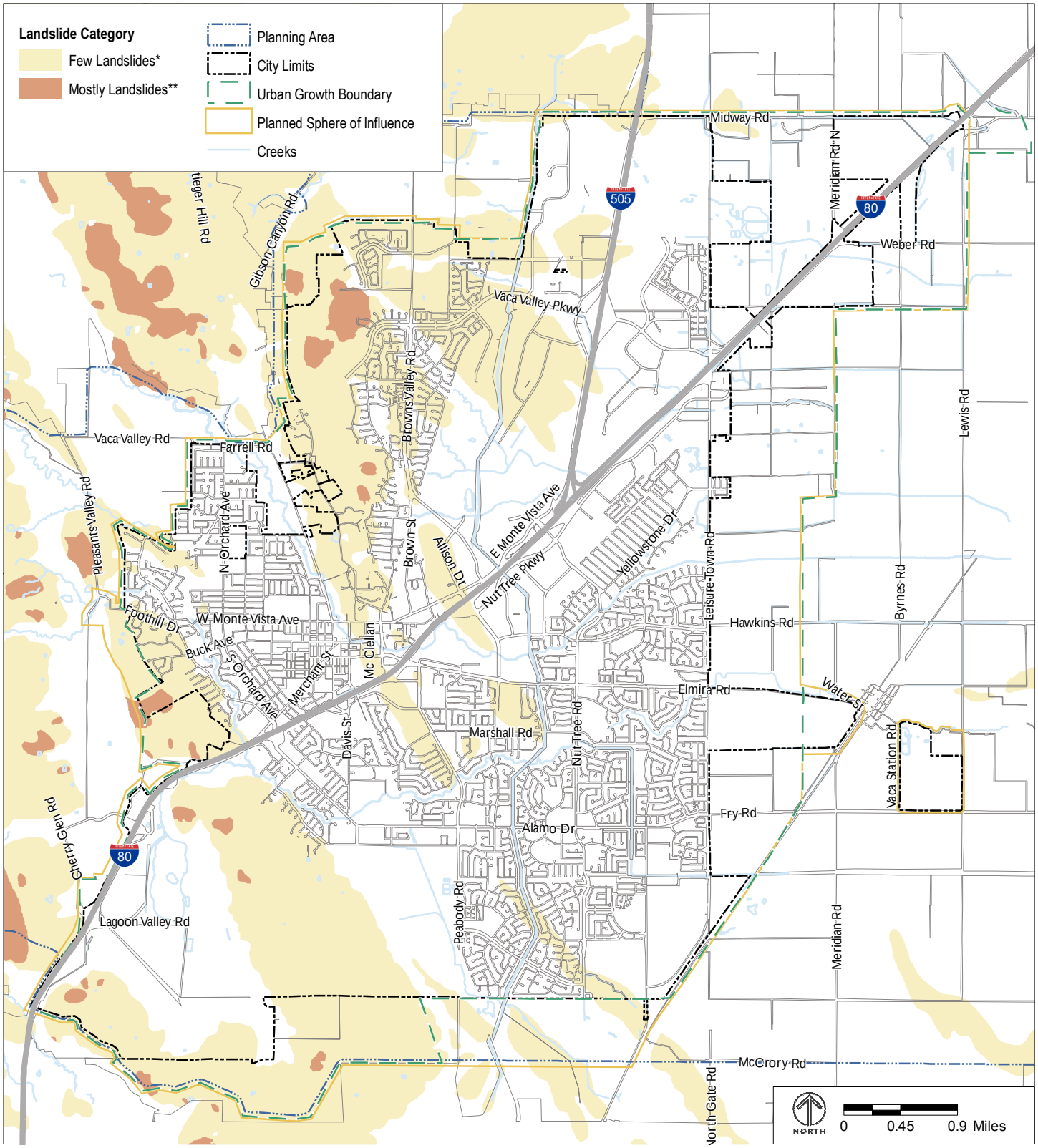
[1] USGS, 2008 Bay Area Earthquake Probabilities, available at http://earthquake.usgs.gov/regional/nca/ucerf/, accessed May 23, 2012.



Source: Solano County, 2008, U.S. and California Geological Surveys and City of Vacaville, 2010.

FIGURE SAF-2

LIQUEFACTION POTENTIAL



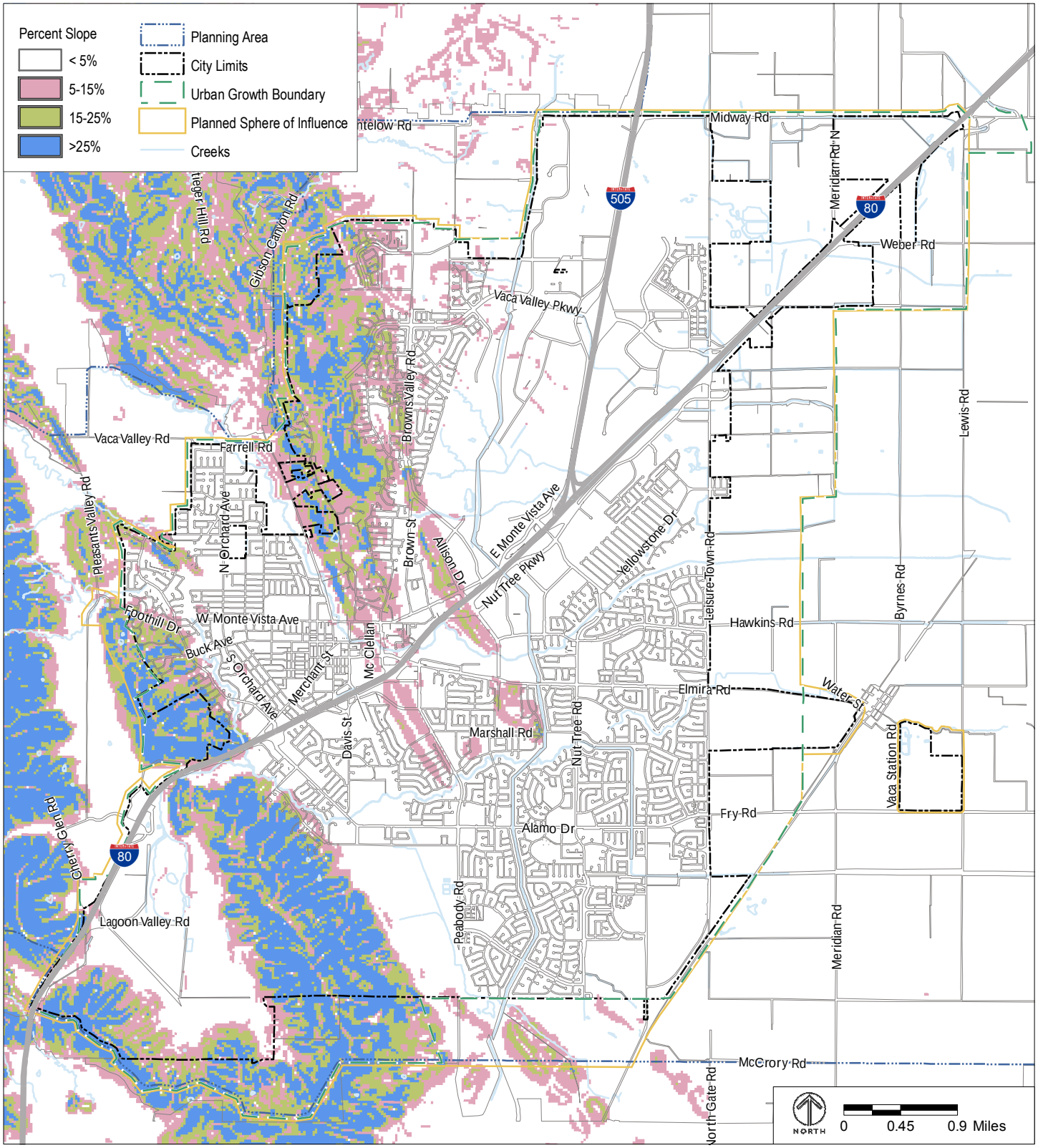
Source: Solano County, 2008, U.S. and California Geological Surveys and City of Vacaville, 2010.

*Few Landslides consists of few, if any, large mapped landslides, but locally contains scattered small landslides in questionably identified larger landslides.

**Mostly Landslides consists of mapped landslides with intervening areas typically narrower than 1500 feet and narrow borders around landslides.

FIGURE SAF-3

HISTORIC MAPPED LANDSLIDES



Source: Solano County, 2008, U.S. and California Geological Surveys and City of Vacaville, 2010.

FIGURE SAF-4
PERCENT SLOPE

Expansive Soils

Certain types of soils have characteristics that make them more susceptible to geotechnical hazards, such as erosion and expansion. Soils subject to expansion increase when water is added and shrink when water dries out. Identifying local soil types and understanding their characteristics help cities to establish appropriate engineering and construction standards for new buildings and remodeling. The primary soil types in the Vacaville area are silty, sandy, and clay loams, with a smaller portion being made up of purely clay soils. Though not all types of clay are expansive, soils with a clay component are more prone to expansion. Approximately 64 percent of Vacaville's soils contain at least some clay component.

Subsidence

Land ***subsidence*** is the sinking of a large area of ground surface with little or no horizontal movement. Subsidence areas are associated with land over areas where groundwater or natural gas is extracted, and can also occur from seismic activity. Subsidence can occur throughout Vacaville, but particularly in any areas where groundwater has been extracted.

Goals, Policies, and Actions

Goal SAF-1	**Minimize exposure to geologic hazards, including slope instability, subsidence, and expansive soils, and to seismic hazards, including groundshaking, fault rupture, liquefaction, and landslides.**

Policies

Policy SAF-P1.1 Consider geologic conditions when designating land use and designing development in Vacaville. Where potential geologic or seismic risks are high and unmitigable, retain low-occupancy or open space forms of use.

Policy SAF-P1.2 Prohibit development on ridges and slopes at or exceeding 25 percent, as shown in Figure SAF-4.

Policy SAF-P1.3 Evaluate and consider the geologic and soil hazards for any proposed extension of urban or suburban land uses into areas that are characterized by slopes from 15 to 25 percent, as shown in Figure SAF-4.

Policy SAF-P1.4 Determine the geologic suitability of proposed development sites during the earliest stages of the planning process. Such analyses should consider the potential structural engineering needs of the project and the impacts development activities may have on adjacent lands.

Policy SAF-P1.5 Require geotechnical studies prior to approving rezoning requests, specific plans, or subdivision maps in areas that have experienced landslides in the past, as shown in Figure SAF-3, and that are within ¼ mile of a fault.

Policy SAF-P1.6 Require preparation of a soils report prior to issuing a building permit, except where the Building Official determines that a report is not needed.

Policy SAF-P1.7 Require comprehensive geologic and engineering studies of critical structures such as hospitals, fire and police stations, utility centers and substations, emergency communications facilities, overpasses, and bridges, regardless of location.

Policy SAF-P1.8 To the extent practical, do not locate structures intended for human occupancy over the trace of an inactive fault. Allow roads to be built over active faults only where alternatives are impractical.

Policy SAF-P1.9 To the extent practical, do not allow facilities and structures that are public, high-occupancy, or critical in disaster situations (e.g. hospitals, fire and police stations, and bridges) to be sited in areas highly susceptible to damage resulting from earthquakes. If locating such a facility or structure in a high-risk area is deemed essential to the public welfare, require that they be sited, designed, and constructed with due consideration of the potential for damage.

Policy SAF-P1.10 Limit cut slopes to 2:1 (50 percent slope) except where an engineering geologist can establish that a steeper slope would perform satisfactorily over the long term. Where practicable, require more gentle slopes than the 2:1 standard. Encourage use of retaining walls, rock-filled crib walls, or stepped-in buildings as alternatives to high cut slopes.

Policy SAF-P1.11 Require contour rounding and revegetation to preserve natural qualities of sloping terrains, mitigate the artificial appearance of engineered slopes, and control erosion. Encourage the use of native trees and shrubbery in revegetation areas.

Policy SAF-P1.12 Require financial protection for public agencies and individuals as a condition of development approval for projects that are located in areas where geologic conditions indicate a potential for high maintenance or repair costs.

Policy SAF-P1.13 Require the formation of geological hazard abatement districts or other methods to reduce potential exposure to geologic hazards prior to development approval in a high risk area. Such measures ensure that geotechnical mitigation measures are maintained over the long term and that financial risks are equitably shared among owners rather than borne by the City.

Actions

Action SAF-A1.1 Consider implementing a hazard reduction program for existing development in high-risk zones. This would include inspection of structures for conformance with the Building Code and could give priority for inspection to emergency and critical facilities, older structures, and public facilities.

Flooding and Storm Drainage

Background Information

Storm Drainage

In general, creeks in Vacaville flow in an east-southeasterly direction and ultimately drain into the Sacramento River via Cache Slough. The southern portion of Vacaville drains either to the Noonan Drain, which discharges ultimately to Barker Slough, or to Union Creek, which discharges to Suisun Bay. The major stream courses within the city include:

- Alamo Creek, including its tributaries Laguna Creek and Encinosa Creek
- Ulatis Creek
- Horse Creek, including its tributary Pine Tree Creek
- Gibson Canyon Creek

There are two existing reservoirs in Vacaville: Lagoon Valley Lake, which is a tributary to Laguna Creek, draining a portion of Lower Lagoon Valley, and the Basherini Reservoir located on Vine Street, which is owned and operated by the Solano Irrigation District.

The major creeks that flow through Vacaville are largely in their natural state and alignment, except at the eastern edge of the city where flood control channels have been constructed. The natural, unaltered portions of the creeks generally do not have adequate flow capacity to convey a 100-year storm event, which is a storm that has a 1 percent chance of occurring in any given year. In addition, there is not adequate capacity in some areas to accommodate a 10-year storm event, which is a storm that has a 10 percent chance of occurring in any given year. Occasionally, overbank flows in Vacaville have resulted in flooding of residential properties, road blockages, and traffic disruptions.

To address these flooding problems, Vacaville uses a variety of flood control facilities and measures. As shown in Figure SAF-5, the City has built several regional detention basins that reduce the flow from the Vaca Mountains before they reach the city in order to reduce urban flooding. The City also maintains a network of storm drains, and works to keep channel flowlines free from debris and vegetation. As part of past flood control efforts, certain creekways have been engineered to handle larger volumes of stormwater than they would in their natural states. In addition, Vacaville's Residential Design Guidelines minimize the extent of

Existing Detention Basins

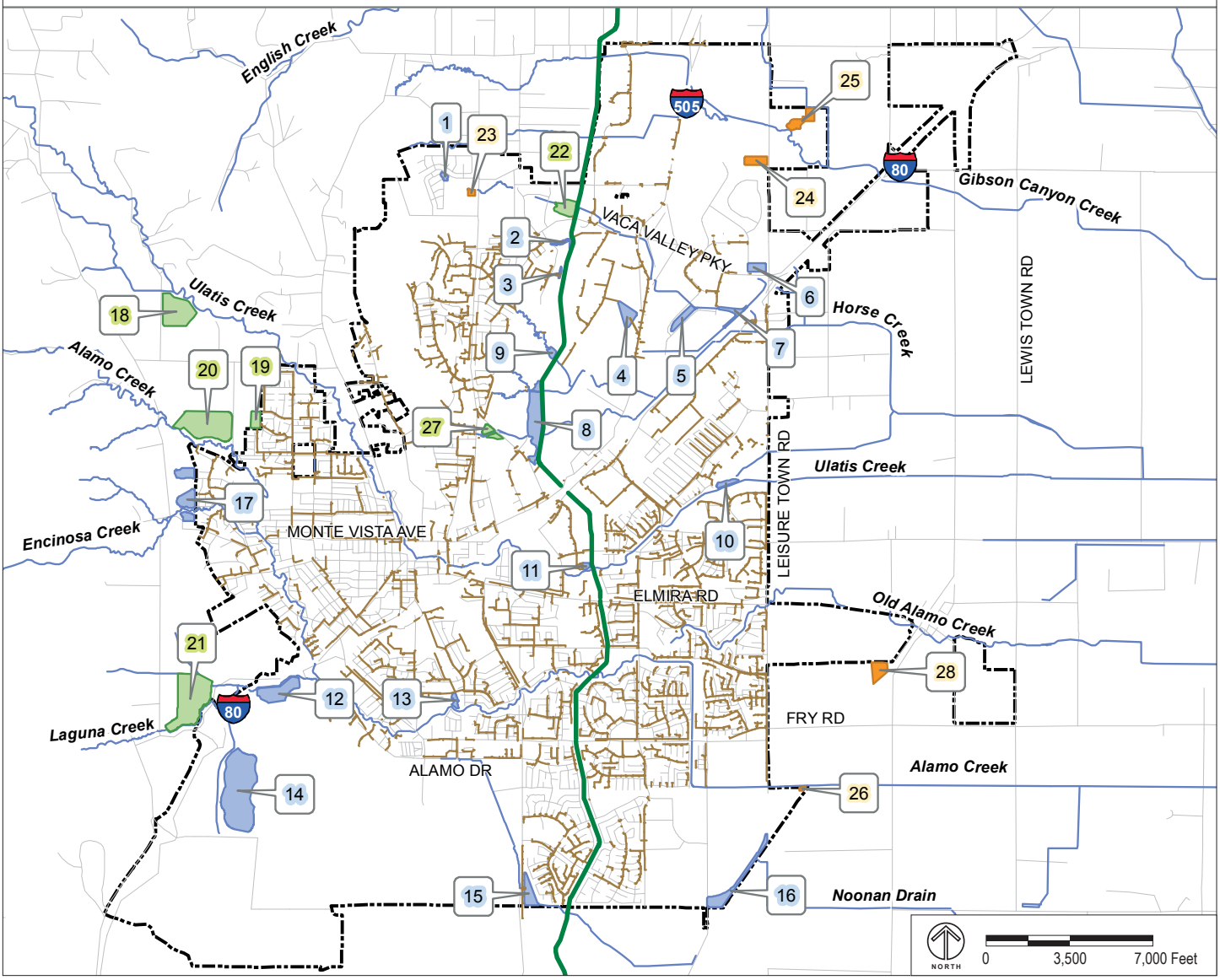
1. Temporary Cheyenne Basin
2. North Horse Basin #1
3. Middle Horse Basin #1
4. Middle Horse Basin #2
5. Vaca Valley Basin
6. North Village Basin #1
7. I-80 Basin
8. South Horse Basin #1
9. South Horse Basin #2
10. Stonegate Basin
11. Ulatis Basin #2
12. Lagunitas Basin
13. Alamo Basin #2
14. Lagoon Lake
15. Union Basin
16. Southtown Basin
17. Pleasants Valley Detention Basin

Proposed Detention Basins City Projects

18. Ulatis Basin
19. Ulatis/Florence Basin
20. Alamo Basin
21. Laguna Basin
22. North Horse Basin #2
27. Pine Tree Basin #1

Proposed Detention Basins Development Projects

23. Rancho Rogelio Project
24. North Village Basin #2
25. North Village Basin #3 (Gibson Canyon Creek Basin)
26. Alamo Basin #3
28. Brighton Landing



Storm Drains
Creeks
Putah South Canal
Existing Detention Storage
Proposed City Detention Storage
Proposed Development Detention Storage
City Limits

FIGURE SAF-5

EXISTING AND PROPOSED DRAINAGE FACILITIES

impervious surfaces, surfaces through which water cannot penetrate, such as a roof, road, sidewalk, or paved parking lot. Because impervious surfaces do not allow water to penetrate into the ground, they increase runoff volumes and contribute to flooding. Minimizing the amount of permitted impervious surfaces helps reduce flooding.

Recent studies have highlighted the need and potential options for enhanced flood control infrastructure within Vacaville. In 2008, the Solano County Water Agency (SCWA) conducted the Ulatis System Drainage Study, which recommended a number of storm drainage improvements in Vacaville, including new detention basins and channel improvements. The City also maintains the Storm Drainage Master Plan, which identifies storm drainage deficiencies and improvements needed to address existing localized flooding problems. The Storm Drainage Master Plan identifies regional detention basins to mitigate the increase in runoff from new development. New development is required to provide 100-year level flood protection within the proposed development area and ensure that developed areas are not adversely impacted.

Floodplain Development Regulations

Regulation of development in known flood-prone areas, based on Federal Emergency Management Agency (FEMA) mapping and other information, is a key tool in reducing flooding risks to life and property. The key development regulations in known flood-prone areas are as follows:

- **Central Valley Flood Protection Plan**. According to California Government Code Sections 65302.9 and 65860.1, every jurisdiction located within the Sacramento-San Joaquin Valley, which includes Vacaville, is required to update its General Plan and Zoning Ordinance in a manner consistent with the Central Valley Flood Protection Plan (CVFPP) within 24 months after the CVFPP's adoption, which occurred in 2012. In addition, the locations of the State and local flood management facilities, locations of flood hazard zones, and the properties located in these areas must be mapped and consistent with the CVFPP. The planning area of the CVFPP is called the Systemwide Planning Area. Vacaville is not included within this area. The CVFPP also catalogs the State Plan of Flood Control, which is the collection of State and federal flood protection system in the Central Valley. None of the facilities within the State Plan of Flood Control are located in Vacaville.
- **AB 5, SB 5, SB 17, and AB 162.** In 2007, several State laws were passed to address flooding risks in California. AB 5 (Wolk), SB 5 (Machado), SB 17 (Florez), and AB 162 (Wolk) require that urban and urbanizing areas in the Sacramento Valley and San Joaquin Valley, such as Vacaville, achieve, or make adequate progress toward achieving, 200-year protection by the year 2015 in order to continue to approve development in the floodplain. Specifically, AB 162 requires that each local jurisdiction's Safety Element include 200-year floodplain maps. Maps must be based on the best available data on flood protection, including areas protected by State and federal project levees, and areas

outside of these areas. As of the preparation of this General Plan in 2013, the 200-year floodplain for the Vacaville study area had not been mapped.

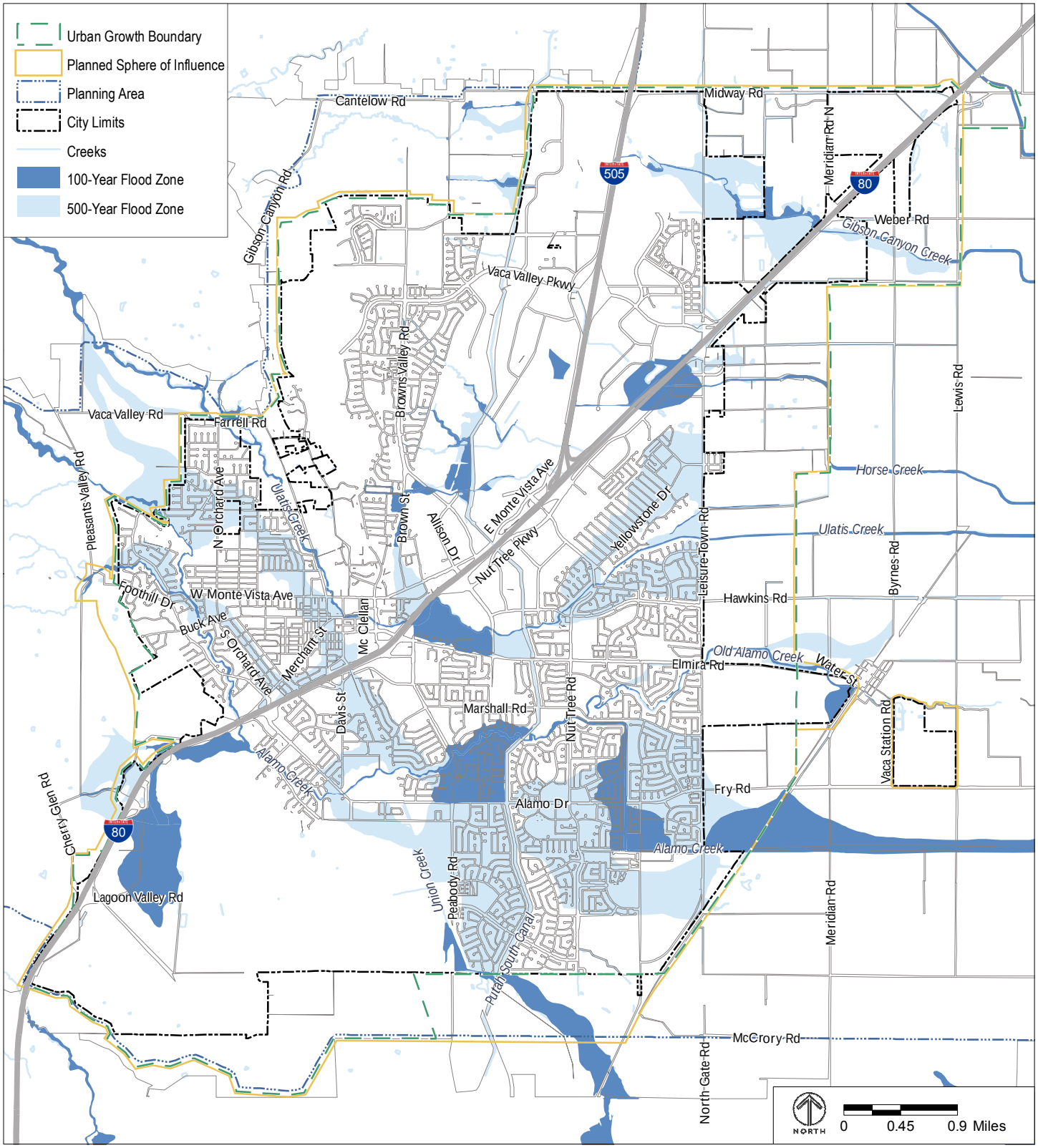
State legislation also requires a jurisdiction's Safety Element to include a Levee Flood Protection Zone map and an Alluvial Fan Floodplain Evaluation and Delineation map. However, because Vacaville is not within a Levee Flood Protection Zone, this Safety Element does not include such a map. In addition, the Alluvial Fan Floodplain Evaluation and Delineation Map program only applies to counties within Southern California.

Flood Zones

The most recent mapping of areas subject to flooding, shown in Figure SAF-6, was prepared by FEMA in 2009. This shows the boundaries of the 100- and 500-year flood plains.

Vacaville has adopted a Floodplain Management Ordinance (Section 14.18 of the Municipal Code) that outlines the requirements for construction within a designated 100-year floodplain or areas prone to flooding. Specifically,

- Residential construction, either new or a substantial improvement, must have the lowest floor, including the basement, elevated to, or above, the base flood elevation, the computed elevation to which floodwater is anticipated to rise during a 100-year storm event. A 100–year storm is defined as storm that has a 1 percent chance of occurring in any given year. Upon the completion of the structure, the elevation of the lowest floor must be certified by a registered professional engineer or surveyor, and verified by the community building inspector to be properly elevated.
- Nonresidential construction, either new or a substantial improvement, must either be elevated to conform to the requirements described above for residential construction, or be flood-proofed below the base flood elevation. If the structure is flood-proofed, it must be watertight with the wall substantially impermeable to the passage of water, have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy, and be certified by a registered engineer or architect.
- All preliminary subdivision proposals must identify the special flood hazard area and the elevation of the base flood.
- All subdivision plans must provide the elevation of the proposed structure(s) and pad(s). If the site is filled above the base flood elevation, the lowest floor and pad elevations must be certified by a registered professional engineer or surveyor.
- All subdivision proposals must be consistent with the need to minimize flood damage.
- All subdivision proposals must have public utilities and facilities located and constructed to minimize flood damage.
- All subdivisions must provide adequate drainage to reduce exposure to flood hazards.



Source: FEMA, 2009.

FIGURE SAF-6
FEMA FLOOD ZONES

- Encroachments within designated floodways are prohibited, including fill, new construction, substantial improvement, and other new development, unless certification by a registered professional engineer is provided demonstrating that encroachments do not result in any increase in the base flood elevation during the occurrence of the base flood discharge.

Dam Inundation

All dams pose the potential risk of failure, most likely from seismically-induced ground shaking or another seismic event, which threatens the area below the dam with inundation of water spilling from the dam. Since 1972, the State has required inundation maps for most dams, showing those areas within the potential dam failure inundation zone. As illustrated in Figure SAF-7, the northeastern portion of Vacaville is subject to potential dam inundation by the Monticello Dam. The inundation map shows the area likely to flood should the dam fail. Constructed between 1953 and 1957 in Napa County, the Monticello Dam forms Lake Berryessa, which stores over 1.6 million acre-feet of water when full. The California Environmental Quality Act requires that agencies like the City of Vacaville take into consideration risks from dam failure when approving development that would place people or structure in dam inundation areas.

State Awareness Mapping Program

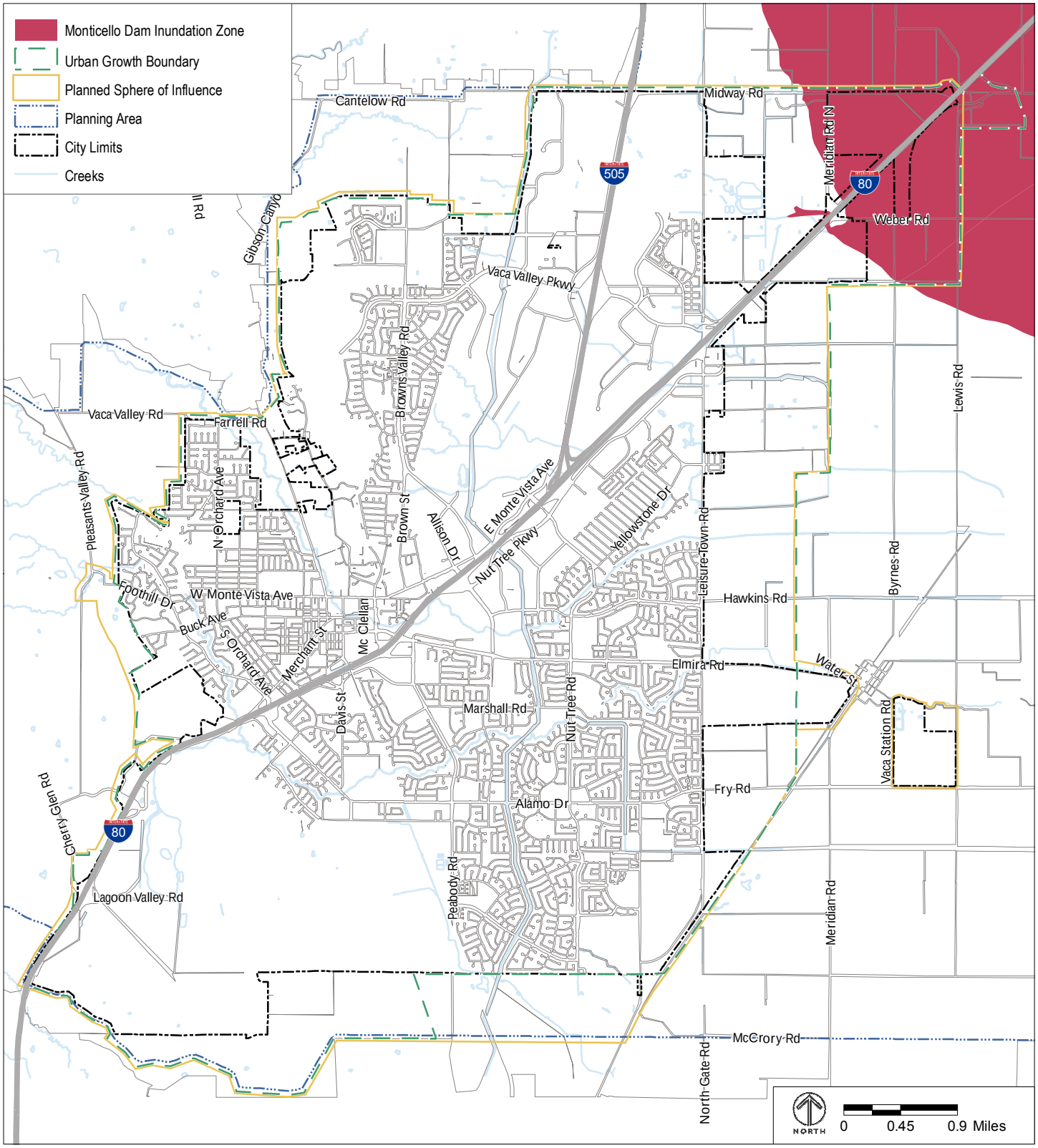
The purpose of the State Awareness Mapping project is to show flood hazards that are not mapped under FEMA's National Flood Insurance Program to give property owners and residents additional information about potential flood hazards. The State has deemed the areas mapped under the Awareness Mapping project as prone to flooding. This designation is advisory only and is not subject to federal or State regulation. Figure SAF-8 shows the Awareness Floodplain Areas within the Vacaville Planning Area.

Goals, Policies, and Actions

Goal SAF-2	**Collect, convey, store, and dispose of stormwater in ways that provide an appropriate level of protection against flooding, account for existing and future development, and address applicable environmental concerns.**

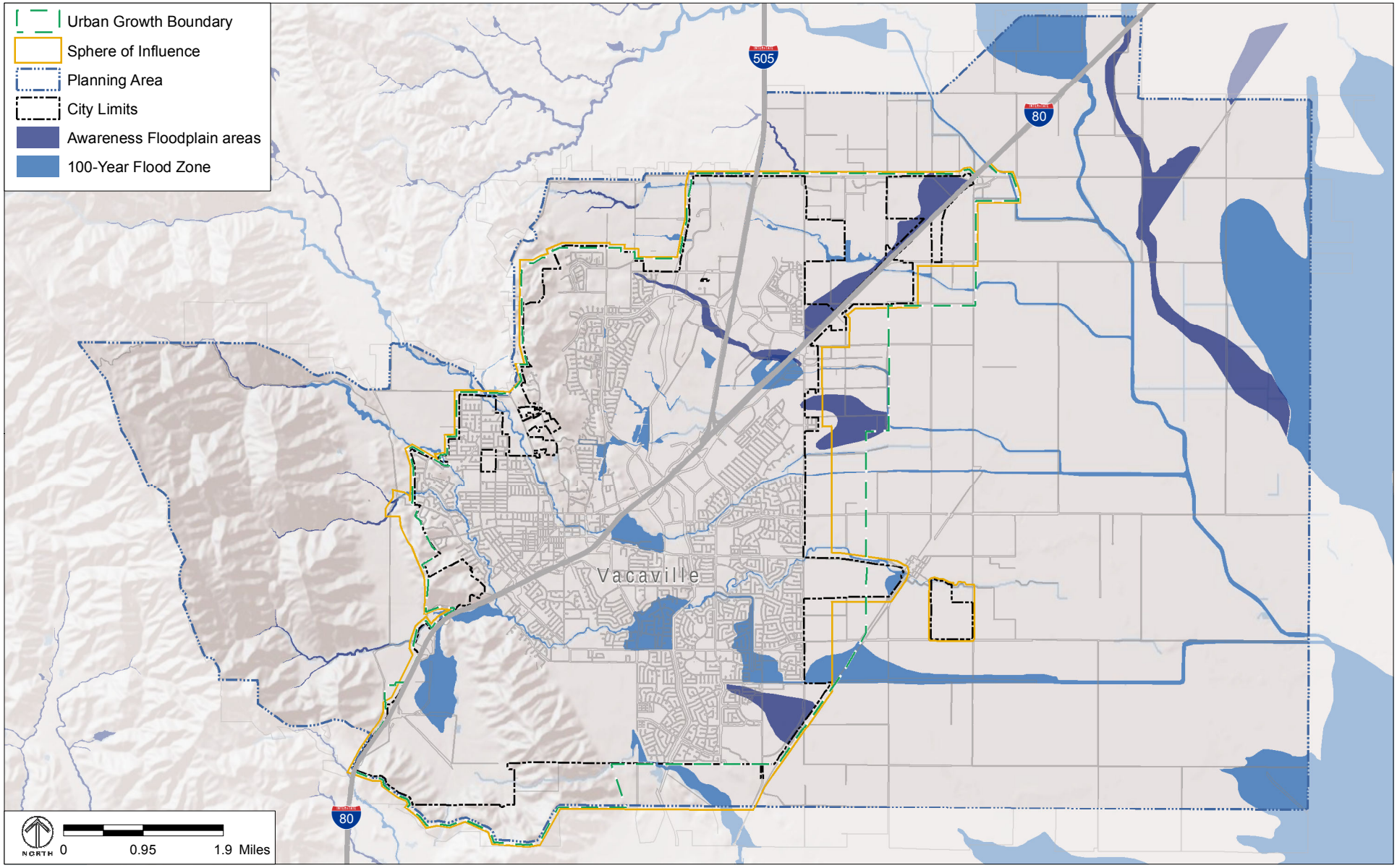
Policies

Policy SAF-P2.1	Continue to develop a comprehensive system of drainage improvements to minimize flood hazards, and maintain storm drainage infrastructure in good condition.
Policy SAF-P2.2	Assess the adequacy of storm drainage utilities in existing developed areas, and program any needed improvements in coordination with new infrastructure that will serve developing areas.



Source: State of California, Governor's Office of Emergency Services, 2000.

FIGURE SAF-7
DAM INUNDATION AREAS



Note: Awareness Floodplain areas have been deemed by the State to be prone to flooding. This designation is advisory only and is not subject to federal or State regulation.

Source: City of Vacaville, 2011; CA Dept. of Water Resources, 2002; FEMA, 2009.

FIGURE SAF-8

AWARENESS FLOODPLAIN AREAS

Policy SAF-P2.3 Encourage the formation of flood control assessment districts for areas with flooding and drainage problems.

Policy SAF-P2.4 Design storm drainage infrastructure to serve dual purposes to the extent possible. This includes the following:

- Drainage facilities integrated into recreation corridors with bike paths, sidewalks, and landscaping.
- Drainage channels integrated with transportation and environmental corridors.
- Active and passive recreation areas incorporated into detention basins where feasible.

Policy SAF-P2.5 Maintain open areas needed to retain stormwater and prevent flooding of urban or agricultural land.

Policy SAF-P2.6 Require new development adjacent to creeks to dedicate the area within 40 feet of the stable top of bank to the City and be designed to allow access to, and visibility of, creek areas for maintenance and public safety purposes.

Actions

Action SAF-A2.1 Study the feasibility of establishing specific fees for those areas in which flooding and drainage problems exist. Assessed fees would be used to mitigate flooding through physical improvements.

Action SAF-A2.2 Develop a financing plan for the construction of upstream regional flood control detention basins.

Action SAF-A2.3 Continue to construct upstream regional flood control detention basins.

Action SAF-A2.4 Continue to update the five-year Capital Improvement Plan to provide for needed storm drainage facilities in relation to the City's financial resources.

Action SAF-A2.5 Develop a long-range strategic capital development plan for storm drainage facilities consistent with the General Plan.

Action SAF-A2.6 Update the City’s Storm Drainage Master Plan to identify storm drain facility improvements necessary to eliminate existing flooding hazards and drainage problems.

Action SAF-A2.7 Continue to implement the storm drain facility improvements identified in the City’s Storm Drainage Master Plan and the Ulatis System Drainage Study.

Action SAF-A2.8 Continue to cooperate with the Solano County Water Agency on developing a comprehensive stormwater management program to accommodate additional development in undeveloped areas.

Goal SAF-3 Provide effective storm drainage facilities for development projects.

Policies

Policy SAF-P3.1 Evaluate the storm drainage needs for each project; this evaluation should account for projected runoff volumes and flow rates once the drainage area is fully developed. In the Alamo Creek watershed upstream of Peabody Road (including Alamo, Laguna, and Encinosa creeks), require post-development 10-year and 100-year peak flows to be reduced to 90 percent of predevelopment levels. In the remainder of Vacaville, for development involving new connections to creeks, peak flows shall not exceed predevelopment levels for 10- and 100-year storm events.

Policy SAF-P3.2 Continue to require development impact fees to fund necessary storm drainage improvements, including drainage detention basins.

Policy SAF-P3.3 Require a Storm Drainage Master Plan to be prepared for new development projects to ensure new development adequately provides for on-site drainage facilities necessary to protect the new development from potential flood hazards and ensure that potential off-site impacts are fully mitigated.

Policy SAF-P3.4 Require that new development designate storm drainage easements or routes when tentative maps or specific plans are approved.

Policy SAF-P3.5 Prohibit extension of storm drainage infrastructure into the Upper Lagoon Valley that would promote its urban development.

Actions

Action SAF-A3.1 Maintain the City's Storm Drainage Master Plan, which ensures that new development adequately provides for on-site and downstream off-site mitigation of potential flood hazards and drainage problems.

Action SAF-A3.2 Revise the Land Use and Development Code to limit the amount of impervious surfaces in non-residential parking lots.

Goal SAF-4 Protect people and property from flood risk.

Policies

Policy SAF-P4.1 Prohibit development within mapped flood-prone areas unless mitigation of flood risk is assured.

Policy SAF-P4.2 Require that the lowest floor of any new construction or substantial improvement be elevated a minimum of 1 foot above the 200-year flood elevation.

Policy SAF-P4.3 When reviewing proposals for new development in dam inundation areas, consider risks from potential dam failure.

Policy SAF-P4.4 Require that new development mitigate its additional runoff and mitigate removal of any floodplain areas.

Policy SAF-P4.5 Continue to participate in the National Flood Insurance Program (NFIP) and provide information to residents and business owners about the NFIP, Federal Emergency Management Agency Flood Insurance Rate Maps, and flood map changes.

Actions

Action SAF-A4.1 Regularly update the Floodplain Management Ordinance to be in accordance with the National Flood Insurance Rate Map regulations.

Action SAF-A4.2 Assist the Federal Emergency Management Agency in updating the Flood Insurance Rate Maps for the Vacaville area and identifying 100-year flood zones.

Action SAF-A4.3 Review and revise the Safety Element concurrently with the adoption of each Housing Element to identify any new housing areas prone to flood hazards.

Action SAF-A4.4 Annually review the Land Use Element to account for new flood information made available during the previous year.

Action SAF-A4.5 Update the Land Use and Development Code to appropriately reflect the Central Valley Flood Protection Plan and to identify current flood hazards and information.

Action SAF-A4.6 Support the efforts of levee owners and regional, State, or federal agencies to design and reconstruct levees that do not meet flood protection standards to bring them into compliance with adopted State and/or federal standards.

Action SAF-A4.7 Amend the Safety Element to include the 200-year floodplain map once it becomes available.

Wildland Fires

This section addresses wildland fires. Additional information and policies regarding urban fires are contained in the Public Facilities and Services Element.

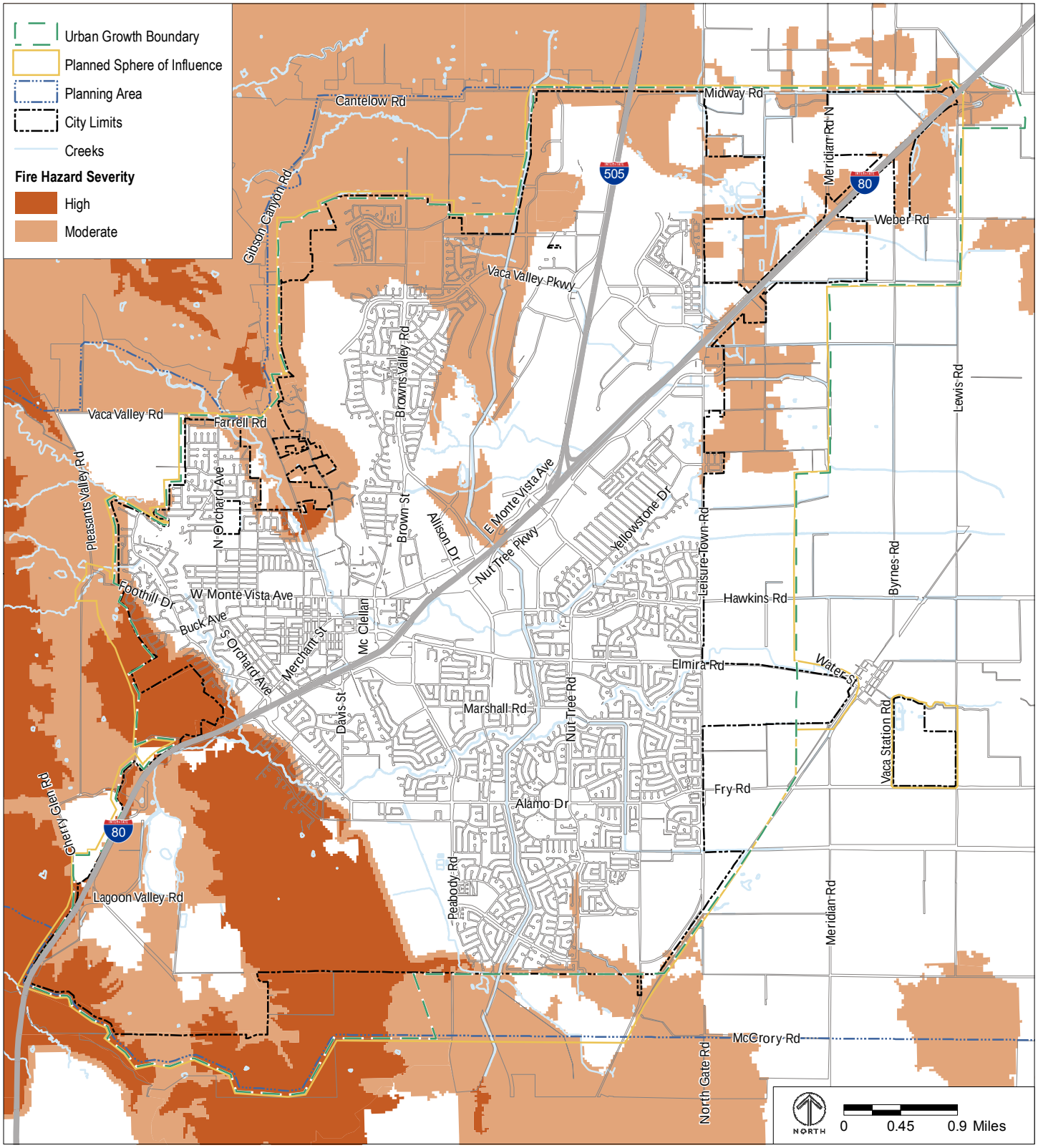
Background Information

Highly flammable vegetation and warm, dry summers create the potential for wildland fires in Vacaville. The risk of wildland fires is related to a combination of factors, including winds, temperatures, humidity levels, and fuel moisture content. Of these four factors, wind is the most crucial. Steep slopes also contribute to fire hazards by intensifying the effects of wind and making fire suppression difficult. Where there is easy public access to dry vegetation, fire hazards increase due to greater chance of human carelessness. High hazard areas in Vacaville include outlying residential parcels and open lands adjacent to residential areas.

To quantify this potential risk, the California Department of Forestry (CDF) has developed a Fire Hazard Severity Scale that utilizes three criteria in order to evaluate and designate potential fire hazards in wildland areas. The criteria are fuel loading (vegetation), fire weather (winds, temperatures, humidity levels, and fuel moisture contents), and topography (degree of slope). Figure SAF-9 shows the Fire Hazard Severity Zones for the City of Vacaville.

In addition to the Fire Hazard Severity Zones mapped by CDF in Figure SAF-9, open agricultural lands in eastern Vacaville pose a threat related to grass fires. Grass fires can travel very fast, and threaten nearby residential areas. Grass fire threats in open agricultural lands are a significant concern in the growth areas in the eastern portion of the city, which are shown in Figure LU-3 in the Land Use Element.

To reduce risks from wildland fires, the City of Vacaville adopted Chapter 14.20.290 of the Municipal Code, Standards for New Construction Adjacent to Open Space Lands Where Wildfire is a Threat. Chapter 14.20.290 provides development standards for new construction adjacent to permanent open or other open lands where no development is anticipated in the near future (as identified in the General Plan) and where wildfire is a threat. Some of the fire reduction strategies incorporated in the code include providing for fire access roads, maintaining a defensible space of non-combustible vegetation around structures, and installing indoor sprinkler systems.



Source: CA Department of Forestry and Fire Protection, 2007.

FIGURE SAF-9

CALFIRE FIRE HAZARD SEVERITY ZONES

Goals, Policies, and Actions

Goal SAF-5 Protect lives and property from wildland fire hazards.

Policies

Policy SAF-P5.1 Reduce the risk from wildfires by restricting development in High and Very High Hazard areas, as shown in Figure SAF-9.

Policy SAF-P5.2 Require that all development in areas of potential wildland fire hazards, including agricultural areas east of Leisure Town Road, include the following:

- Fire breaks adjoining open space areas.
- Adequate access to adjoining open space areas.
- Clearance around structures.
- Fire-resistant ground cover.
- Fire-resistant roofing materials.
- Adequate emergency water flow.

Policy SAF-P5.3 Require that all development adjacent to open agricultural lands comply with State law regarding defensible open space, even if the agricultural lands are designated for future development.

Policy SAF-P5.4 Incorporate drought-resistant and fire-resistant plants in public works projects in areas subject to wildland fires.

Policy SAF-P5.5 Regularly train Vacaville Fire Department staff for wildland firefighting conditions.

Policy SAF-P5.6 Require all development applications to be reviewed and approved by the Fire Department prior to project approval.

Actions

Action SAF-A5.1 Implement standards to address wildfire threat from agricultural areas in the East of Leisure Town Road and Northeast Growth Areas, which are shown in Figure LU-3.

Action SAF-A5.2 Amend Chapter 14.20.290 of the Vacaville Land Use and Development Code, Standards for New Construction Adjacent to Open Space Lands Where Wildfire is a Threat, to be consistent with State law.

Hazardous Materials and Waste

Background Information

Products as diverse as gasoline, paint solvents, film processing chemicals, household cleaning products, refrigerants, and radioactive substances are categorized as hazardous materials. What remains of a hazardous material after use or processing is considered to be a ***hazardous waste***. The handling, transportation, and disposal of such waste is a concern to all communities. Improper handling of hazardous materials or waste may result in significant impacts on human health and the environment.

Many businesses and residents in Vacaville use hazardous materials and generate some amount of hazardous waste. Common hazardous waste is generated from gasoline service stations, dry cleaners, automotive mechanics, auto body repair shops, machine shops, printers and photo processors, and agriculture. Most of these wastes are petroleum-based or hydrocarbon hazardous waste and include cleaning and paint solvents, lubricants, and oils. However, medical wastes, defined as potential infectious waste from sources such as laboratories, clinics, and hospitals, are also included among the hazardous wastes found in Vacaville.

Hazardous materials and hazardous wastes in Vacaville are heavily regulated by a range of federal, State, and local agencies. One of the primary hazardous materials regulatory agencies is the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). DTSC is authorized by the US Environmental Protection Agency (EPA) to enforce and implement federal hazardous materials laws and regulations.

Solano County has taken the lead in preparing and adopting a hazardous waste management plan for all waste projected to be generated in the county. State law requires all businesses to prepare an inventory of hazardous materials they use and store. The County's Department of Environmental Management receives this information and distributes it to local fire protection agencies.

In Vacaville, limited quantities of household hazardous waste may be transported to and dropped off at a recycling center. Local small businesses may also contract with the waste collection service provider to regularly dispose of larger quantities of waste.

Goals, Policies, and Actions

Goal SAF-6	**Minimize risks from the harmful effects of hazardous materials and waste.**

<u>Policies</u>

Policy SAF-P6.1 Work with Solano County and other public agencies to inform consumers about household use and disposal of hazardous materials.

Policy SAF-P6.2 Cooperate with Solano County on implementation of the Hazardous Waste Management Plan, and review development proposals involving hazardous waste facilities to ensure consistency with that Plan.

Policy SAF-P6.3 Require industrial uses that rely extensively on the use of hazardous materials to adopt or have in place an acceptable use, storage, disposal, and emergency response program that has been approved by appropriate agencies.

Policy SAF-P6.4 Require adequate separation between areas where hazardous materials are present and sensitive uses such as schools, residences, and public facilities.

Policy SAF-P6.5 In areas historically used for commercial or industrial uses, require that developers conduct an environmental investigation to ensure that the site was not contaminated by the previous use.

Policy SAF-P6.6 Promote the safe transport of hazardous materials through Vacaville by implementing the following measures:

- Maintain formally-designated hazardous material carrier routes to direct hazardous materials away from populated and other sensitive areas.
- Prohibit vehicles transporting hazardous materials from parking on City streets.
- Require that new pipelines and other channels carrying hazardous materials avoid residential areas and other immobile populations to the extent possible.

Actions

Action SAF-A6.1 Continue to maintain and implement a hazardous materials information disclosure program.

Action SAF-A6.2 Amend the Land Use and Development Code to specify development standards for properties where hazardous materials are present, including adequate separation and buffers from sensitive uses such as schools, residences, and public facilities.

Disaster and Emergency Preparedness

Background Information

The City of Vacaville has adopted the Association of Bay Area Governments' (ABAG's) regional hazard mitigation plan as the City's local hazard mitigation plan. The product of a

regional effort orchestrated by ABAG, the Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area responds to the threats posed by potential hazards and disasters in the Bay Area. The document seeks to improve the resilience of critical systems, including infrastructure, health, housing, the economy, government services, education, the environment, and land use. To do so, the document analyzes natural and human-made risks to these systems and discusses strategies for avoidance, preparation, and mitigation. The document emphasizes probable natural disasters, including earthquakes, wildfires, flood, major storms, and tsunamis, among others. The report includes actions and strategies for local and regional governments to strengthen systems before disasters and manage them during a subsequent recovery.

The Solano County Office of Emergency Services has also prepared a Multiple Hazard Mitigation Plan that assesses hazards, assigns responsibilities, and prescribes evacuation routes for all of Solano County, including Vacaville.

Goals, Policies, and Actions

Goal SAF-7	**Reduce risk to life and property associated with emergencies and natural and manmade disasters.**

Policies

Policy SAF-P7.1	Promote public awareness of potential disaster scenarios for Vacaville and encourage individual preparedness.
Policy SAF-P7.2	Provide education and support to neighborhood- or block-level efforts to prepare for disasters.
Policy SAF-P7.3	Maintain an adequate level of disaster response preparedness through careful review of proposed developments and through staff training in and exercise of the local hazard mitigation plan.
Policy SAF-P7.4	Require that emergency access routes be kept free of traffic impediments.
Policy SAF-P7.5	Maintain comprehensive Emergency Response Plans.

Actions

Action SAF-A7.1	Adopt a comprehensive disaster response plan in coordination with adjoining communities. The plan should include procedures, including teaming and mutual aid, to follow during and after a major earthquake, wildland fire, hazardous substance release, or other catastrophic event.
Action SAF-A7.2	Identify and regularly update emergency access routes.

Action SAF-A7.3 Conduct periodic drills using emergency response systems to test the effectiveness of City procedures.

Climate Change Adaptation

This section focuses on hazards associated with climate change. Additional information and policies to reduce greenhouse gas emissions are contained in the Conservation and Open Space Element.

Background Information

As discussed in the Conservation and Open Space Element, many people, and the State of California, believe that greenhouse gas emissions from human activities are contributing to a concentration of these gases in the atmosphere, and have led to a trend of unnatural warming of the earth's climate, which is known as global warming. The climate and natural resources in California could be adversely affected by the global warming trend. Droughts and wildland fires are expected to become more severe. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include, but are not necessarily limited to, more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters, such as flooding, hurricanes and drought; and increased levels of air pollution.

Goals, Policies, and Actions

Goal SAF-8	**Improve Vacaville's ability to adapt and respond to the impacts of climate change.**

Policies

Policy SAF-P8.1 Promote awareness of climate change and its impacts.

Policy SAF-P8.2 Collaborate regionally to prepare for the effects of climate change.

Actions

Action SAF-A8.1 Develop a Climate Change Preparedness Plan that will prepare for the impacts of climate change on the city's economic and natural systems and provide a climate-resilient community.

Action SAF-A8.2 Establish a Climate Change Contingency Fund that the City can use to respond to extreme or unusual climate events.

Action SAF-A8.3 Establish a regional climate change working group to share information and foster cooperation between Vacaville, neighboring communities, and regional agencies.