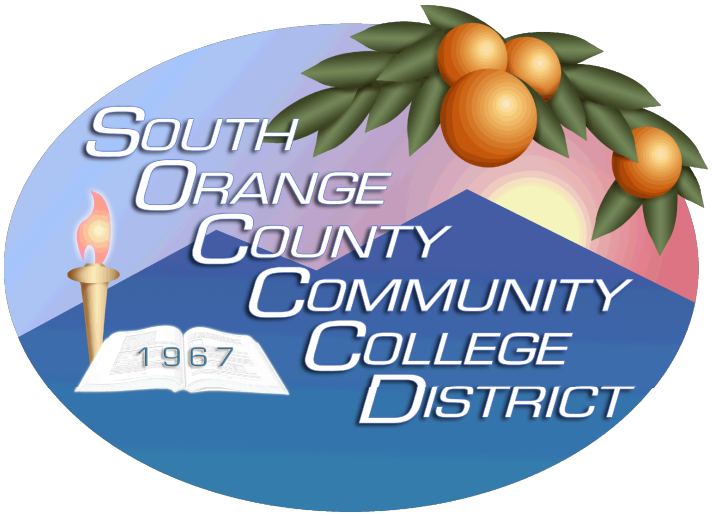

Local Hazard Mitigation Plan

Advanced Technology and Education Park (ATEP),
Irvine Valley College (IVC), and Saddleback College (SC)

June 2022

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PREFACE

Impacts from hazards are often a challenge to communities, its leaders, its staff, and its residents. In addition to injuries, loss of life, and significant damages property after a catastrophic disaster event, communities can experience power outages, loss of telecommunications and water service, limited access to fuel, and closed roadways. Depending on the size of the event, recovery from these events can take weeks, months, and in some instances years. The goal of many communities is to reduce the potential impacts thus shortening the recovery time. This effort is called mitigation.

The Federal Emergency Management Agency (FEMA) defines mitigation as "*any action taken to reduce and/or eliminate the long-term risk to human life and property from natural hazards*." Mitigation is one of the phases of FEMA's emergency management Mission Areas and is the only phase specifically dedicated to breaking the disaster cycle (**Figure 1**). The goal of mitigation is to build resiliency within the community, enabling a more efficient and effective response to and recovery from disasters.

Figure 1- Disaster Cycle

To assist communities in becoming more resilient to hazards, FEMA developed a program and guidance around the creation of Local Hazard Mitigation Plans (LHMPs). LHMPs promote a comprehensive planning process, requiring an assessment of local capabilities against impacts from hazards (risk) in order to identify potential projects and/or strategies.

With an approved and adopted LHMP, communities are eligible for federal Hazard Mitigation Assistance (HMA) grants offered through FEMA: *Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC; formerly Pre-Disaster Mitigation-PDM),* and *Flood Mitigation Assistance (FMA)*. The HMA grants are a great source of funding to help implement potential projects and/or strategies identified in the LHMPs.

LHMPs must include information to meet federal guidance requirements and as such may include information not traditionally found in other planning documents. This LHMP reflects current District mitigation priorities and all future updates to the LHMP will reflect any changes to the mitigation priorities. To ensure the District's LHMP contains all required information and is user-friendly; it has been organized as follows:

Section 1: **Introduction**- describes the purpose and scope of the plan and presents the adoption process and authority.

Section 2: **Planning Process**- describes the methodology used to prepare the LHMP, including a list of the Planning Team members and the public outreach efforts.

Section 3: **Community Profile**- provides background information on the District, ensuring all Planning Team members have a common understanding of the dynamics within and characteristics of the community.

Section 4: **Capability Assessment**- identifies the District's resources that may be utilized to support and implement mitigation.

Section 5: **Hazard Assessment**- identifies and prioritizes each hazard on each campus within the District.

Section 6: **Risk Assessment**- describes the potential exposure and vulnerability to each hazard.

Section 7: **Mitigation Strategy**- describes the actions the District and each campus is proposing to address the risk within the District.

Section 8: **Plan Administration**- provides information on how the District intends to keep the LHMP current, incorporate it into other efforts, and share it with the public.

1 INTRODUCTION

The Local Hazard Mitigation Plan (LHMP) is a "*living document*" that should be reviewed, monitored, and revised regularly to reflect changing conditions and new information. As required, the LHMP must be updated every five (5) years to remain in compliance with regulations to receive federal Hazard Mitigation Assistance (HMA) grants: *Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC; formerly Pre-Disaster Mitigation- PDM),* and *Flood Mitigation Assistance (FMA)*.

This is the South Orange County Community College District's ("District") initial LHMP; and as such, there is no information to review and update as required by the California Governor's Office of Emergency Services (Cal OES) or the Federal Emergency Management Agency (FEMA). However, moving forward, information in this LHMP will serve as the basis for the review and update to stay in compliance with FEMA requirements.

For the purposes of the LHMP, the term(s) "District" will infer both its political jurisdiction (boundary) and the collective information from Irvine Valley College (IVC), Saddleback College (SC), and the Advanced Technology and Education Park (ATEP) campuses.

1.1 PURPOSE OF THE PLAN

The purpose of this plan is to establish strategies to mitigate (reduce and/or eliminate) impacts from hazards within the District.

1.2 SCOPE OF THE PLAN

The scope of this plan is to: 1) assess relevant existing conditions and capabilities within the District; 2) identify potential hazards and their impacts within the District; and, 3) propose mitigation actions to address the impacts from the hazards.

In support of the above scope, this plan will: 1) implement (and document) a comprehensive planning process; 2) present actions to maintain and integrate the LHMP with other District plans; and, 3) establish methods to continuously inform and educate the students, employees, and the public on hazards and potential actions that can be taken to reduce and/or eliminate impacts.

1.3 HAZARD MITIGATION PLANNING DIRECTIVE

In 2000, FEMA adopted revisions to Title 44 of the Code of Federal Regulations (44 CFR). This revision is known as "*Disaster Mitigation Act (DMA) 2000*". Section 322 (a-d) of DMA 2000 requires that local governments, as a condition of receiving federal disaster mitigation funds, have an approved and adopted Hazard Mitigation Plan that describes the process for assessing hazards, risks and vulnerabilities, identifying and prioritizing mitigation actions, and engaging and soliciting input from the *whole community* (i.e., stakeholders, special districts, adjacent jurisdictions and agencies).

1.4 PROMULGATION AUTHORITY

The District is governed by a seven (7) member elected Board of Trustees. The Board of Trustees oversees all academic programs and educational services by establishing policies for the District. The District's Chancellor is the Chief Executive Officer and supervises the college presidents and Districtwide services and activities. The promulgation authority is vested in the members of the Board of Trustees. A list of the members of Board of Trustees is provided in **Table 1.1**.

Table 1.1- Board of Trustees- District

Position	Elected Official
President	Marcia Milchiker
Vice President	Timothy Jemal
Clerk	Dr. Terri Whitt Rydell
Board Member	Dr. Barbara J. Jay
Board Member	Carolyn Inmon
Board Member	T.J. Prendergast III
Board Member	*VACANT*
Student Member	Rachel Abalos

1.5 LOCAL HAZARD MITIGATION PLAN ADOPTION

The LHMP for the District was reviewed and adopted by the Board of Trustees on August 29, 2022. A copy of the Board Meeting Minutes is in **Appendix A**.

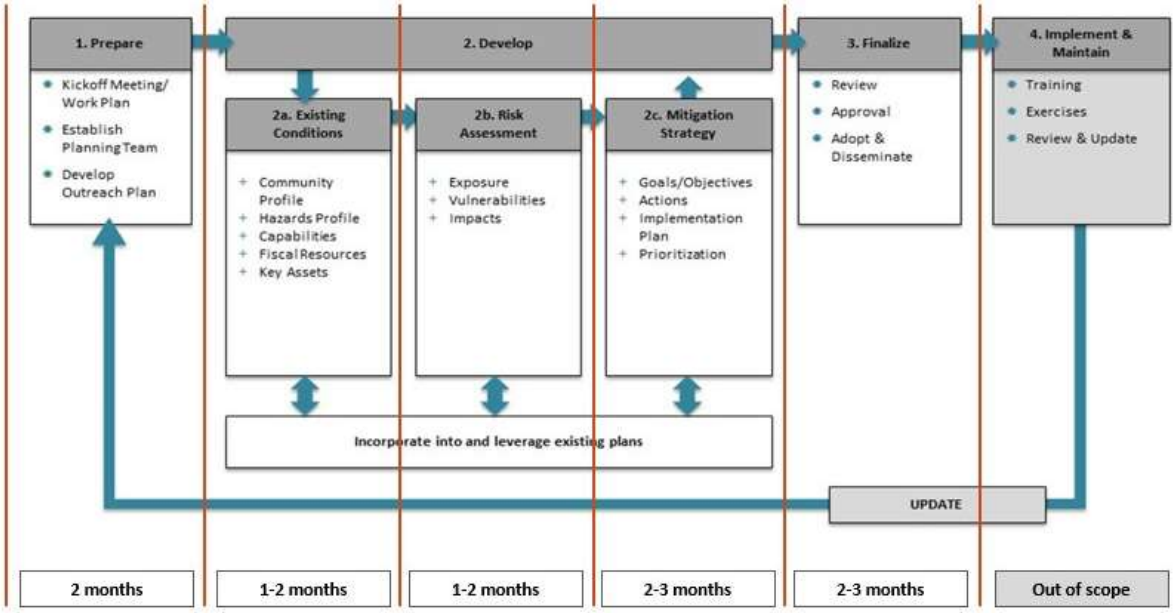
2 PLANNING PROCESS

This section demonstrates the methodology used by the District to develop the LHMP. FEMA's LHMP development guidance outlines recommended actions, emphasizing involving the "*whole community*" in the planning process. The *whole community* concept promotes the inclusion of not only District emergency management staff but also other District and campus representatives (e.g., Irvine Valley College, Saddleback College, Fiscal Services, Facilities Planning, Technology), as well as, outside partners (e.g., surrounding counties/cities, special districts, lifeline companies) to participate in the LHMP effort. The *whole community* concept also includes outreach to the general public to bring awareness to the planning effort and to gain outside perspective. Soliciting and considering input from diverse interests is essential to building a comprehensive plan and gaining community-wide support for the plan.

2.1 METHODOLOGY AND TIMELINE

To complete the LHMP, the District incorporated a three (3) phase planning process (methodology): 1) Prepare; 2) Develop; and, 3) Finalize (**Figure 2.1**). (NOTE: *Phase 4 represents the phase after adoption*.) In addition to the phases, the figure below also depicts the timeline to complete the project. While this methodology is in alignment with the FEMA guidance, sequence and naming of phases were adjusted to better suit the District's needs.

Figure 2.1- Planning Process Methodology



Under phase 1 *Prepare*, the general project tasks included conducting an Administrative Kickoff meeting with the consultant, validation of the Planning Team, identification of the Public Outreach strategy, and a Kickoff meeting with the Planning Team.

Phase 2 *Develop* has three (3) sub-phases that establishes the current conditions, determines the risk, and identifies strategies and/or projects. During the *Existing Conditions* sub-phase, the Planning Team confirmed: a) current staffing resource and methods to augment current staffing, with a focus on resources being used to support mitigation efforts; b) current District mitigation capabilities, current governance guiding mitigation efforts, identification of fiscal resources availability to support mitigation; c) discussion on key assets; and, d) identification and description of local hazards within the District. Under the *Risk Assessment* sub-phase, the Planning Team reviewed exposure and vulnerability (impacts) of hazards within the District; and prioritized hazards. The final sub-phase, *Mitigation Strategies*, had the Planning Team discuss current mitigation efforts, identify and prioritize new mitigation actions, and develop an implementation plan for each mitigation action.

Throughout phase 2 *Develop*, plans and other documents, both internal and external, were also analyzed and leveraged to ensure decisions were based on the best available information and that proposed mitigation actions were compatible with other efforts. Likewise, efforts were made to encourage the LHMP planning process to be considered for incorporation into other planning efforts.

The last phase of the planning process was *Finalize* (phase 3). During this phase, the Planning Team reviewed and provided additional comments on the draft LHMP before forwarding to Cal OES and FEMA for review and approval. This phase also included addressing both Cal OES and FEMA comments and working with the Board of Trustees to adopt the LHMP.

During the planning process, draft LHMP sections were disseminated for review through each phase and sub-phase. This helped the Planning Team to focus on the subject matter while enforcing the relationship between the phases. At the end of the planning process, a comprehensive review cycle was provided with all draft sections under one cover.

2.2 PLANNING TEAM

Building on the *whole community* concept, a Planning Team was established to assist with the development of the District's LHMP. The primary goal of the Planning Team was to help define and identify the strategies within the LHMP. It was determined by the District that the LHMP would fall under the Business Continuity Planning Committee (BCPC). In accordance with the District's composition and charge (bylaws), teams working under the BCPC are called Task Forces. As such, the Planning Team for the LHMP is called a Task Force and will be so referenced moving forward.

The Task Force was led by representatives from the Districts' Procurement, Central Services, and Risk Management Department. The Districts' Procurement, Central Services, and Risk Management Department representatives took on the responsibilities of Project Manager and facilitated and coordinated Task Force activities. Additionally, the District hired a consultant (*APetrow Consulting*) to provide technical support to help manage the process and to prepare the LHMP.

2.2.1 MEMBERS

The Task Force was comprised of experts from a range of subject areas affected by the LHMP. The Task Force embodied a manageable number of members while ensuring that all perspectives were captured and/or included in the planning process. The external Task Force members acted as liaisons to the greater community, exchanging information about the LHMP with outside groups in the community. Internal Task Force members were responsible for communicating the direction and status of the planning effort to their respective constituency group and in return were expected to bring back the constituency's perspective to the Task Force.

The District used a three (3) phased approach to contacting Task Force members. This included conducting one-on-one phone calls to introduce themselves/the project and to make sure they were the best point person for the role. Next the District sent out follow-up emails inviting the Task Force member to become part of the planning team. This was then followed up with meeting invites to attend each of the virtual Task Force meetings.

The District took great efforts to engage and include as many Task Force members as possible. However, while members were invited to all meetings, some were unable to attend meetings due to scheduling conflicts. To help with this, the District created a site in Microsoft (MS) Teams. The MS Teams site housed all information about the project (e.g., meeting announcements, meeting recordings, and draft sections). Task Force members were able to review and comment on draft sections throughout the process, as well as, on the draft LHMP at the end of the process prior to disseminating the draft to the public and/or Cal OES/FEMA. a list of the Task Force members can be found under **Appendix B**.

2.2.2 MEETINGS

There were a series of meetings held with the Task Force. Each meeting had a primary focus and provided an opportunity to discuss/review information and exchange ideas. Below is a list of the Task Force meetings (**Table 2.2**):

Table 2.2- Task Force Meetings

Date	Focus Activity
Aug 27, 2020	*Project Kickoff* – Reviewed goals/objectives of LHMPs, type of information needed, role of the Task Force, LHMP update process, public outreach effort, and project timeline.
Sep 25, 2020	*Existing Conditions* – Discussed relationship between EOPs and LHMPs, reviewed 1) FEMA Review Tool, 2) District Profile, 3) Capabilities, 4) Key Assets, and 5) List of Hazards.
Oct 29, 2020	*Existing Conditions* - Reviewed 1) Hazard Profiles, 2) Key Assets, and 3) List of Hazards and Prioritization.
Dec 3, 2020	*Existing Conditions* – Reviewed 1) summary of campus meetings; 2) updated draft sections; and 3) earthquake scenarios.

Jan 28, 2021	*Existing Conditions* - 1) Validated hazards and screening; 2) finalized key asset list; and 3) presented HAZUS scenarios.
Feb 25, 2021	*Risk Assessment* - Reviewed 1) Hazard Exposures, and 2) Impacts.
Mar 18, 2021	*Mitigation Strategies* - Discussion of 1) goals/objectives; 2) overview of approach to identify mitigation actions; 3) how we will prioritize mitigation actions; and 4) need to identify implementation plan for actions.
Apr 15, 2021	*Mitigation Strategies* - Discussion of New Projects.
May 20, 2021	*Status Update* - Recap of previous meetings and data needs. Also discussed next steps.
Sep 24, 2021	*Mitigation Strategies/Administrative Plan* - Discussion of 1) feasibility assessment, 2) Implementation Plan; and 3) Plan Administration section.
Oct 22, 2021	*Draft Plan* - Reviewed draft LHMP.
Dec 3, 2021	*Draft Plan* - Reviewed of Public Comment on draft LHMP.
May 31, 2022	*Draft Plan* - Review of Cal OES/FEMA Comments on draft LHMP.

In addition to Task Force meetings, the District held campus-specific meetings with campus representatives to discuss some key aspects of the plan. While a variety of topics were discussed during these campus meetings, the purpose of the meetings was to focus on 1) validation of hazards, 2) identification of key assets; and 3) identification of mitigation actions. Below is a summary of the campus-specific meetings (**Table 2.3**):

Table 2.3– Campus-specific Meetings

Date	Focus Activity
Nov 16, 2020	*Existing Conditions* - Reviewed 1) Hazard, 2) hazard screening, and 3) key assets for Saddleback College.
Nov 17, 2020	*Existing Conditions* - Reviewed 1) Hazard, 2) hazard screening, and 3) key assets for Irvine Valley College.
Nov 17, 2020	*Existing Conditions* - Reviewed 1) Hazard, 2) hazard screening, and 3) key assets for ATEP.
Mar 24, 2021	*Mitigation Strategies* - 1) Reviewed Goals and Objectives; 2) discussion on approach and what is need; 3) discussion of potential Mitigation Actions for Irvine Valley College. Also, open discussion on other aspects of project.
Mar 25, 2021	*Mitigation Strategies* - 1) Reviewed Goals and Objectives; 2) discussion on approach and what is need; 3) discussion of potential Mitigation Actions for Saddleback College/District. Also, open discussion on other aspects of project.

Mar 25, 2021	*Mitigation Strategies* - 1) Reviewed Goals and Objectives; 2) discussion on approach and what is need; 3) discussion of potential Mitigation Actions for ATEP. Also, open discussion on other aspects of project.
May 25, 2021	*Mitigation Strategies* - 1) Confirmed hazards and priorities; 2) discussed mitigation actions for Saddleback College. Also, open discussion on other aspects of project.
May 27, 2021	*Mitigation Strategies* - 1) Confirmed hazards and priorities; 2) discussed mitigation actions for Irvine Valley College/ATEP. Also, open discussion on other aspects of project.

2.3 RECURRING COORDINATION WITH STAKEHOLDERS

Although SOCCCD is primarily emphasis is on education, there are several going meetings with stakeholders that are focused on emergency management. Below is an overview of some of those meetings:

- Orange County Sheriff- Police chiefs from both campuses meet with the Orange County Sheriff on a regular basis. The purpose of the meetings is to exchange ideas and information (i.e., programs, polices, resources), discuss challenges and opportunities, and provide status updates on current situations.
- Irvine Valley College has regular Crisis Management Team (CMT) meetings to discuss, train and plan on matters related to emergency preparedness. The mission of the CMT is to maintain the state of readiness and resilience of the campus community. The CMT mobilizes in the EOC to respond to the crisis once life safety issues have become manageable to provide command and control in the Crisis Management and Business Recovery phases.
- As part of a five (5) year agreement, the SOCCCD coordinates with the University of California at San Diego (UCSD) on the High-Performance Wireless Research Network (HPWREN) operation. Part of this agreement is to provide space to install a radio frequency antenna and receiver.

2.4 STAKEHOLDER MITIGATION RELATED PLANNING RESOURCES

To ensure consistency within the region, the Task Force reviewed the state HMP and several LHMPs from surrounding jurisdictions. This list included:

- State of California- Hazard Mitigation Plan
- County of Orange- LHMP
- City of Irvine- LHMP
- City of Mission Viejo- (*was not made available to the Task Force*)
- City of Tustin- LHMP

While not technically considered a hazard mitigation plan, the Task Force also reviewed available Emergency Operations Plans (EOPs) and general plan safety elements from the local jurisdictions identified above. The value of reviewing EOPs is to understand how other communities within the region will respond to events and the type of equipment and facilities they will rely on. Whereas the general plan safety elements provide additional insight into hazards within the community and present a closer tie to community-wide goals and objectives. The Task Force was able to incorporate these considerations into the District's LHMP planning process.

Other stakeholder documents determined relevant to the mitigation effort included:

- Coast Community College District- LHMP
- Riverside Community College District- LHMP

2.5 PUBLIC OUTREACH

FEMA's LHMP guidance requires that the "*whole community*" be involved. A key element of FEMA's "*whole community*" concept is the general public. For the purposes of the LHMP, the public is defined as any person within the District not part of the Task Force. There were two different Public Outreach campaigns during the creation of the District's LHMP: the first informing the public of the development of the LHMP and the second educating the public of hazards and possible actions that can be taken to reduce the effects from hazards. Below is a summary of the campaigns:

2.5.1 LHMP AWARENESS CAMPAIGN

This campaign presents the strategy of how the District engaged the public during the development of the LHMP. The public outreach strategy worked in conjunction with the LHMP planning process and timeline. As the Task Force completed critical milestones, key information was disseminated to the public for consideration and input. In addition to the dissemination of material, the District held two public meetings: one at the start of the project; and, one at the end of the project.

This outreach strategy shared information about the project kickoff, hazards and potential impacts within the community, current mitigation capabilities, and proposed mitigation actions. Key information was shared by the Task Force, via District websites, and through presentations at the public meetings. Comments were collected during the process and shared with the larger Task Force. Meeting announcements were shared through social media platforms (Facebook, Twitter, Instagram, LinkedIn) and through the District and campus websites. Due to challenges from the COVID-19 pandemic, all Public Outreach meetings were virtual.

In October 2020, the District announced the commencement of the LHMP project and the date of the Public Outreach meeting on the District websites, via mass emails, and through social media. The Public Outreach meeting was held November 19, 2020. During the meeting the consultant provided an overview of mitigation and discuss why the District was undertaking this project. Also, during the meeting, the LHMP planning process was reviewed, along with

the list of Task Force members and the hazards identified for inclusion in the LHMP. The public was invited to contact the District if they wished to be considered to join the Task Force.

A second Public Outreach meeting was held on December 7, 2021, to recap past efforts and invite comments on the draft LHMP. During the meeting, a great deal of time was spent on presenting the proposed mitigation actions. Similar to the first public meeting, announcements were widely distributed on the District websites, via mass emails, and through social media. The public announcements and presentations for both meetings can be found in **Appendix C**.

Both Public Outreach meetings were well attended. This was partially due to the virtual meeting platform, which provided easy accessibility. Of the few comments that were received, most were requests for clarification on the information presented or to demonstrate support for inclusion of certain hazards. All public comments were shared with the Task Force; and revisions were incorporated into the LHMP where appropriate.

2.5.2 MITIGATION AWARENESS CAMPAIGN

The District intends to educate the public about hazards in the community, relevant programs to safeguard and protect the campuses against hazards, and actions the public can take to prepare themselves for catastrophic events and natural disasters. Details about the ongoing public hazard awareness efforts are covered under *Section 8 - Plan Maintenance*.

3 COMMUNITY PROFILE

The purpose of this section is to present an overview of the community to provide a common understanding of the existing conditions that impact the LHMP. Having a common understanding of the existing conditions is the basis for the Task Force to assess the impacts of hazards and identify mitigation actions. It helps the Task Force gain additional perspective, promoting consideration of potential challenges.

3.1 OVERVIEW

The District is a political subdivision of the state of California and is a multi-college district in Orange County, California. The District provides post-secondary educational services at Saddleback College (SC), Irvine Valley College (IVC), and the Advanced Technology and Education Park (ATEP). The District is part of the California Community College system (CCC).

The CCC was established in 1967 (California Education Code Title 3 Division 7). The law requires all areas of the state to be included within a locally-controlled community college district. The CCC is governed by an 18-member Board of Governors, which sets system-wide policies. The Board of Governors represent the public, faculty, students, and classified employees and is administered by the CCC Chancellor's Office located in Sacramento. The Chancellor's Office is responsible for consulting with districts, allocating state funding, and providing policy, leadership, and technical assistance to the districts.

The District is one of 73 community college districts in California and one of four districts in Orange County. The District is governed by a Board of Trustees, elected by voters in south Orange County. The Board of Trustees oversees all academic programs and educational services by establishing policies to ensure the quality, integrity, and effectiveness of the student learning programs and services, and the financial stability of the campuses. The District is managed by a Chancellor, who acts as the Chief Executive Officer (CEO) of the District, overseeing district-wide operations.

IVC and SC are both fully accredited and offer programs with transfer opportunities to four-year colleges and universities; associate degrees; certificate awards; employment and occupational skills training; and community and basic skills education. Each college is led by a college President. ATEP is a new, developing campus shared by both colleges to provide opportunities to study advanced technology and complete career, technical, and workforce development training programs for employment in high demand industries.

3.2 LOCATION

The District service area covers 382 square miles and is the largest, by area, of the four community college districts in Orange County. It serves nearly one million residents across 26 communities including Aliso Viejo, Dana Point, Irvine, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Newport Beach, Rancho Santa Margarita, San Clemente, San Juan Capistrano, Tustin, parts of Santa Ana; and the unincorporated

communities of Coto de Caza, Emerald Bay, Ladera Ranch, Las Flores, North Tustin, Trabuco Canyon, and Trabuco Highlands (**Figure 3.1**).

Figure 3.1- District Service Area

ATEP is located at 1624 Valencia Avenue, Tustin, CA 92782, just between US Interstate 405 (San Diego Freeway), the US Interstate 5 (Santa Ana Freeway), and State Highway 55 (Costa Mesa Freeway). There are several access points to enter ATEP (**Figure 3.2**).

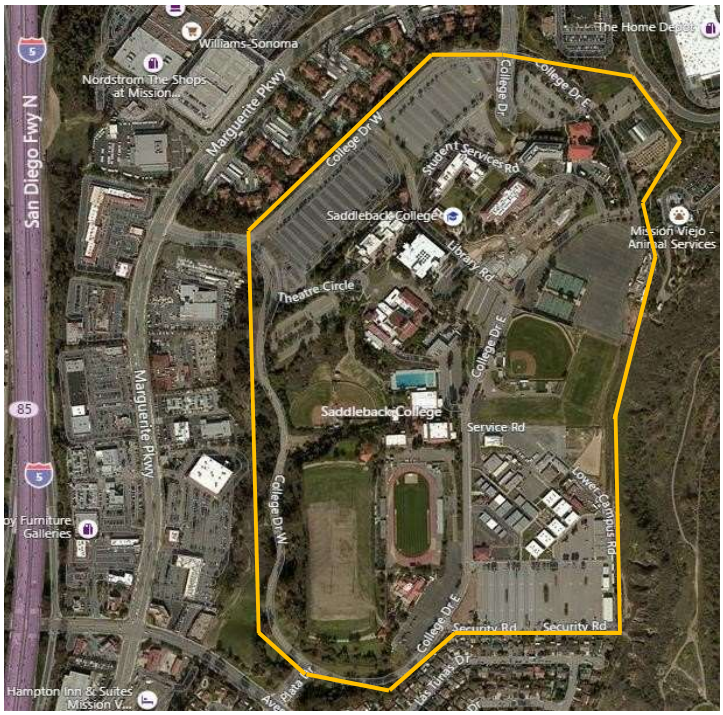
Figure 3.2- Map of ATEP

The IVC campus is located at 5500 Irvine Center Drive, Irvine, CA 92618, just northwest of the intersection of US Interstate 5 (Santa Ana Freeway), US Interstate 405 (San Diego Freeway) and State Route 133 (Laguna Freeway). There are several access points to enter the college. The main entrance to the college is off Irvine Center Drive (**Figure 3.3**).

Figure 3.3- Map of Irvine Valley College

The SC campus is located at 28000 Marguerite Parkway, Mission Viejo, CA 92692, just east of US Interstate 5 (Santa Ana Freeway) near the intersection with State Route 73. There are several access points to enter the college (**Figure 3.4**).

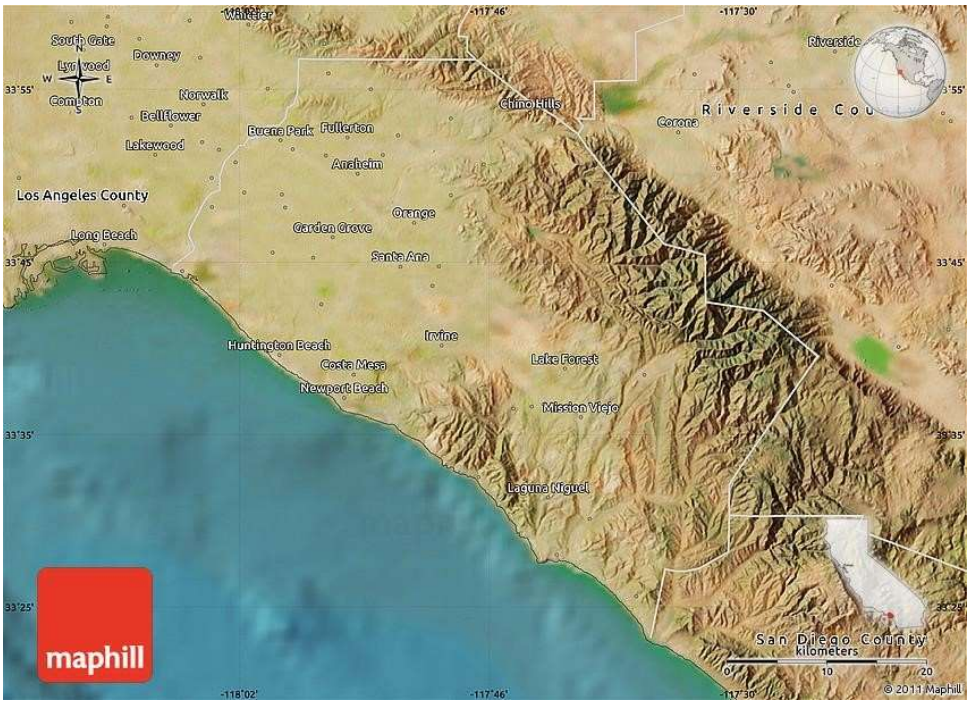
Figure 3.4- Map of Saddleback College



3.3 GEOGRAPHY

The geography of Orange County is dominated by three (3) major features: the coastal plain of the Los Angeles basin in the north and west, the Santa Ana Mountains and foothills in the south and east, and the coastline of the Pacific Ocean to the southwest **(Figure 3.5).** The coastal plain rises into the Santa Ana Mountains, which lie within the boundaries of the county and of the Cleveland National Forest. The high point is Santiago Peak (5,687 ft./1,733 m), about 20 mi (32 km) east of Santa Ana. Santiago Peak and nearby Modjeska Peak, just 200 feet shorter, form a ridge known as Saddleback, visible from almost everywhere in the county. The northern part of the county is located on the coastal plain of the Los Angeles Basin, while the southern half lies in the foothills of the Santa Ana Mountains. Most of Orange County's population resides in one of two shallow coastal valleys in the basin, the Santa Ana Valley and the Saddleback Valley.

Figure 3.5- Orange County Topological Features



The Santa Ana River is the county's principal watercourse. Its major tributary running through the county is Santiago Creek. Other watercourses within the county include Aliso Creek, San Juan Creek, and Horsethief Creek. The San Gabriel River also briefly crosses into Orange County and exits into the Pacific on the Los Angeles-Orange County line between Long Beach and Seal Beach. Laguna Beach is home to the county's only natural lakes, Laguna Lakes, which are formed by water rising up against an underground fault.

3.4 HISTORY

The District was established in 1967 and opened in 1968. The first buildings constructed were on the SC campus and included the District Services offices. In 1971, SC received

accreditation by the Western Association of Schools and Colleges. During the 1970s and 1980s, SC carried on a major construction program, beginning with the Library, completed in 1973. The Science/Math building (1974) was next, followed by the Physical Education/Athletics and Fine Arts complexes (1977), the Business/General Studies building (1986), the Technology/Applied Science building (1989), and the Student Services Center (1990). The Health Sciences building was opened in spring 2005.

In 1979, IVC was established as a satellite campus to SC as the South Orange County area experienced significant population growth. The original campus site was 20 acres and included a cluster of buildings located on the northwest quadrant of the site (currently known as the A Quad). Responding to continued growth in the community and expansion of academic services throughout the 1980s, IVC established independent college status in 1985 and became an accredited institution in 1989. Today, the main campus has expanded to 100.4 acres and contains roughly 466,000 square feet of academic, student services, and support building space.

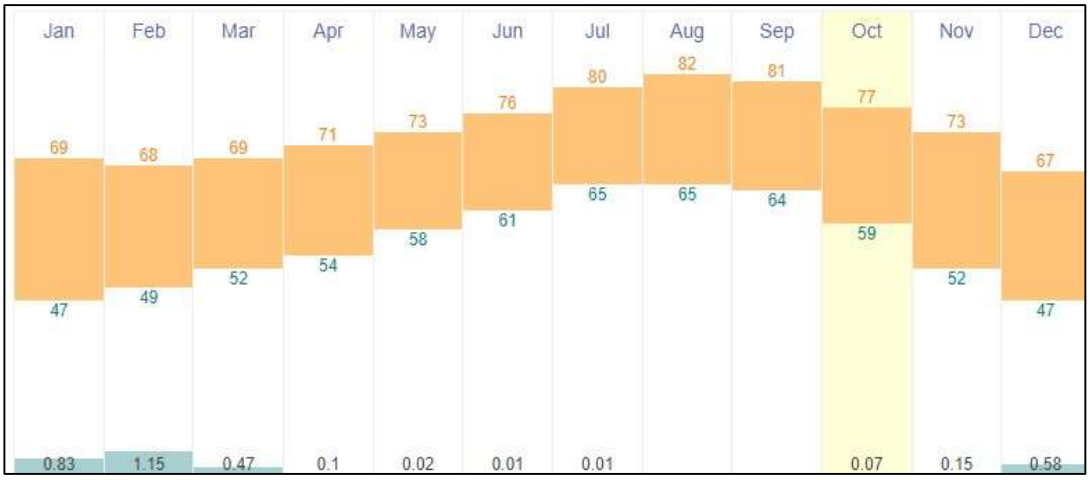
In 2007, the District opened ATEP, which provides opportunities to study advanced technology and complete career, technical, and workforce development training programs for high demand industries. ATEP is located at what was formerly the Marine Corps Air Station Tustin (MCAS Tustin). When the United States Government - Department of the Navy decommissioned MCAS Tustin, the City of Tustin was designated as the local redevelopment agency (LRA). As the LRA, the City obtained approval of a reuse plan for the base. The plan coined the term “Tustin Legacy” and was approved by the United States Government - Department of the Navy. Under Tustin Legacy, the District received 61.4 acres of the former base. The vision of this site is to develop a combination of classrooms, labs, and offices. In December 2011, both IVC and SC presented their ideas for the ATEP Site. The first building to open on ATEP was IVC’s Integrated Design, Engineering and Automation (IDEA) Building in 2018. SC is in the design approved phase for a building focused on advanced transportation, logistics, culinary, and hospitality program on this site.

Since the 1970s, the District’s enrollment has grown from 3,025 to approximately 32,000 students.

3.5 CLIMATE

The climate in the District service area is a semi-arid Mediterranean climate with mild temperatures and sunshine most of the year with average highs during the summer in the mid-80s and lows in the winter in the high 40s (**Figure 3.6**). The warm season lasts for about three months, from July to September, with an average daily high temperature above 81°F. The hottest day of the year is usually in August, with an average high of 85°F and low of 65°F. The cool season lasts for about four months, from November to March, with an average daily high temperature below 70°F. The coldest day of the year is in December, with an average low of 45°F and high of 67°F. The annual rainfall average is 3.39 inches. The rainy period of the year usually lasts from October to April, with a running 31-day rainfall average of at least 0.5 inches. The most rain falls during February, with an average total accumulation of 3.0 inches.

Figure 3.6- Average Annual Temperatures and Precipitation



The areas within the District service area next to the ocean, commonly experience nighttime and morning clouds, especially in the months of May and June. Though the weather in the area is moderate, there are episodes of extreme weather. The Santa Ana winds blowing from inland are hot, dry, high velocity wind events that result in temperatures exceeding 90°F (32°C) with wind speeds of over 40 mph. These events usually happen in the cooler months starting in October but can happen into the summer months. The area also experiences occasional intense rain and wind events. Some of those events during the summer months are caused by the southwest monsoon weather pattern. This weather pattern includes thunderstorms and heavy localized rain.

3.6 DEMOGRAPHICS

The District has conducted extensive demographic research within the service area and on each campus. The results of this research are captured in the *SOCCCD Environmental Scan Report 2019* and subsequently in other Districtwide plans.

As presented in the *SOCCCD Environmental Scan Report 2019*, the population within the District service area (975,000 people) represents about one-third of the total population of Orange County (nearly 3.2 million people). Within the District service area, more than one-fourth of residents live in the City of Irvine; the next largest cities include Mission Viejo (10% of service area residents), Newport Beach (9%), and Lake Forest and Tustin (8% each). Below are some additional, relevant demographics presented in *SOCCCD Environmental Scan Report 2019*:

- **Age**
  - School age children (between 5 to 17 years old) make up about 16 percent of the District population and the broader Orange County population as well.
  - About 9 percent of residents are in the traditional college age cohort (18 to 24 years old), while 54 percent are working age adults.
  - Seniors (age 65 and older), make up about 15 percent of the population.

- **Ethnicity**
  - More than half of residents in Orange County are Asian or Latinx (of any race); about forty percent identify as white.
  - While the District holds a similar ratio of Asian residents as Orange County population, nearly 60 percent of its residents are white.
  - The District has about half the rate of Latinx residents as the County as a whole.
- **Households**
  - The District has fewer average people per household (2.6) than Orange County and the California statewide average (Both 3.0 people per household).
  - Using averages, employees in Orange County have a longer commute time (26.4 minutes) than the normal US worker (25.7 minutes); with an average annual cost of more than $14,000.
  - 3.04 percent of the workforce in Orange County have commutes in excess of 90 minutes.
- **Income and Poverty**
  - District median household income of $97,891 is considerably higher than the Orange County average of $81,851 and much higher than the statewide average of $67,169.
  - The District has a lower percentage of households living in poverty (9%) compared to all of Orange County (12%) and California statewide rates (15%).
- **Demographic information specific to the District and its campuses include**
  - The student population is approximately 36,319
    - 24,733 SC
    - 14,152 IVC (including ATEP)
  - At least 83 percent of enrolled students live within the service area.
  - One in five students (20 percent) live in the City of Irvine.
  - More than 11 percent of District students are residents of Mission Viejo.
  - Both colleges are experiencing an increase in enrollment among older adults and high school age students.

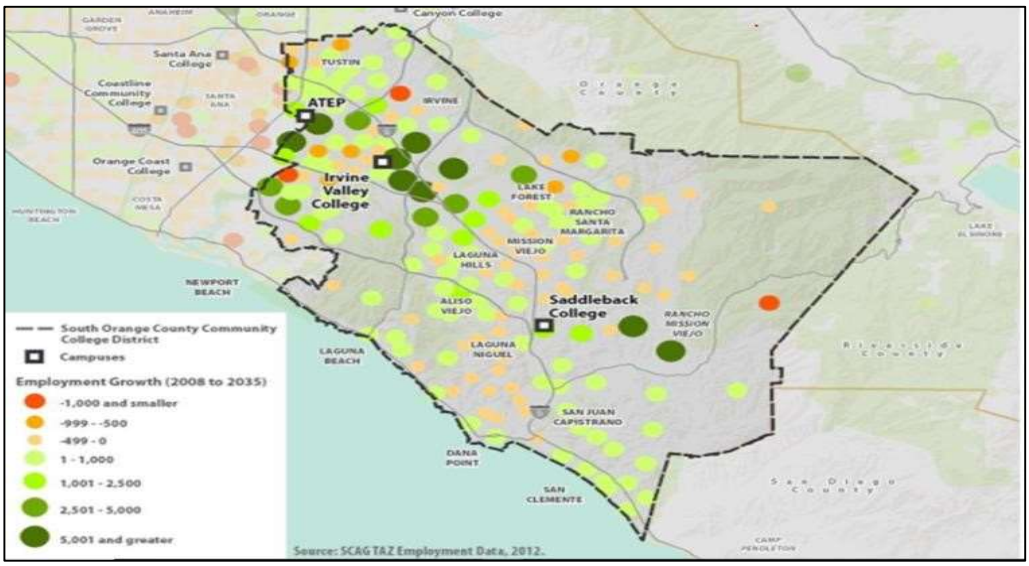
3.7 ECONOMY

The economy within the District service area is strong and employment is projected to grow by nearly 17 percent, with 100,000 new jobs expected by 2035. From 2017 to 2018, employment in Orange County grew at a rate of 0.386 percent, to 1.61 million employees. The most common jobs held by residents of Orange County are Sales & Related Occupations, Management Occupations, and Office & Administrative Support Occupations. Within the District service area, more people are employed in professional and technical services occupations than in other areas of the county.

The District service area median household income of $97,891 is considerably higher than the Orange County average of $81,851 and much higher than the statewide average of $67,169. Median home values are 6 percent higher and rental costs are 18 percent higher in cities within the District than elsewhere in Orange County; By comparison, median home values and rents within the District are nearly 50 percent higher than statewide values and rents.

Emerging industries in the region include those connected to the green economy and businesses involved in the integration of IT and health care. In Southern California, growth in the health care sector over the next decade is expected to create an additional 330,000 jobs in the region. The logistics sector (transportation and warehousing) is projected to grow by 22 percent, adding 81,000 jobs. Hospitality (accommodation and food services) will grow by 15 percent, about 113,000 new jobs. **Figure 3.7** depicts the projected employment growth areas in Orange County. Orange County employment growth projections mirror some of the broader regional trends, with health care, hospitality, and administrative support services sectors projected to grow the most over the next decade. Key industry clusters in Orange County and Southern California include information technology, digital media, and data analytics; biotech, including bioscience research, biopharmaceuticals, and medical device manufacturing; health care services; and professional and technical services. The region is also a hotbed for action sports companies and has large and growing tourism and hospitality industries.

Figure 3.7- Predicted Employment Growth



The District is well positioned to support these economic projections, either with existing curriculum or with its ability to expand curriculum to match demand. This will include understanding the potential shift in the classification of job openings (mid class) and understanding the shift in the nature of work. Nearly a third of all new job openings in the coming years will require “middle skills,” education, and training beyond a high school diploma: such as associate degrees or certification awards, occupational licensing, or apprenticeship opportunities. By 2025, the state of California is likely to face a shortage of more than a million workers with some postsecondary training. Retirements will lead to increased numbers of

openings in middle-skill jobs. The advances of tech-infused workplaces require workers who understand how to use technology and data, and who are flexible and adaptable as industries and work evolves.

3.8 EXISTING LAND USE

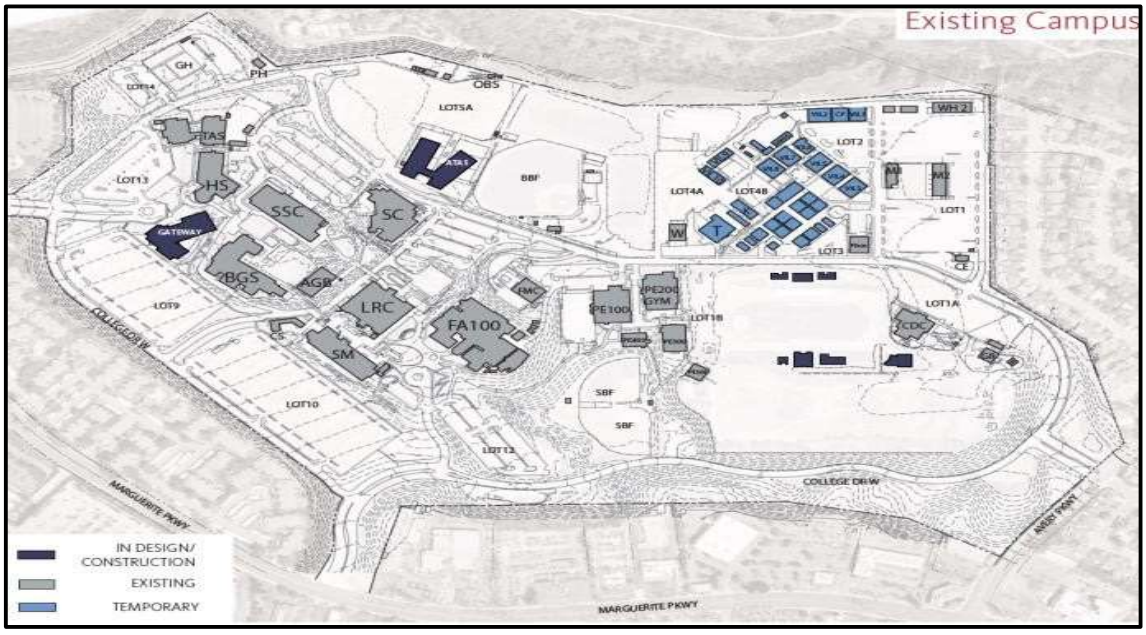
The District has authority over all uses of land on its campuses: ATEP, IVC, and SC. The District works closely with local cities and provides feedback on proposed land use that have the potential to impact the District service area.

Land use on the campuses is guided by a District-wide Facilities Master Plan (FMP). The FMP has been developed to serve as a guide for future development. The recommendations described in the FMP are conceptual and highlight the location and purpose of proposed improvements. The final design of each site and facility project will take place as these projects are funded and detailed programming and design occurs. Below is a summary of land use on each campus:

3.8.1 SADDLEBACK COLLEGE

SC is approximately 200 acres, bounded by both residential and commercial development and a dedicated natural open space area. The campus contains roughly 803,000 square feet of academic, student service, and support building space, along with approximately 41,000 square feet of District Services space. The campus has 30 permanent structures for academic, administrative and facilities functions, athletic fields, parking lots, stadium, and 37 portable buildings identified as “The Village”. The existing land use on Saddleback College is shown in **Figure 3.8**.

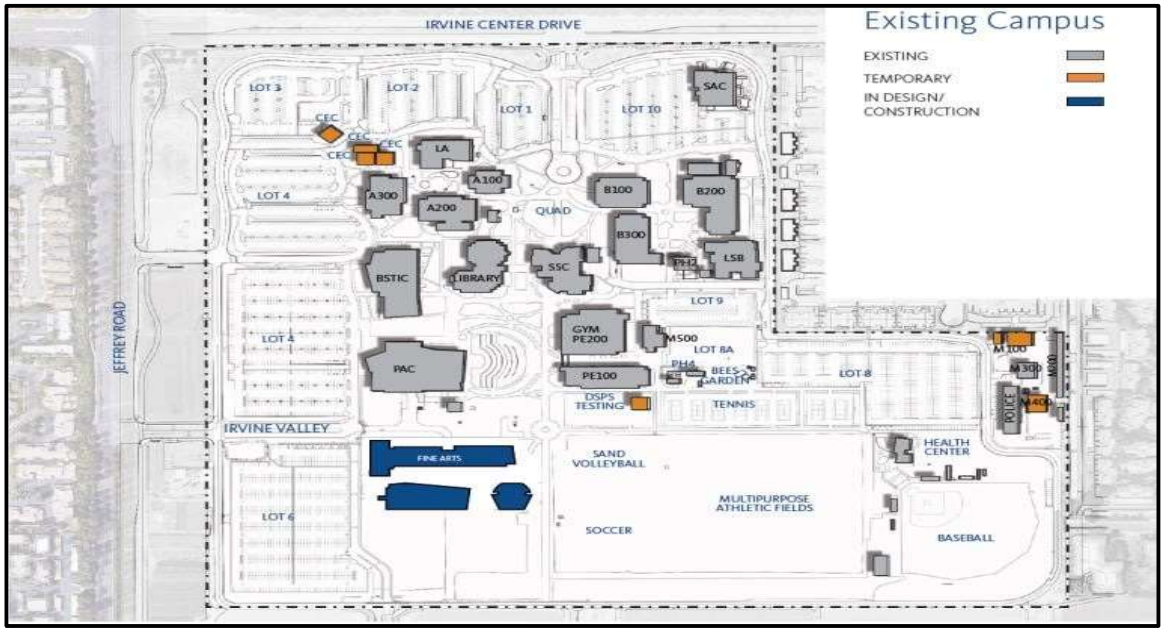
Figure 3.8- Existing Land Use on Saddleback College



3.8.2 IRVINE VALLEY COLLEGE

IVC is approximately 100 acres and contains roughly 466,000 square feet of academic, student service and support building space. The campus also contains 25 permanent structures, athletic fields, and parking lots (**Figure 3.9**). Note that the IDEA building, while counted under the Irvine Valley College structure and square footage totals, is located at ATEP and hence discussed under the ATEP section.

Figure 3.9- Existing Land Use on Irvine Valley College



3.8.3 ADVANCED TECHNOLOGY AND EDUCATION PARK

The Advanced Technology and Education Park (ATEP) is a 61.42-acre site (**Figure 3.10**) shared by both IVC and SC. The only structure currently on the ATEP site is the Integrated Design, Engineering, and Automation (IDEA) Building. The IDEA Building is managed by IVC and contains over 32,000 square feet of academic, student services, and support building spaces. SC intends to construct a building on the ATEP site, and construction is slated to begin in 2023. The building will be for programs focused on advanced transportation, logistics, culinary arts, and hospitality.

Figure 3.10- Existing Land Use on ATEP

3.9 DEVELOPMENT TRENDS

The District has experienced a relatively steady growth in infrastructure over the past few years, consistent with the service areas. This trend is expected to continue over the next five (5) years. Future development is approved and inspected by the Department of General Services, Division of the State Architects (DSA). DSA ensures compliance with the California Education Code, which emphasizes the need to adhere to the Field Act and/or California Building Standards Code. DSA also works with local Fire Marshalls on new construction. It is noteworthy that each of the partner jurisdictions (Irvine, Mission Viejo, Tustin, and Orange County) have their own LHMP with components (i.e., General Plans, Building Codes, Zoning) that may be utilized during local permitting and inspections.

As referred above, development is guided by the District's FMP. The FMP was driven by the District's Education Master and Strategic Plan, which is made up of the District-wide Strategic Plan (DWSP) and the colleges' Education Master Plans (EMP). Guiding considerations in the development of these plans included:

- *Growing Population*- The population within the District service area is projected to grow at a rate of 4 percent from 2020 to 2035, approximately 39,000 new residents. Nearly all the projected growth is estimated to take place in the City of Irvine, which may grow by 15 percent.
- *Declining School Age Enrollment*- Orange County's school-age enrollments are projected to decline sharply by 2025, mirroring larger statewide trends following declines in birthrates after the Great Recession. There will be 40,000 fewer K-12 enrollments in Orange County in 2027 than there were in 2017, a loss of nearly nine percent of school age students.

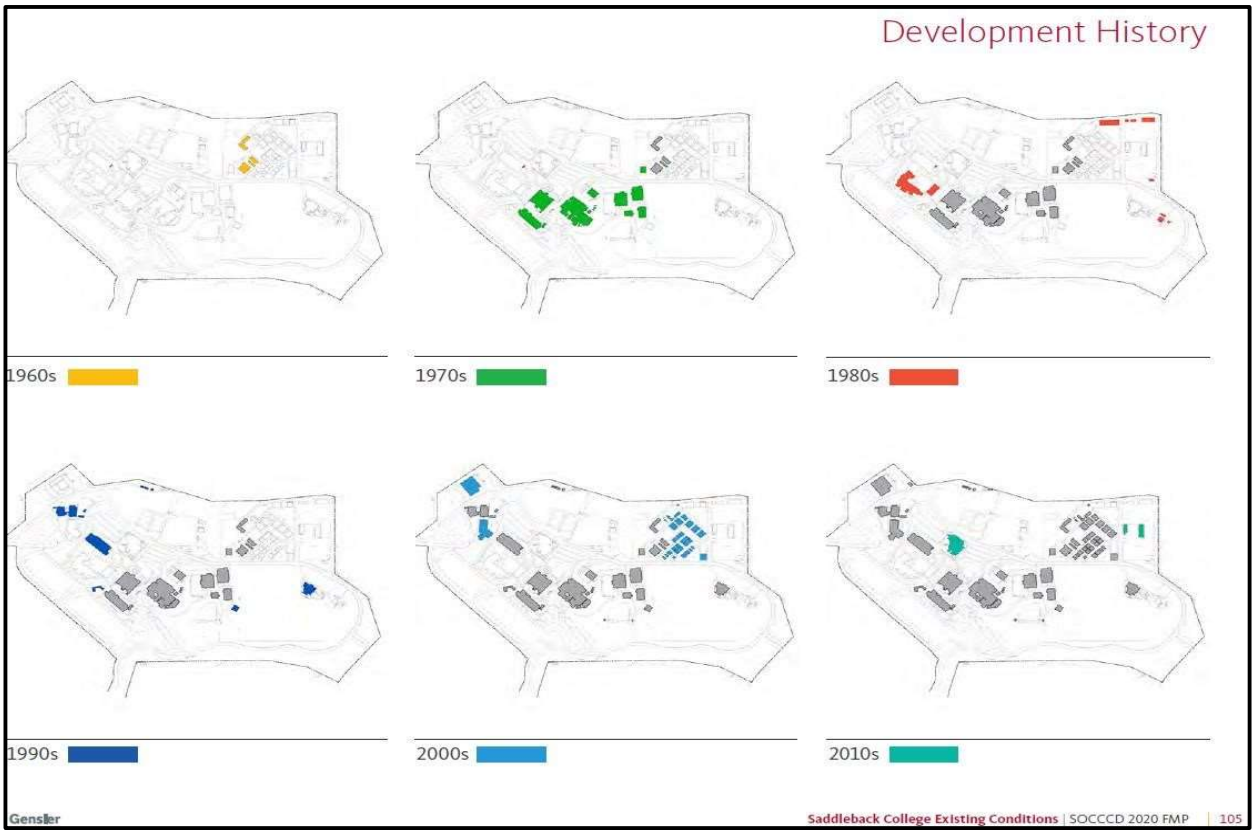
- *Growing Ethnic Diversity*- Southern California will be a majority Latinx/Hispanic region by 2025. By 2060, 40 percent of the population will be Latinx/Hispanic, and 25 percent will be Asian.
- *Aging Populations*- Growing older adult populations may lead to an expansion in health care services and related fields.
- *Instruction Methods*- The number of District students taking online classes has grown 26 percent since 2013. 20 percent of students take classes via multiple methods of instruction. Rates of retention and success are improving among online students, though success rates still fall below traditional classroom outcomes.

Based on these and other considerations, the college FMPs present the anticipated future development of each campus. Below is a summary of the development trends for each campus:

3.9.1 SADDLEBACK COLLEGE

Figure 3.11 provides a summary of the development pattern for SC since its opening in 1968.

Figure 3.11- Saddleback College Development History



The FMP identifies projects and future development of the campus based on considerations and projected needs. There is a tentative timeline for the development, but it will be realized as funding becomes available. **Figure 3.12** depicts the potential future development of SC.

Figure 3.12- Saddleback College Proposed Development

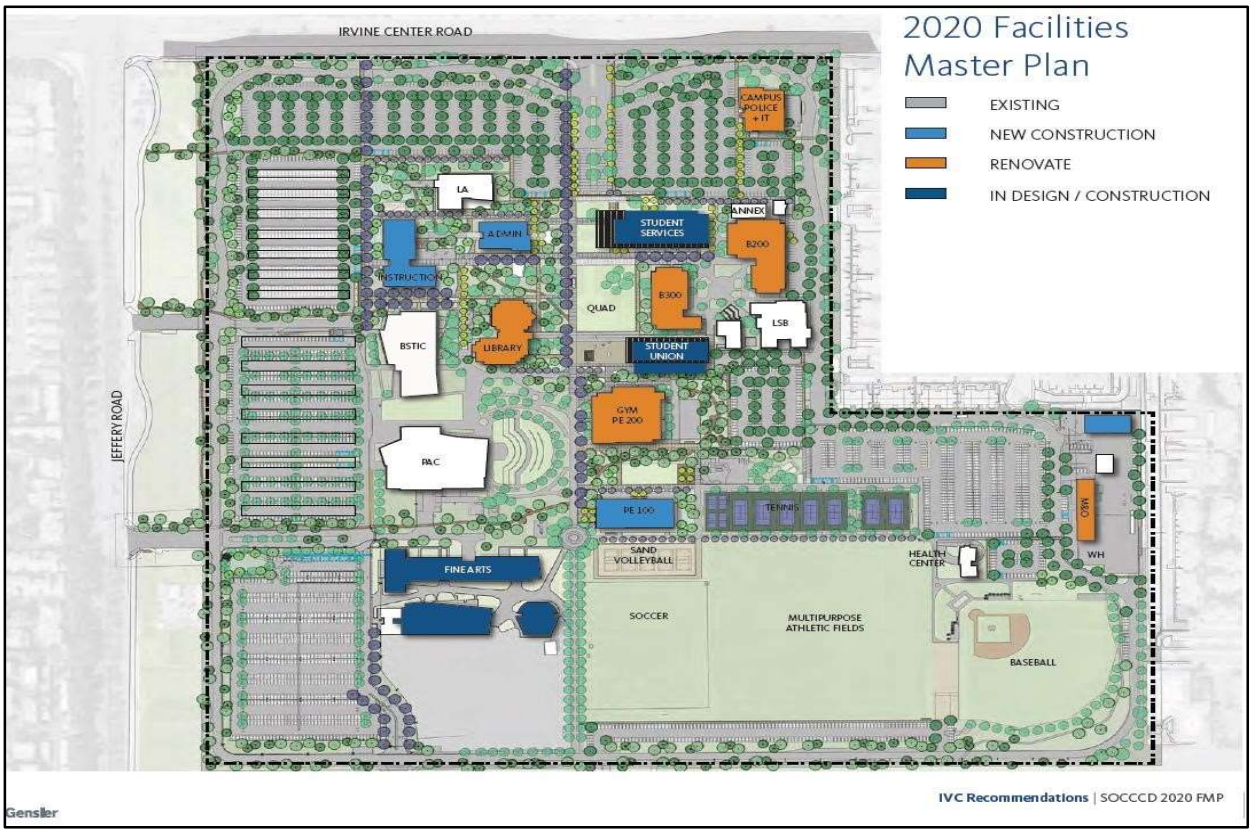
3.9.2 IRVINE VALLEY COLLEGE

Figure 3.13 provides a summary of the development pattern for Irvine Valley College since its opening in 1979.

Figure 3.13- Irvine Valley College Development History

The FMP identifies projects and future development of the campus based on considerations and projected needs. There is a tentative timeline for the development, but it will be realized as funding becomes available. **Figure 3.14** depicts the potential future development at IVC.

Figure 3.14- Irvine Valley College Proposed Development



3.9.3 ADVANCED TECHNOLOGY AND EDUCATION PARK

The District created the ATEP Development Framework to help guide development on the campus. There is a tentative timeline for the development, but it will be realized as funding becomes available and is allocated.

The Development Framework is not about creating a finite plan. Instead, it serves as a high-level guide for the build out and embraces the unique opportunity for creating educational and commercial partnerships. The Development Framework recommends four (4) planning efforts to begin implementation: 1) create design criteria; 2) define the CC&R's; 3) identify best practices for sustainable building, management, and operations; and 4) study parking and transportation needs. A series of phasing assumptions was provided to guide the orderly development of the ATEP Site. Phase 1 includes the development of two 30,000 square-foot (gross area) buildings for the colleges and an 80,000-square-foot partner facility. Phase 2 includes an additional 170,000 square feet of non-educational space. Phase 3 adds 201,000 square feet of educational space. Phase 4 adds 294,000 square feet (gross area) of buildings for the colleges and 290,000 square feet of non-educational space. **Table 3.1** depicts the phasing scenario and **Figure 3.15** depicts the potential future development of ATEP.

Table 3.1- ATEP Phasing Scenario

	PHASE 1		PHASE 2		PHASE 3		PHASE 4/BUILD OUT
BUILDING (GROSS SQUARE FEET)	TOTALS	BUILD	TOTALS	BUILD	TOTALS	BUILD	TOTALS
EDUCATIONAL	60,000	0	60,000	201,000	261,000	294,000	555,000
NON-EDUCATIONAL	80,000	170,000	250,000		250,000	280,000	530,000
TOTALS	140,000		310,000		511,000		1,085,000

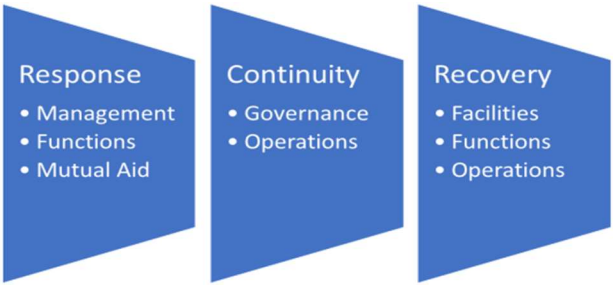
Figure 3.15- ATEP Build Out

3.10 KEY ASSETS

This section provides an overview of the assets critical to ensuring continuity of operations, an efficient response, and a rapid recovery from emergencies and disasters. While the District makes every effort to protect all lives and property ahead of hazards, the key assets are *things* that are needed in the aftermath of hazard events. While a large focus is on buildings (i.e., Police Station, Emergency Operations Center- *EOC*, etc.), the list can (and should) include other elements (i.e., back-up generators, communication equipment, etc.).

The Task Force identified a list of assets essential to the District. The following figure (**Figure 3.16**) was used to guide and orient the Task Force, ensuring a common understanding of key asset.

Figure 3.16- Key Asset Considerations



Under *Response*, the District and each campus considered needs to ensure they were able to manage the immediate response after a catastrophic event or natural disaster. This required consideration of the District and College Emergency Operations Plan (EOP). An EOP usually provides an outline of the organizational structure and the response Concept of Operations. EOPs lay out where coordination will take place (i.e., EOC), how communications will occur, and what actions will be performed. This could also include any mutual aid that the District may provide to others or require from others.

Under *Continuity*, the District and each campus considered needs to ensure they were able to provide and maintain primary functions (i.e., governance, operations). This required consideration of the District and each colleges' draft Business Continuity Plans (BCP). A BCP usually provides an outline of each primary function that needs to be maintained and identify how it will be maintained, including a contingency to maintain the operations, and who is responsible. The focus is on safeguarding vital records and protection of personnel, facilities, and resources.

Under *Recovery*, the District and each campus considered needs to ensure they were able to return to normal (recover) rapidly and efficiently after hazard events. Recovery Plans provide insight to both short-term and long-term efforts and needs. The District and the campuses do not have Recovery Plans as of yet. Based on these considerations, the District and the campuses have identified a list of Key Assets. It is important to note that this list is a dynamic list and will change as new needs are identified or existing needs are re-evaluated. The list of Key Assets can be found in **Appendix D**.

4 CAPABILITY ASSESSMENT

The purpose of this section is to capture the different capabilities (i.e., resources) available to the District in support of its mitigation efforts. To efficiently demonstrate these, resources have been organized into the following subsections: Personnel Resources; Mitigation Governance Resources; Technical Resources; and Fiscal Resources.

4.1 PERSONNEL RESOURCES

This subsection demonstrates the District's capability to dedicate and/or assign, long-term or short-term workforce to mitigation efforts. There are five primary ways the District can provide personnel resources: 1) directly from the District's current workforce; 2) through contracts, 3) through volunteer organizations; 4) through mutual aid; and, 5) through partnerships.

4.1.1 EXISTING STAFF

The District's organizational structure enables each campus (Irvine Valley College, Saddleback College, and ATEP) to operate independently but with some oversight and support from District Services (i.e., Chancellor, Human Services, Business Services, Technology & Learning Services, Public Affairs). Within each campus and the District Services there is a hierarchical organizational structure, including the relationship between each campus and District Services. Additionally, although each campus produces campus-specific plans (i.e., Education Master Plans, Emergency Operations Plans), District Services leads efforts on Districtwide plans and planning efforts (i.e., Strategic Plan, Facilities Master Plan, Technology Master Plan) when the situation calls for a Districtwide approach and perspective.

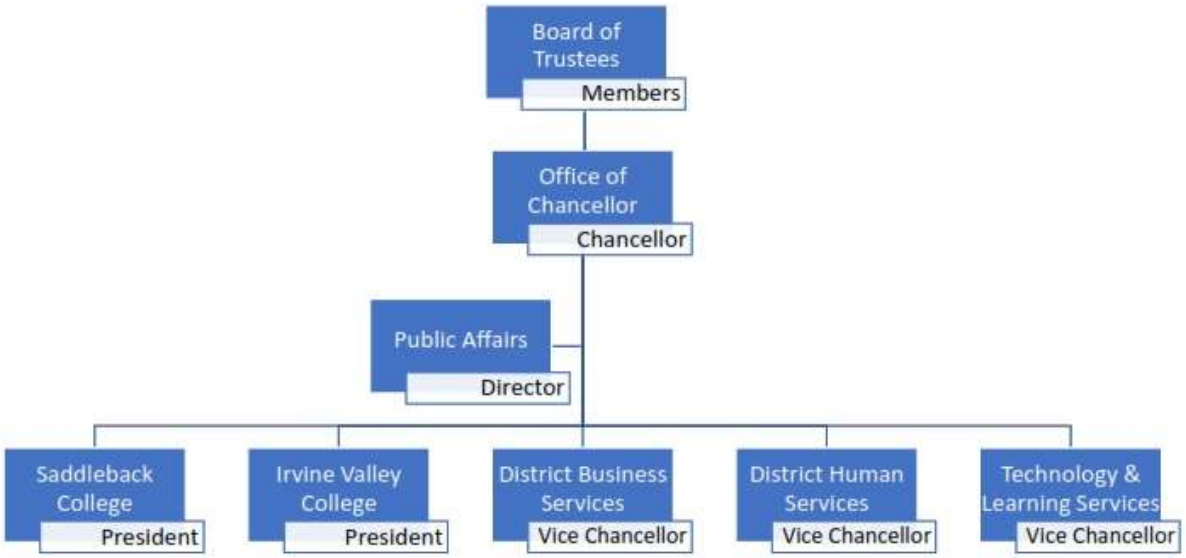
Based on this, the Districts Emergency Management practices are a combination of each campus outlining the methodology and needed resources to implement functions/services needed to prepare for (prevent, protect), respond to, recover from, and mitigate against threats and hazards with guidance and support from District Services. The LHMP is an example of this dynamic. The LHMP is districtwide plan with District Services providing guidance and oversight towards development and maintenance of the LHMP pursuant to the funding allocation process identified in Board Policy and Administrative Regulation 6210 - Basic Aid Funds Allocation Process; while the individual mitigation planning, implementation, including grant funding application efforts are the responsibility of the respective colleges' Vice President of Administrative Services. Because of this relationship, resources could be pulled from the campuses or District Services to support mitigation efforts. The following is an overview of personnel resources for District Services and each campus.

SOUTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT

As mentioned in Section 3 - Community Profile, the District is governed by a Board of Trustees and the Board has delegated authority to the Chancellor to effectively lead and manage the District. The Chancellor manages all centralized district-wide services and supervises the Irvine Valley College (IVC) and Saddleback College (SC) Presidents (**Figure 4.1**). The District

and each campus play a role in emergency management (Preparedness, Response, Recovery, and Mitigation).

Figure 4.1- District Organizational Structure



Below is a summary of the District Services personnel and their roles and responsibilities:

Board of Trustees- The Board oversees all academic programs and educational services by establishing policies to assure the quality, integrity, and effectiveness of the student learning programs and services, as well as the financial stability of the colleges and the District. The Board governs on behalf of the citizens of the District, in accordance with the authority granted and duties defined in Education Code Section 70902. Per District Board Policy 2200, the Board's commitment is to:

- Establish the mission of the District.
- Ensure the development and implementation of short-term and long-term educational, facilities and technology plans.
- Ensure fiscal health and stability.
- Monitor institutional performance, effectiveness and educational quality; including approving curriculum and programs.
- Delegate authority to the Chancellor/Chief Executive Officer to effectively lead and manage the District.
- Work respectfully with the Chancellor and the District/College faculty and staff.
- Offer suggestions and refer concerns to the Chancellor.
- Work respectfully with other Board members.
- Hire and evaluate the Chancellor.
- Advocate for and protect the District.

- Establish policies that implement the College and District mission and goals, and set prudent, ethical, and legal standards for college and District operations, and
- Represent the interest of the public.

Office of the Chancellor- The Office of the Chancellor includes the Chancellor, District Director of Public Affairs and Government Relations, District Director of Chancellor and Board Operations, and Office of the Chancellor and Trustee Services Manager. The Chancellor acts as the Chief Executive Officer (CEO) of the District, overseeing district-wide operations, including a $1.1 billion operating budget and nearly 4,000 employees. The Chancellor manages all centralized district-wide services (Business Services, Human Resources, and Technology and Learning Services) and oversees each of the College Presidents. California Education Code Section 70902(d) and Board Policy 2430 (Delegation of Authority to the Chancellor) defines the Board's delegation of authority to the Chancellor. The Chancellor has full authority and responsibility for the proper conduct of the business and educational programs of the District. The Board specifically authorizes the Chancellor to perform the following functions:

- Hire employees for the district, subject to ratification by the Board.
- Authorize and direct employees of the District to incur travel expenses, including but not limited to mileage to conduct District business, including conference travel, within the limits and budget requirements.
- Sign applications for funds and contracts (under $200,000) for the District, subject to ratification by the Board. In emergencies, the Chancellor, Vice Chancellor of Business Services, or designee may sign contracts over $200,000, subject to ratification.
- Establish and maintain the District's purchasing procedures according to Public Contract Code and other legal requirements.

Board Policy 3100 (Organizational Structure) further provides for the following:

- Participate in legislative actions or retain consultants to engage in legislative actions on behalf of the District.
- The Chancellor shall establish organizational charts that delineate the lines of responsibility and fix the general duties of employees within the District.
- For the District and the colleges to be governed and administered in an effective manner, it is necessary that lines of communication be established within the organization, so they allow for the orderly transaction of business.
- The Chancellor is authorized and responsible for organizing all District standing and ad hoc committees to assist in the operation of the District. Each college president is authorized and responsible for organizing college committees as needed to assist in college operations. Committee membership will be appointed by the appropriate constituent group.
- To support the Board of Trustees' stated philosophy concerning internal administration, it is the policy of the Board of Trustees that all matters called to its attention by District

personnel or by students shall be presented through the Chancellor. Conversely, the Board of Trustees shall direct appropriate matters through the Chancellor.

Business Services- Business Services includes: internal audit, fiscal services, accounting, employee benefits, payroll, risk management, facilities planning, procurement, and warehousing. Business Services strives to serve the colleges, students, and the community by working collaboratively to facilitate accomplishment of the college and District goals. Business Services does this by integrating professional expertise in the areas of fiscal services, facilities planning, internal audit, Workday/ERP training and support, Advanced Technology & Education Park (ATEP) development and partnerships, procurement, central services, and risk management, to design and implement working solutions to operational and academic challenges while maintaining the highest standards of integrity and professionalism. Business Services goals are to:

- Promote a sound, healthy, and compliant fiscal climate to support the colleges, students and community while ensuring good stewardship of public funds
- Innovate and implement new business processes to streamline and improve how the District constituents are served
- Identify, secure, and implement partnerships at ATEP
- Design, construct, and implement improved physical facilities to meet the programmatic needs of the colleges
- Develop, integrate, and encourage safe practices and working environments for the health and safety of the District's students, employees, and physical assets

Within the Business Services, is the Risk Management Department. The Risk Management Department plays a key role in mitigation that include:

- Measuring or assessing risk, then developing mitigation strategies
- Overseeing workers' compensation, property, and general liability programs
- Investigating and coordinating all claims with the District's third-party claims administrator and defense counsel
- Overseeing employee ergonomic evaluations and assessments
- Identifying hazards and safety issues and providing safety training
- Maintaining all Cal/OSHA mandated programs
- Managing accident insurance for classroom students and athletes

Another mitigation-oriented department under Business Services is Facilities Planning. The Facilities Planning Department:

- Plans and coordinates renovation and new construction projects
- Establishes specifications for bidding processes for construction and repair projects

- Assists in preparation of master plans for all campuses. Districtwide plans and studies available for review include:
  - Facilities Condition Assessment Reports
  - Parking Study
  - ADA Transition Report
  - Sustainability Report

Human Resources (HR)- HR includes human resource operations and employer-employee relations. The Vice Chancellor of Human Resources & Employer/Employee Relations oversees services to more than 4,000 employees in the areas of human resources and employee relations. The HR Department manages:

- Position classification and recruitment, selection and orientation of employees
- Wage and salary administration
- Coordination of annual employee evaluations and corresponding salary increases
- Leaves of absence
- Coordination of employee recognition and professional development programs
- Policies and practices to ensure they are in compliance with federal and state nondiscrimination and equal opportunity statutes and regulations
- Receipt and investigation of all complaints from employees and students related to harassment and other issues
- Collective bargaining and mediation
- Grievance, discipline procedures, and administrative hearings
- Interpretation and guidance to administrators and others in areas of negotiated agreements, board policies, and procedures

Technology and Learning Services- The Technology & Learning Services Department:

- Coordinates the development, delivery, and review of all educational programs and services offered in the District
- Coordinates technology services for academic and administrative functions
- Coordinates district and college research functions with a focus on promotion of student success
- Provides leadership and coordination in enrollment management and distance education programs
- Coordinates programs relationships with colleges, universities, local high schools, and regional occupational programs

- Coordinates workforce preparation programs in cooperation with regional businesses/industry
- Chairs the committees and task forces that address issues including academic calendar, student information system, district planning, and distance education
- Reviews technology contract documents

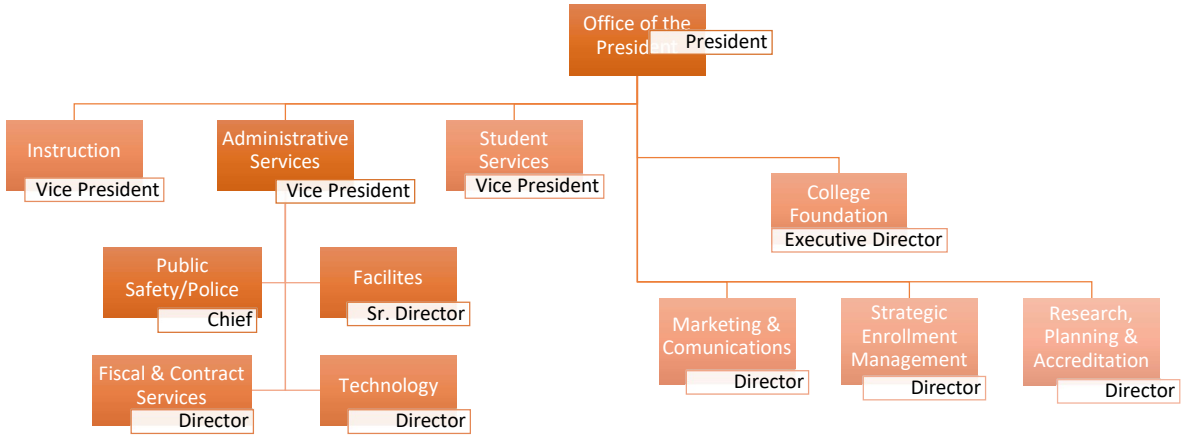
The Information Technology Department plays a key role in mitigation and includes:

- Establishing the creative vision and direction for online services, products and programs for strategic use in serving the needs of students, faculty and staff
- Assuring security, reliability, and continuity of all district-wide network infrastructure, computer operations, and telecommunications
- Ensuring the accurate and timely analysis, development, implementation, and management of management information systems to facilitate decision-making, operational support, program review, research support, and analytical study
- Developing repositories of historical data to facilitate reporting requirements
- Maintaining relationships with students, staff, and faculty user communities

SADDLEBACK COLLEGE

Below is a summary of Saddleback College organizational structure (**Figure 4.2**), and the roles and responsibilities as presented in the Saddleback College Planning and Governance Manual.

Figure 4.2- Saddleback College Organizational Structure



President- As stated in Administrative Regulation 2437 Delegation of Authority to the College President, the President is responsible for implementing the College's Educational Plan, Strategic Plan, and District policies and is the final authority at the college level. The College President is the CEO of the college, with leadership and management responsibility for the effective operation of the college, including the educational programs,

student support services, personnel, annual budgets, facilities, community and external relations, planning, evaluation, and special projects related to the mission of the college.

Campus Police- The Campus Police Department is a service-oriented agency. The department is staffed by fully sworn peace officers, trained and regulated by standards established by the California Peace Officer Standards and Training (P.O.S.T.) Commission.

The officers have the same authority as a municipal police officer or county sheriff's deputy. Campus Police officers are responsible for patrolling campus grounds, taking crime and incident reports, conducting investigations, enforcing all applicable laws, enforcing traffic regulations, and providing a safe environment for our students, faculty, staff, and guests. In addition, Campus Police officers will provide assistance in starting vehicles with dead batteries and help on-campus motorists in obtaining lockout or other assistance.

College Constituent Groups

Management Team- Consisting of college administrators and managers, the Management Team is led by the college president and provides an opportunity to discuss issues pertinent to college managers and administrators, such as accreditation, strategic planning, budget, policies, and governance. The Management Team's authority in making decisions is determined by the scope of responsibility and authority delegated to them in job descriptions for administrator and manager positions (District-wide Planning and Decision-Making Manual 2016-2021). The Management Team has discussion with and makes recommendations to the President.

Academic Senate- The Academic Senate is a representative body, with each instructional area receiving a senator for every ten full-time faculty members or portion thereof, to a maximum of four. Members of Academic Senate are represented on the college's strategic planning committees and consultation council. Academic Senate has a right to participate effectively in decision-making and planning-related efforts toward academic and professional matters (Title 5, California Code of Regulations, Section 53203). According to Education Code (EC), the Academic Senate is also responsible for jointly developing with the District policies and procedures related to faculty hiring (EC 87360b) and administrative retreat rights (EC 87458a).

Classified Senate- The Classified Senate represents the classified employees with regards to governance and decision-making on matters that are not related to collective bargaining and contract negotiations (BP-2510.3). The purpose of Classified Senate is to support the professionalism of all classified staff; to encourage individual leadership, contribution, and development among the members of the Classified Senate; to provide informed member representatives to serve on the college and district decision-making committees; to provide a centralized method of communication among classified staff, and other college and district constituencies; and to represent the collective interests of classified staff in all matters before any appropriate policy-making committee that are not the mandatory subjects of collective bargaining.

California School Employees Association (CSEA)- CSEA is the exclusive union representing classified school employees in the District. All permanent classified employees are represented by CSEA. CSEA is entitled by regulation to provide representation on any college or district task force, committee, or other governance group where there is only one appointment to represent classified employees.

Faculty Association (FA)- The Faculty Association represents the interests of the faculty in the District. The District recognizes the FA as the exclusive representative of full-time and part-time academic employees of the District, including librarians and counselors, for the purposes of meeting and negotiating. Management, confidential, classified, and supervisory employees, as defined by the Educational Employment Relations Act, shall be excluded from the bargaining unit.

Associated Student Government (ASG)- The ASG plans, organizes, promotes, sponsors and finances a comprehensive program of activities and services for all SC students. ASG, along with numerous campus clubs, participate in the planning and execution of special events. Members are also actively involved in various campus committees such as the Budget Committee, Food & Beverage Committee, and President's Council.

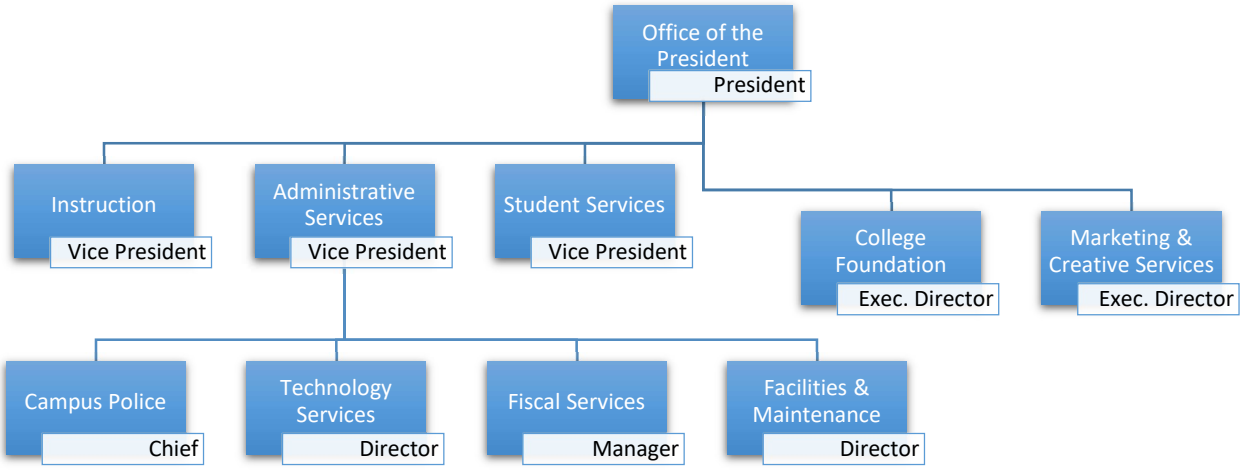
Councils, Committees, and Work Groups

SC participates in decision-making through councils, committees, and work groups that provide opportunities for representation from all constituent groups in order to create a structure for widespread engagement. District-wide administration, District Services, and college constituent groups additionally participate in District-wide decision making through a representative model. College administrators are included on all district-level councils. Academic Senate, Classified Senate, and the exclusive bargaining representatives are included on appropriate college councils. In addition, SC has a number of opportunities for participation through committees and work groups. This includes Consultation Council, College Resources Committee, Education Planning and Assessment Committee, Planning and Budget Steering Committee, and the Strategic Planning Work Group.

IRVINE VALLEY COLLEGE

Below is a summary of IVC organizational structure (**Figure 4.3**) and the roles and responsibilities.

Figure 4.3- Irvine Valley College Organizational Structure



President- As stated in Administrative Regulation 2437 Delegation of Authority to the College President, the President is responsible for implementing the College's Educational Plan, Strategic Plan, and District policies and regulations, and is the final authority at the college level. The college President is the CEO of the college, with leadership and management responsibility for the effective operation of the college, including the educational programs, student support services, personnel, annual budgets, facilities, community and external relations, planning, evaluation, and special projects related to the mission of the college.

Campus Police- The Campus Police Department is a service-oriented agency. The department is staffed by fully sworn peace officers, trained and regulated by standards established by the P.O.S.T. Commission.

The officers have the same authority as a municipal police officer or county sheriff's deputy. Campus Police officers are responsible for patrolling campus grounds, taking crime and incident reports, conducting investigations, enforcing all applicable laws, enforcing traffic regulations, and providing a safe environment for our students, faculty, staff, and guests. In addition, Campus Police officers will provide assistance in starting vehicles with dead batteries and help on-campus motorists in obtaining lockout or other assistance.

College Constituent Groups

Management Team- Consisting of college administrators and managers, the Management Team is led by the college president and provides an opportunity to discuss issues pertinent to college managers and administrators, such as accreditation,

strategic planning, budget, policies, and governance. The Management Team's authority in making decisions is determined by the scope of responsibility and authority delegated to them in job descriptions for administrator and manager positions (District-wide Planning and Decision-Making Manual 2016-2021). The Management Team has discussion with and makes recommendations to the President.

Academic Senate- The Academic Senate is a representative body, with each instructional area receiving a senator for every ten full-time faculty members or portion thereof, to a maximum of four. Members of Academic Senate are represented on the college's strategic planning committees and consultation council. Academic Senate has a right to participate effectively in decision-making and planning-related efforts toward academic and professional matters (Title 5, California Code of Regulations, Section 53203). According to Education Code (EC), the Academic Senate is also responsible for jointly developing with the District policies and procedures related to faculty hiring (EC 87360b) and administrative retreat rights (EC 87458a).

Classified Senate- The Classified Senate represents the classified employees of IVC with regards to governance and decision-making on matters that are not related to collective bargaining and contract negotiations (BP-2510.3). The purpose of Classified Senate is to support the professionalism of all classified staff; to encourage individual leadership, contribution, and development among the members of the Classified Senate; to provide informed member representatives to serve on the college and district decision-making committees; to provide a centralized method of communication among classified staff, and other college and district constituencies; and to represent the collective interests of classified staff in all matters before any appropriate policy-making committee that are not the mandatory subjects of collective bargaining.

California School Employees Association (CSEA)- CSEA is the exclusive union representing classified school employees in the District. All permanent classified employees are represented by CSEA. CSEA is entitled by regulation to provide representation on any college or district task force, committee, or other governance group where there is only one appointment to represent classified employees.

Faculty Association (FA)- The Faculty Association represents the interests of the faculty in the District. The District recognizes the FA as the exclusive representative of full-time and part-time academic employees of the District, including librarians and counselors, for the purposes of meeting and negotiating. Management, confidential, classified, and supervisory employees, as defined by the Educational Employment Relations Act, shall be excluded from the bargaining unit.

Associated Student Government- The Associated Students of Irvine Valley College (ASIVC) is recognized as the official voice for the students in the College consultation process. ASIVC represents the students in the college shared governance process, and plans advocacy and engagement efforts for the student body. ASIVC also includes campus clubs, which provide opportunities for student engagement and community building.

Councils, Committees, and Work Groups

IVC participates in decision-making through councils, committees, and work groups that provide opportunities for representation from all constituent groups in order to create a structure for widespread engagement. District-wide administration, District Services and college constituent groups additionally participate in District-wide decision making through a representative model. College administrators are included on all district-level councils. Academic Senates, Classified Senate, and exclusive bargaining representatives are included on appropriate college councils. In addition, IVC has a number of opportunities for participation through committees and work groups. This includes Consultation Council, College Resources Committee, Education Planning and Assessment Committee, Planning and Budget Steering Committee, and the Strategic Planning Work Group.

ADVANCED TECHNOLOGY & EDUCATION PARK

The ATEP campus is a shared responsibility between IVC and SC. The organizational structure, roles and responsibilities are reflective of those presented in the SC and IVC subsections above.

4.1.2 CONTRACTORS

The District can contract with third-party contractors. A contractor is an individual or firm retained by the District for a predetermined time and price. Benefits of contracting with a third-party include the:

- Ability to contract workers for short-term projects, on an as-needed basis.
- Ability to contract firms/individuals with specialty skills to perform services that are not within the scope of work performed by those of the District's employees.

Disadvantages of contracting with a third party include:

- The third-party may work for several employers simultaneously and may not be available when needed.

4.1.3 VOLUNTEERS

The District can leverage Board-approved volunteers. A volunteer is considered anyone who agrees to work for free. According to California Labor Code Section 1720.4, an individual must perform services freely and without coercion for a civic, humanitarian, or charitable purpose to be considered a volunteer.

California labor law permits the extension of workers' compensation to volunteers during their time in service. Workers' compensation is a type of insurance that covers employees in the event of industrial accidents or occupational injury. Often, public agencies will grant volunteers insurance protection under workers' compensation to help encourage volunteering and avoid the potential for lawsuits. In order to be deemed an employee for workers' compensation, the organization, whether public or private, usually must declare a volunteer as such prior to an injury incident. Under the law, this declaration should be in writing through a resolution or other action of the governing body of the organization or agency, such as its board of trustees.

Unpaid internships are another volunteer opportunity that can be leveraged, however, some criteria must be met. California Labor Relations Department describes unpaid internships as a type of volunteering that is intended to provide educational opportunities and, in some cases, school credit. As of April 2010, the California Labor Relations Department applies six criteria based on federal law when determining the legality of an unpaid internship: 1) the experience must resemble those of vocational schools, 2) the experience is primarily for the benefit of the intern, 3) the intern does not displace a regular employee, 4) the intern's services provide no immediate advantage to the employer, 5) the intern is not entitled to a job at the end of his internship, and 6) both the employer and intern have a mutual understanding that no compensation is expected for the internship.

4.1.4 MUTUAL AID

The District has several mutual aid agreements most focused on public safety. Public Safety mutual aid agreements define and formalize the arrangement to lend assistance across boundaries in situations that exhausted internal resources or where there is a need for increased capabilities. Some of the District's mutual aid agreements are with local jurisdictions, which in turn are coordinated through the State of California. This enables the state to either request or fulfill a mutual aid request from one region to another; enabling locals to maintain readiness in their region.

4.1.5 COLLABORATIONS

The District has the ability to enter into collaborations with surrounding cities and counties, and outside agencies, Universities, special districts, and/or companies. These collaborations are an arrangement where parties agree to cooperate to advance mutual interests. In some cases these collaborations are done through formal agreements or Memorandum of Understanding (MOU) outlining the scope of work, the mission, and roles and responsibilities.

4.2 MITIGATION GOVERNANCE RESOURCES

This subsection demonstrates the variety of governance directly related to or which influence mitigation efforts within the District. This governance generally falls under: 1) laws, regulations, codes, and ordinances; 2) plans, studies, and reports; and 3) programs and policies. While the intent is to capture District-level information, some state-level, county-level, and/or city-level information have direct implications on the District. To ensure there is a comprehensive list of governance, state-level, county-level, and/or city-level information is also captured. However, while it can influence state-level, county-level, and/or city-level information, the District only has the ability to revise, expand, and/or improve District-level information.

4.2.1 LAWS, REGULATIONS, CODES, AND ORDINANCES

***Title*:** Senate Bill (SB) 379
Sponsor: State of California, Senate
Description: In 2017, the California State Senate approved Senate Bill (SB) 379, which requires the General Plan's Safety Element to address climate adaptation and resilience strategies. This must be done after the next revision to the Local Hazard Mitigation Plan

(LHMP) or by January 2022 if the city/county does not have a LHMP. If the jurisdiction has an approved and adopted LHMP it shall be summarized and incorporated by reference into the Safety Element.

***Title*:** Assembly Bill (SB) 477
Sponsor: State of California, Assembly
Description: In 2019, the California State Assembly approved Assembly Bill (AB) 477. AB 477 requires local jurisdictions (cities/counties) to include representatives from the access and functional needs population in the next update of the Emergency Plan. The primary focus areas include, but are not limited to: emergency communications, emergency evacuations, and emergency sheltering.

***Title*:** Assembly Bill (AB) 2140
Sponsor: State of California, Assembly
Description: In 2006, the California State Assembly approved Assembly Bill (AB) 2140. AB 2140 enables the state of California to provide greater than 75 percent of the eligible state share if a local jurisdiction (city/county) has an approved and adopted LHMP as part of the General Plan's Safety Element.

***Title*:** California Building Standards Code
Sponsor: State of California
Description: The District abides by and is governed by California 2019 Building Codes effective January 1, 2020, including sections on electric, plumbing, mechanical, green, and residential requirements, standards and regulations. The County of Orange has adopted these codes.

***Title*:** California Education Code
Sponsor: State of California
Description: A series of codes regarding public education (K-14), including codes on construction.

***Title*:** California Code of Regulations
Sponsor: State of California
Description: The codification of the general and permanent rules and regulations by state agencies. The California Code of Regulations consists of 28 titles and contains the regulations of approximately 200 regulatory agencies.

4.2.2 PLANS, REPORTS, AND STUDIES

***Title*:** District-wide Strategic Plan (2020-2025)
***Sponsor**:* District
***Description**:* The District-wide Strategic Plan articulates overarching institutional goals, desired outcomes, measurable objectives, and targets that are the foundation for all other plans at the District and college level. Together these District-wide goals and objectives constitute an overall strategic plan framework and a guide to identify strategies and action at their institutional level to help achieve these District-wide goals and objectives. The District-wide Strategic Plan is designed to work in conjunction with the SC and IVC Education Master Plans.

***Title*:** Education Master Plans (2020-2030)
Sponsor: Irvine Valley College/Saddleback College
Description: College-level strategic plans that respond to their respective vision, mission, and values. The goals and objectives of these college-level strategic plans are aligned with the goals of the District-wide Strategic Plan, but each of the colleges and district services retains the flexibility to identify the strategies and actions they determine are needed to best support the priorities of the college and District. Annually, the colleges will review these strategies/actions, evaluate the progress that has been made over the past year, and adjust as needed.

***Title*:** Facilities Master Plan (2020)
Sponsor: District
Description: The Facilities Master Plan was developed after and based upon quantitative and qualitative data collected for the District-wide Strategic Plan and the Education Master Plans for both colleges. The Facilities Master Plan provides an inventory and assessment of all campus facilities, determines space requirements based on educational program needs, identifies facility and infrastructure opportunities, and offers a vision for the future development of each campus.

***Title*:** Technology Master Plan (2015-2020)
Sponsor: District
Description: The District Technology Master Plan 2015-2020 provides a roadmap by which the District technology organizations can effectively and efficiently work together to develop, implement, support, and maintain technology systems that support academic excellence and student success. Each college Technology Master Plan ensures the colleges maintain currency and sufficiency with their evolving technological requirements and aligns with educational priorities. The Technology Master Plans are designed to improve technology decision-making processes and identify resources to support ongoing technology systems, infrastructure, and security needs.

***Title*:** Environmental Scan Report (2019)
Sponsor: District
Description: The Environmental Scan provides background information and qualitative and quantitative data in support of the development of the District-wide Strategic Plan and the colleges' Education Master Plans. The Environmental Scan emphasizes the internal and external trends, including changing population demographics, employment projections, college enrollments, and student outcomes, which play a role in the development of the plans, and in determining the future direction of programs, facilities, faculty and staff, support services for students, communications and outreach, and financial resources.

***Title*:** ATEP Development Framework
Sponsor: District
Description: Serves as a high-level guide and blueprint for build out of the ATEP site, embracing the unique opportunity for creating educational and commercial partnerships.

***Title*:** Emergency Operations Plan (EOP; 2014)
Sponsor: District/Irvine Valley College/Saddleback College
Description: The EOP was developed in concurrence with the district-wide Business Continuity Planning Committee and complies with federal, state, and local statutes and agreements made with various agencies. The EOP captures emergency management protocols and strategies the District will follow for preparedness, prevention, response, recovery, and mitigation activities. This all-hazards plan illustrates and implements the mandatory provisions required by the Standardized Emergency Management System (SEMS) and the Incident Command System (ICS).

***Title*:** District-wide Function Map (2021-2026)
Sponsor: District
Description: The District-wide Function Map is intended to illustrate how the two colleges and the district services' offices manage the distribution of responsibility. The model used is organized by the Accrediting Commission for Community and Junior Colleges (ACCJC) Standards produced in July 2015 and by areas of processes and responsibilities for each college and District Services. The District-wide Function Map was developed to promote and sustain strategic planning and effective decision-making throughout the district.

***Title*:** District-wide Planning and Decision-making Manual (2021-2026)
Sponsor: District/Saddleback College
Description: The purpose of the District-wide Planning and Decision-Making Manual is to describe how decisions are made at the District. It has been developed to improve communication and trust across the District. These processes reflect the mechanisms by which the District ensures that there are opportunities for meaningful collaboration and that the voices of all constituent groups are heard. The manual describes how employees of the District are involved by clearly delineating the roles and responsibilities of all constituent groups as defined by law, regulation, and District policies and procedures. The manual also includes general principles and procedures that promote widespread participation in these governance processes.

***Title*:** Planning and Governance Manual (2016)
Sponsor: Saddleback College
Description: The Planning and Governance Manual provides an overview of the college's planning and decision-making processes. This document defines the roles and responsibilities of employees collaborating in efforts within participatory governance, the types of teams engaging in the planning and governance processes, and the college's planning processes.

***Title*:** Emergency Action Plan
Sponsor: Irvine Valley College
Description: Developed to establish the minimum requirements for responding to emergencies and/or disasters. The Plan outlines the procedures for evacuation, responding to a fire, handling an injury or illness, dealing with a hazardous materials situation, or responding during a disaster such as an earthquake. This Plan applies to all Irvine Valley College studens, staff, faculty, and visitors.

***Title*:** Pandemic Business Continuity Plan (Draft)
Sponsor: Irvine Valley College
Description: Developed to identify critical college functions/operations, document the recovery strategies, and develop an Action Plan in response to the pandemic.

4.2.3 PROGRAMS AND POLICIES

***Title*:** Safety Programs
Sponsor: District
Description: The District has many written safety programs designed to inform employees about specific workplace hazards and control methods to promote a safe and healthy work environment. These programs assign responsibility for implementation and include employee training requirements, as well as incident reporting.

***Title*:** District-wide Integrated Budget Planning Resource Guide (2020-2021)
Sponsor: District
Description: The guide details how resource allocation is tied to planning and provides documentation associated with the processes. The intent of the guide is to provide a user-friendly and accessible document that explains how the district resource allocation processes work, guides individuals through the processes, and demonstrates the connection to resource allocation.

4.3 TECHNICAL RESOURCES

This subsection demonstrates the District's in-house capabilities to support mitigation efforts. The District can provide technical resources through in-house proficiencies and expertise, through the availability and implementation of technology, and through methods of communications with internal staff and external stakeholders/partners.

4.3.1 PROFICIENCIES AND EXPERTISE

The District has many proficiencies and expertise that can be leveraged in support of mitigation efforts. In addition to public safety capabilities, the District has staff with skills in Information Technology, Engineering and Construction, Planning, Environmental, Project/Grant Management, and Economic Development.

4.3.2 TECHNOLOGY

The District has been increasing its technology capabilities. This includes providing secure platforms to store and access information, identifying means of ensuring continuity of operations, and general technical support.

4.3.3 COMMUNICATIONS

The District and the campuses have several platforms to communicate with staff, surrounding jurisdictions, students, and the general public. In addition to the standard methods (phones, emails), the District has several radio platforms (a portable 400 UHF and 800 MHz portable transceivers) and Public Announcement platforms (handheld loud speakers and public address feature in police vehicles). The District also has platforms that can "push" communications out

to audiences. These "push" communication platforms consist of television, broadcast radio, websites, and social media (Facebook, Twitter, LinkedIn, and Instagram).

4.4 FISCAL RESOURCES

This subsection demonstrates the District's fiscal resources that may be leveraged to support mitigation efforts. This is generally done by understanding revenue streams and planned expenditures. This subsection provides insight as to how to obtain additional funds or how they can be reallocated.

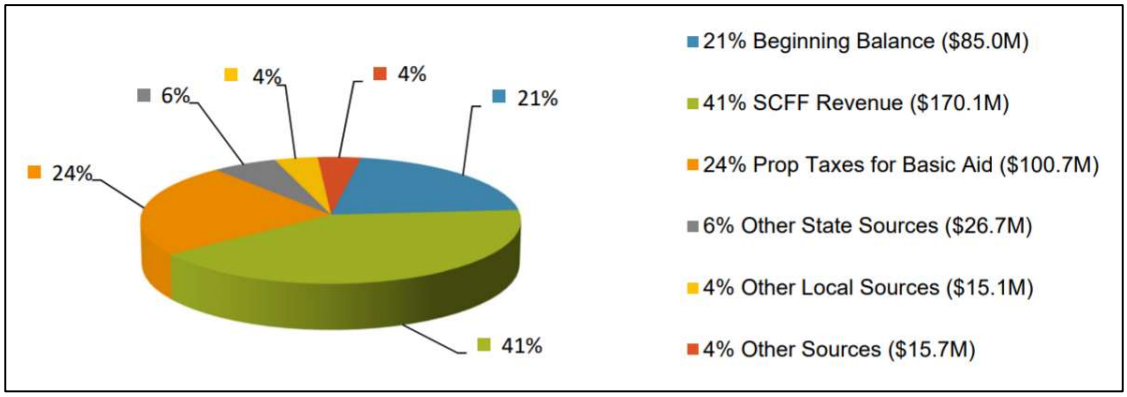
4.4.1 REVENUE

The District is a community-supported (Basic Aid) district; meaning the District's local revenue sources exceed the minimum funding levels (apportionment) calculated by the State of California. Under the State of California, the California Community College (CCC) system office utilizes a specified formula developed in response to the State Budget Act to calculate the minimum distribution of federal, state, and local monies to community college districts. If local revenue sources exceed the minimum proposed allocation, a district will not receive any federal or state apportionment funds for general operations. All federal, state, and local revenues come in the following two categories:

- *Unrestricted funds* are funds that do not have limitations on their use or disposition by their funding source (i.e., do not have specific restrictions placed upon them). These funds can be used for general purpose operating expenses and support of educational programs of the District. These funds are usually referred to as General Fund.
- *Restricted funds* are funds used to account for resources available for the operation and support of educational or other programs specifically restricted by law, regulations, donors, or other outside agencies. All federal, state, and local funds including state categorical programs and grants are recognized as restricted general fund income to the District.

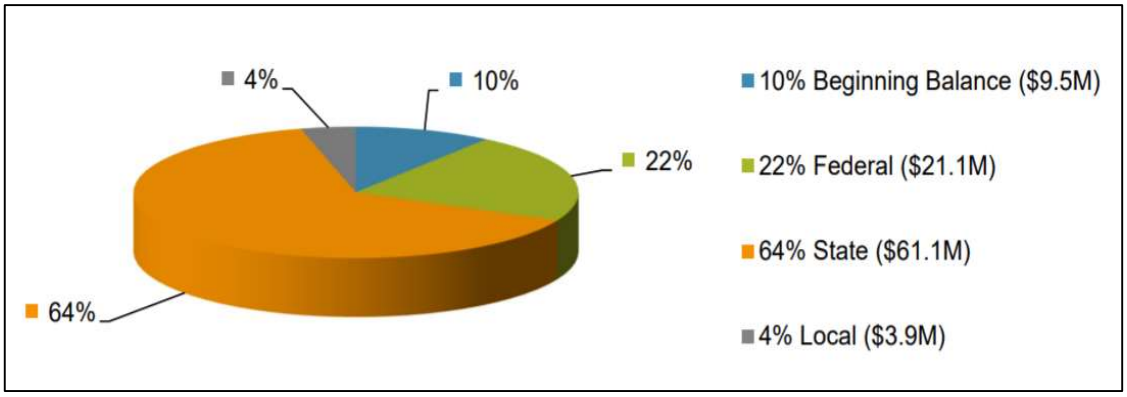
Local unrestricted revenue funds consist of Student Centered Funding Formula (SCFF), excess property taxes, non-resident tuition, and other miscellaneous funds (i.e., state lottery); in addition to the District's beginning unrestricted fund balance. **Figure 4.5** was taken from the *Adopted Budget FY 2021-22* and illustrates the District Unrestricted Fund Revenue.

Figure 4.5- District Unrestricted General Fund Revenue



Local restricted revenue funds consist of federal, state, local, and other sources; in addition to the District's beginning restricted fund balance. **Figure 4.6** was taken from the *Adopted Budget FY 2021-22* and illustrates the District Restricted Fund Revenue.

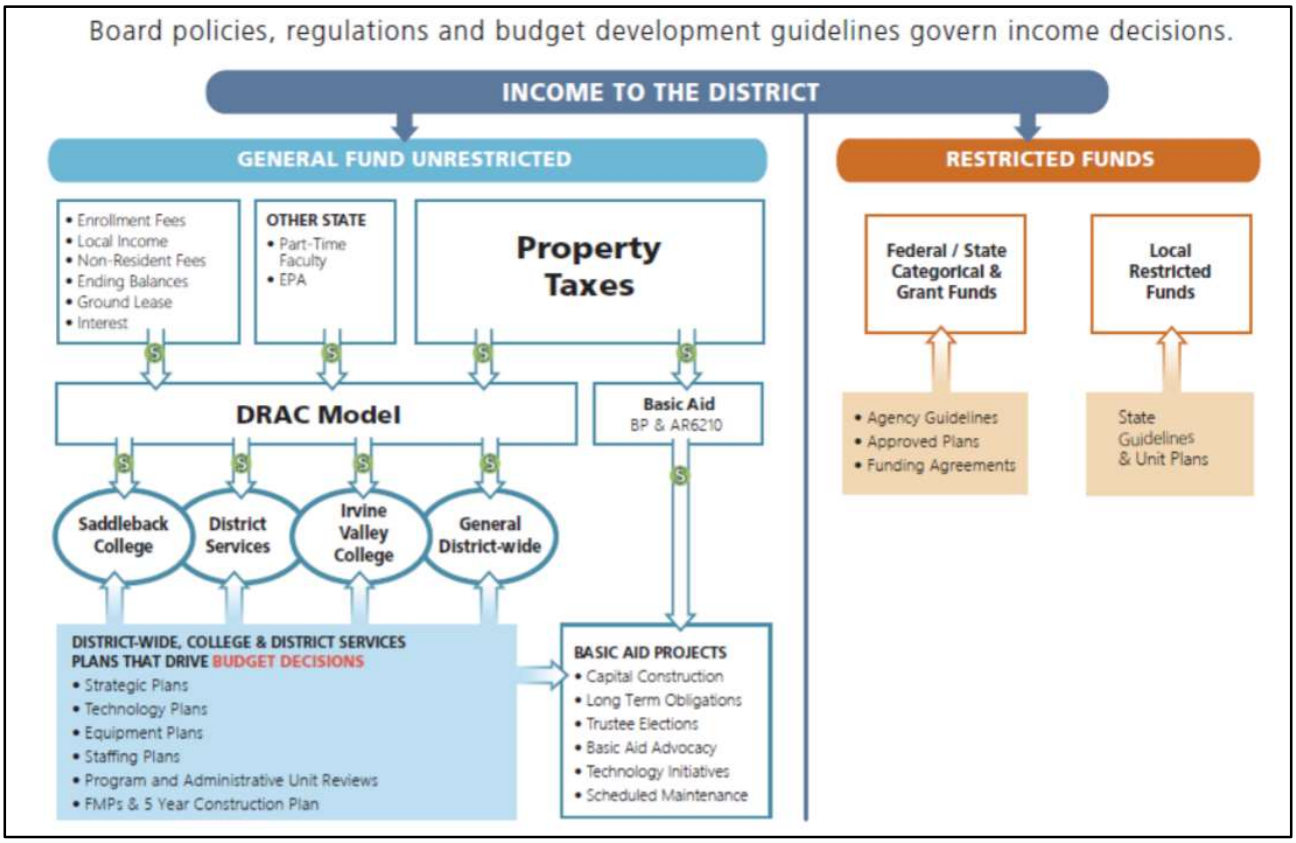
Figure 4.6- District Restricted Fund Revenue



4.4.2 EXPENDITURES

When the District receives its annual state calculated budget estimates, it prepares its proposed budget expenditures. **Figure 4.7** illustrates the District's resource allocation process.

Figure 4.7- District Resource Allocation Process



As the District prepares its budget, careful consideration is given to the unrestricted and restricted funds, ensuring funds are properly allocated when necessary. The budget approval process has both an internal (within the District) and external (State of California) review and approval process. **Figure 4.8** was taken from the Adopted Budget FY 2021-22 and depicts the adopted budget for the District.

Figure 4.8- District Adopted Budget (FY 2021-2022)

SOUTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
ADOPTED BUDGET - FISCAL YEAR 2021-22
Revenues, Expenditures and Change in Fund Balance

		Saddleback College			Irvine Valley College			District Services		
		General Fund Unrestricted	General Fund Restricted	Total	General Fund Unrestricted	General Fund Restricted	Total	General Fund Unrestricted	General Fund Restricted	Total
BEGINNING FUND BALANCE	9712	$ 17,657,929	$ 6,434,837	$ 24,092,766	$ 15,707,731	$ 3,025,898	$ 18,733,629	$ 6,433,058	$ -	$ 6,433,058
SOURCES OF FUNDS										
REVENUES:										
SCFF Revenue	Various	$ 91,027,333	$ -	$ 91,027,333	$ 58,103,558	$ -	$ 58,103,558	$ 18,567,628	$ -	$ 18,567,628
Basic Aid		-	-	-	-	-	-	-	-	-
Federal Sources	8100-8199	-	11,502,003	11,502,003	-	9,570,024	9,570,024	-	-	-
Other State Sources	8600-8699	8,678,129	39,995,620	48,673,749	5,459,871	20,559,646	26,019,517	-	453,970	453,970
Other Local Sources	8800-8899	7,253,775	2,498,453	9,752,228	7,842,167	1,090,150	8,932,317	-	-	-
Total Revenue		106,959,237	53,996,076	160,955,313	71,405,596	31,219,820	102,625,416	18,567,628	453,970	19,021,598
OTHER FINANCING SOURCES:										
Sale of Surplus	8910-8919	61,411	-	61,411	38,589	-	38,589	-	-	-
Fiscal Agent Pass-Thru	8970-8979	-	-	-	-	-	-	-	-	-
Interfund Transfers In	8981-8981	6,098,308	-	6,098,308	6,548,000	-	6,548,000	1,050,000	-	1,050,000
Other Incoming Transfers	8982-8989	-	-	-	-	311,719	311,719	-	-	-
Total Other Sources		6,159,719	-	6,159,719	6,586,589	311,719	6,898,308	1,050,000	-	1,050,000
TOTAL SOURCES OF FUNDS		**113,118,956**	**53,996,076**	**167,115,032**	**77,992,185**	**31,531,539**	**109,523,724**	**19,617,628**	**453,970**	**20,071,598**
USES OF FUNDS										
EXPENDITURES:										
Academic Salaries	1000-1999	$ 54,064,710	$ 7,539,147	$ 61,603,857	$ 35,379,564	$ 3,005,565	$ 38,385,129	$ 1,163,932	$ -	$ 1,163,932
Classified Salaries	2000-2999	21,840,430	8,830,515	30,670,945	16,805,278	5,374,764	22,180,042	10,779,490	-	10,779,490
Employee Benefits	3000-3999	29,626,894	5,453,764	35,080,658	20,783,852	3,554,354	24,338,206	6,635,822	-	6,635,822
Supplies & Materials	4000-4999	1,017,300	6,062,049	7,079,349	808,648	2,118,180	2,926,828	126,000	50,000	176,000
Services & Other Operating	5000-5999	8,235,195	23,433,087	31,668,282	5,340,821	10,793,981	16,134,802	1,528,000	403,970	1,931,970
Capital Outlay	6000-6999	199,662	2,450,898	2,650,560	18,000	890,549	908,549	104,000	-	104,000
Total Expenditures		114,984,191	53,769,460	168,753,651	79,136,163	25,737,393	104,873,556	20,337,244	453,970	20,791,214
OTHER FINANCING USES:										
Interfund Transfers Out	7300-7399	$ 200,000	$ 2,862,969	$ 3,062,969	$ -	$ 5,891,783	$ 5,891,783	$ 450,000	$ -	$ 450,000
Other Outgoing Transfers	7400-7499	-	-	-	-	311,719	311,719	-	-	-
Payments to Students	7500-7699	-	3,798,484	3,798,484	-	2,616,542	2,616,542	-	-	-
Total Other Uses		200,000	6,661,453	6,861,453	-	8,820,044	8,820,044	450,000	-	450,000
TOTAL USES OF FUNDS		**115,184,191**	**60,430,913**	**175,615,104**	**79,136,163**	**34,557,437**	**113,693,600**	**20,787,244**	**453,970**	**21,241,214**
SURPLUS / (DEFICIT)		**$ (2,065,235)**	**$ (6,434,837)**	**$ (8,500,072)**	**$ (1,143,978)**	**$ (3,025,898)**	**$ (4,169,876)**	**$ (1,169,616)**	**$ -**	**$ (1,169,616)**
ENDING FUND BALANCE		**$ 15,592,694**	**$ -**	**$ 15,592,694**	**$ 14,563,753**	**$ -**	**$ 14,563,753**	**$ 5,263,442**	**$ -**	**$ 5,263,442**
COMPONENTS OF ENDING FUND BALANCE										
Assigned Reserve, Economic Uncertainties		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Assigned Reserve, Basic Aid		-	-	-	-	-	-	-	-	-
Nonspendable Fund Balance		-	-	-	-	-	-	-	-	-
Restricted Fund Balance		-	-	-	-	-	-	-	-	-
Assigned Fund Balance		-	-	-	-	-	-	-	-	-
Unassigned Fund Balance		15,592,694	-	15,592,694	14,563,753	-	14,563,753	5,263,442	-	5,263,442
TOTAL ENDING FUND BALANCE		$ 15,592,694	$ -	$ 15,592,694	$ 14,563,753	$ -	$ 14,563,753	$ 5,263,442	$ -	$ 5,263,442

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5 HAZARD ASSESSMENT

5.1 OVERVIEW

The purpose of this section is to capture the approach used by the Task Force to assess (identify and prioritize) hazards within the District's service area. This is an important step to ensure all potential hazards are considered and relevant hazards ranked as to the greatest concern to the District.

This section also presents relevant information on each hazard identified within the District service area. The "*Hazard Profiles*" provide a description of the hazard, the location and/or extent of the hazard on each campus, the history of the hazard within the service area, the probability of the hazard occurring on each campus, and the effects of changing climate conditions. The Task Force utilized the Hazard Profiles when prioritizing the hazards.

5.2 HAZARD IDENTIFICATION

The Task Force went through an extensive effort to identify all hazards present within the District service area. Since this was the initial LHMP for the District, there was no pre-existing list of hazards to review and update. The Task Force utilized several external resources to ensure they were considering all relevant potential hazards. These resources included the State of California HMP (2018), the County of Orange LHMP (2015), the City of Irvine draft LHMP (2020), and the City of Tustin LHMP (2019). The resources helped the Task Force understand statewide, countywide, and surrounding area hazard concerns. Each hazard identified in the external resources were considered for inclusion in the District's LHMP. After careful review, the Task Force identified the following hazards for inclusion in the District's LHMP:

- Aircraft Incident
- Civil Disturbance
- Dam Failure
- Drought
- Earthquake
- Energy Disruption
- Extreme Temperature
- Flooding
- Hazardous Materials Accident
- Infectious Disease
- Landslide
- Natural Gas Pipeline Accident
- Radiological Accident
- Technology Disruption
- Terrorism
- Wildfire
- Windstorm

5.3 HAZARD SCREENING AND PRIORITIZATION

After the list of hazards was identified, the Task Force prioritized the hazards by the degree of concern for each campus. The ranking process consisted of two phases: 1) a survey and 2) a series of meetings (tabletop discussions). The survey consisted of a qualitative ranking of the identified hazards into High, Medium, or Low rating for: 1) *Probability*; and, 2) *Impact* as it pertains to each campus. The following criteria (definitions) were applied:

- **Probability**

  High: (Highly Likely/Likely) There may or may not have been historic occurrences of the hazard in the community or region, but experts feel that it is likely that the hazard will occur in the community. Citizens feel that there is a strong likelihood of occurrence.

  Medium: (Possible) There may or may not have been a historic occurrence of the hazard in the community or region, but experts feel that it is possible that the hazard could occur in the community. Citizens may feel that there is a possibility of occurrence.

  Low: (Unlikely) There have been no historic occurrences of the hazard in the community or region and both experts and citizens agree that it is highly unlikely that the hazard will occur in the community.

- **Impact**

  High: (Catastrophic/Critical) Both experts and citizens feel that the consequences will be significant in terms of building damage and loss of life.

  Medium: (Limited, but not insignificant) Consequences are thought to be modest in terms of building damage and loss of life, limited either in geographic extent or magnitude.

  Low: (Negligible) Consequences are thought to be minimal in terms of building damage and loss of life, limited either in geographic extent or magnitude.

After the surveys were completed, the Task Force held a tabletop discussion to discuss the results for each campus. The *Probability* and *Impact* scoring for each hazard was reviewed and adjusted based on input from the Task Force members.

The results of the tabletop discussions were presented to the Task Force. During this meeting, the *Hazard Profiles* were also presented and discussed. The Task Force took a deeper dive into the hazards, providing more perspective to consider. One of the objectives of the Task Force meeting was to ensure members had a better understanding of the *significant* hazard risks at each campus. In support of this, the Task Force reviewed findings from the Cal OES MyHazards tool (https://myhazards.caloes.ca.gov/). The MyHazards tool is a general public tool offered by Cal OES to assist individuals to discover significant natural hazards in their area (earthquake, flood, fire, and tsunami) and understand some possible actions that can be taken to reduce risk. The three campus addresses were entered into the MyHazards tool and the results were shared with the Task Force. The MyHazards results for Advanced Technology & Education Park (ATEP), Irvine Valley College (IVC) and Saddleback College (SC) are presented in **Figure 5.1**, **Figure 5.2**, and **Figure 5.3**, respectively.

Figure 5.1- Cal OES MyHazards Results; ATEP

State Responsibility Areas (2007), Severity

SRA, Very High

SRA, High

SRA, Moderate

100-Year Floodplains

FEMA/DWR Awareness/Regional Studies /USACE Comprehensive Study

Liquefaction Zone of Required Investigation

Liquefaction Zone Area

Tsunami Emergency Response Planning Zone

Earthquake Fault Zone of Required Investigation

The State Responsibility Area (SRA) is the area of the state where the State of California is financially responsible for the prevention and suppression of wildfires. SRA does not include lands within city boundaries or in federal ownership. FEMA's Flood Map Service Center (https://msc.fema.gov/portal/)

Figure 5.2- Cal OES MyHazards Results; Irvine Valley College

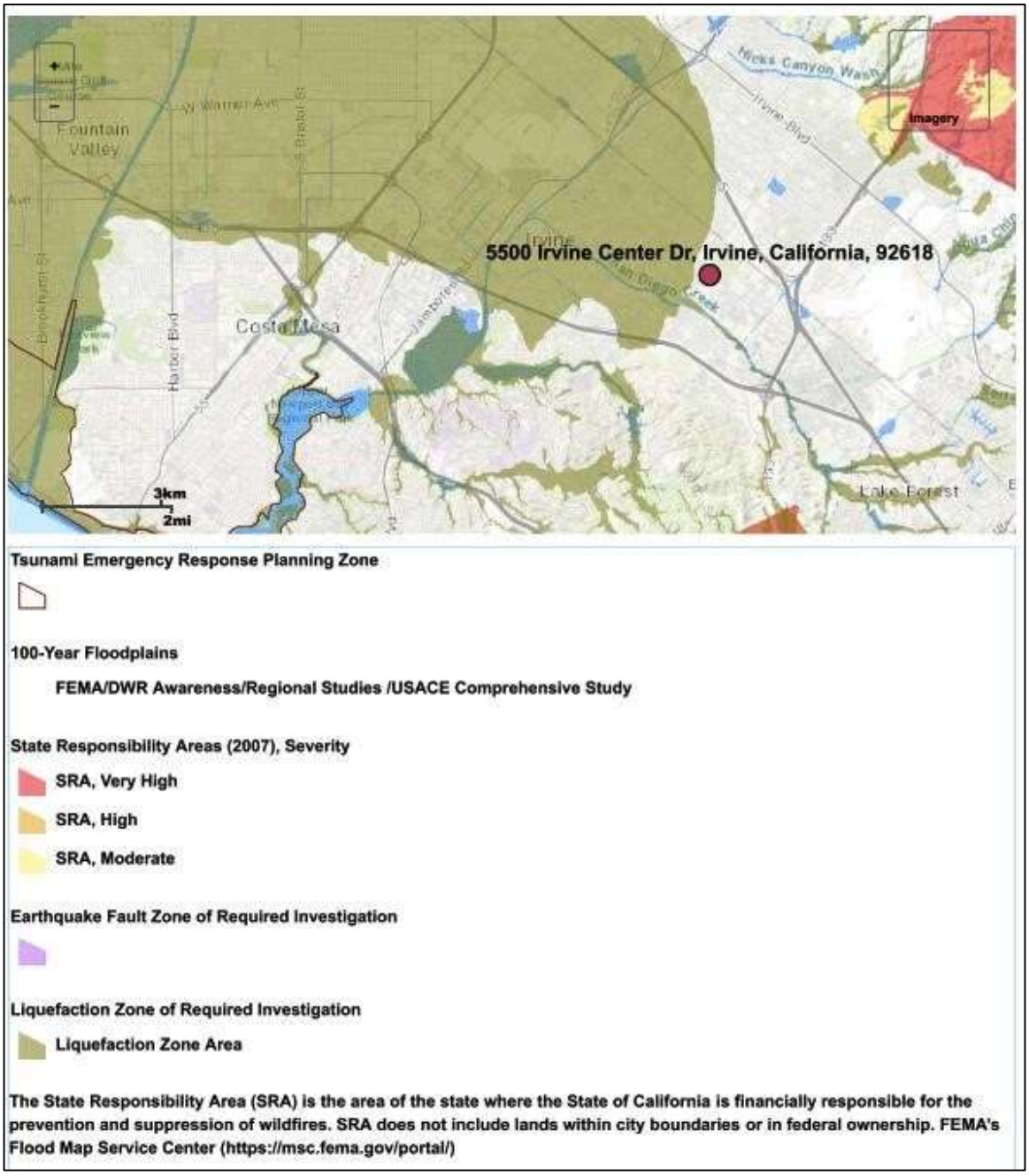
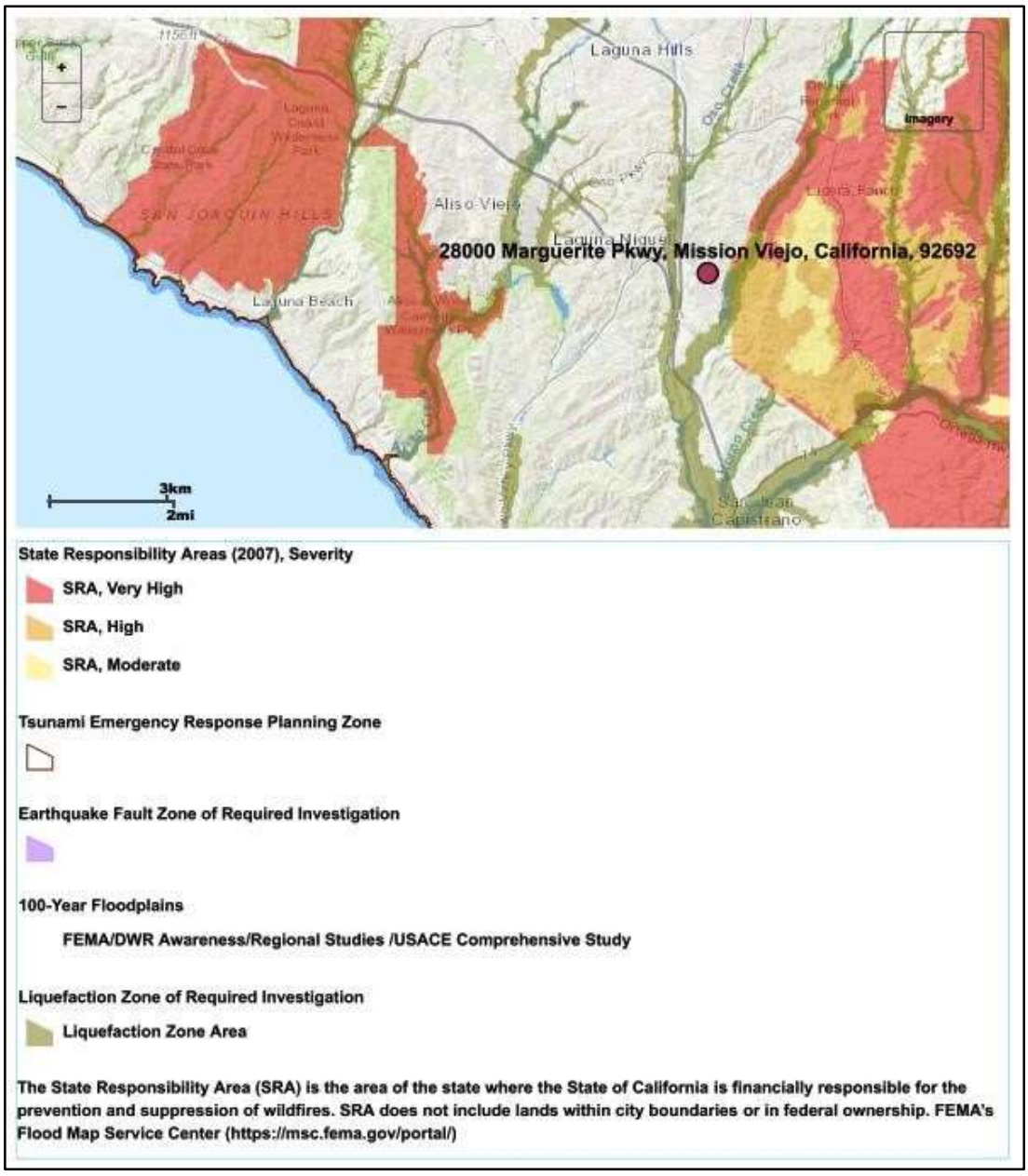


Figure 5.3- Cal OES MyHazards Results; Saddleback College



The culmination of the surveys, tabletop discussions, and meetings were displayed in a graph to assist the Task Force validate the results (**Figure 5.4, Figure 5.5,** and **Figure 5.6**). The Task Force determined all hazards falling within the red-shaded boxes were Tier I priority hazards, those within the blue-shaded boxes were Tier II priority hazards, and those within the white-shaded boxes were Tier III priority hazards. The higher priority hazards (Tier I and Tier II), reflect those hazards that the District should focus on over the next five (5) years. This does not mean that the District would not address the lower priority hazards (Tier III). It means if resources are limited (i.e., funding, staffing), then the primary focus should be on the higher priority hazards.

Figure 5.4- Hazard Prioritization Matrix; ATEP

		Impact		
		High	**Medium**	**Low**
Probability	**High**	• Earthquake • Technology Disruption	•Windstorm	
	Medium	• Infectious Disease	• Civil Disturbance • Energy Disruption • Extreme Temperature	• Wildfire
	Low	• Aircraft Incident	• Natural Gas Pipeline Accident • Terrorism	• Dam Failure • Drought • Flood • HazMat Accident • Landslide • Radiological Accident

Figure 5.5- Hazard Prioritization Matrix; Irvine Valley College

		Impact		
		High	**Medium**	**Low**
Probability	**High**	• Earthquake • Flood • Technology Disruption	• Windstorm	
	Medium	• Infectious Disease	• Civil Disturbance • Energy Disruption • Extreme Temperature	• Wildfire
	Low		• Aircraft Incident • HazMat Accident • Natural Gas Pipeline Accident • Radiological Accident • Terrorism	• Dam Failure • Drought • Landslide

Figure 5.6- Hazard Prioritization Matrix; Saddleback College

		Impact		
		High	**Medium**	**Low**
Probability	**High**	• Earthquake • Technology Disruption • Wildfire	• Windstorm	
	Medium	• Infectious Disease	• Civil Disturbance • Energy Disruption • Extreme Temperature • Natural Gas Pipeline Accident	• Flood • Landslide
	Low		• Aircraft Incident • Radiological Accident • Terrorism	• Dam Failure • Drought • HazMat Accident

5.4 HAZARD PROFILES

The Hazard Profiles section includes information, graphics, and assessments to help the Task Force understand the hazards within the service area and/or on each campus. The specific hazards included in the LHMP and assessed by the Task Force are summarized in alphabetical order, below:

5.4.1 AIRCRAFT ACCIDENT

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*High*
IVC	*Low*	*Medium*
SC	*Low*	*Medium*

- **Description**

Aircraft Accidents have been defined as both those that occur "*in-flight*" and those that occur "*on ground*". Further definitions delineate those that cause death and injuries and those that cause substantial damage to the aircraft. For this LHMP, the Task Force is defining Aircraft Accident as an occurrence associated with in-flight accidents only.

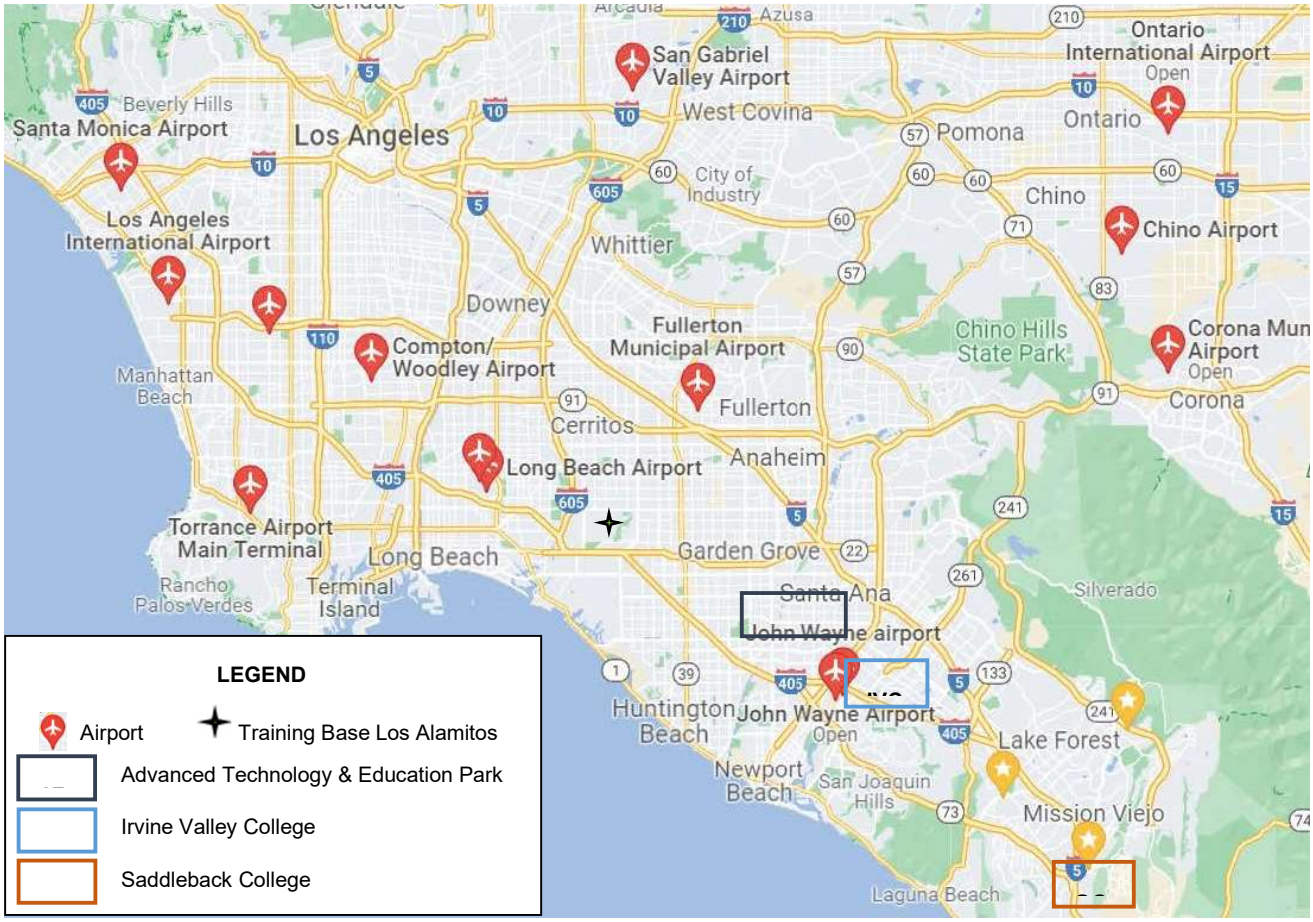
- **Location and Extent**

Of the dozen or so airports within 50 miles of the campuses, the following airports create air traffic near or over the District service area (**Figure 5.7**):

- John Wayne Airport (SNA)
- Fullerton Municipal Airport (FMA)
- Long Beach Municipal Airport (LGB)
- Ontario International Airport (ONT)
- Los Angeles International Airport (LAX)

In addition to the public airports that operate in the region, Joint Forces Training Base Los Alamitos is also located within the District service area. This facility is actively used for military training purposes; however, the frequency of flights is anticipated to be less than the amount from the commercial airports.

Figure 5.7- Airports within 50 miles of the District Service Area



- **History**

John Wayne Airport (SNA) has suffered numerous accidents/incidents in the past. **Table 5.1** provides an overview of the events that have occurred over a 36-year period (1982 – 2018), as tracked by the National Transportation Safety Board (NTSB).

Table 5.1- Aircraft Accidents at John Wayne Airport- 1982-2018

Accidents	62
Fatal Accidents	14
Incidents	6
Aircraft Destroyed	13
Injuries	37
Total Fatal	15
Total Serious	7
Total Minor	16
Total Uninjured	666

Notable historic aircraft accidents within Orange County include:

- August 31, 1986: A DC-9 jetliner collided with a smaller aircraft. Neither aircraft was destroyed in the air, but the operability of both was compromised, causing them to fall more than 6,000 feet from their flight paths, eventually crashing into a housing tract in Cerritos. 16 homes were destroyed and 15 residents in the area of the impact were killed.
- June 30, 2017: A small plane crashed on the 405 Freeway in Costa Mesa near SNA shortly after takeoff. No injuries or deaths occurred on the ground, but the freeway was shut down for many hours.
- August 5, 2018: A small plane seemingly exhausted its fuel reserves and crashed into a strip mall parking lot in Santa Ana near SNA. No injuries or deaths occurred on the ground, but four parked vehicles were destroyed.
- February 3, 2019: A pilot of a small plane lost control of the aircraft and crashed into a housing tract in Yorba Linda, destroying two homes and killing four people on the ground.

- **Probability**

The possibility of an aircraft incident occurring in the District service area will continue to exist. Based on historic events, it is anticipated that future impacts will be similar in nature. A key component to aircraft safety is the Airport Environs Land Use Plan for SNA. This plan identifies safety zones that require land use restrictions to minimize potential impacts. While these efforts can assist in reducing impacts on the ground, little can be done to reduce the impacts associated with aircrafts flying overhead under normal flight conditions. The risk of this hazard to the District is similar to other parts of Orange County and southern California.

- **Climate Change Considerations**

While there are many devices that monitor and/or track weather conditions, it is expected that changing conditions are going to impact air travel. From temperatures altering takeoffs and landing, to increase in rains and winds that alter flight patterns, a change in our environment could increase the likelihood of an aircraft incident.

5.4.2 CIVIL DISTURBANCE

- **Ranking**

Campus	Probability	Impact
ATEP	*Medium*	*Medium*
IVC	*Medium*	*Medium*
SC	*Medium*	*Medium*

- **Description**

Civil Disturbance is a term generally used to describe disorderly conduct or a breakdown of orderly society by a large group of people. Civil Disturbance can range from a form of protest against major socio-political problems to riots.

- **Location and Extent**

Civil Disturbance can occur on any part of the three (3) campuses.

- **History**

No significant historical incidents to report to date. There have been a few small incidents within the District service area that have occurred due to recent social and political movements.

- **Probability**

There are no studies that predict the probability of civil disturbance occurrences.

- **Climate Change Considerations**

While there is no direct linkage between climate change and civil disturbances, there could be indirect linkages. As climate change impacts are either felt or perceived to be felt it could ignite passions within people to demonstrate against possible causes or enablers.

5.4.3 DAM FAILURE

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Low*
IVC	*Low*	*Low*
SC	*Low*	*Low*

- **Description**

California's seasonal and climatic conditions makes water storage critical. Dams and reservoirs help reserve water necessary for agriculture, hydroelectric power, recreational activities, environmental protection, and a stable drinking water supply. They are also critical tools in flood and debris control. Based on the function, dams can be classified as: storage dams, diversion dams, detention dams, debris dams, or coffer dams. In addition to these functional classifications, there are several types of dam constructions:

- *Gravity Dams*- concrete, rubber masonry
- *Embankment Dams*- earth or rock
- *Arch/Multiple Arch Dams*- concrete
- *Buttress Dams*- concrete, timber, steel

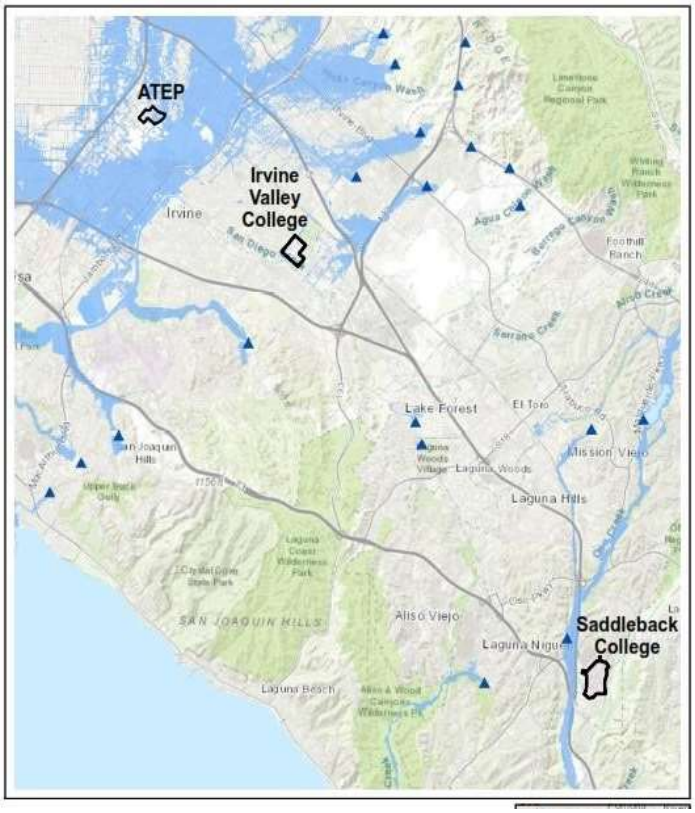
Along with their many benefits, dams and reservoirs present formidable consequences if not properly designed, built, and maintained. Failures to dams and reservoirs are generally due to old age, poor design/construction, lack of maintenance, structural damage, improper siting, landslides flowing into a reservoir, or terrorist actions. Structural damage is often a result of a flood, erosion, or earthquake. A catastrophic dam/reservoir failure could inundate

the area downstream. The degree of flood impact is dependent upon topography, vegetation, duration, and intensity of rainfall with consequent storm water runoff. The force of the water is large enough to carry boulders, trees, automobiles, and even houses along a destructive path downstream. Another factor in dam/reservoir failures is heavy or increased precipitation, especially in very short periods. This increase in rainfall can crest dams, weaken structures, and erode supports. The potential for casualties, environmental damage, and economic loss is great. Damage to electric generating facilities and transmission lines could affect life support systems in communities outside the immediate hazard area.

- **Location and Extent**
  - The District service area has several dams in their vicinity that have the potential to inundate areas if failure were to occur. Some of the more significant dams include:
  - Rattlesnake Canyon Reservoir: Located on Rattlesnake creek, this 79-foot-high earth filled dam was built in 1959 and is owned by Irvine Ranch Water District. This facility impounds 1,480-acre feet of recycled water primarily used for irrigation.
  - Sand Canyon Reservoir: This 58-foot-high earth filled dam, was built in 1912 and is owned by Irvine Ranch Water District. This facility impounds 768-acre feet of recycled water, primarily used for irrigation.
  - Syphon Canyon Reservoir: This 59-foot-high earth filled dam was built in 1966 and is owned by Irvine Ranch Water District. This facility impounds up to 535-acre feet of recycled water, primarily used for irrigation.
  - Peters Canyon Reservoir: Located north of the City of Irvine (approximately 3 miles west of Santiago Dam), this 50-foot earth filled dam was built in 1932 and is owned by the County of Orange. This facility impounds up to 626-acre feet of water.
  - Santiago Dam: This 136-foot-high earth filled dam was built in 1932 and is jointly owned by Irvine Ranch Water District and Serrano Water District. This facility impounds approximately 25,000 acre-feet of water creating the largest freshwater lake contained wholly within Orange County (Irvine Lake).
  - San Joaquin Reservoir: This 224-high earth-filled dam was built in 1966 and is owned by Irvine Ranch Water District. This facility impounds over 3,000 acre-feet of recycled water, primarily used for irrigation.
  - Villa Park Dam: This 118-foot-high earth filled dam was built in 1963 and is owned by the Orange County Flood Control District. This facility has the capacity to impound over 15,000 acre-feet, which is primarily used for flood control purposes.
  - Prado Dam: Located along the Santa Ana River in Riverside County, this dam facility poses a great risk to northern Orange County cities.

Shown in **Figure 5.8** are the dam inundation zones within the District service area.

Figure 5.8- Dam Inundation Areas in the District Service Area



- **History**

The State of California and the federal government have a rigorous Dam Safety Program. This proactive program ensures proper planning in the event of failure, but also sets standards for dam design and maintenance. Because of this, many potential issues have been addressed and/or resolved. Within the District service area, no significant dam failures have occurred. The District has not suffered impacts from a dam inundation event. The closest (geographically) incident involved an extensive episode of winter rains in 2005, which caused seepage along Prado Dam prompting the Army Corps of Engineers (ACOE) to release significant amounts of water downstream, resulting in the evacuations of approximately 3,000 Irvine residents. The flooding caused erosion along portions of the Green River golf course. Since this event, the ACOE has made significant improvements downstream of the dam to increase capacity and reduce future flooding impacts.

- **Probability**

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides, excessive rainfall, and snowmelt. These impacts can be exacerbated by aging or poor maintenance of the structures. There is a “residual risk” associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of

dam failure event is considered low in today's regulatory and dam safety oversight environment.

- **Climate Change Considerations**

Increased rainfall could present a risk to dams and reservoirs in the area if volume of runoff is greater than the dam's capacity. This could cause the release of stored water into the downstream watercourses in order to ensure the integrity of the dam.

5.4.4 DROUGHT

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Low*
IVC	*Low*	*Low*
SC	*Low*	*Low*

- **Description**

Drought can best be thought of as a condition of water shortage for a particular user in a particular location. Drought is a gradual phenomenon and generally is not signified by one or two dry years. California's extensive system of water supply infrastructure (reservoirs, groundwater basins, and interregional conveyance facilities) generally mitigates the effects of short-term dry periods for most water users. However, drought conditions are present when a region receives below-average precipitation, resulting in prolonged shortages in its water supply, whether its water supply is provided by atmospheric, surface, or ground water means. A drought can last for months or years or may be declared after as few as 15 days.

Drought is not a purely physical phenomenon, but rather an interplay between natural water availability and human demands for water supply. There are generally four types of conditions that are referred to as drought:

- *Meteorological drought* is brought about when there is a prolonged period with less than average precipitation.
- *Agricultural drought* is brought about when there is insufficient moisture for average crop or range production. This condition can arise, even in times of average precipitation, owing to soil conditions or agricultural techniques.
- *Hydrologic drought* is brought about when the water reserves available in sources such as aquifers, lakes, and reservoirs fall below the statistical average. This condition can arise, even in times of average (or above average) precipitation, when increased usage of water diminishes the reserves.
- *Socioeconomic drought* associates the supply and demand of water services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall.

The U.S. Drought Monitor, established in 1999, is a weekly map of drought conditions produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center at the University of Nebraska-Lincoln. The map is based on measurements of climatic, hydrologic, and soil conditions as well as reported impacts and observations from more than 350 contributors around the country. Droughts are generally categorized into five categories: D1) Abnormally Dry, D2) Moderate Drought, D3) Severe Drought, D4) Extreme Drought, and D5) Exceptional Drought. There are many considerations that are factored into determining the drought status; these include consideration of status on the Palmer Drought Severity Index, CPC Soil Moisture Model, United States Geological Survey (USGS) Weekly Streamflow, Standardized Precipitation Index, and Objective Drought Indicator Blends.

- **Location and Extent**

The District service area, ATEP, IVC, and SC are subject to drought conditions.

- **History**

The State of California has experienced several server droughts. In the last century, the most significant statewide droughts occurred from 1929 to 1934, from 1975 to 1977, from 1987 to 1992, and from 2012 to 2017. California recently emerged from a proclaimed State of Emergency due to extremely dry conditions. The longest duration of drought (D1-D4) in California lasted 376 weeks beginning on December 27, 2011, and ending on March 5, 2019. The most intense period of drought occurred between 2014 and 2017, where at its peak, over 50 percent of the land in California was under Exceptional Drought (D4) conditions. Orange County has had two (2) drought emergency declaration: 2002 and 2012 to 2017. Both the state and county drought declarations have impacted the District and required it to adjust standard practices to comply with local proclamations. Because of its location within Southern California and changing conditions, the potential for future events impacts remains high within the District.

- **Probability**

In any given year, California can be subject to drought conditions. This is especially true since outside resources that are shared with others provide much of the water. It is also important to note that droughts do not happen overnight, but rather are a slow buildup of conditions. On average, seventy-five percent (75%) of the state's annual precipitation occurs in the "wet season" (*November through March)*. December, January, and February generally see the most precipitation, but there have been many early and late season storms that bring in a substantial amount of precipitation. One of the best ways to predict drought conditions is to study the status of the El Niño Southern Oscillation (ENSO) patterns. In California, ENSO is a periodic shifting of ocean atmosphere conditions in the tropical Pacific that ranges from El Niño (warm phase) to neutral to La Niña (cold phase). La Niña conditions tend to favor a drier outlook for Southern California; while the El Niño conditions favor stronger, and wetter storms.

- **Climate Change Considerations**

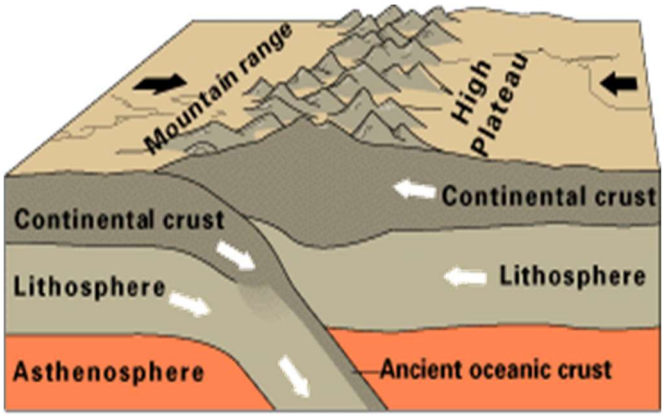
Climate change has the potential to make drought events more common in the West, including California. Extreme heat creates conditions more conducive for evaporation of moisture from the ground, thereby increasing the possibility of drought. A warming planet could lead to earlier melting of winter snow packs, leaving lower stream flows and drier conditions in the late spring and summer. Snow packs are important in terms of providing water storage and ensuring adequate supply in the summer. Changing precipitation distribution and intensity have the potential to cause more of the precipitation that does fall to run-off rather than be stored. The result of these processes is an increased potential for more frequent and more severe periods of drought.

5.4.5 EARTHQUAKE

- **Ranking**

Campus	Probability	Impact
ATEP	*High*	*High*
IVC	*High*	*High*
SC	*High*	*High*

- **Description**

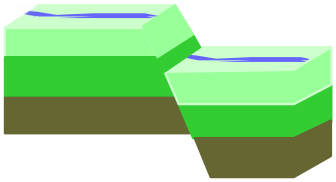


Continental-continental convergence

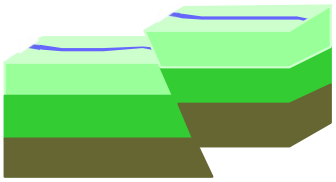
An earthquake is a release of strain within or along the edge of the Earth's tectonic plates, producing surface fault rupture, ground motion, and secondary hazards such as ground failure. For millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet. However, some earthquakes occur in the middle of plates. The severity of the shaking increases with the amount of energy released, decreases with distance from the causative fault or epicenter, and amplified by soft soils. After just a few seconds, earthquakes can cause massive damage and extensive casualties.

A fault is a fracture between blocks of the earth's crust where either side moves relative to the other along a parallel plane to the fracture. There are three different types of earthquake faults: 1) Normal, 2) Thrust; and, 3) Strike-slip. Normal fault and Thrust faults are examples of dip-slip faults. Dip-slip faults are slanted fractures where the blocks mostly shift vertically. If the earth above an inclined fault moves down, the fault is called a normal fault, but when

the rock above the fault moves up, the fault is called a reverse (or thrust) fault. Thrust faults have a reverse fault with a dip of 45° or less.

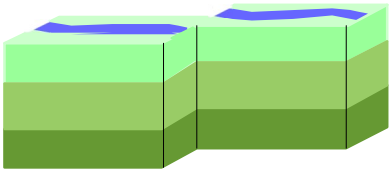


Normal Fault



Thrust Fault

Strike-slip faults are vertical or almost vertical rifts where the earth's plates move mostly horizontally. From the observer's perspective, if the opposite block looking across the fault moves to the right, the slip style is called a right lateral fault; if the block moves left, the shift is called a left lateral fault.



Strike-slip Fault

The effect of an earthquake on various locations throughout the felt area is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and total destruction of property. The intensity scale currently used in the United States is the Modified Mercalli Intensity (MMI) Scale (**Table 5.2**). It was developed in 1931 by the American seismologists Harry Wood and Frank Neumann. This scale is composed of increasing levels of intensity designated by Roman numerals that range from imperceptible shaking (MMI I) to catastrophic destruction (MMI X). It does not have a mathematical basis; instead, it is an empirical scale based on observed effects.

Table 5.2- Modified Mercalli Intensity (MMI) Scale

Intensity	Shaking	Description
I	Not Felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.

V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Many people are familiar with the Richter scale, a method of rating earthquakes based on the amplitude of seismic waves, an indirect measure of energy released (**Table 5.3**). The Richter scale is logarithmic. Each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic waves and a 32-fold increase in energy released. For example, an earthquake registering magnitude 7.0 on the Richter scale releases over 1,000 times more energy than an earthquake registering magnitude 5.0. It should be noted that while an earthquake may have many intensity values across the impacted area, there is just one Richter magnitude associated with each event.

Table 5.3- Earthquake Effects Associated with various Richter Magnitudes

Magnitude	Earthquake Effects
0-1.9	*Micro* - Not felt by people
2.0-2.9	*Minor* - Felt by few people
3.0-3.9	*Minor* - Felt by some people, inside objects can be seen shaking
4.0-4.9	*Light* - Felt by most people, inside object shake and fall
5.0-5.9	*Moderate* - Felt by everyone, damage and possible collapse of unreinforced buildings
6.0-6.9	*Strong* - Felt by everyone, widespread shaking/damage, some buildings collapse
7.0-7.9	*Major* - Felt by everyone, widespread shaking/damage, many buildings collapse
8.0 or greater	*Great* - Felt by everyone, widespread shaking/damage, most buildings collapse

Ground shaking and ground deformation are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, magnitude, and the type of earthquake. Below is an overview of the hazards associated with earthquakes:

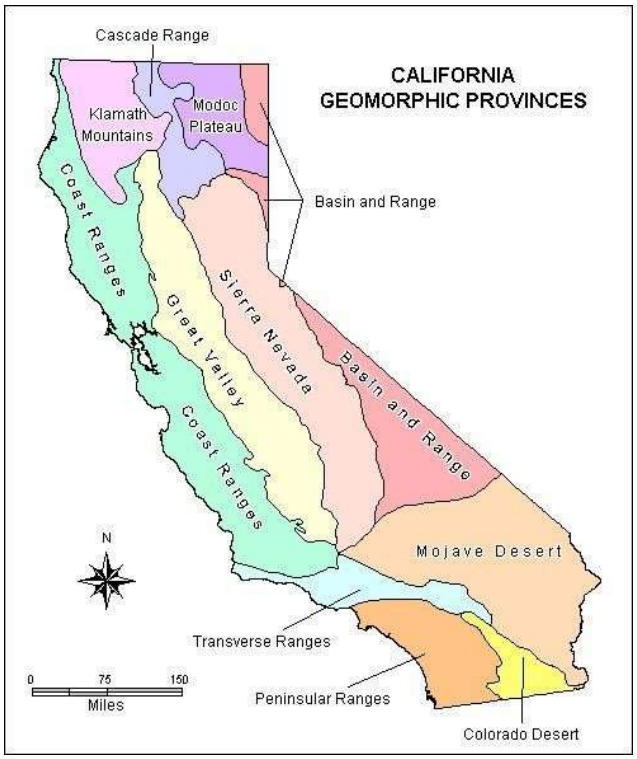
Ground Shaking- Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, distance from the epicenter (where the earthquake originates), and local soil conditions. Soils and soft sedimentary rocks near the earth's surface can amplify earthquake ground shaking. Amplification increases the magnitude of the seismic waves generated by the earthquake. The amount of amplification is influenced by the thickness of geologic materials and their physical properties. Buildings and structures built on soft and unconsolidated soils can face greater risk. Amplification can also occur in areas with deep sediment filled basins and on ridge tops. Peak Ground Acceleration (PGA) is a measure of the strength of ground shaking. Larger PGAs result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%, 5%, or 2%) of being exceeded in 50 years return period. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

Ground Deformation- consist of three (3) main classifications or types:

- *Surface Fault Rupture*- As previously mentioned, the sudden sliding of one part of the earth's crust past another releases the vast store of elastic energy in the rocks as an earthquake. The resulting fracture is known as a fault, while the sliding movement of earth on either side of a fault is called fault rupture. Fault rupture generally begins below the ground surface at the earthquake hypocenter, typically between three and ten miles below the ground surface in California. If an earthquake is large enough, the fault rupture will reach the ground surface (referred to as "surface fault rupture"), wreaking havoc on structures built across its path. Structures built across the fault are at risk of significant damage from surface fault rupture. Recent large earthquakes in Turkey and Taiwan have shown that few structures built across the surface traces of faults can withstand the displacements that may occur during a large earthquake.
- *Landslides*- Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes. (*NOTE: while mentioned here, landslides are addressed separately in a later section*)
- *Liquefaction*- Liquefaction is the phenomenon that occurs when ground shaking causes loose, saturated, sandy soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing

strength. Lateral spreads develop on gentle slopes and entails the sidelong movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength occurs when the soil supporting structures liquefy; causing the structures to settle, resulting in damage and, in some cases, collapse.

- **Location and Extent**

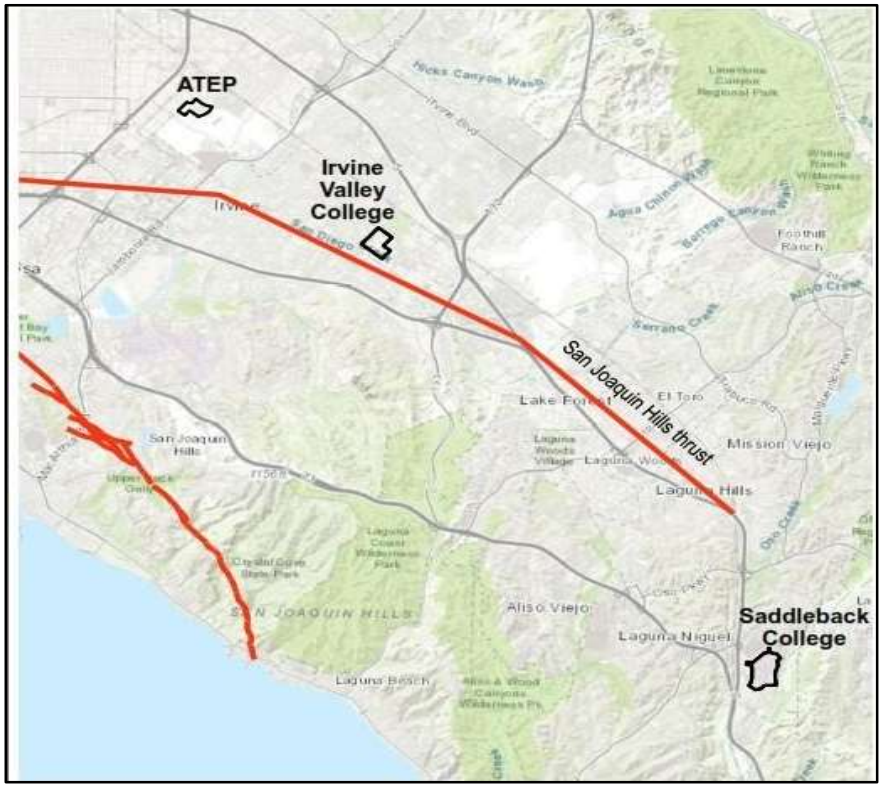


As noted by the California Geological Survey, California is divided into eleven (11) geomorphic provinces. California's geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform. Each region displays unique, defining features based on geology, faults, topographic relief and climate. These geomorphic provinces are remarkably diverse. They provide spectacular vistas and unique opportunities to learn about earth's geologic processes and history. These geomorphic provinces each have the potential to create significant earthquakes and associated hazards. The District is located in a high seismic activity zone in the Transverse Ranges geologic province. The Transverse Ranges are an east-west trending series of steep mountain ranges and valleys. The east-west structure of the Transverse Ranges is oblique to the normal northwest trend of coastal California, hence the name "Transverse." The province extends offshore to include San Miguel, Santa Rosa, and Santa Cruz islands. Its eastern extension, the San Bernardino Mountains, has been displaced to the south along the San Andreas Fault. Intense north-south compression is squeezing the Transverse Ranges. As a result, this is one of the most rapidly rising regions on earth. Great thicknesses of Cenozoic petroleum-rich sedimentary rocks have been folded and faulted, making this one of the important oil producing areas in the United States.

In California, the 1972 Alquist-Priolo Earthquake Fault Zoning Act prohibits the siting of most structures for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting. The more significant faults within the region include the San Andreas Fault, the Newport-Inglewood Fault and the San Joaquin Hills Thrust Fault; these faults and their associated Alquist-Priolo Fault Zones are shown in **Figure 5.9**. In California, movement between the North American and the Pacific tectonic plates manifest primarily along a region known as the San Andreas Fault system. Experts believe the San Andreas Fault is capable of producing an earthquake of magnitude 8.0+ over the next few years. The San Andreas Fault is considered the "*Master Fault*" because it has frequent (geologically speaking), large earthquakes, and it controls the seismic

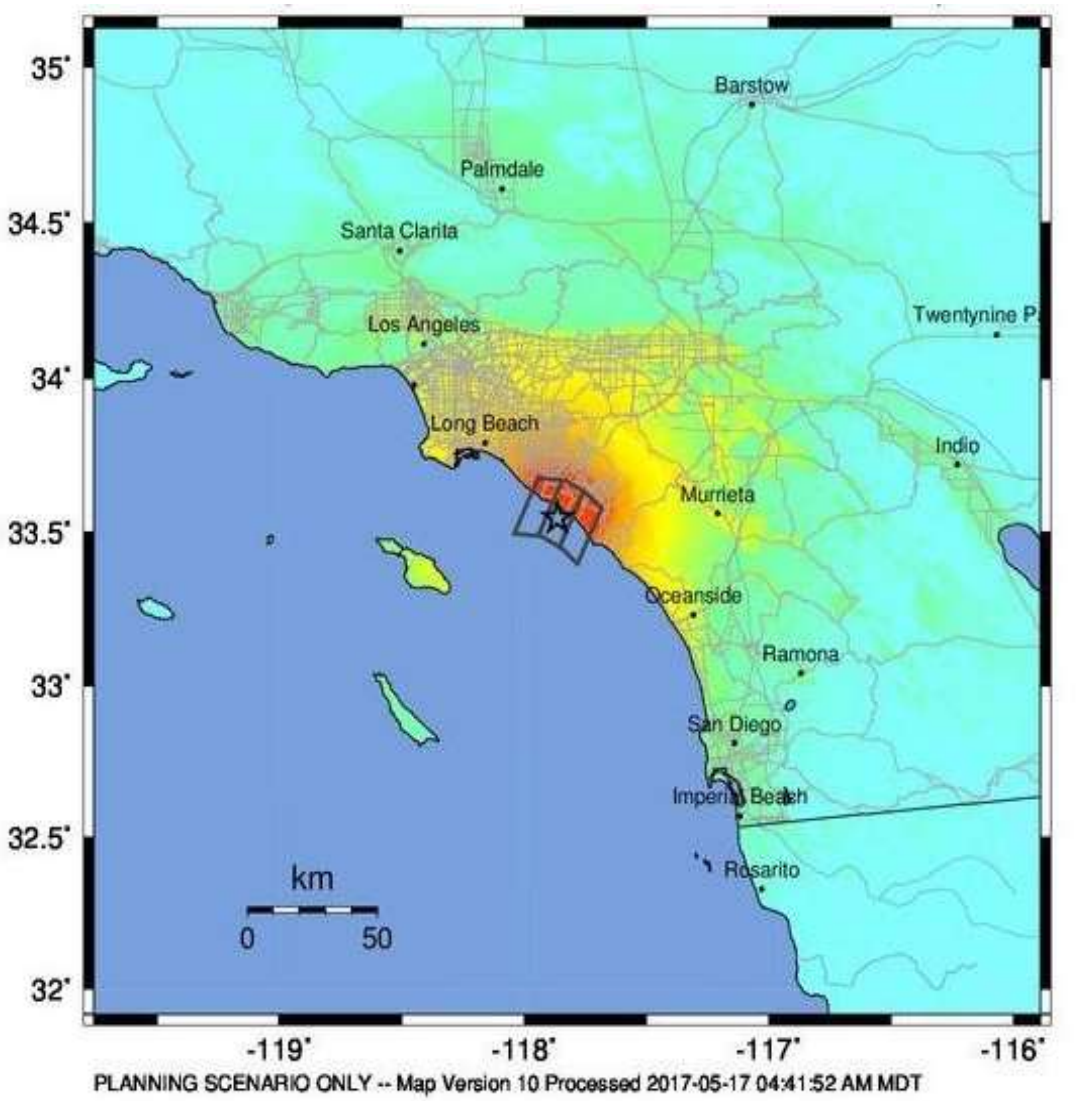
hazard in southern California. Faults in the San Andreas Fault zone that pass through Southern California are part of the very active southern segment.

Figure 5.9- Earthquake Faults and Alquist-Priolo Fault Zones within the District



As previously mentioned, hazards associated with earthquakes include ground shaking and ground deformation (i.e., surface fault rupture, liquefaction, and landslides). Below are figures depicting the potential ground shaking scenarios for earthquakes of significance in the District service area (**Figure 5.10** and **Figure 5.11**) and the exposure to liquefaction hazards for each campus (**Figure 5.12, Figure 5.13,** and **Figure 5.14**).

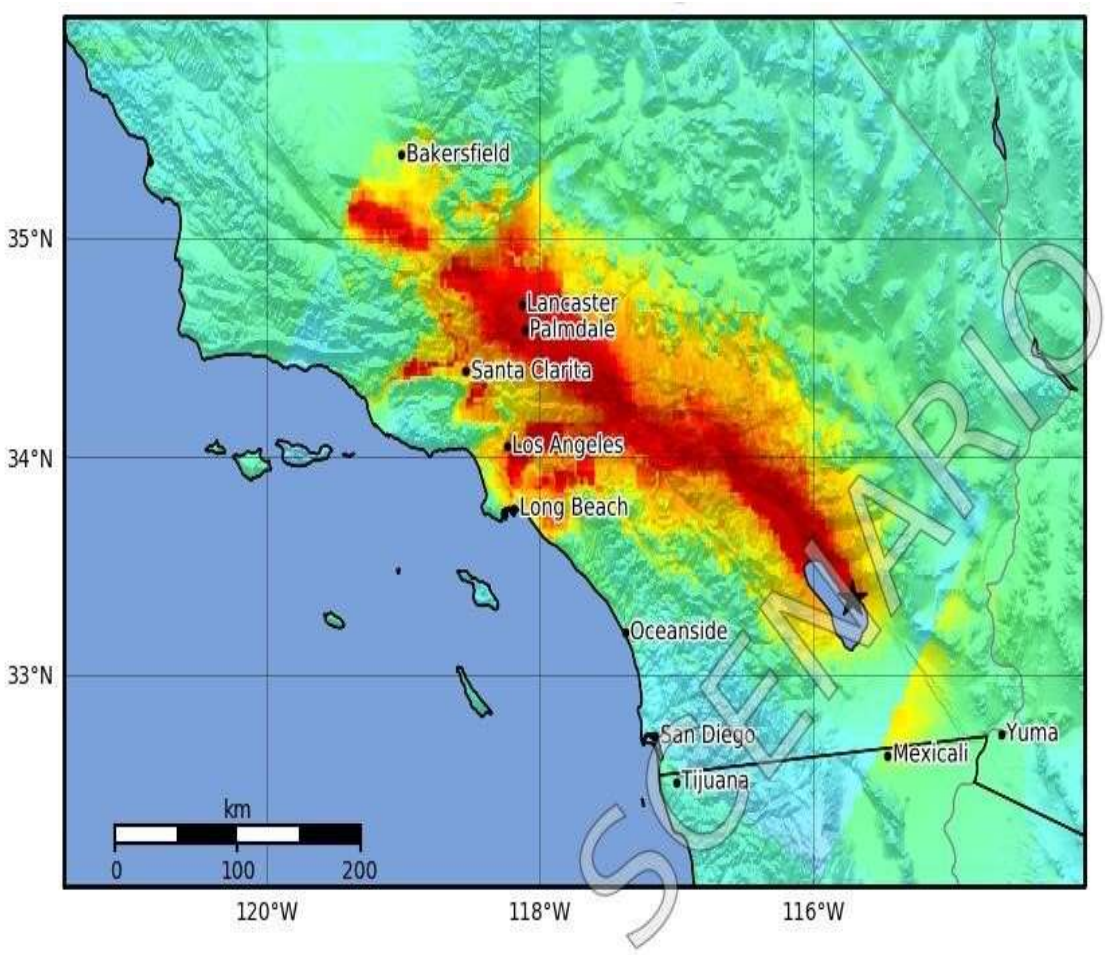
Figure 5.10- San Joaquin Hills Fault (M7.0) Scenario ShakeMap



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

Figure 5.11- San Andreas Fault (M7.8) Scenario ShakeMap



SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	None	None	None	Very light	Light	Moderate	Moderate/heavy	Heavy	Very heavy
PGA(%g)	<0.1	0.49	2.35	6.73	12.6	23.7	44.4	83.3	>156
PGV(cm/s)	<0.07	0.37	1.93	5.8	11.3	21.9	42.5	82.5	>160
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based on Wald et al. (1999) Version 5: Processed 2019-08-09T23:53:03Z

△ Seismic Instrument ○ Reported Intensity ★ Epicenter

Figure 5.12- Liquefaction Hazard Zones in the Vicinity of ATEP

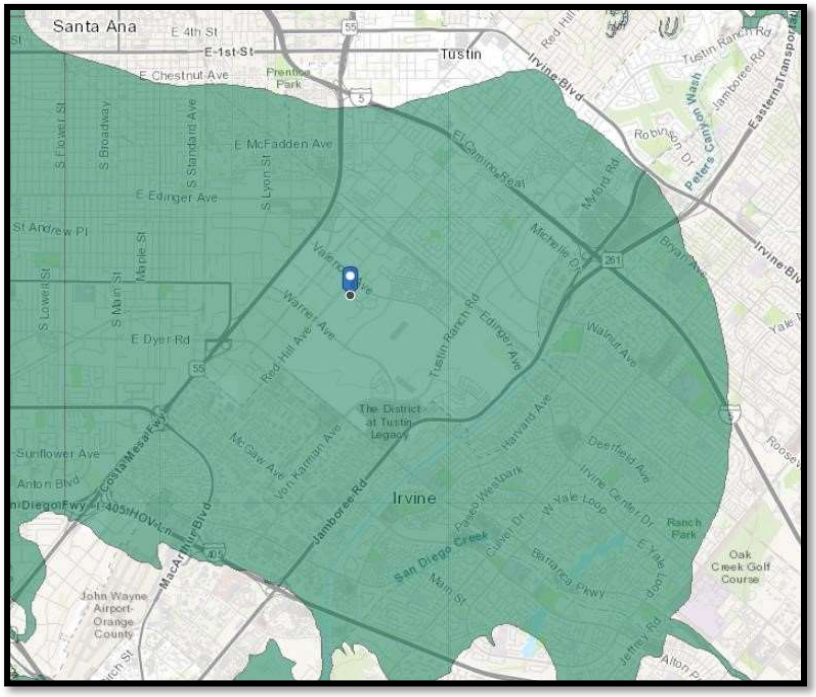


Figure 5.13- Liquefaction Hazard Zones in the Vicinity of IVC

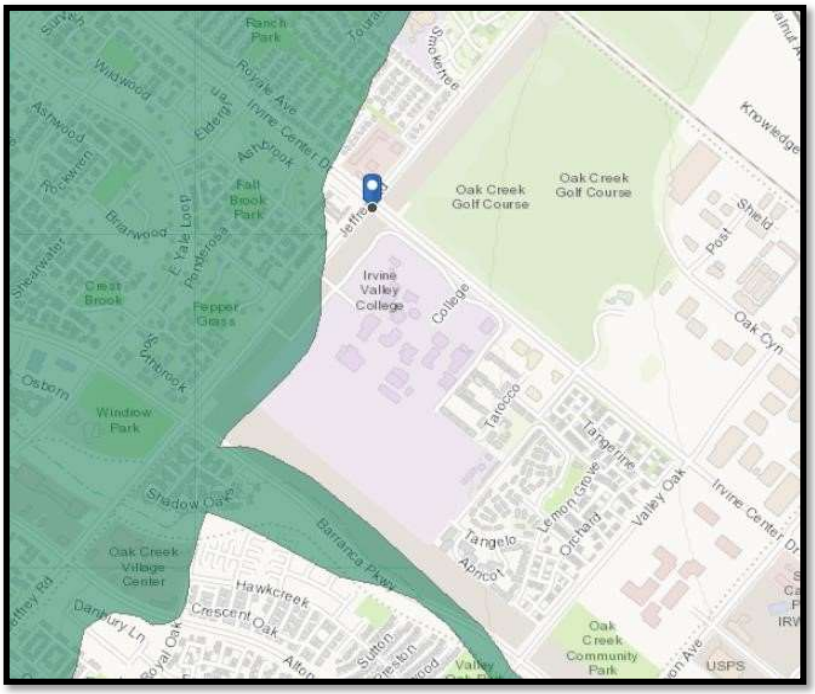
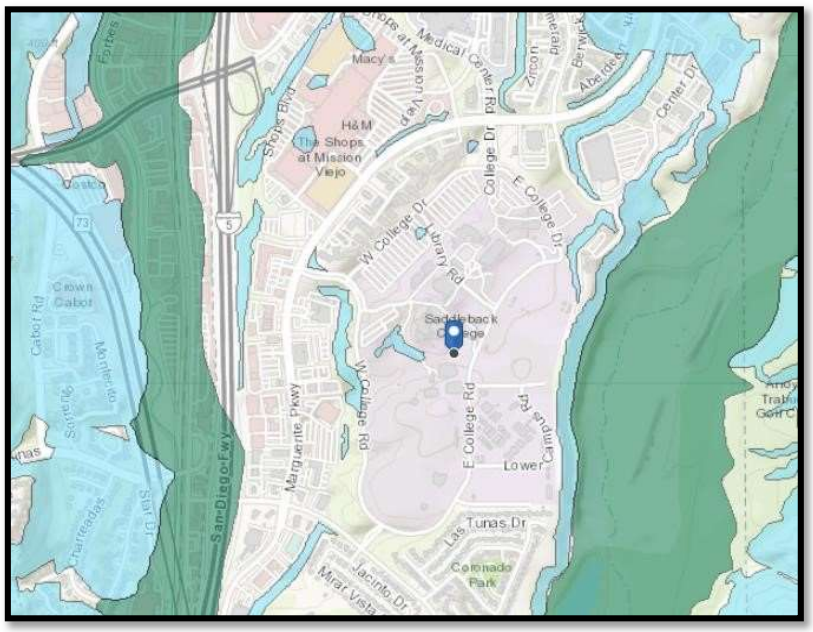


Figure 5.14- Liquefaction and Landslide Hazard Zones in the Vicinity of SC

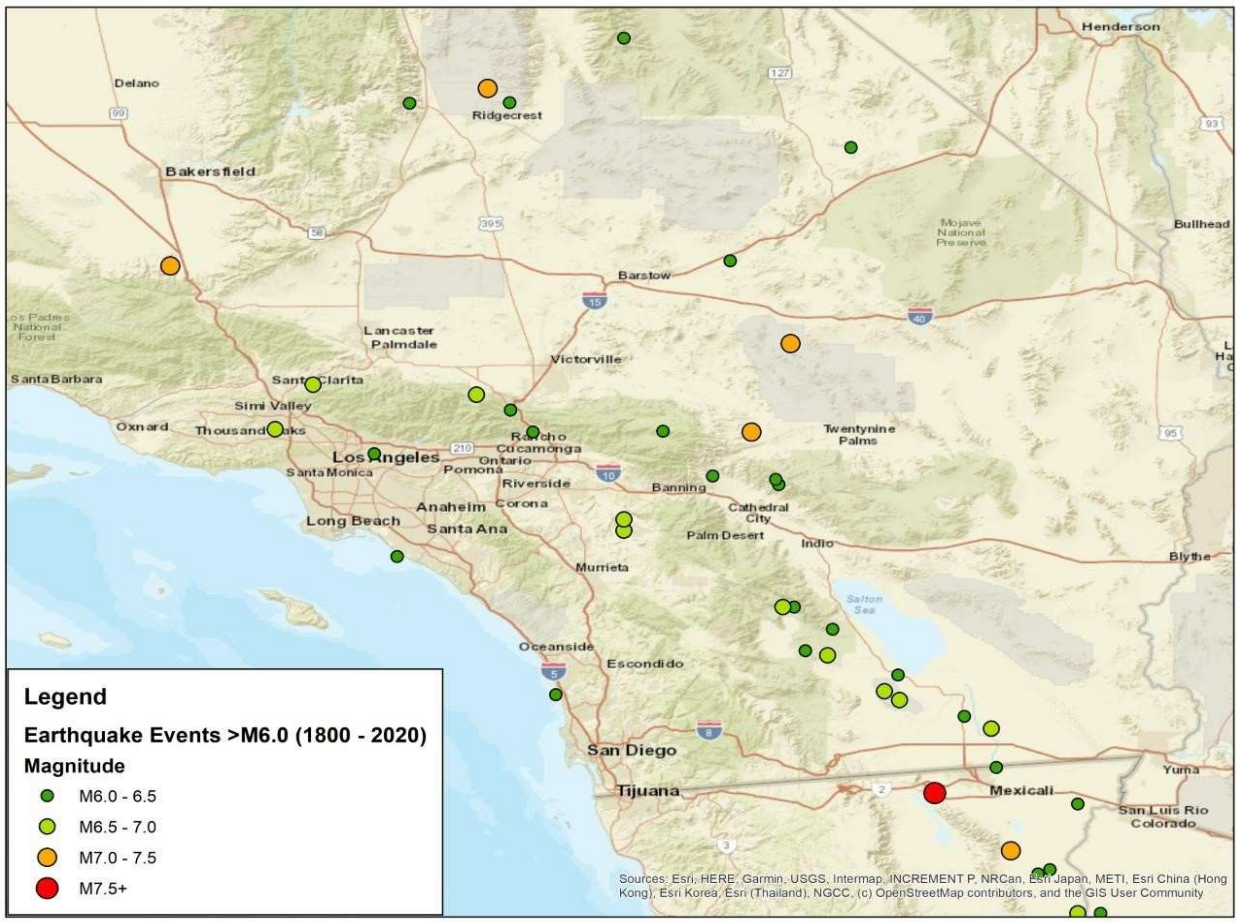


- **History**

There are 45 states and territories in the United States at "moderate" to "very high" risk from earthquakes, and they are located in every region of the country. California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes - most of which occur in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault Zone in Missouri, where a three-month long series of events from 1811 to 1812 included three earthquakes larger than Magnitude 8 on the Richter scale. These earthquakes were felt over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

According to the California Geologic Survey, California has a long history of significant seismic events, greater than magnitude 6.0 since 1800. **Figure 5.15** displays historical epicenters of earthquakes located in Southern California since 1800 as reported by the USGS. Southern California area has experienced several large earthquakes, including Fort Tejon in 1857 (M7.9), Owens Valley in 1872 (M7.6), and Northridge Earthquake in 1994 (M6.7). The Northridge Earthquake struck at 4:31 A.M. on Monday, January 17, 1994 in the San Fernando Valley. In the following days and weeks, thousands of aftershocks occurred, causing additional damage to affected structures. Effects of the earthquake were felt north into Ventura County, south in Orange County, and east into Riverside and San Bernardino Counties. A list of significant historical California earthquakes is provided in **Appendix D**.

Figure 5.15- Significant Earthquakes in Southern California >M6.0

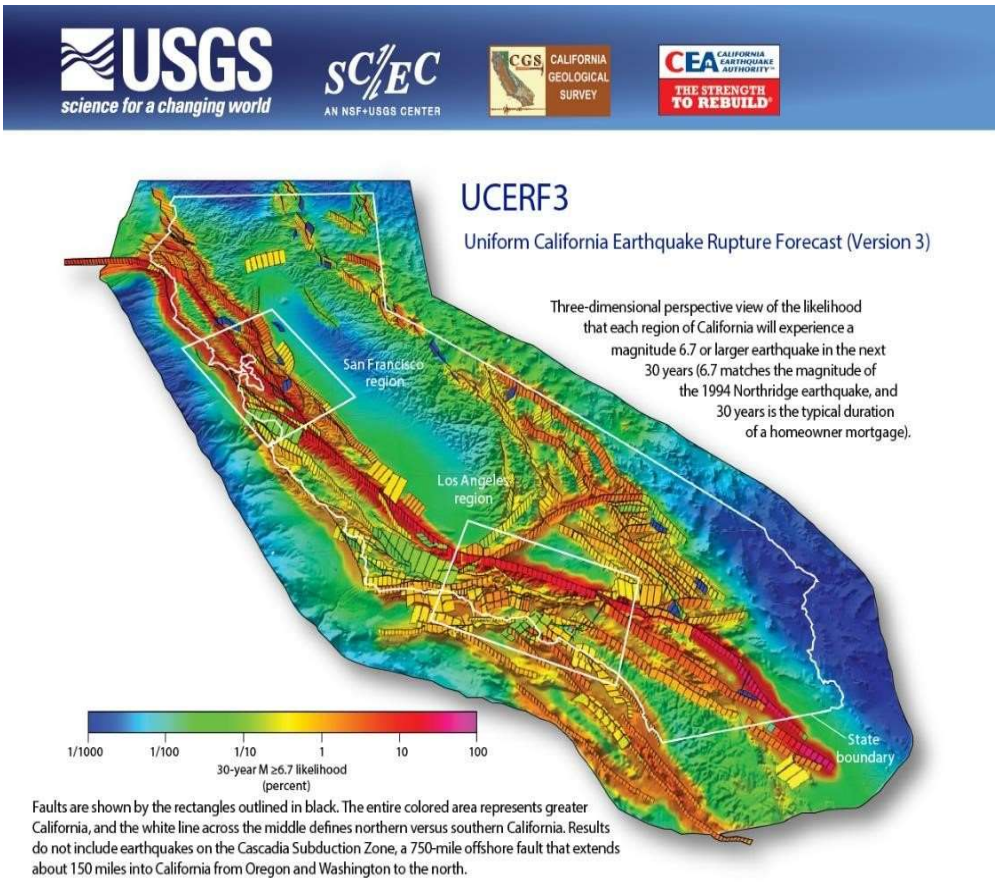


The District has experienced many earthquakes. To date, the damage from the earthquakes have been marginal but they have created disruptions to District operations and services. However, as expected, because of its location within Southern California, the potential for more severe events remains high within the District.

- **Probability**

Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. The probability of a significant (M6.7 or greater) earthquake occurring in Southern California in the next 30 years has been estimated to be 93 percent by the 2014 California Working Group on Earthquake Probability, as shown in **Figure 5.16**.

Figure 5.16- California 30-Year Earthquake Probabilities



Southern California region					
Magnitude (greater than or equal to)	**Average repeat time (years)**		**30-year likelihood of one or more events**		**Readiness**
5	0.24	(0.7)	100%	(1.0)	1.0
6	2.3	(0.9)	100%	(1.0)	1.0
6.7	12	(1.5)	93%	(1.0)	1.0
7	25	(1.4)	75%	(0.9)	1.1
7.5	87	(1.2)	36%	(0.9)	1.2
8	522	(0.4)	7%	(2.5)	1.3

- **Climate Change Considerations**

To date, no credible evidence has been provided that links climate to earthquakes. However, climate and weather does play a significant role in the response and recovery from earthquakes. Effects from climate change could also create cascading complications and impacts.

5.4.6 ENERGY DISRUPTION

- **Ranking**

Campus	Probability	Impact
ATEP	*Medium*	*Medium*
IVC	*Medium*	*Medium*
SC	*Medium*	*Medium*

- **Description**

For the purposes of this LHMP, energy shortage/power outage is confined to rolling blackouts or brownouts and Public Safety Power Shutdown (PSPS) events. A brownout is a partial, temporary reduction in total system capacity, while a blackout is a complete interruption in power. A brownout is caused by high electricity demand that is near or above a utility's production capacity. When this occurs, the utility may reduce the flow of electricity to certain areas to prevent a blackout. A blackout is a large-scale service interruption that can happen because of severe weather or equipment failure at power plants. PSPS events are initiated by power utility companies and are implemented in response to severe weather events. The purpose is to mitigate the increased fire risk during "red flag" weather conditions. Red flag weather conditions include high winds, low humidity, and high temperatures. By shutting off power, the utility companies are ensuring that electrical equipment, which can arc and spark, during severe events, will not exacerbate or start a fire.

- **Location and Extent**

Energy shortage and/or power outage events can occur throughout the District service area.

- **History**

The District, like most of California, has had power outages related to the failure of the statewide or regional systems not being able to meet demand, system shut downs related to fire threats, localized outages related to severe weather, accidents, and localized system failures. System wide outages have become more frequent due to extreme heat and fire threats.

- **Probability**

There are no studies that predict the probability of Energy Shortage and/or Power Outage event occurrences. However, the California Independent System Operator (Cal ISO) does monitor energy supply and demand and provides some near-time predictions when there may be energy shortages and recommend "Flex Alerts" orders. Similarly, PSPS events are implemented and managed by private utility companies. While historically, they have not consistently provided advanced notice of when and where the power would be shutoff, or when the power will be restored, there are noticeable improvements to notifications over recent events.

- **Climate Change Considerations**

Climate plays a significant role in Energy Shortage and/or Power Outage events. As temperatures rise, there will be significant impacts on energy supply and demand. Additionally, increased wildfire risk will increase the frequency and duration of PSPS events.

5.4.7 EXTREME TEMPERATURE

- **Ranking**

Campus	Probability	Impact
ATEP	*Medium*	*Medium*
IVC	*Medium*	*Medium*
SC	*Medium*	*Medium*

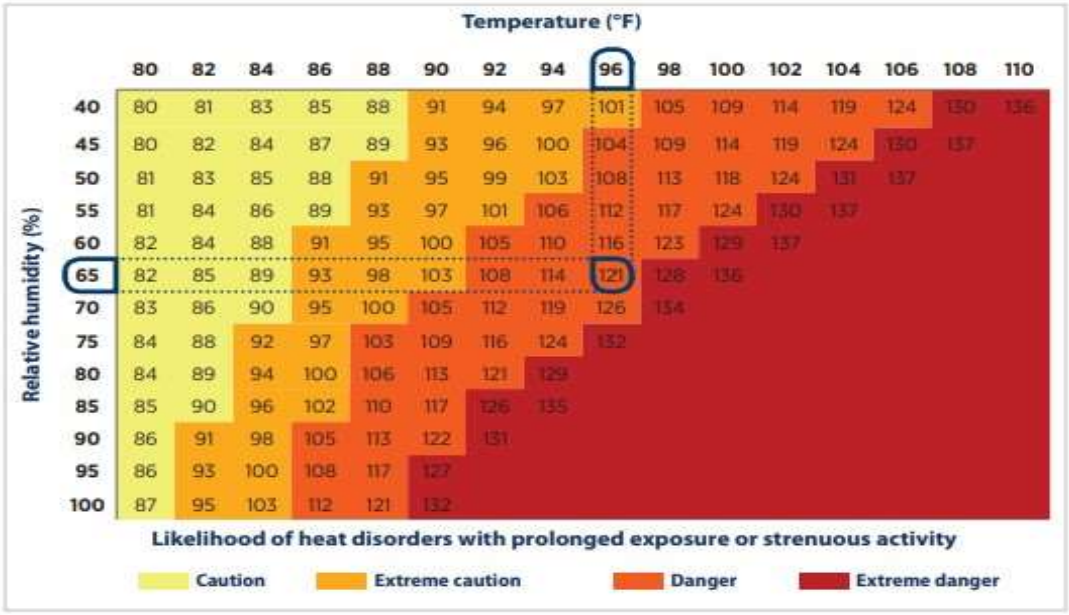
- **Description**

For the purposes of the LHMP, Extreme Temperature include both 1) extreme heat and 2) extreme cold weather conditions.

- **Extreme Heat** conditions, according to the U.S. Environmental Protection Agency (EPA) and Centers for Disease Control and Prevention (CDC), are defined as weather that is much hotter and more humid than average for a particular time and place. The National Weather Services (NWS) issues the following excessive heat products:
  - *Heat Advisory* is a period when excessive heat is expected. The combination of hot temperatures and high humidity will create a situation in which heat related illnesses are possible.
  - *Excessive Heat Watch* is a prolonged period of dangerous excessive heat within about 48 hours.
  - *Excessive Heat Warning* is a prolonged period of dangerous excessive heat within about 24 hours.

The heat index is a measure of how hot it feels when relative humidity is factored in with the actual air temperature (**Figure 5.17**). Relative humidity is the percentage of moisture in the air compared with the maximum amount of moisture the air can hold. Humidity is an important factor in how hot it feels because when humidity is high, water does not evaporate as easily, so it is harder for your body to cool off by sweating.

Figure 5.17- NOAA's National Weather Service Heat Index



Extreme heat kills hundreds of Americans every year and causes many to become seriously ill. Extreme heat can result in significant economic impacts, effect agriculture and livestock, and may cause damage to homes and businesses. Measures to prevent illness are generally common sense, including staying cool indoors, keeping hydrated, limiting physical activity, and monitoring those at highest risk. Prolonged high temperatures can pose a risk to vulnerable populations, particularly if combined with power outages. As the Heat Index rises, so do health risks. Specifically:

- When the Heat Index is 90°F, heat exhaustion is possible with prolonged exposure and/or physical activity.
- When it is 90° to 105°F, heat exhaustion is probable with the possibility of sunstroke or heat cramps with prolonged exposure and/or physical activity.
- When it is 105° to 129°F, sunstroke, heat cramps or heat exhaustion is likely and heatstroke is possible with prolonged exposure and/or physical activity.
- When it is 130°F and higher, heatstroke and sunstroke is extremely likely with continued exposure. Physical activity and prolonged exposure to the heat increase the risks.

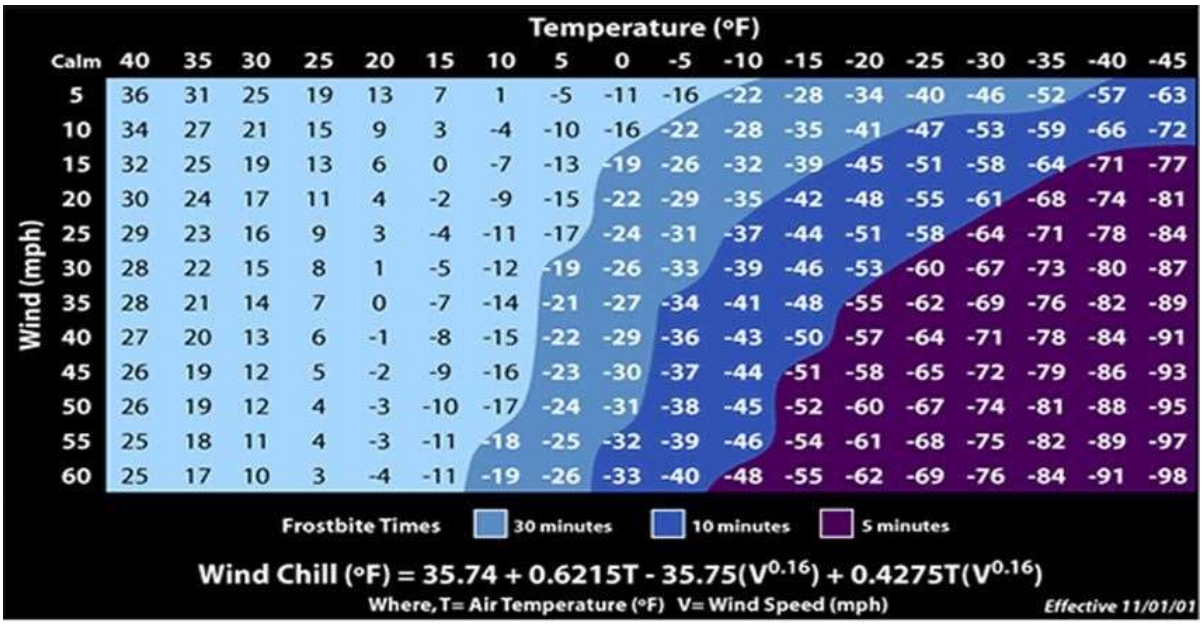
✦ **Extreme Cold** conditions are noted when there are sustained temperatures below freezing (32F). The NOAA provides three different categories of actions for freeze events: advisory, watch, and warning.

- *Frost Advisory* is issued when the minimum temperature is forecast to be 33 to 36 degrees on clear and calm nights during the growing season.

- *Freeze Watch* is issued when there is a potential for significant, widespread freezing temperatures within the next 24-36 hours.
- *Freeze Warning* is issued when significant, widespread freezing temperatures are expected.

When combined with extreme cold temperatures, winds can compound the events creating a phenomenon known as "wind chill" factor. Wind Chill is the term used to describe the rate of heat loss on the human body resulting from the combined effect of low temperature and wind. As winds increase, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature. Animals are also affected by wind chill; however, cars, plants, and other objects are not. **Figure 5.18** shows the NWS Wind Chill Chart that uses science and other information to provide an accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures.

Figure 5.18- Wind Chill Chart



Prolonged freezing temperatures can pose a risk to vulnerable populations, particularly if combined with power outages. Exposure to cold can cause significant health problems, such as frostbite or hypothermia and become life threatening. When combined with precipitation, ice can form on roadways, trees, and power lines creating secondary hazard conditions. Extreme cold can result in significant damage to homes and businesses (e.g., from burst pipes), and can cause significant health problems, such as hypothermia and frostbite. Agriculture and livestock are subject to damage and life loss and may cause economic impacts as well.

- **Location and Extent**

An extreme temperature event can occur throughout the entire District service area, but because of the climate zone, are most likely to occur during the warmer summer months. Measures to prevent illness are generally common sense, including staying cool indoors, keeping hydrated, limiting physical activity, and monitoring those at highest risk.

- **History**

While the District and/or Orange County have not experienced many extreme cold events (1 recent declaration event in 2002), they have experienced many extreme heat events. Some significant historic extreme temperature events include:

- September 1963, the temperature reached 113°F at the now repurposed El Toro Air Force Base and the surrounding region was hot as well, including coastal areas. Temperatures in Carlsbad and Oceanside reached 108°F. Schoolchildren and employees were sent home and some agricultural crops were destroyed.
- December 1988, A week of subfreezing temperatures in Southern California. 5 people died as a result of the cold,
- April 1989, daily high temperature records were set for all weather monitoring stations in Southern California. Los Angeles and Riverside set records at 106°F and 104°F respectively.
- October 2017, Southern California experienced two extreme heat days. The weather monitoring station at Long Beach Airport indicated that temperatures reached 105°F that day.
- July 2018, extreme heat waves occurred throughout Southern California. The hottest day of the heat waves occurred on July 6 when temperatures reached 114°F in Santa Ana, CA. A second but less intense extreme heat wave occurred on July 25 where regional temperatures went above 100°F in places like Burbank. While local temperature data is not available, the weather monitoring station at nearby Long Beach Airport indicates that the temperature reached 95°F that day.
- September 2020, A major heat wave struck the region, temperatures of 121 degrees were recorded in Los Angeles County (the highest temperature on record in County)
- June 2021, Strong high pressure brought a dry heat to inland areas. Temperatures reached 123° in Palm Springs, tying the highest reading on record.

The District has experienced several extreme temperature events. To date, the damage from the events have been marginal but they have created disruptions to District operations and services. However, because of its location within Southern California and changing conditions, the potential for more events remains high within the District.

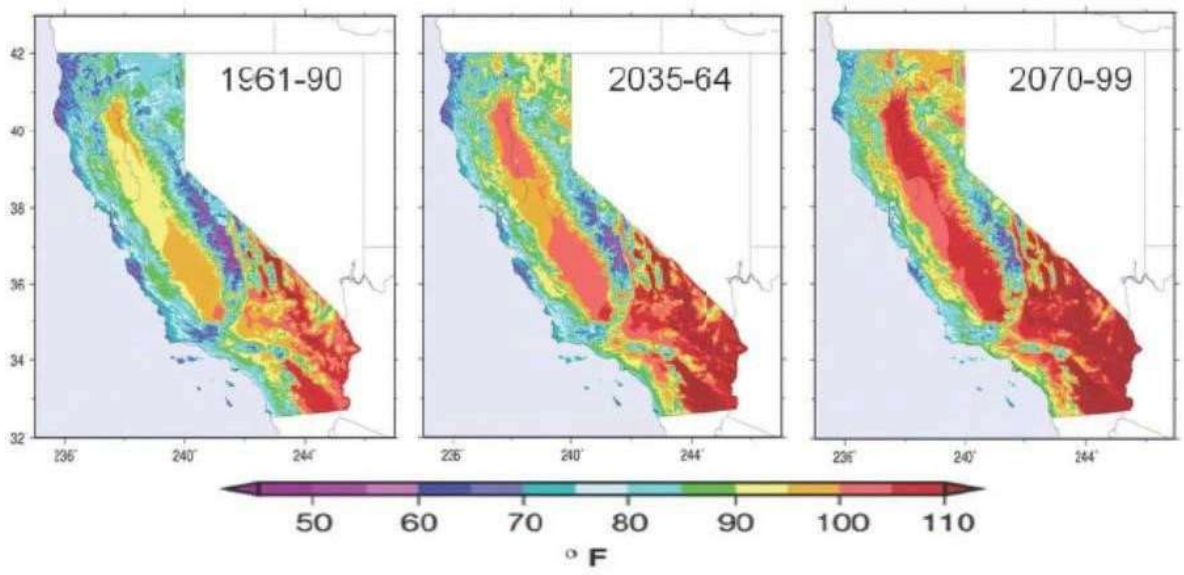
- **Probability**

There are no studies that predict the probability of extreme temperature event occurrences.

- **Climate Change Considerations**

Climate plays a significant role in Extreme Temperature events. As temperatures rise due to changing conditions, Californians will face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. By mid-century, extreme heat events in urban centers could cause two to three times more heat-related deaths than occur today. By 2100, the California Energy Commission is projecting hotter temperatures throughout the state, with an increase of 3 to 5.5°F up to 8 to 10.5°F under different emissions scenarios. The potential change between historical and projected temperature increases are illustrated in **Figure 5.19**.

Figure 5.19- Comparison between Historic and Projected Temperature



5.4.8 FLOOD

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Low*
IVC	*High*	*High*
SC	*Medium*	*Low*

- **Description**

A flood is a temporary condition (short-duration or long-duration) of partial or complete water inundation on land that is normally dry. Generally, this condition is caused by precipitation (i.e., rainfall). Several factors determine the severity of floods, including rainfall intensity and duration, antecedent moisture conditions, surface permeability, and geographic characteristics of the watershed such as shape and slope. Other causes of flooding can include a ruptured dam or levee, rapid ice or snow melting in the mountains, under-engineered infrastructure, or even a poorly placed beaver dam can overwhelm a river or

channel and send water spreading over adjacent land or floodplains. According to FEMA, there are several different types of floods; and some have subtypes, which include:

- *Riverine Flooding*- river/stream overbank flooding, flash floods, dam and levee failure, alluvia fans, ice jam flooding, moveable bed streams)
- *Urban Drainage*
- *Ground Failures*- mud flood and mud flows, subsidence, liquefaction (NOTE: while mentioned here, mud flows are discussed under landslide hazards and Subsidence and Liquefaction hazards are discussed under earthquake hazards)
- *Fluctuating Lake Levels*
- *Coastal Flooding and Erosion- storm surge*

In California, the more common types of flooding are Riverine Flooding (including flash flooding), Urban Flooding, and Coastal Flooding (i.e., storm surge). Floods can take several hours to days to develop. A flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours. Coastal flooding occurs when storms produce large ocean waves that sweep across coastlines making landfall. The following flood characterization designates the amount of time for response:

- Flood Watch- Advanced warning of a possible flood is in the area.
- Flood Warning- Advanced warning of flooding that is already occurring or will occur soon in the area.
- Flash Flood Watch- Little-to-no advanced warning of a possible flash flood in the area.
- Flash Flood Warning- Little-to-no advanced warning of flooding that is already occurring or will occur soon in the area.

- **Location and Extent**

Flooding tends to occur in the summer and early fall because of the monsoon and is typified by increased humidity and high summer temperatures. The majority of flood issues on all campuses fall under urban drainage. While there is a small issue along the SC border, most issues are caused by clogged storm drains or failed water pumps.

The standard measure for riverine flooding is the "*100-year flood*", a benchmark used by the Federal Emergency Management Agency (FEMA) to establish a standard of flood control in communities throughout the country. The 100-year flood is also referred to as the "regulatory" or "base" flood. The term 100-year flood is often incorrectly used and can be misleading. The correct designation is "*the 1% annual chance flood*", meaning that the 100-year flood has a one percent chance of being equaled or exceeded during any given year, not that the flood will occur once every hundred years.

The FEMA National Flood Insurance Program (NFIP) produces Flood Insurance Rate Maps (FIRM). The FIRM identifies potential flood risk in geographic areas. The FIRMs are the

official map of a community on which FEMA has delineated both the special flood hazard areas and the risk premium zones applicable to the community. Historically, FIRMs were produced on paper; however, over recent years FEMA has begun the process of creating digital versions (*DFIRM)*. Due to the limited detail and large scale of the base maps used for most FIRMs, much interpolation between contour lines is done in mapping the floodplain boundaries. This is why you may find discrepancies when actual ground elevations are surveyed: the maps are just the best available graphic representations of the Base Flood Elevations (BFEs).

The flood hazard areas identified on the FIRMs (i.e., the Special Flood Hazard Areas or SFHAs) for ATEP, Irvine Valley College, and Saddleback College are depicted in **Figure 5.20, Figure 5.21,** and **Figure 5.22** respectively. The flood hazard zones depicted on the map are derived from FEMA's DFIRM and indicate the probability of flooding happening over a given period. As defined by FEMA, Zone A, AE, AE Floodway, AH, and AO (lighter shades of blue) indicate a 1% annual chance of flooding; while Zone Shaded X (dark blue) indicates a 0.2% of annual chance of flooding (500-year flooding). Complete definitions of flood zone designations are provided in **Table 5.4**.

Figure 5.20- FEMA Special Flood Hazard Areas for ATEP

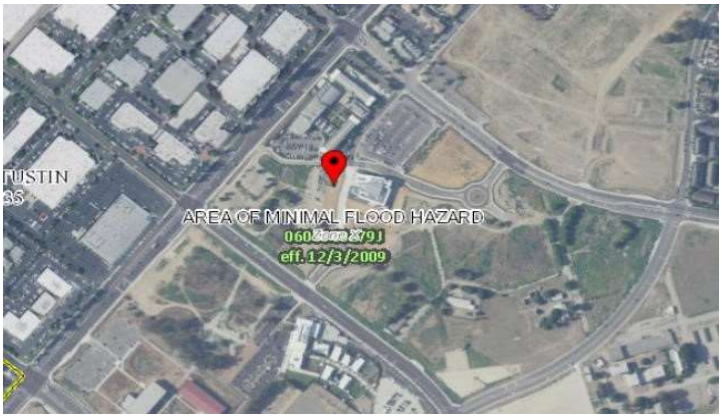


Figure 5.21- FEMA Special Flood Hazard Areas for IVC

Figure 5.22- FEMA Special Flood Hazard Areas for SC

Table 5.4 - FEMA Flood Zone Designations

Risk Level	Flood Zone	Description
High	A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
	AE	The base floodplain where base flood elevations are provided.
	AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
	AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
Moderate to Low	X (Shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods.
	X (Unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.
Undetermined	D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

- **History**

Orange County has experienced several significant flood events; the most significant ones received federal declarations. A list of the County's most recent federally declared flood disasters are presented in **Table 5.5**.

Table 5.5- Recent Orange County Flood Disaster Declarations

Declaration #	Year	Type	Description
DR 1044	1995	Severe Storm	Severe Winter Storms, Flooding, Landslides, Mudflows
DR 1046	1996	Severe Storm	Severe Winter Storms, Flooding, Landslides, Mudflows
DR-1203	1998	Severe Storm	Severe Storms, Flooding, Debris Flows, Mudslides
DR 1585	2005	Severe Storm	Severe Storms, Flooding, Landslides, Debris/Mud flows
DR-1577	2005	Severe Storm	Severe Storms, Flooding, Debris Flows, Mudslides
DR-1952	2011	Flood	Severe Winter Storms, Flooding, Debris/Mud flows
DR-4305	2017	Flood	Severe Winter Storms, Flooding, Mudslides

Locally, on the campuses, there has been some flooding issues. While all campuses experience some level of urbanized flood for a number of reasons (i.e., too much rain all at once, debris clogging water runoff drains), the issues have been isolated and temporary. However, IVC had an event in 2011 that caused flooding of the B Quad buildings due to an extreme rain event and failure of pump system/clogged drains and SC has experienced flooding on the south part of campus requiring a reconfiguration and rerouting of the water runoff system.

- **Probability**

While the methodology to estimate riverine flood frequency and probability is firmly established by FEMA, these methods do not apply to non-riverine (local) flooding related to poor site drainage.

- **Climate Change Considerations**

Climate can act as an amplifier to flood hazards. Extreme weather events have become more frequent over the past 40 to 50 years and this trend is projected to continue. Rising sea levels and shifting weather patterns (temperature, winds) are expected to have a significant impact on rainfall frequency, intensity and distribution, which in turn will have a significant impact on the frequency of flood occurrences. Additionally, warmer weather patterns increase snowmelt, which in turn produces more runoff to the lower elevations.

5.4.9 HAZARDOUS MATERIALS ACCIDENT

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Low*
IVC	*Low*	*Medium*
SC	*Low*	*Low*

- **Description**

Hazardous materials are used and/or created in manufacturing, agriculture, service industries (e.g., gas stations, dry cleaners), and health care facilities. Several household products such as cleaning supplies and paint are also considered hazardous materials. These hazardous materials may be corrosive or otherwise damaging over time. The US Department of Transportation (US DOT) classifies hazard materials into the following classification system:

- Class 1- Explosives
- Class 2- Flammable, non-flammable, and poisonous gases
- Class 3- Flammable liquids
- Class 4- Flammable, spontaneously combustible, and dangerous when wet solids
- Class 5- Oxidizers and organic peroxides
- Class 6- Toxic (poisonous) substances
- Class 7- Radioactive materials
- Class 8- Corrosive substances
- Class 9- Miscellaneous dangerous goods/hazardous materials and articles

The release of these materials can be in three different *types/forms*: liquid, solid, and airborne; and the *category* of the release include scheduled (planned) or accidental (unplanned). The category of release is based on the owner of the hazardous materials perspective, in other words, was the release of the hazardous material planned or unplanned. In the event of a terrorist incident involving the release of the owner's hazardous material, it would fall under the accidental (or unplanned) release category.

Additionally, the release can occur at fixed-site or during the transportation of the hazardous material. A fixed-site release includes the production and manufacturing, handling, and storage of a hazardous product at a single facility as well as any releases that may occur at a designated hazardous waste disposal site. A transportation-related release includes the release that occurs while the hazardous material is in transit from one facility to another or en route to be disposed of at a designated hazardous waste disposal site (e.g., on highways, railways, airports, or in pipelines).

- **Location and Extent**

As outlined above, hazardous materials can be found throughout the District's service area. The location and identity of facilities that store hazardous materials must be reported to local and federal governments as required by the Emergency Planning and Community Right-to-Know Act (EPCRA). Many facilities have their own hazardous materials guides and response plans, including transportation companies who transport hazardous materials.

The release of these materials into a community could result in public health risks, fires, and/or explosions. People, vehicles, wind, and water may carry contamination out of the

immediate area of the incident. Weather conditions can increase the size and intensity of the Hazardous Materials Release. Typography, such as hills and canyons, can increase the size of the release or make it more difficult to contain.

Although these incidents can happen almost anywhere, certain areas are at higher risk, such as near roadways or rail lines used to transport hazardous materials and locations with industrial facilities that use, store, and/or dispose of such materials. On the campuses, this would also include the FMO yards and laboratory facilities.

- **History**

The US DOT maintains statistics of hazardous materials release events throughout the United States. DOT data from 2010-2019 indicate the majority of releases occur during highway transportation (**Table 5.6**).

Table 5.6- Hazardous Material Incidents- 2010-2019 (US DOT)

Mode Of Transportatio	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Grand Total
FAA-AIR	1,295	1,401	1,460	1,442	1,327	1,130	1,204	1,166	1,433	1,668	**13,526**
FMCSA-HIGHWAY	12,658	12,812	13,255	13,887	15,316	15,130	16,527	15,746	17,928	20,659	**153,918**
FRA-RAILWAY	747	745	661	667	718	581	545	573	507	421	**6,165**
USCG-WATER	105	71	70	63	47	24	11	9	9	6	**415**
Grand Total	**14,805**	**15,029**	**15,446**	**16,059**	**17,408**	**16,865**	**18,287**	**17,494**	**19,877**	**22,754**	**174,024**

The US EPA maintains the Toxics Release Inventory (TRI), a database with detailed information on nearly 650 chemicals and chemical categories that over 23,000 industrial and other facilities manage through disposal or other releases, recycling, energy recovery, or treatment. These facilities are required by law to report annually on the disposal or other releases related to these chemicals.

The California Department of Toxic Substances Control (DTSC) also provides an online data management system (EnviroStor) for tracking their cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known or suspected contamination issues. This site can provide a list of sites within an area that has experienced reported hazardous material accidents. These two sources provide a good understanding of the issues in the surrounding area.

As for the District, while the campuses have hazardous materials on site, there have not been any significant accidents.

- **Probability**

The release of hazardous materials can occur throughout the entire District service area on any given day. Incidences can occur during production, storage, transportation, and/or during use or disposal of materials.

- **Climate Change Considerations**

While there is little evidence to link climate change to an increase in occurrences of hazardous materials releases, weather plays a significant factor in certain aspects of hazardous materials releases. Changing conditions can create more mishaps and

accidents with production, storage, transportation, use, and disposal of hazardous materials. Additionally, changing conditions could alter the impact zone and affect the response and recovery efforts after the release.

5.4.10 INFECTIOUS DISEASE

- **Ranking**

Campus	Probability	Impact
ATEP	*Medium*	*High*
IVC	*Medium*	*High*
SC	*Medium*	*High*

- **Description**

Infectious Disease is a broad term used to describe illness caused by a specific type of bacterium, parasite, virus, or fungal organism. Below is a brief overview of the main infectious disease types:

- *Bacterial Infections*- Responsible for a variety of diseases from strep throat to meningitis and tuberculosis.
- *Fungal Infections*- There are roughly 300 types of fungi known to cause infectious disease. Common types include ringworm, blastomycosis, histoplasmosis, and pneumocystis pneumonia.
- *Parasitic Infections*- Responsible for a variety of diseases including malaria, Chagas disease, and toxocariasis.
- *Viral Infections*- Responsible for a variety of diseases including the common cold, influenza, mononucleosis, smallpox, HIV/AIDS, and COVID-19.

These organisms are transmitted:

- Person-to-person (e.g., measles, mumps, meningococcal disease, tuberculosis, COVID-19),
- By consuming contaminated food or water, also known as foodborne (e.g.: salmonella, E.coli, botulinum toxin), or
- Through animal bites (i.e., mosquito, ticks, fleas) also known as vector-borne (e.g.: West Nile virus, dengue, Zika, malaria).

Newly emerging infectious diseases include Ebola, Zika, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), and avian influenza. The current pandemic (COVID-19) is linked to the SARS virus. The SARS coronavirus (SARS-CoV) is a virus identified in 2003 and is thought to be an animal virus from an as-yet-uncertain animal reservoir that first infected humans in the Guangdong province of southern China in 2002. In 2019, in Wuhan China a new coronavirus was discovered. The coronavirus is closely related to the SARS coronavirus. The new virus goes by both COVID-

19, standing for coronavirus disease 2019, and SARS CoV-2. Additional detail about the impacts of the COVID 19 can be found under the History section.

Also, of concern are the threats of potential biological terrorism (bioterrorism), the intentional release or spread of disease (or toxins). Bioterrorism, also known as biological warfare, has been used for centuries. As early as 600 BC, military leaders have implemented practices to poison water supplies and infect citizens/soldiers to gain strategic advantages in their efforts to conquer territories. Today, there have been occurrences at both the large scale (by military) and small scale (by terrorist organizations or individuals). No matter the purpose, the release of organisms could have devastating effects on an international, national, state, or local level if it is a highly infectious disease.

Infectious disease emergencies are incidents caused by these organisms, with the potential for significant illness or death in the population. Infectious disease emergencies can also impact the local economy through loss of production and costs of treating or preventing spread of the disease. The ability to recover from an infectious disease emergency will depend on:

- The type of biological agent (organism),
- The availability of prophylaxis (i.e., vaccine) for responders and the public,
- The scale of the current and ongoing exposure,
- The mode of transmission and whether transmission can be interrupted, and
- Whether the event is affecting critical infrastructure such as transportation, law enforcement, health care, and the medical and food supply chains.

The three levels (or categories) of infectious disease events are as follows:

- *Outbreak*- when there are more cases than would be normally expected, often suddenly, of an infectious disease in a community or facility.
- *Epidemic*- when there are more cases than would be normally expected of an infectious disease, often suddenly, in a population of a large geographic area.
- *Pandemic*- refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people.

Outbreaks, epidemics, or pandemics can occur when a new virus emerges to which the population has little immunity. Public Health measures are used to control outbreaks, epidemics, or pandemics of infectious diseases, and are especially important for diseases with high morbidity or mortality and limited medical prophylaxis and/or rapid treatment. Public Health measures to control disease include:

- Isolation and quarantine of persons or products, and legal closure of food establishments,
- Control of contaminated food through recall of product,

- ✦ Control of contaminated water through “Do Not Use”, “Do Not Drink” or “Boil Water” orders, and
- ✦ Vector control spraying to target animals, bugs, and/or inspects.

- **Location and Extent**

An infectious disease incident can occur throughout the entire District service area any time during the year.

- **History**

Infectious diseases have been of concern for many years. It is only recently, because of COVID-19, that the potential risk has been realized. As cited by the CDC, the 20th century saw three (3) pandemics, the most notable of which was the 1918 Spanish influenza pandemic that was responsible for 20 million deaths throughout the world. The pandemics are now known to represent three (3) different antigenic subtypes of the influenza A virus: H1N1 (in 1918), H2N2 (Asian Influenza in 1957), and H3N2 (Hong Kong Influenza in 1968). Not classified as true pandemics are three (3) notable epidemics: a pseudo pandemic in 1947 with low death rates, an epidemic in 1977 that was a pandemic in children, and an abortive epidemic of swine influenza in 1976 that was feared to have pandemic potential. Major influenza epidemics show no predictable periodicity or pattern, and all differ from one another. Evidence suggests that true pandemics with changes in hemagglutinin subtypes arise from genetic reassortment with animal influenza A viruses.

Currently, the world is dealing with the effects of COVID-19. According to the CDC, COVID-19 was first identified in Wuhan, China, in December 2019. Although most people who have COVID-19 have mild symptoms, COVID-19 can also cause severe illness and even death. Some groups, including older adults and people who have certain underlying medical conditions, are at increased risk of severe illness. Because it is a new virus, scientists are learning more each day. New cases of and death rates from COVID-19 are rising globally each day. Vaccines for adults and children over the age of 12 are available. Potential vaccines are being tested for children under 12 years of age. There is no known cure.

Locally, the District has been impacted by COVID-19 both from an economic standpoint, as well as its operations and functions. There are been several instances of staff, faculty, and students testing positive for COVID-19 or have to quarantine because of contact and/or potential exposure to COVID-19. Other events include 2009 H1N1, 2003 Avian Flu, 2015-17 Zika, 201416 West African Ebola; 2015 West Nile, 2013 large scale Tuberculosis, 2004 botulism Type A, 2003 West Nile.

Bird flu (H5N1) is an influenza A virus subtype that is highly contagious among birds; although rare, some human infections with the Bird flu virus have occurred. Most confirmed cases have occurred in Asia, Africa, the Pacific, Europe, and the Near East. According to the CDC, there are currently no confirmed human cases of Bird flu infections but it remains a serious concern with the potential to cause a deadly pandemic.

Swine flu (H1N1) was first detected in the United States in April 2009. This virus was a unique combination of influenza virus genes never previously identified in either animals or

people. The Swine flu virus caused more illness in young people and pregnant women than is usual for prior flu seasons, and was declared a Worldwide Pandemic by the World Health Organization.

- **Probability**

There is an annual risk of experiencing an infectious disease outbreak in the District service area. While there is a continued threat from a novel influenza virus, the potential threat of outbreaks and epidemics have been increased due to expanding global trade and accessible national and international travel. Infectious disease outbreaks and epidemics occur on an ongoing basis.

Aside from the District currently dealing with the effects from COVID-19, annual outbreaks of the seasonal flu usually occur during the late fall through early spring. Most people have natural immunity, and a seasonal flu vaccine is generally available. According to the CDC, in a typical year, approximately 5 to 20 percent of the population gets the seasonal flu and flu-related deaths range from 3,300 to 48,600 (average 23,600).

- **Climate Change Considerations**

While many vector-borne diseases, such as malaria, yellow fever, dengue, and murine typhus, are rarely seen in the United States, the United States are susceptible to these vector-borne diseases. Many vector-borne diseases are climate sensitive and ecological shifts associated with climate change may influence the distribution and incidences of these diseases. Changes in temperature and precipitation directly affect vector-borne disease transmission through pathogen-host interaction, and indirectly through ecosystem changes and species composition. As temperatures increase, vectors can spread into new areas that were previously too cold. For example, two mosquito vectors that carry malaria are now found at the U.S.-Mexico border.

5.4.11 LANDSLIDE

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Low*
IVC	*Low*	*Low*
SC	*Medium*	*Low*

- **Description**

Landslides are movement of a mass of rock, debris, or earth down an incline. According to the USGS, the term "*landslide*" encompasses five modes of slope movement:

- ✦ Falls are masses of soil or rock that dislodge from steep slopes and free-fall, bounce, or roll downslope.
- ✦ Topples move by the forward pivoting of a mass around an axis below the displaced mass.

- Spreads (lateral) commonly induced by liquefaction of material in an earthquake, move by horizontal extension and shear or tensile fractures.
- Slides displace masses of material along one or more discrete planes.
  - In “rotational” sliding, the slide plane is curved and the mass rotates backwards around an axis parallel to the slope;
  - In “translational” sliding, the failure surface is more or less planar and the mass moves parallel to the ground surface.
- Flows mobilize as a deforming, viscous mass without a discrete failure plane.

Landslides are caused by natural processes or by manufactured activities. Landslides occur when down-slope forces (gravity) exceed the resistance (strength) of the earth materials. Landslides can be initiated by rainfall, snowmelt, changes in water level, stream erosion, changes in ground water, earthquakes, volcanic activity, disturbance by human activities, or any combination of these factors. Two of the more common types of landslides include:

- *Mudflows*- defined as flows or rivers of liquid mud down a hillside on the surface of normally dry land. They occur when water saturates the ground, usually following long and heavy rainfalls, or rapid snowmelt. Mud forms and flows down slope if there is no ground cover such as brush or trees to hold the soil in place.
- *Debris Flow*- defined when water begins to wash material from a slope or when water sheets off a newly burned stretch of land. Chaparral land is especially susceptible to debris flows after a fire. The flow will pick up speed and debris as it descends the slope. As the system gradually picks up speed, it takes on the characteristics of a basic river system, carrying everything in its path along with it.

Fast-moving (or rapidly moving) landslides present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides are at increased risk of serious injury. Debris flows can travel down a hillside with speeds up to 200 miles per hour (though more commonly, 30-50 miles per hour), depending on the slope angle and type of earth and debris in the flow.

Slow-moving landslides include both rotational and translational landslides, and can occur on relatively gentle slopes and can cause significant property damage but are less likely to result in serious human injuries. These slow-moving slides can be deep; slumps are small rotational slides that are generally shallow.

The size of a landslide usually depends on the geology and the initial cause of the landslide. Landslides vary greatly in their volume of rock and soil, the length, width, and depth of the area affected, the frequency of occurrence, and the speed of movement. Some characteristics that determine the type of landslide are slope of the hillside, moisture content, and the nature of the underlying materials. Landslides are named on the type of failure and their composition and characteristics.

Many landslides are difficult to mitigate, particularly in areas of large historic movement with weak underlying geologic materials. As communities continue to modify the terrain and

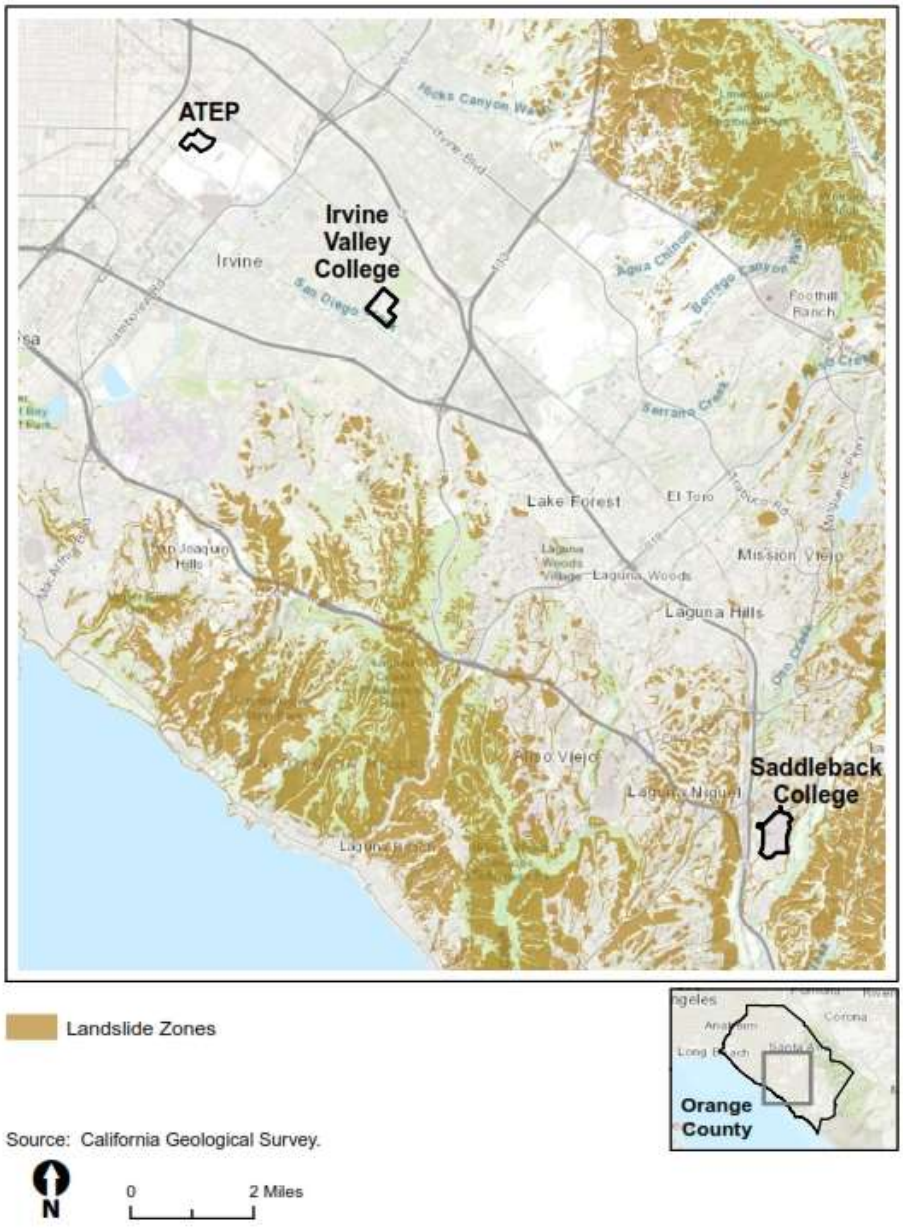
influence natural processes, it is important to be aware of the physical properties of the underlying soils as they, along with climate, create landslide hazards. Proper planning cannot eliminate the threat of landslides to the safety of people, property, and infrastructure; however, without proper planning, landslide hazards will be even more common and more destructive.

- **Location and Extent**

The California Geological Survey is in the process of recording and mapping historical and potential landslides in the state. The location and extent of landslides are extremely difficult to predict and are usually based on historical event and/or soil type and topography. The California Geological Survey has prepared historic landslide inventory maps that cover the District service area (**Figure 5.23**). However, landslides have the potential to occur in areas with one or more of the following conditions:

- On or close to steep hills,
- Steep road-cuts or excavations,
- Existing landslides or places of known historic landslides (such sites often have tilted power lines, trees tilted in various directions, cracks in the ground, and irregular surfaced ground),
- Steep areas where surface runoff is channeled, such as below culverts, V-shaped valleys, canyon bottoms, and steep stream channels,
- Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons, or
- Canyon areas below hillside and mountains that have recently (within 1-6 years) been subjected to a wildland fire.

Figure 5.23- Landslide Inventory Map for District Service Area



- **History**

Historically, the majority of landslides in the District service area have been a secondary hazard to other hazards (i.e., earthquakes, floods); there have been no known previous occurrences of landslides documented in the District service area.

- **Probability**

Landslides are a common hazard in California. Weathering and the decomposition of geologic materials produce conditions conducive to landslides, and human activity further exacerbates many landslide problems. It is difficult to estimate the probability of occurrence

for landslide as the landslide susceptibility maps just identify potential locations. However, recently there has been increased probability for mudflows and debris flows due to wildfire events in the area.

- **Climate Change Considerations**

Climate change can increase the probability, frequency, and/or intensity of landslides. Changes in precipitation, specifically the increased frequency of intense precipitation, can result in significant water run-off, which may cause landslides. Additionally, increase in wildfire hazards will result in loss of hillside vegetation. The loss of hillside vegetation will increase the likelihood of debris and mudflows. This could result in landslides occurring in areas not previously identified.

5.4.12 NATURAL GAS PIPELINE ACCIDENT

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Medium*
IVC	*Low*	*Medium*
SC	*Medium*	*Medium*

- **Description**

Natural gas transported via the interstate pipelines, and some of the California-produced natural gas, is delivered into the Pacific Gas and Electric Company (PG&E) and Southern California Gas (SoCal Gas) intrastate natural gas transmission pipeline systems (commonly referred to as California's "backbone" natural gas pipeline system). Natural gas on the backbone systems is then delivered into the local transmission and distribution pipeline systems, or to natural gas storage fields. PG&E and SoCal Gas own and operate several natural gas storage fields that are located in Northern and Southern California.

Natural gas transmission lines are large-diameter steel pipes carrying natural gas at high pressure and compressed to provide higher carrying capacity. Transmission lines are both interstate and intrastate, with the latter connecting to smaller distribution lines delivering gas directly to homes and businesses.

Compounding the potential risk is the age and gradual deterioration of the gas transmission system due to natural causes. Significant failure, including pipe breaks and explosions, can result in loss of life, injury, property damage, and environmental impacts. Causes of and contributors to pipeline failures include construction errors, material defects, internal and external corrosion, operational errors, control system malfunctions, outside force damage, subsidence, and seismicity.

- **Location and Extent**

Gas disruptions can happen anywhere on the campuses at any time. However, the main concern is with a segment of the gas line infrastructure that runs through the SC campus The natural gas from this segment is used to generate power and distribute heat throughout

the entire campus, with additional gas services running to many of the buildings for heating and educational needs.

- **History**

While there have been several smaller gas leaks on campus the college has continued work proactively to campaign for replacement of the 50-year-old main gas line backbone to help mitigate potential disastrous gas line failure.

- **Probability**

The probability of main gas line failure is real and can happen at any time with no warning. The disruption would be significant with SC's reliance on natural gas for the instructional needs, heating, cooling, and power generation satisfying the need of the entire campus. Other considerations taken into account are natural gas shortages. The Carnegie Mellon Electricity Industry Center Working Paper CEIC-19-03 sights that natural gas fuel shortages caused large failures at gas-fired power plants like ours, and that fuel shortages affected plants with both firm and non-firm pipeline arrangements. These failures contributed to ≤5% of MWh and ≤18% of peak MW lost due solely to the natural gas shortage. These pipeline failures can be related to weather as in the most recent Texas' unseasonable freezing conditions February 2021, or aging infrastructure as in the PG&E gas leak and explosion in 2010.

- **Climate Change Considerations**

Weather conditions have not been known to play a role in natural gas pipeline accidents. Most natural gas pipeline accidents caused by natural causes (i.e., earthquakes, landslides), human error (i.e., construction accidents), or because of equipment failure (i.e., aging infrastructure). Indirectly, changing weather conditions could increase human error (i.e., impair visibility) or expedite the aging of infrastructure.

5.4.13 RADIOLOGICAL ACCIDENT

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Low*
IVC	*Low*	*Medium*
SC	*Low*	*Medium*

- **Description**

For the purposes of this LHMP, Radiological Accident is limited to a significant event at the San Onofre Nuclear Generating Station (SONGS). While SONGS is permanently closed, it still houses nuclear waste. (NOTE: other radiological-type of accidents are covered under Terrorism.)

- **Location and Extent**

SONGS is located on the Orange County and San Diego County border just west of Interstate 5 (**Figure 5.24**). SONGS is governed by several agencies, each ensuring proper

maintenance and safety protocols are in place. As part of this oversight, SONGS maintains an Emergency Preparedness Information document. One of the primary out products of the document is the creation of the three emergency zones: Emergency Planning Zone- *EPZ* (10-mile radius), Public Education Zone- *PEZ* (20-mile radius), and the Ingestion Pathway Zone- *IPZ* (50-mile radius). Figure 23 shows the EPZ and the IPZ. All of the District campuses fall within the IPZ, with Saddleback also falling within the PEZ.

Figure 5.24- SONGS Emergency Planning Zone and Ingestion Pathway Zone

- **History**

There are no documented reports of accidents or accidental release of radiological material at SONGS.

- **Probability**

There are no official studies that address probability of radiological accidents. It is worth noting that SONGS was closed because of potential operational risk, however, while not operating, SONGS does still house several significant radioactive materials. Until this material is removed, there remains a potential risk.

- **Climate Change Considerations**

There have been no direct links between radiological (nuclear) accidents and climate change. Additionally, because SONGS is closed, the likelihood of an accident has decreased. However, some consideration could be made towards sea-level rise. There have been several recent studies looking at the potential impacts from rising seas but most studies indicate that the SONGS location is well protected and situated to withstand the potential impacts.

5.4.14 TECHNOLOGY DISRUPTION

- **Ranking**

Campus	Probability	Impact
ATEP	*High*	*High*
IVC	*High*	*High*
SC	*High*	*High*

- **Description**

Technology disruption includes both deliberate (cyber-attacks) and accidental (equipment failure or human error) actions that can cause the loss of use of technology and/or data. A cyber threat/attack is a circumstance or event that has or indicates the potential to exploit technology vulnerabilities and to adversely impact organizational operations, organizational assets (including information and information systems), individuals, other organizations, or society. Critical infrastructure, such as utilities and telecommunications, are also potential targets. Cyber threats/attacks are most easily described as either external threats (where attacks originate outside of established networks) or internal/insider threats (where attacks originate from users who have existing access to an internal network). Examples of cyber threats/attacks include malware and hacking, phishing, denial of service attacks, ransomware, and state-sponsored hacking. Any one of these threats, if successful, can produce a cyberattack that has major implications throughout the organization. A recent report produced by Verizon (2020) analyzes 32,002 security incidents and 3,950 confirmed breaches from 81 global contributors from 81 countries and indicate the following trends:

- 86 percent of data breaches are for financial gain - up from 71 percent in 2019.
- Cloud-based data under attack - web application attacks double to 43 percent.
- 67 percent of breaches caused by credential theft, errors and social attacks.
- Clearly identified cyber-breach pathways enable a “Defender Advantage” in the fight against cyber-crime.
- On-going patching successful - fewer than 1 in 20 breaches exploit vulnerabilities.
- 37 percent of credential theft breaches used stolen or weak credentials.
- 25 percent involved phishing.
- Human error accounted for 22 percent.

- **Location and Extent**

Technology disruptions can happen anywhere within the District, but are generally focused on administrative (i.e., website, administrative records) or facility (i.e., utilities, communications) type of functions.

- **History**

While the District has experienced several small cyber threats/attacks and minor equipment failures and human errors, none have reached a level of significance.

- **Probability**

The probability of occurrence of technology disruption is on the rise globally, national, and locally. With the increased reliance on the internet and cloud-based computing, there are more opportunities for cyber threats/attacks and/or the loss of connectivity. However, cyber threats/attacks generally target larger corporations or state/national governments. Cyber criminals on the basis that they have fewer resources to defend themselves are increasingly targeting several local government agencies. Unlike natural hazards, where there is historical data, and some predictive modeling, cyber treats/attacks are more challenging to anticipate.

- **Climate Change Considerations**

While there is no evidence to link climate change to increased occurrences of technology disruptions, cyber-attack targets could be related to individuals or companies they perceive to have effect on the climate (i.e., greenhouse gas producers) within the community.

5.4.15 TERRORISM

- **Ranking**

Campus	Probability	Impact
ATEP	*Low*	*Medium*
IVC	*Low*	*Medium*
SC	*Low*	*Medium*

- **Description**

Terrorism has become an undeniable reality throughout the United States. The term terrorism refers to international and/or domestic criminal malicious acts. There is no single, universally accepted definition of terrorism, and it can be interpreted in many ways. Terrorism is defined in the Code of Federal Regulations as "*...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.*" (28 CFR, Section 0.85). For the purposes of this plan, terrorism refers to the use of weapons of mass destruction, including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks (e.g., semi-automatic assault-style rifles, bump-stocks, high magazine clips, etc.); industrial sabotage and intentional hazardous materials releases; and cyber terrorism. Many of these incidents can be well-planned, coordinated attacks with multiple suspects, or the result of a lone individual on a rampage. Conventional Attacks/Active Shooter incidents are generally considered a lone individual incident.

- **Location and Extent**

Terrorism can occur throughout the entire District service area, but due to terrorisms' intended purpose to cause the greatest amount of destruction, it would most likely happen in more populous areas (high value, visually recognized targets) where more devastation, fear, and chaos will ensue.

- **History**

There have been no significant terrorism events.

- **Probability**

Because of the intended purpose of terrorism - to create devastation (and fear) - terrorist incidents would most likely happen in more populous urban areas, rather than on any of the District campuses. However, the District service area and adjacent area contains several high-value targets (i.e., Santa Ana Airport, Disneyland, Anaheim Stadium, Honda Center) that a terrorist organization could target. While not directly on the campuses, fallout from the incident could affect students, faculty, employees, facilities, and operations.

- **Climate Change Considerations**

While there is little evidence to link climate change to increasing occurrences of terrorism, the motivation behind the incident may be targeting individuals and/or organizations perceived to have an effect on the climate (i.e., greenhouse gas producers). Climate conditions could also intensify the incident (i.e., Improvised Explosive Device (*IED)* during high wind event) and/or hinder the response and recovery efforts (i.e., evacuation during flooding).

5.4.16 WILDFIRE

- **Ranking**

Campus	Probability	Impact
ATEP	*Medium*	*Low*
IVC	*Medium*	*Low*
SC	*High*	*High*

- **Description**

There are three different classes of wildfires: 1) surface; 2) ground; and, 3) crown. A "surface fire" is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A "ground fire"; usually started by lightning, is fed by subterranean roots, and smolders on or below the forest floor. A "crown fire" spreads rapidly by wind and moves quickly by jumping along the tops of trees. Wildfires can be classified as either a wildland fire or a wildland-urban interface (WUI) fire. Wildland fires involve situations where a fire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. A WUI fire includes situations in which a wildland fire enters an area that is developed with structures and other human developments. In WUI fires, the fire is fueled by both naturally occurring vegetation

and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the wildland-urban interface is defined as "*…the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.*"

The WUI can be subdivided into three categories (NWUIFPP, 1998): 1) classic wildland-urban interface; 2) the mixed wildland-urban interface; and, 3) the occluded wildland-urban interface. The *classic wildland-urban interface* exists where well-defined urban and suburban development presses up against open expanses of wildland areas. The *mixed wildland-urban interface* is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings. The *occluded wildland- urban interface* exists where islands of wildland vegetation occur inside a largely urbanized area.

Certain conditions must be present for a wildfire hazard to occur: 1) a large source of fuel must be present, 2) the weather must be conducive (generally hot, dry, and windy), and 3) fire suppression sources must not be able to easily suppress and control the fire. The cause of a majority of wildfires is human-induced or lightning. However, once burning, wildfire behavior is based on three primary factors: 1) fuel, 2) topography, and 3) weather. Fuel will affect the potential size and behavior of a wildfire depending on the amount present, its burning qualities (e.g., level of moisture), and its horizontal and vertical continuity. Topography affects the movement of air, and thus the fire, over the ground surface. The terrain can also change the speed at which the fire travels, and the ability of firefighters to reach and extinguish the fire. Weather as manifested in temperature, humidity, and wind (both short and long term) affect the probability, severity, and duration of wildfires. Other factors that create concern are drought conditions and development (the build environment). Drought conditions bring on contributing concerns in that it can lead to relatively drier conditions and leave reservoirs and water tables lower, thus, creating hotter fires and less water to fight the fires. The expansion of the built environment into previously unoccupied areas introduces more people to the hazard and in some cases make response actions more challenging.

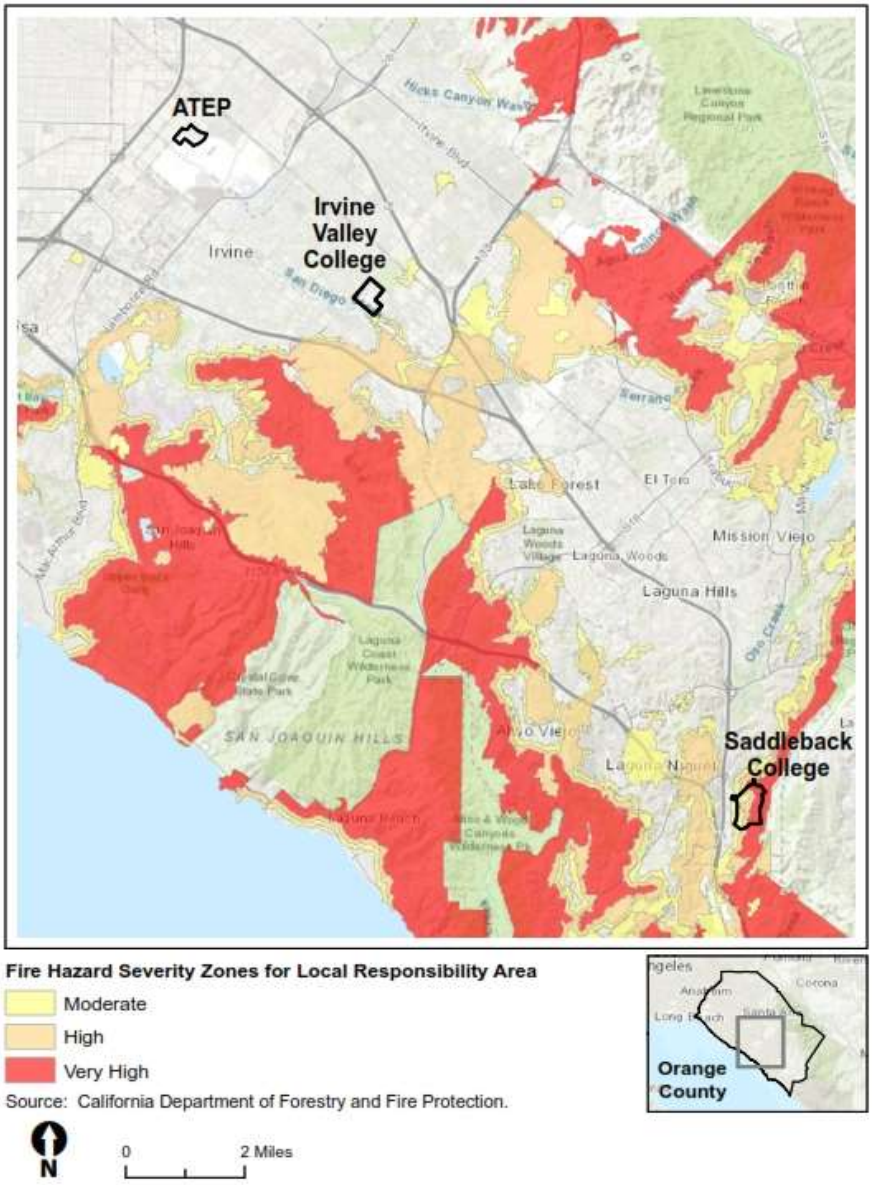
- **Location and Extent**

The climate, topography, and vegetation in/around the District service area is conducive to wildfire events. Limited rainfall, low humidity, and seasonal high temperatures contribute to the desiccation of the grasses and chaparral that cover the foothills, providing prime fuel for intense burns. While their occurrence generally aggravates the fire hazard, some canyon areas are shielded from the direct impact of the dry Santa Ana winds. Additionally, human activities in or near wildlands dramatically increases the risk of a major fire due to careless smokers, illegal campfires, and other related risks.

The California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (CDF-FRAP) mandates creation of Fire Hazard Severity Zones maps. Zones are areas of significant fire hazards based on fuels (vegetation), terrain, weather, and other relevant factors, which define the application of various mitigation strategies to reduce risk associated with wildland fires. CDF-FRAP developed data that displays the relative risk to areas of significant population density from wildfire. Data extrapolated by intersecting

residential housing unit density with proximate fire threat gives a relative measure of potential loss of structures and threats to public safety from wildfire. **Figure 5.25** show the "very high" Fire Hazard Severity Zones (VHFHSZ) located in the District service area.

Figure 5.25- Fire Hazard Severity Zones- District Service Area



- **History**

Due to a combination of topography, weather, and fuel, and exacerbated by potentially high winds and limited access, the southern portion of the District service area is highly susceptible to wildland fire hazards. The 2015 Orange County Hazard Mitigation Plan lists 57 major fires that occurred between 1914 and 2015. In 2017, the Canyon Fire burned 9,217 acres in the Anaheim Hills, destroying 25 structures and forced 16,570 to evacuate from areas in Anaheim, Orange, and Tustin. In October 2020, fires in the

mountains near Irvine required the evacuation of over 60,000 residents. However, the District has not directly experienced wildfires nor has it been used for the care and shelter of evacuees. The most significant fires can receive federal declarations. **Table 5.7** list the most recent federally declared fires in Orange County.

Table 5.7- Federally Declared Fire History for Orange County

Declaration #	Year	Name
EM-3120	1996	Severe Firestorms
FS-2405	2002	San Antonio Fire
FM-2730	2006	Sierra Fire
FM-2737	2007	Santiago Fire
FM- 2683	2007	241 Fire
EM-3279	2007	Wildfires
DR-1731	2007	Wildfire, Flooding, Debris Flows and Mudslides
FM-2792	2008	Freeway Fire Complex
DR-1810	2008	Wildfires
FM-5223	2017	Canyon 2 Fire
FM-5213	2017	Canyon fire
DR-4344	2017	Wildfires

- **Probability**

The majority of work done to estimate the probability of wildfire occurrence has been focused on identifying the potential areas where wildfire could occur. According to the CDF, the FRAP Fire Hazard Severity Zone maps are based on data and models of potential fuels over a 30- to 50-year time horizon and their associated expected fire behavior and expected burn probabilities to quantify the likelihood and nature of vegetation for exposure to buildings. This indicates a very high likelihood of wildfire occurrence in the area.

As previously mentioned, vegetation, weather, and topography are the significant elements in identifying areas of potential threat of wildfire occurrences. Mountains, foothills, and canyons that are covered in susceptible vegetation mark the area north of the District service area. A large amount of the native vegetation in the area is commonly called chaparral; chaparral is a dense and scrubby bush that has evolved to persist in a fire-prone habitat. Chaparral plants will eventually age and die. However, they will not be replaced by new growth until a fire rejuvenates the area. Chamise, manzanita, and ceanothus are all examples of chaparral which are quite common in the area. The region's climate, with its warm and dry summers, contributes to low relative humidity and low fuel moistures. When combined with high fuel loading, the potential for a catastrophic wildfire event is significant. Three weather conditions that may cause the ignition of and/or impact the behavior of wildfires are as follows: 1) thunder and lightning storms; 2) high wind events; and, 3) hot, dry (low humidity) periods.

- **Climate Change Considerations**

  Climate change plays a significant role in wildfire hazards. The changing conditions from wet to dry can create more fuel. The increased possibility of high winds increases risk and presents a challenge. Drought conditions could hinder ability to contain fires. Large wildfires also have several indirect effects beyond those of a smaller, local fire. These may include air quality related health issues, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters such as landslide and flooding.

5.4.17 WINDSTORM

- **Ranking**

Campus	Probability	Impact
ATEP	*High*	*Medium*
IVC	*High*	*Medium*
SC	*High*	*Medium*

- **Description**

For the purposes of this LHMP, windstorms are events with significant straight-line or cyclonic winds, with little-to-no precipitation. These storms have wind speeds capable of reaching up to 100 mph and producing a path of damage extending for hundreds of miles. Winds are characterized by strength and the direction from which they are blowing. Wind is created by air moving from an area of "*higher*" pressure to an area of "*lower*" pressure. The pressure difference over a certain distance determines the wind strength. Air does not move in a straight line because the earth's rotation deflects the airflow (aka. Coriolis Effect). In the Northern Hemisphere, air flows clockwise around high-pressure areas and counterclockwise around low-pressure areas. Wind speed is categorized as follows: breeze (<0-31 mph), gale (32-54 mph), storm (55-72 mph), and hurricane (>73 mph). Further, sub classifications with differential names depict geographic location (i.e., tropical depression, tropical storm/cyclone) and/or categories (i.e., category 3 hurricane). Damage from winds account for half of all severe damage reports in the lower 48 states and is more common than damage from tornadoes. Winds are also measured using the Beaufort Scale. The Beaufort Scale categories winds using Force categories between 0-12 to measure speed and summarize descriptions (**Table 5.8**).

Table 5.8- Beaufort Scale

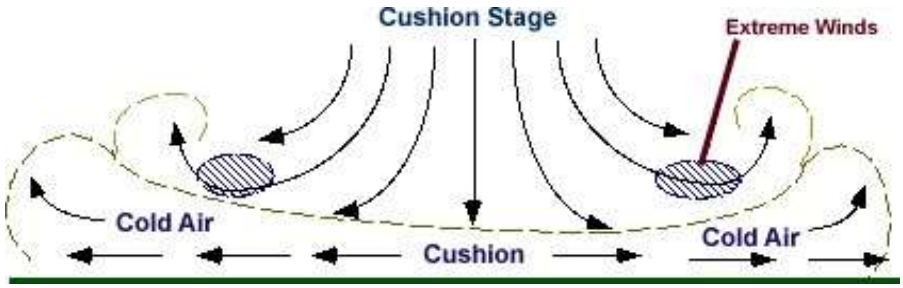
Category (Force)	Speed (MPH)	Description
0	0-1	Calm. Smoke rises vertically and the sea is flat.
1	1-3	Light air. The direction of the wind is shown by drifting smoke, but not wind vanes.
2	4-7	Light breeze. Wind is felt on the face, leaves rustle, and wind vanes move. Small wavelets appear on the ocean, but do not break.
3	8-12	Gentle breeze. Leaves and small twigs are in motion, and light flags extend. Large wavelets appear on the ocean and crests begin to break.
4	13-18	Moderate breeze. Dust and loose paper become airborne, and small branches move. Small waves appear on the ocean.
5	19-24	Fresh breeze. Small trees begin to sway and moderate waves appear.
6	25-31	Strong breeze. Large branches are in motion, and holding an umbrella becomes difficult. Large waves begin to form.
7	32-38	Near gale. Whole trees are in motion, and walking against the wind can be hard. Foam from breaking waves is blown in streaks.
8	39-46	Gale. Walking is difficult and twigs break off trees.
9	47-54	Severe gale. There is slight structural damage, and the crests of waves begin to topple.
10	55-63	Storm. Trees are uprooted and there is considerable damage to structures. Very high waves form in long, overhanging crests.
11	63-72	Violent storm. There is widespread structural damage, exceptionally high waves form, and the ocean is completely covered in foam.
12	>73	Hurricane. There is devastating structural damage. On the ocean, the air is filled with foam and spray.

Terms and characteristics of damaging windstorm events include:

- *Cyclonic winds*- Cyclonic wind (i.e., hurricanes, tornadoes) swirl counter-clockwise in the northern hemisphere or clockwise in the southern hemisphere. The biggest differences between hurricanes and tornadoes are how big they are and how long they last. Hurricanes are typically hundreds of miles in diameter, with high winds and heavy rains over the entire region. Hurricanes can last for days or even weeks. Tornadoes usually last no more than a few minutes.
- *Straight-line winds*- Straight-line winds commonly occur with the gust front of a thunderstorm or originate with a downburst from a thunderstorm. The winds can gust to 130 mph and sustainable winds of 58 mph or more lasting for more than twenty minutes. Straight-line wind events are most common during the spring when instability is highest and weather fronts routinely cross the country.
- *Derecho Storms*- Derechos, Spanish for “straight”, are widespread, long-lived, straight-lined windstorm events that are associated with a land-based, fast-moving group of severe thunderstorms. Derechos can cause hurricane-force winds, tornadoes, heavy rains, and flash floods. A warm-weather phenomenon, derechos occur mostly in summer, especially during June, July, and August.

- *Updrafts/Downdraft* - Localized regions of warm or cool air will exhibit vertical movement (updrafts/downdrafts). Updrafts are small-scale current of rising air, often within a cloud. A mass of warm air will typically be less dense than the surrounding region, and so will rise until it reaches air that is either warmer or less dense than itself. The converse, known as subsidence, will occur for a mass of cool air. This movement of large volumes of air, especially when regions of hot, wet air rise, can create large clouds and is the central source of thunderstorms. Drafts can also be conceived by low or high-pressure regions. A low-pressure region will attract air from the surrounding area, which will move towards the center and then rise, creating an updraft. A high-pressure region will then attract air from the surrounding area, which will move towards the center and sink, spawning a downdraft.
- *Downburst*- Strong, downdraft winds flow out of a thunderstorm cell. A downburst is a straight direction surface wind in excess of 39 miles per hour caused by a small-scale, strong downdraft from the base of convective thundershowers and thunderstorms. Downbursts of all sizes descend from the upper regions of severe thunderstorms when the air accelerates downward through either exceptionally strong evaporative cooling or by very heavy rain, which drags dry air down with it. When the rapidly descending air strikes the ground, it spreads outward in all directions, like a fast-running faucet stream hitting the bottom of the sink (**Figure 5.26**).

Figure 5.26- Downburst

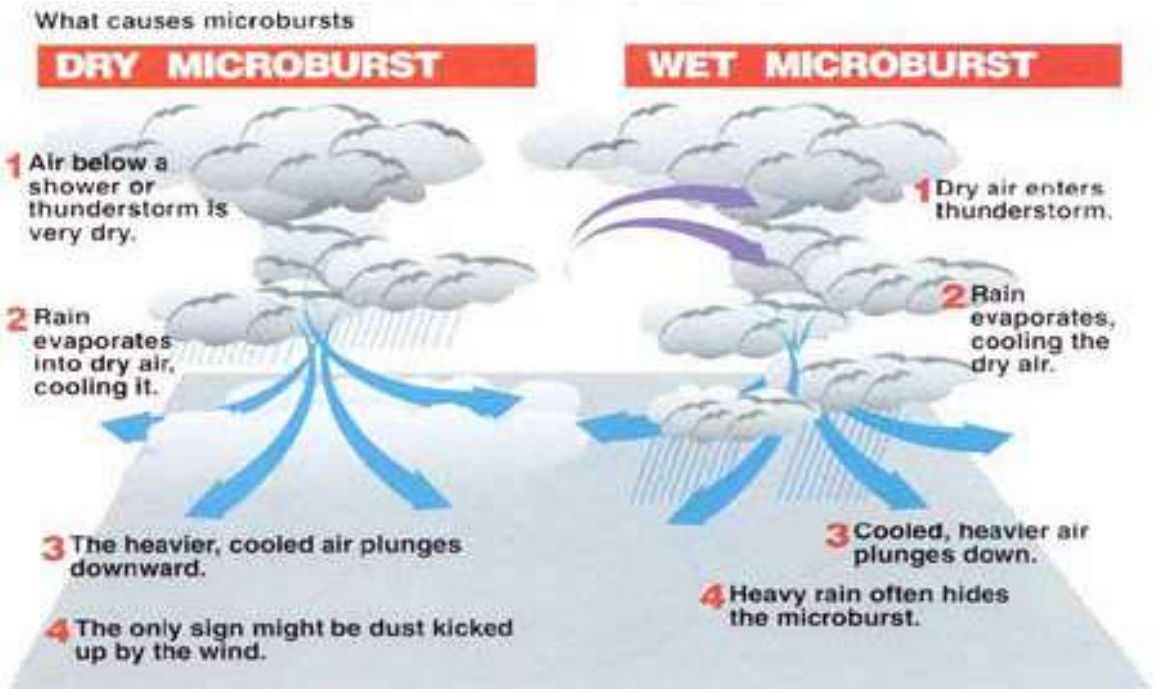


There are two sub-categories of downbursts: the larger macrobursts and smaller microbursts.

- Macroburst- Macrobursts are downbursts with winds up to 117 miles per hour which spread across a path greater than 2.5 miles wide at the surface and which last from 5 to 30 minutes.
- Microburst- Microbursts are strong, damaging winds that strike the ground and often give the impression a tornado has struck. They frequently occur during intense thunderstorms. The origin of a microburst is downward moving air from a thunderstorm's core. Unlike a tornado, microbursts affect a relatively small area - less than 2.5 miles in diameter from the initial point of downdraft impact. An intense microburst can result in damaging winds near 170 miles per hour and often lasts for

less than five minutes. There are two (2) types of microburst windstorms: dry and wet (**Figure 5.27**).

Figure 5.27- Microbursts



- *Gust Front*- A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- *Haboob*- Haboobs, Arabic for blasting/drifting, is a type of intense dust storm carried on an atmospheric gravity current (i.e., thunderstorm), also known as a weather front. When a thunderstorm collapses, and begins to release precipitation, wind directions reverse, gusting outward from the storm and generally gusting the strongest in the direction of the storm's travel. Haboobs occur regularly in arid regions throughout the world.
- *Tornado*- A tornado is a rapidly rotating column of air that is in contact with both the surface of the Earth and a cumulonimbus cloud or, in rare cases, the base of a cumulus cloud. Tornadoes come in many shapes and sizes, and are often visible in the form of a condensation funnel originating from the base of a cumulonimbus cloud, with a cloud of rotating debris and dust beneath it. Most tornadoes have wind speeds less than 110 miles per hour, are about 250 feet across, and travel a few miles before dissipating. The Fujita scale rates tornadoes by damage (**Table 5.9**). An F0 tornado, the weakest category, damages trees, but not substantial structures. An F5 tornado, the strongest category, rips buildings off their foundations and can deform large skyscrapers.

Table 5.9- Fujita Tornado Scale

Category	Wind Speed (MPH)	Description
F0	40-72	Gale Tornado. Light Damage: Some damage to chimneys; breaks twigs and branches off trees; pushes over shallow-rooted trees; damages signboards; some windows broken; hurricane wind speed begins at 73 miles per hour.
F1	73-112	Moderate Tornado. Moderate Damage: Peels surfaces off roofs; mobile homes pushed off foundations or overturned; outbuildings demolished; moving autos pushed off the roads; trees snapped or broken.
F2	113-157	Significant Tornado. Considerable Damage: Roofs torn off frame houses; mobile homes demolished; frame houses with weak foundations lifted and moved; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	158-206	Severe Tornado. Severe Damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forests uprooted; heavy cars lifted off the ground and thrown; weak pavement blown off roads.
F4	207-260	Devastating Tornado. Devastating Damage: Well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and disintegrated; large missiles generated; trees in forest uprooted and carried some distance away.
F5	261-318	Incredible Tornado. Incredible Damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile sized missiles fly through the air in excess of 300 feet (100 meters); trees debarked; incredible phenomena will occur.
F6-12	>319	The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

In Southern California, Santa Ana winds are a common type of windstorm event. Santa Ana winds are katabatic winds - Greek for *"flowing downhill"*. These winds occur below the passes and canyons of the coastal ranges of Southern California. Santa Ana winds often blow with exceptional speed in the Santa Ana Canyon (the canyon from which it derives its name). Santa Ana winds are strong, extremely dry (low humidity) down-slope winds that originate from cool, dry, high-pressure air masses in the Great Basin region (the high plateau east of the Sierra Mountains and west of the Rocky Mountains, including most of Nevada and Utah) and affect Southern California. These winds come up, over, and are pulled southward down the eastern side of the Sierra Nevada Mountain range and into the Southern California region. The air warms as it descends toward the California coast at the rate of 5 degrees Fahrenheit per 1,000 feet due to compressional heating. Thus, compressional heating provides the primary source of warming. The air is dry since it originated in the desert, and it dries out even more as it is heated.

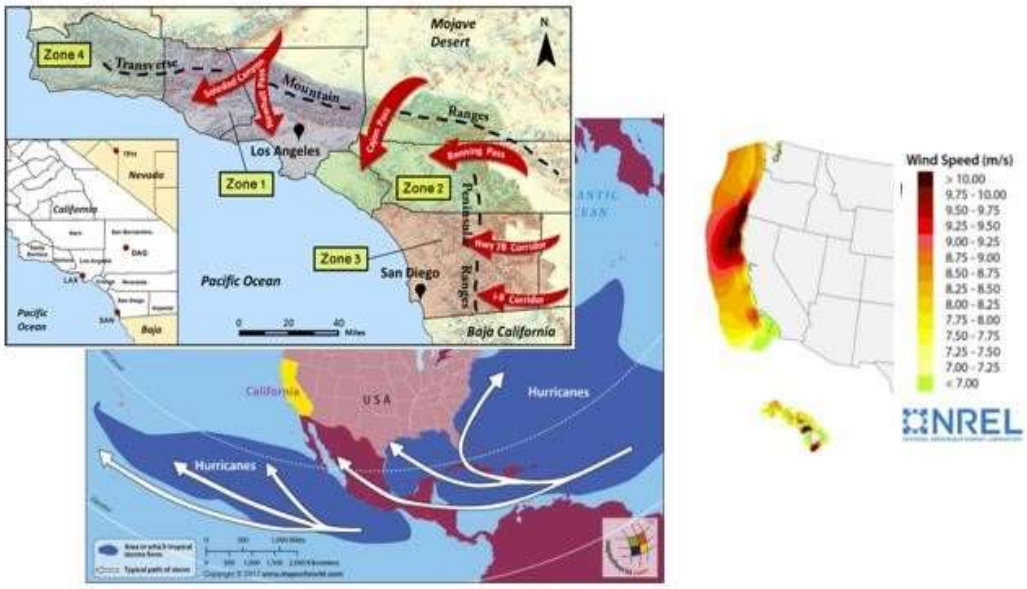
Forecasters at the National Weather Service offices in Oxnard and San Diego usually place speed minimums on these winds and reserve the use of "*Santa Ana*" for winds

greater than 25 knots (29 mph). These winds accelerate to speeds of 35 knots (40 mph) as they move through canyons and passes, with gusts to 50 - 60 knots (57.5 - 69 mph). Santa Ana winds can happen any time during the year but are most prevalent in the autumn and winter months. The most significant hazard associated with Santa Ana winds is an increased wildfire danger, but Santa Ana winds can also cause downed trees and power lines, and property damage, as well as, causing potentially hazardous conditions for RV's, semi-trailers, aircraft, and boaters.

- **Location and Extent**

The entire District service area is susceptible to various types of windstorms. However, Santa Ana winds are the most predominant type of windstorm in the region. **Figure 5.28** depicts the wind patterns (i.e., Santa Ana wind paths, hurricane paths, and onshore wind intensities) that influence the area and are the primary driving force behind windstorms.

Figure 5.28- Wind Patterns Affecting Southern California



- **History**

The National Weather Service has produced a report for historic significant weather events in San Diego, Orange, San Bernadino, Riverside, and some from Los Angeles, Ventura, and Santa Barbara that provides an extensive summary of different type of weather-related events dating back to the 1800s. Winds events can be found under Severe Thunderstorms, Strong Winds, and the Tornadoes, Funnel Clouds, Waterspouts, and Damaging Winds sections. While there have been hundreds of smaller windstorm events, below is a list of the stronger wind events recorded in and around the District service area:

- ✦ November 1957: Santa Ana winds exacerbated wildland fires, endangered air traffic, and triggered sandstorms in the Fontana area.

- April 1962: Strong Santa Ana winds uprooting trees, causing property damage and interrupting power transmission to customers.
- November 1996: Santa Ana winds blew at 35 to 45 miles per hour throughout most of southern California, and recorded close to 100 miles per hour in certain areas.
- December 1996: gusts were recorded in Fremont Canyon near Tustin at 111 miles per hour. Injuries were recorded in Huntington Beach when a 60-foot tree was uprooted by the winds and fell on top of people.
- October 1997: a fire caused by scrap metal was carried by 45-mile-per-hour Santa Ana winds throughout the Santa Ana Mountains, causing widespread property damage in eastern Orange County.
- October 1998: a thunderstorm sent destructive winds through Orange County. Trees were uprooted and blown onto vehicles and buildings. A power outage affected more than 18,000 utility customers across the communities of Los Alamitos, Rossmoor, Cypress, Tustin, Santa Ana, and Garden Grove.
- October 2007: winds up to 85 miles per hour blew through Fremont Canyon near Tustin. These winds caused extensive damage to structures and vehicles. The winds also exacerbated existing wildland fires, causing widespread evacuations and the burning of more than 49,000 acres.
- May 2008: Four tornadoes touched down near Moreno Valley. One was rated EF-2, which was the strongest California tornado since the Sunnyvale tornado in 1998, and was on the ground for an estimated 21 minutes.
- November 2008: strong Santa Ana winds exacerbated and spread the Freeway Complex Fire, one of the most destructive fires in Southern California history. More than 30,000 acres were burned.
- January 2011: A tornado went through Seal Beach and Huntington Beach with wind gust over 60mph. It caused damage to boat and the harbor and created several waterspouts,
- February 2014: A strong storm hit Southern California with westerly winds. A report of a 102 mph wind gust. Numerous large trees and power poles toppled, as well as damage at John Wayne Airport
- April 2014: The strongest and most widespread offshore wind event in years occurred very late in the season. Gusts reached as high as 100 mph, numerous other stations measured speeds that exceeded 60 mph.
- April 2015: A confirmed EF0 tornado touched down just north of Desert Center. Damage for flying debris was reported.
- August 2017: Downburst thunderstorm winds toppled trees and power lines in Wildomar. Lightning struck a transformer in Colton, knocking out power. Damage to mobile homes in east Corona.

- October 2019: Several episodes of Santa Ana winds started on this day and continued through 10.24. Top wind gusts reached 60 to 80 mph. Relative humidity was near zero percent for several locations on several days during this period. Numerous fires broke out across Southern California.
- October 2020: A strong offshore wind, a “cool” Santa Ana, produced many exceeding 70 mph and a top gust of 88 mph. The winds toppled big rig trucks and downed mature trees in the northern Inland Empire. The dry winds also contributed to spreading two fire starts, the Blue Ridge and Silverado fires in eastern Orange County
- December 2021: Winds reached over 80 mph, with coast areas receiving gust over 40 mph caused damage and power outages.

- **Probability**

The District service area is at risk of windstorms at any given time during the calendar year. However, as previously mentioned they are more prevalent in the autumn and winter months. Santa Ana winds, which commonly occur between October and February, can reach speeds of more than 100 miles per hour.

- **Climate Change Considerations**

Climate change will play a significant role with windstorm events. The changing conditions are expected to cause a significant amplification to many existing conditions. Climate change might affect the frequency, duration, and intensity of windstorms. Climate change, although still being studied, could have an effect on high- and low-pressure zones. High- and low-pressure zones are created by many factors, but many are related to uneven heating of the earth’s surface by the sun. Many of the factors that go into heating the earth’s surface may be impacted by climate change (i.e., type of vegetation in areas impact ability to absorb heat, amount of snow cover that reflects heat), as well as altering and possibly increasing frequency of significant winds in the area.

6 RISK ASSESSMENT

6.1 OVERVIEW

The purpose of this section is to estimate the potential impacts from hazards throughout the District. While an emphasis will be on the built environment and the general population, other areas may be considered (i.e., economy, lifeline systems/infrastructure, and environment). Considerations will include potential impacts to the Key Assets. Understanding the potential damage and losses is essential to decision-making at all levels of government, providing a basis for developing plans, policies, programs, and projects. To accomplish this, the following two approaches were used: scientific loss estimation modeling and exposure assessment.

6.1.1 SCIENTIFIC LOSS ESTIMATION MODELING

The scientific loss estimation modeling efforts utilized the FEMA Hazus model. Hazus is a nationally applicable standardized methodology that estimates potential losses from floods, earthquakes, hurricane winds, and tsunamis. Hazus uses state-of-the-art Geographic Information Systems (GIS) software to map hazard data and estimate potential *physical damage* to residential, commercial, schools, critical facilities, and infrastructure; *economic loss*, including lost jobs, business interruptions, repair, and reconstruction cost; and, *social impacts*, including estimating shelter requirements, displace households, and population exposure to the hazard.

Hazus standard configuration allows for out-of-the-box regional or community-wide loss assessment using default (Level 1) building inventory databases, aggregated to the census tract (for earthquakes) or census block (for floods) level. Hazus also allows for the replacement of the default data with data that better reflects the area. Over the past few years, the District has undertaken several projects to capture and/or assess structures on its campuses. The results of these efforts were incorporated into the Hazus model. An overview of the data used in Hazus is provided under Section 6.2- Building Data.

6.1.2 EXPOSURE ASSESSMENT

Since scientific loss estimation models are not available for all types of hazards, an exposure assessment was used to identify potential impacts on some hazards. There are two kinds of exposure assessments: 1) quantitative when there is a hazard exposure area (or footprint); and, 2) qualitative when an exposure area (footprint) does not exist.

A hazard exposure footprint enables the identification of areas as either “in” or “out” of the hazard (i.e., wildfire, dam failure). With this footprint, the Task Force was able to determine which areas represented hazardous exposures and the potential impact was assessed. For those hazards where an exposure footprint did not exist (i.e., infectious disease, energy shortage/power outage), an assessment of the potential impact was completed.

Neither of these two approaches provide a precise estimate of potential damage. Instead, they provide an understanding of the exposure and as such, the potential losses during events.

Types of elements considered during the exposure assessment were the built environment, population, economy, lifelines, and the natural environment.

6.2 BUILDING DATA

As mentioned, Hazus allows for the replacement of the default data. The District elected to replace the default data and incorporate District-specific building data in its place. **Table 6.1** provides a summary of the building data used in Hazus. The building data was compiled from various projects and efforts conducted by the District. This information was vetted by each campus and was utilized in the Hazus model, as well as, considered during the Exposure Assessment.

Table 6.1- Summary of Building Data

	ATEP	IVC	SC	Total
Number of Buildings	1	35	44	**80**
Building Square Footage	32,467	465,722	844,267	**1,342,456**
Replacement Value				
Building	$14,674,000	$158,093,000	$280,195,000	**$452,962,000**
Content	$4,978,000	$40,172,000	$75,513,000	**$120,663,000**
TOTAL	**$19,652,000**	**$198,265,000**	**$355,708,000**	**$573,625,000**
Peak Occupancy	**500**	**8,800**	**20,200**	**29,500**

6.3 HAZARD IMPACTS

Exposure assessment allows for a comprehensive understanding of the District's vulnerability to potential hazards. A thorough review of the 17 potential hazards within the District service area identified the potential impacts on population, buildings, economy, environment, and lifelines.

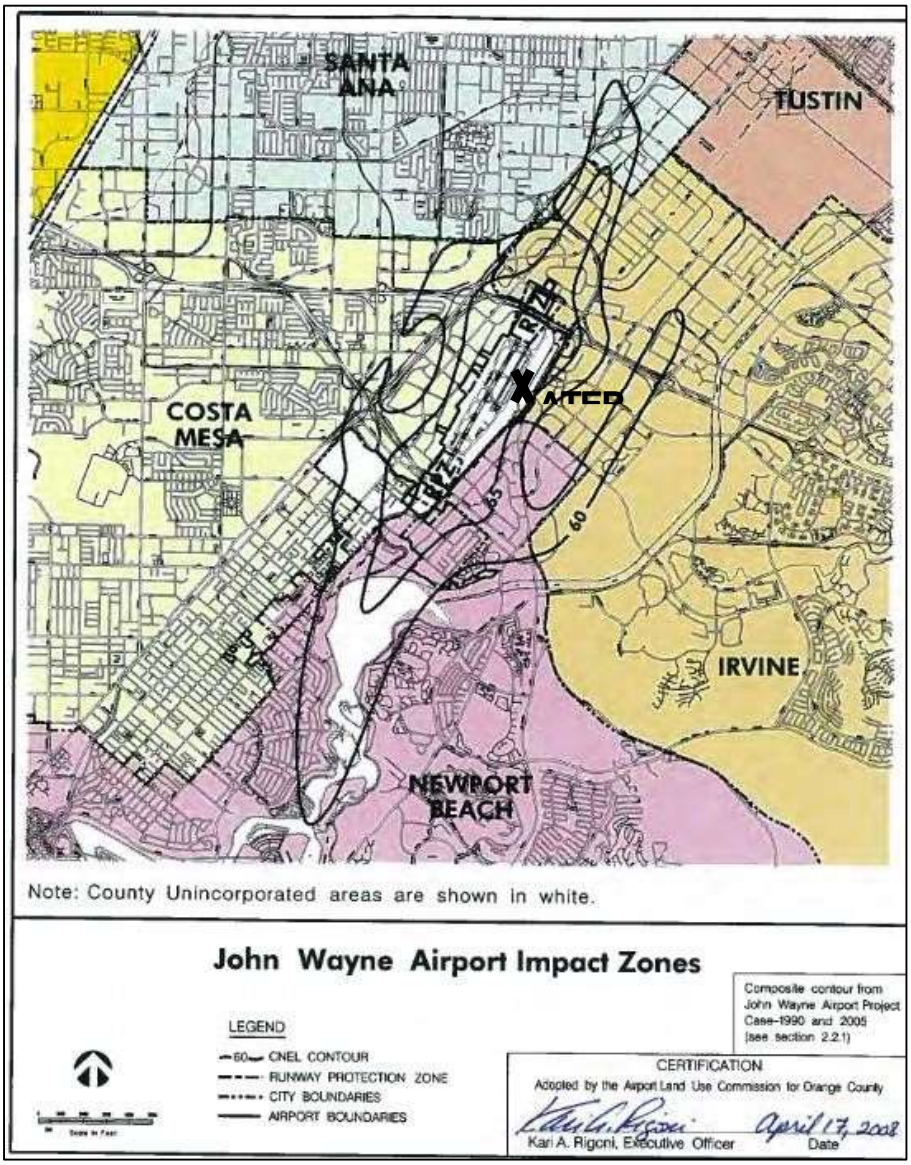
6.3.1 AIRCRAFT ACCIDENT

An exposure assessment was used to understand the vulnerability to an Aircraft Accident. There was no hazard exposure area (or footprint), therefore the Task Force considered potential impacts over the entire campus. While the John Wayne Airport (SNA) is the closest airport to any of the District campuses, none of the campuses fall within the SNA impact/safety zones or notification areas according to the April 2008 Land Use Plan for John Wayne Airport (**Figure 6.1**). However, ATEP is in close proximity to the SNA approach path and all campuses are under flight patterns of small and non-commercial aircrafts.

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality, repurposing

- *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
- *Environment*- loss of vegetation/wildlife, ground displacement, contamination
- *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

Figure 6.1- John Wayne Airport Impact Zone



6.3.2 CIVIL DISTURBANCE

An exposure assessment was completed to understand the vulnerability of civil disturbance on the campuses. There was no hazard exposure area (or footprint), so the Task Force considered potential affects over the entire campus. Southern California is a frequent site of demonstrations due to its high profile and presence of significant government functions and buildings. It is conceivable that a demonstration (or movement), depending on the cause and

effect, could turn to violence and spread into neighboring communities. Civil disturbance can vary in size and length of time, however, on the campuses, it is expected to be smaller and of limited time.

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality, repurposing
  - *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
  - *Environment*- loss of vegetation, contamination
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.3 DAM FAILURE

An exposure assessment was completed to understand the vulnerability to Dam Failure on the campuses. There was a hazard exposure area (or footprint), so the Task Force considered potential affects for portions of the campuses within the hazard footprint. While there are governmental agencies that oversee and regulate dams in California, failures have occurred within the state (i.e., Oroville Dam). The dam inundation studies predict the possible coverage (or area) of water exposure, but generally they do not provide for water depths. In addition, there are other factors to consider when assessing dam failures, such as, how much water is behind the dam or is there time to release some water ahead of time. It is known that elements further away from the dams could experience impacts, but a majority of devastation will occur closer to the dams. As mentioned under Section 5.0 (Hazard Assessment), several dams within the vicinity have the potential to inundate areas around the campuses (see Figure 5.8). As indicated in Figure 5.8, ATEP is the only campus impacted by waters for potential dam failures. **Figure 6.2** provides an overview of the potential impact the campus. However, because of its distance from the dam, impacts are expected to be minimal.

- **Potential Impacts**
  - *Population*- restricted access/use
  - *Buildings*- No damage expected
  - *Economy*- cost of response/care/clean up
  - *Environment*- contamination
  - *Lifelines*- Potential loss of utilities from impacts to outside system failures (secondary impacts)

Figure 6.2- ATEP Dam Failure Exposure

6.3.4 DROUGHT

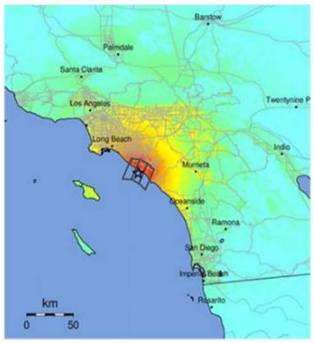
An exposure assessment was completed to understand the vulnerability to Drought & Water Shortage on the campuses. There was no hazard exposure area (or footprint), so the Task Force considered potential affects over the entire campus. California recently emerged from a proclaimed State of Emergency due to extremely dry conditions over an extended period. While during this State of Emergency, several policies and regulations were put into place to assist and lessen the potential impacts from the decreased water supply, and the impacts on the campuses were minimal.

- **Potential Impacts**
  - *Population*- restricted access/use
  - *Buildings*- No damage expected
  - *Economy*- increased operating costs
  - *Environment*- loss of vegetation/wildlife
  - *Lifelines*- Potential loss of utilities from impacts to outside system failures (secondary impacts)

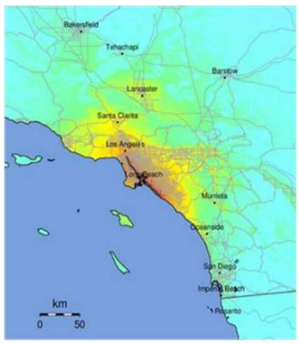
6.3.5 EARTHQUAKE

A scientific loss estimation model (Hazus) was used to understand the campuses vulnerability to earthquakes. As mentioned, the Task Force leveraged structural assessments when running the Hazus model. To provide a better perspective on the vulnerability to earthquakes at each campus, three different earthquake scenarios were run in Hazus. This enabled the Task Force to understand an event occurring in the southern portion of the county (San Joaquin Hills), northern portion of the county (Newport-Inglewood), and in the larger southern California region (San Andreas). **Figure 6.3** depicts the United States Geological Survey (USGS) scenario maps for the San Joaquin Hills Fault (magnitude 7.0), the Newport-Inglewood Fault (magnitude 7.2), and San Andreas Fault (magnitude 7.8) events.

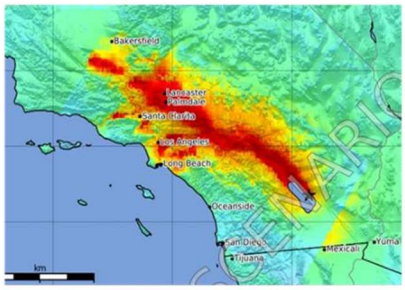
Figure 6.3- Hazus Model Earthquake Scenarios



San Joaquin Hills Fault (M7.0)



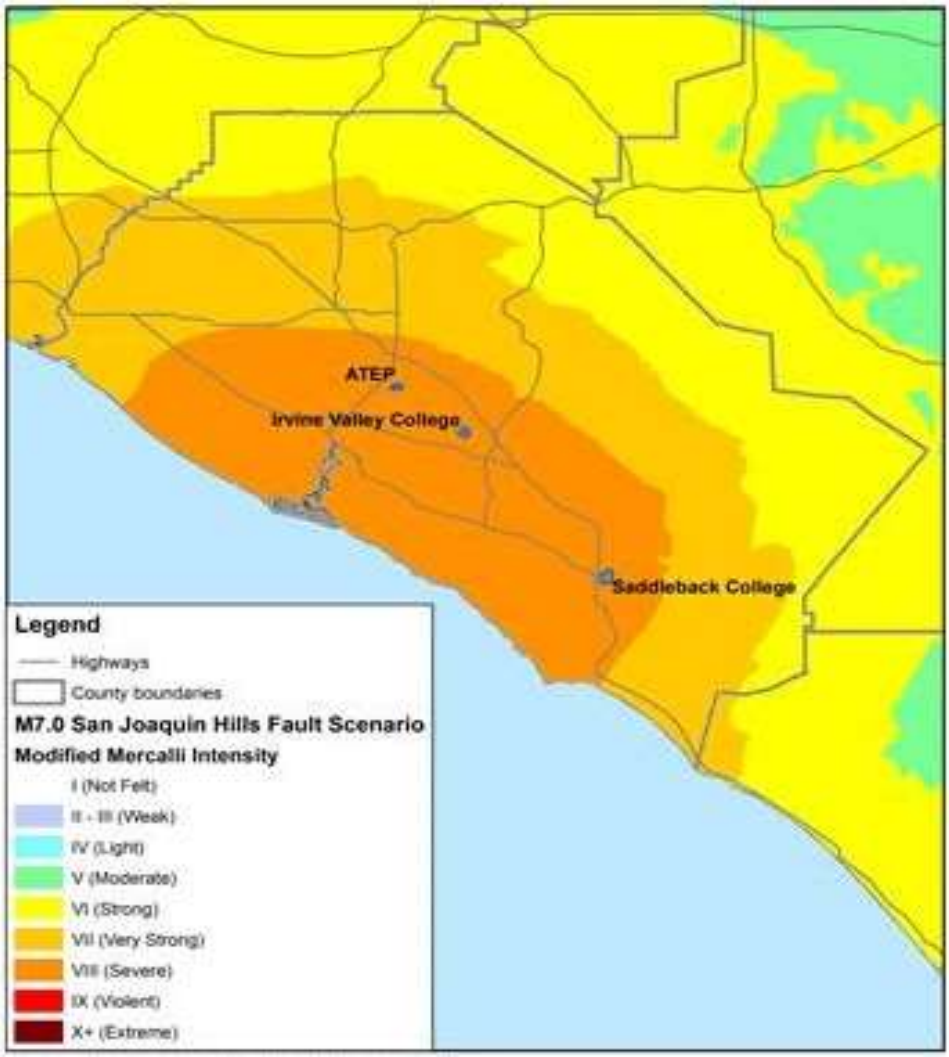
Newport-Inglewood Fault (M7.2)



San Andreas Fault (M7.8)- *ShakeOut*

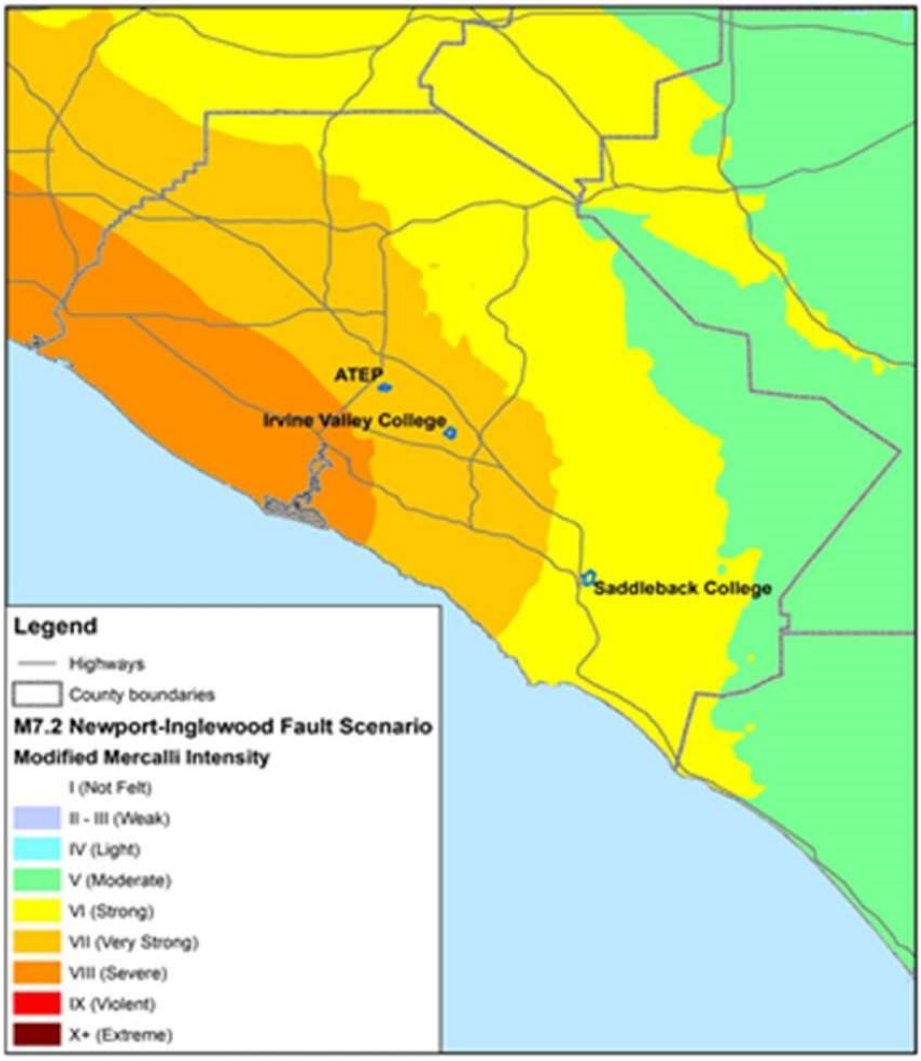
The following tables (**Table 6.1**, **Table 6.2**, and **Table 6.3**) reflect the Hazus model completed for each of the three scenarios using current building data from the District.

Table 6.1- San Joaquin Hills Fault Hazus Scenario Results



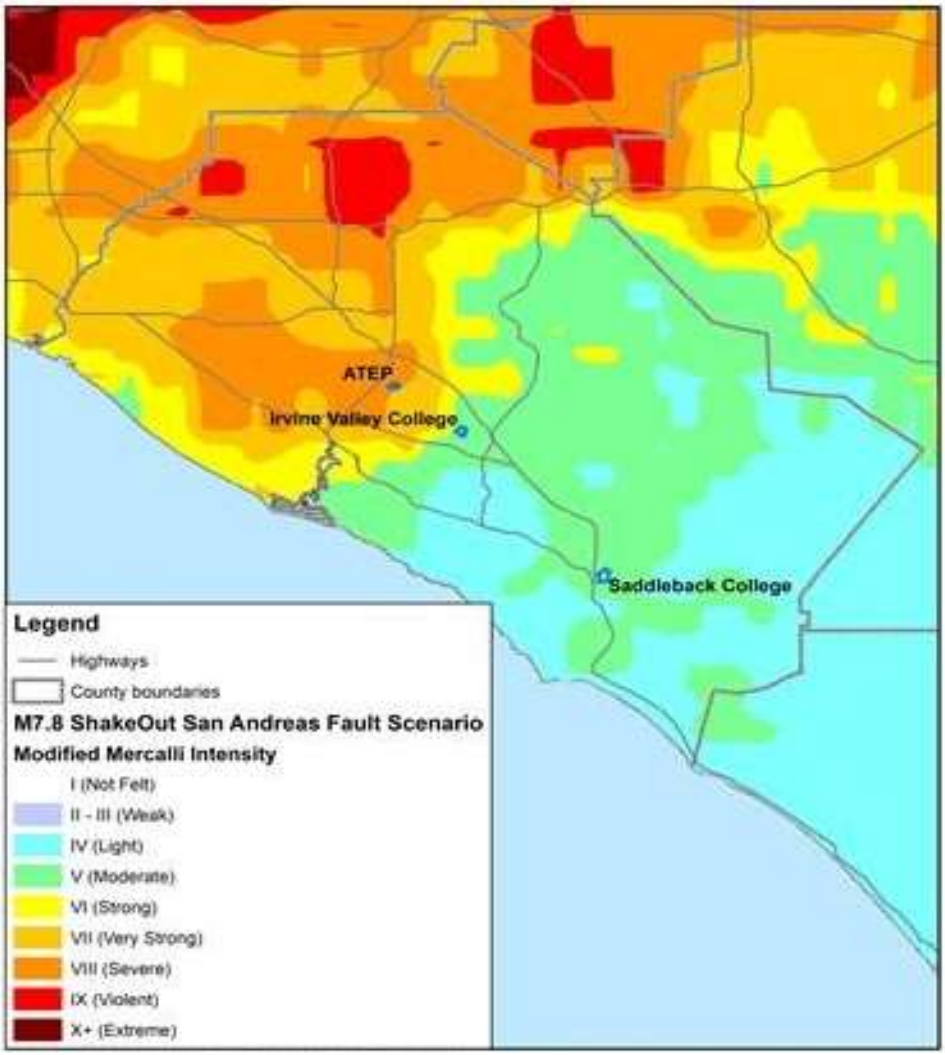
	ATEP	IVC	SC	Total
Building Damage				
Structural Damage	*$109,000*	*$2,495,000*	*$5,981,000*	*$8,585,000*
Non-Structural Damage	*$1,254,000*	*$17,175,000*	*$40,919,000*	*$59,348,000*
	$1,363,000	**$19,670,000**	**$46,900,000**	**$67,933,000**
Contents Damage				
	$150,000	**$2,229,000**	**$5,064,000**	**$7,443,000**
TOTAL	**$1,513,000**	**$21,899,000**	**$51,964,000**	**$75,376,000**
Causality				
Expected Injuries	≤ 5	25 - 50	100 - 150	**150 - 200**
Expected Fatalities	≤ 1	1 - 2	5 - 10	**5 - 10**

Table 6.2- Newport-Inglewood Fault Hazus Scenario Results



	ATEP	IVC	SC	Total
Building Damage				
Structural Damage	*$49,000*	*$692,000*	*$502,000*	*$1,243,000*
Non-Structural Damage	*$670,000*	*$6,046,000*	*$4,830,000*	*$11,546,000*
	$719,000	**$6,738,000**	**$5,332,000**	**$12,789,000**
Contents Damage				
	$85,000	**$800,000**	**$802,000**	**$1,687,000**
TOTAL	**$804,000**	**$7,538,000**	**$6,134,000**	**$14,476,000**
Caus ality				
Expected Injuries	≤ 5	5 - 10	5 - 10	**10 - 25**
Expected Fatalities	≤ 1	≤ 1	≤ 1	**≤ 1**

Table 6.3- San Andreas Fault Hazus Scenario Results



	ATEP	IVC	SC	Total
Building Damage				
Structural Damage	*$7,000*	*$22,000*	*$29,000*	*$58,000*
Non-Structural Damage	*$161,000*	*$325,000*	*$326,000*	*$812,000*
	$168,000	**$347,000**	**$355,000**	**$870,000**
Contents Damage				
	$23,000	**$36,000**	**$43,000**	**$102,000**
TOTAL	**$191,000**	**$383,000**	**$398,000**	**$972,000**
Casualties				
Expected Injuries	≤ 5	≤ 5	≤ 5	**≤ 5**
Expected Fatalities	≤ 1	≤ 1	≤ 1	**≤ 1**

A quick assessment of the Hazus damage estimate against the District building data discovers that the District can expect the following:

- **Structural Damage**- the greatest structural damage impacts are expected under the San Joaquin Fault scenario (15%). While 3% structural damage is expected under the Newport-Inglewood Fault scenario, and 0% under the San Andreas Fault scenario.
- **Non-Structural Damage**- non-structural damage is similar under all three scenarios (87% San Joaquin Fault scenario, 90% under the Newport-Inglewood Fault scenario, and 93% San Andreas Fault scenario).
- **Content Value Loss**- the greatest content value loss is expected under the San Joaquin Fault scenario (6% loss). While 1.4% structural damage is expected under the Newport-Inglewood Fault scenario, and nothing under the San Andreas Fault scenario.
- **Casualties Injuries**- the greatest number of injuries is expected under the San Joaquin Fault scenario (150-200 people). Under the Newport-Inglewood Fault scenario, it is expected that 10-25 people will have injuries. While less than 5 people under the San Andreas Fault scenario.
- **Casualties Fatalities**- the greatest number of fatalities is expected under the San Joaquin Fault scenario (5-10 people) with less than 1 person under the Newport Inglewood Fault scenario and the San Andreas Fault scenario.

6.3.6 ENERGY DISRUPTION

An exposure assessment was completed to understand the vulnerability to energy shortage/power outage on the campuses. There is no hazard exposure area (or footprint), so the Task Force considered potential influences over the entire campus. An energy shortage/power outage event could have a considerable impact on the population, built environment, lifeline infrastructure, and the economy. Society is reliant on power for gadgets and appliances to perform basic daily activities. When there is an energy shortage and/or a loss of power it will not only be an inconvenience but could become a life-threatening experience in some cases. While in most cases, the loss of power will not damage buildings, but rather may affect the buildings functionality. This includes loss of lighting, HVAC, electrical outlets, communications, and access to elevators. Due to interdependencies, the loss or shortage of power can affect several other lifeline systems (i.e., water, telecommunications, natural gas, fuel). While an energy shortage/power outage can vary in size and length of time on the campuses, it is expected to be smaller and of limited time.

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality, repurposing

- *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
- *Environment*- None expected
- *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.7 EXTREME TEMPERATURE

An exposure assessment was completed to understand the vulnerability to extreme temperatures on the campuses. There was no hazard exposure area (or footprint), so the Task Force considered potential impact for the entire campus. An extreme temperatures event could have a considerable impact on the population, built environment, lifelines, economy, and the environment. Exposure to extreme heat can result in heat stroke, heat exhaustion or death, while extreme cold can result in hyperthermia, frostbite, or death. Those at greatest risk are infants and children up to four years of age; people who overexert during work or exercise; people 65 years of age or older; people who are ill or on certain medications; and, people who are overweight. Extreme temperatures can cause equipment failure, which in turn could overheat structures, create electrical overloads, and warp, melt, or freeze parts. A noticeable depletion of water supplies and dehydration of vegetation may also occur, which may cause reduction or loss of flora and fauna and alter the landscape.

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- non-structural damage, loss of building content (equipment) and functionality, repurposing
  - *Economy*- loss of property, cost of response/care/clean up, rise in operating costs
  - *Environment*- loss of vegetation/wildlife
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.8 FLOOD

As discussed under Section 5.0 - Hazard Assessment, flood risks include riverine and urban flooding issues. Analyzing the FIRM maps and underlying data, it was determined that the 100-year or 500-year flood zones (**Figure 6.4**) do not directly affect the campuses. Although Saddleback College (SC) is in close proximity to the 100-year flood zone, it is well separated by elevated topography **(Figure 6.5**). Due to this fact, the District does not carry NFIP insurance and therefore does not have repetitive loss structures as defined by the NFIP (an NFIP-insured structure that has had at least 2 paid flood losses of more than $1,000 each in any 10-year period since 1978.) The greatest flooding risk on the campuses are around urbanized flooding. This pertains to damaged infrastructure, underneath engineered infrastructure, and/or blockage of infrastructure. This hazard is common in some places on each campus. The following types of impacts can be expected:

- **Potential Impacts**
  - *Population*- non-fatal injuries (slips and falls); restricted access/use
  - *Buildings*- some structural damage, but mainly loss of building content (equipment) and functionality due to water backing up into the structure and/or seeping into lower-level areas.
  - *Economy*- loss of property, cost of response/care/clean up, increased operating costs (i.e., keeping air conditioning and/or heating on to properly ventilate the building).
  - *Environment*- some possible contamination if the water is exposed and carries certain chemicals and pollutants.
  - *Lifelines*- possible damage to facilities/infrastructure/systems (i.e., powerhouse, power plant) or loss of equipment if flooding occurs.

Figure 6.4- District 100-year Flood Event Exposure

Figure 6.5- Saddleback College 100-year Flood Event Exposure

6.3.9 HAZARDOUS MATERIALS ACCIDENT

To understand the campuses' vulnerability to hazardous material accidents, an exposure assessment was completed. There is no hazard exposure area (or footprint), so the Task Force considered potential affects for the entire campus. The campuses do contain/store some hazardous materials, but the greatest risk may be from outside (or surrounding) sources. The release of some materials could have a significant impact on the campuses.

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality, repurposing
  - *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
  - *Environment*- loss of vegetation/wildlife, contamination
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.10 INFECTIOUS DISEASE

To understand the campuses' vulnerability to infectious diseases, an exposure assessment was completed. Since there is no hazard exposure area (or footprint), the Task Force considered potential affects over the entire campus. Everyone is vulnerable to infectious disease caused by either newly emerging or existing diseases spread person to person, through a vector, or through food. A significant infectious disease outbreak, epidemic, and/or pandemic could affect a large portion of the population, create challenges on the built environment, overburden essential public services, and effect the economy. Depending on the type of infectious disease event, impacts to the District may include increased use of equipment (i.e., HVAC, water) and adaptive reuse of space in response to and/or recovery from the event. Additionally, it could defer maintenance to equipment if employees and vendors are unavailable. Limited attendance could also influence associated business on the campus (i.e., cafeteria, sporting events). All of this could lead to loss of jobs as well. Actions to address the infectious disease could create higher demand on lifeline systems and cause damage from over/under use or curtailment of services.

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- possible loss of use due to deferred maintenance, repurposing
  - *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
  - *Environment*- possible loss of vegetation/wildlife, contamination
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

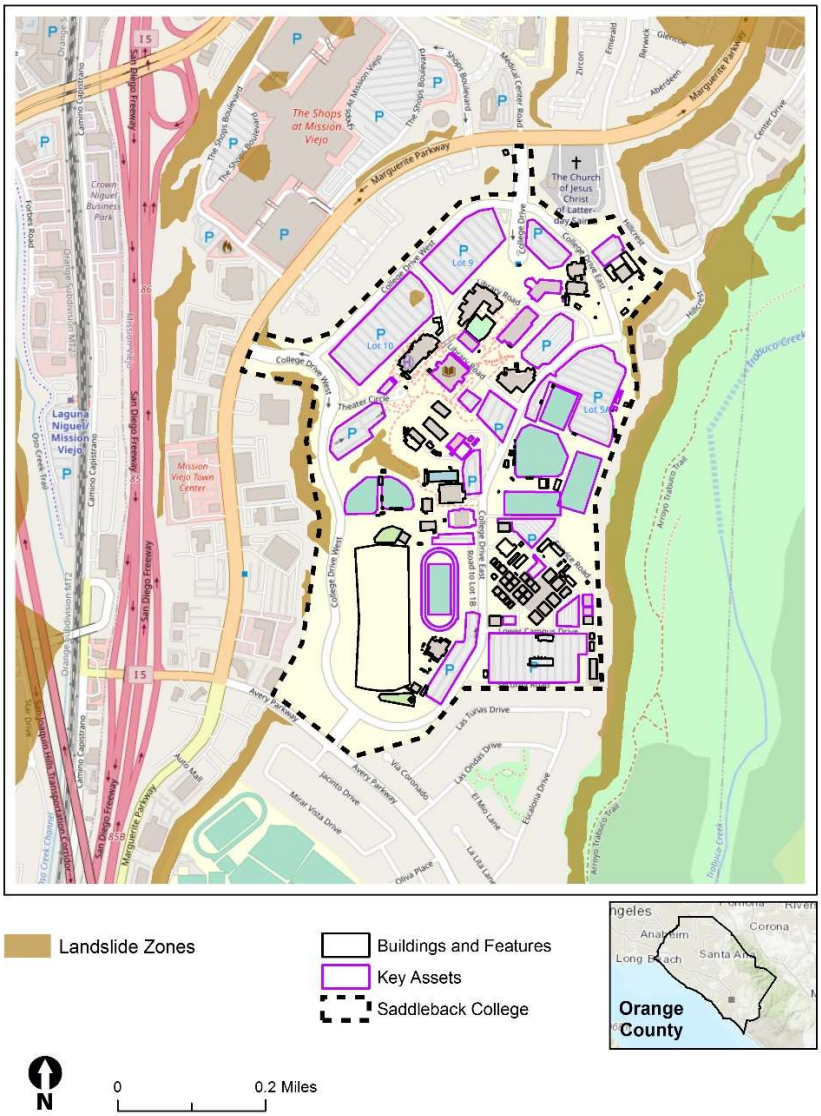
6.3.11 LANDSLIDE

To understand the campuses' vulnerability to landslides, an exposure assessment was completed. Since there is a hazard exposure area (or footprint), the Task Force considered potential affects for portions of the campuses within the hazard footprint. Landslide can be a natural occurrence or triggered by other hazards, such as an earthquake. As mentioned under Section 5.0 *Hazard Assessment*, there are possible landslide areas within the District (*see* Figure 5.23) but only SC is relatively affected.

Figure 5.24 provides an overview of the potential impact on or near the SC campus. The landslide areas just off-campus can have noticeable impacts on the campus. These off-campus landslide areas could undermine the integrity of the land along the southeast corner of the campus, limiting access to areas and causing structural damage.

Figure 6.6 depicts the locations around and near Saddleback College with landslide incidence on the USGS' Landslide Incidence and Susceptibility in the Conterminous United States map (Overview map, 2001). This figure shows areas of landslides and areas susceptible to future land sliding (defined to include most types of gravitational mass movement such as rock falls, debris flows, and the failure of engineered soil materials).

Figure 6.6- Landslide Map for Saddleback College



- **Potential Impacts**
  - ✦ *Population*- non-fatal injuries; restricted access/use
  - ✦ *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality
  - ✦ *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
  - ✦ *Environment*- loss of vegetation, ground displacement
  - ✦ *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.12 NATURAL GAS PIPELINE ACCIDENT

An exposure assessment was completed to understand the vulnerability to natural gas pipeline accidents. Since there is no hazard exposure area (or footprint), the Task Force considered potential influences for the entire campus. Each campus has a series of natural gas services lines across the campus supplying buildings and facilities. The campuses are responsible for the maintenance and upkeep of the lines on the owner side of the meter; and must locate and mark the pipes prior to any digging on the campuses. SC has also identified a stretch of its natural pipes that are in need of replacement. If a natural gas pipeline accident were to occur on campus, there could be considerable impacts as follows:

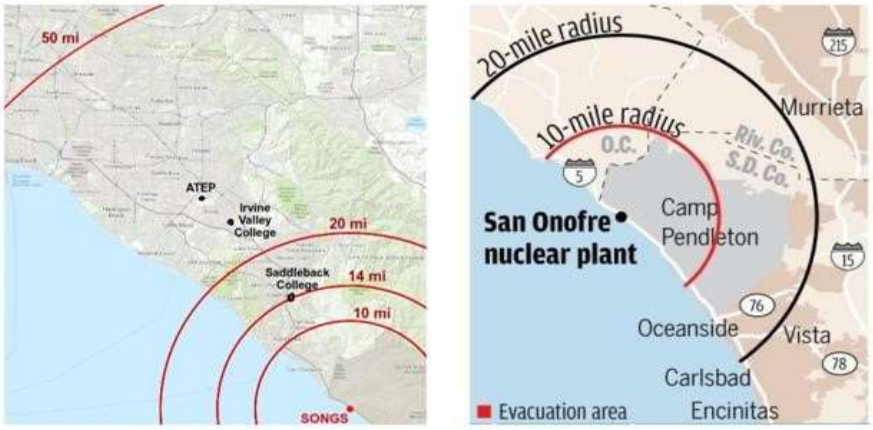
- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Building*- structural and non-structural damage, loss of building content (equipment) and functionality
  - *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
  - *Environment*- None expected
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.13 RADIOLOGICAL ACCIDENT

An exposure assessment was completed to understand the District's vulnerability to radiological accidents. Since there is no hazard exposure area (or footprint), the Task Force considered potential impacts for the entire campus. The San Onofre Nuclear Generating Station (SONGS) is located in San Clemente. The site is decommissioned, but still houses nuclear waste. There are three emergency zones: Emergency Planning Zone (*EPZ;* 10 to 14-mile radius), Public Education Zone (*PEZ;* 20-mile radius), and the Ingestion Pathway Zone (*IPZ;* 50-mile radius). As shown in **Figure 6.7** all of the campuses fall within the IPZ, with SC also falling within the PEZ. An incident at the SONGS site could create significant impacts as follows:

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality, repurposing
  - *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
  - *Environment*- loss of vegetation/wildlife, contamination
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

Figure 6.7- District Exposure to Radiological Accidents



6.3.14 TECHNOLOGY DISRUPTION

An exposure assessment was completed to understand the vulnerability to technology disruption. Since there is no hazard exposure area (or footprint), the Task Force considered potential affects over the entire campus. As with our society, the District is becoming heavily reliant upon technology to perform daily work routines. Whether loss to communication with each other or loss of access to data and materials, this disruption can seriously influence and/or alter the way business is done.

- **Potential Impacts**
  - *Population*- restricted access/use of the campus, buildings, or classrooms
  - *Buildings*- loss of building content (equipment) and functionality
  - *Economy*- loss of revenue, cost of response/care/cleanup, rise in operating costs
  - *Environment*- None expected
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.15 TERRORISM

An exposure assessment was completed to understand the vulnerability to terrorism. Since there is no hazard exposure area (or footprint), the Task Force considered potential affects over the entire campus. The District is vulnerable to terrorism. However, terrorist groups are more prone to target larger, more populous, nationally recognized places since the goal in most cases is to create the greatest amount of destruction while striking fear and creating chaos to the largest number of people. In the unlikely event of a terrorist attack, there could be considerable impact on the campuses as follows:

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality, repurposing

- *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
- *Environment*- loss of vegetation/wildlife, ground displacement, contamination
- *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.16 WILDFIRE

An exposure assessment was completed to understand the vulnerability to Wildfires. Since there is a hazard exposure area (or footprint), the Task Force assessed potential impacts for portions of the campuses within the hazard footprint. The California Department of Forestry and Fire Protection (Cal FIRE) has created and maintains the Fire Hazard Severity Zones maps. These maps, part of the Fire and Resource Assessment Program (FRAP), look at Moderate, High, and Very High fire risk danger areas for both State Responsibility Areas (SRA) and Local Responsibility Areas (LRA). While each campus is vulnerable to secondary effects from wildfires (i.e., flying ambers, poor air quality), SC is the only campus within a Cal FIRE designated Moderate, High, and Very High fire risk danger zone (*see* Figure 5.26). **Figure 6.8** depicts the building footprints over the Cal FIRE LRA maps and **Table 6.4** estimates the potential exposure.

Figure 6.8- Saddleback College Exposure to Wildfires

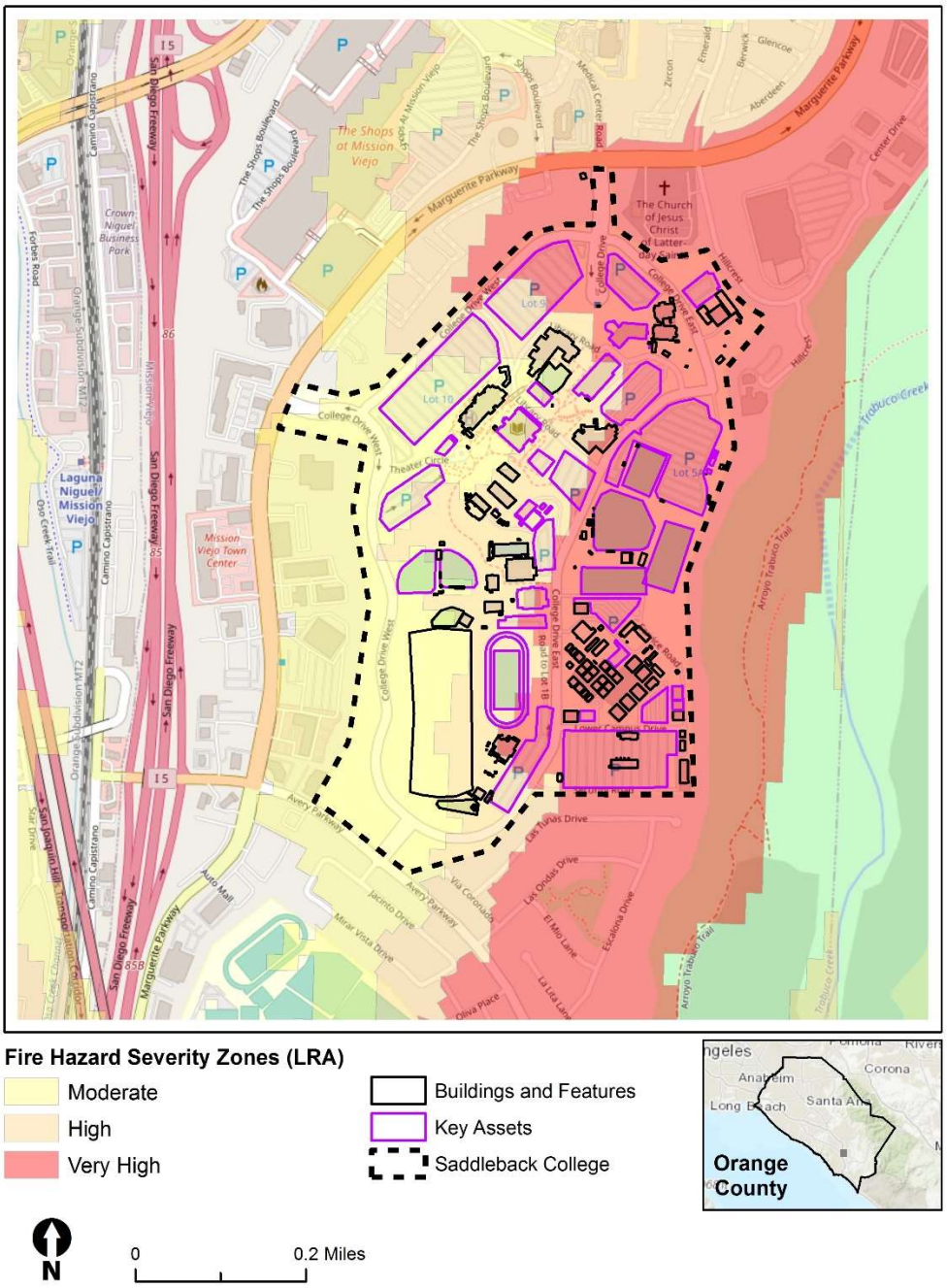


Table 6.4- Saddleback College Exposure to Cal FIRE Hazard Zones

Number of Acres	
Moderate	49 (28% of campus)
High	47 (27% of campus)
Very High	78 (45% of campus)
Number of Buildings in or Partially in the Very High Zone	63 (of 92)
Of which are Key Assets	6 (of 8)
• SSC Student Services Center • Village Campus Portable 2 • PE 200 Gymnasium • HS Health Sciences • CP Campus Police Portable Building • Stadium Complex (select structures)	

A significant wildfire event could affect a large portion of the population, destroy buildings, and effect the economy as follows:

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality
  - *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
  - *Environment*- loss of vegetation/wildlife, contamination
  - *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment

6.3.17 WINDSTORM

An exposure assessment was completed to understand the vulnerability to windstorms. Since there is no hazard exposure area (or footprint), the Task Force considered potential affects over the entire campus. Windstorms have the capability of being of long or short duration. While longer duration events can have impact that is more significant on the population, built environment, lifelines, environment, and/or the economy; shorter duration events can be just as damaging if the winds are powerful. Windstorm events could also trigger other hazards. For example, prolonged periods of high winds, could damage power lines, creating power outages and/or wildfires.

- **Potential Impacts**
  - *Population*- fatal and non-fatal injuries; restricted access/use
  - *Buildings*- structural and non-structural damage, loss of building content (equipment) and functionality

- *Economy*- loss of revenue/property, cost of response/care/clean up, increased operating costs
- *Environment*- loss of vegetation
- *Lifelines*- damage to facilities/infrastructure/systems, loss of equipment.

7 MITIGATION STRATEGY

7.1 OVERVIEW

The purpose of this section is to identify the needed actions to mitigate risk within the District. The mitigation strategy is based on informed assumptions, recognizing both mitigation challenges and opportunities, with the ultimate mission of creating a disaster resistant and sustainable community for the future. The mitigation strategy is derived from an in-depth understanding of possible deficiencies between potential vulnerabilities and existing capabilities, with the mitigation objectives in mind.

7.2 MITIGATION GOALS AND OBJECTIVES

To better assist with the identification of mitigation measures (actions), mitigation goals and objectives were developed. The mitigation goals and objectives support the District's mitigation mission to create a disaster resistant and sustainable community by reducing the long-term vulnerabilities from hazards. Well-defined goals and objectives help focus efforts and ensure progress toward the mitigation mission. The goals and objectives include the following:

Goal 1- Minimize Injuries and Loss of Life

Objective

- Educate students, employees, contractors/vendors, and visitors of hazards and recommended mitigation measures/actions.
- Improve emergency communications and public warning/evacuation systems.
- Develop policies and procedures to better serve disadvantaged and vulnerable populations.

Goal 2- Minimize Damage to Property, Structures, and Equipment

Objective

- Incorporate hazard mitigation considerations into future campus development and facility designs.
- Coordinate with Division of State Architect (DSA) to better understand and improve Building Codes.
- Incorporate mitigation measures into maintenance, repairs, major alterations, new development, and redevelopment projects.
- Ensure that all facilities meet current structural and non-structural codes, standards and best practices.

Goal 3- Ensure Business Continuity

Objective

- Develop, maintain, and exercise Business Continuity Plans.

- Ensure reliability for vital communications.
- Protect vital records.
- Protect essential Information Technology equipment and systems.
- Promote resiliency of essential functions to minimize economic loss/disruption.
- Maintain list of Key Assets and ensure their functionality after hazard events.
- Maintain a list of essential personnel and vendors with contact information.
- Identify and acquire any necessary equipment to maintain functionality.

Goal 4- Strengthen Emergency Management Practices

Objective

- Develop and maintain plans (Response, Recovery, Preparedness, Prevention, Mitigation).
- Establish and maintain emergency management systems and facilities.
- Develop and maintain partnerships for emergency response and needs.
- Develop and maintain Memorandums of Understanding/Mutual Aid Agreements.
- Develop, maintain, and share essential data (demographics, hazards, buildings, resources, personnel) with stakeholders.
- Develop, maintain, and implement emergency management training curriculum.
- Design and implement disaster response exercises (tabletop, functional, full-scale).

Goal 5- Increase Public Awareness of Hazards

Objective

- Promote public outreach programs that bring an understanding of the risks associated with hazards, individual preparedness activities, and the benefits of mitigation measures/actions.
- Share hazard information with government, private sector, business community, citizens, community groups, non-profit organizations, and institutions of higher learning.

Goal 6- Protect the Environment

Objective

- Encourage balance between natural resource management and land use planning.
- Implement mitigation measures that reduce loss of wildlife, habitats, and vegetation after events.
- Protect, rehabilitate, and enhance natural systems and environmental resources.

7.3 PROGRESS IMPLEMENTING MITIGATION MEASURES

Since this is the initial LHMP for the District, there is no previous mitigation strategy to build upon. However, it is worth noting that the District has been taking actions that qualify as mitigation. This includes some work done by Facilities Management, Public Safety, Risk Management, and Technology Services. Past, present, and proposed future mitigation-related projects were analyzed by the Task Force in the development of proposed mitigation measures.

7.4 PRIORITIZING MITIGATION MEASURES

The Task Force used a feasibility assessment to prioritize mitigation measures. The feasibility assessment considered possible challenges that could hinder the ability to implement the mitigation measure. This assessment looked at the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria to evaluate the mitigation measures. This process included the following considerations:

- **Social**
  - Is the proposed action socially acceptable to the community?
  - Are there equity issues involved that would mean that one segment of the community is treated unfairly?
  - Will the action cause social disruption?
- **Technical**
  - Will the proposed action work?
  - Will it create more problems than it solves?
  - Does it solve a problem or only a symptom?
  - Is it the most useful action in light of other community goals?
- **Administrative**
  - Can the community implement the action?
  - Is there someone to coordinate and lead the effort?
  - Is there sufficient funding, staff, and technical support available?
  - Are there ongoing administrative requirements that need to be met?
- **Political**
  - Is the action politically acceptable?
  - Is there public support both to implement and to maintain the project?
- **Legal**
  - Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?

- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by the general plan, or must the general plan be amended to allow the proposed action?
- Will the community be liable for action or lack of action?
- Will the activity be challenged?

- **Economic**
  - What are the costs and benefits of this action?
  - Do the benefits exceed the costs?
  - Are initial, maintenance, and administrative costs taken into account?
  - Has funding been secured for the proposed action? If not, what are the potential sources (public, non-profit, and private)?
  - How will this action affect the fiscal capability of the community?
  - What burden will this action place on the tax base or local economy?
  - What are the budget and revenue effects of this activity?
  - Does the action contribute to other community goals, such as capital improvements or economic development?
  - What benefits will the action provide?
- **Environmental**
  - How will the action affect the environment?
  - Will the action need environmental regulatory approvals?
  - Will it meet local and state regulatory requirements?
  - Are endangered or threatened species likely to be affected?

Each proposed mitigation measure was assessed against each criterion and given a score between 1-5 where 5 is favorable/beneficial (or no major issues/opposition) and 1 is unfavorable/not beneficial (or major issues/opposition). The criterion scores were totaled, and a final score was established for each mitigation measure. A relative comparison of mitigation measures helps understand which mitigation measure may have the greatest potential for implementation. However, the Task Force recognized that this ranking does not (and should not) preclude the District (or the campuses) from funding mitigation actions lower on the list first, especially if funding is available.

7.5 MITIGATION MEASURES

The focus of the mitigation measures was on the “high” priority (Tier I) hazards (Earthquake, Energy Shortage/Power Outage, Flood, Infectious Disease, Technology Disruption, Wildfire, and Windstorm). However, some mitigation measures address the other hazards or cut across

all hazards. Mitigation measures were identified by assessing the effectiveness of current capabilities (existing plans, policies, and programs) against the expected impacts (vulnerabilities). Many of the mitigation measures also had a heavy emphasis on existing buildings and future development. **Table 7-1** represents the proposed mitigation measures identified by the Task Force. The Task Force made assessments to determine if existing plans, policies, and/or programs needed expansion or improvement; and whether those changes would support reducing the hazard. Any recommended changes to plans, policies, and programs are reflective in Table 7.1. It is also worth noting, that consideration was given to needed plans, policies, and programs. They too, if any, are included in Table 7.1.

Table 7.1- Proposed Mitigation Actions

	Mitigation Action	Hazard	Goal	Campus
1	Maintain and share the **Building Inventory Database** created for the LHMP.	Multi-hazard	1, 2, 3, 4	ATEP, IVC, SC
2	Install and/or upgrade current **Heating, Ventilation, and Air Conditioner (HVAC) units.**	Multi-hazard	1, 2, 3, 6	ATEP, IVC, SC
3	Develop and maintain **Emergency Circulation (Traffic) Plan(s)**; acquire necessary equipment to support implementation.	Multi-hazard	1, 3, 4, 5, 6	ATEP, IVC, SC
4	Develop and maintain **Memorandums of Understanding** (MOUs) and p**artnerships** in support of emergency management and business continuity.	Multi-hazard	1, 2, 3, 4, 5, 6	ATEP, IVC, SC
5	Develop and maintain **Business Continuity Plan(s)**, emphasize loss of technology (Tech Down) situation.	Multi-hazard	1, 2, 3, 4, 6	ATEP, IVC, SC
6	Develop and maintain **Public Communications Plan(s)** and systems.	Multi-hazard	1, 2, 3, 4, 5	ATEP, IVC, SC
7	Develop and maintain an **Energy Strategic Plan(s)**; acquire necessary equipment to support implementation.	Multi-hazard	1, 2, 3, 4, 6	ATEP, IVC, SC
8	Develop and maintain a **Vegetation Management Plan(s).**	Multi-hazard	1, 2, 3, 6	ATEP, IVC, SC
9	Update and maintain an **Emergency Operations Plan(s).**	Multi-hazard	1, 2, 3, 4, 5, 6	ATEP, IVC, SC
10	Encourage **incorporation of Hazard Risk** into other plans and development efforts.	Multi-hazard	1, 2, 3, 4, 5, 6	ATEP, IVC, SC
11	Develop Emergency Management **Training and Exercise Program** or incorporate Emergency Management into existing training and exercise programs.	Multi-hazard	1, 2, 3, 4	ATEP, IVC, SC
12	**Replace/Improve campus lifeline infrastructure** to create redundancy and build resiliency.	Multi-hazard	1, 2, 3, 6	ATEP, IVC, SC
13	Establish and maintain a primary and alternative **Emergency Operations Center(s)**; acquire necessary equipment to support implementation.	Multi-hazard	1, 2, 3, 4, 6	ATEP, IVC, SC
14	Participate or establish an **Emergency Management team/group** to coordinate with surrounding governmental agencies.	Multi-hazard	1, 2, 3, 4, 5, 6	ATEP, IVC, SC

	Mitigation Action	Hazard	Goal	Campus
15	Implement recommendations from the Facilities Condition Assessment Report.	Multi-hazard	1, 2, 3, 6	ATEP, IVC, SC
16	**Structural Retrofit** of Studied Buildings.	Earthquake	1, 2, 3	IVC, SC
17	**Non-structural Retrofit** of Studied Buildings.	Earthquake	1, 2, 3	IVC, SC
18	Conduct **Feasibility Study** for building slab replacement; implement recommendations.	Earthquake	2, 3	IVC, SC
19	Conduct **Tier 2 and/or Tier 3 Building Condition Assessments**; implement recommendations.	Earthquake	1, 2, 3	IVC, SC
20	Assess **Non-structural Hazards** in buildings and maintain a database of implemented mitigation actions. Develop plan to implement mitigation measures for all buildings.	Earthquake	1, 2, 3	ATEP, IVC, SC
21	Conduct additional **Building Condition Assessment Reports.**	Earthquake	1, 2, 3	IVC, SC
22	Develop protocols and ensure appropriate personnel are signed up and receive **Earthquake Notification**s from USGS.	Earthquake	1, 2, 3, 4, 5	ATEP, IVC, SC
23	**Non-structural Retrofit** of Studied Buildings.	Flood	1, 2, 3	IVC, SC
24	**Structural Retrofit** of Buildings.	Flood	1, 2, 3	IVC, SC
25	Conduct **Feasibility Study** for Water Infiltration; implement recommendations.	Flood	2, 3	IVC, SC
26	Conduct an **Urban Flood Runoff Study** and install appropriate flood control measures.	Flood	1, 2, 5, 6	SC
27	Maintain the **COVID-19 Prevention and Disinfection Plan.**	Infectious Disease	1, 3, 4, 5	ATEP, IVC, SC
28	**Equipment procurement and installation** to ensure stable, secure, and safe network system and equipment.	Technology Disruption	2, 3, 4	ATEP, IVC, SC
29	Conduct a **Risk Assessment** of the locations and equipment within the network rooms; acquire necessary equipment.	Technology Disruption	2, 3, 4	ATEP, IVC, SC
30	Develop and maintain **IT Incident Response Plans**; implement recommendations.	Technology Disruption	2, 3, 4	ATEP, IVC, SC
31	Conduct a **Risk Assessment** of campus and building access; acquire necessary equipment.	Terrorism	1, 2, 3, 4, 5	ATEP, IVC, SC
32	Incorporate **Defensive Space Standards** in existing and future building designs.	Terrorism	1, 2, 3, 4	ATEP, IVC, SC
33	**Non-structural Retrofit** of Studied Buildings.	Wildfire	1, 2, 3, 6	IVC, SC
34	Ensure **Fire Resistant Materials** are incorporated into existing building modifications and/or future development.	Wildfire	1, 2, 3, 4, 6	SC

	Mitigation Action	Hazard	Goal	Campus
35	Incorporate **Defensive Space Standards** in existing and future building designs.	Wildfire	1, 2, 3, 4	SC
36	**Coordinate with John Wayne Airport** Emergency Management.	Aircraft Accident	1, 3, 4	ATEP
37	**Coordinate with Ca Department of Water Resources.**	Dam Failure	1, 2, 3, 4, 5, 6	ATEP
38	Develop and maintain a **Water Conservation/Management Plan(s).**	Drought	1, 5, 6	ATEP, IVC, SC
39	**Coordinate with Southern California Edison and San Diego Gas and Electric** Emergency Management.	Energy Disruption	1, 2, 3, 4, 5, 6	ATEP, IVC, SC
40	**Coordinate with local Governments.**	Extreme Temperatures	1, 2, 3, 4, 5, 6	ATEP, IVC, SC
41	Maintain **Database of Hazardous Materials.**	HazMat Accident	1, 2, 3, 4, 5, 6	ATEP, IVC, SC
42	Enforce and support annual **HazMat Training and Exercises.**	HazMat Accident	1, 2, 3, 4, 6	ATEP, IVC, SC
43	**Risk Assessment** of storage and housing locations.	HazMat Accident	1, 2, 3, 4, 6	ATEP, IVC, SC
44	Coordinate with surrounding stakeholders to conduct a **Slope Stabilization Study** and implement recommendations.	Landslide	1, 2, 6	SC
45	**Coordinate with Southern California Gas/San Diego Gas and Electric.**	Pipeline Accident	1, 2, 3, 4, 6	ATEP, IVC, SC
46	**Coordinate with Southern California Electric/San Diego Gas and Electric.**	Radiological Accident	1, 2, 3, 4, 5, 6	ATEP, IVC, SC

7.6 MITIGATION MEASURE IMPLEMENTATION PLAN

The following table (**Table 7-2**) reflects the implementation plan for each mitigation measure and identifies the lead department responsible for the action, the estimated cost, potential funding source to support the action, and the proposed timeframe for completion. While a lead department is identified, other departments may actually take the lead depending on the subject of the project. Additionally, the District intends to actively search for other possible funding sources to help implement the mitigation measures, but those resources are unknown at this time. The Hazard Mitigation Assistance (HMA) grants are listed under several of the mitigation measures and recognized to include the Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), and Flood Mitigation Assistance (FMA) funding. The Task Force decided to list it collectively; instead of only selecting one or two of the grant programs as to not limit consideration under the other grant programs.

Table 7.2- Mitigation Measure- Implementation Plan

*CIP= Capital Improvement Program, DOE=Dept. of Energy, EMPG= Emergency Management Performance Grant, HMA=Hazard Mitigation Assistance

	Mitigation Action	Lead	Cost	Timeframe	Fund Source	Score
22	Develop protocols and ensure appropriate personnel are signed up and receive **Earthquake Notifications** from USGS.	Public Affairs Public Safety	<$150,000	1 Year	General Fund	34
30	Develop and maintain IT incident Response Plans; implement recommendations.	Director of Technology Services	<$150,000	1-3 years	General Fund	33
1	Maintain and share the **Building Inventory Database** created for the LHMP.	Facilities	<$50,000	< 1 year	General Fund	32
4	Develop and maintain **Memorandums of Understanding** (MOUs) and **partnerships** in support of emergency management and business continuity.	District Procurement	<$150,000	1-3 Years	General Fund	32
29	Conduct a **Risk Assessment** of the locations and equipment within the network rooms; acquire necessary equipment.	Director of Technology Services	<$250,000	1-3 Years	General Fund	32
41	Maintain **Database of Hazardous Materials.**	Risk Management	<$50,000	1-3 Years	General Fund	32
6	Develop and maintain **Public Communications Plan(s)** and systems.	District Director of Public Affairs and Government Relations	<$250,000	1-3 Years	General Fund	31
27	Maintain and disseminate COVID-19 **Pandemic Response Plan.**	Dean of Student Health & Wellness	<$150,000	1 Year	General Fund	31
31	Conduct a **Risk Assessment** of campus and building access; acquire necessary equipment.	Public Safety	$250,000 - $500,000	3-5 Years	EMPG	31
32	Incorporate **Defensive Space Standards** in existing and future building designs.	Public Safety	As needed	3-5 Years	EMPG	31
35	Incorporate **Defensive Space Standards** in existing and future building designs.	Facilities	As needed	1-3 Years	General Fund	31
5	Develop and maintain **Business Continuity Plan(s)**, emphasize loss of technology (Tech Down) situation.	BCPC; Vice Chancellor, Technology	<$150,000	1-3 Years	General Fund	30
8	Develop and maintain a **Vegetation Management Plan(s).**	Facilities	<$250,000	Annual	General Fund HMA	30

	Mitigation Action	Lead	Cost	Timeframe	Fund Source	Score
17	**Non-structural Retrofit** of Studied Buildings.	Facilities	$250,000 - $500,000	1-3 Years	General Fund HMA	30
20	Assess N**on-structural Hazards** in buildings and maintain a database of implemented mitigation actions. Develop plan for implement mitigation measures for all buildings.	Facilities	$250,000 - $500,000	1-3 Years	General Fund	30
34	Ensure **Fire Resistant Materials** are incorporated into existing building modifications and/or future development.	Facilities	$250,000 - $500,000	3-5 Years	General Fund HMA	30
42	Enforce and support annual HazMat **Training and Exercises.**	Risk Management	<$250,000	1-3 Years	General Fund EMPG	30
43	**Risk Assessment** of storage and housing locations.	Facilities	<$250,000	1-3 Years	General Fund EMPG	30
3	Develop and maintain **Emergency Circulation (Traffic) Plan(s)**; acquire necessary equipment to support implementation.	Public Safety	<$150,000	1-3 Years	General Fund EMPG	29
9	Update and maintain an **Emergency Operations Plan(s).**	Administrative Services	<$150,000	Annual	General Fund EMPG	29
13	Establish and maintain a primary and alternative **Emergency Operations Center(s)**; acquire necessary equipment to support implementation.	Public Safety	$250,000 - $500,000	3-5 Years	General Fund EMGP HMA	29
14	Participate or establish an **Emergency Management team/group** to coordinate with surrounding governmental agencies.	Administrative Services	<$250,000	1 Year	General Fund	29
36	**Coordinate with John Wayne Airport** Emergency Management.	Public Safety	As needed	1-3 Years	General Fund EMPG	29
37	**Coordinate with Ca Department of Water Resources.**	Public Safety Facilities	As needed	1-3 Years	General Fund EMPG	29
39	**Coordinate with Southern California Edison and San Diego Gas and Electric Emergency Management.**	Facilities	As needed	1-3 Years	General Fund EMPG	29
40	**Coordinate with local Governments.**	Public Safety	As needed	1-3 Years	General Fund EMPG	29

	Mitigation Action	Lead	Cost	Timeframe	Fund Source	Score
45	**Coordinate with Southern California Gas/San Diego Gas and Electric.**	Facilities	As needed	1-5 Years	General Fund EMPG	29
46	**Coordinate with Southern California Electric/San Diego Gas and Electric.**	Facilities	As needed	1-5 Years	General Fund EMPG	29
38	Develop and maintain a **Water Conservation/Management Plan(s).**	Facilities	<$150,000	1-3 Years	General Fund	28
10	Encourage **incorporation of Hazard Risk** into other plans and development efforts.	Administrative Services	As needed	1-3 Years	General Fund HMA	27
28	**Equipment procurement and installation** to ensure stable, secure, and safe network system and equipment.	Director of Technology Services & Broadcast Systems	$250,000 - $500,000	1-3 Years	General Fund	27
2	Install and/or upgrade current **Heating, Ventilation, and Air Conditioner (HVAC) units.**	Facilities	>$1,000,000	3-5 Years	General Fund HMA	26
7	Develop and maintain an **Energy Strategic Plan(s)**; acquire necessary equipment to support implementation.	Facilities	<$250,000	1-3 Years	General Fund DOE/CEC	26
12	**Replace/Improve campus lifeline infrastructure** to create redundancy and build resiliency.	Facilities	>$1,000,000	3-5 Years	General Fund HMA	26
15	Implement recommendations from the **Facilities Condition Assessment Report.**	Facilities	>$1,000,000	3-5 Years	General Fund CIP HMA	26
21	Conduct additional **Building Condition Assessment Reports.**	Facilities	$250,000 - $500,000	3-5 Years	General Fund CIP HMA	26
23	**Non-structural Retrofit** of Studied Buildings.	Facilities	$250,000 - $500,000	3-5 Years	General Fund CIP HMA	26
26	Conduct an **Urban Flood Runoff Study** and install appropriate flood control measures.	Facilities	$250,000 - $500,000	1-3 Years	General Fund CIP	26
33	**Non-structural Retrofit** of Studied Buildings.	Facilities	$250,000 - $500,000	1-3 Years	General Fund CIP HMA	26
11	Develop Emergency Management **Training and Exercise Program** or incorporate Emergency Management into existing training / exercise programs.	Administrative Services	<$250,000	Annual	General Fund EMPG	25

	Mitigation Action	Lead	Cost	Timeframe	Fund Source	Score
25	Conduct **Feasibility Study** for Water Infiltration; implement recommendations.	Facilities	<$250,000	1-3 Years	General Fund CIP HMA	25
19	Conduct **Tier 2 and/or Tier 3 Building Condition Assessments**; implement recommendations.	Facilities	$250,000 - $500,000	1-3 Years	General Fund CIP HMA	24
44	Coordinate with surrounding stakeholders to conduct a **Slope Stabilization Study** and implement recommendations.	Facilities	>$1,000,000	1-3 Years	General Fund CIP	24
16	**Structural Retrofit** of Studied Buildings.	Facilities	>$1,000,000	1-3 Years	General Fund CIP HMA	23
18	Conduct **Feasibility Study** for building slab replacement; implement recommendations.	Facilities	$250,000 - $500,000	1 Year	General Fund CIP	23
24	**Structural Retrofit** of Buildings.	Facilities	>$1,000,000	3-5 Years	General Fund, HMA	23

8 PLAN ADMINISTRATION

8.1 OVERVIEW

The purpose of this section is to present how the District will maintain the LHMP over the next five years. The plan administration will provide an overview of not only how the LHMP will be maintained but also how the District will encourage the incorporation of LHMP material into other plans and planning efforts. This section will also discuss how the District intends to keep the public engaged in the mitigation process as well.

8.2 MONITORING, EVALUATING, AND UPDATING THE PLAN

The Vice Presidents for College Administrative Services for Irvine Valley College (IVC) and Saddleback College (SC) will lead the effort and will be responsible for ensuring that this plan is being monitored and evaluated over the next five years. While there is not a confirmed meeting schedule, the Vice Presidents for College Administrative Services will ensure that at a minimum there is an annual meeting to discuss the LHMP. The first annual meeting will occur one year from the date of FEMA approval. The annual review will include; but not be limited to:

- Status on progress towards implementing mitigation measures,
- The need for additional and/or removal of mitigation measures,
- Adjustments to the mitigation measure and/or implementation plan,
- Creation or revision to existing mitigation governance
- Addition to the Goals and/or Objectives, and
- Revisions to Hazard Profiles, primarily focused on description, history, and location.

In addition to the annual meetings, the Vice Presidents for College Administrative Services may also leverage existing meetings to review, evaluate, and discuss progress on the mitigation actions set forth in this plan. The Vice Presidents for College Administrative Services will ensure that the LHMP is an agenda item or incorporated into the discussion in those meetings whenever appropriate.

The Vice Presidents for College Administrative Services will also visit the LHMP after significant events; ensuring lessons learned and other vital information is captured for incorporation into future LHMP updates. This will provide the Vice Presidents for College Administrative Services with an opportunity to evaluate the value of any implemented mitigation actions, validate the needs of the remaining mitigation actions, and possibly identify additional mitigation actions.

Information obtained from all of these meetings will be captured by the Vice Presidents for College Administrative Services and made available for the next LHMP update.

The Vice Presidents for College Administrative Services will also lead the effort to update the LHMP. Understanding the need not to have the LHMP expire, the District will begin the process of updating the LHMP two years prior to the plan expiration date. The District may or may not seek another Hazard Mitigation Assistance grant or the assistance of a consultant to support

the update to the LHMP. If either of these are true, the Vice Presidents for College Administrative Services will incorporate appropriate time to account for those needs.

8.3 INCORPORATION INTO OTHER PLANNING EFFORTS

The District is aware of the hazards and the historical events that have occurred in and around the campuses. The District will continue to strive toward protecting the life, property, and economy on each campus by supporting an all-hazard approach, and encouraging information sharing between District departments for incorporation into other planning efforts. As other plans are developed, the information from the LHMP will be leveraged and incorporated when the other plans could benefit from a better understanding of hazards and the potential mitigation measures that can be taken. As a start, the District is anticipating incorporating and/or leveraging the information from the LHMP into Emergency Operations Plans (EOPs) and Business Continuity Plans (BCPs).

The District has just recently adopted its Facilities Master Plan (FMP). While some information about hazards were considered, it did not go into the level of assessment done under the LHMP. As opportunities present themselves, the District will make every effort to reference and incorporate the LHMP information into any updates to the FMP. In the meantime, the LHMP will be utilized alongside the FMP to assess future development. In addition to reviewing future development against relevant regulations, codes, and standards, it will be reviewed against the risk and proposed mitigation measures in the LHMP. Proposed development projects will be assessed to determine exposure (or risk) to the hazards and will serve as a reference for suggested mitigation measures to reduce and/or eliminate risk from those hazards.

8.4 CONTINUED STAKEHOLDER AND PUBLIC INVOLVEMENT

As mentioned under Section 2.5 *Public Outreach*, the District organizes and/or participates in a variety of meetings/events to share and exchange information with stakeholders and the public. During these meetings/events, the District will look for opportunities to include mitigation to the agenda. In addition to the District outreach efforts, it will also (when appropriate) leverage stakeholder and community social media platforms to announce the meetings/events.

8.5 POINT OF CONTACT

Comments or suggestions regarding this plan should be submitted to:

Irvine Valley College	Saddleback College
Davit Khachatryan VP for College Administrative Services 5500 Irvine Center Drive Irvine, Ca 92618 (949) 451-5326 dkhachatryan@ivc.edu	Cory Wathen VP for College Administrative Services 28000 Marguerite Parkway Mission Viejo, Ca 92692 (949) 582-4872 cwathen@saddleback.edu

APPENDIX A- DISTRICT ADOPTION OF LHMP

Agenda Item Details

Meeting	Aug 29, 2022 - Meeting of the Board of Trustees - August 29, 2022
Category	10. BUSINESS SERVICES
Subject	10.2 SOCCCD: South Orange County Community College District Local Hazard Mitigation Plan
Type	Action
Recommended Action	The Chancellor recommends that the Board of Trustees approves and adopts the South Orange County Community College District Local Hazard Mitigation Plan.

BACKGROUND

On February 13, 2020, the District received notification from the Governor's Office of Emergency Services (Cal OES) that the Federal Emergency Management Agency (FEMA) approved the District's Hazard Mitigation Grant subaward application to develop a Local Hazard Mitigation Plan. On March 23, 2020, the District's Board of Trustees approved and accepted this subaward from Cal OES in the amount of $125,000.37. Shortly thereafter, the District services team along with the colleges' administrative teams began the development of the South Orange County Community College District Local Hazard Mitigation Plan (LHMP) to identify and implement long-term independent solutions to reduce the loss of life and property from future disasters. The districtwide Business Continuity Planning Committee (BCPC) established the LHMP Task Force with representatives from various shared governance constituencies groups, members from the facilities, technology, and police departments in addition to external stakeholders and subject matter experts. APetrow, Inc., was hired to guide the planning process and provide disaster modeling with risk assessments. The performance period on this grant is 36 months and is set to end on December 19, 2022.

STATUS

The LHMP contains information on relevant existing conditions and capabilities within the District, identifies potential hazards and their impacts within the District, and includes proposed actions to mitigate the impacts from the hazards. On February 17, 2022, the LHMP was submitted to CalOES/FEMA for review and approval. On March 17, 2022, CalOES forwarded the LHMP to FEMA for approval. On July 13, 2022, FEMA approved the LHMP pending adoption by the Board.

The District's Board of Trustees has to formally accept and adopt the South Orange County Community College District Local Hazard Mitigation Plan (EXHIBIT A) pursuant to the grant guidelines in order to receive FEMA's final approval. The District must have a FEMA approved LHMP in order to be eligible for FEMA mitigation grants.

RECOMMENDATION

The Chancellor recommends that the Board of Trustees approves and adopts the South Orange County Community College District Local Hazard Mitigation Plan.

Item Submitted By: *Ann-Marie Gabel, Vice Chancellor, Business Services*

EXH A Local Hazard Mitigation Plan.pdf (9,132 KB)

Motion & Voting

The Chancellor recommends that the Board of Trustees approves and adopts the South Orange County Community College District Local Hazard Mitigation Plan.

Student Trustee Advisory Vote: Yes

Motion by Trustee Inmon, second by Trustee Jay.
Final Resolution: Motion Carries
Yes: Trustee Inmon, Trustee Jay, Trustee Prendergast, Trustee Milchiker, Trustee Whitt Rydell, Trustee Jemal

APPENDIX B- TASK FORCE TEAM MEMBERS

Agency	Department	Staff	Position
District	District Business Services	Priya Jerome	Executive Director of Procurement, Central Services, & Risk Management
District	District Business Services	Toni Brady	Risk Manager
District	District Business Services	Sara Sperazza	District Workers' Compensation & Safety Manager
District	District Information Technology	Jeff Dorsz	Executive Director of Information Technology
District	Faculty Association (FA)	Kurt Meyer	FA Representative
District	California School Employees Association (CSEA)	Scott Ferguson Greene	CSEA Representative
District	Irvine Valley College Classified Senate	Benjamin Smith	Classified Senate Representative
District	Irvine Valley College Office of Administration	Davit Khachatryan	VP, College Administrative Services
District	Irvine Valley College Facilities, Maintenance, & Operations	Jeffery Hurlbut	Director of Facilities
District	Irvine Valley College Academic Senate	June McLaughlin	Academic Senate Representative
District	Irvine Valley College Information Technology	Nicholas Wilkening	Director of Information Technology
District	Irvine Valley College Campus Police	Scott Kennedy	Chief of Police
District	Saddleback College Information Technology	Anthony Maciel	Director of Information Technology
District	Saddleback College Academic Senate	Blake Stephens	Academic Senate Representative
District	Saddleback College Classified Senate	Cora Swanson	Classified Senate Representative
District	Saddleback College Office of Administration	Cory Wathen	VP, College Administrative Services
District	Saddleback College Facilities, Maintenance, & Operations	Jose Recinos	Sr. Director of Facilities
District	Saddleback College Facilities, Maintenance, & Operations	Louis Sessler	Facilities Maintenance/Energy Project Manager
District	Saddleback College Campus Police	Patrick Higa	Chief of Police

District	Saddleback College Associated Students	Soleil Berkson	Student Representative
District	Irvine Valley College Student Services	Amrik Johal	Director of Student Life
District	Saddleback College Student Services	Christopher Hargraves	Director of Student Life
City of Irvine	Emergency Management	Robert Simmons	Manager, Emergency Services
City of Mission Viejo	Public Services	Paul Catsimanes	Manager, Emergency Services
Moulton Niguel Water District	Public Services	Len Barton	Staff Member
Municipal Water District of Orange County	Emergency Management	Vicky Osborn	Director of Emergency Management
County of Orange	Sheriff/Office of Emergency Services	Ethan Brown	Sr. Emergency Management Program Coordinator
County of Orange	Sheriff/Office of Emergency Services	Randall Harper	Assistant Emergency Manager
Orange County Fire Authority	Fire	Baryic Hunter	Division IV Chief
Orange County Transit Authority	Fire	Eric Grobmeyer	Emergency Management Specialist
San Diego Gas & Electric	Public Services	Brian D'Agostino	Director of Fire Science and Climate Adaptation
Southern California Edison	Public Services	Kelley Lee	Government Relations Manager
Southern California Gas	Public Services	Gustavo Castillo	Field Operations Specialist II
City of Tustin	Police	Sarah Fetterling	Sergeant
City of Tustin	Community Resources Unit	Stephen Foster	Emergency Management Coordinator

A consulting team supported the District Task Force and included Andrew Petrow, John Rowden, Paula Schulz, Hope Seligson, and Dan Moreno.

APPENDIX C- PUBLIC OUTREACH

The District conducted community (public) meetings to announce the development of a Local Hazard Mitigation Plan (LHMP) and update the community on the project as it developed. The purpose of the meetings was to invite the public to learn about the District's efforts to develop the LHMP and provide feedback on local concerns.

Press Releases, meeting recordings, and related documents are available on the District website at: http://www.socccd.edu/businessservices/bs_riskmgmt_localhazard.html

APPENDIX D- KEY ASSETS

Below are the District's Key Assets, organized by location.

Location	Significant Area	Special Equipment
Advanced Technology and Education Park		
Integrated Design, Engineering and Automation Building	Main Distribution Center (MDF) Independent Distribution Frame (IDF)	
Parking Lots		
Open Space		
Irvine Valley College		
Campus Police Station	IDF	Digital Repeater Vehicles
Library	Executive Council Room IDF	
Administration	Executive Council Room IDF	
Student Service Center	Cafeteria IDF	Digital Repeater
Business Sciences and Technology Innovation Center	MDF IDF	
Health and Wellness Center	IDF	
Gymnasium	IDF	
Storage Container 1 (Evidence)		
Storage Container 2 (Emergency Management)		Back-up Generator Tools Supplies
Storage Container 3 (Traffic)		Tools Material Equipment
M&O Office		
M&O Equipment Storage Rollups		
M&O Staff Office/Mechanical Shop		
M&O Staff Office/IT Warehouse		
M&O Custodial Office/Warehouse		
FMO Yard		Back-up Generator Vehicles
Powerhouse 1		Back-up Generator IT Hub
Powerhouse 2		
Powerhouse 3		
Powerhouse 4		
Powerhouse 5		

Storage Shelter (at Maintenance)		
Open Fields	Baseball, Soccer	
Parking Lots		
Campus (General)		IDFs (other), Vehicles (other)
Saddleback College		
Campus Police Station	IDF	Back-up Generator Vehicles
Health Sciences	District Data Center (MDF) District Services District IT Training Room IDF	Back-up Generator
Village 2	IDF	IT Back-up Generator
Central Plant/Co-Gen Plant	FMO Offices IDF	Vehicles
Administration and Governance Building	President's Conference Room IDF	
Student Services Center	Student Health Center Payment Office Admissions/Records Cafeteria IDF	Back-up Generator
Learning Resources Center	College MDF Radio Station IDF	Digital Repeater Radio Antenna Cell tower (TMobile/Sprint) Back-up Generator
Gymnasium		Back-up Generator
Stadium		Cell tower (AT&T)
Parking Lots		
Open Fields	Baseball, Softball, Football, Throwing Park, Tennis Courts	
Ground and Transportation Yard		Vehicle Gasoline pump
Radio Station (off campus)		Antenna (Newport) Antenna (San Juan Capistrano) Antenna (Laguna Beach)

Campus (General)	IDFs	Vehicles Back-up Generator (BGS) Back-up Generator (SCI) Back-up Generator (CDC) Back-up Generator (FA) Back-up Generator (Cox Shed, EMG-02) Network Equipment/UPS

APPENDIX E- SIGNIFICANT CA EARTHQUAKES

DATE	MAGNITUDE	NAME	REPORTED LOSSES
1800, Nov 22	6.3 *	San Diego and San Juan Capistrano region	Damaged adobe walls of missions in San Diego and San Juan Capistrano
1812, Dec 21	7.1 *	Los Angeles, Ventura, Santa Barbara	1 dead
1812, Dec 8	7.3 *	Wrightwood	40 dead at San Juan Capistrano
1836, Jun 10	6.4 *	Near San Juan Bautista	
1838, Jun 5*	7.4 *	San Francisco to San Juan Bautista	Damage to San Francisco and Santa Clara
1852, Nov 29	6.5 *	Near Fort Yuma, Arizona	
1857, Jan 9	7.9	Great Fort Tejon earthquake	1 dead; damage from Monterey to San Bernardino
1860, Mar 15	6.5 *	Carson City	
1865, Oct 8	6.5	Santa Cruz Mountains	$0.5 million in property damage
1868, Oct 21	7.0	Hayward Fault	30 dead; $350,000 in property damage
1872, Apr 11	6.8	Owens Valley	Aftershock of March 26, 1872 quake
1872, Mar 26	7.4	Owens Valley	27 dead; 56 injured; $250,000 in property damage
1872, Mar 26	6.8	Owens Valley	Aftershock of previous entry
1873, Nov 23	6.9	Crescent City region	Damage in California-Oregon border area
1890, Feb 9	6.8	Uncertain; San Jacinto fault suspected	Little damage
1892, Apr 19	6.6	Vacaville	1 dead; $225,000 in property damage
1892, Feb 24	7.3	Laguna Salida, Baja California	Damage to San Diego and Imperial Valley
1898, Apr 15	6.7 *	Fort Bragg - Mendocino	Damage from Fort Bragg to Mendocino; 3 houses collapsed; landslides reported
1898, Mar 31	6.4	Mare Island	$350,000 in property damage
1899, Apr 16	7.0	Offshore, about 80 miles W of Eureka	
1899, Dec 25	6.7	San Jacinto and Hemet	6 dead; $50,000 in property damage
1899, Jul 22	6.4	Wrightwood	Chimneys knocked down; landslides reported
1906, Apr 18	7.8	Great 1906 San Francisco Earthquake and Fire	3,000 dead; $524 million in property damage (includes damage from fire)
1911, Jul 1	6.6	Morgan Hill area	
1915, Nov 21	6.6	Mexico, about 60 miles S of El Centro	
1918, Apr 21	6.8	San Jacinto	1 dead; $200,000 in property damage
1918, Jul 15	6.5	Offshore, about 40 miles W of Eureka	
1922, Jan 31	7.3	Offshore, about 70 mi W of Eureka	
1923, Jan 22	7.2	Off Cape Mendocino	Destruction in Humboldt County
1925, Jun 29	6.8	Santa Barbara	13 dead; $8 million in property damage
1927, Nov 4	7.1	40 km W of Lompoc	Damage in Santa Barbara & San Luis Obispo County
1932, Dec 21	7.2	Cedar Mountain, near Gabbs, NV	

1933, Mar 11	6.4	Long Beach	115 dead; $40 million in property damage
1934, Dec 30	6.5	Mexico, about 40 miles S of El Centro	
1934, Dec 31	7.0	Mexico, about 100 miles SE of El Centro	
1934, Jul 6	6.5	Offshore, about 100 mi WNW of Eureka	
1940, May 19	7.0	Imperial Valley	9 dead; $6 million in property damage
1941, Feb 9	6.6	Offshore, about 65 miles W of Eureka	
1942, Oct 21	6.6	West of Westmorland	
1947, Apr 10	6.5	East of Yermo	
1952, Jul 21	7.3	Kern County earthquake	12 dead; $60 million in property damage
1954, Aug 24	6.8	Rainbow Mountain, near Fallon, NV	
1954, Dec 16	7.3	Fairview Peak, near Fallon, NV	
1954, Dec 16	7.1	Dixie Valley, near Fallon, NV	
1954, Dec 21	6.6	East of Arcata	1 dead; $2.1 million in property damage
1954, Jul 6	6.8	Rainbow Mountain, near Fallon, NV	
1956, Feb 9	6.5	Mexico, about 80 miles SW of El Centro	
1968, Apr 8	6.6	Borrego Mountain	
1971, Feb 9	6.6	San Fernando	65 dead; > 2,000 injured; $505 million in losses
1976, Nov 26	6.8	Offshore, about 100 mi WNW of Eureka	
1979, Oct 15	6.5	Imperial Valley	9 injured; $30 million in property damage
1980, May 25	6.3	Mammoth Lakes	9 injured; $2 million in property damage
1980, Nov 8	7.4	West of Eureka	6 injured; $2 million in property damage
1983, May 2	6.4	Coalinga	
1984, Apr 24	6.2	Morgan Hill	$8 million in property damage
1986, Jul 21	6.4	Chalfant Valley	$2.7 million in property damage
1987, Nov 24	6.2	Superstition Hills	$3 million in property damage
1987, Nov 24	6.6	Superstition Hills	Included with losses reported above
1987, Oct 1	6.0	Whittier Narrows	8 dead; $358 million in property damage to 10,500 homes and businesses
1989, Oct 17	6.9	Loma Prieta	63 dead; 3,737 injured; $6 billion in property damage
1991, Aug 17	7.0	Offshore, about 100 miles NW of Eureka	Preceded by two quakes (M6.3/M6.2) on Aug 16/17
1991, Jul 12	6.6	Offshore W of Crescent City	
1992, Apr 25	7.2	Petrolia	356 injured; $48.3 million in property damage
1992, Apr 26	6.6	Petrolia	Aftershock of the Apr 25 quake
1992, Apr 26	6.6	Petrolia	Another aftershock of Apr 25 quake
1992, Jun 28	7.3	Landers	1 dead; 402 injured; $91.1 million in property damage

1992, Jun 28	6.5	Big Bear	Included with Landers losses
1994, Jan 17	6.7	Northridge	57 dead; <9,000 injured; ~$40 billion prop. damage
1994, Sep 1	7.0	Offshore, 70 miles W of Cape Mendocino	
1999, Oct 16	7.1	Bullion Mountains (Hector Mine)	Minimal injuries and damage; sparse population
2003, Dec 22	6.5	San Simeon	
2010, Apr 4	7.2	Calexico	
2010, Jan 9	6.5	Ferndale	
2014, Aug 24	6.0	South Napa	2 dead; total economic losses $443 to $800 million
2014, Mar 9	6.8	Ferndale	
2016, Dec 8	6.5	Ferndale Offshore	
2019, Jul 4	6.4	Ridgecrest	
2019, Jul 6	7.1	Ridgecrest	1 dead; est. of economic losses $1 billion to $5 billion