

EXECUTIVE SUMMARY:

Five -Year Action Plan Matrix

The City of Santa Ana Natural Hazards Mitigation Action Plan includes resources and information to assist City residents, public and private sector organizations, and others interested in participating in planning for natural hazards. The Mitigation Plan provides a list of activities that may assist Santa Ana in reducing risk and preventing loss from future natural hazard events. The action items address multi-hazard issues, as well as activities for earthquakes, flooding, and wind storms/severe weather.

How is the Plan Organized?

The Mitigation Plan contains a five-year action plan matrix, background on the purpose and methodology used to develop the mitigation plan, a profile of Santa Ana, sections on three natural hazards that occur within the City, and a number of appendices. All of the sections are described in detail in Section 1, the plan introduction.

Who Participated in Developing the Plan?

The City of Santa Ana Natural Hazards Mitigation Action Plan is the result of a collaborative effort between Santa Ana citizens, public agencies, non-profit organizations, the private sector, and regional and state organizations. Public participation played a key role in development of goals and action items. Interviews were conducted with stakeholders across the City, and two public workshops were held to include City of Santa Ana residents in plan development. The City provided a link on its website to allow for ongoing citizen/stakeholder input. A project Steering Committee guided the process of developing the plan.

The Steering Committee was comprised of representatives from:

- ✓ City of Santa Ana Emergency Management
- ✓ City of Santa Ana Finance
- ✓ City of Santa Ana Fire Department
- ✓ City of Santa Ana Police Department
- ✓ City of Santa Ana Planning and Development
- ✓ City of Santa Ana Public Works
- ✓ California Division of Mines and Geology
- ✓ Federal Emergency Management Agency
- ✓ The Governor’s Office of Emergency Services

What is the Plan Mission?

The mission of the City of Santa Ana Natural Hazards Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City towards building a safer, more sustainable community.

What are the Plan Goals?

The plan goals describe the overall direction Santa Ana agencies, organizations, and citizens can take to work toward mitigating risk from natural hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations outlined in the action items.

Protect Life and Property:

- ✓ Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural hazards.
- ✓ Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards.
- ✓ Improve hazard assessment information to make recommendations for discouraging new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

Public Awareness:

- ✓ Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
- ✓ Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

Natural Systems:

- ✓ Balance natural resource management, and land use planning with natural hazard mitigation to protect life, property, and the environment.
- ✓ Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

Partnerships and Implementation:

- ✓ Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, businesses, and industry to gain a vested interest in implementation.
- ✓ Encourage leadership within public and private sector organizations to prioritize and implement local and regional hazard mitigation activities.

Emergency Services:

- ✓ Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.
- ✓ Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, businesses, and industry.
- ✓ Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

How are the Action Items Organized and Prioritized?

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the time line for implementation. Short-term action items are activities that City agencies may implement with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take between one and five years (or more) to implement.

The action items were organized and prioritized following the guidelines as listed below. In addition, the Hazard Mitigation Steering Committee met to prioritize the mitigation actions. The committee reviewed the identified hazards based on the hazard identification and risk analysis for the City of Santa Ana and ranked the mitigation actions according to the risks and vulnerabilities. Consideration was also given to cost benefit review, social impact, technical feasibility, administrative capabilities, political and legal effects, as well as environmental issues.

Data collection, research and the public participation process was included in the development of these action items. (Refer to Appendix B for additional public participation process information).

Coordinating Organization:

The coordinating organization is the public agency with regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, county, or regional agencies that are capable of or responsible for implementing activities and programs.

Timeline:

Action items include both short and long-term activities. Each action item includes an estimate of the time line for implementation. Short-term action items are activities which City agencies are capable of implementing with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take between one and five years (or more) to implement.

Ideas for Implementation:

Each action item includes ideas for implementation and potential resources, which may include grant programs or human resources. The matrix includes the page number within the mitigation plan where this information can be found.

Plan Goals Addressed:

The plan goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins. The plan goals are organized into the following five areas:

- ✓ Protect Life and Property
- ✓ Public Awareness
- ✓ Natural Systems
- ✓ Partnerships and Implementation
- ✓ Emergency Services

Partner Organizations:

The Partner organizations are not listed with the individual action items or in the plan matrix. Partner organizations are listed in Appendix A, of this plan and are agencies or public/private sector organizations that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

The partner organizations listed in the Resource Directory of the City of Santa Ana Natural Hazards Mitigation Plan are potential partners recommended by the project steering committee, but were not necessarily contacted during the development of the Mitigation Plan. Partner organizations should be contacted by the coordinating organization to establish commitment of time and resources to action items.

Constraints:

Constraints may apply to some of the action items. These constraints may be a lack of City staff, lack of funds, or vested property rights which might expose the City to legal action as a result of adverse impacts on private property.

How Will the Plan be Implemented, Monitored, and Evaluated?

The Plan Maintenance Section of this document details the formal process that will ensure that the City of Santa Ana Natural Hazards Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a Plan revision every five years. This section describes how the City will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how the City of Santa Ana government intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City’s General Plan, Emergency Operations Plan, Capital Improvement Plans, and Building & Safety Codes.

Plan Adoption

Adoption of the Natural Hazard Mitigation Plan by the local jurisdiction’s governing body is one of the prime requirements for approval of the Plan. Once the Plan is completed, the City Council will be responsible for adopting the City of Santa Ana Natural Hazards Mitigation Plan. The local agency governing body has the responsibility and authority to promote sound public policy regarding natural hazards. The City Council will periodically need to re-adopt the Plan as it is revised to meet changes in the natural hazard risks and exposures in the community. The approved Natural Hazard Mitigation Plan will be significant in the future growth and development of the community.

Coordinating Body

A City of Santa Ana Hazard Mitigation Advisory Committee will be responsible for coordinating implementation of Plan action items and undertaking the formal review process. The City Manager, or designee, will assign representatives from City agencies, including, but not limited to, the current Hazard Mitigation Advisory Committee members.

Convener

The City Council will adopt the City of Santa Ana Natural Hazard Mitigation Plan, and the Hazard Mitigation Advisory Committee will take responsibility for Plan implementation.

The City Manager, or designee, will serve as a convener to facilitate the Hazard Mitigation Advisory Committee meetings, and will assign tasks such as updating and presenting the Plan to the members of the committee. Plan implementation and evaluation will be a shared responsibility among all of the Natural Hazard Advisory Committee Members.

Implementation through Existing Programs

The City of Santa Ana addresses statewide planning goals and legislative requirements through its General Plan, Emergency Operations Plan, Capital Improvement Plans, and City Building & Safety Codes. The Natural Hazard Mitigation Plan provides a series of recommendations that are closely related to the goals and objectives of these existing planning programs. The City of Santa Ana will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

Economic Analysis of Mitigation Projects

The Federal Emergency Management Agency's approaches to identify costs and benefits associated with natural hazard mitigation strategies or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards can provide decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Formal Review Process

The City of Santa Ana Natural Hazards Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and time line, and identifies the local agencies and organizations participating in Plan evaluation. The convener will be responsible for contacting the Hazard Mitigation Advisory Committee members and organizing the annual meeting. Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

Continued Public Involvement

The City of Santa Ana is dedicated to involving the public directly in the continual review and updates of the Hazard Mitigation Plan. Copies of the Plan will be catalogued and made available at City Hall and at all City operated public libraries. The existence and location of these copies will be publicized in City newsletters.

The Plan also includes the address and the phone number of the City Planning Division, responsible for keeping track of public comments on the Plan. In addition, information on where to view copies of the Plan and any proposed changes will be posted on the City website. This site will also contain an email address and phone number to which people can direct their comments and concerns.

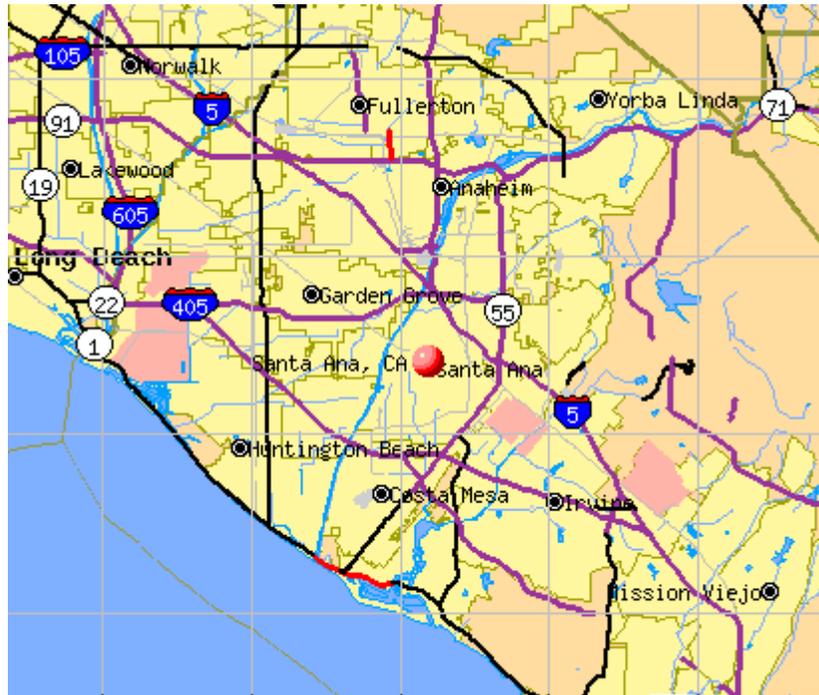
SECTION 1:

- Introduction -

Throughout history, the residents of the City of Santa Ana have dealt with the various natural hazards affecting the area. Photos, journal entries, and newspapers from the 1800's show that the residents of the area dealt with earthquakes, earth movements, flooding, and wind storms.

Although there were fewer people in the area, the natural hazards adversely affected the lives of those who depended on the land and climate conditions for food and welfare. As the population of the City continues to increase, the exposure to natural hazards creates an even higher risk than previously experienced.

The City of Santa Ana, located in Orange County, has a population of 347,200, and is the largest city in Orange County by population and the ninth largest in California by population. It offers the benefits of living in a Mediterranean type of climate and the City is characterized by the unique and attractive landscape that makes the area so popular. However, the potential impacts of natural hazards associated with the terrain make the environment and population vulnerable to natural disaster situations.



The City is subject to earthquakes, flooding, and wind storms. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the City. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from these natural disasters.

The City of Santa Ana most recently experienced some destruction during the October 2004 flooding.

Why Develop a Mitigation Plan?

As the costs of damage from natural disasters continues to increase, the community realizes the importance of identifying effective ways to reduce vulnerability to disasters. Natural hazard mitigation plans assist communities in reducing risk from natural hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The Plan provides a set of action items to reduce risk from natural hazards through education and outreach programs and to foster the development of partnerships, and implementation of preventative activities such as land use programs that restrict and control development in areas subject to damage from natural hazards.

The resources and information within the Mitigation Plan:

- (1) Establish a basis for coordination and collaboration among agencies and the public in the City of Santa Ana;
- (2) Identify and prioritize future mitigation projects; and
- (3) Assist in meeting the requirements of federal assistance programs.

The Mitigation Plan works in conjunction with other City plans, including the City General Plan and Emergency Operations Plans.

Whom Does the Mitigation Plan Affect?

The City of Santa Ana Natural Hazards Mitigation Plan affects the entire city. This Plan provides a framework for planning for natural hazards. The resources and background information in the Plan is applicable city-wide, and the goals and recommendations can lay groundwork for local mitigation plans and partnerships.

Natural Hazard Land Use Policy in California:

Planning for natural hazards should be an integral element of any city's land use planning program. All California cities and counties have General Plans and the implementing ordinances that are required to comply with the statewide planning regulations.

The continuing challenge faced by local officials and state government is to keep the network of local plans effective in responding to the changing conditions and needs of California's diverse communities, particularly in light of the very active seismic region in which we live.

This is particularly true in the case of planning for natural hazards where communities must balance development pressures with detailed information on the nature and extent of hazards.

Planning for Natural Hazards, calls for local plans to include inventories, policies, and ordinances to guide development in hazard areas. These inventories should include the compendium of hazards facing the community, the built environment at risk, the personal property that may be damaged by hazard events, and most of all, the people who live in the shadow of these hazards.

Support for Natural Hazard Mitigation:

All mitigation is local, and the primary responsibility for development and implementation of risk reduction strategies and policies lies with local jurisdictions. Local jurisdictions, however, are not alone. Partners and resources exist at the regional, state and federal levels. Numerous California state agencies have a role in natural hazards and natural hazard mitigation. Some of the key agencies include:

- ✓ The Governor's Office of Emergency Services (OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- ✓ The Southern California Earthquake Center (SCEC), gathers information about earthquakes, integrates this information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives.
- ✓ The California Division of Forestry (CDF) is responsible for all aspects of wildland fire protection on private, state, and administers forest practices regulations, including landslide mitigation, on non-federal lands.
- ✓ The California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, the development of partnerships aimed at reducing risk, and exceptions (based on science-based refinement of tsunami inundation zone delineation) to state mandated tsunami zone restrictions; and
- ✓ The California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public, serves local water needs by providing technical assistance

Plan Methodology:

Information in the Mitigation Plan is based on research from a variety of sources. Staff from the City of Santa Ana conducted data research and analysis, facilitated steering committee meetings and public workshops, and developed the final Mitigation Plan. The research methods and various contributions to the Plan include:

Input From the Steering Committee:

The Hazard Mitigation Advisory Committee convened to guide development of the Mitigation Plan. The committee played an integral role in developing the mission, goals, and action items for the Mitigation Plan. The committee consisted of representatives of public and private agencies and organizations in City of Santa Ana, including:

- ✓ City of Santa Ana Emergency Management
- ✓ City of Santa Ana Fire Department
- ✓ City of Santa Ana Police Department
- ✓ City of Santa Ana Emergency Preparedness Commission
- ✓ City of Santa Ana Police Department
- ✓ City of Santa Ana Finance
- ✓ City of Santa Ana GIS
- ✓ City of Santa Ana Planning and Development
- ✓ City of Santa Ana Public Affairs
- ✓ City of Santa Ana Transportation Department
- ✓ City of Santa Ana Water Resources Division

Stakeholder Interviews

City staff conducted interviews with individuals and specialists from organizations interested in natural hazards planning. The interviews identified common concerns related to natural hazards and identified key long and short-term activities to reduce risk from natural hazards. Stakeholders interviewed for the Plan included representatives from:

- ✓ Water Providers
- ✓ School District(s)
- ✓ Orange County Health Department
- ✓ County of Orange Resources and Development Management
- ✓ Utility Providers
- ✓ Local Businesses
- ✓ City of Santa Ana Chamber of Commerce
- ✓ American Red Cross

State and Federal Guidelines and Requirements for Mitigation Plans

Following are the Federal requirements for approval of a Natural Hazard Mitigation Plan:

- ✓ Open public involvement, with public meetings that introduce the process and project requirements.
- ✓ The public must be afforded opportunities for involvement in: identifying and assessing risk, drafting a Plan, and public involvement in approval stages of the Plan.

- ✓ Community cooperation, with opportunity for other local government agencies, the business community, educational institutions, and non-profits to participate in the process.
- ✓ Incorporation of local documents, including the City's General Plan, the Zoning Ordinance, the Building Codes, and other pertinent documents.

The following components must be part of the planning process:

- ✓ Complete documentation of the planning process;
- ✓ A detailed risk assessment on hazard exposures in the community;
- ✓ A comprehensive mitigation strategy, which describes the goals & objectives, including proposed strategies, programs & actions to avoid long-term vulnerabilities;
- ✓ A plan maintenance process, which describes the method and schedule of monitoring, evaluating and updating the Plan and integration of the All Hazard Mitigation Plan into other planning mechanisms;
- ✓ Formal adoption by the City Council; and
- ✓ Plan Review by both State OES and FEMA.

These requirements are spelled out in greater detail in the following Plan sections and supporting documentation.

A minimum of two public workshops (or other public forums) is recommended to meet the requirement for public participation, in addition to the inclusion of representatives from outside organizations on the planning committee itself. The timing and scheduling of the workshops may vary from one community to another depending on how each city's committee organizes its work and the particular needs of the community.

City of Santa Ana staff examined existing mitigation plans from around the country, current FEMA hazard mitigation planning standards (386 series) and the State of California Natural Hazards Mitigation Plan Guidance.

Other reference materials consisted of county and city mitigation plans, including:

- ✓ Clackamas County (Oregon) Natural Hazards Mitigation Plan
- ✓ State of Washington Natural Hazards Mitigation Plan

Hazard Specific Research:

Santa Ana staff collected data and compiled research on three hazards: earthquakes, flooding, and wind storms/severe weather. Research materials came from federal agencies including FEMA; state agencies including OES, and CDF; City level such as the Safety Plan, and other sources. City of Santa Ana staff conducted research by referencing historical local newspapers, interviewing long time residents, long time City of Santa Ana employees and locating City of Santa Ana information in historical documents.

City of Santa Ana staff identified current mitigation activities, resources and programs, and potential action items from research materials and stakeholder interviews.

Public Workshops:

City of Santa Ana staff facilitated two public workshops to gather comments and ideas from City of Santa Ana citizens about mitigation planning and priorities for mitigation plan goals.

The resources and information cited in the Mitigation Plan provide a strong local perspective and help identify strategies and activities to make City of Santa Ana more disaster resilient.

How the Plan is Used:

Each section of the Mitigation Plan provides information and resources to assist people in understanding the City and the hazard-related issues facing citizens, businesses, and the environment. Combined, the sections of the Plan work together to create a document that guides the mission to reduce risk and prevent loss from future natural hazard events.

The structure of the Plan enables people to use a section of interest to them. It also allows City government to review and update sections when new data becomes available. The ability to update individual sections of the Mitigation Plan places less of a financial burden on the City.

Decision-makers can allocate funding and staff resources to selected pieces in need of review, thereby avoiding a full update, which can be costly and time-consuming.

New data can be easily incorporated, resulting in a Natural Hazards Mitigation Plan that remains current and relevant to City of Santa Ana.

The Mitigation Plan is organized in three volumes. Volume I contains an executive summary, introduction, community profile, risk assessment, multi-hazard goals and action items, and Plan maintenance. Volume II contains the five natural hazard sections and Volume III includes the appendices. Each section of the Plan is described below.

Volume I: Mitigation Action Plan:

Executive Summary: Five-Year Action Plan

The Five-Year Action Plan provides an overview of the Mitigation Plan mission, goals, and action items. The Plan action items are included in this section, and address multi-hazard issues, as well as hazard-specific activities that can be implemented to reduce risk and prevent loss from future natural hazard events.

Section 1: Introduction

The Introduction describes the background and purpose of developing the Mitigation Plan for the City of Santa Ana.

Section 2: Community Profile

This section presents the history, geography, demographics, and socioeconomics of the City of Santa Ana. It serves as a tool to provide an historical perspective of natural hazards in the City.

Section 3: Risk Assessment

This section provides information on hazard identification, vulnerability and risk associated with natural hazards in the City of Santa Ana.

Section 4: Multi-Hazard Goals and Action Items

This section provides information on the process used to develop goals and action items that cut across the five natural hazards addressed in the Mitigation Plan.

Section 5: Plan Maintenance

This section provides information on Plan implementation, monitoring and evaluation.

Volume II: Hazard Specific Information:

Hazard-Specific Information on the five chronic hazards are addressed in this Plan. Chronic hazards occur with some regularity and may be predicted through historic evidence and scientific methods. The chronic hazards addressed in the Plan include:

Section 6: Earthquake

Section 7: Flooding

Section 8: Windstorm

Catastrophic hazards do not occur with the frequency of chronic hazards, but can have devastating impacts on life, property, and the environment. In southern California, because of the geology and terrain, earthquake, earth movement, flooding and wildfire also have the potential to be catastrophic as well as chronic hazards. For the coastal areas of southern California, tsunamis, while very rare, have the potential to calamitously devastate low-lying coastal areas.

Each of the hazard-specific sections includes information on the history, hazard causes and characteristics, hazard assessment, goals and action items, and local, state, and national resources.

Volume III: Resources:

The Plan appendices are designed to provide users of the City of Santa Ana Natural Hazards Mitigation Plan with additional information to assist them in understanding the contents of the Mitigation Plan, and potential resources to assist them with implementation.

Appendix A: Plan Resource Directory

This appendix provides a resource directory which includes City, regional, state, and national resources and programs that may be of technical and/or financial assistance to the City of Santa Ana during Plan implementation.

Appendix B: Public Participation Process

This appendix includes specific information on the various public processes used during development of the Plan.

Appendix C: Benefit Cost Analysis

This appendix describes FEMA's requirements for benefit cost analysis in natural hazards mitigation, as well as various approaches for conducting economic analysis of proposed mitigation activities.

Appendix D: List of Acronyms

This appendix provides a list of acronyms for City, regional, state, and federal agencies and organizations that may be referred to within the City of Santa Ana Natural Hazards Mitigation Plan.

Appendix E: Glossary

This appendix provides a glossary of terms used throughout the Plan.

Appendix F: California Disasters

This appendix lists Major California Disasters Since 1950.

Appendix G: Maps/Charts

This appendix contains maps as referenced throughout the Plan.

Appendix H: References

This appendix contains a listing of references used in the preparation of the Plan

Appendix I: Plan Adoption

Formal Plan adoption documentation.

SECTION 2: - Community Profile -

Why Plan for Natural Hazards in the City of Santa Ana?

Natural hazards impact citizens, property, the environment, and the economy of the City of Santa Ana. Earthquakes, flooding and wind storms/severe weather have exposed Santa Ana residents and businesses to the financial and emotional costs of recovering after natural disasters. The risk associated with natural hazards increases as more people move to areas affected by natural hazards.

Even in those communities that are essentially “built-out” i.e., have little or no vacant land remaining for development, population density continues to increase when low density housing is replaced with medium and high density development projects.

The inevitability of natural hazards, and the growing population and activity within the City create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future natural hazard events. Identifying the risks posed by natural hazards, and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities. Local residents and businesses can work together with the City to create a natural hazards mitigation plan that addresses the potential impacts of hazard events.

Community Profile

Don Gaspár de Portolá, a Spanish expedition party leader, discovered a picturesque valley and river in Southern California which he christened Santa Ana, in honor of Saint Anne, on July 26, 1769. José Antonio Yorba, a youthful expedition soldier, and his nephew Juan Peralta, were given a Spanish land grant for the area. They developed the Rancho Santiago de Santa Ana for cattle grazing and productive farmland. In 1869, William H. Spurgeon purchased 70 acres from the Yorba family and plotted a townsite. The new town was given the name Santa Ana. In 1886, Santa Ana was incorporated as a city. Orange County was separated from Los Angeles in 1889, and Santa Ana was designated the County Seat. Santa Ana is the financial and governmental center of Orange County and a major city in the state.

The City of Santa Ana, the Orange County Seat, is the ninth largest city in the state of California and the 52nd largest city in the nation. With a population of 348,379 residents in an area of 27.2 square miles, Santa Ana holds the second highest ratio of persons per square mile in the state; San Francisco ranks the highest.

The City’s ratio of 4.2 persons per household exceeds the county’s average of 2.9. The growth rate in population is expected to be constant at 1% in the coming years.

City of Santa Ana

Natural Hazards Mitigation Plan – Community Profile

The City is bounded on the North by the cities of Anaheim and Orange, Tustin to the east, Costa Mesa to the South and Garden Grove, Westminster, and Fountain Valley on the West. The City is intersected by the I-5 (Santa Ana,) the 22 (Garden Grove) and the 55 (Costa Mesa) Freeways, the Santa Fe Railway, an underground aircraft fuel line (JP5), Santiago Creek and the Santa Ana River.

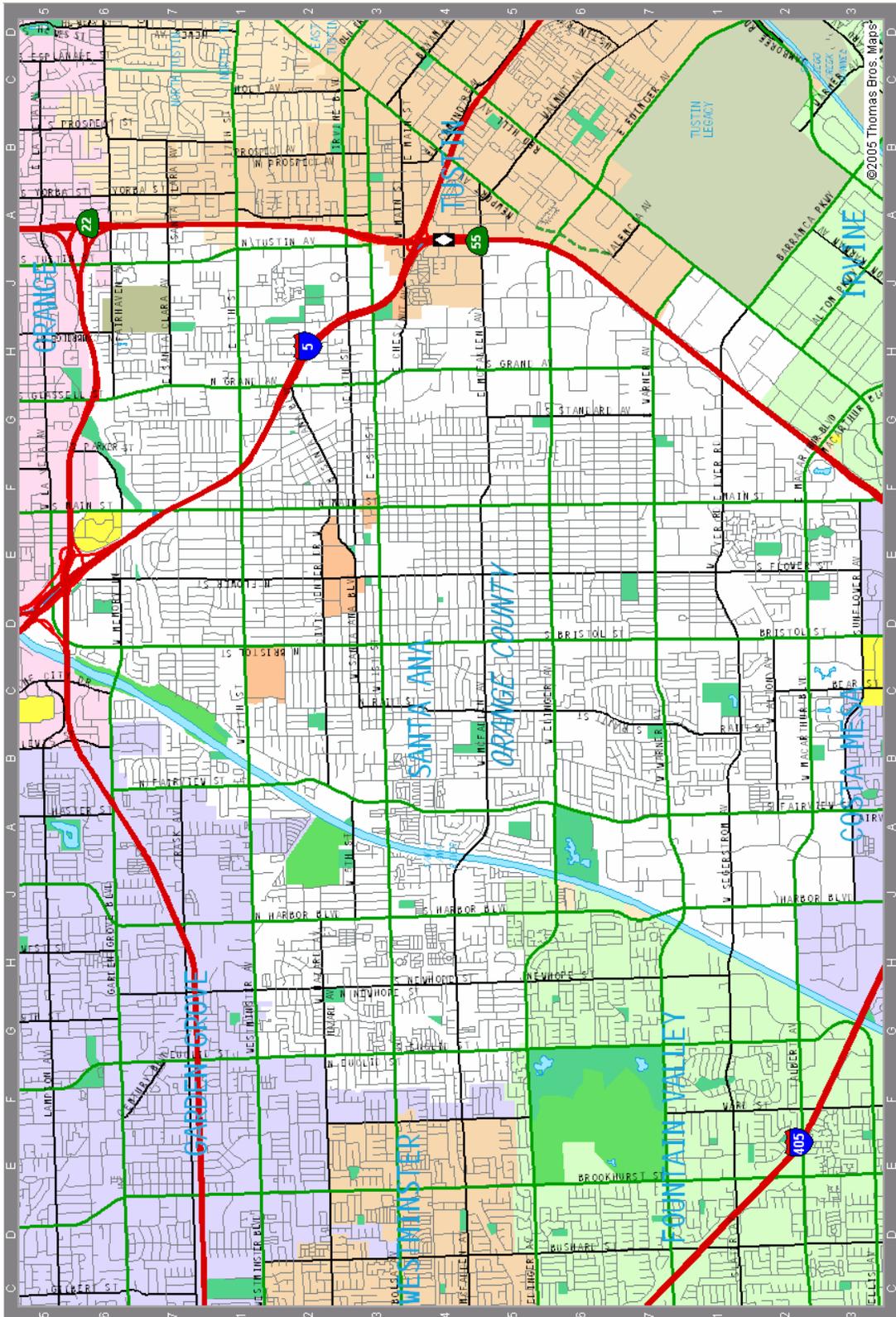
Today, Santa Ana continues to face a variety of threats, both natural and technological. Certainly the most destructive of the natural hazards are earthquakes. With the multitude of faults that crisscross the state, the threat to major urban centers is so great that planning for a large earthquake is one of the greatest challenges facing Emergency Management professionals. Winter storms and flooding have caused substantial damage in Southern California in recent years, including Santa Ana.

The Santa Ana River and Santiago Creek are subject to the threat of flooding during winter storms. Additionally, dam failure is one of the most serious man-made hazards to be considered.

Freeway Map of Orange County



Map of Santa Ana



Map of Santa Ana and Surrounding Communities

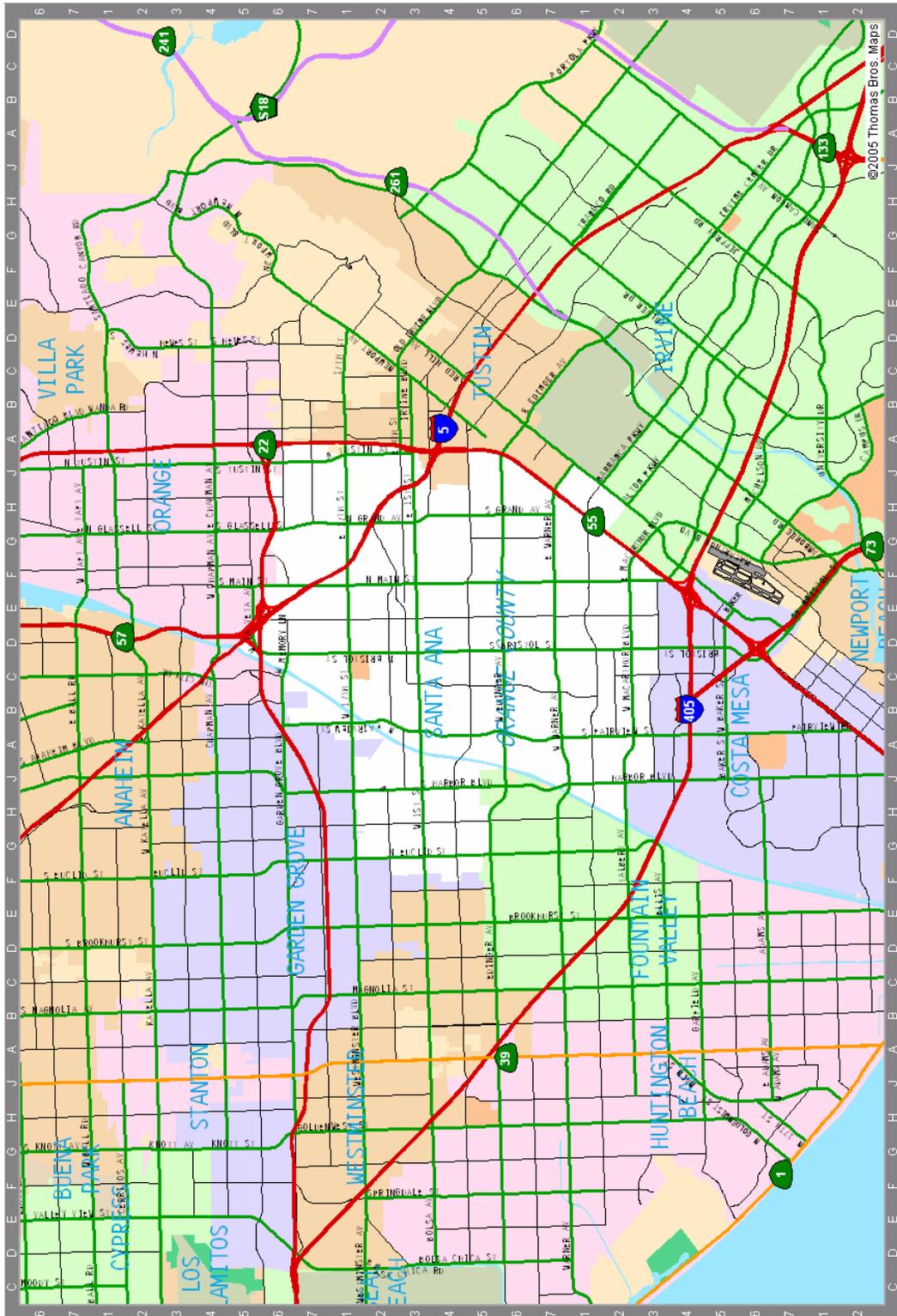
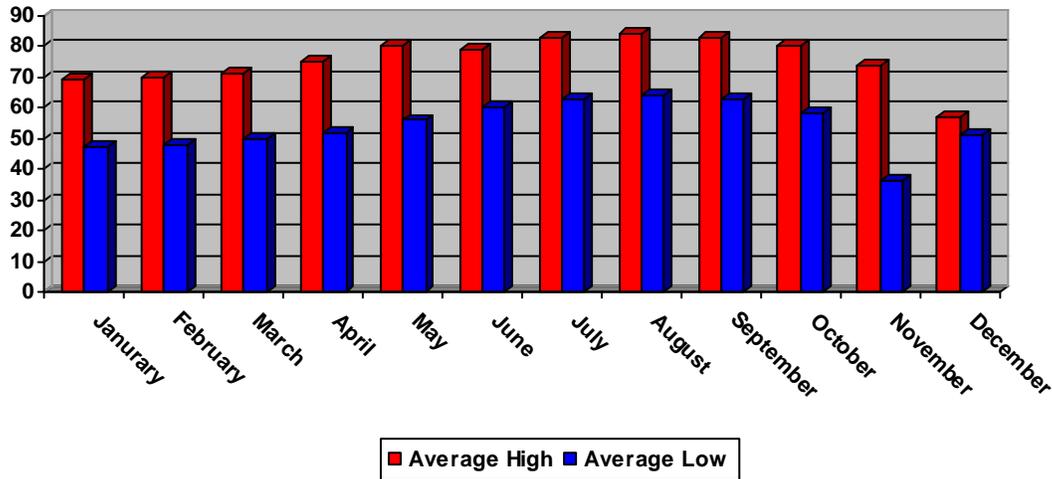
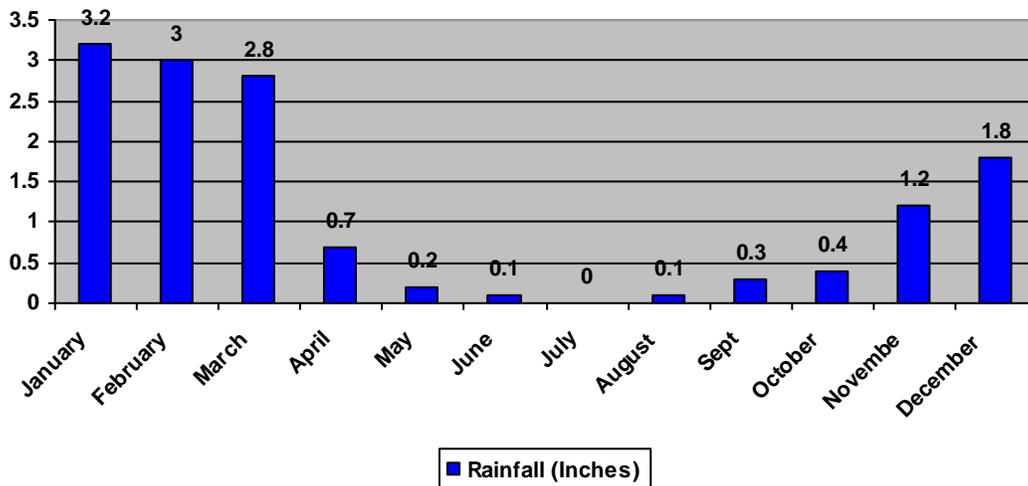


Table 2-1: Average Temperature in Degrees Fahrenheit



Temperatures in the City of Santa Ana range from an average low of 46 degrees in the winter months to an average high of 85+ degrees in the summer months. However the temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures and very low humidity. Temperatures rarely exceed 100 degrees F in the summer months (June - September), and rarely drop below 30 degrees F in the winter months (November-March).

Table 2-2: Average Yearly Rainfall in Inches



Rainfall in the City averages 13.8 inches of rain per year. However the term “average rainfall” is misleading because over the recorded history of rainfall in the City of Santa Ana rainfall amounts have ranged from one-third the normal amount to more than double the normal amount. There are three types of storms that produce precipitation in the southern California area, which includes Santa Ana: winter storms, locally generated thunderstorms, and summer tropical storms.

Furthermore actual rainfall in southern California tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. In short, rainfall in southern California might be characterized as feast or famine within a single year. Flash floods in this desert area are not uncommon and have caused damage in the past.

Minerals and Soils

The characteristics of the minerals and soils present in City of Santa Ana indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquakes, liquefaction, and landslides.

The surface material includes unconsolidated, fine-grained deposits of silt, sand, gravel, and recent flood plain deposits. Torrential flood events can introduce large deposits of sand and gravel. Sandy silt and silt containing clay are moderately dense and firm, and are primarily considered to be prone to liquefaction, and earthquake related hazards. Basaltic lava consists mainly of weathered and non-weathered, dense, fine-grained basalt. Though the characteristics of this lava may offer solid foundation support, landslides are common in many of these areas where weathered residual soil overlies the basalt.

Understanding the geologic characteristics of Santa Ana is an important step in hazard mitigation and avoiding at-risk development.

See Map in Appendix H.

Other Significant Geologic Features

The City of Santa Ana, like most of the Orange County and southern California, lie over the area of one or more known earthquake faults, and potentially many more unknown faults, particularly so-called lateral or blind thrust faults.

The major faults that have the potential to affect the greater Orange County, and therefore the City of Santa Ana are the:

- ✓ San Andreas
- ✓ Newport / Inglewood
- ✓ Palos Verdes
- ✓ Whittier
- ✓ Santa Monica
- ✓ Sierra Madre
- ✓ Verdugo
- ✓ Elysian Park
- ✓ Raymond

The Orange County region, which includes Santa Ana, has a history of powerful and relatively frequent earthquakes, dating back to the powerful 8.0+ San Andreas earthquake of 1857, which did substantial damage to the relatively few buildings that existed at the time. Paleoseismological research indicates that large (8.0+) earthquakes occur on the San Andreas fault at intervals between 45 and 332 years with an average interval of 140 years. Other lesser faults have also caused very damaging earthquakes since 1857.

Notable earthquakes include the Long Beach earthquake of 1933, the San Fernando earthquake of 1971, the 1987 Whittier earthquake, and the 1994 Northridge earthquake. In addition, many areas in the Orange County area have sandy soils that are subject to liquefaction. The City of Santa Ana has liquefaction zones as shown on the attached map.

See Appendix in H.

Population and Demographics

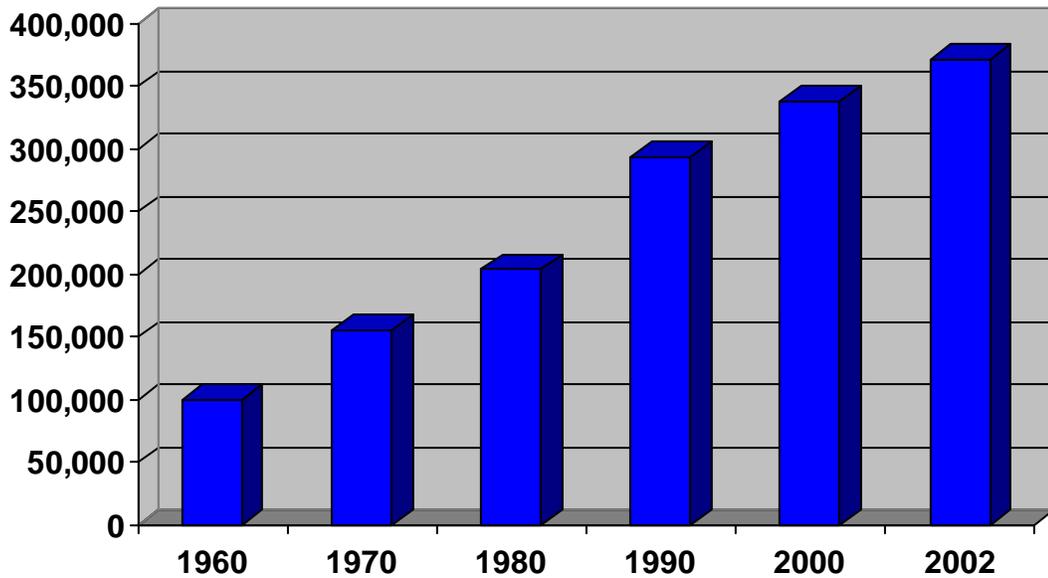
The increase of people living in City of Santa Ana creates more community exposure, and changes how agencies prepare for and respond to natural hazards. For example, more people living on the urban fringe can increase risk of fire. Wildfire has an increased chance of starting due to human activities in the urban/rural interface, and has the potential to injure more people and cause more property damage. But an Urban/wildland fire is not the only exposure to the city of Santa Ana. In the 1987 publication, Fire Following Earthquake issued by the All Industry Research Advisory Council, Charles Scawthorn explains how a post-earthquake urban conflagration would develop. The conflagration would be started by fires resulting from earthquake damage, but made much worse by the loss of pressure in the fire mains, caused by either lack of electricity to power water pumps, and /or loss of water pressure resulting from broken water mains.

Furthermore, increased density can affect risk. For example, narrower streets are more difficult for emergency service vehicles to navigate, the higher ratio of residents to emergency responders affects response times, and homes located closer together increase the chances of fires spreading.

Over the years, the City of Santa Ana has experienced a great deal of in-fill development, which is increasing the population density creating greater service loads on the built infrastructure, including roads, water supply, sewer services and storm drains.

Natural hazards do not discriminate, but the impacts in terms of vulnerability and the ability to recover vary greatly among the population. According to Peggy Stahl of the Federal Emergency Management Agency (FEMA) Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed upon special needs groups: women, children, minorities, and the poor.

Table 2-3: Population 1960 – 2004



**Table 2-4: Year 2000 Census Figures -
Demographic Make Up of the City:**

RACE	PERCENT
White	12.42
Hispanic or Latino (of any race)	76.07
African-American	1.7
Asian	8.81
American Indian and Alaska Native	1.19
Native Hawaiian and Other Pacific Islander	0.34
Two or more races	4.58

Table 2-5: Percentage of Poverty in the City of Santa Ana per the 2000 Census:

POVERTY STATUS	PERCENT
Families	
Percent below poverty level	16.1
With related children under 18 years	
Percent below poverty level	19.6
With related children under 5 years	
Percent below poverty level	23.5
Families with female householder, no husband present	
Percent below poverty level	26.3
With related children under 18 years	
Percent below poverty level	32.7
With related children under 5 years	
Percent below poverty level	38.5
Individuals	
Percent below poverty level	19.8
18 years and over	
Percent below poverty level	17.5
65 years and over	
Percent below poverty level	10.4
Related children under 18 years	
Percent below poverty level	24.1
Related children 5 to 17 years	
Percent below poverty level	23.7
Unrelated individuals 15 years and over	
Percent below poverty level	33.5

Vulnerable populations, including seniors, disabled citizens, women, and children, as well as those people living in poverty, may be disproportionately impacted by natural hazards.

Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural disasters identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

The cost of natural hazards recovery can place an unequal financial responsibility on the general population when only a small proportion may benefit from governmental funds used to rebuild private structures. Discussions about natural hazards that include local citizen groups, insurance companies, and other public and private sector organizations can help ensure that all members of the population are a part of the decision-making processes.

Land and Development

Development in Southern California from the earliest days was a cycle of boom and bust. The Second World War however dramatically changed that cycle. Military personnel and defense workers came to Southern California to fill the logistical needs created by the war effort. The available housing was rapidly exhausted and existing commercial centers proved inadequate for the influx of people. Immediately after the war, construction began on the freeway system, and the face of Southern California was forever changed. Home developments and shopping centers sprung up everywhere and within a few decades the central basin of Los Angeles County was virtually built out. This pushed new development further and further away from the urban center, into areas such as the City of Santa Ana.

The City of Santa Ana General Plan addresses the use and development of private land, including residential and commercial areas. This plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.

The environment of most Orange County cities is nearly identical with that of their immediate neighbors and the transition from one incorporated municipality to another is seamless to most people.

Housing and Community Development

In the City of Santa Ana, the demand for housing outstrips the available supply, and the recent low interest rates have further fueled a pent up demand. Demand for available housing is extremely high with few existing homes available. Demand for low to medium priced homes continues to be strong. According to the 2000 Census the median value of homes in the City of Santa Ana was estimated at \$184,500. As of May 2004, the median home price in Santa Ana was estimated to be over \$400,000. This climb in valuation is expected to continue into the foreseeable future.

To address development issues, the Planning and Development Department has engaged in activities that promote the quality of life for the citizens of the City of Santa Ana. The large-scale effort is termed the City of Santa Ana Community Program, and includes neighborhood and other public facility improvements, rehabilitation of existing housing, and new housing development.

HUD provides funding for the City of Santa Ana's Community Program.

The City participates in the Community Development Block Grant (CDBG) program. The primary resource available to address non-housing community development needs is the CDBG. City of Santa Ana's CDBG allocation for the year 2004 was \$350,000.

City of Santa Ana

Natural Hazards Mitigation Plan – Community Profile

The City of Santa Ana’s Economic Development Commission (EDC) is a body that helps to promote economic prosperity throughout the City. The EDC's mission is to promote development while maintaining quality of life and integrity of the environment.

This estimate can be used to compare economic areas as a whole, but it does not reflect how the income is distributed among residents of the area being examined. The City's per capita personal income is also increasing relative to California’s and the United State's average per capita incomes, resulting in a more affluent community than the average population.

Subtle but very measurable changes occur constantly in communities that increase the potential loss that will occur in a major disaster. There are a number of factors that contribute to this increasing loss potential. First, populations continue to increase, putting more people at risk within a defined geographic space. Second, inflation constantly increases the worth of real property and permanent improvements. Third, the amount of property owned per capita increases over time.

Information from the U.S. Census Bureau shows gains in average housing standards.

Amount of Property per person	1975	1998
Increased Size of new homes	1645 sq. ft.	2190 sq. ft.
% of homes with 4 + bedrooms	21%	33%
% of homes with 2 ½ or more baths	20%	52%

Source: U.S. Department of Census

If we look at the greatest recorded earthquakes in American history, and compare the level of population and development today with that which existed at the time of the event, the scale of potential damage is staggering.

- ✓ 1886 Charleston earthquake M7.3 in Charleston, SC
 Estimated insured damage if happened today \$10 Billion

- ✓ 1906 San Francisco earthquake M8.3 Significant fire following damage
 Estimated insured damage if happened today \$36 Billion

- ✓ 1811-12 New Madrid earthquake 1811-12, series of 4 EQs over 7 weeks
 Estimated insured damage if happened today \$88 Billion

Source: Risk Management Solutions

Employment and Industry

Industries such as retail trade, manufacturing, and educational/health/social services, are the City of Santa Ana's principal employment and industrial activities. The City business climate has been strong and growing. Occupations of persons 16 years and older who were employed in 2000 (per the 2000 Census) is apportioned as follows:

Table 2-6: Employment by Industry

EMPLOYMENT BY INDUSTRY	PERCENT
Agriculture, forestry, fishing and hunting, and mining	1.5
Construction	8.1
Manufacturing	24.7
Wholesale trade	4.1
Retail trade	10.4
Transportation and warehousing, and utilities	2.7
Information	1.9
Finance, insurance, real estate, and rental and leasing	4.8
Professional, scientific, management, administrative and waste mgt.	12.3
Educational, health and social services	10.4
Arts, entertainment, recreation, accommodation and food services	10.4
Other services (except public administration)	6.5
Public administration	2.0

Mitigation activities are needed at the business level to ensure the safety and welfare of workers and limit damage to industrial infrastructure. Employees are highly mobile, commuting from surrounding areas to industrial and business centers. This creates a greater dependency on roads, communications, accessibility and emergency plans to reunite people with their families. Before a natural hazard event, large and small businesses can develop strategies to prepare for natural hazards, respond efficiently, and prevent loss of life and property.

Transportation and Commuting Patterns

The City of Santa Ana is the largest in the County of Orange. Over the past decade, the county experienced rapid growth in employment and population. There has been a constant increase in vehicle licensing transactions in the Orange County region.

Table 2-7: Auto Registration in Orange County

Year	Automobiles	Trucks	Trailers	Motorcycles	Total
2002	1,816,481	390,691	119,539	40,484	2,367,195
2001	1,763,180	377,729	130,214	37,404	2,308,527
2000	1,718,057	373,340	119,647	34,155	2,245,199
1999	1,660,907	358,159	109,233	32,503	2,160,802

Private automobiles are the dominant means of transportation in Southern California and in the City of Santa Ana.

However, the City of Santa Ana meets its public transportation needs through a mixture of a regional transit system (OCTA), Metrolink rail system, and various city contracted bus systems.

SECTION 3:

- Risk Assessment -

What is a Risk Assessment?

Conducting a risk assessment can provide information: on the location of hazards, the value of existing land and property in hazard locations, an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the three levels of a risk assessment are as follows:

1) Hazard Identification

This is the description of the geographic extent, potential intensity and the probability of occurrence of a given hazard. Maps are frequently used to display hazard identification data. The City of Santa Ana identified three major hazards that affect this geographic area. These hazards - earthquakes, flooding, and wind storms - were identified through an extensive process that utilized input from the Hazard Mitigation Advisory Committee. The geographic extent of each of the identified hazards has been identified by the City of Santa Ana's General Plan Safety Element using the best available data, and is illustrated by the charts/map listed in Appendix H.

2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard, how it has affected the City of Santa Ana in the past, and what part of the City of Santa Ana's population, infrastructure, and environment has historically been vulnerable to each specific hazard. A profile of each hazard discussed in this Plan is provided in each hazard section. For a full description of the history of hazard specific events, please see the appropriate hazard chapter.

3) Vulnerability Assessment/Inventorying Assets

This is a combination of hazard identification with an inventory of the existing (or planned) property development(s) and population(s) exposed to a hazard. Critical facilities are of particular concern because these entities provide essential products and services to the general public that are necessary to preserve the welfare and quality of life in the City and fulfill important public safety, emergency response, and/or disaster recovery functions. The critical facilities have been identified, charted, and are illustrated in the chart in Appendix H. A description of the critical facilities in the City is also provided in this section. In addition, this Plan includes a community issues summary in each hazard section to identify the most vulnerable and problematic areas in the City, including critical facilities, and other public and private property.

4) Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets.

5) Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of land uses and development trends within the community so that mitigation options can be considered in land use planning and future land use decisions. This Plan provides comprehensive description of the character of Santa Ana in the Community Profile. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of Santa Ana can help in identifying potential problem areas, and can serve as a guide for incorporating the goals and ideas contained in this Mitigation Plan into other community development plans.

Hazard assessments are subject to the availability of hazard-specific data. Gathering data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard-specific section of the Plan includes a section on hazard identification using data and information from City, County or State agency sources.

The City of Santa Ana conducted a vulnerability assessment for the flood hazard using Geographic Information Systems (GIS) to identify the geographic extent of the hazard and assess the land use and value at risk from the flood hazard. The vulnerability assessment for the earthquake hazard is addressed in part from FEMA's HAZUS analysis model. Insufficient data exists to conduct vulnerability assessments and risk analyses for the other hazards addressed in the Plan: flooding and wind storms.

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in each hazard section of this Plan. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure. Action items throughout the hazard sections provide recommendations to collect further data to map hazard locations and conduct hazard assessments.

Federal Requirements for Risk Assessment:

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201 include a requirement for risk assessment. This risk assessment requirement is intended to provide information that will help communities to identify and prioritize mitigation activities that will reduce losses from the identified hazards. There are three hazards profiled in the Mitigation Plan, including earthquakes, flooding, and wind storms. The Federal criteria for risk assessment and information on how the City of Santa Ana’s Natural Hazard Mitigation Plan meets those criteria is outlined in the table:

Federal Criteria for Risk Assessment:

Section 322 Plan Requirement	How is this addressed?
Identifying Hazards	Each hazard section includes an inventory of the best available data sources that identify hazard areas. To the extent GIS data are available, the City developed maps identifying the location of the hazard in the City. The Executive Summary and the Risk Assessment sections of the plan include a list of the hazard maps.
Profiling Hazard Events	Each hazard section includes documentation of the history, and causes and characteristics of the hazard in the City.
Assessing Vulnerability: Identifying Assets	Where data is available, the vulnerability assessment for each hazard addressed in the mitigation plan includes an inventory of all publicly owned land within hazardous areas. Each hazard section provides information on vulnerable areas in the City in the Community Issues section. Each hazard section also identifies potential mitigation strategies.
Assessing Vulnerability: Estimating Potential Losses:	The Risk Assessment Section of this mitigation plan identifies key critical facilities and lifelines in the City and includes a map of these facilities. Vulnerability assessments have been completed for the hazards addressed in the plan, and quantitative estimates were made for each hazard where data was available.
Assessing Vulnerability: Analyzing Development Trends	The City of Santa Ana Profile Section of this plan provides a description of the development trends in the City, including the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns.

Critical Facilities and Infrastructure:

Facilities critical to government response and recovery activities (i.e., life safety and property and environmental protection) include: 911 centers, emergency operations centers, police and fire stations, public works facilities, communications centers, sewer and water facilities, hospitals, bridges, roads, and shelters. Facilities that, if damaged, could cause serious secondary impacts may also be considered "critical." A hazardous material facility is one example of this type of critical facility.

Critical and essential facilities are those facilities that are vital to the continued delivery of key government services or that may significantly impact the public's ability to recover from the emergency. These facilities may include: buildings such as the jail, law enforcement center, public services building, community corrections center, the courthouse, and juvenile services building and other public facilities such as schools.

Summary:

Natural hazard mitigation strategies can reduce the impacts concentrated at large employment and industrial centers, public infrastructure, and critical facilities. Natural hazard mitigation for industries and employers may include developing relationships with emergency management services and their employees before disaster strikes, and establishing mitigation strategies together. Collaboration among the public and private sector to create mitigation plans and actions can reduce the impacts of natural hazards.