Regional Catastrophic Earthquake Logistics Response Plan

Annex to the San Francisco Bay Area Regional Emergency Coordination Plan

February 2014

Prepared for:
California Governor's Office of Emergency Services

Cities of Oakland, San Francisco, and San Jose
Counties of Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma

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Prepared for:

Bay Area Urban Area Security Initiative

With support from:

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This plan has been prepared for the Bay Area Urban Area Security Initiative Approval Authority (Approval Authority) on behalf of the counties and cities in the 12-county Bay Area region. The plan describes the general strategy for emergency response to an incident with regional impact. The plan has been prepared in accordance with the standards of the National Incident Management System, the California Standardized Emergency Management System, and other Federal and State requirements and standards for emergency response plans applicable as of the date of the plan's preparation.

The plan provides guidance only; it is intended for use in further development of response capabilities, implementation of training and exercises, and defining the general approach to incident response. The actual response to an incident, whether at the regional, county, or city level, is dependent on:

- The specific conditions of the incident, including the incident type, geographic extent, severity, timing, and duration
- The availability of resources for response at the time of the incident
- Decisions of Incident Commanders and political leadership
- Actions taken by neighboring jurisdictions, the State, and the Federal Government

These and other factors may result in unforeseen circumstances, prevent the implementation of plan components, or require actions that are significantly different from those described in the plan. The Approval Authority and its contractors; the counties, cities, and other organizations that have participated in plan development; the State; and the Federal Government are not responsible for circumstances related to the implementation of the plan during an incident.

The plan is not applicable outside the 12-county region that comprises the planning area.

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Foreword

The vulnerability of the San Francisco Bay Area to earthquakes is well known. According to the 2008 Uniform California Earthquake Rupture Forecast, the probability of an **M** 6.7 or greater earthquake in the Bay Area in the next 30 years is 63 percent. An earthquake of this magnitude results in widespread and catastrophic damage.

A catastrophic earthquake in the Bay Area will immediately overwhelm local, regional, and State emergency response capabilities. The region will need massive, rapid support from the Federal and State Governments, other local governments in California, other states, and private-sector and voluntary organizations. The effectiveness of the region's response will affect the long-term recovery of the region's communities and economy. An effective response is possible only if comprehensive planning has taken place.

The Federal Government is providing funding under the Regional Catastrophic Preparedness Grant Program (RCPGP) to selected metropolitan areas throughout the United States to plan for catastrophic events. The San Francisco Bay Area is one of the metropolitan areas. The Federal Emergency Management Agency (FEMA) is administering the program. The Bay Area Urban Area Security Initiative (UASI) Program is implementing the RCPGP for 11 counties and 3 cities in the Bay Area. For fiscal year 2010, the UASI Program has used RCPGP funding to prepare regional and local plans for managing logistics response.

This document, the Regional Catastrophic Earthquake Logistics Response Plan (Plan), has been prepared under the RCPGP. Logistics planning is an important component of any response, but it is especially critical in responding to complex events such as the catastrophic earthquake scenario.

This Plan is an annex to the Regional Emergency Coordination Plan, and as such is consistent both with it and with the Regional Emergency Coordination Plan Logistics Subsidiary Plan. It is also consistent with the San Francisco Bay Area Catastrophic Earthquake Readiness Response Concept of Operations Plan prepared by FEMA.

This Plan has been prepared for the Bay Area UASI Approval Authority on behalf of the counties and cities in the 12-county Bay Area region. The Plan describes the general strategy for logistics-specific emergency response to an incident with regional impact. The Plan has been prepared in accordance with the standards of the National Incident Management System, the California Standardized Emergency Management System, the National Response Framework, the Homeland Security Exercise and Evaluation Program, and other Federal and State requirements and standards for emergency response plans that were available and applicable as of the date of the Plan's preparation.

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1 Introduction

Logistics is an essential component of emergency response plans at local, regional, State, and national levels to ensure the availability of the right products in the right location at the right time and in the right quantities. Logistics planning for a disaster requires knowledge of the geographic, social, political, cultural, and physical characteristics of the region. In general, logistics planning addresses the following questions:

- What resources are needed and in what quantity?
- How can they be procured?
- How can they be transported to the affected location?
- How can they be received, staged, stored, distributed, and tracked?
- Which organizations have critical roles and responsibilities in the logistics supply chain?
- How is coordination regarding logistics activities achieved between different organizations?

1.1 Purpose

The Regional Catastrophic Earthquake Logistics Response Plan (Plan) is a scenario-driven, function-specific operations plan for the 12-county Bay Area planning region that describes the logistics response system for distributing life-sustaining commodities in the aftermath of a catastrophic earthquake on the San Andreas Fault.

The Plan provides guidance for coordinating logistics support necessary to respond effectively to the earthquake for the benefit of those affected by the disaster. It provides logistics-related details for:

- Establishing a logistics framework for prioritizing, requesting, receiving, staging, distributing, and tracking life-sustaining commodities.
- Activating and operating local logistics staging areas (LSAs) and commodity points of distribution (PODs).
- Applying the Standardized Emergency Management System (SEMS), the National Incident Management Systems (NIMS), and the Incident Command System (ICS) for logistics response operations.
- Coordinating logistics activities among local, regional, State, Federal, private-sector, and non-governmental organizations (NGOs).

As an event-specific annex to the Regional Emergency Coordination Plan (RECP), the Plan is intended for:

- The personnel responsible for implementing the RECP, including emergency managers and Regional Emergency Operations Center (REOC) personnel.
- The agencies, departments, and organizations responsible for implementing logistics response operations in the region.

Finally, this document was developed as an event-specific plan, and the details presented pertain to a catastrophic earthquake. However, the Plan could be scaled easily to smaller earthquakes or to non-seismic disasters such as fires or floods. Where appropriate, this Plan includes suggestions for ways to adapt the Plan to smaller or other types of events.

1.2 Objectives

The objectives of the Plan are to:

- Define planning assumptions for the logistics response based on projected catastrophic impacts of the earthquake
- Identify and describe the logistics-related roles and responsibilities of agencies and organizations
- Identify recommended, time-based priorities and objectives to guide logistics response operations
- Establish a response timeline for individual tasks in logistics support operations

1.3 Scope and Definitions

The Plan pertains to logistics response operations in the 12-county Urban Areas Security Initiative (UASI) planning region, which is defined and discussed below. It addresses the broader regional level response to the disaster and focuses on the interactions between the State of California and the Operational Areas that comprise the planning region.

1.3.1 Nature and Duration of the Scenario Event

As described in the National Response Framework (NRF), a catastrophic event is any natural or human-caused incident that results in an extraordinary level of casualties, damage, or disruption that severely affects the population, infrastructure, environment, economy, morale, and government functions of the area in question, and potentially the nation as a whole.

The scenario used in the development of this Plan is a moment magnitude (**M**) 7.9 earthquake on the northern segment of the San Andreas Fault. The impacts from the earthquake are catastrophic. Although the shaking from an earthquake and the aftershocks last only seconds or minutes, recovery can take several years. See **Section 2** and **Appendix C** for more information about the scenario event.

1.3.2 Geographic Scope

The earthquake has a catastrophic impact on the Bay Area region. The Plan includes the following 12 counties (also see maps in **Appendix B**):

- Alameda County
- Contra Costa County
- Marin County

- Monterey County
- Napa County
- San Benito County
- San Francisco County
- San Mateo County
- Santa Clara County
- Santa Cruz County
- Solano County
- Sonoma County

Impacts to these jurisdictions affect local, regional, State, and Federal response and recovery decisions. These counties bear direct and significant impacts, impacts from regional disruption of critical infrastructure systems, and/or short- or long-term impacts to the economy. Counties adjacent to the region, such as Mendocino, Sacramento, San Joaquin, and Stanislaus, may be affected directly by damage or indirectly by evacuations and other response actions, but these counties are not included in this Plan.

1.3.3 Time Frame

The time frame for the Plan begins with the occurrence of the earthquake and ends 60 days after the earthquake. The planning periods (phases) are presented in hours and days after the earthquake or event occurrence (E). The Plan does not address preparedness activities that may occur before the earthquake or long-term activities that occur after 60 days. However, it does provide guidance for initial steps in planning restoration of critical lifelines and the transition to long-term recovery activities.

1.3.4 Definitions of Key Terms

Commodity Point of Distribution (POD) - A POD is a centralized location where the public receives commodities following a disaster or emergency, typically life-sustaining in nature, such as pre-packaged, shelf-stable meals and bottled water. A commodity POD is different from a public health “point of dispensing” which provides pharmaceuticals and/or medical supplies.

Critical Lifeline – A “critical lifeline” represents the systems, physical or virtual, so vital that their disruption would have a debilitating effect on public health and safety. The Plan specifically addresses water and wastewater, electric power and fuel.

Logistics - The term “logistics” as used in this Plan refers to the process of planning, implementing, and controlling the efficient, request, acquisition, movement, storage, staging, and distribution of life-sustaining commodities from their point of origin to point of use.

Staging Area – A “staging area” is an ICS defined location to receive and stage shipments, typically consisting of critical commodities, supplies and equipment that

have not yet been assigned to an incident. A local government, multiple local governments, the State, and the Federal Government can establish staging areas. For the plan, staging areas refer to sites that receive, stage, and deliver life-sustaining commodities.

Acronyms used in this plan are listed and defined in **Appendix A**.

1.4 Applicability

As an event-specific, function-specific annex to the RECP, the Plan is consistent with the foundational concepts described in it, including SEMS, NIMS, and ICS. The plan is also consistent with the plans listed below.

1.4.1 Regional Emergency Coordination Plan and Logistics Subsidiary Plan

The RECP provides an all-hazards framework for collaboration among responsible entities and coordination during emergencies in the San Francisco Bay Area. The RECP also defines procedures for regional coordination, collaboration, decision-making, and resource sharing among emergency response agencies in the Bay Area. The Logistics Subsidiary Plan describes the general approach of the California Governor's Office of Emergency Services (Cal OES) and other entities in coordinating the influx of out-of-region and out-of-state resources and commodities that can be expected following a catastrophic incident such as a major earthquake.

1.4.2 San Francisco Bay Area Earthquake Readiness Response: Concept of Operations Plan

The Plan is also consistent with the San Francisco Bay Area Earthquake Readiness Response: Concept of Operations Plan (CONPLAN)[1], prepared by the Federal Emergency Management Agency (FEMA) and Cal OES. The CONPLAN describes the joint State–Federal response to an **M** 7.9 earthquake on the San Andreas Fault in the Bay Area and includes an annex describing transportation and logistics response operations. The CONPLAN describes the establishment of a Joint Field Office (JFO) with a Unified Coordination Group that coordinates joint State–Federal operations in support of the response in the Bay Area. The CONPLAN also has a tab for a Transportation and Logistics section, which describes the joint Federal and State Concept of Operations for logistical support to the region.

1.5 Plan Organization

Section 1 – Introduction provides the scope and applicability of the Plan and the authorities, regulations, and requirements that provide the foundation for the logistics operations that are discussed in the Plan.

[1] FEMA will conduct an update and revision of the CONPLAN in 2014.

Section 2 – Situation and Assumptions contains a description of the scenario event and its projected impacts and the assumptions underlying the scenario event and the logistics-specific response to it.

Section 3 – Roles and Responsibilities describes the roles and responsibilities of key organizations at each level of the coordinated logistics response.

Section 4 – Operational Priorities and Objectives contains a listing of the time-based operational priorities and objectives for the logistics-specific response, sorted into three time periods following the earthquake.

Section 5 – Coordination and Communication describes the overall approach to coordinating the establishment of a logistics framework to receive stage, store, track, deploy, and distribute resources and commodities.

Section 6 – Concept of Operations describes the concept of operations, which includes the response coordination system and the operational components of the logistics response operation.

Section 7 – Plan Maintenance describes how the plan is maintained, updated, and executed. It also identifies the agency responsible for maintaining the Plan.

Appendix A is a glossary of acronyms and abbreviations.

Appendix B contains the maps that are referenced in the Plan.

Appendix C provides the background information for how scenario and assumptions details were derived.

Appendix D provides the results of the Logistics Capability Assessment Tool analysis for the region.

Appendix E provides templates for public information releases related to commodity distribution and donations.

Appendix F contains a response timeline for the logistics support component of the response. More specifically, the timeline presents the individual tasks necessary to achieve the objectives and priorities laid out in **Section 4**.

Appendix G contains critical lifeline restoration plans (Fuel Supply Restoration; Electric Power Restoration; Water/Wastewater Restoration).

Appendix H is a guide to commodity PODs.

Appendix I describes critical information collection requirements.

Annexes contain annexes for each Operational Area in the region.

1.6 Authorities, Regulations, and Requirements

The following local, regional, State, and Federal authorities, regulations, and requirements apply to the preparation of this Plan and to logistics operations that are conducted in response to a catastrophic earthquake.

1.6.1 Local

In general, local governments, including cities and counties, have primary responsibility for the public health and safety of their residents after disasters of any type. Local authorities for emergency response are described in each county's and city's Emergency Operations Plan.

1.6.2 State

As described in the RECP, emergency response operations are conducted in accordance with the:

- California Emergency Services Act, Government Code (GC) §§ 8550–8668
- California Disaster Assistance Act (CDAA), GC §§ 8680–8692
- Interstate Civil Defense and Disaster Compact and the Emergency Management Assistance Compact (EMAC), GC §§ 177–179
- California Code of Regulations, Title 19, Division 2, which includes SEMS, public assistance, and individual assistance and which also establishes the role of Cal OES
- California State Emergency Plan
- RECP, Cal OES Coastal Region, March 2008

1.6.3 Federal

Federal operations in support of local governments and the State are governed by the following:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, 42 United States Code §§ 5121–5206, 2008 (the Stafford Act)
- NRF
- NIMS
- Code of Federal Regulations, Title 44, which defines the roles of the FEMA and the Department of Homeland Security (DHS)

2 Situation and Assumptions

This section contains a description of those aspects of the scenario earthquake and its projected impacts that pertain specifically to logistics. The scenario earthquake for this Plan is the same as that developed for and used in previous Regional Catastrophic Preparedness Grant Program (RCPGP)-funded planning efforts at the local and regional levels. The full description of the scenario earthquake and the additional general planning assumptions are presented in **Appendix C**. The scenario earthquake is a recurrence of the 1906 earthquake on the northern segment of the San Andreas Fault. The basis for the scenario is a Hazards U.S. (HAZUS)[2] model run and analysis, the details of which are also presented in **Appendix C**.

2.1 Catastrophic Nature of the Earthquake

Threats and hazards resulting from the earthquake include structural and non-structural damage to buildings and infrastructure, fires, subsidence and loss of soil-bearing capacity, landslides, hazardous materials spills and incidents, dam/levee failure resulting in flooding, and civil disorder. Many residential, commercial, and industrial buildings would be rendered uninhabitable. The earthquake would significantly affect all regional utilities and transportation networks; large portions of the transportation infrastructure would be damaged or destroyed. Utility and water supply damage, even in areas with less extreme structural impacts, would compound the problem of housing people. Most Internet connectivity, telephone lines, and cellular telephone systems are damaged, causing communication difficulties throughout the region.

The earthquake would result in:

- More than 400,000 displaced residents
- More than 300,000 people seeking shelter
- More than 1 million people who need transportation assistance
- 2.9 million households without electricity
- 1.8 million households without potable water
- 7,000 fatalities
- 50 million tons of debris

2.2 General Assumptions

- Within 24 hours:
  - County administrators proclaim local emergencies.

[2] HAZUS is a loss-estimation software program developed by the National Institute of Building Sciences for the Federal Emergency Management Agency. The version used for this analysis (HAZUS-MH MR3) was developed by National Institute of Building Sciences in 2003.

  - The Governor proclaims a State of Emergency and requests that the President declare a disaster. The proclamation allows for State-funded financial assistance, in accordance with CDAA, GC §§ 8680–8692.
  - The President declares a Major Disaster, making Federal assistance available under the Stafford Act.
  - DHS and FEMA implement the NRF Catastrophic Incident Supplement and begin mobilizing Federal resources.
  - DHS activates or elevates the level of activation of all DHS command and coordinating facilities.
  - Cal OES activates the REOC and the State Operations Center (SOC).
- The FEMA Region IX Regional Response Coordination Center in Oakland is not functional. FEMA co-locates with Cal OES at the SOC until a JFO is established.
- Outside the affected region, all elements of SEMS, including communications and mutual aid systems, are functional.
- Operational Area Emergency Operations Centers (EOCs) in the region experience varying degrees of damage but are at least partly operational. All other local government functions in the Operational Areas are either severely compromised or are focused entirely on responding to the earthquake.
- Response capabilities and resources of the cities, Operational Areas, and State agencies in the region are quickly overwhelmed or exhausted.
- Operational Area EOCs are overwhelmed and challenged to coordinate the Operational Area response effectively.
- A detailed and credible common operating picture cannot be achieved for 24 to 48 hours (or longer) after the disaster. As a result, response activities begin without the benefit of a detailed and complete situation or critical needs assessment.
- First responders, providers of recovery services, and other critical response personnel are personally affected by the disaster and may be unable to report to their posts for days because of damaged transportation infrastructure.
- Once the President declares a disaster and commits Federal resources, the State and Federal governments establish joint operations to provide assistance to local jurisdictions.
- Because of damage to transportation infrastructure, out-of-region mutual aid, State and Federal resources, and resources from other states cannot begin to arrive for up to 72 hours.

2.3 General Logistics Assumptions

The following assumptions pertain specifically to logistical constraints, capabilities, and expectations of the logistical framework after the earthquake. Additional assumptions, specifically those addressing the capabilities of local governments in

the region, can be derived from data obtained and documented in **Appendix D, Logistics Capability Assessment Tool (LCAT) Report**.

- Responding effectively to the needs of impacted communities after a catastrophic event requires a vast amount of resources.
- Nearly 5 million people may require bottled or other potable water supplies due to disruption of regional water distribution systems. Lack of water and sanitation results in emerging public health crises in the hardest-hit areas (Marin, San Francisco, San Mateo, Santa Clara, and Santa Cruz counties). Restoration and repair of water distribution systems requires at least 8 weeks.
- Approximately 2.2 million people require feeding and other basic life-sustaining commodities due to lack of services, loss of residence, or because they are visitors or commuters who are stranded.
- Existing stockpiles of critical life-sustaining commodities are limited. The supply by contractors and distribution capabilities is severely compromised by the overwhelming need and the damage to facilities and transportation infrastructure.
- Massive assistance in the form of response teams, equipment, materials, and volunteers begin to flow toward the region, providing urgently needed resources but creating coordination and logistical support challenges.
- Resource requirements to support response and recovery for a catastrophic earthquake are great; and they are necessary over an extended period.
- In-state mutual aid, EMAC, and Federal and private-sector resources are required to support extended operations.
- Staging areas, temporary facilities for incident command posts and other field operations centers, and disaster service worker living accommodations and support are required to support response efforts.
- Military (Department of Defense - DoD, the Reserves, and National Guard) resources may be limited or not available to support operations due to other national security mission requirements.
- Many resources necessary to support an effective response are in short supply and may need to come from a long distance.
- Staging areas, PODs, and other locations supporting emergency response require security in varying degrees.
- Due to the impacts of the earthquake and the limited amount of lodging available on any given day, disaster service workers may be required to live in austere conditions for an extended period.
- Damage to transportation infrastructure, including the region's ports and shipping channels and its three major international airports, requires extensive repairs before large quantities of commodities can be received by sea or air.
- Due to damage to transportation infrastructure, jurisdictions have to consolidate some operations and share resources.

- Private businesses that provide lodging, food, services, and fuel near the affected area and along evacuation routes may be closed, have limited supplies and resources, or be overwhelmed with civilian customers.
- Many private businesses have resources and desire to assist in the response, but implementation varies based on a company's understanding of how best to integrate with the system.
- Donations, both needed and unneeded, arrive in large numbers. Staging and storage facilities are necessary.
- Although NIMS and ICS are national standards employed by all compliant government agencies, in-state and out-of-state mutual aid workers and volunteers arrive with varying degrees of experience and understanding of these basic emergency response principles and guidelines.
- Housing in or near the affected communities must be provided to first responders and recovery personnel. This may further exacerbate the housing shortage for displaced households.
- The initial capability to provide support (e.g., shelter, food, sanitation) to emergency response personnel does not meet requirements.
- Facilities identified to support a specific function may not be available due to potential or identified damage or due to a lack of basic utilities.
- Facilities designed for a particular function before a disaster may be redefined to support more critical functions.

2.4 Commodity Assumptions

The following assumptions refer to the need and availability of critical commodities. Additional assumptions that address the restoration of fuel, electric power, and water and wastewater critical lifelines are found in **Appendix G, Critical Lifelines**.

2.4.1 Fuel

Assumptions for need and availability of fuel are:

- Damage to marine terminals, oil refineries, fuel transmission lines, and fuel dispensaries limits the availability of fuel needed to support immediate and follow-on response operations, the movement of evacuees and resources, and power generation.
- Damage to Bay Area refineries and the fuel distribution and delivery infrastructure causes not only a shortage of fuel in the Bay Area but also shortages across the nation.
- The quantity of fuel needed to support response operations and other critical functions is inadequate, requiring the prioritization of fuel allocations.
- Power outages make it difficult to pump gas out of the ground at most Bay Area gas stations.

- Due to widespread power outages, generated power, which requires fuel to produce, is critical for supporting response operations and sustaining other critical operations; this places a further demand on the fuel supply.

2.4.2 Water and Wastewater

Assumptions for need and availability of water and wastewater are:

- Damage to potable water treatment and distribution systems and the loss of electrical power creates a significant challenge and makes potable water a priority commodity.
- Critical pipelines, tunnels, bypasses, pumping stations, supply lines, and feeder mains fail, negatively impacting the provision of water.
- A massive, coordinated emergency potable water distribution system is necessary to support disaster service workers and sustain populations in the region.
- Some private companies may provide supplies of bottled water and should be incorporated into the potable water distribution system.
- Water utility companies operate based on their own water recovery and distribution plans, but water supply resources are insufficient, resulting in the request for and need to acquire water from sources outside the region.
- Resources to move the water, such as water tenders, are very limited and require prioritization.
- Chemicals needed for water treatment/decontamination may not be readily available because of hazardous materials restrictions, damage to chemical storage facilities, and transportation infrastructure damage.

2.4.3 Sanitation

Assumptions for need and availability of sanitation are:

- Existing wastewater/sanitation systems are inoperative due to lack of power, damage to treatment plants, and damage to wastewater collection and pumping systems. Restoration and repairs require months. The need for portable/temporary sanitation systems is critical to preserve public health.
- A small percentage of the population remains in impacted areas after the recommendations/orders for evacuation are carried out; they need to be supported with sanitation, food, and water.
- Portable toilets, hand washing stations, and portable showers are required to support response personnel and sheltering populations.

2.4.4 Food

Assumptions for need and availability of food are:

- Widespread power outages cause perishable foods to spoil, leaving only non-perishable foods. Most households have not stored sufficient supplies of non-

perishable food necessary to sustain life adequately until power and water are restored and food distribution systems have been reestablished.

- Significant impacts to the food supply chain due to damage to grocery stores, warehouses, and food distribution centers, in combination with disruptions to the transportation system, limit the amount of food available in the region.
- Initially, feeding programs provide packaged food like meals, ready-to-eat (MREs); they expand to include warm, prepared food as mobile kitchens are established.
- In addition to shelter populations, households choosing to shelter in their homes also require food and water.
- Disaster service workers need food and water in order for them to respond effectively and continue operations.

2.4.5 Generators and Other Mass Care Supplies

Assumptions for need and availability of generators and mass care supplies are:

- The requirements for resources such as blankets, cots, potable water, and food exceed stockpiles maintained by State and Federal departments and agencies.
- Due to widespread power outages, generated power is required to sustain critical functions. Both the number of generators and fuel availability is limited, making prioritization of these resources necessary.
- The American Red Cross (ARC) assumes that approximately 1.7 million people sheltering in place require food support due to power and water outages and disruptions to food distribution and retail systems. These people need food, water, first-aid supplies, tents, blankets, and other supplies from distribution locations and/or shelters until utility service and retail food distribution are restored.

2.5 Transportation System Disruptions

The following assumptions refer to disruptions in the transportation system that constrain the ability of all levels of government to push resources into the region.

- The earthquake significantly affects all regional transportation networks and their ability to facilitate the movement of people and supplies. Large portions of the transportation infrastructure are likely to be damaged or destroyed, precluding their use for both normal transportation and evacuation.
- Transportation of first responders, commodities, and other required resources into the Bay Area is significantly affected by damage to transportation infrastructure, debris removal operations, inspections, and closures for repairs.
- The time required to restore damaged infrastructure increases the effects of the earthquake on employees in the region, impeding access to critical facilities and infrastructure; further disrupting transportation systems; depleting critical

resources, particularly fuel; increasing the need for critical equipment; and other cumulative impacts.

- Extensive damage to the infrastructure, equipment, and operations for all modes of transportation affects the ability of all levels of government and the private sector to:
  - Complete transportation damage/functionality assessments.
  - Establish ingress and egress routes.
  - Initiate evacuation operations.
  - Move emergency service workers into the affected areas.
  - Deliver resources.
  - Provide security and logistics required for response operations.
- Rail systems in the affected area suffer a significant reduction in or complete loss of operational capacity because of compromised rail beds and track alignments, displacement, ground failures, and structural damage to aerial structures and bridges.
- The three regional international airports (Oakland, San Francisco, and San Jose) sustain moderate to severe damage.
  - Airport operations—including passenger-plane runways, lighting, terminal facilities, control towers, terminal buildings, cargo handling facilities, and access roads—are likely to be damaged and may be inoperable for 60 days or longer.
  - Initially, these airports are available only to small fixed-wing and rotary aircraft. Air operational capability for large fixed-wing aircraft may be restored within a week, but many of the fueling, servicing, and cargo-handling facilities remain inoperable for a longer period.
  - Passenger operations may be delayed for 15 days or longer.
- Roadways leading to the three international airports—such as U.S. Highway 101 to San Francisco; Interstate 880 to Oakland; and U.S. Highway 101, Interstate 880, and State Route 17 to San Jose—are damaged, constraining access to the airports and further limiting their usefulness.
- Cargo-handling facilities at the ports are expected to sustain significant damage. Piers, harbors, buildings, cranes, and rail lines are likely to be damaged. Key cargo-handling infrastructure could be non-functional for 60 days or more. Containerized cargo operations are temporarily rerouted among Bay Area terminals or diverted to other West Coast ports. Emergency logistics may require use of roll-on/roll-off terminals.
- Existing ferry terminals, which are located in Alameda, Marin, San Francisco, and Solano counties, may be damaged. Through the establishment of temporary facilities and emergency repairs, ferry service is available almost immediately. Maritime transportation routes, facilities, and assets may be the best immediate means for transportation of first responders, disaster service workers, emergency materials, and evacuations.

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3 Roles and Responsibilities

This section discusses the roles and responsibilities of the government agencies, private businesses, and NGOs that are involved in logistics response operations. The sections are organized by SEMS levels to reflect the fact that resource requests follow SEMS protocols.

3.1 Field

In accordance with SEMS and NIMS, the management of an incident occurs at the lowest level possible. The Incident Commander coordinates the support needs for the response to the incident, such as ordering resources and providing facilities, transportation, supplies, equipment maintenance and fuel, food service, communications, and medical services for incident personnel. The operation of receiving centers, staging areas, PODs, storage facilities, warehouses, and other logistics support sites are also operated at the field level, although staff from all levels may support these sites.

3.2 Local Government

Local governments coordinate support for field level operations by providing resources, commodities, and logistical support. Local governments are responsible for the establishment, management, and operation of receiving centers, storage facilities, LSAs, and PODs. While local governments continue to plan and prepare to meet these capabilities, in a catastrophic event it is unlikely local governments are able to operate these logistical support sites at the scale necessary to support their communities. If a local government lacks the capabilities to establish and operate these sites, it requests support through the Operational Area.

3.3 Operational Area

An Operational Area coordinates information, resources, and decisions regarding priorities among local governments, NGOs, and private businesses in the Operational Area boundaries, including activation of the Operational Area EOC. It also serves as a coordinating and communication link between local and regional SEMS levels. During a disaster impacting multiple Operational Areas in the region, Operational Area EOCs coordinate the establishment of the system for receiving, staging, and distributing commodities. This may include coordinating with local governments for the activation of receiving centers, storage facilities, LSAs, and PODs. Operational Areas are also responsible for coordinating the integration of requested response personnel and equipment.

3.4 Region

The purpose of the region is to provide for the more effective application and coordination of mutual aid and other emergency services in support of Operational Areas. The regional level manages and coordinates information and resources

among Operational Areas in the region and also between the Operational Areas and the State level. The regional level is also responsible for coordinating overall State agency support for emergency response activities in the region.

SEMS guidance for the regional level is primarily but not exclusively directed at regional facilities and systems that administer or coordinate mutual aid for the region. These would include Cal OES REOCs and discipline-specific regional mutual aid coordinators (for example, fire, law, medical).

Other State agency administrative and operational sub-levels also have a regional structure; for example, California Highway Patrol (CHP) divisions, California Department of Transportation (Caltrans) districts, California Department of Forestry and Fire Protection (CAL FIRE) and California Department of Fish and Wildlife regions. The region also includes other multi-jurisdictional organizations like the Metropolitan Transportation Commission (MTC).

3.4.1 California Governor's Office of Emergency Services Coastal Region

The Coastal Region of Cal OES oversees Region II of the Mutual Aid System and the Coastal Administrative Region. When activated, the Cal OES Coastal REOC coordinates the emergency activities of State agencies in the region and uses the resources of those agencies to fulfill mission requests to support emergency operations when requested by an Operational Area. The Regional Mutual Aid Coordinators and the REOC work together to coordinate mutual aid and other assistance among Operational Areas in the region, as needed. The primary role of the REOC is the coordination of information and resources in the region. The REOC also coordinates with the SOC. To support logistics operations in the region, the REOC:

- Works with the Operational Areas to identify requirements for commodities and resources to support commodity distribution operations
- Works with the Operational Areas to identify appropriate locations for staging areas and other facilities
- Coordinates in-bound commodities with the Operational Areas to ensure that these commodities are ready to be received and are supported appropriately
- Coordinates the acquisition of the necessary personal, equipment, and sites to assist the Operational Areas with logistics by mission-tasking State agencies or other means

For an event of this scale, the State deploys liaisons to the Operational Area EOCs in collaboration with Federal Government representatives to ensure that deployed commodities are supported logistically, arrive as requested, and are sufficient to meet requirements.

3.4.2 Metropolitan Transportation Commission

The MTC serves as the coordinating entity for transportation planning and investment in a nine-county region of the Bay Area. In a disaster that requires mass transportation/evacuation, MTC's logistics support role is to:

- Coordinate the response of Bay Area transit resources among mass transportation agencies
- Coordinate with Cal OES to identify regional transportation needs
- Coordinate activities under the San Francisco Bay Area Transit Operators Mutual Aid Agreement through which transit agencies provide requested support if the needs for resources or capabilities of an individual agency are exceeded
- Collect information from the region's transit agencies to provide a common operating picture of transportation issues in the region

3.5 State

The State level is responsible for coordinating resource requests and resolving priority issues that might arise at the regional level among the three Cal OES Administrative Regions. Cal OES also administers financial assistance provided by FEMA and State assistance offered under the CDAA when available.

The State agencies listed below have critical roles in establishing or supporting specific components of the logistics support system.

3.5.1 California Emergency Management Agency Headquarters/State Operations Center

The SOC is located at the Cal OES Headquarters in Mather and supports the regions. When activated, the SOC supports the activated REOC(s), coordinates the emergency activities of State agencies, and coordinates mutual aid at the State level. The SOC may activate the Business Operations Center (BOC) and the Utilities Operation Center (UOC) to facilitate coordination with private sector partners on resource issues and utilities on lifeline restoration.

The SOC also provides the primary point of contact among the State, FEMA, other Federal agencies, and with other states through the Interstate Civil Defense and Disaster Compact and EMAC. If dictated by the magnitude and duration of an event, regional and State support of emergency activities may transition to a JFO in order to co-locate operations with FEMA and other Federal agencies.

The SOC works to acquire resources that are not available or cannot be provided at the regional level. The SOC may request resources from other regions in the State, from State agencies, from other states—either through the Interstate Civil Defense and Disaster Compact or through EMAC—or from the Federal Government. To provide logistics support, the SOC:

- Projects commodity needs for the region

- Coordinates the pre-positioning of commodities for deployment to the region
- Identifies State staging areas and other support facilities, including property owned or managed by State agencies
- Coordinates State provision of labor and materials-handling equipment at these locations
- Identifies State resources that can be used to transport commodities, such as assets provided by the California National Guard, including prioritization and use of air assets

3.5.2 California Emergency Function 7 – Resources

California Emergency Function 7 – Resources (CA-EF 7) provides an organizational structure to coordinate State support for managing resource operations. CA-EF 7 coordinates plans and activities to locate, procure, and pre-position resources to support emergency operations. CA-EF 7 may function as part of the REOC, SOC, or JFO organization and works with personnel from Federal Emergency Support Function #7, Logistics Management and Resource Support (ESF #7), to provide joint support to the affected region. The California State Consumer Services Agency leads CA-EF 7.

3.5.3 California Energy Commission

The California Energy Commission maintains the State's Petroleum Fuels Set-Aside Program, which is a formal allocation program used to ensure that fuel supplies are available to emergency responders during a widespread or prolonged shortage. For additional information about this program and the agency's efforts to support the sustainment of the fuel lifeline, see **Appendix G, Tab 1**.

3.5.4 California Highway Patrol

The CHP is responsible for enforcing the provisions of the California Vehicle Code, especially in areas of State responsibility, and for providing police protection of State assets. The CHP supports emergency logistics by providing a security escort for pre-identified shipments of commodities, supplies, and other resources that come from outside the region. The CHP is responsible for these shipments over State and Federal highways; it is also responsible for them under any contracted arrangements that may exist with local law enforcement. In the absence of contract arrangements to provide traffic law enforcement to local governments, the responsibility of escorting such shipments transfers to local law enforcement once the shipments enter local roadways.

The 12 counties covered by this Plan are in the CHP's Golden Gate Division (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties) and Coastal Division (which covers Santa Cruz, Monterey, and San Benito Counties, among others outside of the Plan area). Each county is organized into one or more area offices.

3.5.5 California Department of Forestry and Fire Protection

CAL FIRE provides fire protection and stewardship of designated State responsibility areas in California's privately owned wild lands. CAL FIRE provides varied fire suppression, urban search and rescue, hazardous materials response, and emergency medical services through contracts with local governments in multiple Bay Area counties. Due to its size and major incident management experience, CAL FIRE's incident management teams have played a lead role in the management of major incidents across California and nationally, including the Loma Prieta and Northridge earthquakes.

CAL FIRE has extensive experience in managing logistical operations, including organizing, staffing, and operating staging areas for emergency responder resources, bases, and camps to feed and otherwise support first responders during incidents. CAL FIRE maintains relationships with vendors who provide support services to camps and other logistical operations.

3.5.6 California Department of General Services

California Department of General Services (DGS) provides a variety of services to State agencies in a non-emergency and emergency capacity, including procurement and acquisition solutions, real estate management and design, state-of-the-art telecommunications, and transportation. DGS also:

- Maintains an emergency supply matrix for California, a list containing 20 of the most needed commodities for evacuation centers and has identified methods and resources to obtain and deliver these commodities quickly
- Uses an e-procurement system that is available to all DGS customers (including counties, cities, the California State University system, the University of California system, and junior colleges)
- Maintains close working relationships with real estate owners throughout the State and can identify and obtain access to vacant properties within a matter of hours
- Coordinates with the Emergency Partnership Advisory Workgroup to secure agreements between affected governments and the private sector during disasters and to integrate and engage the private sector as a full partner in all phases of emergency management
- Uses California's participation in the Western States Contracting Alliance to gain significant purchasing leverage in obtaining commodities and resource support required to respond to the incident

3.5.7 California National Guard

The California National Guard is the component of the U.S. National Guard in the State of California and includes Army and Air National Guard components. The Constitution of the United States charges the National Guard with dual Federal and State missions, making the National Guard the only U.S. military force that is empowered to function on a State basis. National Guard functions range from limited

actions during non-disaster situations to full-scale enforcement of martial law when local law enforcement cannot maintain civil control. The President or Congress may also call the National Guard into Federal service.

The Governor of California may call individual members or units of the California National Guard into State service during disasters when deemed appropriate by the Governor. In the response to a disaster, the California National Guard supports Cal OES.

The California National Guard participates in State-wide law enforcement, security, and evacuation activities through coordination with the Cal OES Law Enforcement Branch, CHP, California Department of Justice, California Department of Corrections, CAL FIRE, and other State agencies.

3.5.8 California State Military Reserve

The mission of the California State Military Reserve (CSMR) is to provide an adequately trained and organized State military reserve force under the exclusive control of the Governor. When the Guard is federalized or otherwise not available, the CSMR is meant to be capable of accomplishing those State emergency responsibilities normally assigned to the National Guard.

The CSMR is a volunteer operational force upon which the California National Guard depends. Its members are subject to be called to State active duty by the Governor of the State of California.

3.5.9 California Department of Transportation

Caltrans is the owner and operator of the State highway system. Its disaster response priorities include damage assessment and route recovery on State highways. The 12 counties covered by this Plan are in either Caltrans District 4 or Caltrans District 5. Caltrans District 4 is responsible for State roadways and bridges (with the exception of the Golden Gate Bridge) in nine counties in the San Francisco Bay Area, all of which are covered by this Plan (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma). Caltrans District 5 is responsible for the State roadways and bridges in five counties along the coast, including the remaining three counties covered by this Plan (Santa Cruz, Monterey, and San Benito).

During a disaster, Caltrans activates its EOC, which collects information and defines priorities for the response. Caltrans District 4 also operates the region's Transportation Management Center (TMC) in its Oakland office in partnership with the CHP. The TMC is co-located with the District EOC and operates 24 hours a day. Similarly, Caltrans District 5 operates the region's TMC, which is located in its San Luis Obispo office, in partnership with the CHP.

Each regional TMC contains functional sections, such as communications, traffic management, the CHP, the 511 Traveler Information Center, and a separate unit that functions like an EOC until the Caltrans EOC has been activated. The

responsibility for the initial determination of the open/close status of State highway system roads resides with the TMC, but when the Caltrans District EOCs are staffed, the TMC supports the corresponding District EOC.

Caltrans is responsible for coordinating all aspects of transportation, including ground, air, and waterway transportation. In the San Francisco Bay Area, this responsibility is shared with the MTC and Water Emergency Transportation Authority. In a catastrophic earthquake that affects the 12 counties addressed in this Plan, Caltrans Districts 4 and 5 coordinate the emergency response activities.

3.6 Private Businesses and Other Non-Governmental Organizations

The following organizations make much-needed contributions to the logistics response.

3.6.1 California Resiliency Alliance

The California Resiliency Alliance (CRA) is a 501(c)(3) non-profit organization. It facilitates local partnerships between businesses and government to fill important gaps in all phases of emergency management. It works closely with Cal OES, other State agencies, and local governments as well as with its business and trade association members.

Upon request from Cal OES, CRA reports to the BOC. CRA has also identified seven private-sector representatives that can report to Operational Area EOCs in the Coastal Region. In all of these venues, CRA representatives assist by communicating information to and from the private sector and by providing access to private-sector resources.

3.6.2 Business Operations Center

Depending on the scope of the event, the State establishes a BOC at the SOC. The BOC serves as a location for business representatives to coordinate directly with the State on providing resources and services.

3.6.3 Utilities Operations Center

When an event has major impacts on utilities in the region, the California Utilities Emergency Association activates the UOC to serve as a location for utility representatives to coordinate restoration efforts and the provision of alternate means of services. The UOC also coordinates the mobilization of in-state and out-of-state resources to provide assistance to local utilities to repair and restore utility infrastructure.

3.6.4 American Red Cross

The ARC logistics operation supports the organization's own disaster response mission in the delivery of the following services:

- Shelter
- Support to people who do not use shelters
- Basic health care and disaster mental health
- Assistance to impacted individuals and families

The ARC also supports impacted residents who do not use shelters—either because they can't access shelters or because they choose to stay in their own residences. Support for those outside of shelters may include offering the following items:

- Water
- Meals (prepared or packaged)
- Personal sanitation supplies
- Tarps
- Blankets, personal hygiene kits

3.6.5 Northern California Voluntary Organizations Active in Disaster

The Northern California Voluntary Organizations Active in Disaster (NorCal VOAD) improves outcomes for people affected by disasters by facilitating cooperation, communication, coordination, and collaboration among non-profit organizations, community-based groups, government agencies, and for-profit companies. NorCal VOAD may coordinate with NGOs to provide additional support for the operation of PODs and other commodity distribution operations. NorCal VOAD and National VOAD send representatives to the SOC or JFO to facilitate the integration of voluntary organizations into operations.

3.6.6 Other Non-Governmental Organizations

After a catastrophic disaster, numerous NGOs offer services to impacted communities. While they operate under their own management structures and missions, many NGOs have agreements with local governments to provide services. Others are encouraged to provide representatives to local government and Operational Area EOCs to coordinate activities.

3.7 Federal Government

In catastrophic events, the Federal government plays a critical support role, providing resource and financial support to States, local governments, businesses, and individuals. The following agencies provide direct support for logistics.

3.7.1 Federal Emergency Management Agency

The roles and responsibilities of FEMA, DHS, and other Federal agencies are described in the NRF. Major responsibilities with regard to logistics include:

- Activation of the FEMA Regional Response Coordination Center at FEMA Region IX in Oakland or at an alternate location; FEMA National Response Coordination Center in Washington, D.C.; and the DHS National Operations

Center in Washington, D.C., to coordinate the initial deployment of Federal resources and commodities

- Immediate deployment of a liaison and subsequent deployment of an incident management assistance team to the SOC to initiate integrated operations with the State
- Activation of logistics support facilities, such as logistics centers, mobilization centers, and Federal staging areas, to support deployment of commodities (see **Section 6** for descriptions of these facilities)
- Deployment of labor and materials-handling equipment for operations at these facilities
- Immediate mobilization of incident-specific commodities identified in the NRF Catastrophic Incident Supplement
- Coordination with the State to plan the transfer of commodities to State control and to identify State and local plans for commodities distribution
- In coordination with the State, deployment of representatives to Operational Area EOCs to ensure that deployed commodities are supported logistically, arrive as requested, and are sufficient to meet requirements
- Tasking of Federal agencies to carry out mission assignments for delivery of commodities in response to State requests

3.7.2 Federal Emergency Management Agency Headquarters Logistics Management Directorate

The FEMA Logistics Management Directorate (LMD) is the primary office for directing and overseeing disaster support for all logistics functions during all incident phases. LMD responsibilities for this event include:

- Establish, maintain, and execute agency-wide logistics plans, policies, procedures, doctrines, standards, and governance
- Develop and maintain national logistics support requirements, capabilities, and visibility of resources
- Provide agency-wide funding, budget, and resource management for logistics
- Provide FEMA Headquarters and Region IX logistics with functional command, coordination, and oversight of all logistics activities (including national resource management at the JFOs and Distribution Centers)
- Coordinate the agency logistics response through the FEMA Logistics Operations Center
- Provide agency-wide logistics information management and communications capabilities

3.7.3 Federal Emergency Management Agency Region IX

Region IX directs, oversees, and executes regional support for all logistics functions during all incident phases. Region IX responsibilities for this incident include:

- Establish, maintain, and execute supplemental regional plans, policies, and procedures that implement FEMA Headquarters plans, policies, and procedures
- Staff the JFO and Federal staging areas, and coordinate the agency logistics response among field units
- Develop and coordinate regional requirements and capabilities with the State and local responders, and link with the State to coordinate the logistics interface
- Provide accountability for FEMA property and equipment assigned to Region IX
- Execute agreements with other Federal agencies and NGOs, and procure support from local sources

3.7.4 Federal Emergency Management Agency Field Units

Field units (primarily JFOs and Federal staging areas) are responsible for FEMA field logistics execution during all incident phases. Field Unit responsibilities for this incident include:

- Execute field unit logistics plans, policies, and procedures.
- Execute field logistics funding, budget, and resource management
- Execute agreements with other Federal agencies and NGOs at the field level
- Execute field logistics contracts with the private sector
- Coordinate agency logistics response at the field units

3.7.5 Federal Emergency Support Function #7, Logistics Management and Resource Support

Federal Emergency Support Function #7, Logistics Management and Resource Support (ES-#7), assists DHS by:

- Providing a comprehensive national disaster logistics planning, management, and sustainment capability that harnesses the resources of Federal logistics partners, key public and private stakeholders, and NGOs to meet the needs of disaster survivors and responders.
- Supporting Federal agencies and State, tribal, and local governments that need resource support before, during, and/or after incidents requiring a coordinated Federal response

3.7.6 Federal Emergency Support Function #12, Energy

Federal Emergency Support Function #12, Energy (ESF #12) facilitates the restoration of damaged energy systems and components when activated by DHS for incidents requiring a coordinated Federal response. It accomplishes this by:

- Providing information concerning the energy restoration process, such as projected schedules, percent completion of restoration, and geographic information on the restoration

- Facilitating the restoration of energy systems through legal authorities and waivers.
- Providing technical expertise to the utilities, conducting field assessments, and assisting government and private-sector stakeholders in overcoming challenges in restoring the system.

3.7.7 U.S. Department of Transportation

The U.S. Department of Transportation (DOT) is the coordinating agency for Federal Emergency Support Function #1, Transportation (ESF #1). DOT works with local and State transportation departments and industry partners to assess the damage to the transportation infrastructure and analyze the impact of the incident on transportation operations, nationally and regionally; DOT also reports promptly as changes occur. DOT implements response and recovery functions performed under DOT statutory authorities, including the prioritization or allocation of civil transportation capacity; funds for repair to Federal Aid highways; hazardous materials containment response and movement; and damage assessment that includes safety- and security-related actions concerning movement restrictions, closures, quarantines, and evacuations.

3.7.8 General Services Administration

The General Services Administration (GSA) is the coordinating agency for ESF #7. In this role, GSA supports the requirements for obtaining facilities, facility setup, space management, building services, general facility operations, and contracting for transportation services.

3.7.9 U.S. Department of Defense

DoD has a broad range of capabilities that can be used to support post-earthquake transportation and logistics requirements. Although the availability of DoD resources is subject to higher-priority tasking, large numbers of vehicles, aircraft, ships, and other equipment may be requested through the Defense Coordinating Officer. Basic capabilities include:

- DoD facilities may be used as National Logistic Staging Areas and other logistics centers.
- DoD can provide heavy- and medium-lift rotary-wing aircraft, short-field fixed-wing aircraft, and specially configured medical evacuation aircraft as well as maintenance crews and logistical support for air operations. The U.S. Air Force also coordinates airspace control for military aircraft in coordination with the California National Guard under the Joint Task Force Airspace Control Plan.
- DoD can provide ships for transportation, movement of resources across the San Francisco Bay, movement of cargo to shore via cranes and ramps, bases for helicopter operations, support for other small-boat operations, berthing for first responders, pierside water and power generation, and medical care.

- DoD can provide trucks, materials-handling equipment, and construction equipment.

3.7.9.1 U.S. Army Corps of Engineers[3]

Commodity distribution. Following a natural disaster or emergency, the U.S. Army Corps of Engineers (USACE) can manage the procurement of critical commodities, such as packaged ice and bottled water, for FEMA as part of the Federal government's unified national response. USACE has 11 specially trained teams to address national needs for ice, water, and combined commodity planning; these response teams are ready to deploy throughout the country to carry out these missions during emergency response operations. Although the State and local governments, with support from FEMA, are responsible for the actual distribution of the commodities, USACE can provide assistance and guidance with the distribution, if requested.

Also, USACE can provide other technical assistance regarding the distribution of these critical commodities, including advance planning and preparedness exercises, assessment of emergency water and ice requirements, determination of the requirements and optimal locations for staging and distribution sites, coordination of transportation resources, and training for distribution site staffs.

Lifeline restoration. Following a natural disaster or emergency, USACE can provide State and local governments with a variety of support for emergency power needs at critical public facilities, assistance that is in support of FEMA as part of the Federal government's unified national response under the National Response Framework.

USACE has emergency power planning and response teams throughout the country with the capability to deploy and provide support ranging from technical expertise to turn-key installation of emergency generators at critical public facilities, such as hospitals and shelters.

The emergency power planning and response teams work closely with FEMA, the Department of Energy, local and State entities, and contractors to execute this mission.

USACE also manages structural safety assessments of commercial and residential structures as well as the assessments of infrastructure systems, such as water and waste water treatment, when requested.

3.7.9.2 Defense Logistics Agency

The Defense Logistics Agency (DLA) is a major supplier of consumable commodities supporting FEMA disaster response through stockpiled Distribution Center inventories and logistics field support requests following a catastrophic

[3] http://www.usace.army.mil/Missions/EmergencyOperations/NationalResponseFramework.aspx

earthquake. DLA resources can be requested through the FEMA LMD or through DLA representatives co-located with logistics staff at the JFO.

Basic response resources for this incident include:

- Meals (MREs and shelf-stable meals)
- Bottled water
- Tents
- Blankets
- Cots
- Comfort kits
- Fuel

3.7.10 Federal Aviation Administration

The DOT Federal Aviation Administration (FAA) oversees the operation and regulation of the U.S. National Airspace System, including the operation of the system during emergencies. Under certain conditions, the FAA may delegate use of specified airspace for national defense, homeland security, law enforcement, and response missions (such as search and rescue), but retains control of the airspace at all times. The FAA may also implement air traffic and airspace management measures such as temporary flight restrictions in conjunction with these missions. Following an earthquake, the FAA evaluates information provided by airports regarding conditions (such as damage to runways, communications, navigation, and air traffic control systems) and may restrict traffic at airports, depending on the conditions. The FAA may also waive certain regulations to allow for the ingress and egress of response resources.

3.7.11 U.S. Coast Guard

The jurisdiction of the 11th U.S. Coast Guard (USCG) District covers the State of California, including the ports in the San Francisco Bay Area and the California Delta. The 11th USCG District command with jurisdiction over the Bay Area is USCG Sector San Francisco, headquartered on Yerba Buena Island.

In the event of an emergency such as an earthquake, the USCG does the following:

- Maintains, monitors, and reports on the safety and navigability of Bay Area waterways.
- Makes and enforces decisions regarding the use of Bay Area waterways, including the opening or closing of waterways to vessel traffic.
- Activates, if required, a mutual assistance plan in which ferry operators in the region have agreed to respond to incidents that threaten the safety of passengers and crew aboard vessels in the San Francisco Bay and the California Delta.

3.7.12 U.S. Department of Transportation, Maritime Administration

The DOT Maritime Administration (MARAD) currently has 13 ships in the Bay Area that may be requested and may be available for use in various roles in the event of a major catastrophe. These ships are currently located as follows:

- 10 berthed at Alameda Point
- 3 berthed at the Port of San Francisco

These ships have a number of features that could augment other commodity distribution operations in the region, including:

- **Potable fresh water.** Each ship can make a minimum of 17,000 gallons of fresh water per day, provided the seawater source is not contaminated. Each ship can store approximately 200 to 600 tons of fresh water, depending on the ship's specifications. The tanker vessel at Alameda Point can hold approximately 40,000 tons of fresh water, provided the tanks are properly prepared.
- **Subsistence rations**. Each ship can prepare and serve an average of 4,000 meals per day (two meals per day for 2,000 people) with shoreside supply and replenishment.
- **Electricity.** Each ship can produce 1,000 to 5,000 kilowatts of electricity (varies by vessel) above the needs of the ship, which could be supplied shoreside to support an emergency facility or tent camp.
- **Shelter.** Smaller ships have ventilated interior cargo areas that could provide shelter for up to 2,000 people. Larger ships could accommodate up to 6,000. Cots and bedding would be needed. Heating, toilet facilities, and sewage treatment capabilities would require equipment installations and modifications to the ship's piping, depending on the duration of use and other circumstances.
- **Refrigeration.** All of the ships have industrial walk-in refrigeration compartments for food stores, and most have refrigerated shipping container plug-in capability.
- **Fuel.** Each ship has sufficient fuel on board to steam for a minimum of 5 days at a service speed of 16 to 19 knots or to run electrical service generators for approximately 30 days while pierside at anchor.

4 Priorities and Objectives

This section outlines the priorities for logistics response support and the objectives that support each of those priorities.

4.1 Overview of Priorities and Objectives

In general, the response priorities with regard to logistics involve determining the needs of those affected by the disaster; efficiently informing the media and potential resource providers about those needs; and establishing a network of sites to receive, process, distribute, and track resources. The detailed, time-based priorities and objectives below support these larger goals.

Because this is a regional plan, the list of the priorities and objectives focuses on the 12-county planning region and is written from the point of view the Cal OES Coastal Region. However, it contains information about the response and coordination activities occurring at the Operational Area and local government levels and is not limited to the specific duties of any particular agency or entity.

The objectives are described according to three time periods of the response. The periods are:

- E to E+72 hours
- E+72 hours to E+14 days
- E+14 days to E+60 days

The last of these periods includes objectives for transitioning to long-term recovery. It involves establishing mechanisms for ongoing maintenance of systems and processes to continue providing management of resources. Concepts for eventual cessation and shutdown of these management operations are beyond the scope of this plan.

The three time periods do not correspond to any particular phase of the emergency management cycle. Instead, this Plan recognizes that there is a gradual transition from the initial response to an event (which focuses on immediate emergency support for lives and property) and the longer-term recovery (which focuses on reestablishing the health and safety of the community).

The following subsections present the operational priorities and objectives by time-phase. In addition, **Appendix F, Response Timeline** contains a comprehensive response timeline for logistics response operations. The timeline shows the individual tasks used to meet these objectives and the agencies responsible for performing them.

Note that the particular time periods for the priorities, objectives, and tasks specified here are for a catastrophic earthquake in which damage to the transportation and communication infrastructure is extensive. In the most heavily damaged places, it takes several days for initial damage assessments and communications systems to

be completed. In smaller or more localized events—or in disasters other than earthquakes—many of these activities could be completed sooner. Thus, to produce a more general plan than this one, the activities in this Plan could be scaled down.

4.2 E to E+72 Hours

The first 72 hours after an earthquake are closely associated with incident analysis, in which the affected areas, infrastructure status, and commodity needs are determined.

4.2.1 Operational Priorities

The operational priorities are:

- Develop situational awareness of the impacts of the earthquake with respect to the disruption of critical lifeline infrastructure and the scope of the requirements necessary to provide life-sustaining logistics support to affected populations
- Establish and operate an organization to coordinate ordering, receiving, and distributing disaster response commodities and supplies, including the anticipated influx of State and Federal resources into the region
- Establish a regional system to determine the priority for distribution of life-sustaining logistics support to affected populations based on life-safety concerns

4.2.2 Objectives

The response objectives are:

- Establish an ICS structure that coordinates logistics operations by integrating local, Operational Area, region, State, and Federal operations, as well as the private sector
- Establish interoperable emergency communications among public- and private-sector transportation and logistics entities involved in logistics operations
- Determine impacts to transportation infrastructure and the private-sector commodity distribution system (i.e., food, water, and fuel distributors)
- Identify the locations and sizes of affected populations, including people with access and functional needs
- Assess the feasibility of pre-identified local LSAs and PODs
- Identify sites for LSAs and PODs that are nearest the locations of the most affected populations
- Determine priority transportation routes for logistics activities to enable the initiation of debris clearance and infrastructure inspection and repair
- Identify priorities for the use of available resources to assist in movement of commodities into impacted areas
- Coordinate logistics assessments with initial damage assessments and other situational reports

- Coordinate with the Mass Care and Shelter Branch to maintain situational awareness of the current and ongoing need for shelters and pickup points
- Notify all agencies that support LSAs and PODs

4.3 E+72 Hours to E+14 Days

From 72 hours to 14 days after the earthquake, State and local governments establish staging areas and PODs.[4] Coordination with government and non-government agencies is critical during this phase. The public should be notified about the locations of PODs and the availability of commodities.

4.3.1 Operational Priorities

The operational priorities are:

- Develop a plan of operations to support the movement of commodities into the affected area
- Establish LSAs for the receipt of Federal and other commodities from outside the region
- Establish PODs for the distribution of commodities to affected individuals
- Develop a public information plan to inform affected populations about the locations and operation of PODs throughout the region
- Develop a fuel plan to support movement of commodities and operation of LSAs and PODs
- Identify other, non-government distribution operations to prevent duplication of services
- Identify private-sector resources to support government distribution activities

4.3.2 Objectives

The response objectives are:

- Finalize the list of priority transportation routes being used, and coordinate with debris clearance and public works agencies to confirm the availability of routes
- Identify PODs and coordinate with local governments to support the operation of the sites
- Support the development of incident action plans at PODs to address operations and the eventual decrease in volume and demobilization
- Coordinate with the Transportation Branch to acquire and deploy appropriate resources to move commodities between LSAs and PODs in the region
- Mobilize staff and supplies for LSAs and PODs
- Open LSAs and PODs
- Coordinate with the Joint Information Center to disseminate timely information about POD operations to the general public

[4] The State does not set up or operate PODs.

- Acquire and deploy additional transportation resources from local, State, Federal, and private-sector sources as the resources become available
- Acquire, maintain, and deploy logistics support resources such as fuel distribution systems, maintenance support, and law enforcement staff
- Monitor activities of PODs to ensure efficient distribution of commodities
- Establish a Multi-Agency Coordination System (MACS) group for commodity distribution, if needed
- Provide information to the Construction/Engineering Branch about routes that must be opened to support logistics
- Establish communication systems between PODs, LSAs, and EOCs
- Coordinate with the Mass Care and Shelter Branch to identify and support people who choose not to use shelters but need commodities
- Gather data on commodity-use rates to anticipate potential shortages

4.4 E+14 Days to E+60 Days

During the period from 14 days to 60 days after the earthquake, logistics planning should focus on demobilizing operations, while continuing to serve residents who still need commodities. While the Plan timeline extends only through the first 60 days of the event, the Plan recognizes that logistics operations extend well beyond that point.

4.4.1 Operational Priorities

The operational priorities are:

- Maintain support of PODs
- Continue to support people who choose not to use shelters by providing information and commodities to the extent possible
- Initiate the demobilization of the earthquake response supply chain

4.4.2 Objectives

The response objectives are to:

- Continue to monitor distribution activities of PODs
- Continue to support LSAs and PODs with resources for sites and transportation of commodities
- Monitor and coordinate the capabilities of agencies, vendors, and other organizations to support the distribution of commodities
- Identify opportunities to close PODs and consolidate distribution activities in the most-impacted communities
- Coordinate with the private sector to identify conflicts between the restoration of retail businesses and POD activities
- Demobilize unnecessary PODs and LSAs

5 Coordination and Communication

The coordination and communication section of this Plan describes the overall approach to coordinating the establishment of a logistics framework to receive, stage, store, track, deploy, and distribute resources and commodities. **Section 5.1** describes the organization of the system activation and coordination, the information-sharing systems, and the manner in which the region requests, receives, and coordinates outside resources. **Section 5.2** conveys the plan for creating, integrating, and dispensing public information regarding the location of PODs and the commodities available.

5.1 Activation of the Logistics Support Framework

After the earthquake, local governments and State agencies begin to assess the damage to infrastructure and the impact to local communities to determine which areas of the region require assistance. Information flows up through SEMS channels to the State and Federal governments to aid in determining which resources are needed and the most effective means and routes of getting them to the places that need them the most.

Given the impact of the earthquake, the Federal Government immediately begins movement of Federal resources toward the affected area in anticipation of requests for assistance from the State. FEMA requests the use of military bases as National LSAs through the DoD. The FEMA National Response Coordination Center initiates deployment of personnel to establish and operate National LSAs, which remain FEMA-run facilities but have support and assistance from designated support agencies. Transportation assets are established at designated National LSAs to meet anticipated requirements for moving commodities and response teams. Mission assignments are issued as needed to the DoD and other agencies to provide transportation assets at the National LSAs.

The State works with local governments in a coordination role to support the establishment of LSAs in strategic locations. Local governments also establish PODs, warehouses, and other logistical support sites as necessary. The locations of these sites must be communicated and coordinated with those providing resources.

5.1.1 Field

In field operations, Incident Commanders request resources to accomplish their objectives. When those resources arrive, they must be integrated into the response. The activation and operation of LSAs, PODs, and warehouses occur at the field level. Incident Commanders also operate shelters, evacuation pickup points, incident command posts, and local mobilization centers that all require logistics resource support.

5.1.2 Local Governments

Local governments activate EOCs to coordinate and provide support to field operations. Local government activities include coordinating the activation and operation of the following sites that support logistics operations:

- LSAs
- PODs
- Warehouses

In addition, local governments are responsible for providing logistics support to the local operations of:

- Shelters
- Evacuation pickup points
- Incident command posts
- Emergency responder mobilization centers
- Mass feeding and water distribution

The EOC communicates directly with Incident Commanders of each of these operational sites to determine resource shortfalls and to continually evaluate the effectiveness of the response strategy and monitor the achievement of objectives.

5.1.3 Operational Areas

The Operational Area is the intermediate level of SEMS and is responsible for coordinating the sharing of information and the acquisition of resources in a county, including all political subdivisions in the county boundary (e.g., cities, special districts) and unincorporated areas in the county.

In response to a disaster, Operational Areas:

- Process requests from local governments for commodities and other resources, and forward those requests to the region when resources are unavailable in the Operational Area
- Communicate directly with the REOC or with the regional staff at the JFO if the REOC function is folded into the JFO
- Provide information and updates about the condition of the affected jurisdictions, including reports on the status of the disaster, damaged areas and infrastructure, affected populations, and other pertinent information to the Cal OES Coastal Region
- Coordinate with local governments and the private sector to determine the most appropriate locations for activating LSAs and PODs to support distributing commodities and the staging and deployment of resources
- Coordinate with local governments in the Operational Area to determine the most effective means of distributing scarce resources and commodities to the affected communities

5.1.4 Cal OES Coastal Region

As described in the RECP Base Plan, the Cal OES Coastal Region coordinates resource requests from the affected Operational Areas with other Operational Areas in the region, State agencies, and the SOC. The Coastal Region:

- Works with the Operational Areas to identify requirements for commodities and resources to support commodity distribution operations
- Works with the Operational Areas to identify sites for LSAs and other facilities that are to be strategically located in the region to effectively deliver resources to the areas that are the most severely impacted
- Coordinates in-bound commodities with the Operational Areas to ensure that these commodities are supported appropriately
- Obtains the necessary personal, equipment, and sites to assist the Operational Areas with logistics by mission-tasking State agencies or by other means
- Deploys liaisons to the Operational Area EOCs, in collaboration with Federal Government representatives, to ensure that deployed commodities are supported logistically, arrive as requested, and are sufficient to meet requirements

Due to the catastrophic nature of the scenario earthquake, it is assumed that the regional function of SEMS is co-located with the SOC or JFO as they are activated.

5.1.4.1 Regional Coordination Group

The RECP defines the Regional Coordination Group as an entity that brings together representatives from the Operational Areas, local governments, the Coastal Region, the State, and subject matter experts to discuss aspects of the response. The Regional Coordination Group exists primarily to prioritize resource allocation among the Operational Areas in the region when resources are insufficient to address all requests. Due to the numerous resources that need prioritization, the Regional Coordination Group is likely to seek assistance from function-specific task forces.

5.1.4.2 Commodity Distribution Task Force

After a disaster, the distribution of commodities, including donations, to communities in need requires local jurisdictions, the State and Federal governments, NGOs, and businesses to work together. While FEMA supplies certain commodities, commodities also come from donations, NGOs, and other governments. The Commodity Distribution Task Force identifies commodity sources and coordinates their delivery to the locations where the commodities are distributed. This task force is a unified effort of representatives from local governments, the State, the Federal Government, NGOs (i.e., ARC and NorCal VOAD), and private businesses (i.e., CRA).

5.1.5 State of California

The State coordinates with the region and Federal agencies initially at the SOC and later at the JFO, once it is established. The State coordinates the acquisition and provision of resources that cannot be acquired in the region. The State may request resources from other regions in the State that are less affected or unaffected, from State agencies and from other states either through the Interstate Civil Defense and Disaster Compact, through the EMAC, or from the Federal Government. As part of its coordination function, the State:

- Projects commodities needs for the region
- Coordinates the pre-positioning of commodities for deployment to the region
- Identifies State staging areas and other support facilities, including property owned or managed by State agencies
- Coordinates the State provision of labor and materials-handling equipment at these locations
- Identifies State resources that can be used to transport commodities, such as assets provided by the California National Guard, including prioritization and use of air assets
- Receives commodities from the Federal Government and other providers—either at Federal staging areas or at State staging areas—and transports these commodities to locations for deployment, such as PODs

Cal OES is responsible for ensuring that State and Federal response operations are coordinated and for coordinating the integration of Federal resources and commodities into the State response operation. Cal OES initiates this process at the SOC and later coordinates with FEMA at the JFO, once that facility is established.

5.1.6 Federal Government

State and Federal agencies respond to the earthquake under their own authorities. Once the Unified Coordination Group is established, these activities must be coordinated with the joint State/Federal organization established as part of the JFO so that they can be accounted for in the incident action plan process. To the extent possible, sustained operations should be folded into the joint State/Federal response through the mission-tasking/mission-assignment processes.

5.1.6.1 Joint Field Office

JFO is a temporary Federal facility that provides a central location for the coordination of Federal, State, tribal, and local governments and private-sector and nongovernmental organizations with primary responsibility for response and recovery. The JFO structure is organized, staffed, and managed in a manner consistent with *NIMS* principles and is led by the Unified Coordination Group. Although the JFO uses an ICS structure, the JFO does not manage on-scene operations. Instead, the JFO focuses on providing support to on-scene efforts and conducting broader support operations that may extend beyond the incident site.

Personnel from Federal and State departments and agencies, other jurisdictional entities, the private sector, and NGOs may be requested to staff various levels of the JFO, depending on the requirements of the incident.

5.1.6.2 Unified Coordination Group

The JFO is led by the Unified Coordination Group, which is comprised of specified senior leaders representing State and Federal interests, and in certain circumstances tribal governments, local jurisdictions, the private sector, or NGOs. The Unified Coordination Group typically consists of the Principal Federal Official (if designated), Federal Coordinating Officer (FCO), State Coordinating Officer, and senior officials from other entities with primary statutory or jurisdictional responsibility and significant operational responsibility for an aspect of an incident (e.g., the Senior Health Official, Department of Defense representative, or Senior Federal Law Enforcement Official if assigned). Within the Unified Coordination Group, the FCO is the primary Federal official responsible for coordinating, integrating, and synchronizing Federal response activities.

The composition of the Unified Coordination Group will vary, depending upon the scope and nature of the incident and the assets deployed in support of the affected jurisdiction.

The JFO structure normally includes a Unified Coordination Staff. The Unified Coordination Group determines the extent of staffing based on the type and magnitude of the incident.

5.1.7 American Red Cross

The ARC's logistics supply chain is a self-contained operation that is separate from government logistics operations. However, when the ARC needs additional resources to fulfill its mission, it requests them from government entities or from individuals and businesses in the form of donations.

The ARC assigns representatives to each level of government, from the Operational Area to the REOC (if activated), the SOC, and the JFO. If circumstances demand it, the ARC also assigns representatives to local government EOCs. Traditionally, the ARC assigns representatives with mass care expertise to operations branches of Operational Area EOCs and the REOC. Because the organization now recognizes that support of mass care activities is just as important as actual provision of shelter services, the ARC plans to put both a mass care and a logistics representative in the activated Operational Area EOCs that are most severely impacted by the scenario earthquake. ARC representatives in the JFO coordinate ARC activities with the State government response and FEMA's Federal Emergency Support Function #6, Mass Care, Emergency Assistance, Housing and Human Services (ESF #6). By providing representatives at all levels of government, the ARC aims to prevent duplication of services and resource requests.

Despite the catastrophic and regional nature of the scenario, the ARC's operation is based on local response. As described in the Regional Catastrophic Earthquake Mass Care and Sheltering Plan, ARC personnel from local chapters open shelters as soon as possible. A regional Disaster Response Operations office is opened to support all Bay Area chapters. The Disaster Response Operations office communicates directly with ARC National Headquarters. Thus, the ARC has situational awareness of the event response from the field level to the Federal level.

In heavily damaged areas, the ARC may co-locate its distribution activities with locally managed PODs, which distribute the commodities and services of government and other non-profit organizations. However, the ARC attempts to stage its commodities independently in its own local staging areas in order to control inventory.

5.1.8 Other NGOs

NGOs are integrated into the coordination structure at the level of SEMS most consistent with the NGO's scope of services. For example, NGOs whose mission is to provide services to only one community or local government are integrated into the response through coordination with the local government EOC. In contrast, larger NGOs—those that serve communities across the country or communities outside the State of California—are integrated into the response through the coordination of the individual assistance branch of the joint State/Federal Operations Section.

5.2 Information and Communication

Rapid evaluation of the earthquake impact is essential, as a coordinated appraisal of the intensity and extent of the incident is critical to supporting decision making. The flow of information from local government and Operational Area EOCs to the region (REOC), the State (SOC), and to the Federal Government (JFO) requires a disciplined approach to facilitate effective development of a common operating picture and to compensate for the earthquake-driven degradation of the communications system.

5.2.1 Intelligence and Information Sharing

The collection, compilation, and sharing of data is another key component of effective logistics response operations. Specific, credible, and actionable information is required from staging areas, PODs, shelters, pickup points, and other logistics operations sites. See **Section 6.5.4** for details on information-sharing systems used in the region.

5.2.2 Public Information

Effective public messaging is a critical component of any effective emergency response. For the scenario earthquake, public assistance flows into the region in many forms, including but not limited to commodities such as food, water, fuel, and

various types of donated goods. To get these items successfully into the hands of those needing assistance, public messaging is critical. Local governments should be prepared to disseminate messages to the public. Message development and coordination are accomplished at Joint Information Centers (JICs). JICs may be established at different levels for different audiences depending on the nature of the event. Most likely, JICs are operated by Operational Areas and at the JFO. Key messages regarding logistics response operations should include the following:

- Locations of PODs
- Types of commodities and other supplies that the public can receive at a POD
- What to expect on arrival at a POD
- What, if anything, individuals need to bring with them to a POD
- Locations where goods can be donated
- Where to find additional information regarding PODs and donations

Media relations. The media may wish to visit POD sites. This must be coordinated with the jurisdiction's Public Information Officer (PIO). All questions from the media must be directed to that PIO. This ensures a common message across the jurisdiction and other PODs. Community relations staff and the POD manager are the primary points of contact for media inquiries.

Public relations. Community relations staff can also provide information to POD customers. This information is provided by the PIO of a jurisdiction. The information may be conveyed verbally or through handout flyers. The POD Manager should work closely with community relations staff to ensure that correct messages and languages are being provided.

FEMA and the State, through Cal OES, also provide public messaging to broader audiences. The State protocol for coordinating public information centralizes State efforts in the Office of Public Information and Media Relations at Cal OES Headquarters. The Office of Public Information provides support directly to Cal OES's regional offices and to the REOC; it works with other State agencies to ensure proper coordination, exchanges, and dissemination of information. Templates for public information releases can be found in **Appendix E**.

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6 Concept of Operations

The general concept for logistics operations for the region integrates elements of all of the other regional catastrophic earthquake plans but primarily includes concepts from the CONPLAN, the Regional Catastrophic Earthquake Mass Transportation/Evacuation Plan, the Regional Donations Management Plan, and the Regional Catastrophic Earthquake Mass Care and Sheltering Plan.

The concept of operations for this Plan provides the 12-county Bay Area region with a coordinated logistics response plan that addresses both the system of staging, storing, and distribution and the resources necessary to make the system operational. The concept of operations presents an overall framework for logistics; the roles and responsibilities of government departments, NGOs, and the private sector; an outline for operations; and strategies for requesting and procuring needed resources to increase the response, relief, and recovery capabilities of the region.

6.1 Activating the Logistics Support System

The movement and distribution of resources and commodities both in anticipation of requests from the State and local governments and in response to actual requests follows a hub-and-spoke concept in the region. The hubs are shown in **Appendix B, Map B-3**. Immediately upon the occurrence of the incident and the activation of the State's emergency management system, local governments, Operational Areas, and Cal OES begin collecting information to gain situational awareness. Priority is placed on determining the resources required to save lives, protect public health and safety, and sustain the population. At the same time, FEMA and other Federal agencies activate Federal operations centers, both in the region and nationally; activate the national system for logistics; and begin deployment of resources and commodities as specified in the NRF Catastrophic Incident Supplement,[5] in anticipation of requests from the State.

Shipment of resources and commodities begins within 12 hours of an incident. FEMA coordinates the movement of commodities with Cal OES, initially at the SOC and then at the JFO, once that facility is established. Initially, FEMA moves commodities to Federal mobilization centers and to Federal staging areas set up in the vicinity of the affected area. Once the State requests these commodities, they are transferred to State control at the Federal staging areas or delivered to State and local LSAs and receiving/distribution points located in each hub. When requested and if possible, FEMA may deliver commodities directly to PODs. FEMA provides logistical support and handling of commodities until the commodities are transferred to the State or to the local government for distribution to the public, although FEMA may provide resources to support these operations at the State's

[5] Upon recognition that a catastrophic incident condition (e.g., involving mass casualties and/or mass evacuation) exists, the Secretary of DHS immediately begins implementation of the NRF Catastrophic Incident Supplement.

request. Local governments are responsible for distribution of the commodities to the general public.

Operational control and execution of logistics functions are pushed down to the lowest effective level. FEMA leads the synchronization and integration of out-of-state resource support capabilities from Federal, State, local governments, NGOs, and private-sector responders. State requests for support are submitted to FEMA, which facilitates acquisition through all available sources. FEMA Logistics employs a push/pull strategy for resource response. Initially, critical response assets are pushed to Federal staging areas in order to establish a supply of response assets based on estimated requirements for the region. Once operational control is established in the field, the push concept transitions to a pull concept regarding identified and established operational LSAs. During the pull execution, in order to maintain effective resource management, the FEMA Regional Response Coordination Center, Unified Coordination Group, and JFO communicate resource requirements through the FEMA LMD based on actual commodity consumption rates.

6.1.1 National Distribution Centers

Upon request from the State, FEMA looks for resources in their national distribution centers. FEMA distribution centers are permanent Federal storage facilities that receive, store, and ship disaster commodities and equipment. These commodities are shipped to staging areas identified in coordination with the JFO.

6.1.2 National Logistics Staging Areas

National LSAs are temporary facilities in the vicinity of the affected area at which commodities, equipment, and personnel are received and pre-positioned for deployment upon State request. These commodities are supplied from logistics and mobilization centers or from vendors; they are under the control of the Operations section of the JFO. National LSAs are generally projected to hold 1 to 2 days of commodities. For the Bay Area earthquake, potential national LSAs are listed below and shown in **Appendix B, Map B-5**.

- Travis Air Force Base (Solano County)
- Beale Air Force Base (Yuba County)
- Lemoore Naval Air Station (Kings County)

6.2 Establishing Receiving, Staging, and Distribution Sites

Local governments in coordination with Operational Areas must establish mechanisms for receiving, managing, and distributing commodities. Depending on the specific impact of the scenario earthquake, commodities may be delivered to:

- LSAs and receiving centers, either at existing facilities or temporary facilities established in response to the earthquake, where they are staged for future use

- Shelters, medical treatment sites, and other locations
- PODs, where they can be distributed directly to the general public

Local governments manage the use of these sites for receipt and distribution of commodities, regardless of source, including those provided by the State and Federal governments, the private sector, or donated by the public. Sites are identified and activated based on the following considerations:

- Some local governments have pre-identified sites and have arrangements with site owners to use those locations for emergencies or disasters. After the scenario earthquake, these sites must be evaluated to confirm that they are still viable options.
- If sites have not been pre-identified, efforts must be made immediately following the earthquake to identify locations suitable for LSAs and PODs.

Use of State-owned or State-managed facilities, such as fairgrounds, must be coordinated with the region and the appropriate State agency to minimize potential conflicts for use and prioritization of these sites.

6.2.1 Local Logistics Staging Areas

Local LSAs are established as intermediate sites in the hub-and-spoke system of commodity distribution and resource allocation. While some commodity shipments are delivered directly to POD locations, other commodities are routed to LSAs where they can be temporarily staged or stored before being routed to the location where they are distributed or used. To support efforts to restore lifelines and critical infrastructure, LSAs may temporarily warehouse commodities, equipment, and supplies that are needed to support communities impacted by the earthquake and may temporarily house emergency responders.

The State coordinates with Operational Areas on the establishment of LSAs for the receipt, staging, and distribution of commodities. These staging areas are used to receive large quantities of commodities, generally in truckload quantities. Shipments are broken down and allocated according to the needs of the distribution points served by the LSA.

An LSA may receive commodities from:

- Local government caches and vendors
- State agencies
- Federal mobilization centers and national LSAs
- NGOs and private businesses

If requested, the State may assist the region by tasking other State agencies, such as the State's Departments of General Services and Parks and Recreation, with identifying appropriate State-owned sites for use as LSAs. The State may also task other State agencies to provide support to local governments in managing and operating LSAs.

Potential sites for establishing an LSA should have the following characteristics:

- Near a major highway
- Fenced or an otherwise secure area
- Separate ingress/egress routes for shipments
- Ready access to multiple modes of transportation
- Area with paved or compressed rock, sufficient for parking vehicles containing commodities that are not unloaded (i.e., refrigerated trailers or staging vehicles that are used to transport resources)
- Covered area for inside warehousing of commodities
- Loading dock or portable ramp capability

6.2.2 Points of Distribution

PODs are locations where commodities such as water, ice, packaged food, medical supplies, repair supplies, and other necessities are distributed directly to individuals. In general, PODs must have sufficient space for unloading trucks, space for storage and distribution of at least one day's worth of commodities, and access and waiting space or parking for the public. Specific considerations for setting up PODs and the different types of PODs are provided in **Appendix H, Commodity Points of Distribution**. Publicly accessible PODs can be shared sites at which the goods from the ARC and other voluntary agencies and private-sector entities may be distributed. Those commodities arrive at PODs through logistics systems that are managed by the respective organizations.

The determination to activate, operate, and demobilize a POD is at the discretion of the local government. The determination of the location, number, and type of PODs is based on:

- Needs analysis
- Population density
- Current methods of commodity distribution
- Types and availability of commodities needed
- Site capabilities
- Access to the POD site

For the scenario earthquake, NGOs and businesses may set up PODs to distribute donated commodities. NGOs and businesses should coordinate the activation of these PODs with local government so that needs are met without duplicating efforts and so that the restoration of the normal retail supply chain can be restored.

6.3 Commodity Distribution

After a catastrophic earthquake in the region, many communities are without power, water, sanitation, food, and medical supplies for long periods of time. A description

of the critical commodities and the process for requesting and distributing them are described in **Sections 6.3.1** and **6.3.2**.

6.3.1 Alternative Distribution Methods

Due to several factors, such as access to affected communities, serving those with access and functional needs, security issues, and the lack of appropriate sites to support a POD, local governments may choose to distribute commodities by alternate means.

- **Mobile delivery** requires the use of vehicles to drive into an affected area and provide commodities at different drop locations where the need is identified. This type of distribution is common in rural areas and where roads are damaged.
- **Direct delivery** is coordinating with a specific location, such as a shelter, feeding site, hospital, or long-term care facility for the delivery of specific items and quantities. These commodities could include food, water, ice, and comfort kits. Direct deliveries are usually larger in size and more specific in commodity type than what is delivered through mobile delivery.

Since event impacts and community needs differ from jurisdiction to jurisdiction, local governments should develop plans for distributing commodities that are specific to the anticipated needs of their communities. The local plans should address establishing PODs, but also consider alternative means of distribution like those mentioned above to address members of the community that may not be able to visit PODs. Localized commodity distribution planning is especially important in address populations with access and functional needs.

6.3.2 Types of Commodities

6.3.2.1 Water

After an earthquake, water is needed for fighting fires, facilitating a sanitary environment, and drinking, among other uses. After the scenario earthquake there is significant damage to the water delivery system and to the wastewater transport system. Due to these impacts, there is a critical need for bottled water and non-potable water for purposes other than drinking or cleaning food, but this should not preclude other potable water delivery such as the use of on-site water purification systems and members of the community bringing their own containers to acquire water.

Cal OES developed the Multi-Agency Response Guidance for Emergency Drinking Water Procurement and Distribution to:

- Outline how to integrate the SEMS and NIMS protocols in responding to an emergency that affects the local water utility water distribution system during a large-scale or regional event that triggers local emergency proclamations or a Governor's state-of-emergency proclamation

- Assist local utilities and emergency response organizations to facilitate and develop local protocols for activating a MACS group for emergency drinking water, as needed
- Provide a common understanding of the key roles and responsibilities and the emergency management response structure to be assumed by the local water utility and the other SEMS and NIMS response organizations relative to the procurement and distribution of emergency drinking water

Water and wastewater utilities have their own plans for business resumption and the distribution of drinking water after an event that disrupts normal service. Water and wastewater utilities have partnered under an organization called the California Water/Wastewater Response Network to support and promote State-wide emergency preparedness, disaster response, and mutual assistance matters for public and private water and wastewater utilities. After an event, these utilities work through SEMS channels to provide assistance to water/wastewater utilities that need additional resources to recover from damage to infrastructure and damage to the communities impacted by a loss in service.

Additional information regarding the water lifeline and efforts to restore services can be found in **Appendix G, Tab 2**.

6.3.2.2 Food

Due to massive power outages and the fact that not all households store non-perishable foods, the distribution of MREs and heater meals and the provision of other methods of feeding are necessary. The procurement and distribution of food is handled through a partnership of government and non-government organizations and private businesses. Shipments of food commodities arrive at the LSAs and are distributed to each POD in the hub based on the projected population to be served. NGOs and private businesses may also set up PODs to distribute food acquired through their own channels, but these organizations are encouraged to coordinate their efforts with local governments so that the commodities reach the communities in need efficiently, thus limiting waste and/or duplication of effort.

6.3.2.3 Fuel

Based on assumptions in **Section 2.4.1**, fuel availability is scarce and must be prioritized. Fuel is used to support the movement of resources and to power generators, and as a heating/cooling source in homes and businesses. Fuel is also considered a lifeline in that it is a critical requirement for an effective emergency response. Additional information on restoring the fuel lifeline can be found in **Appendix G, Tab 1**.

6.3.2.4 Sanitation

Based on the assumption that water and wastewater delivery systems are severely degraded or entirely non-functional, resources to support proper sanitation are

required. For locations where operations are being conducted, those receiving services and personnel providing services need:

- Portable toilets
- Toilet paper
- Wet wipes
- Portable showers
- Sanitary disposal

6.3.2.5 Medical supplies

Many people are injured and require medical care after the earthquake, which exhausts the resources that exist in the region. Additionally, people that require daily medications and other health services need continued access to prescription medicines and health care. Requests for medical supplies and pharmaceuticals are initiated through local health departments, and they manage their own logistics supply chain during the response. The coordination and management of medical supplies and pharmaceuticals is not addressed in this plan.

6.3.2.6 Generators

After the scenario earthquake it is estimated that over 2.9 million households are without power. The lack of power also impacts numerous businesses, government agencies, hospitals, transportation systems, and other critical service providers. Many critical service providers have prepared for power outages and have installed generators so that they may continue to provide services. These generators are entirely reliant on the supply of fuel on hand. Generators vary in size, in their capable support load, in the amount and type of fuel they require, and in the length of time for which they can provide alternative power.

6.3.2.7 Other commodities

Depending on community needs, other supplies are often requested and distributed, such as ice, blankets, tents, cots, and diapers. PODs distribute some of these items, and some may be distributed through the alternative means described above. However, most commodities of this type are distributed by NGOs to shelter residents. The BOC with assistance from CRA representatives can assist in coordinating the acquisition of these commodities.

6.4 Resource Coordination

After a catastrophic earthquake, local governments are overwhelmed and lack the necessary resources to respond effectively. Resources flow into the region from several sources. Some resources are formally requested, while others come unrequested, such as donations and spontaneous unaffiliated volunteers.

6.4.1 Requesting Commodities

Local governments are responsible for identifying potential requirements for commodities. Assuming that on-hand commodities are insufficient, the local government may seek support from vendors, ARC, and other NGOs, and the Operational Area. If the Operational Area cannot obtain the required commodities, it may request support from the State through the Region. In general:

- Commodities required to support the population, such as food and water, may be requested through the Care and Shelter Branch of the Operations Section at the Operational Area EOC
- Medical and public health commodities are requested through the Medical and Health Branch by the Medical/Health Operational Area Coordinator, as described in the RECP Medical and Health Subsidiary Plan.

6.4.2 Commodity Sources

To effectively match commodities with needs, local governments need to be aware of inbound commodities and where they are coming from. Commodities may come from the following sources:

6.4.2.1 Government-Provided Commodities

Commodities may be available from unaffected local governments in Northern California and others in Southern California, State agencies, other states, and the Federal Government. These commodities typically flow into the region in a more orderly fashion, as they are formally requested and can be tracked from the point of departure to their final destination. It is the responsibility of each level of SEMS to track and coordinate commodity shipments.

6.4.2.2 Donated Commodities

Although monetary contributions are preferred, many resources, including commodities, are donated by businesses, individuals, and NGOs. Integrating these resources into the distribution system is a joint effort between government agencies and the NGOs and businesses providing the goods and services.

Depending on the type of donation, the locations to which donated resources are routed may vary. Efforts are made to direct donated commodities to LSAs so they can be combined with the commodities provided by FEMA and other government sources. Many NGOs like the ARC receive donations directly and manage their receipt, staging, and distribution.

While donations are often helpful, some donations arrive that are not needed, causing logistical challenges. For these items, it is important for local governments to identify warehouses where they can be stored until a need arises or until they can be re-donated. Additional detail on the management of donations can be found in the Regional Donations Management Plan.

6.4.2.3 Procurement and Contracting

In general, local governments have established procurement and contracting guidelines; however, some local governments may not have established guidelines for procurement and contracting during a proclaimed emergency. Each agency is responsible for establishing effective administrative funding controls, segregation of duties for proper internal controls, and accountability to ensure that costs incurred are consistent with the missions identified.

A service contract and memorandum of understanding (MOU) should be maintained that contains details of pricing and delivery timeframes for each item supplied by a contractor. The status of a contract or MOU should be verified at least annually. Contact lists that include electronic mail addresses, phone numbers, fax numbers, and cellular numbers of representatives should be regularly maintained.

MOUs should also specify delivery methods. An agreement on shipping terms and delivery time frames should be included in each MOU.

6.5 Resource Movement and Distribution

The region may coordinate the acquisition of resources through several channels, including the following:

- Identification of a governmental resource in the region
- Identification of a non-governmental resource that can work directly with the Operational Area
- Coordination with the SOC/JFO, which can find government resources in the State from other regions, mission-task State agencies to provide additional resources, or request Federal support

The following are examples of resource requests to support logistics response operations:

- Identification of facilities for multi-agency warehouses
- Identification of sites for LSAs, bases, camps, and PODs
- Coordination with regional organizations to address staffing of sites
- Technical assistance to support local logistics response operations
- Assistance with transportation of resources

State and Federal resources flow through the Cal OES regional structure to support Operational Areas and local governments. Following the principles of SEMS, all disasters are local and are coordinated by local government. State and Federal resources may be requested by Operational Areas using the standard resource request processes in their Emergency Operations Plans and the State of California Emergency Plan.

6.5.1 Axes of Movement

The overarching strategy to complete the mission is to execute an integrated approach that increases response capabilities while gaining access along multiple axes of movement into the most severely affected areas. The axes of movement include the use of available land routes, air transport, and maritime transport to support the affected population by restoring critical services. As access is gained, resources are moved into the affected area according to the following priorities:

- Response teams to support lifesaving actions including firefighting, search and rescue, and medical treatment
- Response teams for public safety
- Teams and equipment required for clearing priority routes
- Supplies for sheltering and commodity distribution
- Teams to assess damage to structures

The joint effort by local, State, and Federal agencies emphasizes the reestablishment of the transportation system to facilitate the effective movement of resources into the most severely affected areas (from national LSAs and other sources) and to move the injured, evacuees, and others out of the affected areas. Lines of supply and transportation include:

- Priority land routes, as shown in the Regional Catastrophic Earthquake Mass Transportation/Evacuation Plan, depending on damage to or closure of key bridges and freeways
- Air routes, using rotary-wing aircraft in the Bay Area and established heliports, local airports, regional airports, and temporary sites for landings
- Water routes, using in-region ferry assets, MARAD vessels, and out-of-region vessels from the DoD and other sources, particularly between San Francisco and inland ports (depending on the damage to port facilities)

The axes of movement provide a framework for the commodity distribution flow, as described in **Section 6.5.2.**

6.5.2 Commodity Distribution Flow

The commodity distribution flow represents the flow of commodities from their point of origin to the location where they are distributed to those who would use them. Sources of commodities are described in **Section 6.4**. These sources organize commodities at locations outside the region through stockpiling and warehousing, procurement from vendors, and soliciting donations. FEMA initiates the flow of commodities from national distribution centers. FEMA commodities flow from these centers to national LSAs to local LSAs and PODs established in the region. FEMA may choose to deliver commodities directly to PODs when:

- The incident impacts are confined to a limited number of jurisdictions
- PODs are setup and ready to receive and distribute commodities
- PODs are accessible

Commodities from other sources flow from many different origination points. The general flow of commodities is shown in **Figure 6.1**.

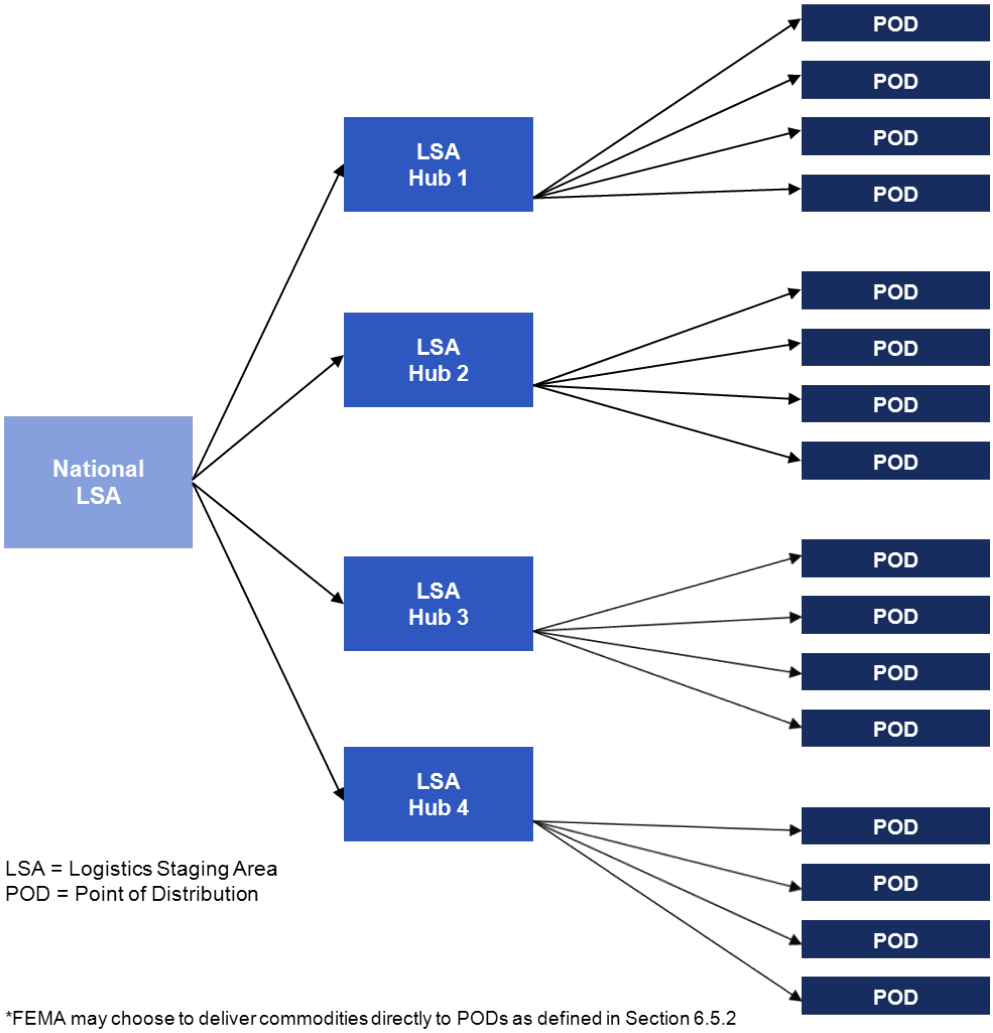


Figure 6.1. Resource flow.

6.5.3 Transportation of Commodities

Transportation assets will be established at designated National LSAs to meet anticipated requirements for moving commodities and response teams. Mission assignments will be issued as needed to the DoD and other agencies to provide transportation assets at National LSAs. These assets will transport commodities to LSAs and PODs through the joint coordination of the State and FEMA at the JFO.

Local governments are responsible for transporting commodities from LSAs to PODs. If local governments lack the necessary transportation assets to transport the commodities, they are encouraged to request support from the State.

6.5.4 Resource Tracking

Local governments and the State use an array of technologies to manage their resources. Some use off-the-shelf software packages, while others have developed custom systems ranging from basic spreadsheets in Excel or Access to tools with greater functionality. In some cases resources are tracked centrally; in others, each department with resources (fire, police, public works, parks, and others) is responsible for tracking its own resources. The following tools have been adopted in the region to manage resources.

6.5.4.1 Response Information Management System/WebEOC

In California the system currently used to share information and track resources is the Response Information Management System (RIMS). In 2013/14, the State transitions from RIMS to WebEOC. The purpose of the State's transition to WebEOC is to create a State-wide system that is transparent regarding the status of resources and to increase efficiency during an event through real-time reporting of information.

6.5.4.2 National Donations Management Network

The National Donations Management Network (NDMN) is a national online tool that is used to match needs with donated in-kind resources. This web-based network directly connects donors, who register themselves and their donations before or after the event, with recipient organizations. The NDMN helps increase the flow rate and availability of donations, reduces the time it takes to get donations to survivors, and may reduce the need for costly warehousing of donated goods.

The California portal for NDMN is administered by Cal OES Individual Assistance. In California, the system addresses in-kind donations, transportation, and warehousing. In-kind goods can be requested at any time, and the State NDMN Administrator can publish the items needed for potential donors to match.

6.5.4.3 California Resiliency Alliance Disaster Asset Registry

The California Resiliency Alliance Disaster Asset Registry (CRADAR) is a tool for private-sector donation registration and planning. CRADAR sits on the same platform as the NDMN, although the two applications do not currently interface. CRADAR contains pre-registered business resources, whereas NDMN has resource needs and requests posted in real time during an event.

6.6 Lifeline Restoration

A successful recovery is largely contingent on how quickly the private sector and local governments can help restore critical lifelines. The restoration of critical lifelines is an important part of maintaining community populations. Without these basic services, people tend to move permanently out of the area. After a major earthquake, restoring the following lifelines is a priority:

- Fuel

- Electrical power
- Transportation
- Water/wastewater

With the exception of the transportation infrastructure lifeline, which is described in the Regional Catastrophic Earthquake Mass Transportation/Evacuation Plan, additional information on these lifelines, the agencies responsible for maintaining and/or restoring them, and a general strategy for how to restore and recover them can be found in **Appendix G, Critical Lifelines**.

6.6.1 Lifeline Interdependencies

When considering prioritization of resources to support the restoration of critical lifelines, it is important to be aware of their interdependencies. For example, electrical power is used to run water and wastewater systems and to pump fuel out of the ground. Additionally fuel is necessary to move response vehicles, power generators, and heat homes. Transportation infrastructure is necessary to move people and commodities. The interdependencies of these lifelines create a unique prioritization challenge when allocating resources.

6.7 Transition to Long-Term Recovery

As response efforts wind down, the transition to long-term recovery begins. Making the transition to recovery activities has implications for all resources committed to the response. In this plan, long-term recovery extends beyond 60 days and can last years after an earthquake of this severity. Tasks or roles that the region, SOC, or JFO may be called on to perform to support an extended response to unmet needs and long-term recovery efforts include the following:

- Demobilization and reconstitution of resources
- Tracking of resources
- Inventories of supplies
- Demobilization of LSAs, warehouses, and PODs
- Documentation
- Issuing press releases regarding response and recovery activities

Planning for long-term recovery should be initiated as early as possible in the response to promote an effective transition.

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7 Plan Maintenance

The process for maintaining the Plan is described in this section. The discussion identifies who receives and reviews the Plan, how updates are to be integrated into the Plan, how the Plan is tested, what type of training and exercises are developed to enhance understanding and execution of the Plan, and how after-action review is conducted after the Plan has been implemented as part of an exercise or in response to a real emergency.

7.1 Plan Distribution

Once completed and approved, the Regional Catastrophic Earthquake Logistics Response Plan is distributed to the Logistics Steering Committee and the UASI Management Team. The Plan is also distributed to each of the 12 counties and core cities in the RCPGP planning area and to the Cal OES Coastal Region.

7.2 Plan Updates

Cal OES Coastal Region is responsible for the maintenance, revision, and distribution of the Plan. In coordination with key stakeholders and agencies with critical roles and responsibilities for logistics during disasters, the Cal OES Coastal Region annually assesses the need for revisions to the Plan based on the following considerations:

- Changes to State or Federal regulations, requirements, or organization
- Lessons learned through exercises or actual events
- Implementation of new tools or procedures that alter or improve on Plan components

Cal OES Coastal Region maintains a record of amendments and revisions as well as executable versions of all documents and is responsible for distributing the Plan to all applicable agencies.

7.3 Plan Testing, Training, and Exercises

Exercising the Plan and evaluating its effectiveness involves using training, exercises, and evaluation of actual disasters to determine whether goals, objectives, decision, actions, and the timing outlined in the Plan led to a successful response.

Exercises are the best method of evaluating the effectiveness of the Plan and are also a valuable tool in training emergency responders and government officials. Exercises allow emergency responders and government officials to become familiar with the procedures, facilities, and systems that they will actually use or manage in emergency situations. Cal OES is responsible for planning and conducting emergency exercises for the region.

Exercises are conducted on a regular basis to maintain readiness. Exercises should include as many Operational Areas, other regions, and State and Federal agencies as is practical.

7.4 After-Action Review and Corrective Action

After every exercise or disaster, an After-Action Report (AAR)/Improvement Plan (IP) should be completed. The AAR/IP has two components: an AAR, which captures observations and recommendations based on incident objectives associated with the capabilities and tasks; and an IP, which identifies specific corrective actions, assigns them to responsible parties, and establishes targets for their completion. Cal OES is the lead agency for the development of the AAR/IP and convenes participants to discuss action items and solicit recommendations for improvement.

SEMS requires that local agencies declaring local emergencies for which the Governor proclaims a State of Emergency complete and transmit an AAR to Cal OES within 90 days of the close of the incident period, which is determined by Cal OES. SEMS further requires that Cal OES, in cooperation with involved local and State agencies, complete an AAR within 120 days after each declared disaster.

Appendix A:
Glossary

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Appendix A: Glossary

A.1 Acronyms and Abbreviations

AAR..... After Action Report
ARC ..... American Red Cross
BOC ..... Business Operations Center
Cal OES..... California Governor's Office of Emergency Services
Caltrans..... California Department of Transportation
CAL FIRE..... California Department of Forestry and Fire Protection
CDAA..... California Disaster Assistance Act
CHP ..... California Highway Patrol
CONPLAN..... San Francisco Bay Area Earthquake Readiness Response: Concept of Operations Plan
CRA ..... California Resiliency Alliance
CRADAR..... California Resiliency Alliance Disaster Asset Registry
CSMR ..... California State Military Reserve
DHS ..... Department of Homeland Security
DLA..... Defense Logistics Agency
DGS ..... Department of General Services (California)
DOT ..... U.S. Department of Transportation
DoD..... U.S. Department of Defense
E..... event occurrence
EF ..... Emergency Function
EMAC..... Emergency Management Assistance Compact
EOC ..... Emergency Operations Center
ESF..... Emergency Support Function
FAA..... Federal Aviation Administration
FCO ..... Federal Coordinating Officer
FEMA..... Federal Emergency Management Agency
GC..... Government Code
GSA ..... General Services Administration
ICS..... Incident Command System
IP..... Improvement Plan
JFO ..... Joint Field Office
JIC..... Joint Information Center
LCAT..... Logistics Capability Assessment Tool
LMD ..... Logistics Management Directorate
LSA ..... Logistics Staging Area

M	moment magnitude
MACS	Multi-Agency Coordination System
MARAD	Maritime Administration
MOU	Memorandum of Understanding
MRE	meal, ready to eat
MTC	Metropolitan Transportation Commission
NDMN	National Donations Management Network
NGO	non-governmental organization
NIMS	National Incident Management System
NRF	National Response Framework
PIO	Public Information Officer
Plan	Regional Catastrophic Earthquake Logistics Response Plan
POD	Commodity Point of Distribution
RCPGP	Regional Catastrophic Preparedness Grant Program
RECP	Regional Emergency Coordination Plan
REOC	Regional Emergency Operations Center
RIMS	Resource Information Management System
SEMS	Standardized Emergency Management System
SOC	State Operations Center
TMC	Transportation Management Center
UASI	Urban Areas Security Initiative
USACE	United States Army Corps of Engineers
USCG	U.S. Coast Guard
UOC	Utilities Operations Center
VOAD	Voluntary Organizations Active in Disaster

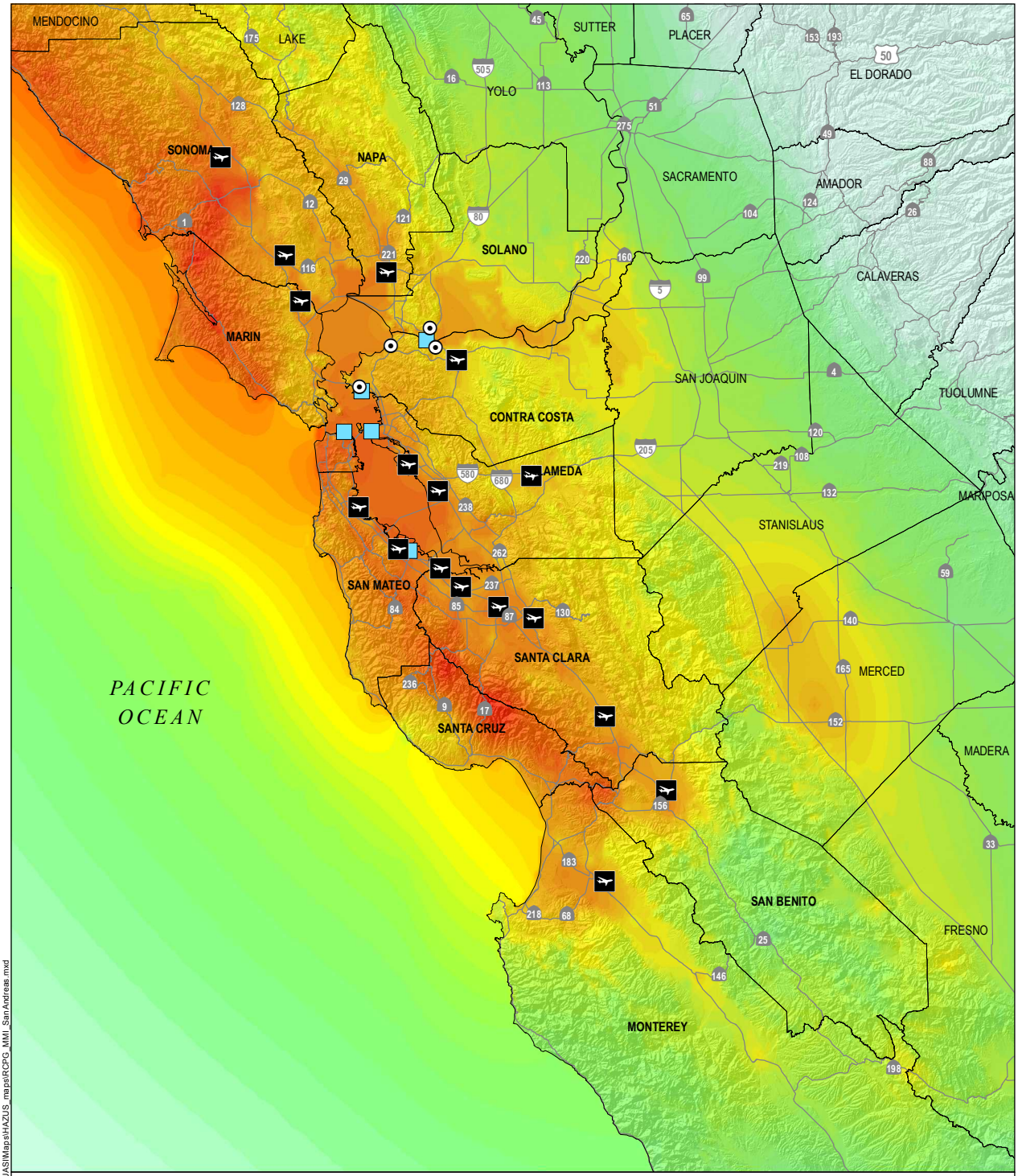
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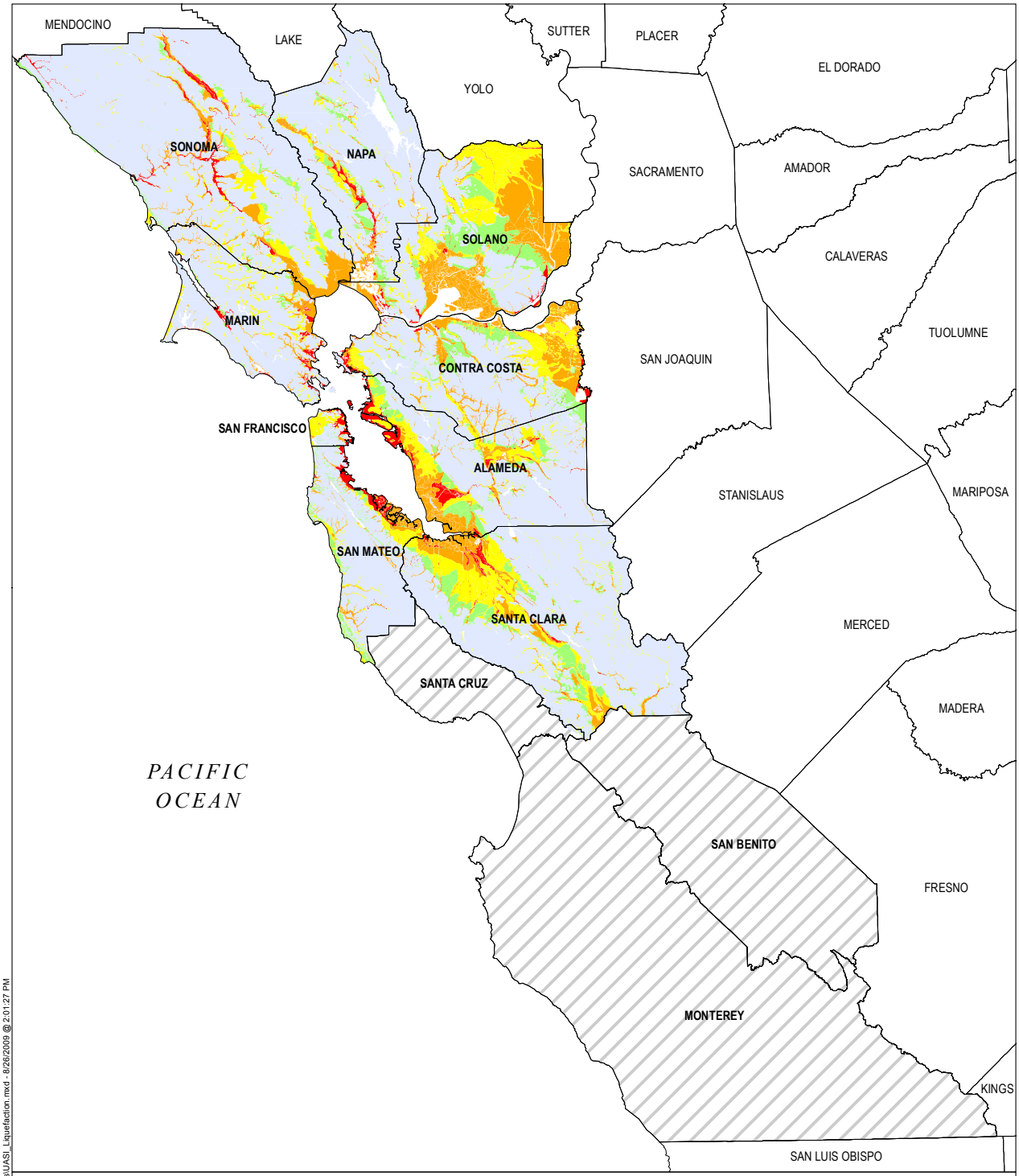


Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map B-1 Modified Mercalli Intensity (MMI)
Scenario: **M** 7.9 San Andreas Fault earthquake (1906)

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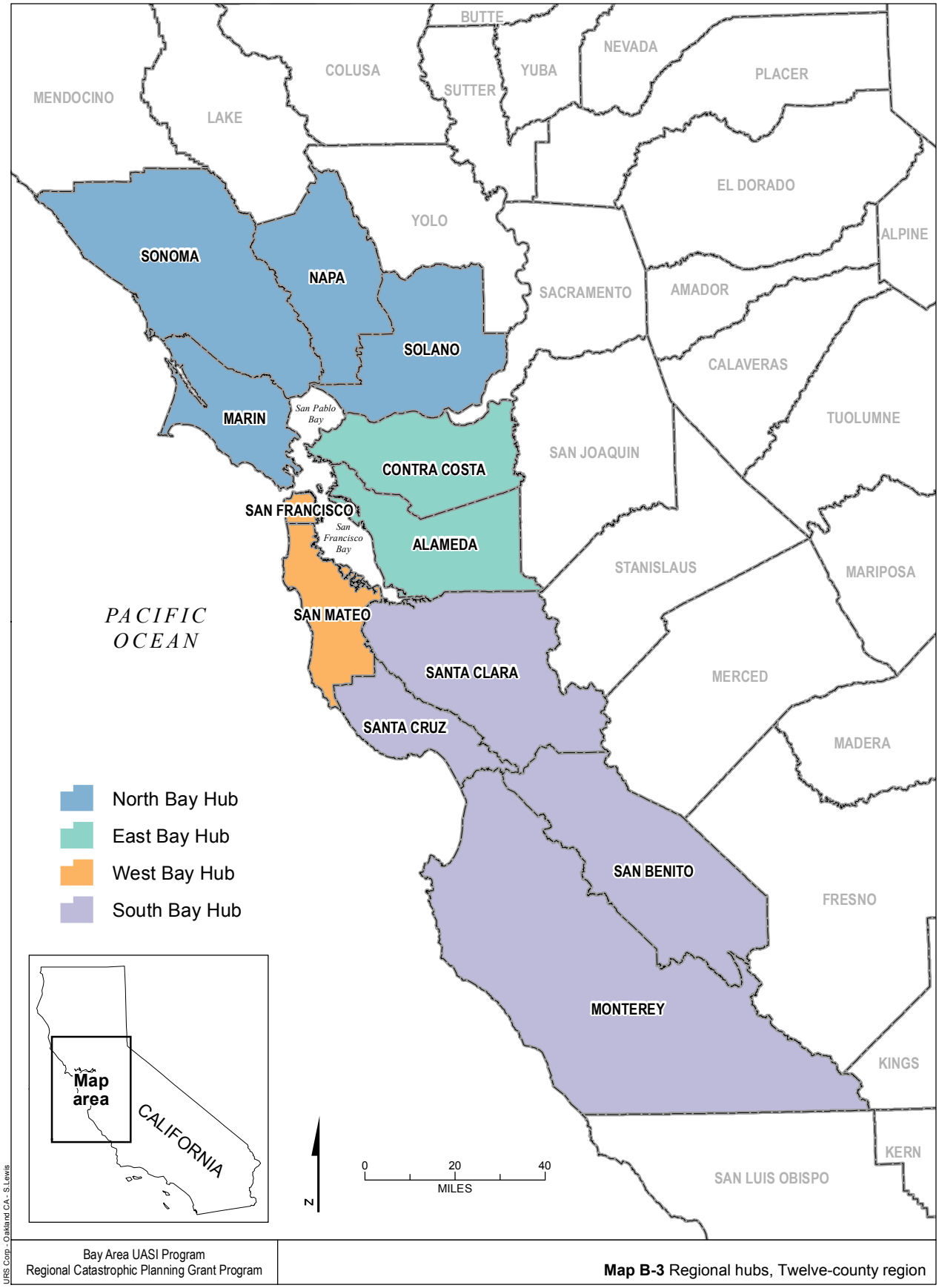


Data source: Knudsen et al. (in progress)

Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map B-2 Liquefaction susceptibility

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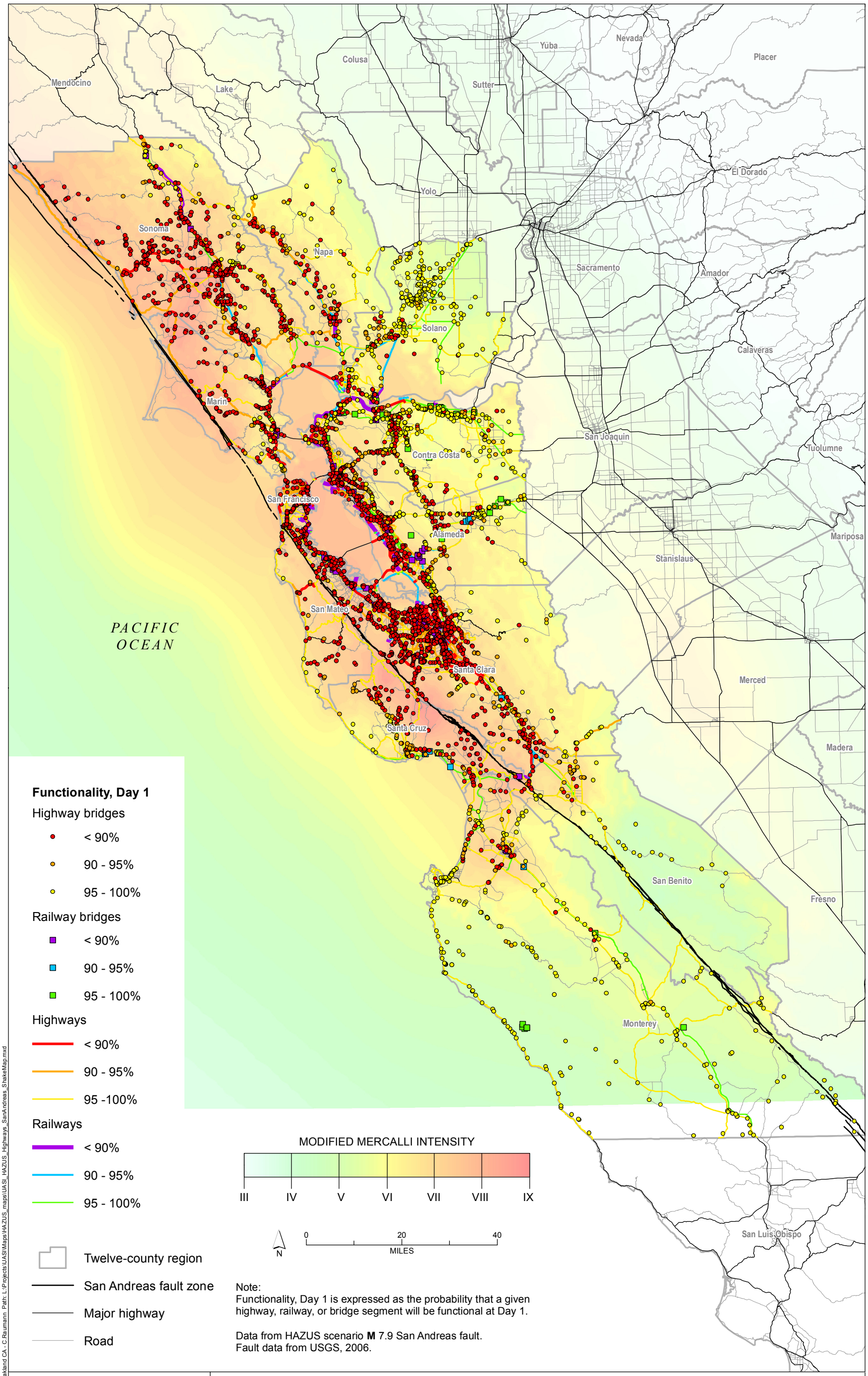


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Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map B-3 Regional hubs, Twelve-county region

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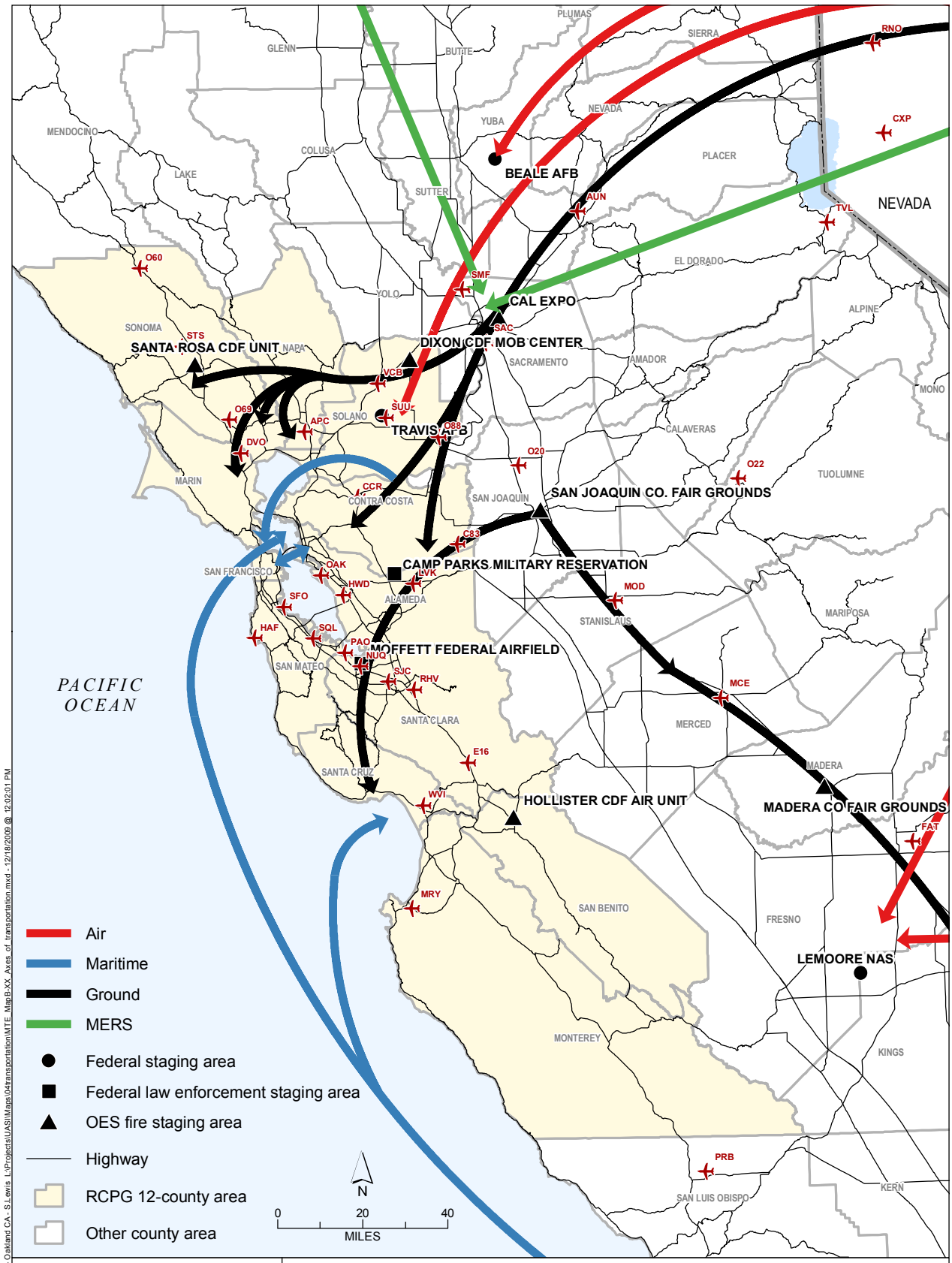


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Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4 Regional Transportation System Damage – San Andreas Fault
Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault earthquake
1906 Modified Mercalli Intensity (MMI)

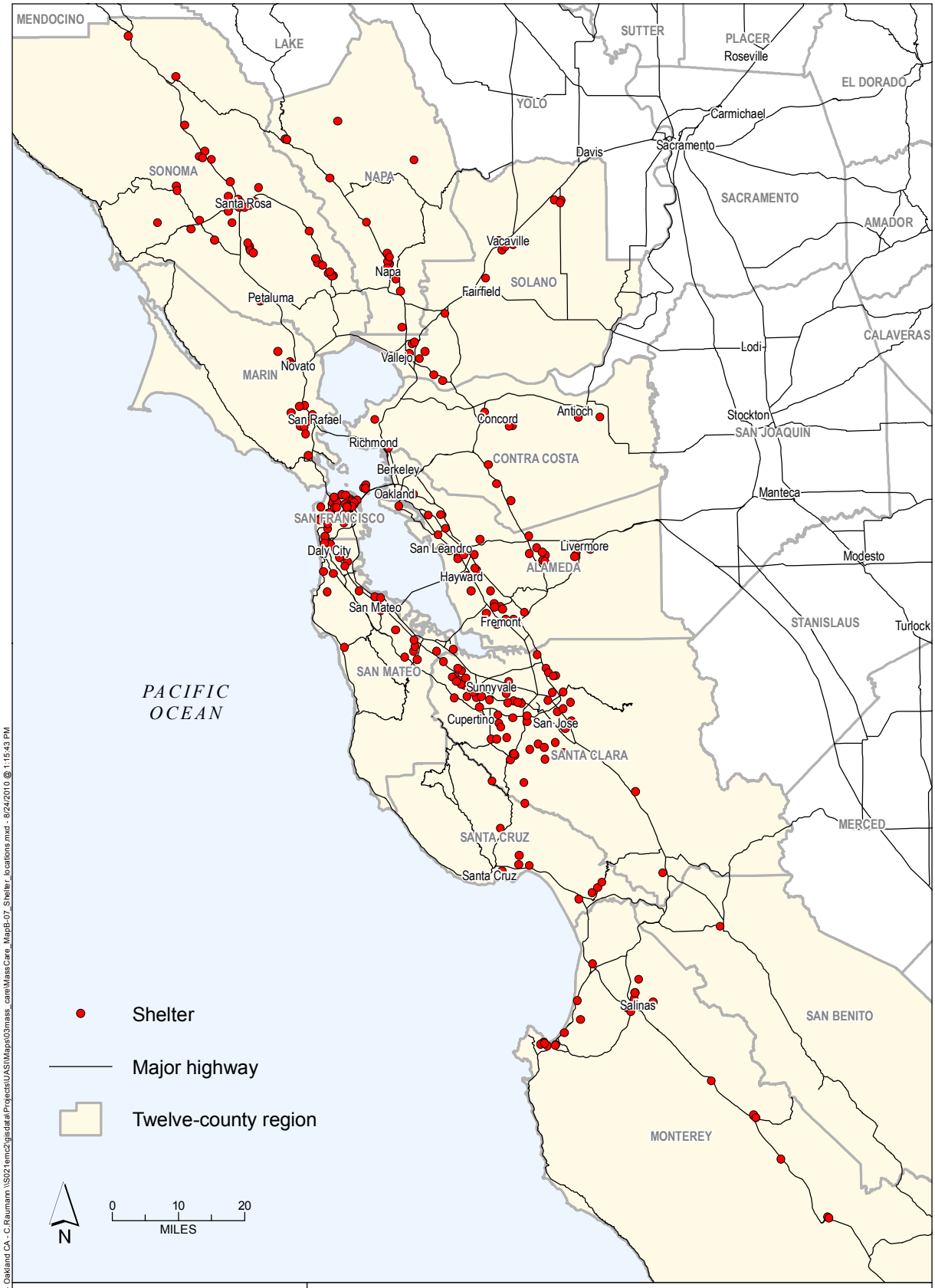
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Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map B-5 Axes of transportation - First responders



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Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6 Shelter locations in the 12-county Bay Area region

Appendix C:
Scenario and Assumptions Report

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Acronyms

Cal EMA	California Emergency Management Agency
CONPLAN	San Francisco Bay Area Catastrophic Earthquake Readiness Response: Concept of Operations Plan
DHS	Department of Homeland Security
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
g	acceleration due to gravity
HAZUS	Hazards U.S., a FEMA risk-assessment software program for analyzing potential losses from floods, hurricane winds, and earthquakes
HAZUS-MH	Hazards-U.S. – Multi-Hazard
HSIP	Homeland Security Infrastructure Program
ICS	Incident Command System
JFO	Joint Field Office
M	moment magnitude
MMI	Modified Mercalli Intensity
MRE	Meal, Ready-to-Eat
NIBS	National Institute of Building Sciences
NIMS	National Incident Management System
NSS	National Shelter System
PGA	peak ground acceleration
Plan	Regional Catastrophic Earthquake Logistics Response Plan
POD	Points of Distribution
RCPGP	Regional Catastrophic Preparedness Grant Program
SOC	State Operations Center
USGS	U.S. Geological Survey

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C.1 Introduction

This report describes the scenario and assumptions that have been developed to support the Regional Catastrophic Earthquake Logistics Response Plan (Plan) for the 12-county Bay Area planning region under the Regional Catastrophic Preparedness Grant Program (RCPGP).

The Plan is the latest scenario function-specific plan that will be developed as part of the RCPGP. The earthquake scenario described in this report is the same scenario used for the other RCPGP plans, but it has been reviewed and updated where appropriate. The assumptions in this report apply to the Regional Catastrophic Earthquake Logistics Response Plan and to the Bay Area region Operational Area and city annexes that will be developed as part of the Plan.

C.1.1 Purpose of the Report

The purpose of this report is to:

- Provide the Plan scenario and assumptions to the Steering Committee and county and city representatives for review and approval.
- Provide a mechanism for county and city representatives, subject-matter experts, and other critical stakeholders to identify potential areas where data available from other sources may be used to improve the accuracy and relevance of the assumptions. Once the assumptions have been reviewed and revised, they will be used for planning purposes and will be incorporated into the regional and county/city plans, as appropriate.

C.1.2 Approach

The Plan will reflect the logistical support necessary to support function-specific responses identified in previously developed RCPGP-sponsored plans addressing a Bay Area catastrophic earthquake. The Plan will define needs, constraints, and the overall operational concept for the request, movement, distribution, and use of critical life saving and sustaining commodities and resources. The scenario used for planning purposes is a recurrence of the 1906 moment magnitude (M) 7.9 earthquake on the northern segment of the San Andreas fault. The assumptions in the main body of this report are based on that event.

The scenario data and assumptions in the main body of the report have been derived from the following:

- An analysis of incident impacts associated with the San Andreas fault earthquake, prepared using Hazards – U.S. Multi-Hazard (HAZUS), version 2.0. HAZUS is a loss estimation software program developed by the National Institute of Building Sciences for Federal Emergency Management Agency (FEMA). A description of the HAZUS analysis is provided in **Tab A**.

- The San Francisco Bay Area Earthquake Readiness Response: Concept of Operations Plan (CONPLAN), prepared by FEMA and the California Emergency Management Agency (Cal EMA) in September 2008.
- Data obtained from county and city plans and communications with county and city agency leads.
- Additional sources, such as the U.S. Census.

In addition to the above data and assumptions, a review of the scenario data and impacts was conducted, and updates to the data were made when appropriate. The update was conducted by analyzing updates in the latest version of HAZUS 2.0 and performing an updated run. Details of the updates are discussed in **Tab A**.

C.1.3 Report Organization

This report defines the scenario used for all the Bay Area RCPGP plans, the general assumptions that apply to all plans, and the function-specific assumptions that apply specifically to the Logistics Response Plan.

As stated above, a description of the HAZUS analysis is provided in **Tab A**. **Tab B** contains maps that pertain to the 12 counties and 2 cities included in the planning region.

C.2 Scenario

C.2.1 General Description of the Earthquake

As described in **Section C.1**, the earthquake scenario is a recurrence of the 1906 earthquake on the northern segment of the San Andreas fault. The basis for the scenario is a HAZUS analysis originally performed by the Earthquake Engineering Research Institute, with support from the U.S. Geological Survey (USGS) and Cal EMA, beginning in 2005 and modified in 2009 by URS for use in developing the Bay Area RCPGP functional catastrophic earthquake plans. Refer to **Tab A** for a description of the modified analysis.

The characteristics of the earthquake used in the development of the scenario are:

1. The earthquake occurs in January on a weekday at 1400 hours Pacific Standard Time. The month and the time of the scenario earthquake were changed from those in the 1906 earthquake to maximize the potential impact on infrastructure and the population.
2. A foreshock precedes the main shock by 20 to 25 seconds. There is no other warning.
3. The main shock lasts 45 to 60 seconds.
4. The epicenter is just outside the entrance to the San Francisco Bay, west of the Golden Gate Bridge.
5. The earthquake ruptures approximately 300 miles of the northern segment of the San Andreas fault, from the San Juan Bautista area in the south to Cape Mendocino in the north.
6. Shaking is felt in Oregon to the north, Los Angeles to the south, and Nevada to the east.
7. The estimated magnitude is **M** 7.9 with a Modified Mercalli Intensity (MMI) of VIII (severe shaking/moderate to heavy damage) to IX (violent shaking/heavy damage) in widespread areas of the most severely affected counties. Pockets in the affected counties experience instrument intensity of MMI X (extreme shaking/very heavy damage), particularly areas immediately adjacent to the fault and areas where liquefaction is likely to occur. The shaking intensity in Bay Area region and the areas where liquefaction is likely to occur are shown in **Maps B-1** and **B-2**, respectively.
8. Ground shaking and damage occur in 19 California counties, from Monterey County in the south to Humboldt County in the north and into the San Joaquin Valley.
9. Damage is catastrophic in the areas that experience shaking intensities of MMI IX and X and high or very high levels of susceptibility for liquefaction (i.e.,

areas adjacent to the fault in Marin, San Francisco, San Mateo, Santa Clara, Santa Cruz, and Sonoma counties).

10. Counties along the fault outside the Bay Area, such as Mendocino, may sustain damage and require response.
11. Central Valley counties such as Sacramento and San Joaquin may be affected and require immediate response action such as evacuations, search and rescue, flood rescue, and fire fighting.
12. The rest of California and the Nation will be affected significantly by the need to respond, effects on the population, economic disruption, and media attention.
13. Threats and hazards resulting from shaking, surface fault rupture, and liquefaction include:
    - Structural and nonstructural damage to buildings and infrastructure, including widespread collapse of buildings
    - Widespread fires
    - Subsidence and loss of soil-bearing capacity, particularly in areas of liquefaction
    - Displacement along the San Andreas fault
    - Widespread landslides
    - Hazardous materials spills and incidents
    - Dam/levee failure resulting in flooding and/or loss of water supply from Hetch-Hetchy corridor
    - Civil disorder
14. Threats and hazards resulting from the main shock are aggravated or recur during aftershocks, which continue for months after the main shock.
15. The earthquake does not generate a tsunami or seiche, despite its magnitude.
16. Potable water supply systems suffer major damage because of the following:
    - Extensive damage to pipelines from ground deformation
    - Interruption of pumps and treatment due to power outages
    - Damage to treatment facilities, storage facilities, and distribution infrastructure
    - Contamination of potable water systems because of damaged lines
    - The number of households without potable water is provided in **Table C.2-1**, based on the estimated damage to potable water pipelines, treatment plants and other facilities and derived using HAZUS.
17. The earthquake results in massive power outages, and auxiliary power systems and generators are not sufficient to meet critical needs. The number

of households without electricity is provided in **Table C.2-2**, based on the estimated damage to electrical facilities, substations, and distribution circuits.

Table C.2-1. Number of households without potable water after the scenario event.

County	Total Number of Households	Day(s) after Scenario Event			
		Day 1	Day 3	Day 7	Day 30
Alameda	564,200	465,000	459,800	448,200	341,800
Contra Costa	384,600	105,700	85,700	45,600	N/A
Marin	105,300	56,300	48,600	29,300	N/A
Monterey	130,300	N/A	N/A	N/A	N/A
Napa	50,300	3,900	<100	0	0
San Benito	17,300	N/A	N/A	N/A	N/A
San Francisco	358,900	340,100	336,400	326,100	N/A
San Mateo	268,000	236,900	234,300	228,100	149,700
Santa Clara	624,700	516,800	512,300	502,700	423,100
Santa Cruz	95,800	16,100	6,500	<100	<100
Solano	140,900	12,500	3,700	<100	<100
Sonoma	182,900	87,800	81,900	69,100	<100
Total	**2,923,200**	**1,841,100**	**<1,769,300**	**<1,649,300**	**<914,900**

Source: HAZUS analysis conducted by URS in 2009. The estimates were adjusted, by county, for population increases since 2000.

N/A = HAZUS does not present reliable results for these counties.

Table C.2-2. Number of households without electricity after the scenario event.

County	Total Number of Households	Day(s) after Scenario Event			
		Day 1	Day 3	Day 7	Day 30
Alameda	564,200	23,600	13,700	5,400	1,200
Contra Costa	384,600	15,400	9,300	3,700	800
Marin	105,300	3,700	2,400	1,100	200
Monterey	130,300	N/A	N/A	N/A	N/A
Napa	50,300	2,000	1,200	500	100
San Benito	17,300	N/A	N/A	N/A	N/A
San Francisco	358,900	253,900	161,300	73,100	18,300
San Mateo	268,000	100,100	62,800	27,900	6,800
Santa Clara	624,700	57,100	34,300	14,400	3,400
Santa Cruz	95,800	15,500	9,600	3,900	800
Solano	140,900	5,600	3,200	1,400	300
Sonoma	182,900	60,000	40,400	19,700	5,000
Total	**2,923,200**	**536,900**	**338,200**	**151,100**	**36,900**

Source: HAZUS analysis conducted by URS in 2009. The estimates are adjusted, by county, for population increase since the year 2000. For Contra Costa, Napa, and Solano counties the power loss is not accurately represented in HAZUS and has been taken as an average of losses for Alameda and Marin counties. HAZUS does not provide reliable results for Monterey and San Benito counties, but it can be assumed that there will be some power loss in these counties.

N/A = HAZUS does not present reliable results for these counties.

C.3 Assumptions

C.3.1 General Operational Assumptions

1. Within 24 hours:
   - County Administrators proclaim local emergencies.
   - The Governor proclaims a State of Emergency and requests that the President declare a disaster.
   - The President declares a Major Disaster, making Federal assistance available under the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (42 U.S.C. §§ 5121–5206 [2008]) (the Stafford Act).
   - The Department of Homeland Security (DHS) and FEMA implement the Catastrophic Incident Supplement to the National Response Framework and begin mobilizing Federal resources.
   - DHS activates or elevates the level of activation of all DHS command and coordinating facilities.
   - Cal EMA activates the Regional Emergency Operations Center and the State Operations Center (SOC).
2. FEMA Region IX's Regional Response Coordination Center in Oakland is not functional. FEMA will co-locate with Cal EMA at the SOC until a Joint Field Office (JFO) is established.
3. Outside the affected region, all elements of the Standardized Emergency Management System, including communications and mutual aid systems, are functional.
4. Operational Area Emergency Operations Centers (EOCs) experience some damage but are at least partly operational. All other local government functions in the Operational Areas are severely compromised or focused entirely on response to the earthquake.
5. Response capabilities and resources of the cities, Operational Areas, and the State in the region are quickly overwhelmed or exhausted.
6. Operational Area EOCs are overwhelmed and challenged to manage the Operational Area response effectively.
7. A detailed and credible common operating picture cannot be achieved for 24 to 48 hours (or longer) after the disaster. As a result, response activities begin without the benefit of a detailed and complete situation or critical needs assessment.
8. First responders, providers of recovery services, and other critical response personnel are personally affected by the disaster and may be unable to report to their posts for days because of damaged transportation infrastructure.

9. Once the President declares a disaster and commits Federal resources, the State and Federal governments establish joint operations to provide assistance to local jurisdictions.
10. Because of damage to transportation infrastructure, out-of-region mutual aid, State and Federal resources, and resources from other states cannot begin to arrive for up to 72 hours.

C.3.2 General Logistics Assumptions

1. Responding effectively to the needs of impacted communities after a catastrophic event will require a vast amount of resources.
2. Nearly 5 million people may require bottled or other potable water supplies due to disruption of regional water distribution systems. Lack of water and sanitation will result in emerging public health crises in the hardest hit areas (Marin, San Francisco, San Mateo, Santa Clara, Santa Cruz). Restoration and repair of water distribution systems will require at least 8 weeks.
3. Approximately 2.2 million people will require feeding and other basic life sustaining commodities due to lack of services, loss of residence, or the fact that they are visitors or commuters who are stranded.
4. Existing stockpiles of critical life sustaining commodities are limited. Supply by contractors and distribution will be severely compromised by overwhelming need and damage to transportation infrastructure.
5. Massive assistance in the form of response teams, equipment, materials, and volunteers will begin to flow towards the region, providing urgently needed resources, but creating coordination and logistical support challenges.
6. Resource requirements to support response and recovery for a catastrophic earthquake will be great and necessary over an extended period of time.
7. In-state mutual aid; Emergency Management Assistance Compact; and Federal, non-governmental, and private-sector resources will be required to support extended operations.
8. Staging areas, temporary facilities for incident command posts and other field operations centers, and disaster service worker living accommodations and support will be required to support response efforts.
9. Military (Department of Defense, Reserves, and National Guard) resources may not be available to support operations due to other national security mission requirements.
10. Many resources necessary to support an effective response will be in short supply and may need to come from a long distance.

11. Staging areas, Points of Distribution (POD), and other locations supporting emergency response will require security in varying degrees.
12. Due to the impacts of the earthquake and the limited amount of lodging available on any given day, disaster service workers may be required to live in austere conditions for an extended period of time.
13. Damage to transportation infrastructure, including the region's ports and shipping channels and the three major international airports, will require extensive repairs before large quantities of commodities can be received by sea or air.
14. Due to damage to transportation infrastructure, jurisdictions will have to consolidate some operations and share resources.
15. Private businesses that provide lodging, food, services, and fuel near the affected area and along evacuation routes may be closed, have limited supplies and resources, or be overwhelmed with civilian customers.
16. Many private businesses will have resources and will desire to assist in the response, but implementation will vary given a company's understanding of how best to integrate into the system.
17. Donations will come in large numbers both needed and unneeded. Staging and storage facilities will be needed.
18. Although that National Incident Management System (NIMS) and Incident Command System (ICS) are national standards employed by all compliant government agencies, disaster service workers will arrive with varying degrees of experience and understanding of basic emergency response principles and guidelines.
19. Housing in or near the affected communities will need to be provided to first responders and recovery personnel. This may further exacerbate the housing shortage for displaced households.
20. The capability to initially provide support (e.g., shelter, feeding, sanitation) to emergency response personnel will not meet requirements.
21. Facilities identified to support a specific function may not be available due to potential or identified damage or due to lack of basic utilities.
22. Facilities designed for a particular function before a disaster may be redefined to support more critical functions.

C.3.3 Core Commodity Assumptions

The following assumptions refer to the need and availability of critical commodities.

C.3.3.1 Fuel

1. Damage to marine terminals, oil refineries, fuel transmission lines, and fuel dispensaries will limit availability of fuel needed to support immediate and follow-on response operations, the movement of evacuees and resources, and power generation.
2. Damage to Bay Area refineries and the fuel distribution and delivery infrastructure will cause not only a shortage of fuel in the Bay Area but also shortages across the Nation.
3. The quantity of fuel needed to support response operations and other critical functions will be inadequate, requiring the prioritization of fuel allocations.
4. Power outages will make it difficult to pump gas out of the ground at most Bay Area gas stations.
5. Due to widespread power outages, generated power, which requires fuel to produce, will be critical for supporting response operations and sustaining other critical operations, placing a further demand on fuel supply.

C.3.3.2 Water and Wastewater

1. Damage to potable water treatment and distribution systems will create a significant challenge and will make potable water a priority commodity.
2. Critical pipelines, tunnels, bypasses, pumping stations, supply lines, and feeder mains will fail, negatively impacting the provision of water.
3. A massive, coordinated emergency potable water distribution system will be necessary to support disaster service workers and sustain populations in the region.
4. Some private companies may provide supplies of bottled water and should be incorporated into the potable water distribution system.
5. Water utility companies will operate based on their own water recovery and distribution plans, but water supply resources will be insufficient, resulting in the request for and need to acquire water from sources outside the region.
6. Resources to move the water, such as water tenders, are very limited and will require prioritization.
7. Chemicals needed for water treatment/decontamination may not be readily available because of hazardous materials restrictions, damage to chemical storage facilities, and transportation infrastructure damage.

C.3.3.3 Sanitation

1. Existing waste water/sanitation systems will be inoperative due to lack of power, damage to treatment plants, and damage to waste water collection and pumping systems. Restoration and repairs will require months. The need for portable/temporary sanitation systems will be critical to preserve public health.
2. A small percentage of the population will remain in impacted areas after the recommendations/orders for evacuation are carried out, and will need to be supported with sanitation, food, and water.
3. Portable toilets, hand washing stations, and portable showers will be required to support response personnel and sheltering populations.

C.3.3.4 Food

1. Widespread power outages will cause perishable foods to spoil, leaving only nonperishable foods. Most households have not stored sufficient supplies of nonperishable food necessary to adequately sustain life until power and water are restored and food distribution systems have been reestablished.
2. Significant impacts to the food supply chain due to damage to grocery stores, warehouses, and food distribution centers, in combination with disruptions to the transportation system, will limit the amount of food available in the region.
3. Feeding programs will initially be based on packaged food like Meals, Ready-to-Eat (MREs) and Heater Meals but will expand to include warm, prepared food as mobile kitchens are established.
4. In addition to shelter populations, households choosing to shelter in their homes will also require food and water.
5. Disaster service workers will need food and water in order for them to respond effectively and continue operations.

C.3.3.5 Generators and Other Mass Care Supplies

1. The requirements for resources such as blankets, cots, potable water, and food will exceed stockpiles maintained by State and Federal departments and agencies.
2. Due to widespread power outages, generated power will be required to sustain critical functions. Both the number of generators and fuel availability will be limited, making prioritization of these resources necessary.
3. The American Red Cross assumes that approximately 1.7 million people sheltering in place will require feeding support due to power and water outages and disruptions to food distribution and retail systems. These people will need food, water, first-aid kits, tents, blankets, and other supplies from distribution

locations and/or shelters until utility service and retail food distribution are restored.

3.4 Transportation System Disruptions

The following assumptions refer to disruptions in the transportation system that constrain the ability of all levels of government to push resources into the region.

1. The earthquake significantly affects all regional transportation networks and their ability to facilitate the movement of people and supplies. Large portions of the transportation infrastructure are likely to be damaged or destroyed, precluding their use for both normal transportation and evacuation.
2. Transportation of first responders, commodities, and other required resources into the Bay Area will be significantly affected by damage to transportation infrastructure, debris removal operations, inspections, and closures for repairs.
3. The time required to restore damaged infrastructure is increased by the effects of the earthquake on employees in the region; impeded access to critical facilities and infrastructure; damage to transportation infrastructure; depletion of critical resources, particularly fuel; increased need for critical equipment; and other cumulative impacts.
4. Extensive damage to the infrastructure, equipment, and operations for all modes of transportation affect the ability of all levels of government and the private sector to:
   - Complete transportation damage/functionality assessments
   - Establish ingress and egress routes
   - Initiate evacuation operations
   - Move emergency service workers into the affected areas
   - Deliver resources
   - Provide security and logistics required for response operations
5. Rail systems in the affected area suffer a significant reduction in or complete loss of operational capacity because of compromised rail beds and track alignments, displacement, ground failures, and structural damage to aerial structures and bridges.
6. The three regional international airports (Oakland, San Francisco, and San Jose) sustain moderate to severe damage.
   - Airport operations, including passenger-plane runways, lighting, terminal facilities, control towers, terminal buildings, cargo handling facilities, and access roads, are likely to be damaged and may be inoperable for 60 days or longer.
   - Initially, these airports are available only to small, fixed-wing, and rotary aircraft. Air operational capability for large fixed-wing aircraft may be

restored within 1 week, but many of the fueling, servicing, and cargo-handling facilities remain inoperable for a longer period.

- Passenger operations may be delayed for 15 days or longer.

7. Roadways leading to the three international airports such as U.S. 101 to San Francisco; I-880 to Oakland; and U.S. 101, I-880, and SR 17 to San Jose are damaged, constraining access to the airports and further limiting their usefulness.
8. Cargo-handling facilities at the ports are expected to sustain significant damage. Piers, harbors, buildings, cranes, and rail lines are likely to be damaged. Key cargo-handling infrastructure could be nonfunctional for 60 days or more. Containerized cargo operations will be temporarily rerouted among Bay Area terminals or diverted to other West Coast ports. Emergency logistics may require use of roll-on/roll-off terminals.
9. Existing ferry terminals, which are located in Alameda, Marin, San Francisco, and Solano counties, may be damaged. Through the establishment of temporary facilities and emergency repairs, ferry service will be available almost immediately. Maritime transportation routes, facilities, and assets may be the best immediate means for transportation of first responders, disaster service workers, emergency materials, and evacuations.

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Tab A:
Description of HAZUS Earthquake Analysis Update

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Tab A: Description of HAZUS Earthquake Analysis Update

This tab describes the HAZUS analyses that URS used to prepare the earthquake scenarios for the first seven RCPGP plans on behalf of the Bay Area Urban Area Security Initiative Program. It also describes the modifications that URS made to adapt existing HAZUS analyses prepared by the Earthquake Engineering Research Institute with support from USGS and others to the RCPGP; describes the limitations associated with the resulting data; in an additional section, describes how the data were reviewed; and identifies updates made to the scenario.

URS prepared the original HAZUS analysis with assistance of Hope Seligson of MMI Engineering, Eduardo Escalona of FEMA Region IV, and Douglas Bausch and Jesse Rozelle of FEMA Region VIII. The HAZUS analysis for transportation was updated using HAZUS MH 2.0 in 2012 and is discussed in Section A.4.3.

A.1 Description of the Default HAZUS Analysis

The default HAZUS analysis is a Level 1 analysis that uses earthquake ground motions calculated within HAZUS using a simplified model of the seismic source along with the default inventory available with the HAZUS software. A Level 2 analysis may incorporate additions or modifications to the HAZUS inventory as well as imported maps that display refined and area-specific estimates of ground shaking, liquefaction, and/or landslide potential. A Level 3 analysis is the highest level of analysis and would constitute a significant incorporation of updated and region-specific inventory data, seismic hazard maps, revisions of fragility and damage functions, and other refinements. The inputs to the HAZUS analysis in this study are described in the following sections along with other modifications to bring it to a Level 2 HAZUS analysis.

A.2 ShakeMap – San Andreas Fault M 7.9 Earthquake Scenario

The RCPGP is based on a reoccurrence of the San Francisco Earthquake of 1906. This earthquake occurred along the northern San Andreas fault. The scenario map for this earthquake was developed by Boatwright and Bundock (2005) who reevaluated and relocated over 600 observations of damage and shaking reports compiled by Lawson (1908). The ShakeMap methodology was used to map shaking intensities (Map B-1).

URS performed a loss estimation study using the FEMA software HAZUS MH MR3 developed by the National Institute of Building Sciences (NIBS 2003). The HAZUS analysis was performed using a liquefaction susceptibility map developed by the California Geological Survey and the Boatwright and Bundock (2005) ShakeMap as input. **Table A-1** describes the characteristics of the ShakeMap scenario for the San Andreas fault. Map B-3 shows a depiction of the ground shaking as a result of the San Andreas scenario.

Table A-1. Characteristic of ShakeMap scenario input into HAZUS.

Scenario	Moment Magnitude	Depth	Latitude	Longitude	Rupture Length
San Andreas fault (1906 rupture from Mendocino to San Juan Bautista)	7.9	6 miles (10 km)	37.75	–122.55	296 miles (477 km)

Source: USGS

A.3 Liquefaction Map

A liquefaction susceptibility map of the Bay Area was developed (Witter 2006) and refined (Knudsen In progress) (Map B-2). The liquefaction susceptibility map was derived from recently produced Quaternary geologic maps. The geologic map units were compared against observations of liquefaction from historical earthquakes. A classification of liquefaction susceptibility units was developed from these two datasets. Map B-2 illustrates the liquefaction susceptibility zones used in HAZUS. HAZUS predicts liquefaction-related damage to highways and railroads. HAZUS software calculates road damage based on the liquefaction susceptibility because roads are highly susceptible to ground deformation. In recent earthquakes, liquefaction damage to roadways has generally been repaired within days. Consequently, few organizations responsible for maintaining roadways have chosen to mitigate against future liquefaction damage. This is not true of bridges; it can take months or years to repair bridges. Consequently, there has been significant investment in recent decades to mitigate against damage to bridges.

A.4 URS Modifications to the HAZUS Analysis

To achieve the objectives of the RCPGP, it was necessary for URS to modify the default HAZUS analysis, both to incorporate updated data and to extract the specific data required for planning. This section describes these modifications to bring the HAZUS analysis to a Level 2 analysis.

A.4.1 Modifications to Kircher Data

The building inventory information used to create a study region appropriate for the 12 Bay Area counties was derived from a HAZUS study (Kircher 2006) that also evaluated the losses in a repeat of the 1906 earthquake. The Kircher study region replaced the single default occupancy mapping scheme in HAZUS with 22 custom mapping schemes that relate building occupancy to model building type (Kircher 2006). The building mapping scheme reflects the changes in occupancy as a function of age distribution and hence seismic design level across the region. No changes were made to the databases of square footage, counts, or exposure value. Building height and seismic design level are also included in the mapping scheme. A good example of the changes caused by using the Kircher occupancy scheme for San Francisco is that more multistory wood-frame buildings with design level pre-code are included in the census tracts near the Marina District in San Francisco.

The Kircher study region also differs from the default HAZUS inventory in that it has categories for retrofitted wood-frame, concrete, and unreinforced masonry buildings. These were new building categories added under the special code designation. We applied the Kircher fragility and capacity curves, part of HAZUS damage functions, to the special category designated for each additional retrofitted building type (Kircher 2006). **Table A-2** is a summary of the revised building type mapping schemes.

Table A-2. Remapped retrofitted building types and corresponding design levels.

	Kircher Study Region			Translated to Special Code	
Structure Model Building Type	**Design Level**	**Description**	**Building Height**	**Translated**	**Design Level**
C1LR	MC	Concrete moment frame (retrofitted)	Low-rise	C1L	L
C1MR	MC		Mid-rise	C1SM	L
C1HR	MC		High-rise	C1SH	L
C3LR	MC	Concrete frame with unreinforced masonry infill walls (retrofitted)	Low-rise	C3SL	L
C3MR	MC		Mid-rise	C3SM	L
C3HR	MC		High-rise	C3SH	L
UMLR (URMLR)	LC	Unreinforced masonry bearing walls (retrofitted)	Low-rise	URML	L
UMLR (URMLR)	MC		Low-rise	URML	M
UMMR (URMMR)	LC	Unreinforced masonry bearing walls (retrofitted)	Mid-rise	URMM	L
UMMR (URMMR)	MC		Mid-rise	URMM	M
W1R	MC	Wood, light frame (≤ 5,000 square feet)	N/A	W1	L
W2R	None	Wood, commercial and industrial (> 5,000 square feet)	N/A	W2	L

Source: Kircher 2006

L = Special Low
LC = Low Code
M = Special Moderate
MC = Moderate Code
N/A = not applicable

The Kircher study region incorporated changes to fragility curves in the default HAZUS inventory that were available when the inventory was created in 2005. The default HAZUS inventory in HAZUS MR1 was modified by Kircher, and those changes to the fragility curves were transferred to later versions of HAZUS MR3. When a ShakeMap is used in HAZUS MR3, the new user-defined fragility curves are used. Thus, URS was able to update the fragility curves for all building structure types by using the existing user-defined fragility curves, using Kircher's curves for default building types, and inputting modified fragility curves under the special-code distinction for Kircher's retrofitted building types (Kircher 2006).

Kircher made two additional damage function changes that were incorporated into the URS study. Collapse probabilities are used to estimate the number of buildings that have the potential to collapse in an earthquake. Kircher modified the collapse probabilities by adjusting wood-frame collapse probabilities slightly downward and increasing the unreinforced masonry structure rates by a factor of 2. The other change Kircher made was to the damage state weighting factors. These weighting factors are used to estimate the number of uninhabitable units due to structural damage (Kircher 2006). **Table A-3** shows the differences between the default HAZUS data and the factors used in the URS study.

Table A-3. Damage-state weighting factors.

Weight Factor	Description	Default Value	URS Value
wSFC	Single-Family Dwelling – Complete Damage	1.0	1.0
wSFE	Single-Family Dwelling – Extensive Damage	0.0	0.5
wSFM	Single-Family Dwelling – Moderate Damage	0.0	0.0
wMFC	Multi-Family Dwelling – Complete Damage	1.0	1.0
wMFE	Multi-Family Dwelling – Extensive Damage	0.9	1.0
wMFM	Multi-Family Dwelling – Moderate Damage	0.0	0.1

Source: Kircher 2006

C = Complete Damage
E = Extensive Damage
M = Moderate Damage
MF = Multi-Family
SFC = Single-Family

Kircher also made changes to demographic data for the “time-of-day” populations to better reflect local trends in the commuting populations. For example, the commuting population was increased in counties such as Contra Costa, where many people reside but work in San Francisco. During the day, those populations would be in San Francisco and at night in Contra Costa County. These changes are reflected in the injury and fatality estimates for different times of day (although results are reported only for 1400 hours Pacific Standard Time).

A.4.2 Modifications to Essential Facilities

In HAZUS, essential facilities include hospitals, schools, police stations, fire stations, and emergency operations centers (NIBS 2003). All of the essential facilities inventories were updated in 2007 from default HAZUS inventory using Homeland Security Infrastructure Program (HSIP) data (HSIP 2007). The HSIP data is a national inventory used by FEMA for disaster planning. The national inventory was updated in HAZUS by FEMA Region IV using information in the HSIP data (HISP 2007) and augmented the inventory with replacement cost estimates provided by:

- The Veteran’s Affairs Office of Facilities Management for hospital replacement costs

- Construction Report, published by School Planning and Management, for schools using square footage as a proxy for replacement cost (Construction Report n.d.)
- College planning and management statistics for colleges and universities (College 2007)

Though all five essential facility types defined by HAZUS were updated using the HSIP data, not all of these results were used in the URS analysis. URS did not use fire stations or police stations in planning results. The emergency operations centers in the HSIP are not an improvement on the default HAZUS inventory and are not used in the URS analysis. Hospitals and schools are used in the URS analysis and the development of these two datasets is described below.

Hospital damage and functionality is calculated directly from HAZUS. Hospital bed availability is calculated using the HSIP data. URS also gathered information on the number of hospital beds available for each county.

School damage and functionality was examined since schools often serve as locations of temporary shelters. URS examined the National Shelter System (NSS n.d.) list, which is a database of primarily American Red Cross–designated shelters. URS compared the shelter list to the school inventory in HAZUS and identified vulnerable schools that are likely to be used as shelters. URS also used a California Division of the State Architect inventory of vulnerable schools to identify schools that response planners may not want to use as shelters. The goal is to identify schools for shelters that are most likely to perform well during an earthquake and recommend 6 to 12 safe schools to be used as key shelters.

A.4.3 Modifications or Updates to the Transportation HAZUS Analysis

In 2009 when the HAZUS runs, using HAZUS MH MR3, were originally completed for the RCPGP the most up-to-date databases for California were used to conduct the analysis. This database, the default at the time, was updated between 2009 and 2012 to incorporate the following recent characterizations of bridges, roads, and rail systems using HAZUS MH 2.0 (NIBS 2011):

- Highway Segments: National Highway Planning Network 2005, produced by the Federal Highway Administration.
- Light Rail Segments and Facilities: Fixed-Guideway Transit Facilities database (2007), obtained from Research and Innovative Technology Administration's Bureau of Transportation Statistics.
- Railway Segments: National Rail Network database, obtained from the Bureau of Transportation Statistics (U.S. Department of Transportation).
- Railway Facilities: Amtrak Stations database (2007), obtained from the Bureau of Transportation Statistics (U.S. Department of Transportation) and published by Federal Railroad Administration.

The most significant impact of the updated transportation databases in HAZUS MH 2.0 is the incorporation of more road segments in the major cities in the 11-county Bay Area region. The original 2009 runs contained damage analysis for only the California State Highways. The updated analysis using HAZUS MH 2.0 includes urban freeways, expressways, and major city streets. These updates are expected to significantly affect the escape routes and planning routes for recovery transportation efforts.

A.4.4 General Description of HAZUS Results Reported for RCPGP Assumptions Report

The HAZUS results are only as good as the input data used. The beginning of Section A.4 explains the changes to the default data set that have been made in the HAZUS runs. Even with perfect data, which can never be obtained, loss estimation methodologies cannot precisely estimate earthquake loss. Predictive methods are approximate and have large uncertainty (NIBS 2003). In particular, the calculation performed in this study was a Level 2 study. The largest sources of uncertainty in earthquake loss estimation are the ground shaking parameters; also of importance are the structural fragilities, both of which directly impact structural damage.

The following discusses some of the more significant limitations in this study.

A.4.4.1 Population

The HAZUS results do not take into account inflation or population growth; they represent values and demographics from the year 2000. These factors were applied at the county level for the casualties and shelter data. The increase in population in the counties in the Bay Area region from 2000 to 2009 is provided in **Table A-4**.

Table A-4. Population increase in the Bay Area region from 2000 to 2009.

County	Percent Increase
Alameda	7.81
Contra Costa	11.76
Marin	4.58
Monterey	7.50
Napa	10.7
San Benito	8.98
San Francisco	8.86
San Mateo	5.47
Santa Clara	10.40
Santa Cruz	5.10
Solano	8.05
Sonoma	6.11
Average	**7.94**

Source: California Department of Finance, 2009

A.4.4.2 Transportation Damage and Functionality

Transportation data included in this report is for highway segment and bridge damage and railroad segment and bridge damage. The functionality at Day 1 is depicted in the maps for each county in **Tab B** (Maps B-5–B-16). The functionality at Day 1 is defined as the probability that a given bridge or segment of a highway or railway will be functional the day of the earthquake. The probability of functionality for segments depends primarily on the mapped liquefaction susceptibility and related ground deformation. The probability of functionality for bridges depends on strong ground shaking. The ground failure damage functions in HAZUS currently contain an error. The developers of HAZUS have been made aware of this problem, but the issue is not yet resolved. It is recommended that the results be used with caution because they may result in over-estimation of ground failure and losses.

HAZUS also keeps highway segment and bridge damage separate, such that if there is severe damage to a bridge, the adjacent segment is independently assessed and may show full functionality. In addition, these HAZUS runs do not take into consideration transportation interruptions from post-earthquake fires and landslides.

A.4.4.3 Debris Data

The debris information from HAZUS is reported in terms of thousands of tons of concrete, steel, brick, and wood. The debris estimates reflect only debris resulting from building damage related to strong ground shaking and liquefaction. The debris

resulting from post-earthquake fires and transportation or utility system damage are not included in the HAZUS results.

A.4.4.4 Shelter and Displaced Households Data

The displaced household results from HAZUS are derived from populations potentially displaced by building damage. Building damage results are only for strong ground shaking and liquefaction. The short-term shelter needs are derived from estimates of vulnerable populations based on ethnicity, income level, age, and whether members of the population rent or own their homes. Population data is derived from the 2000 census. The HAZUS results do not take into consideration displaced population due to post-earthquake fires or landslides. URS adjusted the HAZUS results by a population increase for each county (see **Table A-4**).

A.4.4.5 Fatalities Data

Estimates of fatalities (severity level 4) and severe injuries (severity level 3) from HAZUS are based on building damage (as are all injury levels in HAZUS). Building damage is dependent only on strong ground shaking and liquefaction in this study. Thus the fatalities from post-earthquake fires, transportation damage (such as collapsed bridges and tunnels), and landslide are not included in the HAZUS results. Fatalities estimates are based on population data from the 2000 census. URS adjusted the HAZUS results by a population increase for each county (see **Table A-4**). Injuries are categorized by severity level as shown in **Table A-5**.

Table A-5. Injury categorization in HAZUS.

Severity Level	Injury Description
1	Injuries requiring basic medical aid that could be administered by paraprofessionals. These types of injuries would require bandages or observation. Some examples are: a sprain, a severe cut requiring stitches, a minor burn (first degree or second degree on a small part of the body), or a bump on the head without loss of consciousness. Injuries of lesser severity that could be self-treated are not estimated by HAZUS.
2	Injuries requiring a greater degree of medical care and use of medical technology such as x-rays or surgery, but not expected to progress to a life-threatening status. Some examples are third-degree burns or second-degree burns over large parts of the body, a bump on the head that causes loss of consciousness, fractured bone, dehydration, or exposure.
3	Injuries that pose an immediate life-threatening condition if not treated adequately and expeditiously. Some examples are: uncontrolled bleeding, punctured organ, other internal injuries, spinal column injuries, or crush syndrome.
4	Instantaneously killed or mortally injured.

Source: NIBS, 2011

A.4.4.6 Data for Households without Potable Water

Estimates of the number of households without potable water depend on how long it will take to repair breaks to water pipeline systems. This estimate is calculated from strong ground shaking and liquefaction. The pipeline distribution is estimated as a street-length proxy and has a default material assumption of 80 percent brittle and 20 percent ductile. Estimates of repair time to fix pipes and breaks depend on the diameter of the pipes and the material of which the pipe is composed. Repair estimates are only for pipelines in the 12-county study area. Reservoir capacity and pipelines transporting potable water from distant sources (e.g., Hetch-Hetchy) are not considered in this study. It is expected that additional information from individual water agencies will augment the HAZUS results. URS adjusted the HAZUS results by a population increase for each county (see **Table A-4**).

A.4.4.7 Data for Households without Electricity

Estimates for numbers of households without electricity are based on estimates of damaged substations. Damage is estimated based on strong ground shaking, primarily peak ground acceleration (PGA), and liquefaction hazards. Substations are not well represented in the default HAZUS inventory, which is used in this analysis, and should be taken as approximate. Components of the utility system such as circuit breakers outside the 12-county area that feed into the area are not considered.

The methodology used to estimate the number of people without electrical power is driven by the ground motions. If the PGA exceeds 0.44 acceleration due to gravity (g), then the substations affected by census tract are used to estimate the number of people that will be without power. In the case of the San Andreas earthquake scenario the PGA does not exceed 0.44 g for any census tracts in Contra Costa, Monterey, Napa, San Benito, and Solano counties. Consequently, HAZUS results indicate that there are no households in these counties without power. However, it is likely that Contra Costa, Napa, and Solano counties will have electrical power losses based on their proximity to the earthquake and on ground motion distributions. Since Alameda and Marin counties both have 4 percent power losses on average at Day 1, URS has applied the same power loss estimate to Contra Costa, Napa, and Solano counties. For Monterey and San Benito counties, it is likely that there will be some power loss, but it cannot be quantified using these analyses.

Other hazards to electric utilities that are not considered in this HAZUS analysis include post-earthquake fires, landslide-related damage, and flooding. URS adjusted the HAZUS results by a population increase for each county (see **Table A-4**).

A.4.4.8 School Functionality

The schools inventory used in the HAZUS analysis is derived from the HSIP Gold 2007 datum (HSIP 2007). The school inventory is based on national estimates of children in each school, and the building square footage is based on the school population. The school building type inventory has not been validated on a county or

city level. School damage calculations, which depend on building type, are dependent on the level of strong ground shaking and liquefaction at each school location. These HAZUS runs do not calculate losses due to post-earthquake fires or loss of power or water at the school.

A.4.4.9 Availability of Hospital Beds

Hospital data used in the HAZUS analysis are derived from the HSIP Gold 2007 study datum (HSIP 2007). Estimates of number of beds are based on the size of the hospital. The number of beds available is calculated as a probability of the building suffering no damage. The damage, which depends on building type, depends on the level of strong ground shaking and liquefaction at each hospital location. These HAZUS runs do not calculate losses due to post-earthquake fires, loss of power or water at the hospital, or impacts upon individuals relied on to staff the facility.

URS plans to compare the numbers of hospital beds to an inventory collected by regional planners for each of the 12 counties in the study.

A.5 Caveats and Limitations

The largest sources of uncertainty are the input ground shaking parameters and possible structural fragilities. The limitations in the HAZUS results are as follows:

- Runs do not include effects from fires following earthquake, landslides, and flooding.
- HAZUS does not address damage to infrastructure networks, such as water systems, entering and leaving the study region.
- The resolution is good to census-tract level only.
- ShakeMap for the San Andreas fault scenario is based on only 600 data points, and therefore ground motions are interpolated between points. Data points from the 1906 earthquake are based on information that is more than 100 years old and subject to interpretation (Lawson 1908).

A.6 References

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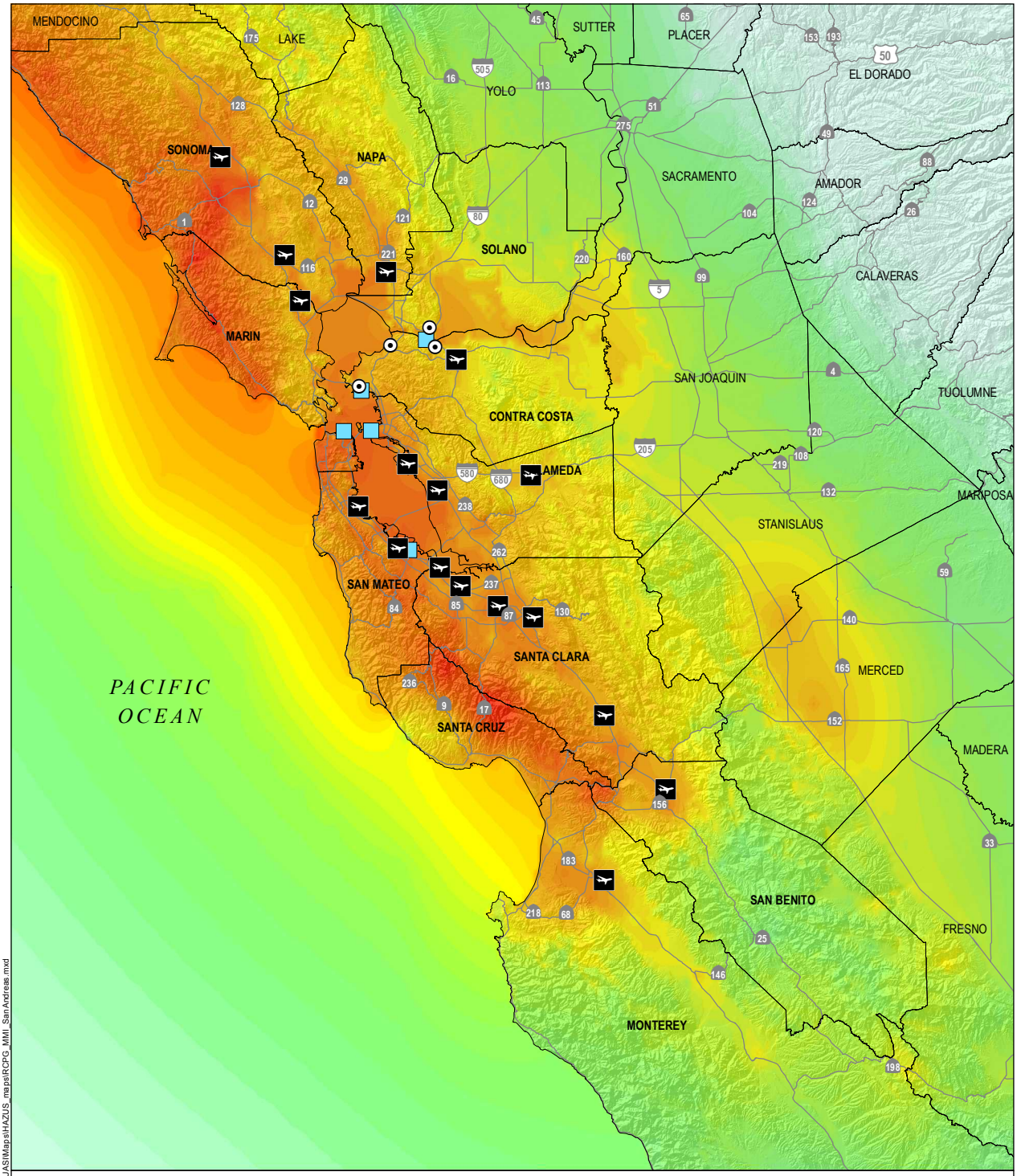
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Tab B:
Maps

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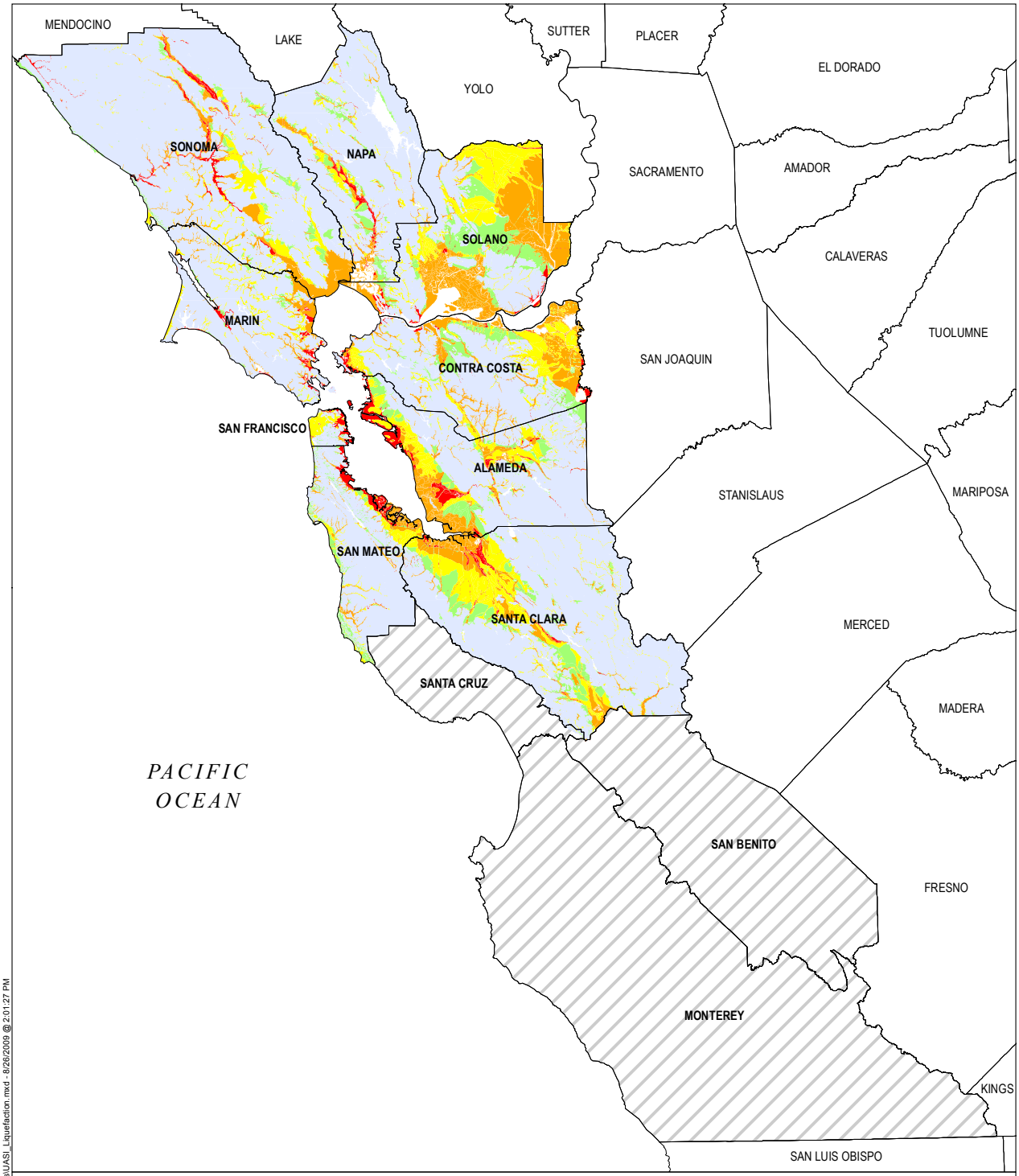


Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map c.B-1 Modified Mercalli Intensity (MMI)
Scenario: **M** 7.9 San Andreas Fault earthquake (1906)

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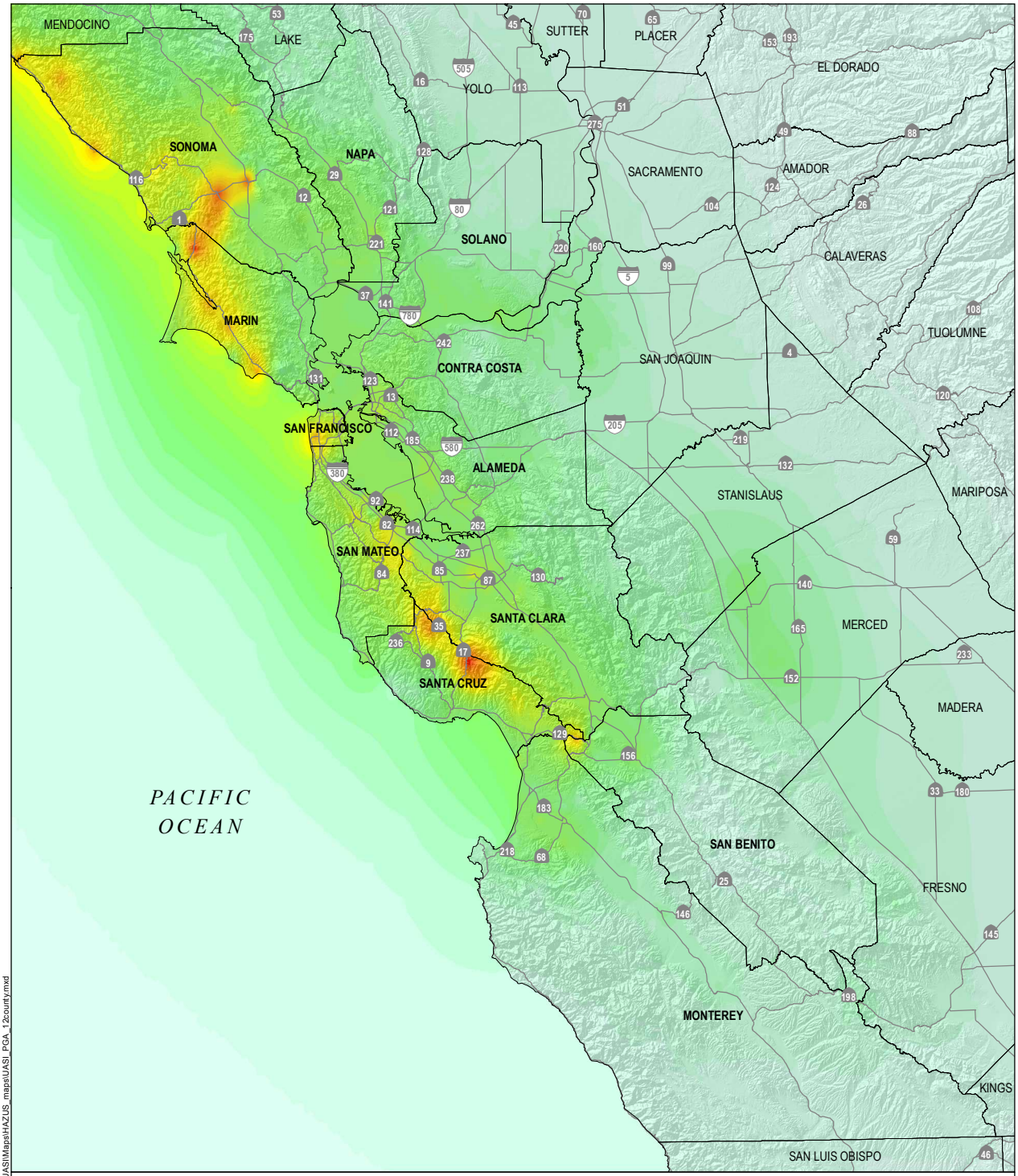


Data source: Knudsen et al. (in progress)

Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map c.B-2 Liquefaction susceptibility

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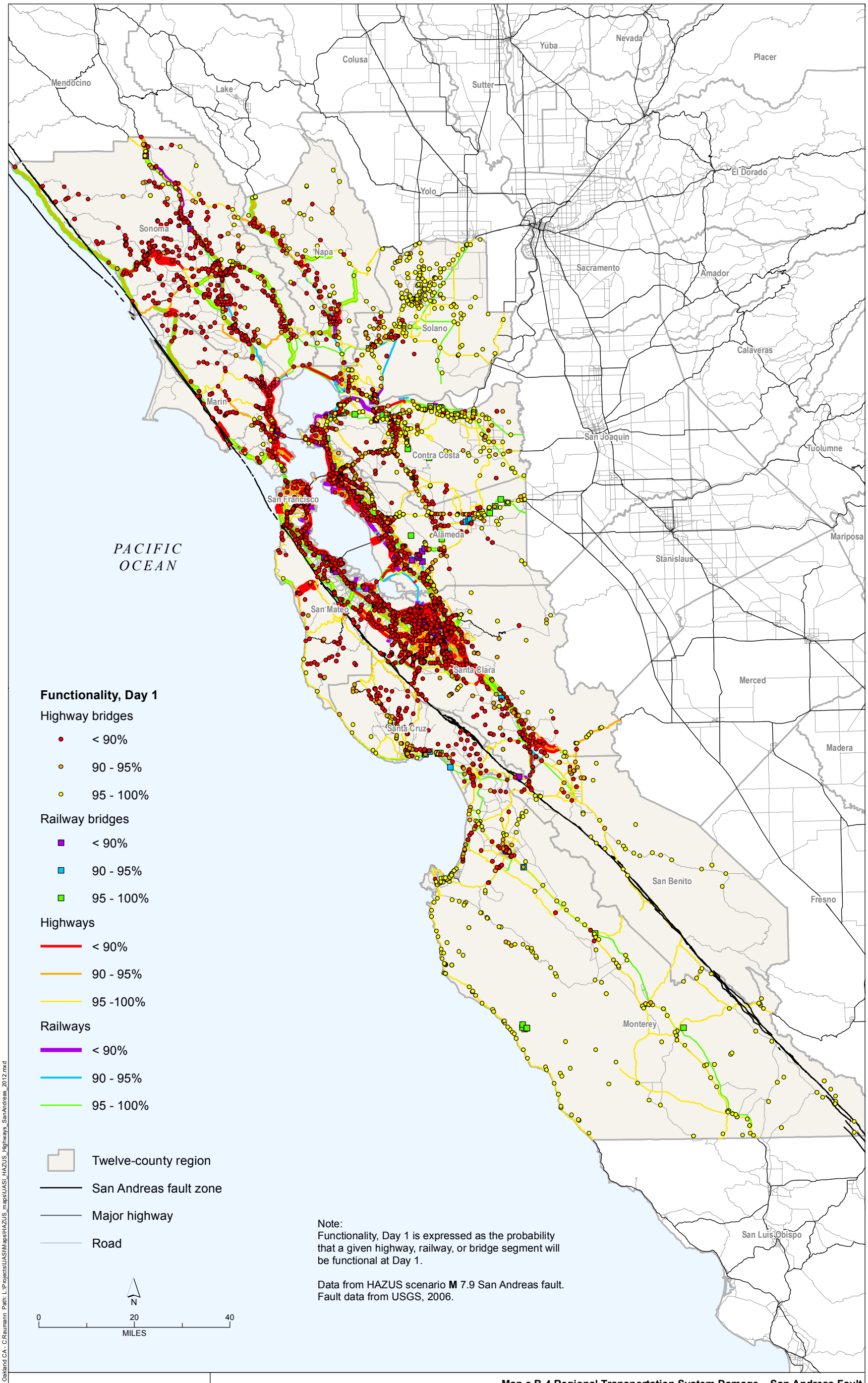
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Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map c.B-3 Peak ground acceleration (PGA)
Scenario: **M** 7.9 San Andreas Fault Fault earthquake
1906 Modified Mercalli Intensity (MMI)

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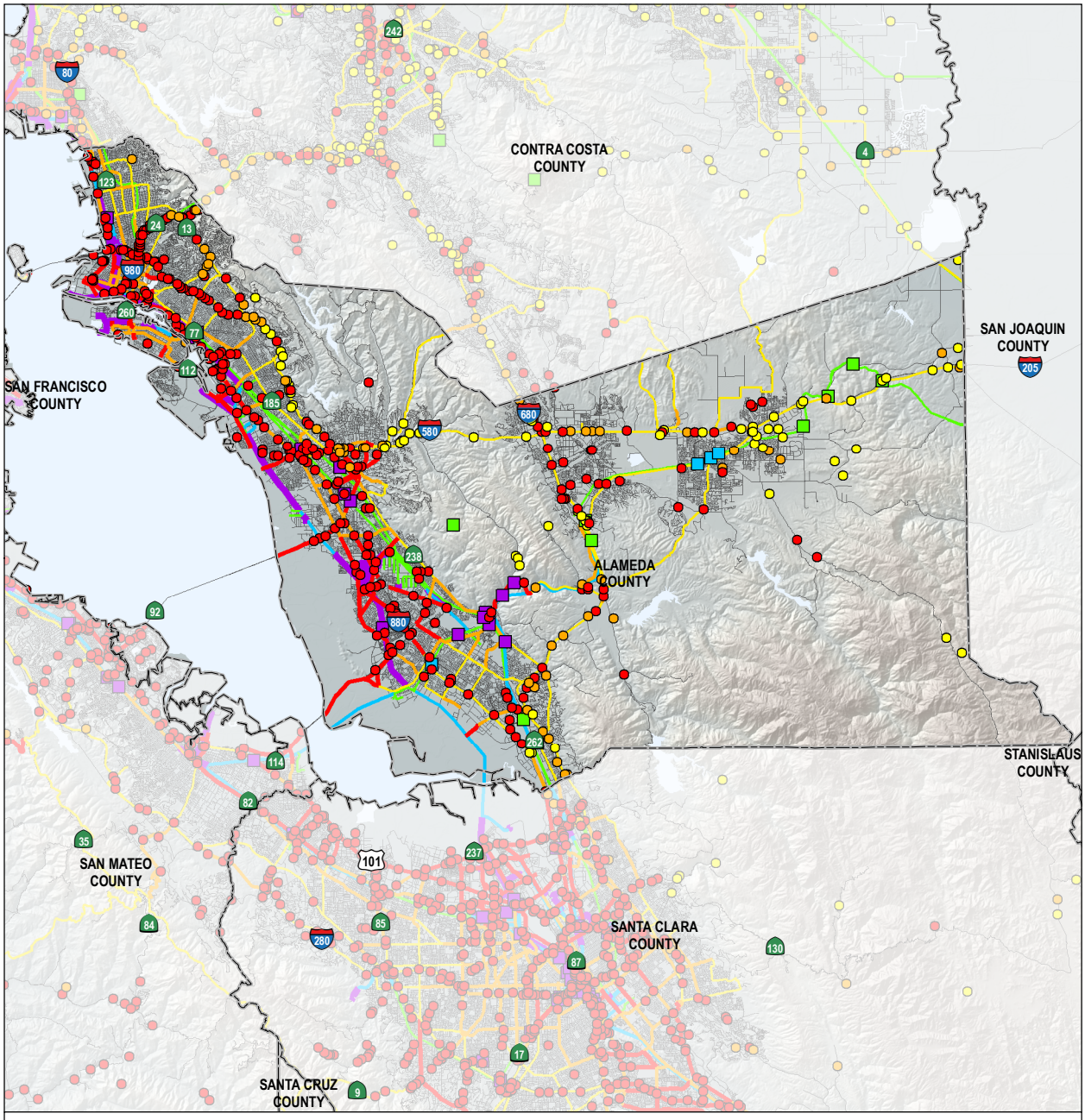


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Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map c.B-4 Regional Transportation System Damage – San Andreas Fault
Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault earthquake
1906 Modified Mercalli Intensity (MMI)

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County boundary

Road

N

0 5 10

MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

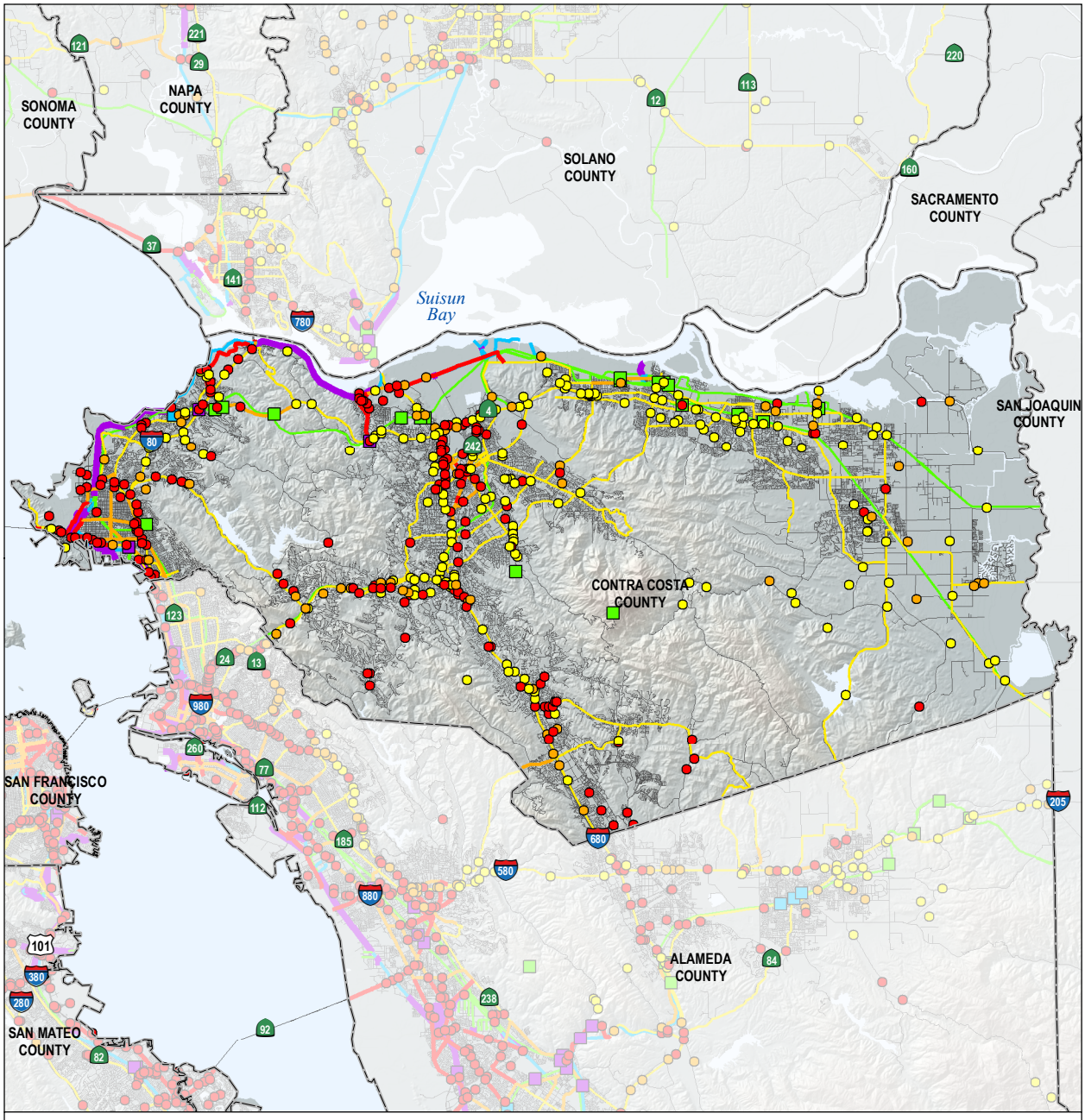
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Map c.B-5 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906
Modified Mercalli Intensity (MMI)
County: Alameda



County boundary

Road

N

0 5 10

MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

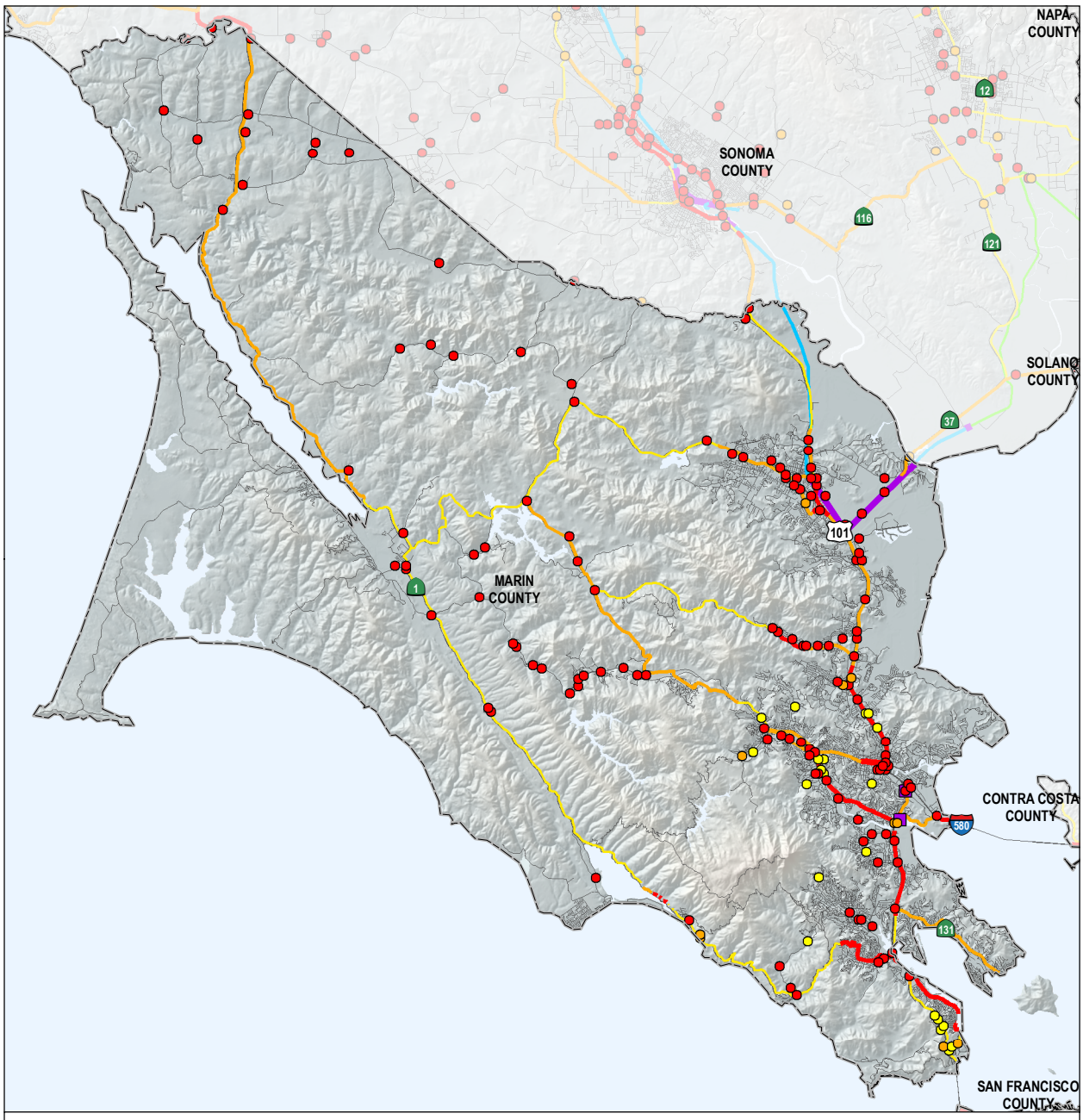
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Map c.B-6 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906
Modified Mercalli Intensity (MMI)
County: Contra Costa



County boundary
Road

N

0 5 10
MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

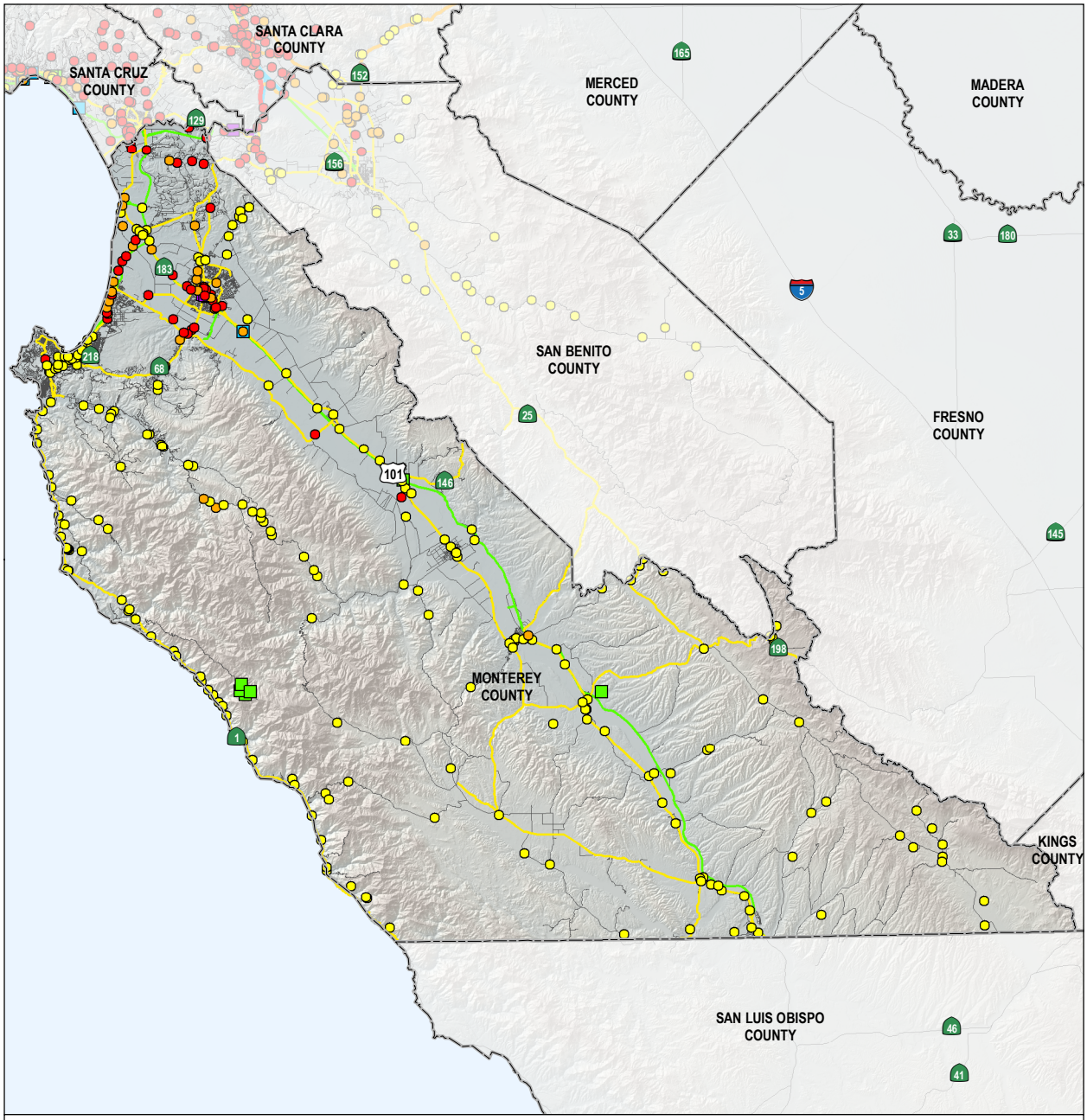
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Map c.B-7 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906
Modified Mercalli Intensity (MMI)
County: Marin



County boundary
Road

N

0 5 10
MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

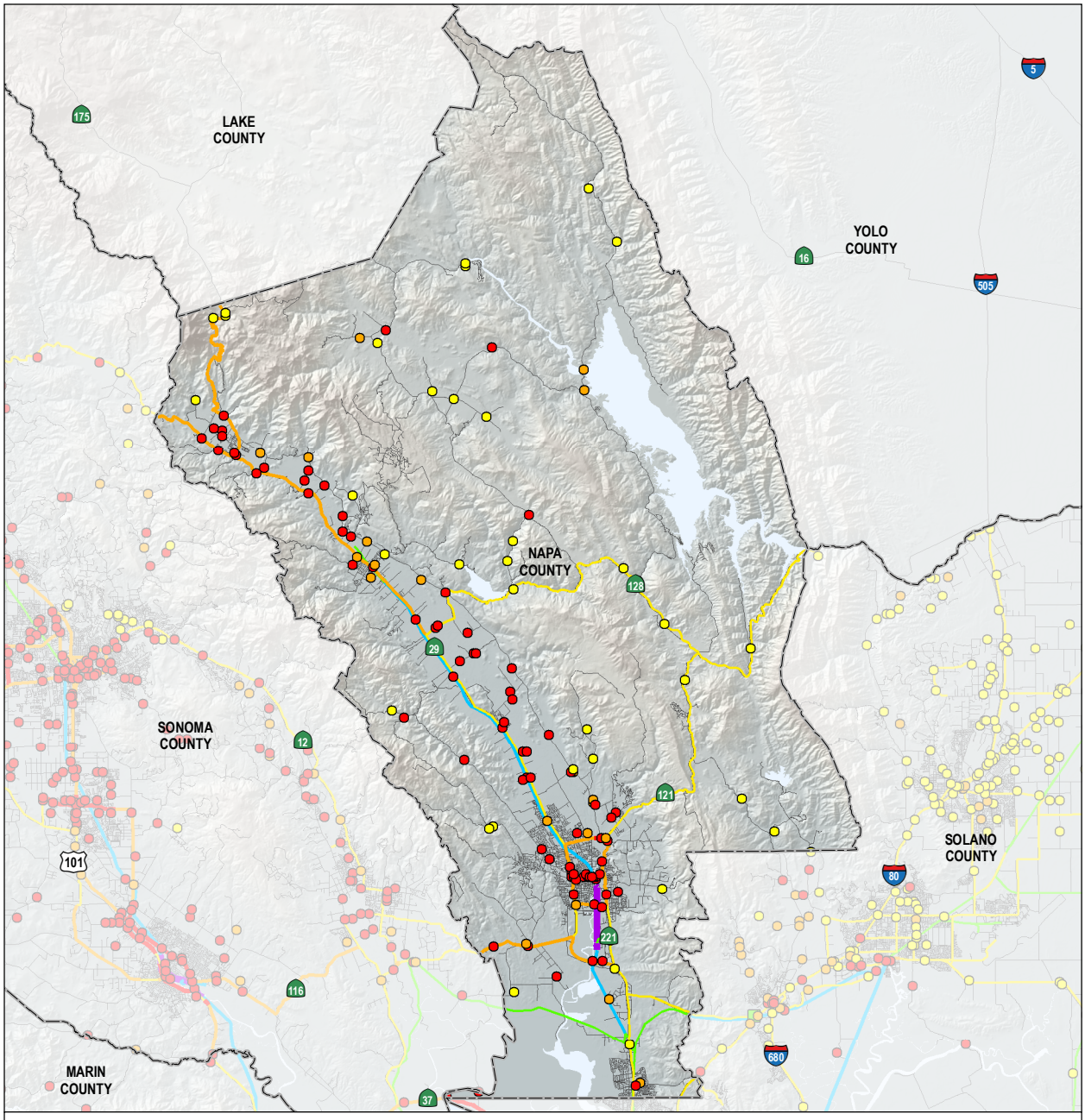
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Map c.B-8 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906
Modified Mercalli Intensity (MMI)
County: Monterey



County boundary
Road

N

0 5 10
MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

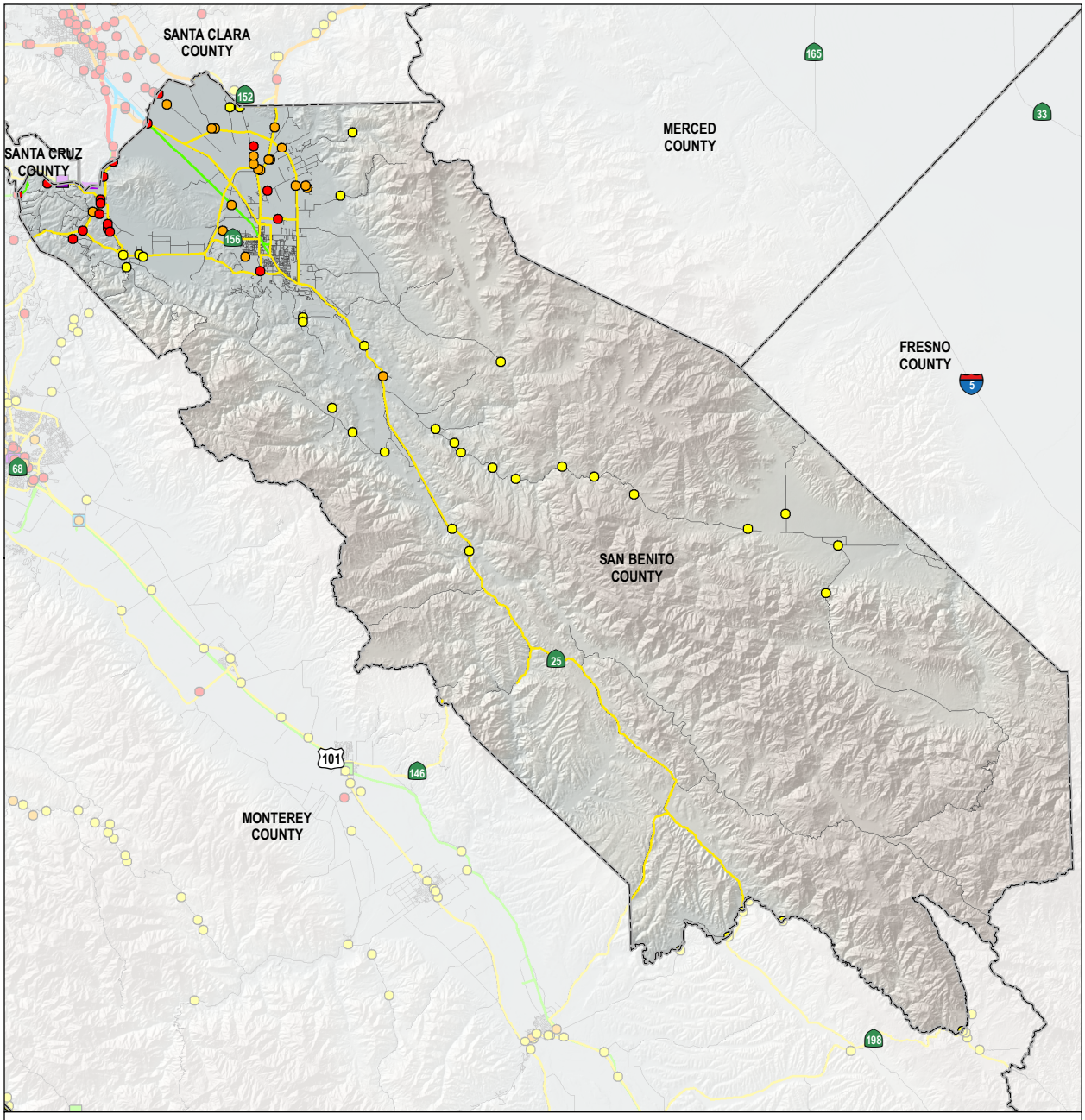
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Map c.B-9 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906
Modified Mercalli Intensity (MMI)
County: Napa



County boundary
Road

N

0 5 10
MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

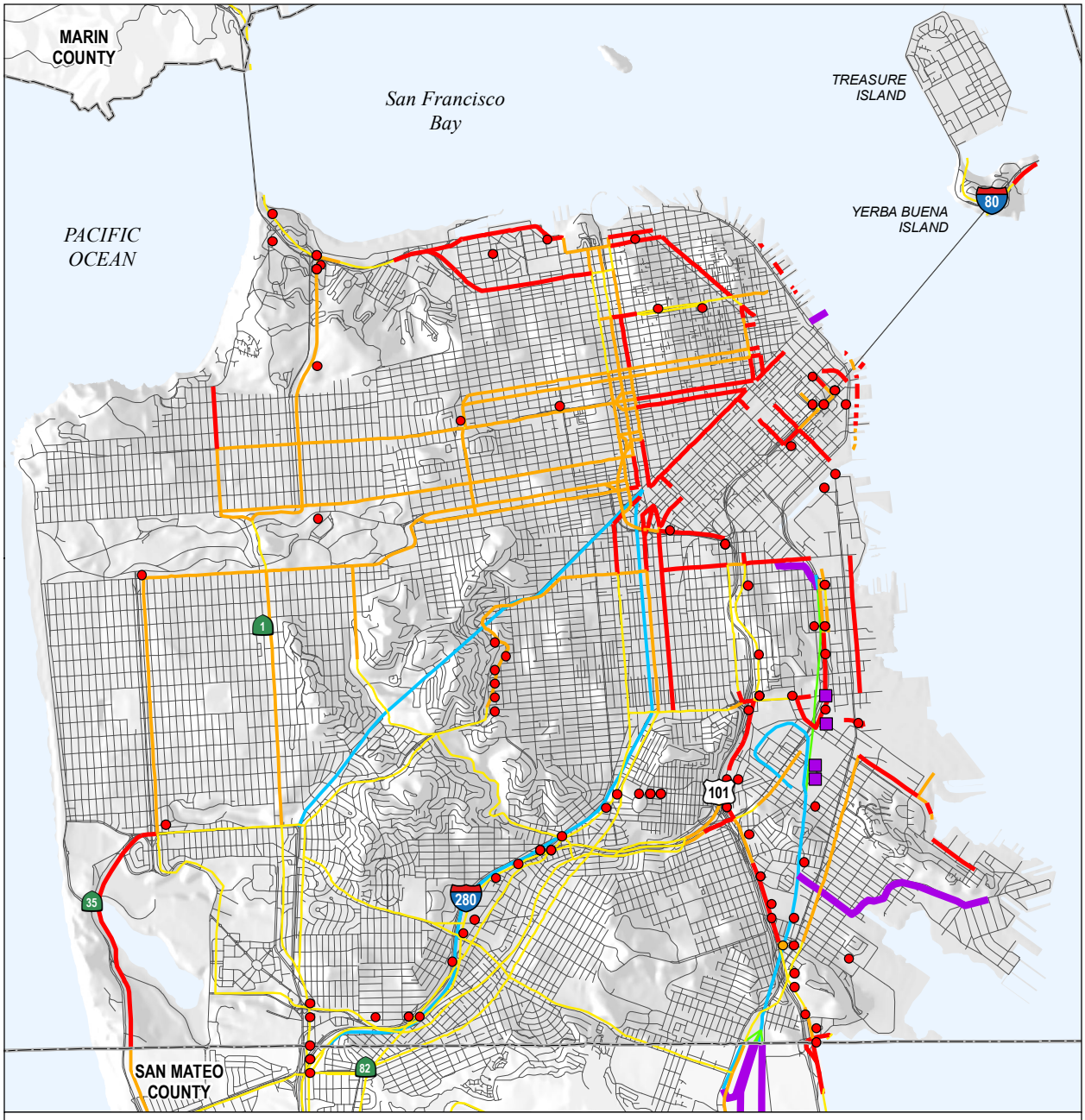
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Map c.B-10 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906 Modified Mercalli Intensity (MMI)
County: San Benito



N

0 1 2
MILES

Notes:
1. Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.
2. HAZUS default transportation
3. Road data source: HCIP Gold, 2007
4. Fault data source: USGS, 2006
5. Topographic data source: USGS NED

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

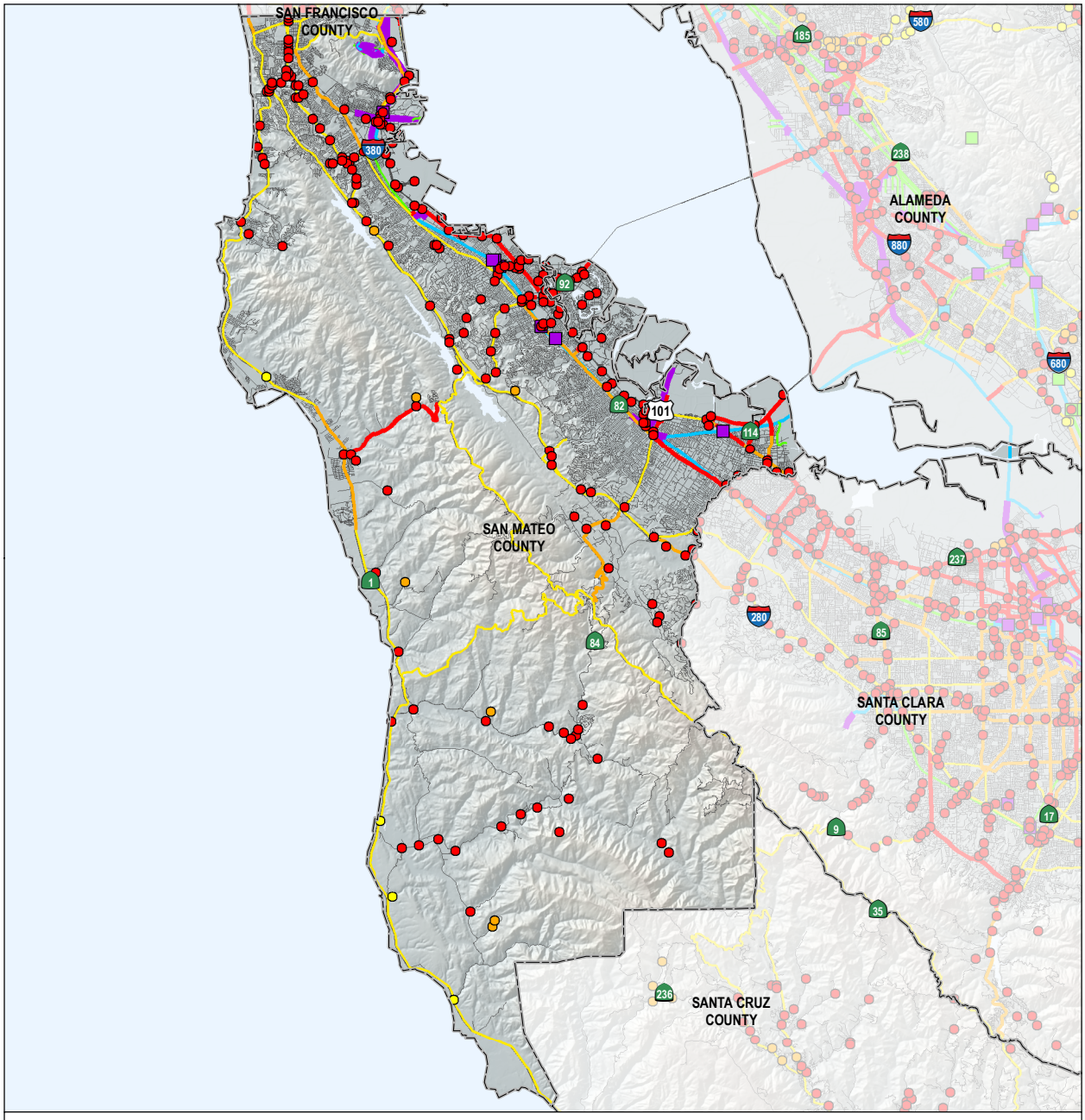
Railways
- < 90%
- 90 - 95%
- 95 - 100%

County boundary
Road

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Map c.B-11 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906 Modified Mercalli Intensity (MMI)
County: San Francisco



County boundary

Road

N

0 5 10

MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

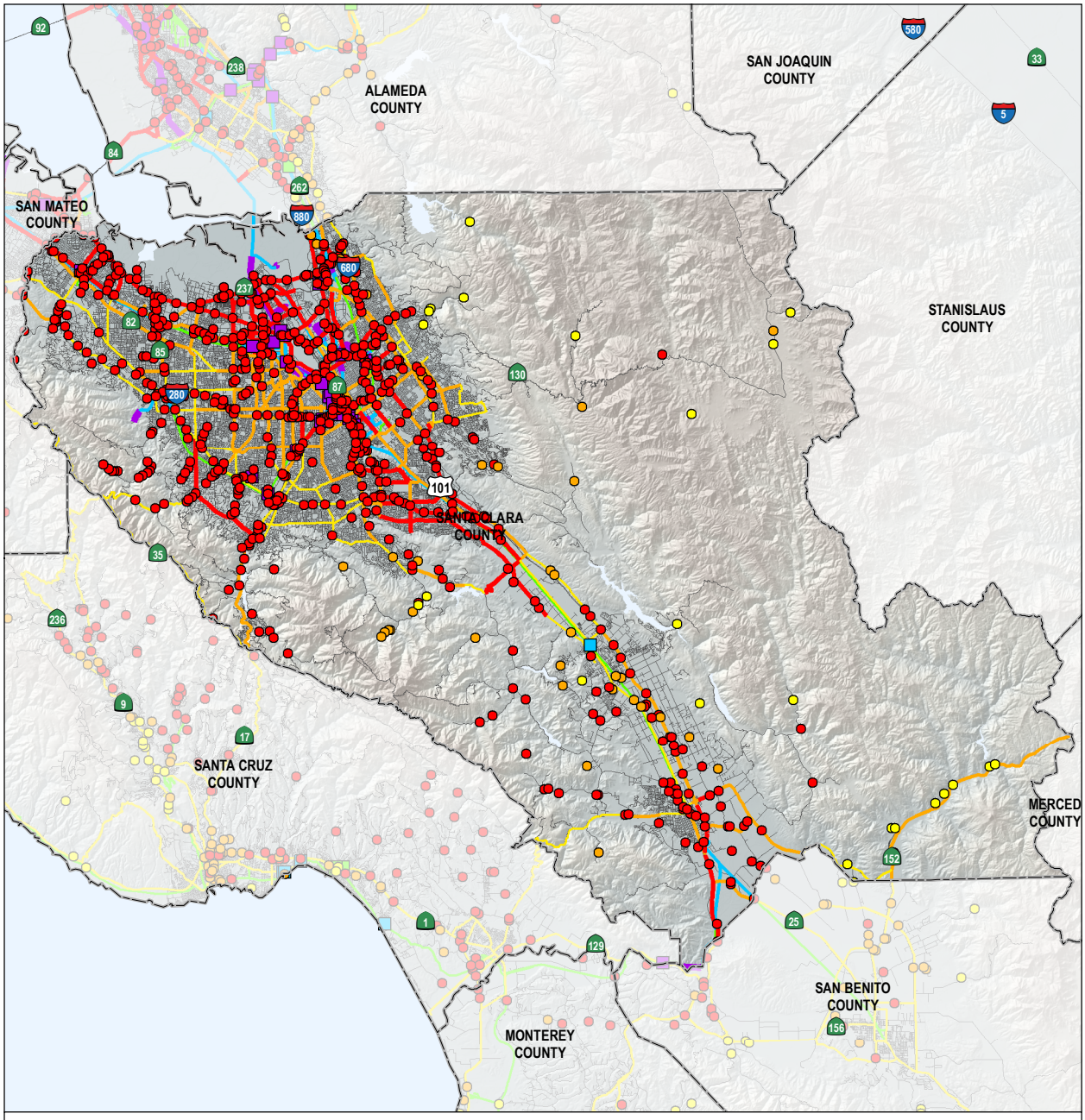
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Map c.B-12 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906 Modified Mercalli Intensity (MMI)
County: San Mateo



County boundary

Road

N

0 5 10

MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

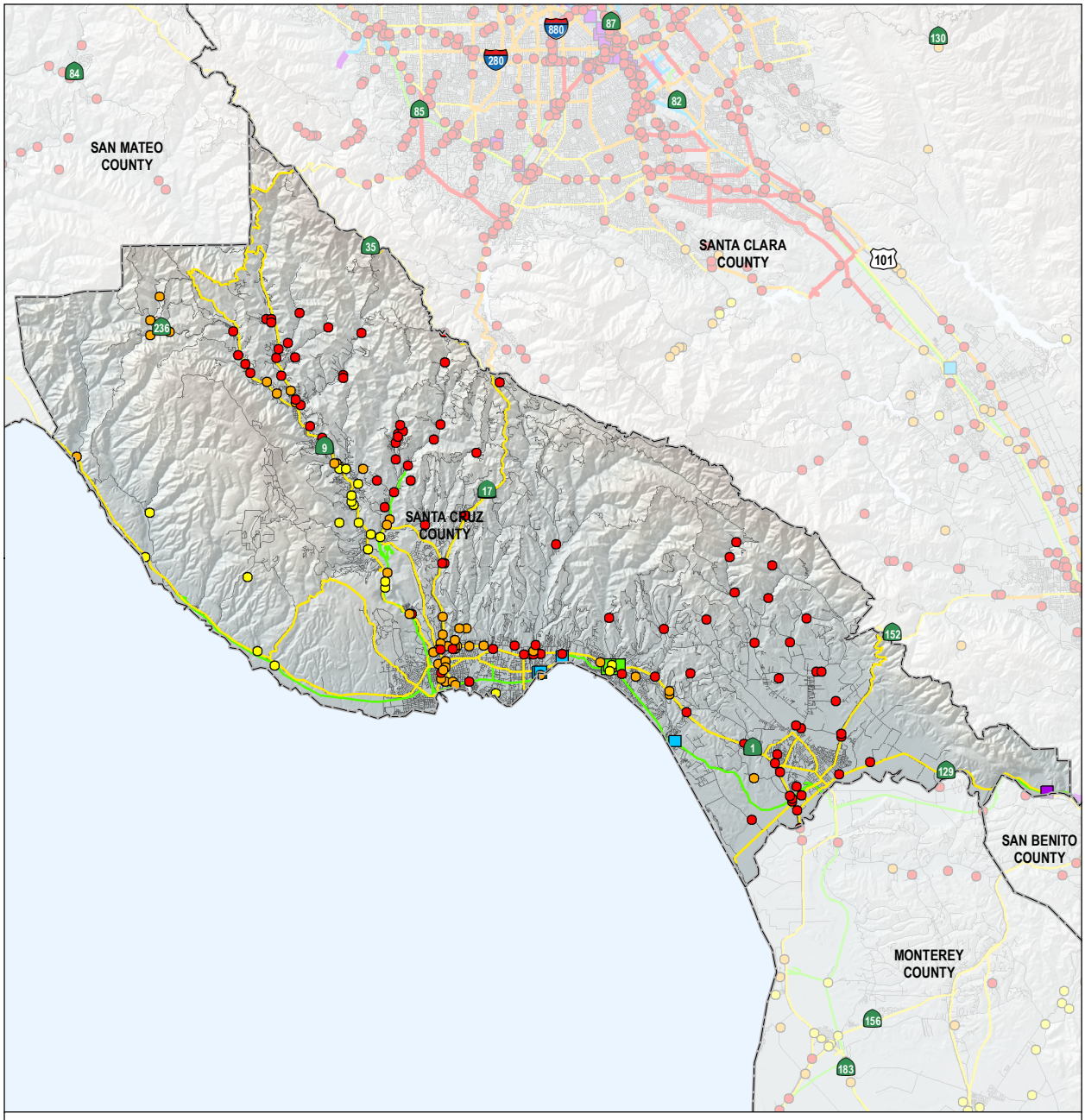
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map c.B-13 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906
Modified Mercalli Intensity (MMI)
County: Santa Clara



County boundary
Road

N

0 5 10
MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

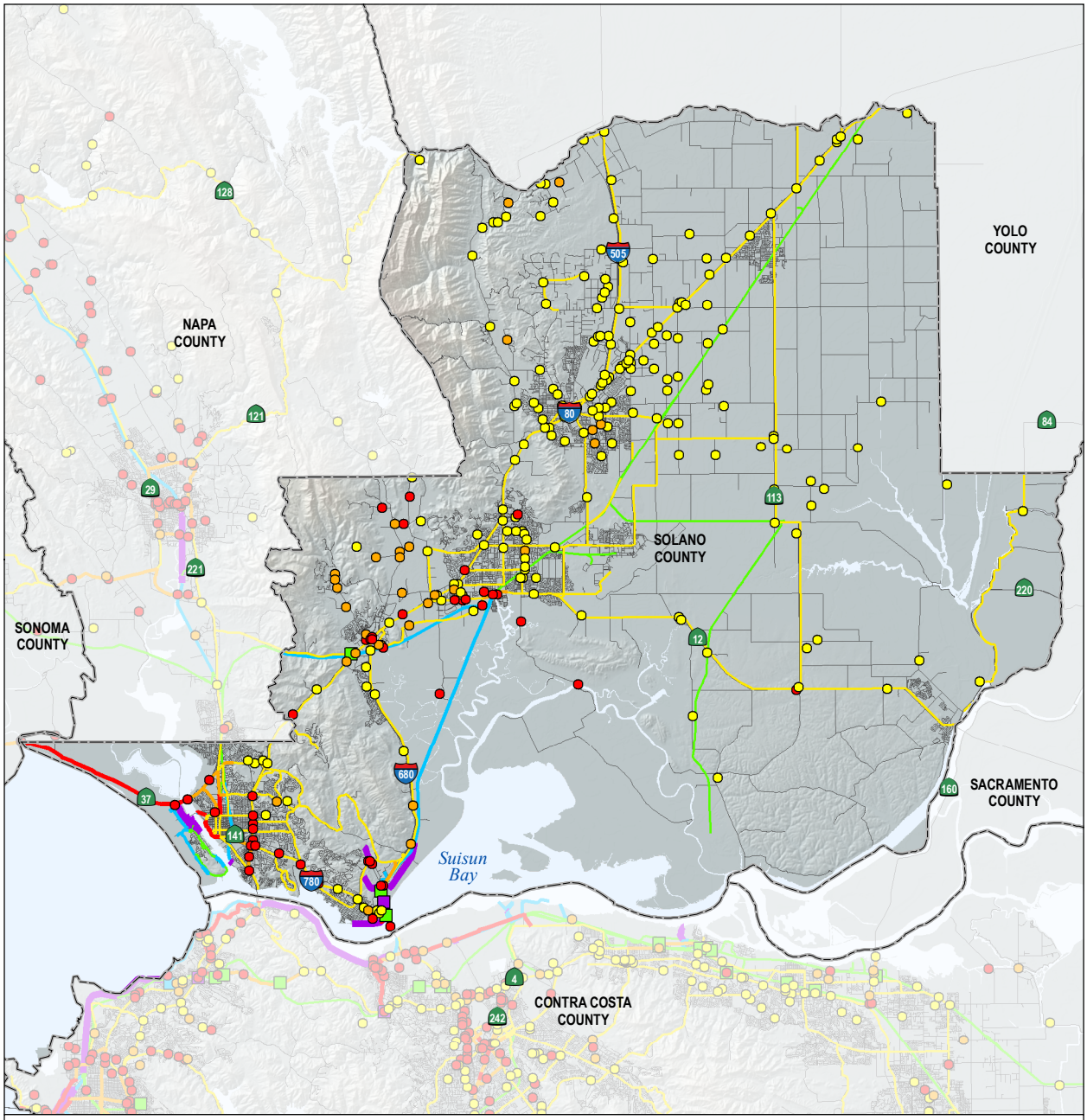
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

URS Corp - Oakland CA - C.Raumann

Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map c.B-14 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906 Modified Mercalli Intensity (MMI)
County: Santa Cruz



County boundary

Road

N

0 5 10

MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

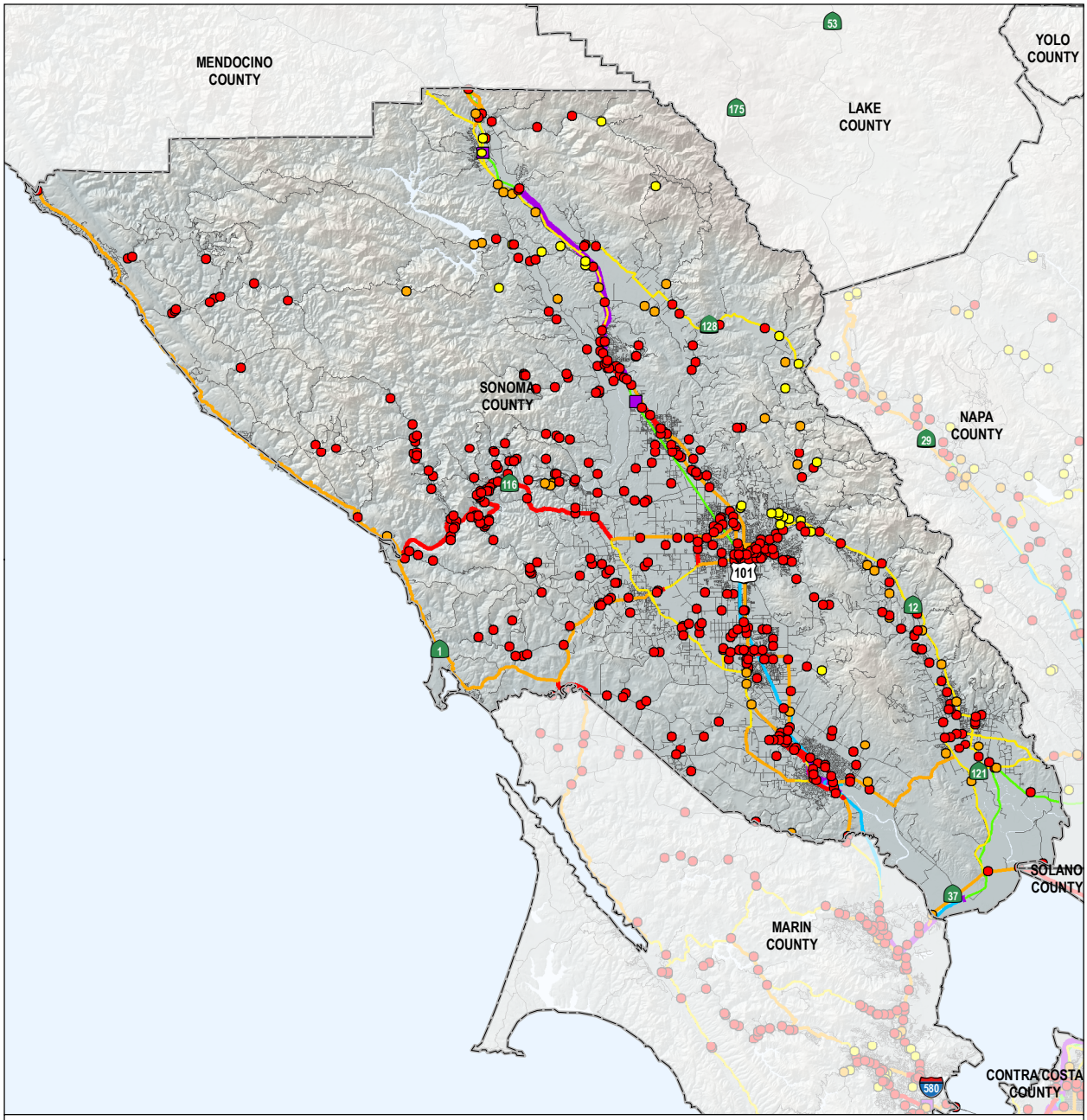
Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

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Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map c.B-15 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906
Modified Mercalli Intensity (MMI)
County: Solano



County boundary
Road

N

0 5 10
MILES

HAZUS default transportation
Road data source: HCIP Gold 2007
Topographic data source: USGS National Elevation Dataset, 30-m hillshade

Functionality, Day 1

Highway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Railway bridges
- < 90%
- 90 - 95%
- 95 - 100%

Highways
- < 90%
- 90 - 95%
- 95 -100%

Railways
- < 90%
- 90 - 95%
- 95 - 100%

Note:
Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.

URS Corp - Oakland CA - C.Raumann

Bay Area UASI Program
Regional Catastrophic Planning Grant Program

Map c.B-16 Estimated highway and railway infrastructure damage
Scenario: **M** 7.9 San Andreas Fault Fault earthquake 1906 Modified Mercalli Intensity (MMI)
County: Sonoma

Appendix D:
Logistics Capability Assessment Report

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Acronyms

ARC ..... American Red Cross

Cal OES ..... California Governor's Office of Emergency Services

CONPLAN..... San Francisco Bay Area Earthquake Readiness Response Concept of Operations Plan

CRA ..... California Resiliency Alliance

FEMA ..... Federal Emergency Management Agency

GIS ..... Geographic Information Systems

LCAT ..... Logistics Capability Assessment Tool

Plan ..... Regional Catastrophic Earthquake Logistics Response Plan

POD ..... Point of Distribution

RCPGP ..... Regional Catastrophic Preparedness Grant Program

RECP ..... Regional Emergency Coordination Plan

SEMS ..... Standardized Emergency Management System

UASI ..... Urban Area Security Initiative

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D.1 Introduction

The Regional Catastrophic Earthquake Logistics Response Plan (Plan) is being prepared for the Bay Area Urban Area Security Initiative (UASI), with funding provided from the Regional Catastrophic Preparedness Grant Program (RCPGP). The project will produce the Plan, annexes for the 12 Operational Areas in the planning area and for the two core cities of Oakland and San Jose.[1] This document is intended to provide an initial assessment of emergency logistics capabilities across the planning area, and for the four established hubs[2] therein.

D.1.1 Purpose of the Appendix

In developing the Plan, URS was tasked by the Bay Area UASI to conduct a Logistics Capability Assessment, through the development of a uniform question set applicable to Operational Areas and local governments in California and the Bay Area. The purpose of this document is to describe the assessment process, including development and administration of the Logistics Capability Assessment Survey and the facilitation of associated stakeholder meetings, and to explain the survey results on both a regional level and across each of the four hubs.

D.1.2 Scope

The scope of this report is limited to explaining the development and administration of the Logistics Capabilities Assessment Survey; briefly describing the survey process and the follow-up stakeholder meetings; synthesizing and providing the survey results region-wide and by Hub; and documenting key findings. The individual survey results of Operational Areas and core cities are not presented in this report.

The scope of the Plan is limited to providing a concept of operations for the distribution of potable water, food, sanitary supplies, fuel, and other critical life sustaining commodities. The Plan will also address critical lifelines such as water and wastewater, electricity, fuel, and sanitation. The concept of operations for joint Federal and State response, including logistics, to a Northern California catastrophic earthquake is described in the San Francisco Bay Area Earthquake Readiness Response Concept of Operations Plan (CONPLAN). The Plan will align with the CONPLAN as well as the Logistics Subsidiary Plan to the Regional Emergency

[1] The Operational Areas and cities represented are Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma Counties, the City and County of San Francisco, and the Cities of Oakland and San Jose.

[2] This convention has been used throughout Bay Area RCPGP plan development, to refer to a specified grouping of adjacent counties. The convention is based on a "hub and spoke" concept for distribution of commodities, by which resources would flow to a Federal staging area within the hub for subsequent distribution to county and local jurisdictions. The hubs are organized geographically as follows: North Bay Hub (Marin, Napa, Solano, and Sonoma Counties), South Bay Hub (Monterey, San Benito, Santa Clara, and Santa Cruz Counties), East Bay Hub (Alameda and Contra Costa Counties), and West Bay Hub (San Francisco and San Mateo Counties).

Coordination Plan (RECP), which describe coordination between SEMS levels for emergency logistics.

The survey results are intended to provide a baseline understanding of the logistics capabilities of *local* government. Further analysis is taking place as members of the project team engage Operational Areas and core cities, in order to complete data collection instruments designed to further inform the development of the Plan and Operational Area and core city annexes. Specific capabilities of the Federal Emergency Management Agency (FEMA), California Governor's Office of Emergency Services (Cal OES), private sector[3], and American Red Cross (ARC) have been, or will be, identified through separate engagement.

The presentation of detailed, individual survey results for each Operational Area and core city is not within the scope of this report. Instead, survey results from these jurisdictions will be used as an information tool by the URS project team during development of annexes for each jurisdiction.

D.1.3 Organization

This document contains the following sections:

Section 1: Introduction – provides the overall purpose of the document and a description of its scope and organization.

Section 2: Methodology – explains survey development and administration, stakeholder engagement, and the methods used to present and analyze the data.

Section 3: Results – provides a synthesis of the results across multiple counties and core cities. Results are provided regionally across the RCPGP planning area, as well as by multi-county Hub.

Section 4: Analysis – provides analysis and discussion of the results.

Section 5: Conclusion – summarizes the key points identified in the Analysis; describes how this report and the results will be used in the development of the Plan and the associated local plan annexes.

[3] vis-à-vis the California Resiliency Alliance

D.2 Methodology

This section describes the methodology used to conduct the Logistics Capabilities Assessment. Described below are the survey development and administration processes, stakeholder meetings, and the methods used to present and analyze the results.

D.2.1 Plans Review

In developing the Plan Analysis Report, URS reviewed various logistics plans including those of the City and County of San Francisco and the City of San Jose. Formal logistics plans for the other Bay Area jurisdictions were unavailable as they are either yet to be developed or in the process of being developed.

D.2.2 Survey Development

URS adapted the FEMA Logistics Capability Assessment Tool (LCAT) (FEMA, 2010) so that it was applicable to Operational Areas and local governments. URS determined that the existing LCAT was too lengthy, was State-oriented in its approach, and was not sufficiently tailored to emergency management in California. URS sought to reduce the total number of questions; adapt the LCAT to the capabilities, roles, and responsibilities of local governments in the Bay Area; and to incorporate language consistent with California's Standardized Emergency Management System (SEMS).

During the survey development process, URS obtained the newly released LCAT Local Question Set, a localized version of the LCAT that was in the process of being developed by FEMA. The Local Question Set includes two versions: a Capstone Local Question Set (122 questions), "designed to assess jurisdictions that have mature logistics Capabilities (FEMA, 2012; p. 45)"; and a Fundamental Local Question Set, "designed to assess jurisdictions that are developing their logistics capabilities (FEMA, 2012; p. 45)". Based on the specific criteria outlined by FEMA, URS determined that the Fundamental Local Question Set was the better suited of the two for administration to the Operational Areas and core cities, given what we know of current logistics plans and processes, the outcomes of the Policy Analysis, and discussions held with stakeholders.

Using the LCAT Local Question Set as a starting point, URS refined the questions to align with SEMS and eliminate questions that were not relevant to the development of the Plan and local annexes. The resulting Logistics Capability Assessment Survey was administered to the Operational Areas and core cities.

The final Logistics Capability Assessment Survey is provided in Appendix A, and contains the following sections:

- Plan Development
- Staffing
- Distribution Planning

- Procurement Procedures and Protocols
- Staging Areas/PODs
- Commodity Requirements and Management
- Procurement
- Commodity Distribution
- Inventory Control
- Property Management
- Warehouse and Facility Management
- Logistics Equipment Management and Maintenance
- Logistics Quality Management

Each question is organized as follows: the Capability section provides the answers from which to choose, ordered by degree of capability, with 1 being the most basic and 5 being the most sophisticated. These five levels of capability align with the FEMA LCAT and are defined in Section 3.1. The Intent section provides perspective as to why the question is being asked. The Comments section provides an opportunity for respondents to document additional information relevant to the question. If none of the choices provided are completely accurate, respondents are asked to select the most accurate response and provide written comments.

The Logistics Capability Assessment Survey is not included in this document, due to length; however, it is available by contacting the Bay Area UASI.

D.2.3 Survey Administration

The Logistics Capability Assessment Surveys were administered to the 12 Operational Areas and two core cities. The surveys were distributed by email to emergency management executives in each of these jurisdictions. Each jurisdiction was asked to convene emergency management staff and other government staff responsible for emergency logistics (e. g. public works; general services; or other public agency personnel having responsibility for facilities management, inventory management, contracting, and/or purchasing) in a collaborative effort to complete the survey. Jurisdictions were requested to provide responses strictly based on their own capabilities and not based on capabilities of partner agencies, such as ARC, unless the question explicitly asked for such information.

Respondents representing each jurisdiction were instructed to select the multiple choice answer best corresponding with the current logistics capabilities of their jurisdictions. Respondents were asked to be as candid as possible.

The surveys were distributed in Microsoft Word via electronic mail (email). URS requested that completed surveys be returned in either hard copy format or via email.

D.2.4 Stakeholder Engagement

Logistics Capability Assessment Outreach

URS conducted outreach to the Operational Areas and core cities as follows. Formal letters were distributed by email in late August 2012, requesting participation in the Logistics Capability Assessment, including a request to complete the Logistics Capability Assessment Survey and a request to attend one of a series of stakeholder meetings. The Logistics Capability Assessment process was further explained at the preliminary Plan Steering Committee Meeting in late August, 2012. Additional follow-up was conducted with each Operational Area and core city, as needed.

Stakeholder Meetings

Stakeholder meetings were scheduled to take place in mid- to late-September 2012, and were organized according to the four hubs. One stakeholder meeting was offered in each hub, and each jurisdiction was asked to attend the meeting in its respective hub. The purpose of these meetings was to facilitate completion of the Logistics Capability Assessment Survey; provide additional information to stakeholders regarding the Regional Logistics Plan project; and discuss the survey results, logistics capabilities, and challenges with local emergency managers and other local government representatives. Operational Area, core city, and UASI representatives were invited. Operational Area and core city representatives were asked to bring the Logistics Capability Assessment Survey to their respective stakeholder meetings, completed to the extent possible.

Based on feedback from the UASI, and from feedback obtained from local jurisdictions, URS emphasized that attending the stakeholder meetings was optional in the event that jurisdictions had already completed, or would not require assistance in completing the Logistics Capability Assessment Survey. This was intended to minimize the burden on jurisdictions. URS additionally offered jurisdictions the option to meet individually, if they preferred.

D.2.5 Analytical Methodology

Survey results in Section 3 are presented by region and by hub. For a given question, the results presented are extrapolated based on the lowest level of capability identified among the collective responses of the jurisdictions.

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D.3 Results

This section documents the results of the Logistics Capability Assessment Survey and the associated stakeholder meetings.

D.3.1 Survey Results

Table 3.1 provides the survey results. The results are presented by region and by hub, as described in Section 2.5. The capability levels of 1 through 5 are defined as follows:

Level 1: Static – The local jurisdiction has not yet developed and/or implemented a viable strategy within the functional area.

Level 2: Functional – The local jurisdiction has implemented informal plans or processes, but standard operating procedures (SOPs) have not been defined or adopted.

Level 3: Horizontal Integration – The local jurisdiction has developed and implemented formalized, integrated SOPs across its emergency management organization.

Level 4: External Collaboration – The local jurisdiction has coordinated plans and SOPs with other state, local or tribal, and external partner agencies, organizations, and private vendors.

Level 5: Synchronized – All local, state, and private partners have fully integrated and synchronized plans, procedures, and operations. All plans and SOPs have been documented and exercised regularly with all participants. The local jurisdiction has demonstrated mastery of this capability.

Table D.3-1. Logistics Capability Assessment Survey Results

Question	West Bay Hub	East Bay Hub	North Bay Hub	South Bay Hub	Region
Plan Development					
(Q1) Does your local jurisdiction have a current formal logistics plan?	1	1	1	1	1
(Q2) How does the local jurisdiction capture logistics response requirements for a catastrophic disaster?	2	2	1	1	1
(Q3) How does the local jurisdiction determine the quantities and types of critical commodities needed to support affected populations during the first 72 hours after the scenario earthquake?	1	1	1	1	1
(Q4) How are logistics requirements identified for evacuating local residents and visitors, and receiving evacuees from other jurisdictions or areas?	1	1	1	1	1
(Q5) How are risks associated with the local jurisdiction's logistics plans addressed?	1	1	1	1	1
(Q6) How does the local jurisdiction identify logistics resource shortfalls?	1	1	1	1	1
(Q7) What standard typing protocols does your local jurisdiction use to identify required logistics resources by capability?	2	1	2	1	1
Staffing					
(Q8) What organization is defined as the local jurisdiction's lead agency coordinator for logistics?	2	4	2	1	1
(Q9) What is the status of disaster logistics personnel staffing?	1	2	1	1	1
(Q10) What roles and standard processes and procedures are established for local jurisdiction logistics personnel?	2	2	1	1	1
(Q11) What is the process for ensuring that local jurisdiction logistics personnel have access to the common operating picture so that they have appropriate situational awareness?	4	1	3	2	1
(Q12) What standard operating procedures (SOP) are in place for vetting potential commodity and service providers in the local jurisdiction?	1	1	1	1	1

Table D.3-1. Logistics Capability Assessment Survey Results

Question	West Bay Hub	East Bay Hub	North Bay Hub	South Bay Hub	Region
(Q13) Do the local jurisdiction's logistics plans include public-private partnerships?	3	1	2	1	1
Distribution Planning					
(Q14) What access to information on post-disaster damage to transportation infrastructure does the local jurisdiction logistics team have?	3	2	2	2	2
(Q15) How has the local jurisdiction worked within its area to identify or determine capabilities of other agencies or the private sector to support food distribution?	1	1	1	1	1
(Q16) How do your local jurisdiction's plans address transporting materials through restricted areas?	2	1	1	1	1
Procurement Procedures & Protocols					
(Q17) What SOPs are in place for ordering and acquiring resources and services?	2	2	1	1	1
(Q18) How are contracts and emergency purchase procedures linked to local jurisdiction accounting practices and procedures?	2	3	1	1	1
(Q19) How does the local jurisdiction balance its portfolio of vendor contracts, to include local, regional, and national/enterprise level providers?	4	2	1	1	1
(Q20) What process is used to make private sector liaisons easily accessible to local jurisdiction logistics personnel?	3	2	1	1	1
Staging Areas/PODs					
(Q21) Have locations for Local Staging Areas (LSA) and Points of Distribution (PODs), and the staff and material requirements been identified?	1	1	1	1	1
(Q22) What documented SOPs does the local jurisdiction have for local LSA operations?	1	1	1	1	1
(Q23) How are PODs identified and typed in the local jurisdiction's logistics plan?	1	1	1	1	1

Table D.3-1. Logistics Capability Assessment Survey Results

Question	West Bay Hub	East Bay Hub	North Bay Hub	South Bay Hub	Region
(Q24) How has the local jurisdiction captured the POD concept of support in plans, such EOPs or related annexes?	1	1	1	1	1
(Q25) How has the local jurisdiction identified staff and material requirements for POD operations?	1	1	1	1	1
(Q26) Does the local jurisdiction sponsor or provide LSA and/or POD training?	1	1	1	1	1
(Q27) Do the logistics plans and operational activities meet all safety requirements?	2	1	2	1	1
(Q28) Are POD requirements generated through an ad hoc or formal process based on established and accepted planning factors?	1	1	1	1	1
(Q29) What does your local jurisdiction have as documented SOPs for POD operations?	1	1	1	1	1
(Q30) What security provisions are made for distribution points?	2	1	2	1	1
(Q31) How does your local jurisdiction demobilize PODs?	1	1	1	1	1
Commodity Requirements & Management					
(Q32) How are estimated shelter support requirements included in the local jurisdiction's overall commodity requirements?	1	1	1	1	1
(Q33) How are generator requirements determined by the local jurisdiction?	1	1	1	1	1
(Q34) What are the local jurisdiction's resource management processes and procedures?	2	1	1	1	1
(Q35) How does the local jurisdiction document commodity or equipment orders? Is automated information technology used to facilitate order status updates? If the local jurisdiction does not use automated information technologies, how is information management used to facilitate order status updates?	3	3	1	1	1

Table D.3-1. Logistics Capability Assessment Survey Results

Question	West Bay Hub	East Bay Hub	North Bay Hub	South Bay Hub	Region
Procurement					
(Q36) How is purchasing training incorporated into the local jurisdiction's disaster logistics process? Are lead time standards in place to give the logistics staff and customers realistic expectations of when supplies and resources can be delivered to points throughout the supply chain? Is a first-in, first-out commodity sharing structure in place?	1	1	1	1	1
Commodity Distribution					
(Q37) How are inbound shipments to your local jurisdiction scheduled or managed to control distribution flow into distribution points?	1	1	1	1	1
(Q38) To what extent has the local jurisdiction determined transportation requirements for commodity distribution?	1	1	1	1	1
(Q39) How does the local jurisdiction determine when security escorts will be used to protect critical loads?	3	2	1	1	1
Inventory Control					
(Q40) How does your local jurisdiction receive order status updates? How are orders closed out upon delivery in your local jurisdiction?	1	2	2	1	1
Property Management Personnel					
(Q41) What is the local jurisdiction capability to warehouse and distribute commodities to impacted populations using vendor-managed inventory and/or jurisdiction-owned commodities? Does the local jurisdiction have manager responsible for local jurisdiction owned commodities and equipment?	1	2	1	2	1
Warehouse & Facility Management					
(Q42) What warehousing requirements has your local jurisdiction determined are needed to support impacted population?	1	1	1	1	1

Table D.3-1. Logistics Capability Assessment Survey Results

Question	West Bay Hub	East Bay Hub	North Bay Hub	South Bay Hub	Region
Logistics Equipment Management & Maintenance					
(Q43) What level of scalability does the local jurisdiction have for equipment management and maintenance capabilities?	2	2	2	1	1
Logistics Quality Management					
(Q44) What standard methodology does the local jurisdiction have in place for collecting and storing logistics data from past incidents and exercises?	1	2	2	1	1
(Q45) What ongoing logistics training and exercise plan does your location jurisdiction have?	2	2	2	1	1

D.3.2 Stakeholder Meeting Results

The West and East Bay Hub meetings were cancelled due to low attendance by several jurisdictions within those hubs. The North Bay Hub Meeting was attended by representatives from Marin, Napa, Solano, and Sonoma Counties and the Bay Area UASI. The South Bay Hub meeting was attended by representatives from the City of San Jose, San Mateo, Santa Clara, and Santa Cruz Counties (San Mateo County elected to attend following the cancellation of the West Bay Hub Meeting), the Bay Area UASI, and California Energy Commission. URS met separately with the City of Oakland.

D.3.2.1 Summary of Issues Identified

The following issues were identified:

- Most counties do not have formal emergency logistics plans. Those that do, have plans that are limited in scope to agency roles and responsibilities and EOC operations. These plans do not cover field operations, such as activating and operating Points of Distribution (PODs).
- Some counties have initiated POD planning, but most have not. Many are unfamiliar with the concept of PODs, including Federal expectations that the distribution of federally provided commodities will take place through locally managed PODs.
- No counties identified government-operated warehouses.
- Oil refineries, water and wastewater treatment facilities, seaports, airports, and other critical infrastructure are overwhelmingly located in soil liquefaction zones.
- Availability of fuel for response operations is a chief concern:

  - Reserves for government operations are very limited.
  - Fuel pump systems require power, and almost all of them lack redundancies to provide electric power in the event of power grid failure, or the capability to readily receive feeds from portable auxiliary generators.
  - Self-pumping fuel transport/delivery capabilities are limited and, as with all critical commodities, will be difficult to move into the region due to transportation infrastructure damage.
  - There is perhaps a 72-hour supply of fuel at refineries at any given time (based on daily distribution to retailers in Northern California, Southern Oregon, Northern Nevada, and Western Utah), as refineries rely on "just-in-time" shipments.
  - Refinery marine terminals will not be able to receive crude oil shipments until they are inspected and repaired if necessary. Shipping channels to marine terminals must be surveyed and dredged or cleared of debris before crude carriers can transit to them.
  - Refineries will likely go offline immediately, and will remain so for at least 3 days, even given limited damage to the physical plant. Damage to refineries is likely; therefore, they are unlikely to be online during the initial response phase.
- Transportation infrastructure is highly vulnerable to disruption due to shaking damage, as identified in the Regional Catastrophic Earthquake Mass Transportation/Evacuation Plan and revised HAZUS runs recently performed by URS based on updated census and infrastructure data.
- Damage to transportation infrastructure, including highways and roads, airports, and seaports (and associated shipping channels) will disrupt the capacity to expediently move commodities.
- Traditional lifelines are chief concerns, including:
  - Water for fire suppression operations.
  - Potable water.
  - Waste water.
- Strategic planning requirements will differ among jurisdictions based on geography.
  - A number of the regions' more outlying counties routinely experience floods and landslides that temporarily isolate communities. Response to the scenario earthquake will likely be similar to these relatively "routine" responses, but on a much larger scale.
  - Residents in outlying areas may be relatively more self-reliant.
  - Some outlying counties expressed concerns that evacuees from impacted urban areas may take temporary shelter within their jurisdictions; these counties expressed concerns that their capabilities to receive evacuees are limited.

  - Solano and Alameda Counties contain major ingress and egress routes via highways, and are strategically important for evacuation and transportation of commodities into and out of areas with the highest impacts.
- Many counties report that they are highly dependent upon ARC for commodity distribution and associated logistics.
- A few counties have established agreements or have engaged in planning efforts with large wholesalers and major retail chains.

D.4 Analysis

This section provides a written discussion, interpretation, and analysis of the survey and stakeholder meeting results. The sections below align with the various sections of the Logistics Capability Assessment Survey, although some sections are consolidated or omitted for brevity.

D.4.1 Plan Development

All but two of the jurisdictions surveyed do not have formal logistics plans. The two formal logistics plans are predominantly limited in scope to describing EOC operations. These plans do not provide specific operational requirements or concepts of operations for PODs, staging areas, or supply chain management.

Identification of logistics response requirements among the jurisdictions is generally limited. Some logistics requirements have been developed as part of previous Bay Area RCPGP planning, and through the CONPLAN. These plans have identified, at a regional level, the quantities of some critical commodity requirements such as food and water based on the catastrophic earthquake scenario. Most of the jurisdictions surveyed have not identified specific resource shortfalls.

D.4.2 Staffing

Survey results varied considerably across jurisdictions with regard to staffing. Discussions during the stakeholder meetings revealed that the employees of the Operational Areas and core cities are generally well trained with regard to activation of the Logistics Section of the EOC; however, most jurisdictions have identified only limited staff, if any, to conduct logistics operations in the field, such as POD and local staging area operations.

Tools to support EOC staff in developing, maintaining, and disseminating situational awareness range from automated tools such as WebEOC, manual-entry tools such as Excel or other spreadsheet software, to written hard-copy documentation.

D.4.3 Distribution Planning

Discussions during the stakeholder meetings revealed that most of the Operational Areas and core cities have performed either limited or no distribution planning.

Methods for capturing situational awareness and documenting situation status of transportation infrastructure vary widely across jurisdictions. Several jurisdictions use Geographical Information Systems (GIS) for this purpose.

Five Operational Areas reported having identified sufficient transportation assets to deliver critical commodities during the first 72 hours; however most jurisdictions have not identified these assets.

D.4.4 Procurement Procedures and Protocols

Procedures and protocols for procurement vary considerably among the jurisdictions. In general, emergency purchasing procedures and local jurisdiction accounting are integrated; however, a few jurisdictions report that there are no standard practices for integration with accounting, other than the establishment of the EOC's Finance/Administration Section. Consistent points-of-contact with the private sector for procurement purposes exist through some of the EOCs of the more populated Operational Areas and core cities (through vendors or private sector liaisons), but are less established in the less populated Operational Areas. The California Resiliency Alliance (CRA), in coordination with Cal OES, provides a means for private sector coordination. CRA member organizations provide voluntary staff to serve as liaisons to government agencies; however, staff is limited and may or may not be available to Operational Area and core city EOCs.

D.4.5 Staging Areas/PODs

Potential locations for local staging areas (for commodities) and PODs have generally not been formally identified.

The survey and stakeholder meetings revealed that local jurisdictions are not familiar with POD operations, nor do expectations of local roles and responsibilities in managing POD operations align with Federal and State expectations. Several Operational Areas report that they expect ARC to manage PODs.

D.4.6 Commodity Requirements & Management

Commodity management processes, including ordering, receiving, invoicing, and payment vary widely across the Region. Approximately one-third of Operational Areas reported that commodity management processes are documented based on standard processes and use some level of automation in the commodity management process. Most jurisdictions do not have standardized processes for commodity management.

Commodity requirements for emergency shelters for each Operational Area and the two cities are identified in the RCPGP Mass Care and Shelter Plan, based on the same catastrophic earthquake scenario.

Most jurisdictions have not conducted planning to determine emergency power generation requirements. One Operational Area reported that an emergency fuel plan had been developed to specifically support generators and the fuel requirements of local and mutual aid resources.

D.4.7 Inventory Control

Nearly all jurisdictions do not have automated systems to support situational awareness of inventory management and movement of commodities. Instead, most jurisdictions expect to rely on manual updates on the status of requests, and notifications of delivery through EOC Logistics Sections. A number of jurisdictions

use WebEOC; however, this system is not specifically oriented toward inventory management.

D.4.8 Warehouse and Facility Management

Most jurisdictions report that they have not determined required warehousing needs, or property management needs for commodity distribution, nor have locations been selected to warehouse or stage commodities, other than those locations managed by ARC.

D.4.9 Logistics Equipment Management and Maintenance

Jurisdictions overwhelmingly reported that local capabilities to manage and maintain logistics equipment are sufficient to handle routine responses, pre- and post-incident. However, scalability of equipment management and maintenance capabilities is limited.

D.4.10 Logistics Quality Management

Through standard training and exercise programs and after action processes, frameworks are in place to provide quality management for emergency logistics. It can be inferred from the survey results and stakeholder meetings that logistics training and exercises are mostly limited to EOC operations. Considerable training and exercises have taken place in relation to logistics support for local health department points of dispensing.

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D.5 Conclusion

The survey results provided in this report are intended to provide a baseline understanding of the emergency logistics capabilities of local government, as represented by the Operational Areas and the two core cities within the RCPGP planning region. The individual survey results of each of the participating local jurisdictions will be used as an information tool by the URS project team during development of the Plan and annexes that are specific to each Operational Area and the two core cities.

This report highlights the following key issues:

- Most jurisdictions do not have formal logistics plans. The plans of those that do are predominantly limited to policies and procedures of the Logistics Section in EOCs, and do not provide policies and procedures for field operations.
- POD locations have not been identified in plans.
- Identification of and planning for commodity staging areas have not been addressed at the local level.
- Most jurisdictions have very limited familiarity, or are not familiar, with POD operations.
- Expectations on the part of most local governments, concerning local roles and responsibilities in managing POD operations, do not align with Federal and State expectations. In addition, several Operational Areas report that they expect ARC to manage PODs.
- The availability of fuel is a major concern; local governments typically have very limited fuel supplies. Fuel dispensing stations, both public and private, will not function without power; a majority of fuel stations do not have backup generators. Refineries operated based on just-in-time delivery of crude, and hold limited supplies of fuel which will not be readily accessible following a catastrophic earthquake.
- Commodity management processes, including requesting, ordering, receiving, invoicing, and purchasing vary widely across a given region; most jurisdictions do not have standardized procedures for commodity management.
- Most jurisdictions lack automated inventory tracking systems and expect to rely on EOC staff to manually track the status of inventory and commodity movement. However, a number of jurisdictions use WebEOC, which in itself is not geared towards inventory tracking.

Issues identified above that are not addressed in the Plan will be documented in the Regional Catastrophic Earthquake Logistics Response Plan Summary and Recommendations Report, which will be provided at the end of the project.

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D.6 Bibliography

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Appendix E:
Sample Press Releases and Public Information Announcements

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APPENDIX E: SAMPLE PRESS RELEASES/PUBLIC INFORMATION ANNOUNCEMENTS

The following Point of Distribution (POD) templates are provided:

- Example of a POD Announcement: Distribution Site Openings Delayed
- Example of a POD Announcement: Update on Distribution Sites
- Example of a POD Announcement: Ice, Water, and Medical Mobile Service Locations

E.1 Example of a POD Announcement: Distribution Site Openings Delayed

[JURISDICTION LOGO]

EMERGENCY UPDATE
[Jurisdiction]
EMERGENCY OPERATIONS CENTER
[Address]
[Website]

NEWS RELEASE

DATE: _____
TIME: _____

CONTACT: _____
PHONE (Media Only): _____
[INCIDENT/EVENT NAME] HOTLINE: _____

[Incident/Event Name] Advisory #__
Distribution Site Openings Delayed

[Jurisdiction Name] is making every effort to provide water and ice through numerous distribution centers throughout the [Jurisdiction Name]. The State Emergency Operations Center dispatched tractor-trailer rigs, which were due to arrive in [Jurisdiction Name] by noon today. Although deliveries have been delayed, law enforcement officials are currently escorting trucks containing water, ice, and meals ready to eat (MREs) from [Location] to the distribution points. The distribution sites are expected to be operational by early evening. Residents are asked not to leave their home to go to a distribution site until it is announced that the sites are open. An updated list of distribution sites is provided below.

The [Jurisdiction Name] [Office Name] has announced that the [Jurisdiction-wide] curfew for [Jurisdiction] will continue on [Date] at 7 p.m. until [Date] at 7 a.m. All residents and businesses are expected to observe curfew laws. Exemptions to the curfew include essential personnel such as law enforcement, fire-rescue, hospital or other health care workers, emergency management, and others involved in recovery efforts.

The [Agency or Department Name] has placed all [Jurisdiction Name] communities under a “boil water order.” If you are currently without water, you will be required to disinfect your water once service resumes. The boil water order is in effect until further notice.

[Utility Name] reported that approximately [%] of [Jurisdiction Name] is without power. There has been extensive damage to the transmission and substation infrastructure. More than ____ personnel are in the field working on power restoration.

[Jurisdiction Name] Distribution Sites for Ice, Water and MREs
Updated [Time], [Date]

[Site Name]
[Site Address]

[Site Name]
[Site Address]

[Site Name]
[Site Address]

E.2 Example of a POD Announcement: Update on Distribution Sites

[JURISDICTION LOGO]

EMERGENCY UPDATE
[Jurisdiction]
EMERGENCY OPERATIONS CENTER
[Address]
[Website]

NEWS RELEASE

DATE: _____
TIME: _____

CONTACT: _____
PHONE (Media Only): _____
[INCIDENT/EVENT NAME] HOTLINE: _____

[Incident/Event Name] Advisory #__
Update on Distribution Sites

The ice, water and meals ready to eat (MREs) distribution sites in [Jurisdiction Name] will operate on [Date], from 9 a.m. to 6 p.m. An updated list of distribution sites follows on page 2.

Residents should NOT go to the distribution sites this evening, as [Jurisdiction Name] is under a curfew that is effective until [Date] at 7 a.m. All residents and businesses are expected to observe curfew laws. Exemptions to the curfew include essential personnel such as law enforcement, fire-rescue, hospital or other healthcare workers, emergency management, and others involved in recovery efforts. Those personnel should carry identification with them.

The Federal Emergency Management Agency has approved the declaration for individual grant assistance for [Jurisdiction Name] residents who suffered damage to personal property resulting from [Disaster Name]. Residents can call _____ for more information.

[Name] Transit bus service is suspended until further notice.
[Name} Airport and Port of [Name] remain closed.

An estimated ____ customers, or ____ percent of [Jurisdiction Name], remain without power due to extensive damage to the transmission and substation infrastructure. More than ____ personnel, including ____ out-of-state contractors and utility workers, are in the field working on power restoration. Residents do not need to call to report outages, but they should call to report any downed power lines. The phone number is _____.

Due to widespread power outages, traffic lights at most intersections throughout [Jurisdiction Name] are not functioning. Drivers are urged to use extreme caution and to treat intersections as four-way stops.

The [Agency or Department] has placed all [Jurisdiction Name] communities under a “boil water order.” The boil water order is in effect until further notice. Water should be sanitized by being brought to a rolling boil for at least 1 minute. Residents who do not have power can sanitize water by adding eight drops, or about a quarter teaspoon, of unscented bleach to a gallon of water and letting it stand for 30 minutes.

Normal [Jurisdiction Name] government operations remain closed. However, all [Jurisdiction Name] employees should contact their immediate supervisor for instructions on reporting to work. Employees who are unable to contact their supervisor should call the [Jurisdiction Name] [Disaster Name] Hotline at _____ and provide their current contact information.

The [Incident/Event Name] Hotline remains open. Residents can call _____ for the latest information on [Incident/Event Name] recovery efforts.

[Jurisdiction Name] Distributions Sites for Ice, Water and MREs
Updated [Date], [Time]

[Site Name]
[Site Address]

[Site Name]
[Site Address]

[Site Name]
[Site Address]

[Site Name]
[Site Address]

E.3 Example of a POD Announcement: Ice, Water, and Medical Mobile Service Locations

[JURISDICTION LOGO]

EMERGENCY UPDATE
[Jurisdiction]
EMERGENCY OPERATIONS CENTER
[Address]
[Website]

NEWS RELEASE • NEWS RELEASE • NEWS RELEASE

FOR IMMEDIATE ATTENTION
DATE: _____
TIME: _____

CONTACT: _____
PHONE (Media Only): _____
[INCIDENT/EVENT NAME] HOTLINE: _____

[Incident/Event Name] Advisory #___
Ice, Water, Food and Medical Mobile Service Locations Announced for [Date]

The following three distribution centers for ice and water will be open on [Date], from 9 a.m. to 5 p.m. or until supplies are depleted:

[Site Name]
[Site Address]

[Site Name]
[Site Address]

[Site Name]
[Site Address]

The American Red Cross will serve lunch at the following site on [Date]:

[Site Name]
[Site Address]

Medical mobile service units will be operating on [Date] at the two following locations. The medical mobile service units provide care services including screening, evaluation, minor treatment, referrals, and limited prescriptions, from 9 a.m. to dusk.

[Site Name]
[Site Address]

[Site Name]
[Site Address]

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Appendix F:
Response Timeline

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Table F-1. Response tasks timeline for Logistics Response.

Objective	Line	Time Frame	Task	Lead/Coordinating Entity	Supporting Entity	Details and Comments
A.1 Establish an Incident Command System structure that coordinates logistics operations by integrating local, State, and Federal operations, as well as the private sector	1	E to E+72h	**Activate** the SOC and REOC	Cal OES	Other State agencies/departments as necessary	A FEMA IMAT will report to the SOC to establish Federal/State coordination
	2	E to E+72h	**Activate** local government and Operational Area EOCs	Operational Areas, local governments	Cal OES	—
	3	E to E+72h	**Activate** other regional EOCs	MTC, Caltrans, CHP, WETA	Cal OES	—
	4	E to E+72h	**Provide** liaisons to the SOC and REOC	CRA, ARC, Utilities	Cal OES	BOC and UOC would be established to support private-sector coordination. Liaisons may also be sent to local and Operational Area EOCs to support coordination of activities at those levels.
	5	E to E+72h	**Designate** primary entity for coordinating regional logistics activities	Cal OES	Operational Areas	—
	6	E to E+72h	**Event Observed:** State and Federal governments begin establishing JFO	Cal OES, FEMA	UCG	The UCG will stand up almost immediately at the SOC and will transfer to the JFO upon activation. It may take up to 72 hours to establish the JFO
A.2 Establish interoperable emergency communications among public- and private-sector transportation and logistics entities involved in logistics operations	7	E to E+72h	**Activate** and test communications systems	Operational Areas, local governments	Cal OES	Interoperability among agencies' systems may be an issue, even if systems are fully functional
	8	E to E+72h	**Implement** RECP Communications Subsidiary Plan and communication elements of CONPLAN	Cal OES	Operational Areas, local governments	—
	9	E to E+72h	**Establish** communications among relevant facilities	Operational Areas, local governments	—	Local government EOCs will need to communicate with field-level logistics sites such as warehouses, LSAs, and PODs when established
	10	E to E+72h	**Designate** appropriate communications protocols for government agencies	Local governments	Operational Areas	Subject to each agency's systems and communications plan, and post-event functionality
A.3 Determine impacts to transportation infrastructure and the private-sector commodity distribution system (i.e., food, water, and fuel distributors)	11	E to E+72h	**Assess** condition of transportation infrastructure and lifeline routes through initial reports	Caltrans	CHP, Operational Areas, local governments, utilities	Initial assessments based on reports from transit agencies, local governments, utilities, safety inspections, and media reports. Information combined with MTC Situation Reports to gain awareness of the status of the regional transportation network
	12	E to E+72h	**Assess** condition of other priority transportation routes	Caltrans, local public works departments	Transportation agencies	Initial assessments based on reports from local governments, safety inspections, and media reports
	13	E to E+72h	**Assess** other transportation systems' status immediately following event	All transportation agencies	—	Address facilities and equipment, casualties, vehicles, and roadways/tracks
	14	E to E+72h	**Assess** condition of regional port facilities and ferry terminals	Port authorities	WETA, port facility operators, USACE, USCG	Evaluate capabilities for both passenger and cargo movement
	15	E to E+72h	**Assess** condition of region's airports	Airport authorities	FAA	Prioritize larger commercial and general aviation facilities that can accommodate commercial airliners
	16	E to E+72h	**Compile** situation reports from mass transportation agencies in the region into a Regional Summary Report for the regional transportation system	MTC	Caltrans, CHP, Operational Areas, transportation agencies (all 12 counties), USCG, port authorities, airport authorities	First MTC Regional Summary Report due within 4 hours of event; focus on priority transportation routes and access roads, and transportation agencies' operational status; MTC jurisdiction does not include three southern counties, but Cal OES can designate MTC to support them as well, or MTC may activate a mechanism to coordinate with the three southern counties' mass transportation agencies
	17	E to E+72h	**Compile** regular status reports on transportation infrastructure and resources	Cal OES	MTC, Caltrans, CHP, Operational Areas	—
A.4 Identify the locations and sizes of affected populations, including people who have access and functional needs	18	E to E+72h	**Develop** projections of affected populations based on event estimates and modeling	Cal OES, FEMA	USGS, Operational Areas	Projections are subject to initial analysis of event location and magnitude
	19	E to E+72h	**Obtain** information on the locations, numbers, and demographics of displaced and potentially displaced populations	Local governments	NGOs	Initial damage assessments will provide situational awareness on areas with the greatest structural damage. It will take additional time to determine the amount of households needing shelter/commodity assistance
	20	E to E+72h	**Conduct** aerial survey of region to determine damage	Local law enforcement, CHP, National Guard	—	Local media with helicopters may provide additional information

Table F-1. Response tasks timeline for Logistics Response.

Objective	Line	Time Frame	Task	Lead/Coordinating Entity	Supporting Entity	Details and Comments
	21	E to E+72h	**Determine** affected populations based on windshield surveys, media reports, and other data collection methods	Local governments	Operational Areas	Transportation network may not be operational, and could affect ability to collect information
	22	E to E+72h	**Compile** locally collected information to estimate and map affected populations	Cal OES	Operational Areas	Transportation network may not be operational, and could affect ability to collect information
A.5 Assess the feasibility of pre-identified local LSAs and PODs	23	E to E+72h	**Determine** if pre-identified LSA site(s) are the most appropriate, given the location of incidents and impacts to infrastructure	Local governments	Operational Areas, Cal OES	—
	24	E to E+72h	**Analyze** information collected on transportation infrastructure damage to determine if it inhibits access to potential LSA and POD sites	Local governments	Operational Areas, Cal OES	—
	25	E to E+72h	**Conduct** inspections of facilities to determine structural integrity and access to lifelines such as electrical power, water, and wastewater services	Local governments	Utilities	—
	26	E to E+72h	**Determine** if pre-identified sites are capable of supporting operational activities consistent with the magnitude of the event	Local governments	Operational Area, Cal OES	See **Appendix H,** Guide to Points of Distribution
A.6 Identify sites for LSAs and PODs that are nearest the locations of the most affected populations	27	E to E+72h	**Evaluate** locations of pre-identified LSAs and PODs and their proximity to communities needing services	Local governments, Operational Areas	Cal OES	—
	28	E to E+72h	**Coordinate** with governments, NGOs, and businesses to acquire access to potential sites	Local governments	Operational Areas, CRA, NGOs	—
	29	E to E+72h	**Determine** the type of PODs required to support communities identified	Local governments	Operational Areas, Cal OES	For the different POD types, see **Appendix H,** Guide to Points of Distribution
	30	E to E+72h	**Analyze** situation reports on transportation infrastructure damage and community impacts	Local governments	Operational Areas, Cal OES	—
A.7 Determine priority transportation routes for logistics activities to enable the initiation of debris clearance and infrastructure inspection/repair	31	E to E+72h	**Analyze** the ability of lifeline routes and other priority transportation routes to support logistics response activities	Caltrans, Cal OES	CHP, Operational Areas, local governments	Routes need to be re-assessed continuously after the event
	32	E to E+72h	**Analyze** the ability of rail systems to support the movement of commodities and other resources	Rail-based transportation agencies and private rail operators	—	Based on the condition of rail systems, and available rolling stock
	33	E to E+72h	**Analyze** the ability of marine-based systems to support the movement of commodities and other resources	Port authorities	WETA, port facility operators, USACE, USCG	Based on the condition of docking facilities and landside infrastructure, navigability of waterways, and availability of vessels
	34	E to E+72h	**Analyze** ability of air-based systems to support the movement of commodities and other resources	Airport authorities	FAA	Based on the condition of runways, airport infrastructure, and fuel supply
	35	E to E+72h	**Analyze** sizes and locations of affected populations in relation to priority transportation routes and shelter destinations	Cal OES	MTC, ARC/shelter operators, NGOs, Operational Areas	—
A.8 Identify priorities for the use of available resources to assist in movement of commodities into impacted areas	36	E to E+72h	**Determine** transportations assets required to move commodities	Local governments, Operational Areas	Cal OES, FEMA	—
	37	E to E+72h	**Evaluate** transportation modes (i.e., air, rail, waterways, and trucking) for effective means of bringing commodities and other resources into the region	Local governments, Operational Areas	Cal OES, FEMA	—
	38	E to E+72h	**Identify** gaps in available transportation assets	Local governments, Operational Areas	Cal OES, FEMA	—
	39	E to E+72h	**Determine** human resources necessary to conduct commodity distribution operations	Local governments, Operational Areas	Cal OES, FEMA	—
	40	E to E+72h	**Coordinate** security resources to escort commodity shipments	Cal OES, CHP	Local governments	—
	41	E to E+72h	**Identify** gaps in available human resources	Local governments, Operational Areas	Cal OES, FEMA	—

Table F-1. Response tasks timeline for Logistics Response.

Objective	Line	Time Frame	Task	Lead/Coordinating Entity	Supporting Entity	Details and Comments
A.9 Coordinate logistics assessments with initial damage assessments and other situational reports	42	E to E+72h	**Gather** information on resource availability and shortfalls	Local governments	Operational Areas, Cal OES, FEMA	—
	43	E to E+72h	**Determine** status of logistics support resources and infrastructure	Local governments, Caltrans, DGS	Operational Areas, Cal OES	—
	44	E to E+72h	**Gather** information on any inbound or pre-staged resources	Local governments, Operational Areas	Cal OES, FEMA	—
	45	E to E+72h	**Provide** information on the intent to establish logistics support sites such as LSAs and PODs	Local governments, Operational Areas	Cal OES	—
A.10 Coordinate with the Mass Care and Shelter Branch to maintain situational awareness of the current and ongoing need for shelters and pickup points	46	E to E+72h	**Estimate** current number of people needing sheltering services, and anticipate capability for local governments to support sheltering needs	Local governments	Operational Areas, Cal OES, FEMA	—
	47	E to E+72h	**Collect** estimates of access and functional needs populations to project any unique commodities requirements or distribution methods	Local governments	ARC, NGOs	—
	48	E to E+72h	**Update** initial estimates of demand for shelter on multiple spatial scales: neighborhood, city, county, and region	Local governments, Operational Areas	ARC, NGOs, Cal OES, FEMA	Mass Care and Shelter collects this information from Operational Areas and local government
	49	E to E+72h	**Develop** and **distribute** estimated total shelter demand by location	Local governments, Operational Areas	ARC, Cal OES, FEMA	—
	50	E to E+72h	**Collect** information on the location of shelters and pickup points	Local governments	Operational Areas, Cal OES, ARC	—
	51	E to E+72h	**Determine** the need for commodities at the shelters and pickup points	Local governments	Operational Areas, ARC	—
	52	E to E+72h	**Determine** shelter provider's capability to provide commodities to all shelter communities	ARC, NGOs, local governments	Operational Areas, Cal, EMA, FEMA	—
A.11 Notify all agencies that support LSAs and PODs	53	E to E+72h	**Determine** the most effective communication tools for issuing notifications, considering impacts to communication infrastructure	Local governments	Operational Areas, Cal OES	Information coordination occurs through the Joint Information System
	54	E to E+72h	**Issue** notifications	Local governments	Operational Areas, Cal OES	—
	55	E to E+72h	**Provide** information on where to report, anticipated shift hours, duties, and items to bring	Local governments	Operational Areas, Cal OES	Information provided to identified organizations and staff that will staff LSA and PODs.
	56	E to E+72h	**Provide** information to NGOs and businesses on commodity donation procedures	Local governments	Cal OES, CaliforniaVolunteers, CRA	—
B.1 Finalize the list of priority transportation routes being used; coordinate with debris clearance and public works agencies to confirm availability of routes	57	E+72h to E+14d	**Re-evaluate** condition of transportation network	Caltrans, MTC, WETA, CHP, port authorities, airport authorities, transportation agencies, private rail operators, local governments	Operational Areas, Cal OES	Includes all modes of transportation
	58	E+72h to E+14d	**Revise** list of priority transportation routes to be used, based on latest situational analysis	Cal OES, FEMA	Caltrans, MTC, WETA, CHP, port authorities, airport authorities, transportation agencies, private rail operators, Operational Areas, local governments	Includes all modes of transportation
	59	E+72h to E+14d	**Communicate** available routes (land, air, and waterways) to transportation providers, including those with inbound commodities	Cal OES, FEMA	Caltrans, MTC, WETA, CHP, port authorities, airport authorities, transportation agencies, private rail operators, Operational Areas, local governments	—
B.2 Identify PODs and coordinate with local government to support the operation of the sites	60	E+72h to E+14d	**Identify** sites that would be appropriate for hosting an LSA or POD	Local governments	Operational Areas	—
	61	E+72h to E+14d	**Select** sites based on accessibility and proximity to communities in need	Local governments	Operational Areas, Cal OES	—

Table F-1. Response tasks timeline for Logistics Response.

Objective	Line	Time Frame	Task	Lead/Coordinating Entity	Supporting Entity	Details and Comments
	62	E+72h to E+14d	**Provide** information on selected sites to stakeholders	Local governments	Operational Areas, Cal OES, FEMA	Information on selected sites should be shared with those coordinating the movement of commodities
	63	E+72h to E+14d	**Coordinate** the activation of each POD with local governments to determine their capability of providing support for their operation	Operational Areas	Cal OES	—
	64	E+72h to E+14d	**Coordinate** with local governments on the requirements necessary to establish and operate a POD	Operational Areas	Cal OES, FEMA	—
B.3 Support development of incident action plans at PODs to address operations, and the eventual decrease in volume and demobilization	65	E+72h to E+14d	**Initiate** incident action planning for POD sites	POD managers	Local governments, Operational Areas,	—
	66	E+72h to E+14d	**Coordinate** with POD managers through sharing information about the anticipated demand for commodities at the POD site	Local governments	Operational Areas	—
	67	E+72h to E+14d	**Coordinate** with POD managers to determine the need for continued operation of the PODs	Local governments	Operational Areas	—
	68	E+72h to E+14d	**Provide** assistance with the development of POD Incident Action Plans	Local governments	Operational Areas	—
B.4 Coordinate with the Transportation Branch to acquire and deploy appropriate resources to move commodities between LSAs and PODs within the region	69	E+72h to E+14d	**Coordinate** the transport of commodities from the LSA to PODs	Local governments, Operational Areas, Cal OES	FEMA	—
	70	E+72h to E+14d	**Notify** POD managers of the departures and anticipated arrival times of commodities	Local governments	Operational Areas, Cal OES, FEMA	—
	71	E+72h to E+14d	**Determine** the need for transportation assets to support the movement of commodities from LSAs to PODs	Local governments, Operational Areas	Cal OES, FEMA	—
	72	E+72h to E+14d	**Develop** procedures for the receipt of inbound commodities at LSAs and PODs	Local governments	Operational Areas	—
B.5 Mobilize staff and supplies for LSAs and PODs	73	E+72h to E+14d	**Determine** the number of personnel needed to operate established LSAs and PODs	Local governments	Operational Areas, Cal OES	—
	74	E+72h to E+14d	**Notify** all staff to report to LSAs and PODs	Local governments	Operational Areas	This notification includes the request for support to volunteer organizations and their volunteers.
	75	E+72h to E+14d	**Identify** any anticipated personnel shortfalls for the LSAs and PODs	Local governments,	Operational Areas	—
	76	E+72h to E+14d	**Request** additional resources to support the operation of LSAs and PODs	Local governments, Operational Areas	Cal OES	—
B.6 Open LSAs and PODs	77	E+72h to E+14d	**Coordinate** the opening of LSAs and PODs	LSA and POD managers	Local governments, Operational Areas, Cal OES	—
	78	E+72h to E+14d	**Ensure** all staff and resources are in place to support the operation of LSAs and PODs	LSA and POD managers	Local governments, Operational Areas	—
	79	E+72h to E+14d	**Ensure** security is in place before activating LSAs and PODs	LSA and POD managers	Local governments, Operational Areas	—
	80	E+72h to E+14d	**Ensure** that sufficient quantities of commodities have arrived for the anticipated demand before opening PODs	POD managers	Local governments, Operational Areas	Opening a POD without sufficient quantities of commodities may cause unrest in the crowd, and should be avoided if possible
B.7 Coordinate with the JIC to disseminate timely information about POD operations to the general public	81	E+72h to E+14d	**Coordinate** with local governments, NGOs, and private businesses regarding opening times and hours of operation of PODs	Operational Areas	Local governments, CRA and NGO liaisons	—
	82	E+72h to E+14d	**Develop** public information releases covering POD hours of operation and POD operation details	Local governments	Operational Areas, Cal OES, FEMA	The general public should be informed of POD hours of operation, what to expect when they arrive at a POD, and what to bring with them to a POD—if anything

Table F-1. Response tasks timeline for Logistics Response.

Objective	Line	Time Frame	Task	Lead/Coordinating Entity	Supporting Entity	Details and Comments
	83	E+72h to E+14d	**Disseminate** information through a broad spectrum of media outlets	Local governments	Operational Areas, Cal OES, FEMA	—
B.8 Acquire and deploy additional transportation resources from local, State, Federal, and private-sector sources as the resources become available	84	E+72h to E+14d	As additional transportation resources become available, **integrate** them into the logistics response	Local governments	Operational Areas, Cal OES, FEMA, MTC	—
	85	E+72h to E+14d	**Coordinate** the arrival of additional resources	Local governments	Operational Areas	—
	86	E+72h to E+14d	**Communicate** the anticipated arrival times of resources with LSA and POD managers	Local governments, Operational Areas	Cal OES, FEMA	—
	87	E+72h to E+14d	**Coordinate** with the private sector to determine their availability and capability to support the movement of commodities	Local governments, Operational Areas, Cal OES	CRA	—
B.9 Acquire, maintain, and deploy logistics support resources such as fuel distribution systems, maintenance support, and law enforcement staff	88	E+72h to E+14d	**Determine** resource gaps to support general logistics operations	Local governments	Operational Areas, Cal OES, FEMA	—
	89	E+72h to E+14d	**Determine** resource gaps to support the distribution of fuel	Local governments	CEC, Cal OES, FEMA, Operational Areas	—
	90	E+72h to E+14d	**Determine** security needs at all logistic support sites	Local governments	Operational Areas	—
	91	E+72h to E+14d	**Identify** sources for needed resources	Local governments, Operational Areas, Cal OES	FEMA, CRA, NGOs	—
	92	E+72h to E+14d	**Acquire** and allocate additional resources	Local governments	Operational Areas	—
	93	E+72h to E+14d	**Coordinate** the deployment of newly acquired resources	Local governments	Operational Areas	—
B.10 Monitor activities of PODs to ensure efficient distribution of commodities	94	E+72h to E+14d	**Communicate** with POD managers to determine the effectiveness of commodity distribution strategy	Local governments	Operational Areas	—
	95	E+72h to E+14d	**Identify** PODs that are overwhelmed by community needs to determine whether additional PODs may need to be established	Local governments	Operational Areas	—
	96	E+72h to E+14d	**Identify** PODs that are experiencing low community turnout to determine if commodity distribution can be consolidated or demobilized	Local governments	Operational Areas	—
	97	E+72h to E+14d	**Identify** issues that prevent the efficient distribution of commodities at all POD sites	Local governments	Operational Areas, Cal OES, FEMA	—
B.11 Establish a Multi-Agency Coordination System group for commodity distribution, as needed	98	E+72h to E+14d	**Activate** the Commodity Distribution Task Force	Cal OES, FEMA	Local governments, Operational Areas, CRA	—
	99	E+72h to E+14d	**Notify** appropriate agencies of the decision to activate the Commodity Distribution Task Force	Cal OES, FEMA	—	—
	100	E+72h to E+14d	**Activate** Logistics Support Task Forces	Local governments, Operational Areas	—	Local government and Operational Area EOCs may wish to establish task forces to deal primarily with logistics issues occurring within their jurisdictions. These task forces will vary in scope and participants
B.12 Provide information to the Construction/ Engineering Branch about routes that must be opened to support logistics	101	E+72h to E+14d	**Identify** routes that are prohibiting access to PODs, LSAs, and other commodity distribution sites	Local governments	Caltrans, CHP	—
	102	E+72h to E+14d	**Classify** impassable routes by reason of obstruction	Local governments, Caltrans	CHP, USCG	—
	103	E+72h to E+14d	**Prioritize** routes that need to be opened	Local governments, Cal OES, FEMA	Operational Areas, Caltrans, CHP	—

Table F-1. Response tasks timeline for Logistics Response.

Objective	Line	Time Frame	Task	Lead/Coordinating Entity	Supporting Entity	Details and Comments
	104	E+72h to E+14d	**Provide** estimates for route openings to all stakeholders	Local governments, Caltrans	Operational Areas, Cal OES, FEMA	—
B.13 Establish communication systems between PODs, LSAs, and EOCs	105	E+72h to E+14d	**Determine** current communication capabilities	All agencies	—	—
	106	E+72h to E+14d	**Test** communication systems to determine what systems are available	All agencies	—	—
	107	E+72h to E+14d	**Prioritize** communication systems, and communicate the preferred method of communication to PODs, LSAs, EOCs, and Incident Command Posts	Local governments, Operational Areas	Cal OES	—
	108	E+72h to E+14d	**Coordinate** with communication service providers to determine systems restoration times and alternative methods of communication	Local governments, Operational Areas	Cal OES, CRA, communication service providers	—
B.14 Coordinate with the Mass Care and Shelter Branch to identify and support people who choose not to use shelters but need commodities	109	E+72h to E+14d	**Identify** areas of the region where communities need commodities	Local governments	Operational Areas, Cal OES	—
	110	E+72h to E+14d	**Determine** methods of distribution appropriate for each community based on need and access	Local governments	Operational Areas	—
	111	E+72h to E+14d	**Identify** which commodities are most needed	Local governments	Operational Areas	—
	112	E+72h to E+14d	**Acquire** resources to support distributing commodities by alternate means to those communities that are isolated or, for other reasons, cannot come to a POD	Local governments	Operational Area, Cal OES	—
B.15 Gather data on commodity use rates to anticipate potential shortages	113	E+72h to E+14d	**Collect** information from PODs on the rate of distribution for each commodity	Local governments	Operational Areas	—
	114	E+72h to E+14d	**Determine** anticipated shortfalls or excesses in commodities at each POD	POD managers	Local governments, Operational Areas	—
	115	E+72h to E+14d	**Reallocate** commodities among PODs, if necessary	Local governments	Operational Areas	—
	116	E+72h to E+14d	**Redirect** shipments of commodities to PODs with higher demand, as appropriate	Local governments	Operational Areas, Cal OES, FEMA	—
C.1 Continue to monitor distribution activities of PODs	117	E+14d to E+60d	Continue to **coordinate** with POD mangers to determine any issues	Local governments	Operational Areas	POD managers should be aware of commodity distribution rates, security issues, other items being requested at PODs
	118	E+14d to E+60d	**Gather** POD status information to include in Incident Action Plans and situation reports	POD managers	Local governments, Operational Areas	—
	119	E+14d to E+60d	**Share** information with POD managers about expectations on commodity demands	Local governments	Operational Areas	—
C.2 Continue to support LSAs and PODs with resources for sites and transportation of commodities	120	E+14d to E+60d	**Analyze** current commodities on hand at PODs	POD managers	Local governments, Operational Areas	—
	121	E+14d to E+60d	**Analyze** current commodity amounts at LSAs to support demand at PODs	LSA Managers	Local governments, Operational Areas	—
	122	E+14d to E+60d	**Request** additional commodities and resources to support their distribution as needed	Local governments	Operational Areas	—
	123	E+14d to E+60d	**Provide** transportation assets to move commodities from LSAs to PODs	Local governments	Operational Areas, Cal OES	—
	124	E+14d to E+60d	**Provide** security escort for in-transit commodities	Local law enforcement	CHP	—
C.3 Monitor and coordinate the capabilities of agencies, vendors, and other organizations to support the distribution of commodities	125	E+14d to E+60d	**Coordinate** with private-sector and NGO liaisons to determine their capabilities in supporting logistics operations	Local governments, Operational Areas, Cal OES	ARC, CRA, other NGO and private business liaisons	—
	126	E+14d to E+60d	**Provide** description of needs to private-sector and NGOs liaisons, and solicit their assistance	Local governments	Operational Areas	—

Table F-1. Response tasks timeline for Logistics Response.

Objective	Line	Time Frame	Task	Lead/Coordinating Entity	Supporting Entity	Details and Comments
	127	E+14d to E+60d	**Integrate** donated or procured resources into logistics response operations	Local governments	Operational Areas, Cal EMA, CaliforniaVolunteers	—
	128	E+14d to E+60d	**Provide** assistance to NGOs and private business as necessary to better integrate their services into the commodity distribution system	Operational Areas	Cal OES, CRA	—
C.4 Identify opportunities to close PODs and consolidate distribution activities in the most impacted communities	129	E+14d to E+60d	**Identify** significant reduction in the number of people seeking commodities at PODs	POD managers	Local governments, Operational Areas	—
	130	E+14d to E+60d	Continue to **share** information with the public regarding the availability of commodities	JIC	Local governments, Operational Areas, Cal OES, FEMA	—
	131	E+14d to E+60d	**Move** commodities from demobilized PODs to those PODs in communities that still have needs	Local governments	Operational Areas	—
	132	E+14d to E+60d	**Provide** information to the general public, commodity suppliers, and LSAs on the consolidation and demobilization of PODs.	Local governments, Operational Areas	Cal OES, CRA, FEMA	—
C.5 Coordinate with the private sector to identify conflicts between restoration of retail businesses and POD activities	133	E+14d to E+60d	**Develop** a plan to assist businesses transition from commodity distribution activities to normal retail operations	Operational Areas, local governments	Cal OES, FEMA, CRA	—
	134	E+14d to E+60d	**Determine** if government-run PODs are capable of supplying commodities to those who may still need them after the demobilization of any private-sector distribution operations	Operational Areas, local governments	CRA, private business liaisons	—
	135	E+14d to E+60d	**Provide** public information releases regarding the demobilization of private-sector commodity distribution operations	JIC	CRA, private business liaisons	—
	136	E+14d to E+60d	**Event Observed:** Private-sector commodity distribution operations are demobilized	Private businesses	CRA, private business liaisons	—
C.6 Demobilize unnecessary PODs and LSAs	137	E+14d to E+60d	Prior to demobilizing any PODs, **provide** the general public with the schedule for closing PODs, as well as other information on where to receive assistance	JIC	Operational Areas, local governments	—
	138	E+14d to E+60d	**Notify** supporting agencies of the intent and schedule for closing LSAs and PODs	Local governments	Operational Area, Cal OES	—
	139	E+14d to E+60d	**Collect** all logs, Incident Action Plans, and other important information for use in after-action planning	All incident command system organizations	—	—
	140	E+14d to E+60d	**Notify** all stakeholders of LSA and POD closures	Local governments	Operational Areas, Cal OES, FEMA	—

Source: URS analysis (2012)

— = Not applicable

ARC = American Red Cross

Cal OES = California Governor's Office of Emergency Services

Caltrans = California Department of Transportation

CEC = California Energy Commission

CHP = California Highway Patrol

CONPLAN = San Francisco Bay Area Earthquake Readiness Response: Concept of Operations Plan

CRA = California Resiliency Alliance

d = days

DGS = California Department of General Services

E = event or earthquake occurrence

EOC = Emergency Operations Center

FAA = Federal Aviation Administration

FEMA = Federal Emergency Management Agency

h = hours

IMAT = Incident Management Assistance team

JFO = Joint Field Office

JIC = Joint Information Center

LSA = local staging area

MTC = Metropolitan Transportation Commission

NGO = non-governmental organization

POD = point of distribution

RCG = Regional Coordination Group

REOC = Regional Emergency Operations Center

SOC = State Operations Center

UCG = Unified Coordination Group

USACE = U.S. Army Corps of Engineers

USCG = U.S. Coast Guard

WETA = Water Emergency Transportation Authority

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Appendix G:
Critical Lifelines

Tab 1: Fuel Supply Restoration

Tab 2: Electric Power Restoration

Tab 3: Water and Wastewater Restoration

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Tab 1: Fuel Supply Restoration

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Appendix G: Critical Lifelines – Tab 1: Fuel Supply Restoration

Acronyms

Cal OES ..... California Governor's Office of Emergency Services
CaLEAP ..... California Local Energy Assurance Program
CEC ..... California Energy Commission
CUEA ..... California Utilities Emergency Association
E ..... event occurrence
EOC ..... Emergency Operations Center
FEMA ..... Federal Emergency Management Agency
JFO ..... Joint Field Office
PG&E ..... Pacific Gas and Electric Company
REOC ..... Regional Emergency Operations Center
SEMS ..... Standardized Emergency Management System
SOC ..... State Operations Center
Tab 1 ..... Appendix G: Critical Lifelines – Tab 1: Fuel Supply Restoration
UOC ..... Utilities Operations Center

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G1-1 Introduction

Restoration of lifelines is the capability to initiate and sustain restoration activities, including facilitating the repair or replacement of infrastructure for lifelines such as oil, gas, electricity, telecommunications, drinking water, wastewater, and transportation services.

This document, Appendix G: Critical Lifelines – Tab 1: Fuel Supply Restoration (Tab 1), provides details and a concept of operations for sustaining and/or restoring the fuel supply.

G1-1.1 Purpose

The purpose of Tab 1 is to:

- Identify government agencies and private service providers with roles and responsibilities for fuel supply restoration
- Describe how governments coordinate with the refineries and other private fuel suppliers
- Identify response objectives for fuel supply restoration

G1-1.2 Scope

Tab 1 provides details regarding fuel supply restoration in the region (**Map G1-1** illustrates the Bay Area fuel resource system). While many of the providers of services are private companies that keep internal operational information confidential, Tab 1 serves as a guide for supporting their efforts to restore the fuel supply and for collecting and sharing information such as impacts to the distribution system, the availability of fuel, and estimates for restoration of normal fuel distribution.

G1-1.3 Planning Assumptions

This section provides planning assumptions related to fuel supply restoration.

G1-1.3.1 Impacts on the Fuel Delivery System

The scenario earthquake causes the following impacts to the fuel delivery system:

- Damage to marine terminals, oil refineries, fuel transmission lines, and fuel dispensaries limits availability of fuel needed to support immediate and follow-on response operations, the movement of evacuees and resources, and power generation.
- Damage to Bay Area refineries and the fuel distribution and delivery infrastructure causes not only a shortage of fuel in the Bay Area but also shortages across the nation.
- The quantity of fuel needed to support response operations and other critical functions is inadequate, requiring the prioritization of fuel allocations.

- Power outages make it difficult to pump gas out of the ground at most Bay Area gas stations and wholesale gasoline suppliers.
- The resulting uncertainty caused by low fuel supplies encourages people to buy more fuel than they otherwise would. Additionally, private suppliers of fuel may raise prices due to lower availability and higher demand.
- Natural gas providers will shut off distribution in the hardest impacted areas until repairs can be mitigate to avoid ignition risk

G1-1.3.2 Constraints and Anticipated Needs

After the scenario earthquake, certain impacts constrain fuel supply restoration. Additionally, the region and those entities responsible for restoring fuel supplies need resources in order to restore services quickly. The region assumes the following constraints and anticipated needs:

- Because fuel pumps at stations run off electrical power and lack backup power generation, customers and first responders are unable to acquire fuel from these locations until power is restored.
- With wide-scale power outages, many critical facilities operate under generated power. Additional fuel is needed to support the extended use of generators.
- Several regulations, including those issued by the California Environmental Protection Agency and the U.S. Environmental Protection Agency, that may burden expanding fuel supply must be waived.
- Due to the assumed damage to marine terminals and oil refineries, restoration of damage railroads may offer the quickest method for bringing in outside fuel.
- Personnel with varying degrees of skills and experience from outside the region and the state will arrive to fill resource requests made by local governments. Verifying credentials and granting access to certain areas must be coordinated in order to for these resources to effectively provide support.

G1-1.4 Applicable Plans, Authorities, and Guidance

The following plans, authorities, and guidance are relevant to fuel supply restoration in the region:

G1-1.4.1 Emergency Order #6

Emergency Order #6 is one in a set of pre-existing orders prepared by the former California Emergency Council. Emergency Order #6 can be issued by the Governor to implement the Petroleum Fuels Set-Aside Program that empowers the California Energy Commission (CEC) to hold control of petroleum stocks needed to ensure the health, safety, and welfare of the public.

G1-1.4.2 California Energy Emergency Response Plan

The draft California Energy Emergency Response Plan, being prepared by the CEC, will describe the State's strategy for responding to an energy emergency. An energy emergency is an actual or potential loss of energy supply that significantly impacts the State. An energy emergency can be caused by natural disasters (such as earthquake, fire, or flood) or geopolitical events (such as war, terrorism, civil disturbance, or embargo). The chairman of the CEC can activate the plan upon a State of Emergency Declaration by the Governor.

G1-1.4.3 California Petroleum Fuels Set-Aside Program Applicant Handbook

The California Petroleum Fuels Set-Aside Program Applicant Handbook, prepared by the CEC, provides a description of the application process, eligibility requirements, and instructions for completing the application form when applying for fuel under the Petroleum Fuels Set-Aside Program.

This application process is used only during a state of emergency when fuel supplies are limited or unavailable to support response operations. Additionally, the program exists to support local governments in their response to an emergency and does not provide relief to businesses or individuals.

G1-1.4.4 California Local Energy Assurance Planning Program

The California Local Energy Assurance Planning (CaLEAP) program assists local governments develop plans to become more energy resilient; ensuring energy supply to “key assets.” The emphasis of “key assets” is to ensure functionality of essential services, thus protecting safety and public health, and minimizing economic loss. The goal of the program is to help local governments prepare for, respond to, recover from and mitigate against potential emergencies that impact energy.

The program through the CEC provides technical assistance to local governments to build local energy expertise and awareness of impacts and interdependencies; help them identify deficiencies and vulnerabilities, and explore energy choices, including alternative resources, that are reliable, safe, diverse, affordable and environmentally acceptable[1].

[1] CaLEAP Fact Sheet, 2013

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G1-2 Roles and Responsibilities

While no single organization is responsible for managing or maintaining the entire fuel distribution system, the entities identified below have critical roles in recovering the system and/or providing alternate sources of fuel until the system is recovered.

G1-2.1 Local Governments

Local governments, defined in California Standardized Emergency Management System (SEMS) as cities, counties, and special districts, are responsible for managing the last mile of fuel distribution. The last mile for fuel distribution refers to getting fuel from pumps and other containers into the tanks or response vehicles, and into generators. While local governments are dependent on the private sector for restoration of the fuel supply, local governments have the responsibility of prioritizing resources to aid in the response and restoration efforts.

G1-2.2 Utilities and/or Service Providers

The following utilities and/or service providers play and important role in restoring the fuel supply and distribution system.

G1-2.2.1 Pacific Gas and Electric Company

The Pacific Gas and Electric Company (PG&E) is a private provider of electric power and natural gas to Bay Area customers. PG&E has confidential policies and procedures for gas and electric power restoration and coordinates with local governments, Operational Areas, and the State on post-disaster restoration activities. PG&E sends agency representatives to the Emergency Operations Centers (EOCs) of impacted jurisdictions and to the Regional Emergency Operations Center (REOC), State Operations Center (SOC), or the Joint Field Office (JFO) to facilitate this coordination.

G1-2.2.2 Kinder Morgan

Kinder Morgan is a private company that operates and maintains petroleum fuel pipelines in the Bay Area and throughout the United States. Kinder Morgan owns and maintains the pipelines but not the transported fuel. Following an earthquake, Kinder Morgan will shut down the pipelines in the impacted area and conduct damage assessments using pressure tests and field personnel.

G1-2.2.3 Bay Area Oil Refineries

The Bay Area is home to five oil refineries. Consistent with assumptions defined in **Section G1-1.3.1**, the refineries are likely to experience varying degrees of damage. The refineries have plans to respond to life safety issues occurring at their facilities first and then transition to restoring refinery operations.

The following is a list of Bay Area refineries (a map showing refinery locations can be found at the end of this Tab**, Map G1-1**):

- Chevron Refinery, Richmond
- Conoco Phillips Refinery, Rodeo
- Shell Oil Refinery, Martinez
- Tesoro Golden Eagle Refinery, Martinez
- Valero Refinery, Benicia

The Bay Area refineries are part of the Petrochemical Mutual Aid Organization, which supports planning to provide mutual aid resources to refineries when assistance is requested. Bay Area refineries that either avoid or sustain limited damage after the earthquake may be available to assist other refineries in their response and restoration activities.

G1-2.2.4 Gas Stations

Gas stations are private businesses, and will generally continue to operate under normal conditions until their fuel supply is disrupted or impacts from the earthquake halts their operation. Following an incident, gas station operators will need to work closely with government agencies to prioritize and/or ration fuel supply when necessary.

G1-2.3 State of California

The State will organize its resources to provide support to responsible jurisdictions in partnership with the private sector and the Federal Emergency Management Agency (FEMA) to restore gas, electricity, water, wastewater, and telecommunications functions. The following State of California agencies play important roles in fuel lifeline restoration:

G1-2.3.1 California Emergency Commission

The CEC administers the Petroleum Fuels Set-Aside Program. This program is implemented at the direction of the Governor only after proclamation of a state of emergency. In addition, the Governor must officially sign and announce Emergency Order #6, which empowers the Energy Commission to “hold control of petroleum stocks" as needed to ensure the health, safety, and welfare of the public.

This order gives the CEC the legal authority to provide as much fuel as necessary to support the response to the disaster. In cooperation with the California Governor’s Officer of Emergency Services (Cal OES), the CEC directs oil companies to provide the fuel needed by the emergency service providers responding to the disaster.

The program exists to support local governments in their response to an emergency and does not provide relief to businesses or individuals. However, in the event of a shortage that causes extraordinary economic hardship, the program can also be used to assist with critical industry fuel shortages, such as for the California agricultural industry.

G1-2.3.2 California Utility Emergency Association

The California Utility Emergency Association serves as a point of contact for critical infrastructure utilities, Cal OES, and other Governmental agencies before, during, and after an event to:

- Activate the Utilities Operations Center (UOC) at the REOC or SOC
- Facilitate communications and cooperation among member utilities, public agencies, and with non-member utilities (where resources and priorities allow)
- Provide emergency response support wherever practical for electric, petroleum pipeline, telecommunications, gas, and water and wastewater utilities
- Support utility emergency planning, mitigation, training, exercises, and education

G1-2.4 Federal Government

The Federal government will work jointly with the State of California to provide resource support and assistance to local governments and critical lifeline service providers. The Federal Government, through requests to FEMA, can offer the following:

- Damage assessments on energy systems
- Issues legal authorities and waivers
- Technical expertise to the utilities, including field assessments, and assists government and private-sector stakeholders to overcome challenges in restoring the energy system
- Acquisition and distribution of fuel
- Resources to assist with the repair and restoration of fuel systems
- Generators to assist with pumping fuel

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G1-3 Information and Coordination

The following organizations and programs have been established to support information sharing and the coordination of response and restoration activities as well as to facilitate the effective flow of information.

G1-3.1 Inter-Agency Coordination

Inter-agency coordination for assessing and sharing information regarding fuel supply and distribution systems follows standard SEMS protocols. Local government agencies and private businesses conduct initial assessments and determine restoration priorities and resource needs. Information such as damage assessments, situation reports, and Action Plans and requests for assistance are communicated up through SEMS levels as appropriate.

General regional, State and Federal coordination including the Regional Coordination Group and the Unified Coordination Group are described in **Section 5, Coordination and Communication** of the Regional Catastrophic Earthquake Logistics Response Plan.

G1-3.2 Information Collection/Sharing

The collection, compilation, and sharing of data is another key component of effective lifeline restoration. Specific, credible, and actionable information is required from field units and utility operators to being forming a common operating picture. Critical information collection requirements for lifeline restoration is located in **Appendix I, Critical Information Collection Requirements** of the Logistics Plan.

G1-3.3 Action Planning

Each coordinating and response organization should develop Action Plans for their organizations. These Action Plans document the situation, priorities, goals, and objectives, and resource assignments and serve as the organization's plan for a specific period of time (Operational Period). Action Plans should be briefed and shared with all entities with roles in response and restoration efforts.

G1-3.4 Agency Representatives

The CEC is the primary point of contact for oil companies, pipeline companies, and other petroleum-related industry organizations. Direct contact between the CEC and local governments may occur when the requests have been approved by Cal OES to better coordinate quantities, types of fuel, and delivery locations.

PG&E may send representatives to the EOCs of affected jurisdictions, the REOC, the SOC, or the JFO, depending on the nature of the event, to promote information-sharing and to coordinate natural gas and electrical power restoration priorities.

G1-3.5 Utilities Operations Center

The UOC is comprised of the California Utilities Emergency Association (CUEA) and representatives of utility companies actively supporting post-disaster response and restoration activities. In most cases, the UOC operates in the Operations Section of the SOC or JFO but in limited cases it may directly support the REOC. To support fuel restoration operations, the UOC may have participation from PG&E, Kinder Morgan, refinery representatives, CEC, and other fuel providers.

G1-3.6 Energy Emergency Management Center

The Energy Emergency Management Center is not a physical location but a structure that provides centralized management for the coordination of energy emergencies.[2] It is generally managed from the Energy Commission Headquarters. The Center allows a more efficient structure to:

- Provide timely reports, analyses, and action recommendations
- Coordinate more effectively with Cal OES, CUEA, and the California Independent System Operator during proclaimed emergencies
- Ensure that the CEC can respond quickly to emergency fuel distribution missions at the request of Cal OES
- Ensure effective operation of the Fuels Set-Aside Program
- Ensure that a separate accounting of emergency response and recovery activity is documented for reimbursement purposes

[2] California Energy Emergency Response Plan, 2006

G1-4 Restoration Operations

Immediately following a catastrophic earthquake, efforts will begin to assess the status of the fuel delivery system, begin mitigating against additional loss or disruption, repair damaged infrastructure, and establish an alternate system for acquiring fuel. The following sections describe these operations.

G1-4.1 Damage Assessment

Prior to conducting repair and restoration activities, assessment teams must determine the extent and locations of damaged infrastructure. Private fuel suppliers such as PG&E and Kinder Morgan, have automated systems that detect pressure changes indicating possible infrastructure damage. Additionally, they deploy field assessment teams to visibly inspect pipelines for damage. Assessment information is collected over several days providing situational awareness for effective action planning.

G1-4.2 Prioritizing Restoration Efforts

Each organization has predetermined restoration priorities that drive initial response activities. As the response continues, priorities can and will change due to changes in the situation. Service providers coordinate with government agencies through liaisons to discuss and determine changes in restoration priorities. Effective communication between service providers and government agencies must occur if priorities are to be aligned.

G1-4.3 Fuel and Electrical Power Interdependency

Fuel and electrical power restoration are often dependent on each other. This interdependency can drive restoration priorities. A few examples are:

- Fuel pumps at gas stations require electric power to operate. Without electric power, the fuel in underground tanks is inaccessible
- Small and large generators, used when electrical power is disrupted require fuel to function
- Vehicles for electric power maintenance crews require fuel
- Transmitters in pipelines that provide information about possible breaks require electric power to function
- Kinder Morgan requires electrical power to pump fuel through their pipelines

Emergency managers should consider these interdependencies when defining restoration priorities.

G1-4.3 Alternate Sources of Fuel

As described in **Section G1-1.3.1** fuel supplies will dwindle drastically over time following a catastrophic earthquake. With widespread power outages making it difficult to pump fuel at stations, facilities using additional fuel to operate generators,

and impacts to refineries and the fuel distribution system, fuel will be increasingly unavailable in the Bay Area. Until infrastructure is repaired and electric power is restored, additional fuel supply must be brought in from outside the region to address growing demand.

Additional fuel supply will arrive in the region by ground through tanker trucks and by sea by tanker vessels. Access to the region by land will be dependent on damage to roads and bridges. While access by sea will be dependent on the status of marine terminals. Supplies of fuel may be delayed until transportation infrastructure is inspected and or repaired.

G1-5 Restoration Objectives

Even though the earthquake has immediate impacts on the fuel distribution system, fuel shortages are not apparent until initial supplies are exhausted. Anticipating shortages is critical. **Section G1-5** identifies objectives for assessing impacts to the fuel distribution system and supply chain and for their restoration. The objectives are organized by phases consistent with those identified in the Regional Catastrophic Earthquake Logistics Response Plan. Those phases are: event occurrence (E) to E+72 hours, E+72 hours to E+14 days, and E+14 days to E+60 days.

G1-5.1 E to E+72 Hours

In the first 72 hours following the earthquake, priority is placed on assessing damage to the fuel distribution system and anticipating potential shortages in supply. The following objectives frame assessment and restoration activities from E to E+72 hours.

- Identify disruptions in fuel transmission lines to include natural gas, refined and unrefined fuel, and jet fuel
- Identify disruptions in the capability of local refineries to receive, refine, and distribute fuel
- Ensure that assessment team personnel can access and remain in the affected areas to complete assessment activities
- Ensure that the appropriate utility representatives are included in response and restoration planning activities
- Provide information to the public on home safety measures, service disruptions, fuel availability, rationing guidance, and restoration activities
- Develop situational awareness concerning the demand for fuel and fuel supply restoration activities
- Identify critical facilities and response agencies whose missions are adversely affected by the loss of fuel
- Disseminate established information on regulatory relief for fuel acquisition and distribution
- Provide and coordinate alternate means for providing fuel

G1-5.2 E+72 Hours to E+14 Days

After assessments are completed and restoration activities begin, priorities shift to identifying alternate fuel supplies to meet demand and continuing restoration activities. The following objectives frame the establishment of alternative fuel supply strategies and ongoing restoration activities from E+72 hours to E+14 days.

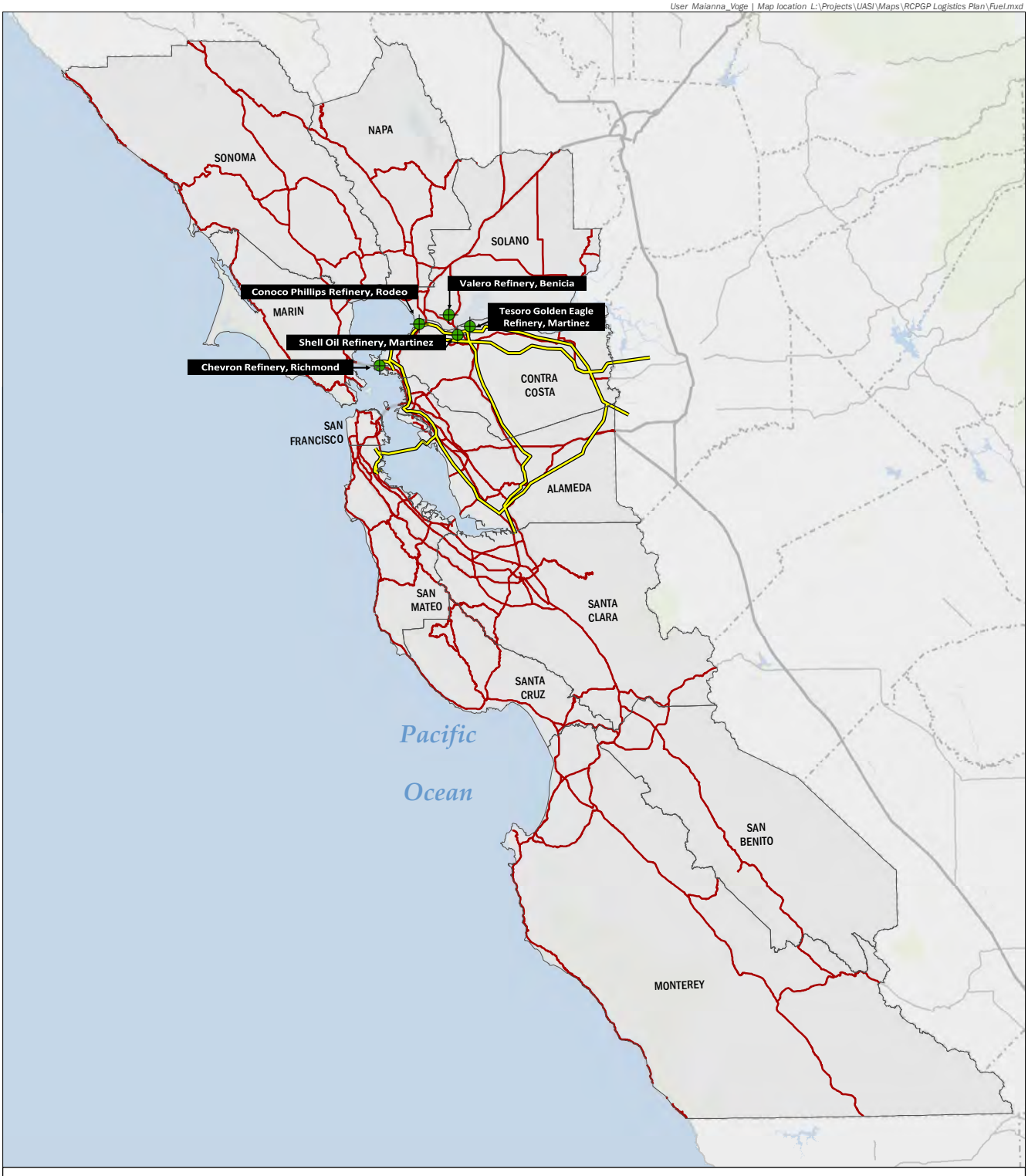
- Identify resources required to support the restoration of the fuel supply and fuel distribution system
- Identify interdependencies among fuel and other lifelines that may impact restoration priorities

- Analyze current fuel demand and supply and request additional fuel if appropriate
- Continue to coordinate the sharing and dissemination of priority information regarding fuel supply restoration activities
- Coordinate the fuel distribution plan to support critical response activities
- Set up a system to receive and distribute fuel to critical facilities and response agencies
- Continue to provide information to the public on home safety measures, service disruptions, fuel availability, rationing guidance, and restoration activities
- Continue to develop situational awareness concerning the demand for fuel and fuel supply restoration activities
- Determine the need for Federal assistance in the acquisition of alternate fuel supplies and request support if necessary

G1-5.3 E+14 Days to E+60 Days

Many of the activities that occur from E+72 hours to E+14 days continue from E+14 days to E+60 days, but efforts in this period transition to normalizing fuel demand and distribution. The following objectives are in addition to the objectives that are ongoing from the previous phase. These objectives frame the transition to recovery of the fuel distribution system from E+14 days to E+60 days.

- Restore normal refining capabilities and the distribution of refined fuel
- Repair and restore fuel transmission lines
- Continue to evaluate the need for Federal assistance in the acquisition of alternate fuel supplies and request support if necessary
- Transition fuel distribution from government-regulated strategies to normal market-based distribution mechanisms
- Demobilize any alternate fuel distribution systems



Oil refinery locations
Kinder Morgan pipeline
Major truck network

N 0 40 Miles

Data sources: Caltrans, WestCarb, Kinder Morgan.

Bay Area UASI Program - RCPGP
Appendix G: Critical Lifelines

Map G1-1
Fuel Resource System

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Tab 2: Electric Power Restoration

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Appendix G: Critical Lifelines – Tab 2: Electric Power Restoration

Acronyms

CaLEAP ..... California Local Energy Assurance Planning
Cal OES ..... California Governor's Office of Emergency Services
CEC ..... California Energy Commission
CUEA ..... California Utilities Emergency Association
E..... event occurrence
HAZUS..... Hazards – U.S.
JFO ..... Joint Field Office
PG&E ..... Pacific Gas and Electric Company
REOC..... Regional Emergency Operations Center
SEMS..... Standardized Emergency Management System
SFPUC..... San Francisco Public Utilities Commission
SOC ..... State Operations Center
Tab 2..... Appendix G: Critical Lifelines – Tab 2: Electric Power Restoration
UOC ..... Utilities Operations Center
USACE..... U.S. Army Corps of Engineers

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G2-1 Introduction

Restoration of lifelines is the capability to initiate and sustain restoration activities, including facilitating the repair or replacement of infrastructure for lifelines such as oil, gas, electricity, telecommunications, drinking water, wastewater, and transportation services.

This document, Appendix G: Critical Lifelines – Tab 2: Electric Power Restoration (Tab 2), provides details and a concept of operations for sustaining and/or restoring electric power after the disaster.

G2-1.1 Purpose

The purpose of Tab 2 is to:

- Identify the entities responsible for post-disaster repairing, maintaining, and restoring of electric power to the Bay Area
- Describe how governments coordinate after the disaster with electric power providers/maintainers
- Identify response objectives for electric power restoration
- Describe how post-disaster restoration efforts are prioritized

G2-1.2 Scope

Tab 2 provides details regarding electric power restoration in the region (**Maps G2-1** and **G2-2** illustrates the electric power and natural gas services areas throughout the Bay Area). While Pacific Gas and Electric Company (PG&E) is a private company and keeps internal operational information confidential, Tab 2 serves as a guide for supporting its efforts to restore electrical power and for collecting and sharing information such as impacts to the distribution system, the extent of electrical power service disruption, and estimates for restoration of normal electrical power distribution.

G2-1.3 Planning Assumptions

This section provides planning assumptions related to electric power restoration.

G2-1.3.1 Impacts on the Electric Power Grid

The scenario earthquake causes the following impacts to the electric power delivery system:

- **Table G2.1-1** shows the number of households without electricity after the earthquake (see **Maps G2-3a** through **G2-3d** for a visual representation).
- Many other lifelines are dependent on electric power, such as fuel distribution, economic activity, water and wastewater systems, communications, and operation of critical facilities.

Table G2.1-1. Number of households without electricity after the earthquake.

County	Total Households	Households without Electricity Post-Event			
		E+24 Hours	E+72 Hours	E+7 Days	E+30 Days
Alameda	564,200	23,600	13,700	5,400	1,200
Contra Costa	384,600	15,400	9,300	3,700	800
Marin	105,300	3,700	2,400	1,100	200
Monterey	130,300	N/A	N/A	N/A	N/A
Napa	50,300	2,000	1,200	500	100
San Benito	17,300	N/A	N/A	N/A	N/A
San Francisco	358,900	253,900	161,300	73,100	18,300
San Mateo	268,000	100,100	62,800	27,900	6,800
Santa Clara	624,700	57,100	34,300	14,400	3,400
Santa Cruz	95,800	15,500	9,600	3,900	800
Solano	140,900	5,600	3,200	1,400	300
Sonoma	182,900	60,000	40,400	19,700	5,000
Total	**2,923,200**	**492,200**	**308,400**	**139,000**	**36,900**

Source: Hazards – U.S. (HAZUS) analysis conducted by URS in 2009. Estimates have been adjusted, by county, for population increase since the year 2000. For Contra Costa, Napa, and Solano counties, the power loss is not accurately represented in HAZUS and is an average of losses for Alameda and Marin counties. HAZUS does not provide reliable results for Monterey and San Benito counties, but it can be assumed that there would be some power loss in these counties.

E = earthquake or scenario event
N/A = not available (HAZUS results are unreliable)

- Resources to repair and restore electric power are insufficient to meet the demand, so efforts must be prioritized.
- The need for back-up power generators exceed the demand, so available generators must be allocated to the most critical facilities first.

G2-1.3.2 Constraints and Anticipated Needs

After the scenario earthquake, certain impacts constrain electric power restoration. While PG&E has significant resources to address impacts to the electric power generation, transmission, and distribution system, it too needs assistance from outside agencies to expedite repairs to the system. The region assumes the following constraints and anticipated needs:

- Because fuel pumps at gas stations run off electric power and lack back-up power generation, customers and first responders are unable to acquire fuel from these locations until power is restored.

- With wide-scale power outages, many critical facilities operate under generated power.
- PG&E needs to coordinate restoration priorities with local governments to target those critical facilities that may have limited backup power capabilities.
- Personnel with varying degrees of skills and experience from outside the region and the state will arrive to fill resource requests made by local governments. Verifying credentials and granting access to certain areas must be coordinated in order to for these resources to effectively provide support.

G2-1.4 Applicable Plans, Authorities, and Guidance

The following plans, authorities, and guidance apply to fuel supply restoration.

G2-1.4.1 Service Provider Emergency Response Plans

PG&E, San Francisco Public Utilities Commission (SFPUC), and other electrical power utilities in the Bay Area have developed plans that are considered sensitive material and are not distributed publicly, although some plans are shared with government agencies when appropriate to facilitate effective coordination post-disaster. These plans guide response activities and prioritization of service restoration.

G2-1.4.2 California Energy Emergency Response Plan

The draft California Energy Emergency Response Plan, being developed by the California Energy Commission (CEC), will describe the State strategy for responding to an energy emergency. An energy emergency is an actual or potential loss of energy supply that significantly impacts the State. An energy emergency can be caused by natural disasters (such as earthquake, fire, or flood) or geopolitical events (such as war, terrorism, civil disturbance, or embargo). The chairman of the CEC can activate the plan upon a State of Emergency Declaration by the Governor.

G2-1.4.3 California Local Energy Assurance Planning Program

The California Local Energy Assurance Planning (CaLEAP) program assists local governments to develop plans to become more energy resilient; ensuring energy supply to “key assets.” The emphasis of “key assets” is to ensure functionality of essential services, thus protecting safety and public health, and minimizing economic loss. The goal of the program is to help local governments prepare for, respond to, recover from and mitigate against potential emergencies that impact energy.

The program through the CEC provides technical assistance to local governments to build local energy expertise and awareness of impacts and interdependencies; help them identify deficiencies and vulnerabilities, and explore energy choices, including alternative resources, that are reliable, safe, diverse, affordable and environmentally acceptable[3].

[3] CaLEAP Fact Sheet, 2013

G2-2 Roles and Responsibilities

The following agencies are responsible for the maintenance, repair, and restoration of the electric power generation and the transmission and distribution system.

G1-2.1 Local Governments

Local governments, defined in SEMS as cities, counties, and special districts, are responsible for managing the last mile of electric power delivery. The last mile for electric power delivery refers to providing temporary power generation to critical service providers. While local governments are dependent on the private sector for restoration of electric power, local governments have the responsibility of prioritizing generator power resources to aid in the response and restoration efforts.

G1-2.2 Utilities and/or Service Providers

The following utilities and/or service providers play an important role in restoring electric power.

G2-2.2.1 Pacific Gas and Electric Company

PG&E is a private provider of electric power and natural gas to Bay Area customers. PG&E has confidential policies and procedures for gas and electric power restoration and coordinates with local governments, Operational Areas, and the State on post-disaster restoration activities. PG&E may send liaisons to the Emergency Operations Centers of affected jurisdictions and to the Regional Emergency Operations Center (REOC), State Operations Center (SOC), or Joint Field Office (JFO) to facilitate this coordination. PG&E also deploys mobile command centers to the field to coordinate the field-level response with first responders.

G2-2.2.2 San Francisco Public Utilities Commission

SFPUC is the City of San Francisco's municipal power utility. SFPUC owns and maintains the Hetch Hetchy power generation system. SFPUC is responsible for serving essential services in the city as well as Treasure Island. SFPUC's system are well integrated with PG&E and coordinates restoration activities closely with PG&E following an event causing widespread power outages. Additionally, representatives from SFPUC work within the City of San Francisco's emergency management organization to coordinate response and restoration activities.

G2-2.3 State of California

The State will organize is resources to provide support to responsible jurisdictions in partnership with the private sector and the Federal Emergency Management Agency (FEMA) to restore gas, electricity, water, wastewater, and telecommunications functions. The following State of California agencies play important roles in electric power restoration:

G2-2.3.1 California Emergency Commission

Post-disaster, the CEC is responsible for information gathering, analyzing energy infrastructure impact, response coordinating, and supporting the California Emergency Management Agency (Cal OES) as it coordinates alternate means of providing power.

Representatives of the CEC work out of the Utilities Operations Center (UOC) in the REOC or SOC to coordinate support for PG&E restoration activities.

G2-2.3.2 California Utilities Emergency Association

The California Utilities Emergency Association serves as a point of contact for critical infrastructure utilities and Cal OES and other governmental agencies before, during, and after an event to:

- Activate the UOC at the REOC or SOC
- Facilitate communications and cooperation among member utilities, public agencies, and non-member utilities (where resources and priorities allow)
- Provide emergency response support wherever practical for electric, petroleum pipeline, telecommunications, gas, and water and wastewater utilities
- Support utility emergency planning, mitigation, training, exercises, and education

G2-2.3.3 California Independent System Operator

The California Independent System Operator is an impartial link between the electrical generating power plants and the utility companies that provide electricity to more than 30 million consumers. When the demand for electricity exceeds the generating capacity of power plants, the California Independent System Operator must determine the manner in which limited electrical supply is distributed through the transmission and distribution network.

G2-2.3.4 California National Guard

The California National Guard may be requested to assist local governments to provide and set up backup power generation for critical facilities. The California National Guard also is capable of providing generators at gas stations to aid in fuel pumping.

G2-2.4 Federal Government

The Federal government will work jointly with the State of California to provide resource support and assistance to local governments and critical lifeline service providers. The Federal Government through requests to FEMA can offer the following:

- Damage assessments on energy systems
- Assessment of energy supply and market impacts

- Issues legal authorities and waivers
- Technical expertise to the utilities, including field assessments, and assists government and private-sector stakeholders to overcome challenges in restoring the energy system
- Acquisition and distribution of generators
- Resources to assist with the repair and restoration of electric power systems

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G2-3 Information and Coordination

The following organizations and programs have been established to support information sharing and the coordination of response and restoration activities as well as to facilitate the effective flow of information.

G2-3.1 Inter-Agency Coordination

Inter-agency coordination for assessing and sharing information regarding electric power restoration follows standard California Standardized Emergency Management System (SEMS) protocols. Local governments, utilities, and private businesses conduct initial assessments and determine restoration priorities and resource needs. Information such as damage assessments, situation reports, and Action Plans and requests for assistance are communicated up through SEMS levels as appropriate.

General regional, State and Federal coordination including the Regional Coordination Group and the Unified Coordination Group are described in **Section 5, Coordination and Communication** of the Regional Catastrophic Earthquake Logistics Response Plan.

G2-3.2 Information Collection/Sharing

The collection, compilation, and sharing of data is another key component of effective lifeline restoration. Specific, credible, and actionable information is required from field units and utility operators to being forming a common operating picture. Critical information collection requirements for lifeline restoration is located in **Appendix I, Critical Information Collection Requirements** of the Logistics Plan.

G2-3.3 Action Planning

Each coordinating and response organization should develop Action Plans for their organizations. These Action Plans document the situation, priorities, goals, and objectives, and resource assignments and serve as the organization's plan for a specific period of time (Operational Period). Action Plans should be briefed and shared with all entities with roles in response and restoration efforts.

G2-3.4 Utilities Operations Center

The UOC is operated by the California Utilities Emergency Association (CUEA) in conjunction with liaisons from utility companies actively supporting post-disaster response, restoration, and recovery activities. In most cases, the UOC operates as part of the Operations Section of the SOC but in limited cases may operate in direct support of a REOC. To support restoration operations, the UOC may have participation from PG&E, the CEC, and other representatives that support electric power restoration. Within the UOC, the State will communicate their priorities to CUEA, and CUEA will communicate to the utility companies.

G2-3.5 Agency Representatives

PG&E sends agency representatives to the Emergency Operations Centers of affected jurisdictions, the REOC, the SOC, or the JFO depending on the nature of the event to promote information sharing and coordinate natural gas and electric power restoration priorities. Organizations such as the U.S. Army Corps of Engineers (USACE) and the California National Guard may also send representatives to affected governments to coordinate restoration activities.

G2-3.6 Energy Emergency Management Center

The Energy Emergency Management Center is not a pysical location but a structure that provides centralized management for the coordination of energy emergencies.[4] It is generally managed from the Energy Commission Headquarters. The Center allows a more efficient structure to:

- Provide timely reports, analyses, and action recommendations
- Coordinate more effectively with Cal OES, CUEA, and the California Independent System Operator during proclaimed emergencies
- Provides a central location to coordinate the integration of assisting agencies
- Ensure that a separate accounting of emergency response and recovery activity is documented for reimbursement purposes

[4] California Energy Emergency Response Plan, 2006

G2-4 Restoration Operations

Immediately following a catastrophic earthquake, efforts will begin to assess the status of the electric power system, begin mitigating against additional loss or disruption of power, and repair damaged infrastructure. The following sections describe these operations.

G2-4.1 Damage Assessment

Prior to conducting repair and restoration activities, assessment teams must determine the extent and locations of damaged infrastructure. The general process for restoring service includes the following steps:

- Locate and clear downed power lines
- Inspect generation facilities
- Inspect transmission lines
- Inspect substations
- Inspect distribution and neighborhoods tap lines

G2-4.2 Prioritizing Restoration Efforts

Each organization has predetermined restoration priorities that drive initial response activities. These priorities are aligned with restoring service to critical facilities. As the response continues, priorities can and will change due to changes in the situation. Service providers coordinate with government agencies through liaisons to discuss and determine changes in restoration priorities. Effective communication between service providers and government agencies must occur if priorities are to be aligned.

G2-4.3 Fuel and Electrical Power Interdependency

Fuel and electrical power restoration are often dependent on each other. This interdependency can drive restoration priorities. A few examples are:

- Fuel pumps at gas stations require electric power to operate. Without electric power, the fuel in underground tanks is inaccessible.
- Small and large generators, used when electrical power is disrupted require fuel to function
- Vehicles for electric power maintenance crews require fuel
- Transmitters in pipelines that provide information about possible breaks require electric power to function
- Electric power may remain off until natural gas lines are repaired to mitigate against ignition risk

Emergency managers should consider these interdependencies when defining restoration priorities.

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G2-5 Restoration Objectives

Section G2-5 identifies objectives for assessing impacts to the electric power system and for its restoration. The objectives are organized by phases consistent with those identified in the Regional Catastrophic Earthquake Logistics Response Plan. Those phases are: event occurrence (E) to E+72 hours, E+72 hours to E+14 days, and E+14 days to E+60 days.

In this context, PG&E coordinates with local governments to address requests for priority restoration of:

- Hospitals
- Regional airports
- Water, wastewater treatment plants, and/or sewage pumping stations
- Other critical infrastructure, such as emergency response facilities (e.g., emergency operations centers and 911/dispatch centers)
- Emergency shelters or other high-occupancy facilities
- Facilities from which people cannot be easily relocated. (e.g., nursing homes and assisted-living facilities)
- Refineries, pipelines, gas stations, and other fuel distribution infrastructure

G2-5.1 E to E+72 Hours

In the first 72 hours following the earthquake, priority is placed on assessing damage to the electrical power grid and addressing hazardous situations, such as downed wires. The focus then transitions to restoring power to the largest number of customers as quickly as possible and on making repairs that restore service to critical facilities such as hospitals, water pumping stations ,and police and fire departments.[5] The following objectives frame assessment and restoration activities from E to E+72 hours:

- Ensure assessment team personnel can access and remain in the affected areas to complete assessment activities
- Determine the extent of electric power outages
- Identify portions of the electrical power grid that pose a threat to life safety
- Identify damage to the generation facilities, substations, and transmission and distribution lines
- Ensure that the appropriate utility representatives are included in response and restoration planning activities
- Provide information to the public on home safety measures, service disruptions, and restoration activities

[5] As specified on PG&E's website: www.pge.com/myhome/customerservice/energystatus/preparationandresponse/index.shtml

- Identify critical facilities and response agencies whose missions are adversely affected by the loss of electrical power
- Coordinate the request, acquisition, and prioritization of backup power generators

G2-5.2 E+72 Hours to E+14 Days

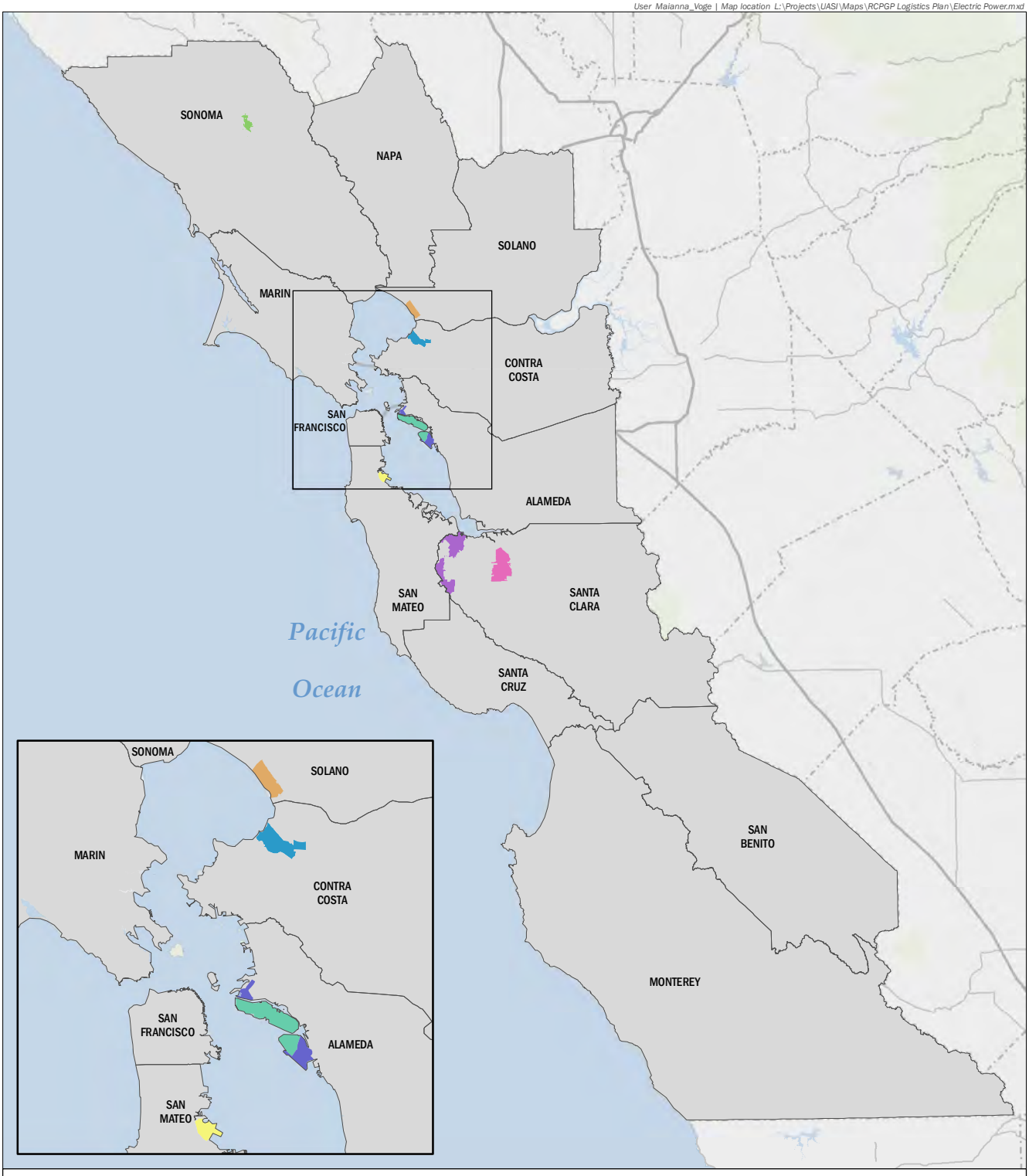
The following objectives frame the ongoing restoration activities from E+72 hours to E+14 days:

- Identify resources required to support the restoration of the electric power transmission and distribution systems
- Identify interdependencies among electric power and other lifelines that may impact restoration and backup power generation priorities
- Continue to coordinate the sharing and dissemination of priority information on electric power restoration activities
- Provide estimates for electric power restoration to aid in evacuation and sheltering planning
- Monitor electric power needs for critical facilities and provide backup power generation if necessary
- Coordinate with PG&E to determine potential resource needs
- Continue to monitor the electric power generation, transmission, and distribution system for any hazardous situations

G2-5.3 E+14 Days to E+60 Days

Many of the activities that occur from E+72 hours to E+14 days continue from E+14 days to E+60 days, but efforts in this period transition to restoring electric power to individual customers and other non-critical facilities. The following objectives are in addition to the objectives that are ongoing from the previous phase. These objectives frame the transition to recovery of the electric power generation and distribution system from E+14 days to E+60 days:

- Repair and restore normal electric power generation and distribution
- Continue to evaluate the need for Federal assistance in the acquisition of resources to repair and augment electric power service
- Transition facilities on generated power to electric power after service has been restored
- Continue to monitor the electric power generation, transmission, and distribution system for any hazardous situations

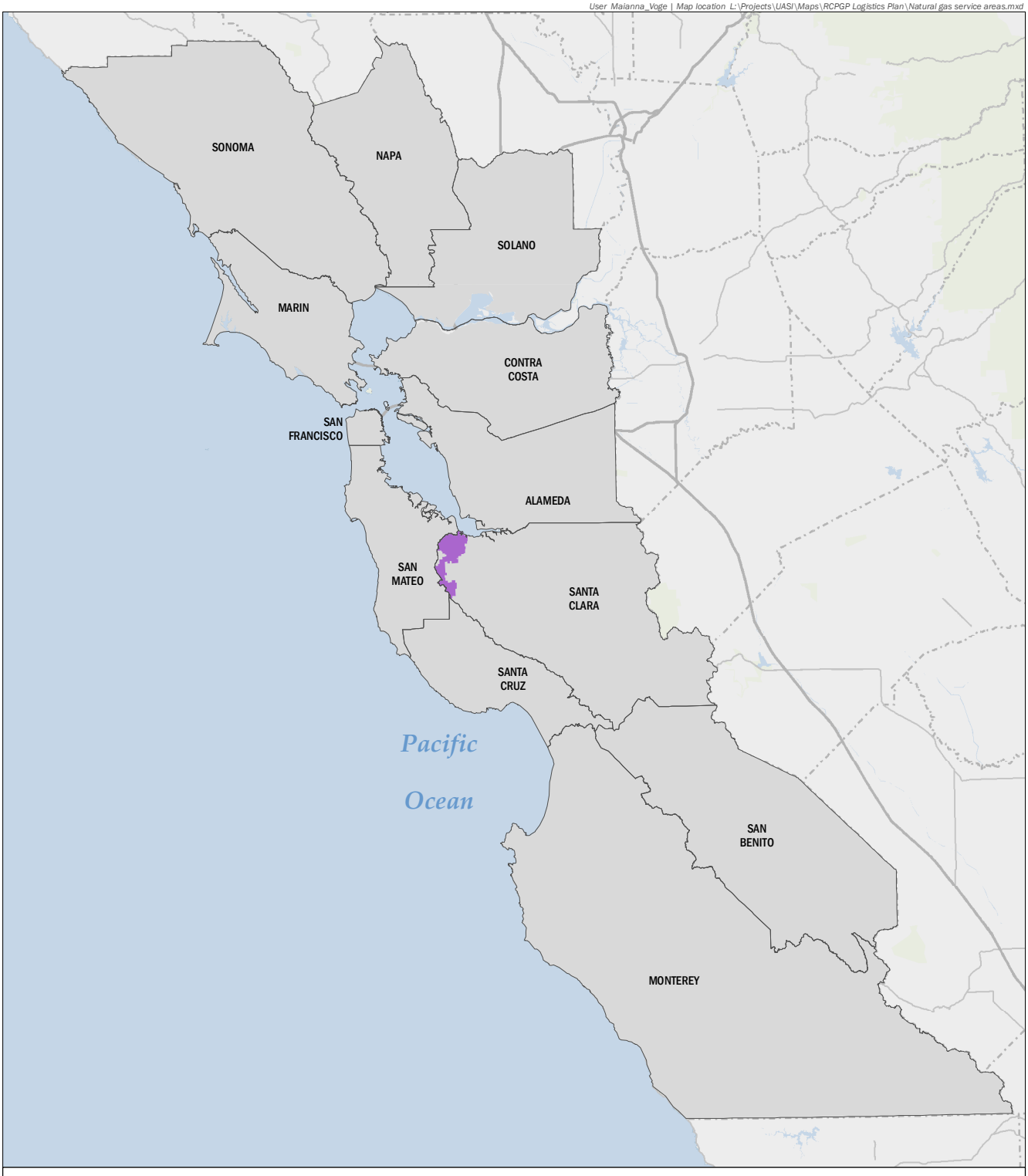


Data source: California Energy Commission.

Bay Area UASI Program - RCPGP
Appendix G: Critical Lifelines

Map G2-1
Electric Power Service Areas

User Maianna_Voge | Map location L:\Projects\UASI\Maps\RCPGP Logistics Plan\Natural gas service areas.mxd

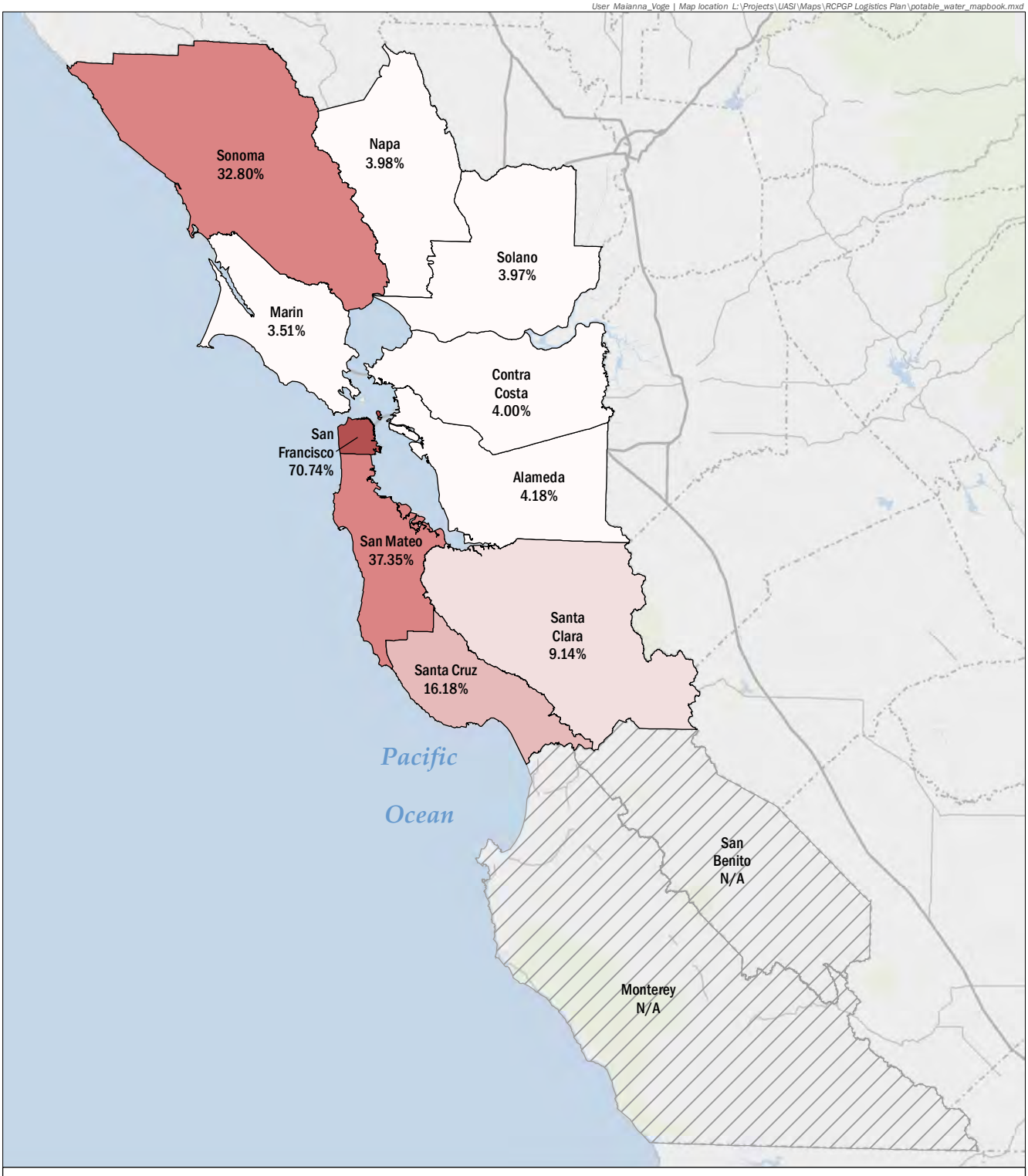


Natural Gas Service Area
- City of Palo Alto Utilities
- Pacific Gas & Electric Company

N 0 40 Miles

Data source: California Energy Commission.

Map G2-2
Natural Gas Service Areas



Percent of households without electricity 24 hours post-event

- 0 - 5%
- 6 - 15%
- 16 - 25%
- 26 - 50%
- 51 - 75%
- N/A

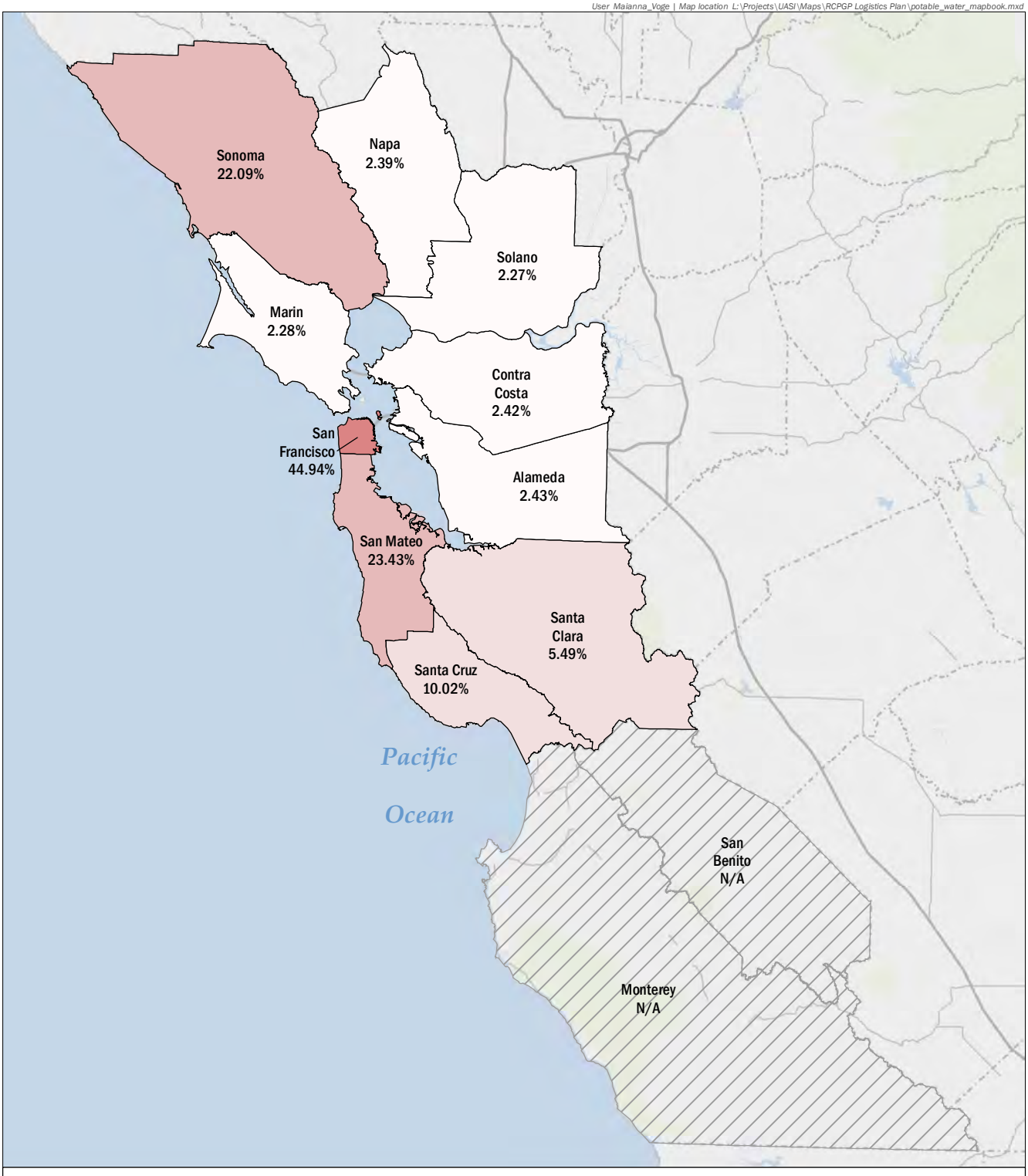
N

0 40 Miles

Data source: U.S. (HAZUS) analysis conducted by URS in 2009. N/A = not available (HAZUS results are unreliable).

Bay Area UASI Program - RCPGP
Appendix G: Critical Lifelines

Map G2-3a
Households without electricity 24 hours post-event



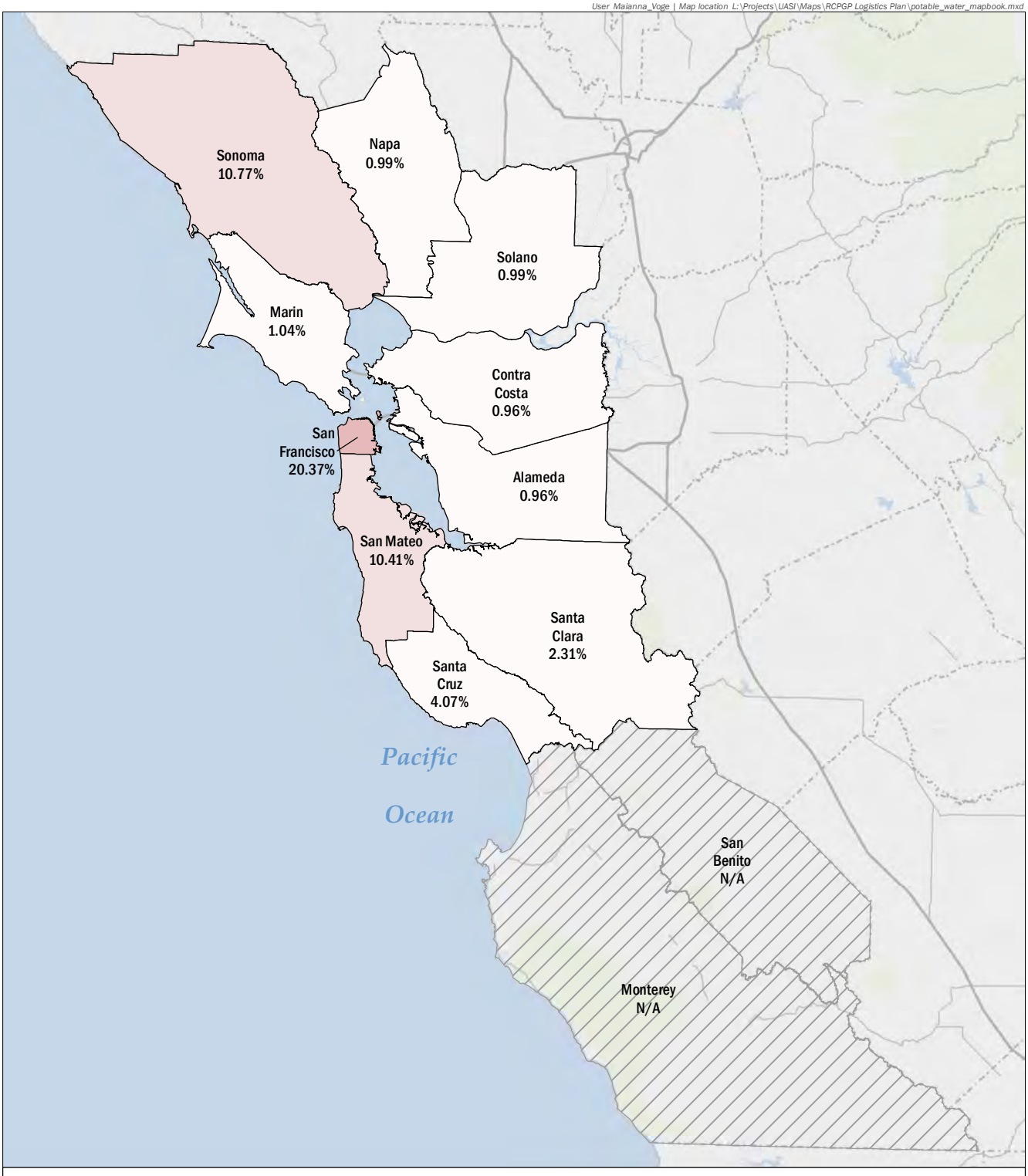
Percent of households without electricity 72 hours post-event

- 0 - 5%
- 6 - 15%
- 16 - 25%
- 26 - 50%
- N/A

N 0 40 Miles

Data source: U.S. (HAZUS) analysis conducted by URS in 2009. N/A = not available (HAZUS results are unreliable).

Bay Area UASI Program - RCPGP Appendix G: Critical Lifelines	Map G2-3b Households without electricity 72 hours post-event



Percent of households without electricity 7 days post-event

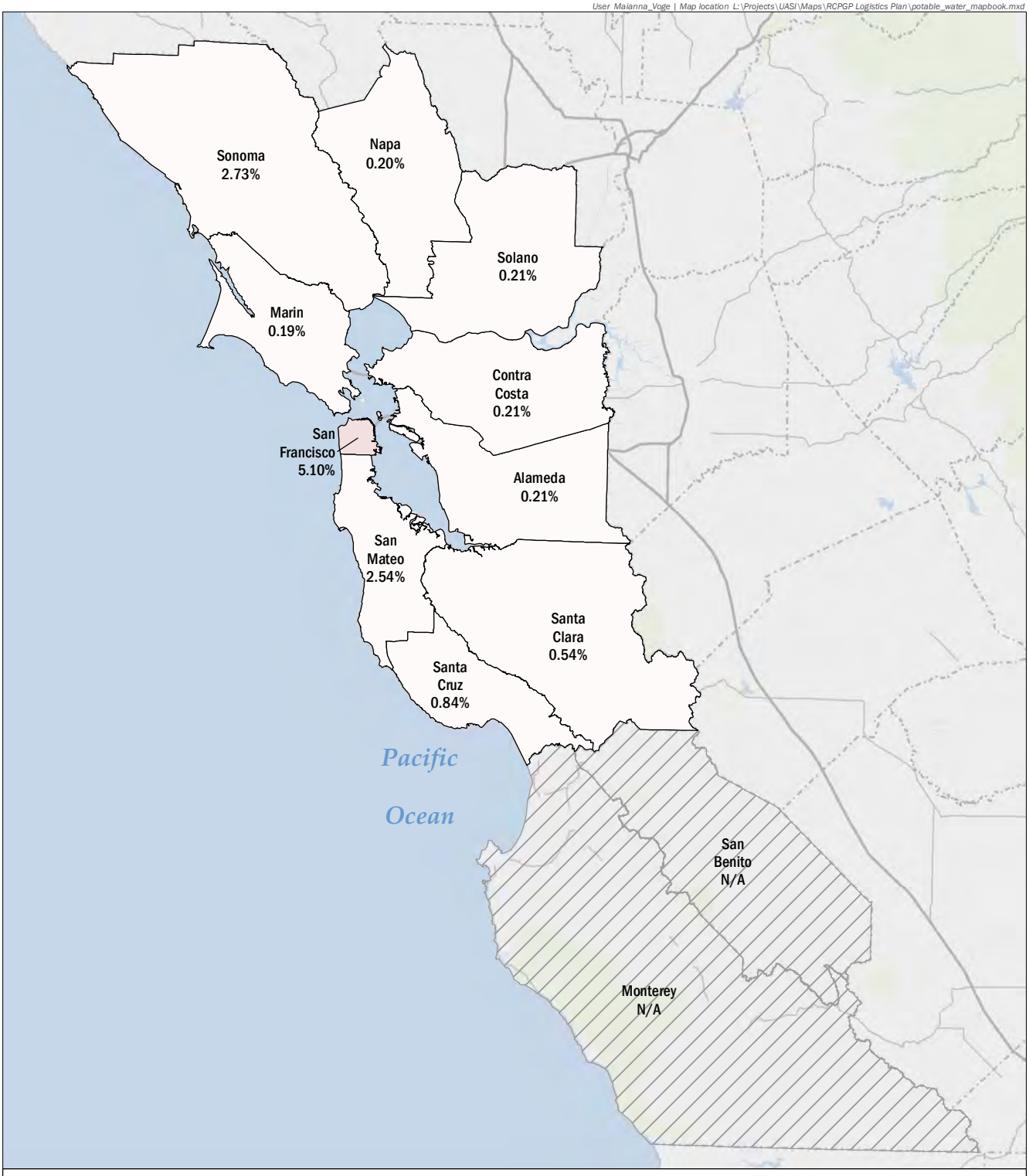
- 0 - 5%
- 6 - 15%
- 16 - 25%
- N/A

N

0 40 Miles

Data source: U.S. (HAZUS) analysis conducted by URS in 2009. N/A = not available (HAZUS results are unreliable).

Bay Area UASI Program - RCPGP Appendix G: Critical Lifelines	Map G2-3c Households without electricity 7 days post-event



Percent of households without electricity 30 days post-event

- 0 - 5%
- 6 - 15%
- N/A

N 0 40 Miles

Data source: U.S. (HAZUS) analysis conducted by URS in 2009. N/A = not available (HAZUS results are unreliable).

Bay Area UASI Program - RCPGP Appendix G: Critical Lifelines	Map G2-3d Households without electricity 30 days post-event

Tab 3: Water and Wastewater Restoration

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Appendix G: Critical Lifelines – Tab 3: Water and Wastewater Restoration

Acronyms

Cal OES	California Governor's Office of Emergency Services
CRA	California Resiliency Alliance
CUEA	California Utilities Emergency Association
CalWARN	California Water/Wastewater Agency Response Network
E	event occurrence
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
JFO	Joint Field Office
REOC	Regional Emergency Operations Center
SEMS	Standardized Emergency Management System
SOC	State Operations Center
Tab 3	Appendix G: Critical Lifelines – Tab 3: Water and Wastewater Restoration
UOC	Utilities Operations Center
USACE	U.S. Army Corps of Engineers

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G3-1 Introduction

Restoration of lifelines is the capability to initiate and sustain restoration activities. This includes facilitating the repair/replacement of infrastructure for lifelines such as oil, gas, electricity, telecommunications, drinking water, wastewater, and transportation services.

This document, Appendix G: Critical Lifelines – Tab 3: Water and Wastewater Restoration (Tab 3), provides details and a concept of operations for sustaining and/or restoring water and wastewater systems.

G3-1.1 Purpose

The purpose of Tab 3 is to:

- Identify agencies with roles in maintaining, repairing, and restoring water and wastewater services following a disaster
- Describe how government coordinates with private companies and special districts to facilitate the restoration of services
- Identify response objectives for water and wastewater restoration

G3-1.2 Scope

Tab 3 provides details regarding water and wastewater systems restoration in the region (**Map G3-1** illustrates the Bay Area Water and Wastewater Systems). While many of the service providers are special districts and private companies that keep internal operational information confidential, Tab 3 serves as a guide for supporting their restoration efforts and for collecting and sharing such information as impacts to water and wastewater systems and estimates for service restoration.

G3-1.3 Planning Assumptions

This section provides planning assumptions related to water and wastewater restoration.

G3-1.3.1 Impacts to Water and Wastewater Systems

The scenario earthquake causes the following impacts to water and wastewater systems in the region; **Table G3.1-1** shows the number of households without potable water after the earthquake (see **Maps G3-2a** through **G3-2d** for a visual representation).:

- Potable water supply systems suffer major damage because of the following:
  - Extensive damage to pipelines from ground deformation
  - Interruption of pumps and treatment due to power outages
  - Damage to treatment facilities, storage facilities, and distribution infrastructure
  - Contamination of potable water systems because of damaged lines

- Damage to potable water treatment and distribution systems creates a significant challenge and makes potable water a priority commodity.
- Critical pipelines, tunnels, bypasses, pumping stations, supply lines, and feeder mains fail, negatively impacting the provision of water.
- Massive, coordinated emergency potable water distribution systems are necessary to support disaster service workers and to sustain populations in the region.
- Peninsula, South Bay, and San Francisco customers are fully or partially cut off from the Hetch Hetchy system. East, South, and North Bay aqueduct systems are equally affected.
- Most of the locally stored water supplies for fire, medical, and other critical services from tanks and small reservoirs are depleted within 72 hours after the event occurrence (E).
- Dams may fail, causing flooding, infrastructure damage, loss of water storage capacity, and increased loss of life.
- Trucks delivering treatment chemicals to water treatment plants may be delayed due to roadway damage.
- Onsite storage of treatment chemicals determines how long water treatment plants are able to treat water to bring it to potable standards; most plants are not able to function for more than 3 to 5 days.
- Partially treated raw sewage may discharge into the San Francisco Bay for up to one month due to facility and pipeline damage.
- Loss of electrical power could render pumping plants unusable, causing sewage back-ups and spills through street access holes.
- Pumping and treatment operations may be interrupted due to power outages.
- Some private companies may provide supplies of bottled water and should be incorporated into the potable water distribution system.
- Water utility companies operate based on their own water recovery and distribution plans, but water supply resources are insufficient, resulting in the request for and need to acquire water from sources outside the region.
- Resources to move the water, such as water tenders, are very limited and require prioritization.
- Chemicals needed for water treatment/decontamination may not be readily available because of hazardous materials restrictions, damage to chemical storage facilities, and transportation infrastructure damage.

Table G3.1-1. Number of households without potable water after the earthquake.

County	Total Households	Households without Potable Water Post-Event			
		E+24 Hours	E+72 Hours	E+7 Days	E+30 Days
Alameda	564,200	465,000	459,800	448,200	341,800
Contra Costa	384,600	105,700	85,700	45,600	N/A
Marin	105,300	56,300	48,600	29,300	N/A
Monterey	130,300	N/A	N/A	N/A	N/A
Napa	50,300	3,900	<100	0	0
San Benito	17,300	N/A	N/A	N/A	N/A
San Francisco	358,900	340,100	336,400	326,100	N/A
San Mateo	268,000	236,900	234,300	228,100	149,700
Santa Clara	624,700	516,800	512,300	502,700	423,100
Santa Cruz	95,800	16,100	6,500	<100	<100
Solano	140,900	12,500	3,700	<100	<100
Sonoma	182,900	87,800	81,900	69,100	<100
Total	**2,923,200**	**1,841,100**	**1,769,200**	**1,649,400**	**914,900**

Source: Hazards – U.S. analysis conducted by URS in 2009. Estimates have been adjusted, by county, for population increases since 2000.

E = earthquake or scenario event
N/A = not available (Hazards – U.S. results are unreliable)

G3-1.3.2 Constraints and Anticipated Needs

After the scenario earthquake, certain impacts constrain water and wastewater system restoration. Additionally, the region and those entities responsible for restoring the water and wastewater system need resources in order to quickly restore services. The region assumes the following constraints and anticipated needs:

- Because pumping stations and wastewater treatment facilities operate on electric power and have limited backup power generation, customers and first responders may be unable to acquire water at least until power is restored even if the pumping stations and pipes avoid significant damage.
- With wide-scale power outages, many critical facilities in the water and wastewater system operate under generated power. Additional fuel is needed to support the extended use of generators at these facilities.
- Expected major needs related to water and wastewater systems are:
  - Electricity/generators for sewage lift stations.
  - State and Federal environmental sewage discharge waivers.

  - Large and/or specialized repair parts (that are not on hand), such as valves and pipes.
  - Fuel for vehicles, equipment, and wastewater treatment plants.
  - Chemicals to treat wastewater; procurement should be initiated within 96 hours. Wastewater utilities estimate that local supplies of wastewater-treatment chemicals are exhausted within 7 days.
  - Equipment and qualified personnel.
  - An estimated 5 million gallons per day of potable water.
  - Water for facilities critical to response operations, including hospitals and shelters.
  - Access to sites to conduct damage assessments and to initiate repairs
- Personnel with varying degrees of skills and experience from outside the region and the state will arrive to fill resource requests made by local governments. Verifying credentials and granting access to certain areas must be coordinated in order to for these resources to effectively provide support.

G3-1.4 Applicable Plans, Authorities, and Guidance

The following plans, authorities, and guidance apply to water and wastewater system restoration:

- California Governor's Office of Emergency Services (Cal OES) Emergency Planning Guidance: Public and Private Water Utilities, 1999
- California Government Code Section 8607.2(c)
- California Water/Wastewater Agency Response Network (CalWARN) Mutual Aid/Assistance Operational Plan, 2009
- San Francisco Bay Area Earthquake Readiness Response: Concept of Operations Plan, 2008
- Association of Bay Area Governments, Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area, 2010

G3-2 Roles and Responsibilities

While no single organization is responsible for managing or maintaining water and wastewater treatment systems, the entities identified below have critical roles in providing emergency response support and assisting with system repairs and service restoration.

G3-2.1 Local Governments

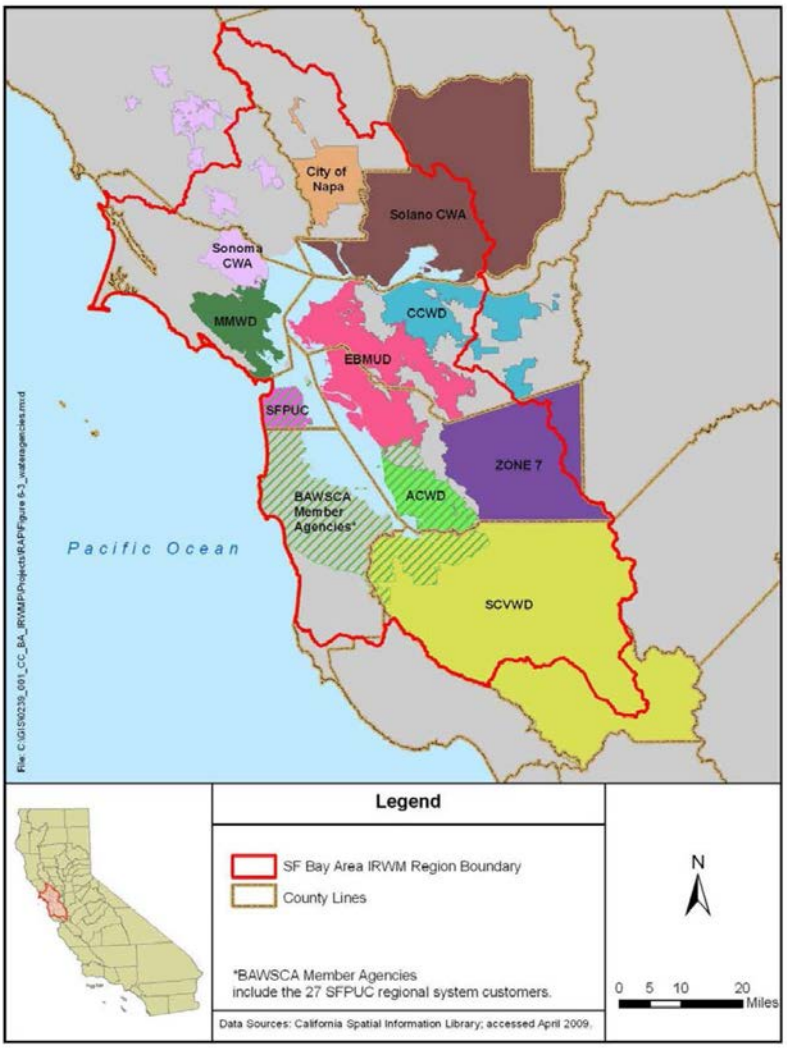
Local governments, defined in California Standardized Emergency Management System (SEMS) as cities, counties, and special districts, are responsible for managing the last mile of water and wastewater restoration. The last mile for water and wastewater services refers to providing alternate supply of potable water and temporary sanitation solutions. While in some cases local governments are dependent on private utility companies or special districts for restoration of water and sanitation, local governments have the responsibility of prioritizing resources to aid in the response and restoration efforts.

G3-2.1.1 Local Water and Wastewater Utilities

Local water and wastewater utilities manage and coordinate the utility's emergency response and recovery activities in their service boundaries. These efforts include conducting damage assessments, repairing damaged infrastructure, coordinating with the local health department on water quality, and determining alternatives. The utility may be a private utility, a city or county department, or an independent special district.

During an emergency that impacts the normal water distribution system, the local water utility is also responsible for coordinating with local government to procure and distribute alternate emergency drinking water for populations in the jurisdiction, provided local alternate water sources are available and local utility resources are available to manage it. When the local water utility's capacity to maintain lead responsibility for alternate drinking water supplies is exceeded, a Joint Water Task Force (see **Section G3-3.6**) may be established to manage the delivery of emergency water.

The following figure is from the 2013 San Francisco Bay Area Integrated Regional Water Management Plan and illustrates the major water agencies in the Bay Area Region (http://bairwmp.org/).



Source: *2013 San Francisco Bay Area Integrated Regional Water Management Plan and illustrates the major water agencies in the Bay Area Region (http://bairwmp.org/).*

Figure G3.1. Major Water Agencies of the Bay Area Region

G3-2.1.2 Local Health Departments

Local health departments play a critical role is testing and evaluating the safety of local drinking water. Additionally, local health departments issue public notices regarding the safety of drinking water. Local health departments and water and wastewater service providers coordinate to ensure accurate information is disseminated to the public.

G3-2.2 State of California

The State will organize is resources to provide support to responsible jurisdictions in partnership with the private sector and the Federal Emergency Management Agency (FEMA) to restore gas, electricity, water, wastewater, and telecommunications functions. The following State of California agencies play important roles in water and wastewater systems restoration:

G3-2.2.1 California Utilities Emergency Association

The California Utilities Emergency Association (CUEA) facilitates communications and coordination between members and public agencies and with non-member utilities when resources and priorities allow. During an emergency response, CUEA collects damage assessments, coordinates mutual aid/assistance requests, and facilitates the restoration of water utilities. CUEA also activates the Utilities Operations Center (UOC) to coordinate support to local utility service providers.

G3-2.2.2 California Department of Water Resources

The California Department of Water Resources implements emergency protective measures, such as the stabilization and repair of breaches, to reduce infrastructure damage due to failure of levees in the Sacramento Delta and to protect the State's water supply. The Department of Water Resources also assesses damage to dams and makes determinations regarding their safety and operation.

G3-2.2.3 California Water/Wastewater Agency Response Network

Water and wastewater utilities in the State have established the California Water/Wastewater Agency Response Network (CalWARN) to improve the flow of mutual aid/assistance among the signatory utilities throughout the State. CalWARN utilities have agreed to provide assistance and/or resources to other utilities when requested and available.

CalWARN is organized according to the six Cal OES mutual aid regions. During major events where multiple utilities are affected and assistance is required to coordinate the number of requests, a CalWARN response team consisting of pre-trained utility personnel from unaffected utilities may be called on to support coordination efforts at the Regional Emergency Operations Center (REOC), State Operations Center (SOC), or the Joint Field Office (JFO).

G3-2.2.4 California National Guard

The California National Guard may be requested to provide support to local governments for the transport and distribution of bottled water. The National Guard can also provide:

- Engineers and equipment to support water and wastewater utilities in the restoration of water distribution systems
- Generators for use at pumping stations and wells
- Reverse osmosis water purification units

G3-2.2.5 California Department of Public Health

The California Department of Public Health Division of Drinking Water and Environmental Management regulates public drinking water systems. Following the earthquake, the Drinking Water Program assists utilities with obtaining drinking water system testing and may also analyze samples. The Drinking Water Program

uses out-of-region offices to staff assessment teams. Water systems can use CalWARN and California Rural Water Association for mutual aid and recovery assistance and to engage assessment teams from out-of-region water districts (there are approximately 8,000 water districts in the State). Additionally, the California Department of Public Health coordinates with local health departments on broader messaging regarding the safety of drinking water following and incident.

G3-2.3 Federal Government

The Federal government will work jointly with the State of California to provide resource support and assistance to local governments and critical lifeline service providers. The Federal Government through requests to FEMA can offer the following:

- Damage assessments on water and wastewater systems.
- Issues legal authorities and waivers.
- Technical expertise to the utilities, including field assessments, and assists government and private-sector stakeholders to overcome challenges in restoring water and wastewater systems.
- Acquisition and distribution of equipment and supplies
- Resources to assist with the repair and restoration of water and wastewater systems
- Acquisition and distribution of emergency water supplies
- Acquisition and distribution of temporary sanitation solutions

G3-2.4 California Resiliency Alliance

The California Resiliency Alliance (CRA) is a 501(c)(3) non-profit organization. It facilitates local partnerships between business and government to fill important gaps in all phases of emergency management. It works closely with Cal OES, other State agencies, local governments, and with its business and trade association members.

Upon request from Cal OES, CRA reports to the Business Operations Center. CRA has also identified seven private-sector representatives who can report to Operational Area Emergency Operations Centers (EOCs) in the Coastal Region. In these venues, CRA representatives assist by communicating information to and from the private sector and by providing access to private-sector resources. In past emergencies, CRA has been successful in procuring bottled water for distribution to affected communities.

G3-3 Information and Coordination

The following organizations and programs have been established to support information sharing and the coordination of response and restoration activities as well as to facilitate the effective flow of information.

G3-3.1 Inter-Agency Coordination

Inter-agency coordination for assessing and sharing information regarding water and wastewater systems follows standard SEMS protocols. Local governments, utilities, and private businesses conduct initial assessments and determine restoration priorities and resource needs. Information such as damage assessments, situation reports, and Action Plans and requests for assistance are communicated up through SEMS levels as appropriate.

General regional, State and Federal coordination including the Regional Coordination Group and the Unified Coordination Group are described in **Section 5, Coordination and Communication** of the Regional Catastrophic Earthquake Logistics Response Plan.

G1-3.2 Information Collection/Sharing

The collection, compilation, and sharing of data is another key component of effective lifeline restoration. Specific, credible, and actionable information is required from field units and utility operators to being forming a common operating picture. Critical information collection requirements for lifeline restoration is located in **Appendix I, Critical Information Collection Requirements** of the Logistics Plan.

G1-3.3 Action Planning

Each coordinating and response organization should develop Action Plans for their organizations. These Action Plans document the situation, priorities, goals, and objectives, and resource assignments and serve as the organization's plan for a specific period of time (Operational Period). Action Plans should be briefed and shared with all entities with roles in response and restoration efforts.

G3-3.4 Utilities Operations Center

The UOC is comprised of CUEA and liaisons of utility companies actively supporting post-disaster response and restoration activities. In most cases, the UOC operates in the Operations Section of the State Operations Center (SOC), but in limited cases it may operate in direct support of the Cal OES Regional Emergency Operations Center (REOC). To support water and wastewater system restoration operations, the UOC may have participation from utility representatives, CUEA, and other agencies that can support restoration efforts or provide alternate means of water distribution.

G3-3.5 Agency Representatives

Water and wastewater utilities may send agency representatives to the EOCs of impacted jurisdictions, the REOC, the SOC, or the JFO, depending on the nature of the event, to promote information sharing and coordination of water and wastewater system restoration priorities.

G3-3.6 Joint Water Task Force

When multiple water utilities or local jurisdictions are affected by the disaster, a Joint Water Task Force may be established; it could be established at any level of the SEMS organization and include representatives from the affected water utilities, local governments, and Operational Areas, local health departments, California Health and Human Services, Cal OES, FEMA, CUEA, and volunteer or private organizations as necessary.

G3-3.7 California Water/Wastewater Agency Response Network

Water and wastewater utilities in the State have established CalWARN to improve the flow of mutual aid/assistance among the signatory utilities throughout the State. Resources may be requested directly from one utility to another and do not require the declaration of an emergency. Public and private resources are available through the system. The methods for activating the system and accessing resources can be accessed by members online at www.calwarn.org.

CalWARN is organized according to the six Cal OES mutual aid regions. During major events where multiple utilities are affected and assistance is required to coordinate the number of requests, a CalWARN response team consisting of pre-trained utility personnel from unaffected utilities may be called on to support coordination efforts at the REOC, SOC, or JFO.

G3-4 Restoration Operations

Immediately following a catastrophic earthquake, efforts will begin to assess the status of water and wastewater systems and repair damaged infrastructure. The following sections describe these operations.

G3-4.1 Damage Assessment

Prior to conducting repair and restoration activities, assessment teams must determine the extent and locations of damaged infrastructure. Automated systems such as SCADA provide initial indications of damage. More detailed information will be gather as field response teams are deployed to inspect pumps, pipes, and other water and wastewater system infrastructure.

G3-4.2 Prioritizing Restoration Efforts

Each organization has predetermined restoration priorities that drive initial response activities. These priorities are aligned with restoring service to critical facilities and mitigating against additional loss of capabilities. As the response continues, priorities can and will change due to changes in the situation. Service providers coordinate with government agencies through liaisons to discuss and determine changes in restoration priorities. Effective communication between service providers and government agencies must occur if priorities are to be aligned.

G3-4.3 Fuel, Electrical Power, and Water Interdependencies

Fuel supply availability and electrical power restoration impact water and wastewater system continuity and restoration. These interdependencies can drive restoration priorities. A few examples are:

- Most pumping stations rely on electric power to pump water to end users
- When electric power is disrupted, fuel is required to operate generators to pump water
- Small and large generators, used when electrical power is disrupted require fuel to function.
- Vehicles for electric power maintenance crews require fuel

Emergency managers should consider these interdependencies when defining restoration priorities.

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G3-5 Restoration Objectives

Section G3-5 identifies objectives for assessing impacts to the water and wastewater systems and for their restoration. The objectives are organized by phases consistent with those identified in the Regional Catastrophic Earthquake Logistics Response Plan. Those phases are E to E+72 hours, E+72 hours to E+14 days, and E+14 days to E+60 days.

G3-5.1 E to E+72 Hours

In the first 72 hours following the earthquake, priority is placed on assessing damage to the water and wastewater systems and anticipating potential disruptions in service. The following objectives frame assessment and restoration activities from E to E+72 hours:

- Assess water and wastewater infrastructure (i.e., pumping stations, wastewater treatment plants, pipelines, wells, reservoirs, and dams) to identify damage and service disruptions
- Ensure that assessment team personnel can access and remain in the affected areas to complete assessment activities
- Ensure that the appropriate utility representatives are included in response and restoration planning activities
- Determine capabilities to restore the water and wastewater systems and request assistance if needed
- Provide information to the public on water safety, service disruptions, alternate water sources, and restoration activities
- Share and disseminate priority information on water and wastewater system restoration activities
- Develop situational awareness concerning water quality and the demand for potable water
- Identify critical facilities and response agencies with missions that are adversely affected by the loss of water and/or sanitation
- Provide and coordinate alternate means for providing water and sanitation

G3-5.2 E+72 Hours to E+14 Days

After assessments have been completed and restoration activities have begun, priorities shift to identifying alternate means of distributing water to meet the demand and to continuing restoration activities. The following objectives frame the establishment of alternative fuel supply strategies and ongoing restoration activities from E+72 hours to E+14 days:

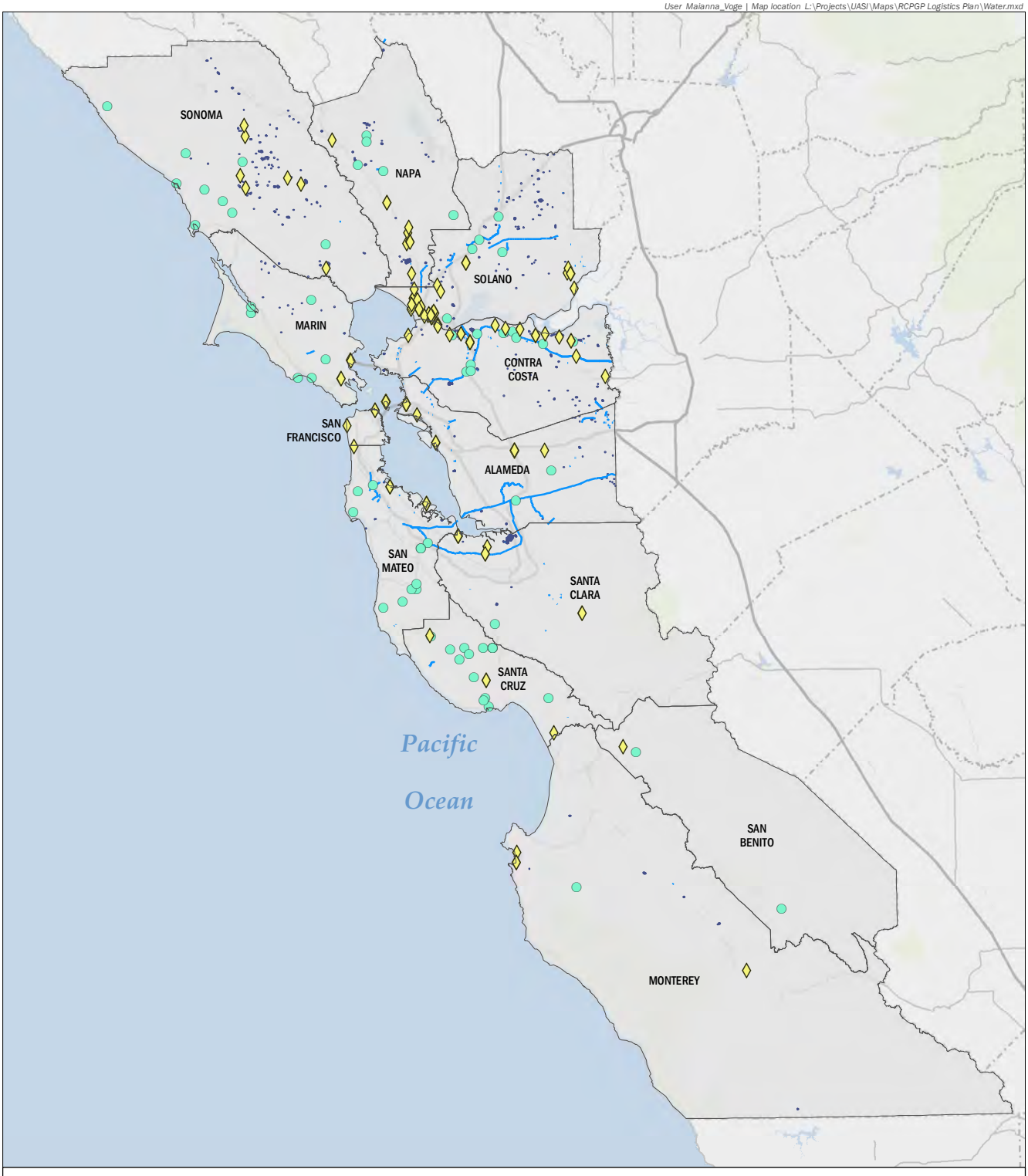
- Conduct assessments of water quality for functioning distribution systems
- Identify interdependencies among water and wastewater systems, electrical power, fuel, and other lifelines that may impact restoration priorities

- Evaluate current potable water availability versus demand and request additional potable water if appropriate
- Continue to coordinate the sharing and dissemination of priority information on water and wastewater system restoration activities
- Coordinate the water distribution plan to support critical response activities
- Set up a system to receive and distribute water and sanitation supplies to impacted communities and response agencies
- Continue to develop situational awareness concerning the demand for water as well as water and wastewater system restoration activities
- Determine the need for Federal assistance in the acquisition of alternate water and sanitation supplies and request support if needed
- Locate and/or repair damaged water and wastewater pipes, pumping stations, wells, and aqueducts

G3-5.3 E+14 Days to E+60 Days

Most of the activities that occur from E+72 hours to E+14 days continue from E+14 days to E+60 days, but efforts in this time frame transition to normalizing water demand and distribution. The following objectives are in addition to the objectives that are ongoing from the previous phase. These objectives frame the transition to recovery of the water distribution system from E+14 days to E+60 days:

- Restore normal water distribution and wastewater services
- Continue to locate and repair water and wastewater pipes
- Continue to repair pumping stations, wells, and aqueducts
- Continue to evaluate the need for Federal assistance in the acquisition of alternate water and sanitation supplies; request support if necessary
- Demobilize any alternate water and sanitation distribution systems



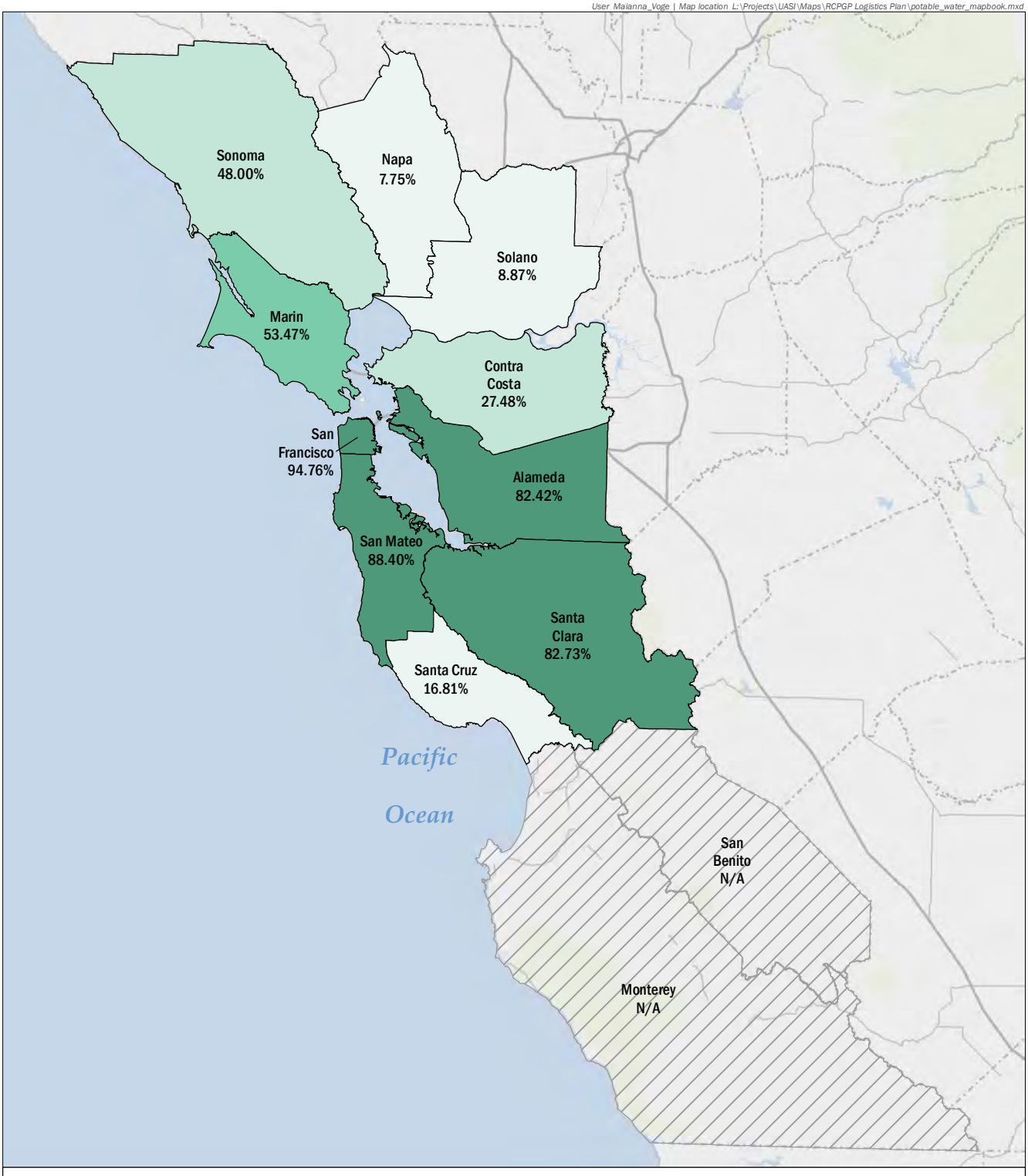
Public water supply plant
Wastewater treatment facility
Water pipeline
Reservoir

N 0 40 Miles

Data sources: EPA, NHD, USGS.

Bay Area UASI Program - RCPGP
Appendix G: Critical Lifelines

Map G3-1
Water & Wastewater Systems



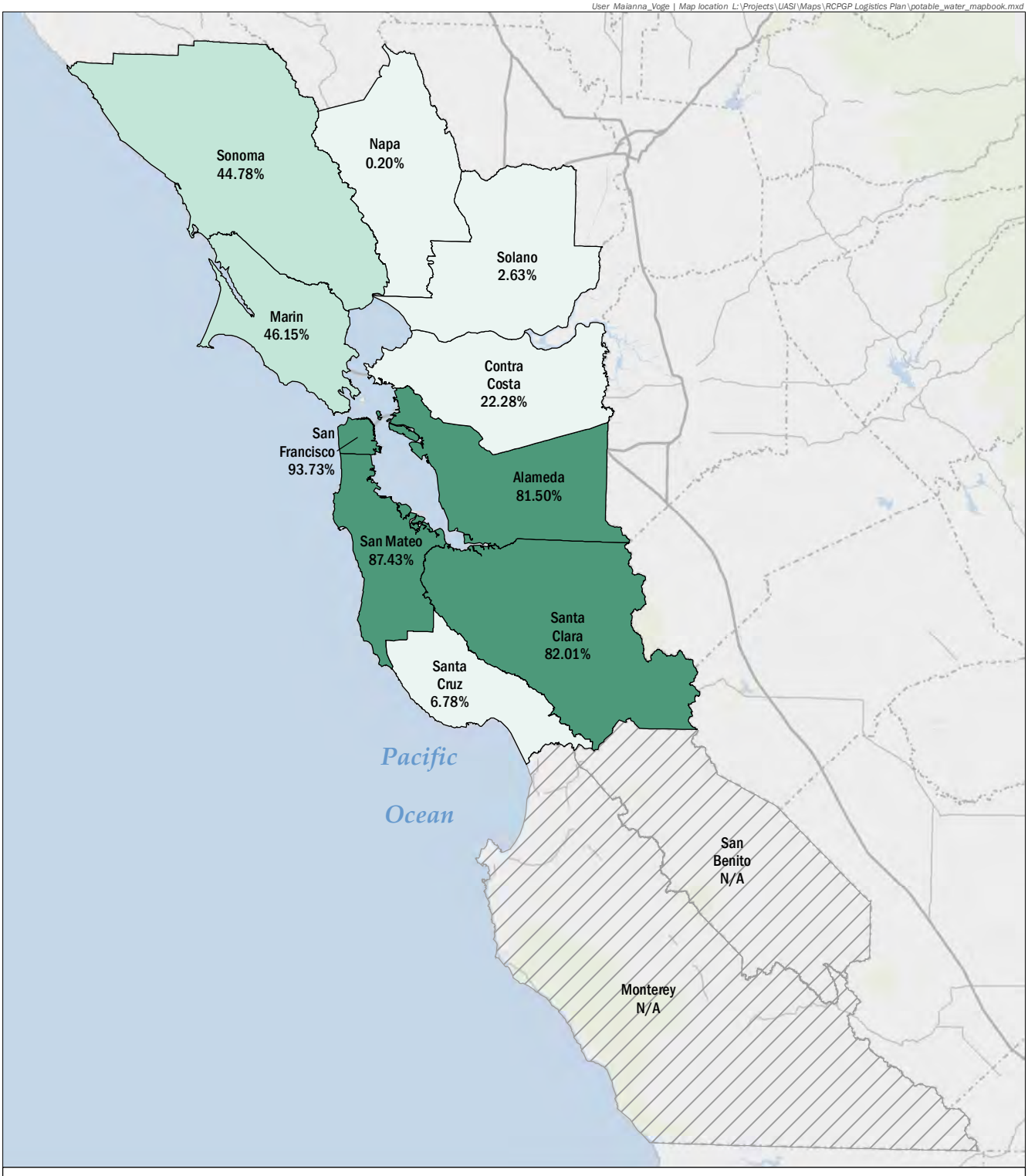
Percent of households without water 24 hours post-event

- 0 - 25%
- 26 - 50%
- 51 - 75%
- 76 - 100%
- N/A

N 0 40 Miles

Data source: U.S. analysis conducted by URS in 2009. N/A = not available (Hazards - U.S. results are unreliable).

Bay Area UASI Program - RCPGP Appendix G: Critical Lifelines	Map G3-2a Households without potable water 24 hours post-event



Percent of households without water 72 hours post-event

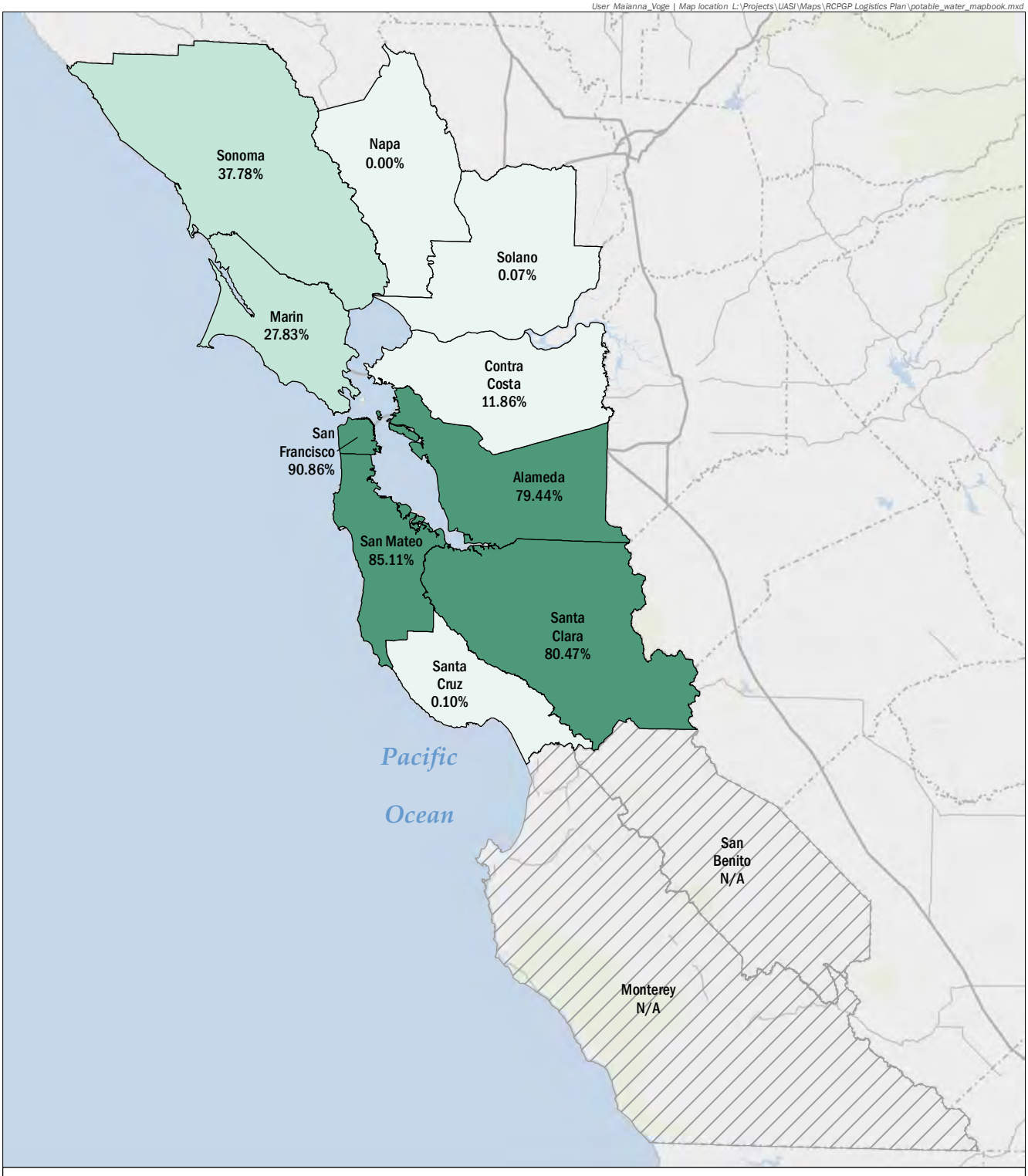
- 0 - 25%
- 26 - 50%
- 51 - 75%
- 76 - 100%
- N/A

N 0 40 Miles

Data source: U.S. analysis conducted by URS in 2009. N/A = not available (Hazards - U.S. results are unreliable).

Bay Area UASI Program - RCPGP
Appendix G: Critical Lifelines

Map G3-2b
Households without potable water 72 hours post-event

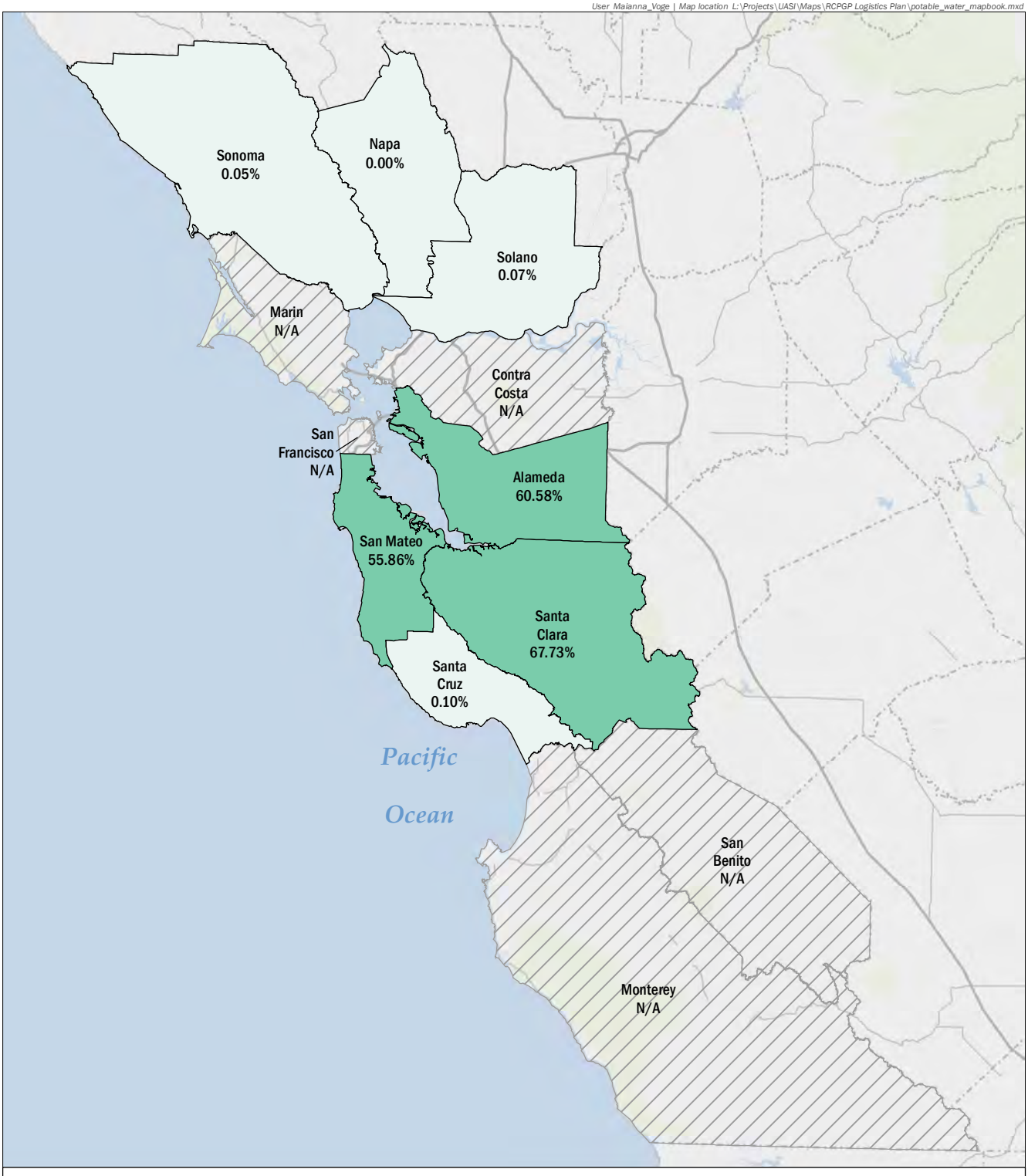


Percent of households without water 7 days post-event
- 0 - 25%
- 26 - 50%
- 51 - 75%
- 76 - 100%
- N/A

N 0 40 Miles

Data source: U.S. analysis conducted by URS in 2009. N/A = not available (Hazards - U.S. results are unreliable).

Bay Area UASI Program - RCPGP Appendix G: Critical Lifelines	Map G3-2c Households without potable water 7 days post-event



Percent of households without water 30 days post-event

- 0 - 25%
- 26 - 50%
- 51 - 75%
- N/A

N

0 40 Miles

Data source: U.S. analysis conducted by URS in 2009. N/A = not available (Hazards - U.S. results are unreliable).

Bay Area UASI Program - RCPGP Appendix G: Critical Lifelines	Map G3-2d Households without potable water 30 days post-event

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Appendix H:
Commodity Points of Distribution

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Acronyms

Appendix	Appendix H: Commodity Points of Distribution
ANSI	American National Standards Institute
ARC	American Red Cross
Cal OES	California Governor's Office of Emergency Services
C-POD	Commodity Point of Distribution
CONPLAN	San Francisco Bay Area Earthquake Readiness Response: Concept of Operations Plan
DOC	Department Operations Center
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
FOG	Field Operations Guide
IAP	Incident Action Plan
ICP	Incident Command Post
ICS	Incident Command System
IS	Independent Study
MRE	Meal, Ready-to-Eat
NY-NJ-CT-PA	New York-New Jersey-Connecticut-Pennsylvania
POD	point of distribution
RCPGP	Regional Catastrophic Preparedness Grant Program
USACE	U.S. Army Corps of Engineers

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H.1 Introduction

This document, Appendix H: Commodity Points of Distribution (Appendix), provides guidance on points of distribution (PODs) of commodities, including an overview of POD operations, roles and responsibilities of local government, POD organization structure, position descriptions for personnel who manage and operate PODs, requirements to set up and operate PODs, additional planning considerations, and training guidelines.

The Appendix is strategic in nature and focuses primarily on command-and-control and Emergency Operations Center (EOC) operations. A separate tactical guide, the POD Field Operations Guide (FOG), provides details on how to manage an individual POD.

H.1.1 Purpose of the Appendix

This Appendix:

- Provides a baseline overview of POD operations
- Outlines standardized POD typing, in accordance with the National Incident Management System, and associated capabilities and operational requirements for specific types of PODs
- Provides a concept of operations to coordinate support for PODs from the EOC
- Identifies planning considerations for PODs in advance of, and in response to, a catastrophic incident
- Outlines key decisions that must be made by local government
- Provides tools and reference materials that support emergency managers and other key local government personnel in advance of, and during, POD operations

H.1.2 Scope

This Appendix is limited in scope to a concept of operations for conducting POD planning, managing POD operations from the POD Operations Center or Department Operations Center (DOC), coordinating support for PODs from the EOC, and considerations for pre-incident planning and incident action planning. Specific instructions for execution of POD operations at individual PODs are provided separately in the POD FOG.

POD operations must be viewed as part of a general mass feeding and food supply-chain restoration strategy. The operations described in this Appendix are intended to complement and support emergency feeding as necessary.

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H.2 POD Overview

This section provides basic information about PODs, including definition, situations requiring POD activation, and typical commodities distributed at PODs.

H.2.1 POD Definition

A POD is a centralized location where the public receives commodities following a disaster or emergency,[1] typically life-sustaining in nature, such as pre-packaged, shelf-stable meals and bottled water

PODs are not the same as points of dispensing.[2]

H.2.2 Situations Requiring POD Activation

A POD is a mechanism for bulk distribution to the public when ordinary sources such as grocery stores, household food (including refrigeration thereof), and potable tap water are not available or otherwise cannot supply sufficient goods to meet basic needs.

A POD is required when:

- An incident significantly impedes or disrupts normal access to life-sustaining commodities for the local population for at least 48 hours, AND other mass feeding strategies cannot meet the needs of the population or are not appropriate based on the precipitating incident
- A visible need for life-sustaining commodities arises in the population, AND this need cannot be met through existing mechanisms in the private or public sector

H.2.3 Commodities Distributed at PODs

Below is a description of commodities that may be provided at PODs. Emergency managers must determine which items to provide, based on need. Shelf-stable food, bottled water, and baby formula are the most commonly needed items.

H.2.3.1 Shelf-Stable Meals

For the purpose of emergency logistics, shelf-stable meals are unopened, pre-packaged meals that do not require refrigeration and may or may not be self-heating. Typical examples include Meals, Ready-To-Eat (MREs), and Heater Meals. If possible, consideration should be given to special dietary needs of the population, including the provision of kosher, halal, vegetarian, and/or vegan meals.

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1 In some cases, PODs may distribute non-life-sustaining commodities such as tools or other supplies that assist with immediate recovery.

2 Points of dispensing are intended solely for bulk distribution of pharmaceuticals.

H.2.3.1.1 Meal, Ready-To-Eat

The MRE is a self-contained, self-heating, individual field ration in lightweight packaging. The MRE is intended to remain stable outdoors across a wide range of temperatures. MREs are to be eaten for a maximum of 21 days. MREs are available in multiple varieties, including kosher, halal, vegan, and vegetarian.

H.2.3.1.2 Other Shelf-Stable Meals

Various brands of shelf-stable meals are commonly provided via bulk distribution during disasters.

H.2.3.2 Bottled Water

Bottled water is provided in containers, or in cases. Container sizes vary.

H.2.3.3 Baby Formula

Baby formula, if available, should be provided to households with infants under 1 year of age.

H.2.3.4 Ice

Ice may be provided for the purposes of temporary refrigeration in the absence of power. Priority should be given to individuals/households dependent upon medications requiring refrigeration. A list of such medications is provided in the POD FOG. Ice may also be used to help preserve existing household food supplies.

H.2.3.5 Other Items

Other items that a jurisdiction may choose to distribute at PODs include:

- Personal sanitary supplies, including diapers and feminine hygiene products
- Tarps
- Medications[3]
- Tools or cleanup supplies

[3] PODs may be co-located with points of dispensing, as points of dispensing may be required to serve individuals requiring medications.

H.3 POD Organization

PODs are managed using the Incident Command System (ICS) and are supported by the EOC. This section describes roles and responsibilities of local government regarding PODs, the organization structure for command and control of PODs, and its relationship to the EOC. Roles and responsibilities of specific personnel in the POD organization structure are also described.

H.3.1 Roles and Responsibilities of Local Government

This section describes specific roles and responsibilities of organizations and of Local Government in activating, operating, and demobilizing PODs.

H.3.1.1 Local Government

Local governments are responsible for activating, operating, and demobilizing PODs. To enhance this capability, local governments should perform the following in advance of a catastrophic incident:

- Determine requirements to establish and operate PODs in response to a catastrophic event
- Identify potential POD sites
- Determine staffing and equipment resources existing in the jurisdiction to operate PODs
- Identify anticipated resource shortfalls
- Develop partnerships to address resource shortfalls
- Following a catastrophic incident, local governments should activate the EOC to:
  - Develop appropriate situational awareness of population, housing, and infrastructure impacts
  - Coordinate POD requirements as part of a comprehensive mass feeding strategy
  - Estimate needs in order to determine initial requirements to activate the appropriate number of PODs
  - Select the kinds, types, quantity, and locations of PODs to be established
  - Provide notice to the appropriate entities to activate and manage POD staff and to equip PODs
  - Coordinate with the Operational Area regarding POD locations that are adjacent to other local governments
  - Coordinate ongoing operational and logistical support for PODs

H.3.1.2 Lead Agency

Local government must identify a lead agency responsible for activating, operating, and demobilizing PODs. The lead agency will typically be the local general services or public works agency.

H.3.1.3 Operational Area

The Operational Area is responsible for sharing information with local governments on the locations of PODs in adjacent jurisdictions and coordinating between jurisdictions to ensure PODs are efficiently and effectively dispersed so as to meet the needs across affected areas in the Operational Area. In some cases, local governments may wish to collectively manage PODs using a Multi-Agency Coordination Group at the Operational Area level or delegate authority to the County, if mutually agreed upon.

H.3.2 Organizational Structure

This section outlines the organizational structure for the command and control of PODs and their relationship to the EOC. PODs are managed using ICS and led by a POD Manager (or Task Force Leader). The most basic unit in the organizational structure is the POD Task Force, which is the organizational unit that executes POD operations at a given POD. **Section H.3.2.1** outlines the organizational structure for a POD Task Force. **Section H.3.2.2** outlines the organizational structure for the POD Operations Center, which manages all POD Task Forces in the jurisdiction.

H.3.2.1 POD Task Force

Figure H.3-1 provides the organizational structure for a POD Task Force.

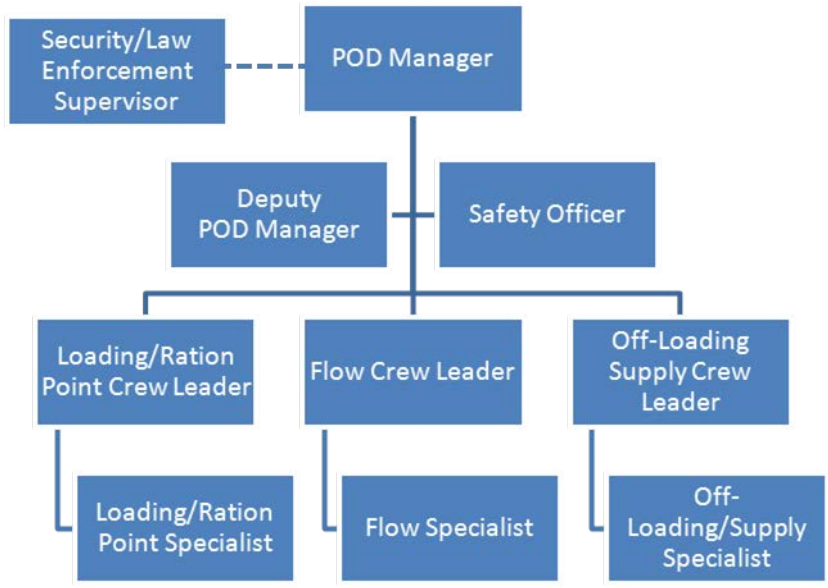


Figure H.3-1. POD task force.

H.3.2.2 POD Operations Center

The POD Operations Center serves the role of command post from which to manage all POD operations in the jurisdiction; it is led by the POD Operations Center Commander, typically a senior member of the lead agency. The DOC of the lead agency may serve as the POD Operations Center. The POD Operations Center should be established as soon as action is taken in the field to establish and operate PODs. The POD Operations Center requests resources from the EOC, based on resource needs identified by POD Managers. For span of control purposes, Division Supervisors or Branch Directors may be used. **Figure H.3-2** provides an example command structure for the operation of multiple PODs, showing POD Operations Center personnel and POD task forces, as well as the EOC, which supports the POD Operations Center Commander.

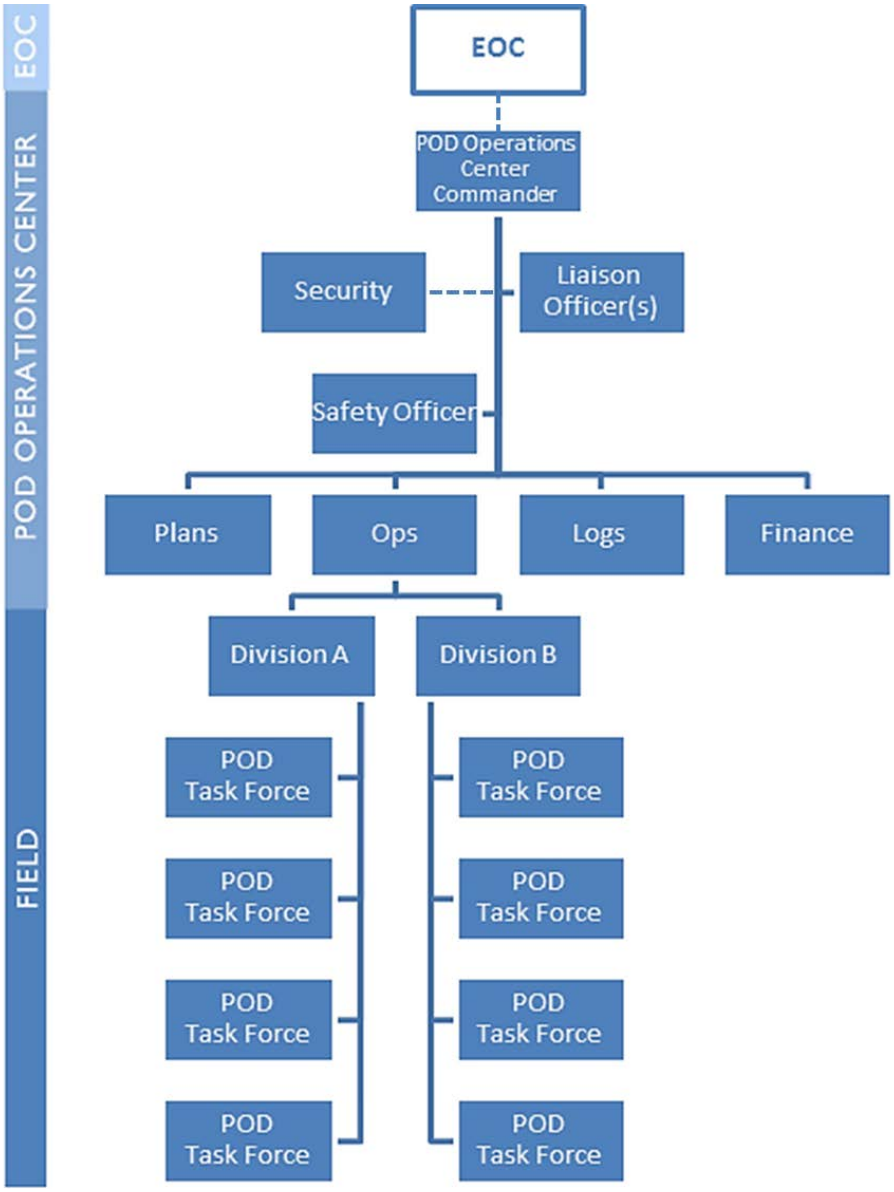


Figure H.3-2. Example command structure for the operation of multiple PODs.

H.3.3 Position Descriptions

H.3.3.1 POD Operations Center

The following tables describe roles and responsibilities of Command Staff and General Staff and positions in each Section, with the exception of POD Task Forces. These personnel constitute the POD Operations Center Team and are responsible for staffing the POD Operations Center. POD Task Force personnel are responsible for staffing PODs; they are described in **Section H.3.2.1**. Below, **Table H.3-1** lists Command Staff, **Table H.3-2** lists General Staff, and **Table H.3-3** lists staff who support the various Section Chiefs.

Table H.3-1. Command Staff.

POD Operations Center Commander	• Maintains command and control of all PODs in the jurisdiction or operational area • Establishes objectives • Typically staffed by a senior-level representative from the lead agency
Liaison Officer	• Serves as a point of contact for partner agencies, organizations, and private entities that are part of the POD organization structure but not the lead agency
Public Information Officer	• Facilitates the two-way flow of information between the POD Command and the Joint Information Center • Serves as an external interface with the public, media, and other agencies to provide coordinated information • Develops accurate and complete briefings on operations, situation status, resources committed, and other matters of general interest
Safety Officer	• Monitors, reports, and provides for the conduct of safe operations at all locations in the jurisdiction • Coordinates with safety officers at individual PODs, monitoring POD operations and advising the POD Operations Center Commander on all matters relating to operational safety, including the health and safety of POD personnel • Retains the authority to stop or prevent operations if a life-safety issue warrants such action • Establishes systems and procedures to ensure staff safety, as well as the general safety of operations • Advises the Safety Officer at each POD on all matters relating to operational safety

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics Program
C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

Table H.3-2. General Staff.

Operations Section Chief	• Oversees and supports POD operations • Develops and implements strategies and tactics to carry out distribution objectives • Organizes, assigns, and supervises all tactical field resources • Supervises up to seven Division Supervisors (or Branch Directors), depending on the number of PODs required
Planning Section Chief	• Collects information about the status of POD operations and resources • Manages the planning process • Develops the Incident Action Plan for each operational period • Provides situation reports to the EOC • Looks beyond the current and next operational periods to anticipate potential problems or events
Logistics Section Chief	• Issues resource requests and acquires necessary resources not currently under the control of the POD Command. Seeks support from the EOC when needed.
Finance/ Administration Section Chief	• Tracks costs associated with POD operations

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics Program

C-POD = Commodity Point of Distribution
EOC = Emergency Operations Center
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

Table H.3-3. Staff who support the Section Chiefs.

Operations Section Staff (Field Personnel)	
Branch Director	• Used in a very large POD organization structure to supervise up to seven Division Supervisors
Division Supervisor	• Oversees and supports non-security operations at up to seven PODs • Directly supervises up to seven POD Managers/Task Force Leaders
POD Manager/Task Force Leader	• See **Table H.3-4**
Planning Section Staff	
Resources Unit Leader	• Maintains the status of, and tracks, all resources • Plans the staffing of personnel and resources • Plays a significant role in preparing the IAP
Situation Unit Leader	• Collects and analyzes information on the current situation • Prepares situation reports and provides updates to the EOC • Develops staffing, equipment, and commodity projections
Documentation Unit Leader	• Gathers, maintains, and stores all incident-related documentation • Provides duplication services, including for the IAP
Demobilization Unit Leader	• Ensures that resources are released from the incident in an orderly, safe, and cost-effective manner
Logistics Section Staff	
Communications Unit Leader	• Prepares and supports the POD Communications Plan • Distributes and maintains communications equipment; sources any additional communications equipment from the EOC • Ensures all communications work properly at all PODs in the operational area or jurisdiction
Medical Unit Leader	• Provides guidance, as needed, to the Safety Officer at each POD; confirms that a Medical Plan is established at each POD
Food Unit Leader	• Establishes a feeding plan for the lead agency and PODs (if not emergency meals) • Coordinates with the Ground Support Unit Leader to arrange for meals to be delivered to the PODs. Works with the POD Deputy Manager to arrange for POD staff to consume water and emergency meals if meal service cannot be arranged.
Supply Unit Leader	• Assists in determining the type and amount of supplies needed to support the incident • Coordinates with the EOC to acquire equipment and supplies needed for the POD and the operations of the lead agency • Receives, stores, and distributes equipment, supplies, and commodities • Coordinates service of non-expendable equipment • Maintains inventory of supplies and equipment
Facilities Unit Leader	• Sets up and maintains the facility used by the lead agency • Coordinates site security with the Security Director • Identifies maintenance services and needs (sanitation, refuse, etc.) of the lead agency and PODs

Table H.3-3. Staff who support the Section Chiefs.

Ground Support Unit Leader	• Identifies transportation and ground resource needs • Arranges for, activates, and documents the fueling and maintenance of ground resources, including vehicles, forklifts, and portable light towers/generators • Arranges for ground transportation • Arranges for the transportation of food for staff to POD sites, if needed • Provides any repairs to vehicles, as needed • Assists with signage at and around the sites
Finance/Administrative Section Staff	
Time Unit Leader	• Tracks time and hours worked by lead agency staff • Works with the POD Manager to ensure that ICS 211 (Check-in/Check-out) forms are completed accurately and submitted for each operational period
Compensation/Claims Unit Leader	• Supports and directs all administrative matters pertaining to compensation for injury and claims related to POD operations
Cost Unit Leader	• Collects all cost data associated with the operations of PODs in the Operational Area or jurisdiction • Performs cost effectiveness analyses • Provides cost estimates • Makes cost savings recommendations

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics Program

C-POD = Commodity Point of Distribution
EOC = Emergency Operations Center
IAP = Incident Action Plan
ICS = Incident Command System
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

H.3.3.2 POD Task Force

Table H.3-4 states roles and responsibilities of POD Task Force personnel. Action checklists for these positions are provided in the POD FOG.

Table H.3-4. POD Task Force personnel.

POD Manager (Task Force Leader)	• Oversees and manages all aspects of the operation of an individual POD • Establishes and maintains proper lines of command, control, and communication • Manages communication between the POD and POD Operations Section Chief or Division Supervisor
Deputy POD Manager	• Supports the POD Manager as head of staff • Ensures that all roles in the POD are staffed, staff are signed in and trained, and operations run smoothly
Safety Officer	• Develops and recommends measures for ensuring personnel safety; assesses and directs the mitigation of hazardous and unsafe situations

Table H.3-4. POD Task Force personnel.

Security/Law Enforcement Supervisor	• Oversees security inside and outside the POD • Provides protection to staff and the public and otherwise deters criminal activity • Controls crowds and manages traffic • Coordinates with law enforcement personnel • Works with the Off-Loading/Supply Crew Leader to control truck entry to the POD • Works with the Flow Crew Leader to control public entry to the POD
Loading/Ration Point Crew Leader	• Oversees the distribution of commodities to the public in a safe and efficient manner • Ensures that goods are distributed fairly and according to set guidelines • Coordinates with the Off-Loading/Supply Crew Leader to maintain a steady and efficient commodity distribution flow
Flow Crew Leader	• Serves as the public face of the POD • Leads a crew that directs the movement of the public • Manages the line leading into the POD and disseminates information to the public concerning operating hours, commodity allocation, and commodity status • Leads a crew that directs the public to the POD, through the distribution area, and out the exit
Off-Loading/Supply Crew Leader	• Oversees the unloading, positioning, and movement of commodities in the storage and distribution areas • Manages documentation and inventory control • Ensures that work areas are organized and free of trash and debris
Loading/Ration-Point Specialist	• Distributes commodities to the public • Performs the final check to ensure that commodities have not expired or are not otherwise unfit for consumption
Off-Loading/Specialist	• Secures, organizes, and stocks commodities for distribution • Unloads commodities and operates equipment • Some personnel must be forklift certified
Flow Specialist	• Directs recipients to and through the POD • Provides information to the public (operating hours, commodity allocation, etc.) • Determines individual eligibility for additional commodities when necessary • Records the number of pedestrians or vehicles receiving commodities

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics Program

C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

H.4 POD Requirements

This section outlines POD types, basic capabilities, and basic equipment and staff requirements. Staffing requirements are provided in **Section H.4.3**. Equipment requirements are provided in **Section H.4.4**. Information on commodity requirements is outlined in **Section H.4.5**.

H.4.1 POD Typing

This section provides an overview of PODs by kind (Vehicular or Pedestrian[4]) and type (I, II, or III). POD typing is helpful in determining layout, staffing, equipment, and commodity requirements. Forecasting the required quantity of PODs, by kind and type, is described in **Section H.5.1**.

Table H.4-1 provides the number of persons served per day by Type I, II, and III PODs, based on a 12-hour-per-day-distribution/12-hour-per-day-restocking operating pattern. Note that criteria for Type III Pedestrian PODs do not exist.

Table H.4-1. Persons served per day, based on POD type.

POD Type	POD Kind	Persons Served per Day
Type I	Vehicular or Pedestrian	20,000
Type II	Vehicular or Pedestrian	10,000
Type III	Vehicular	5,000

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics Program

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POD = Point of Distribution
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H.4.2 POD Layout

This section provides schematics of the physical layout of each kind and type of POD, which are shown on **Figures H.4-1** (legend) and **Figures H.4-2** through **H.4-6**. Each kind and type of POD requires a level, graded, and preferably paved surface on which to load and unload supplies, ensure smooth flow of pedestrians or traffic, and load and distribute rations. Specific information on the setup of PODs is provided separately in the POD FOG.

[4] Vehicular POD typing is based on a model developed jointly by the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers (USACE). Pedestrian POD typing is based on a model developed by the New York City Office of Emergency Management, in cooperation with FEMA and the USACE.

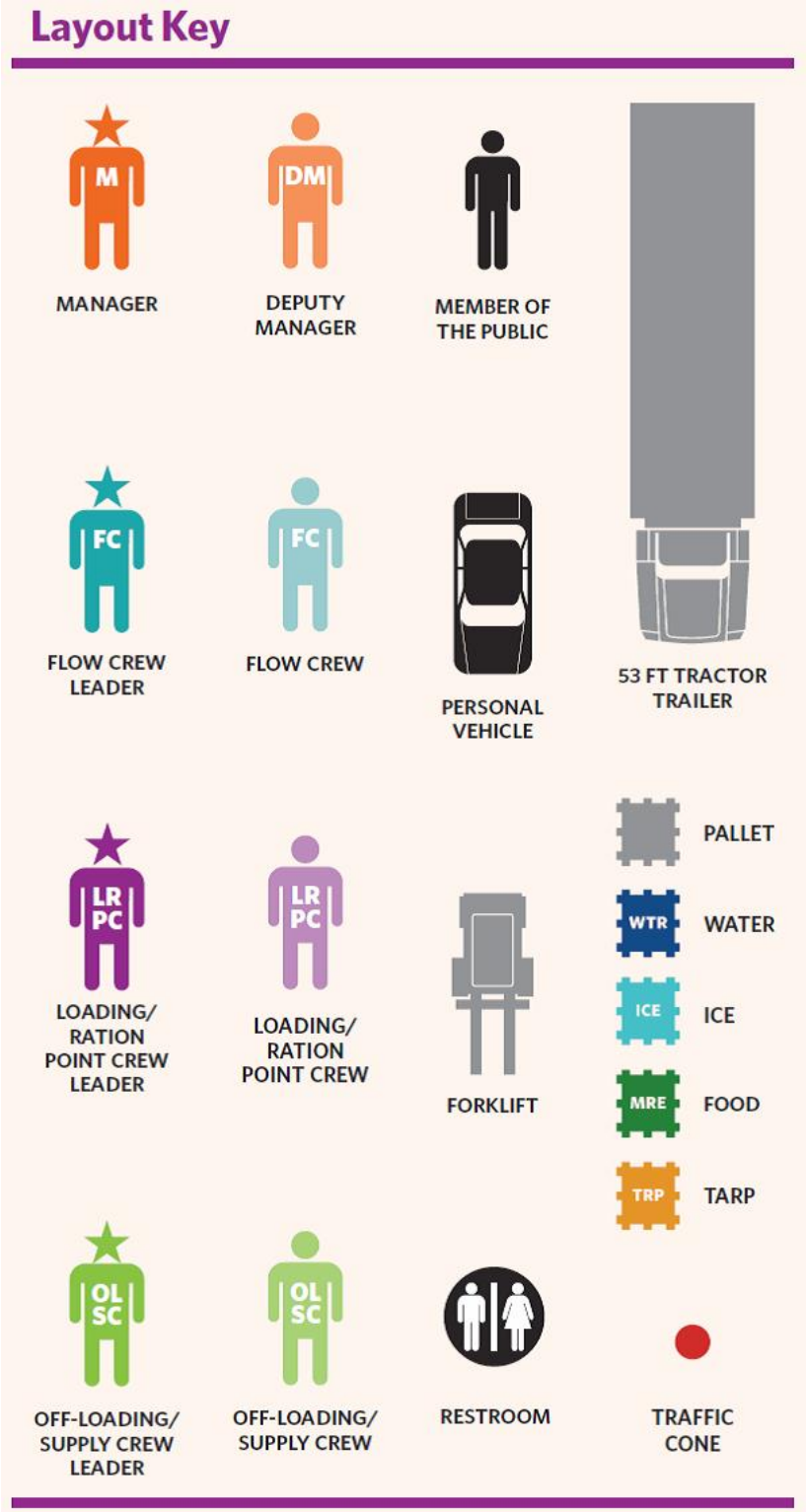
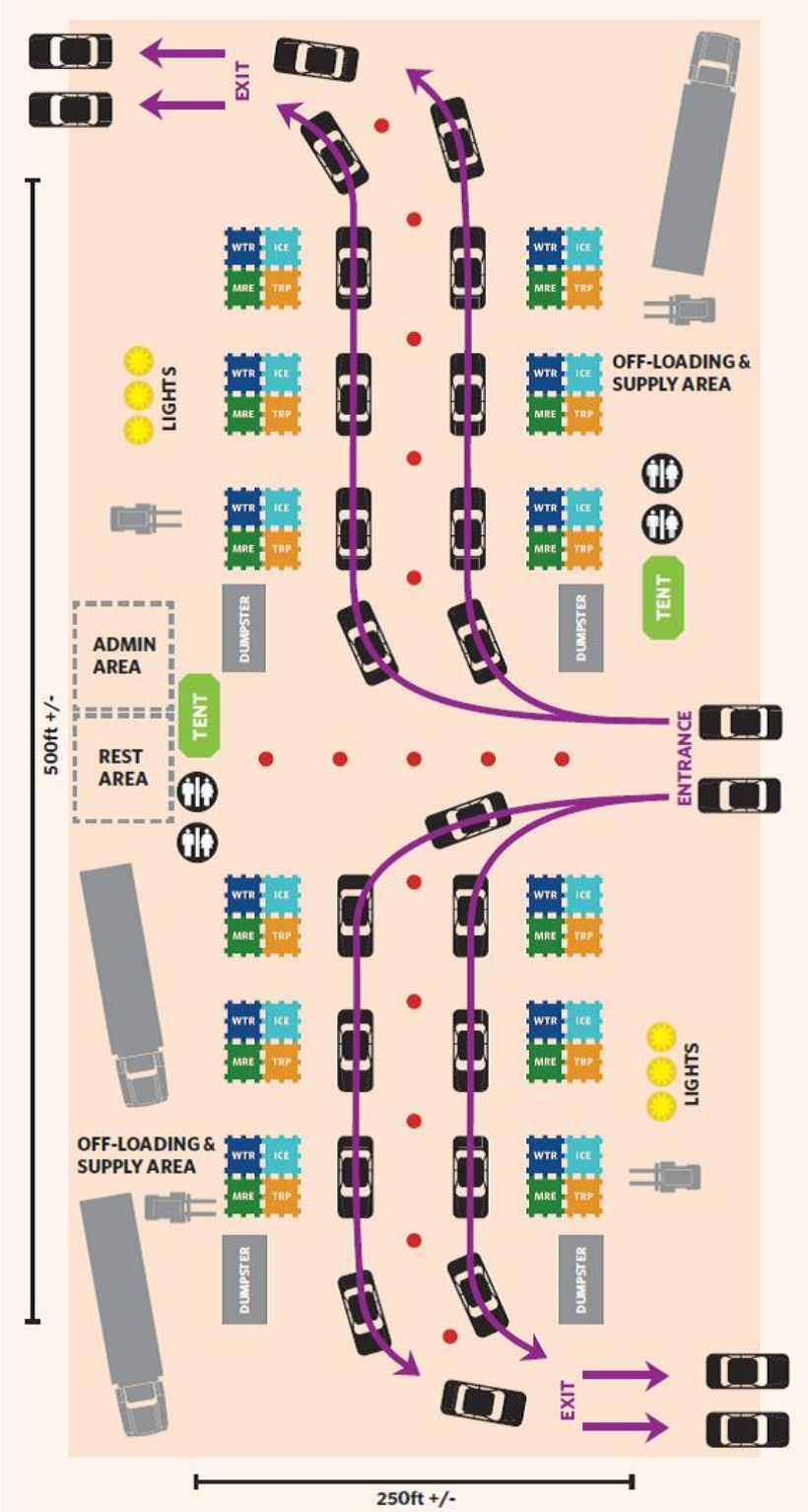


Figure H.4-1. Legend.

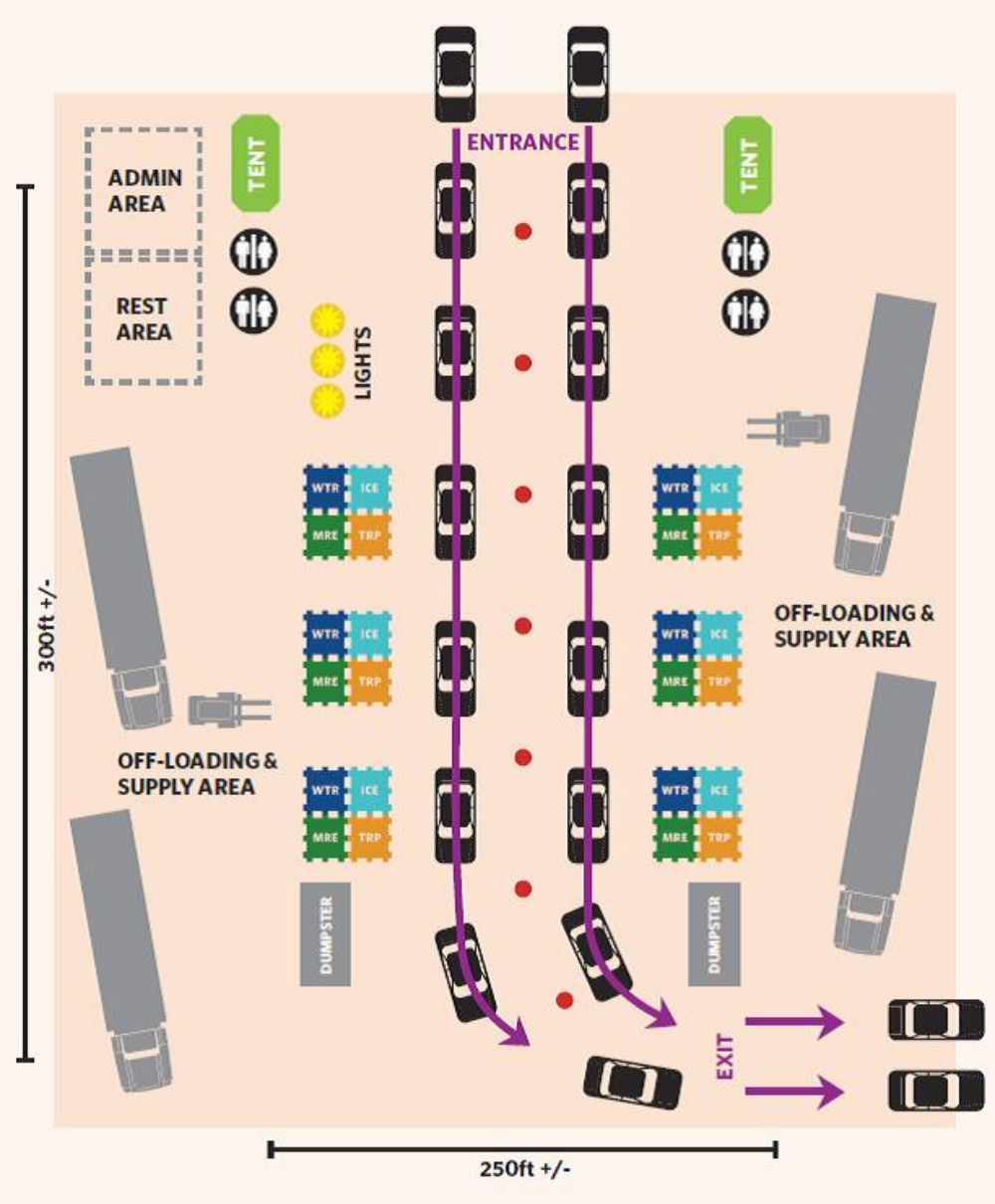
H.4.2.1 Type I Vehicular POD



Note: minimum space requirement is 100,000 square feet.

Figure H.4-2. Type I Vehicular POD layout.

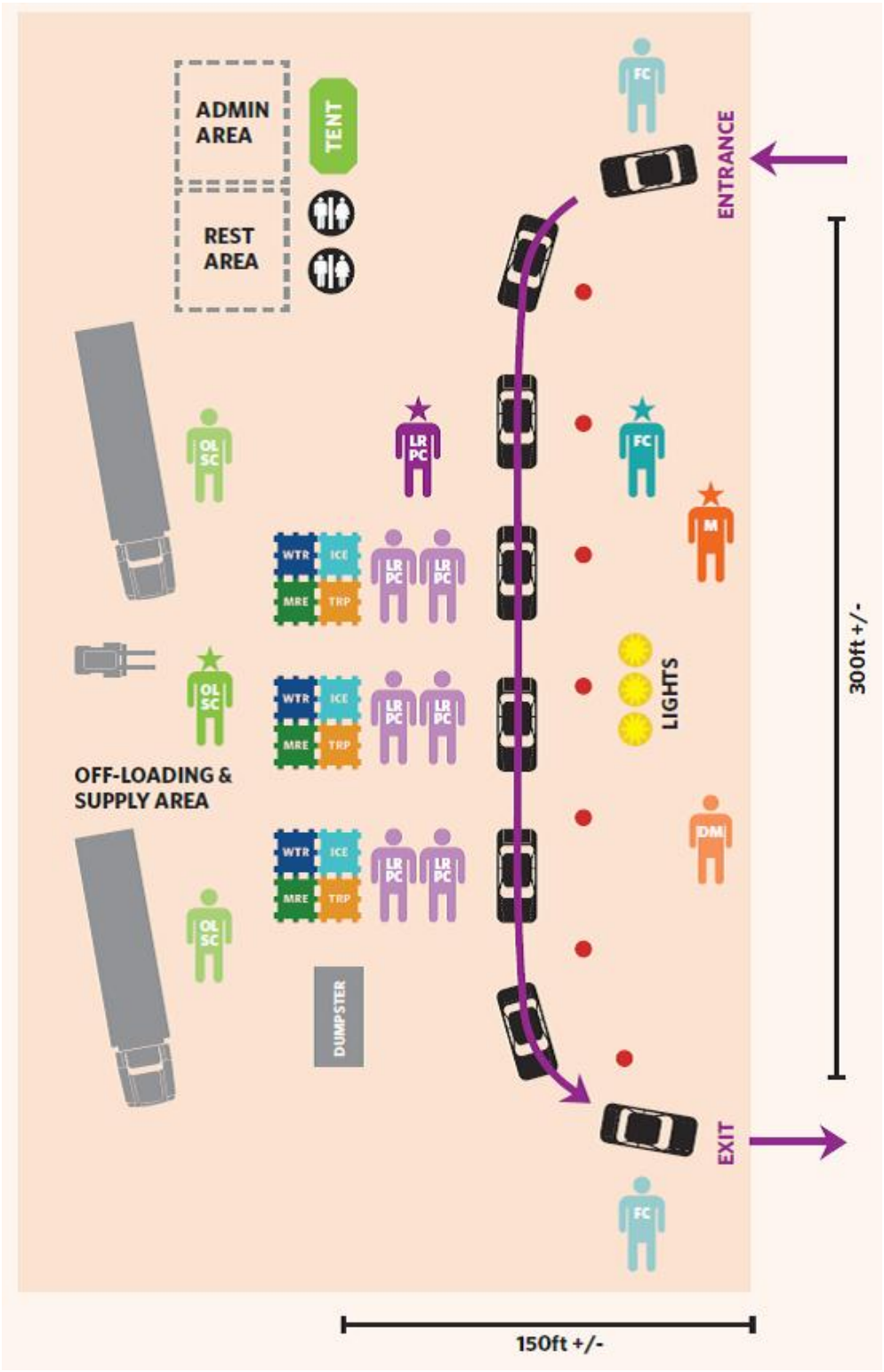
H.4.2.2 Type II Vehicular POD



Note: minimum space requirement is 75,000 square feet.

Figure H.4-3. Type II Vehicular POD layout.

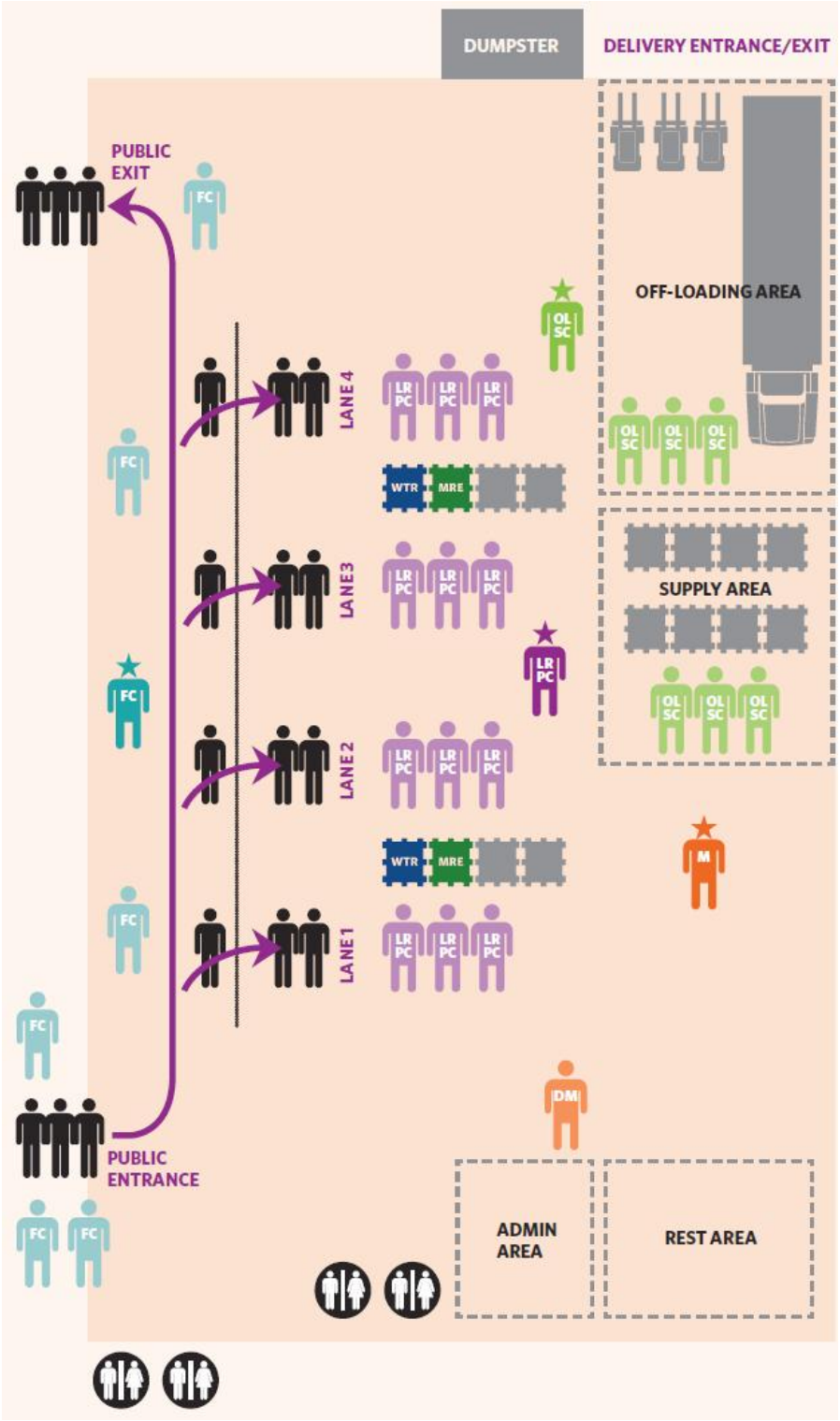
H.4.2.3 Type III Vehicular POD



Note: minimum space requirement is 50,000 square feet.

Figure H.4-4. Type III Vehicular POD layout.

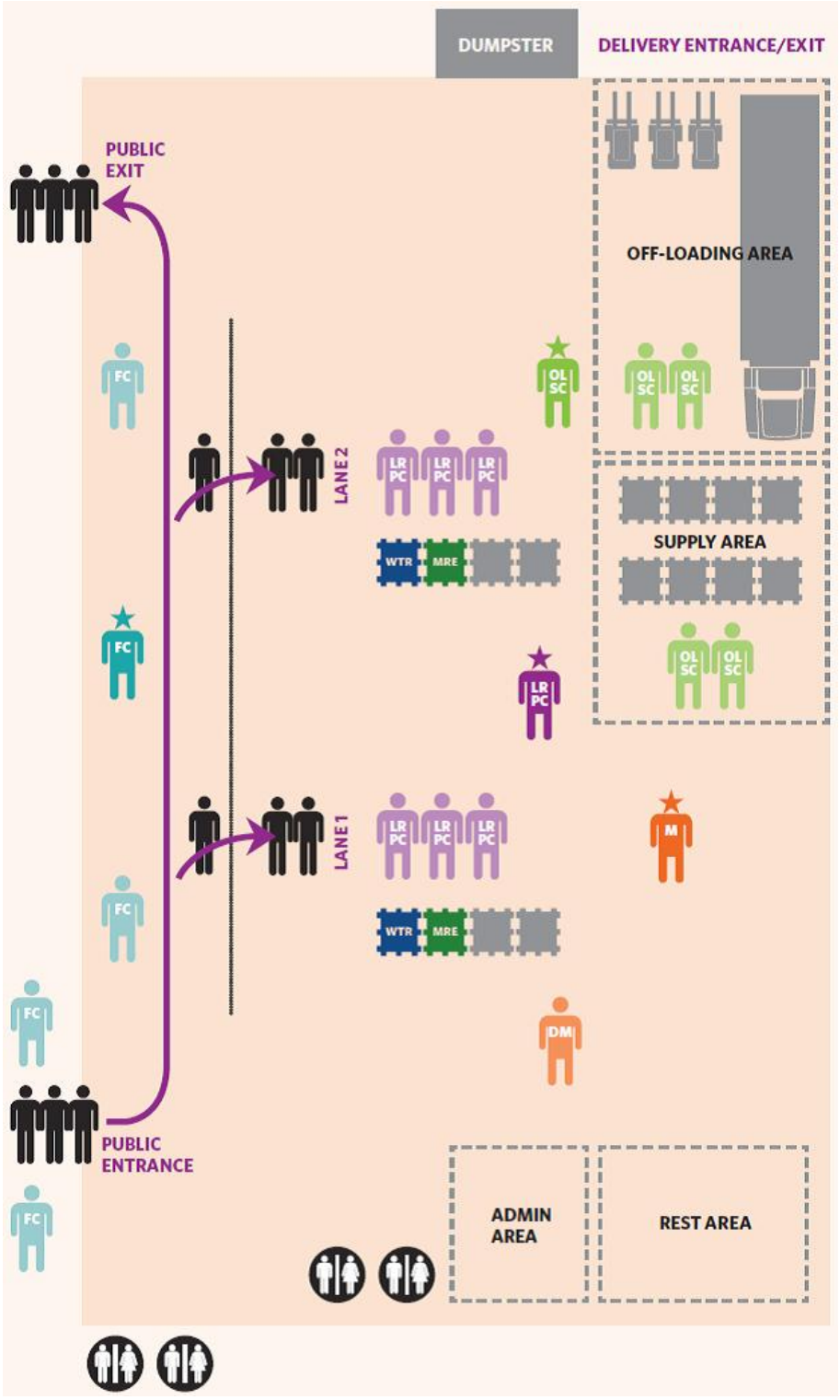
H.4.2.4 Type I Pedestrian POD



Note: Pedestrian PODs are established in parks, parking lots, and other large, open spaces. There are no specific standardized requirements for the dimensions of a Pedestrian POD.

Figure H.4-5. Type I Pedestrian POD layout.

H.4.2.5 Type II Pedestrian POD



Note: Pedestrian PODs are established in parks, parking lots, and other large, open spaces. There are no specific standardized requirements for the dimensions of a Pedestrian POD.

Figure H.4-6. Type II Pedestrian POD layout.

H.4.3 Staff Requirements

This section provides staff requirements for each kind and type of POD. Specific staff requirements are outlined in **Tables H.4-2** through **H.4-6** and assume a daily operating pattern of 12-hour distribution (day) and 12-hour restocking (night).

The operating pattern may be adjusted to 24-hour distribution with concurrent restocking or less than 12-hour distribution with daytime restocking. Personnel requirements vary based on operating pattern. These staffing requirements are guidelines for minimum staffing. Additional staff may be necessary, as determined by the POD Manager.

Law enforcement staffing requirements listed in **Table H.4-2** assume civil order; they may require augmentation. These are minimum requirements. Actual law enforcement staffing is to be determined at the discretion of local law enforcement.

Staff positions are classified as skilled and unskilled. Skilled workers require training in advance. Unskilled positions do not and they can be staffed by volunteer personnel who may have limited advance training. However, forklift training is preferred for some otherwise unskilled staff positions. Suggested resources to staff unskilled positions are provided in **Section H.5.2.3**. POD Training is described in **Section H.6**. All personnel operating at PODs, including volunteers, must be registered Disaster Service Workers.

H.4.3.1 Type I Vehicular POD

Table H.4-2. Staffing requirements for a Type I Vehicular POD.

Position	Day	Night
POD Manager	1	1
Deputy POD Manager	1	1
Safety Officer	1	1
Security/Law Enforcement Supervisor	1	1
Security/Law Enforcement Staff	4	1
Loading/Ration Point Crew Leader	1	1
Loading/Ration Point Specialists	36	0
Flow Crew Leader	1	1
Flow Crew Specialists	8	0
Off-Loading/Supply Crew Leader	1	1
Off-Loading/Supply Crew Specialists*	6	6
Total Skilled	8	5
Total Unskilled	53	9
Total	**61**	**14**

* Forklift certification preferred

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics Program

C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

H.4.3.2 Type II Vehicular POD

Table H.4-3. Staffing requirements for a Type II Vehicular POD.

Position	Day	Night
POD Manager	1	1
Deputy POD Manager	1	1
Safety Officer	1	1
Security/Law Enforcement Supervisor	1	1
Security/Law Enforcement Staff	2	1
Loading/Ration Point Crew Leader	1	1
Loading/Ration Point Specialists	18	0
Flow Crew Leader	1	0
Flow Crew Specialists	5	0
Off-Loading/Supply Crew Leader	1	1
Off-Loading/Supply Crew Specialists*	4	4
Total Skilled	6	5
Total Unskilled	30	6
Total	**36**	**11**

* Forklift certification preferred

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics

C-POD = Commodity Point of Distribution
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H.4.3.3 Type III Vehicular POD

Table H.4-4. Staffing requirements for a Type III Vehicular POD.

Position	Day	Night
POD Manager	1	1
Deputy POD Manager	1	1
Safety Officer	1	1
Security/Law Enforcement Supervisor	1	1
Security/Law Enforcement Staff	1	1
Loading/Ration Point Crew Leader	1	1
Loading/Ration Point Specialists	9	0
Flow Crew Leader	1	0
Flow Crew Specialists	3	0
Off-Loading/Supply Crew Leader	1	1
Off-Loading/Supply Crew Specialists*	2	2
Total Skilled	5	5
Total Unskilled	17	4
Total	**22**	**9**

* Forklift certification preferred

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics

C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
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H.4.3.4 Type I Pedestrian POD

Table H.4-5. Staffing requirements for a Type I Pedestrian POD.

Position	Day	Night
POD Manager	1	1
Deputy POD Manager	1	1
Safety Officer	1	1
Security/Law Enforcement Supervisor	1	1
Loading/Ration Point Crew Leader	1	0
Loading/Ration Point Specialists	16	0
Flow Crew Leader	1	0
Flow Crew Specialists	10	0
Off-Loading/Supply Crew Leader	1	1
Off-Loading/Supply Crew Specialists*	6	6
Total Skilled	4	4
Total Unskilled	35	7
Total	**39**	**11**

* Forklift certification preferred

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics

C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
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H.4.3.5 Type II Pedestrian POD

Table H.4-6. Staffing requirements for a Type II Pedestrian POD.

Position	Day	Night
POD Manager	1	1
Deputy POD Manager	1	1
Safety Officer	1	1
Security/Law Enforcement Supervisor	1	1
Loading/Ration Point Crew Leader	1	0
Loading/Ration Point Specialists	8	0
Flow Crew Leader	1	0
Flow Crew Specialists	5	0
Off-Loading/Supply Crew Leader	1	1
Off-Loading/Supply Crew Specialists*	4	4
Total Skilled	4	4
Total Unskilled	20	5
Total	**24**	**9**

* Forklift certification preferred

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics

C-POD = Commodity Point of Distribution
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H.4.4 Equipment Requirements

This section lists specific equipment requirements (both required and preferred equipment) for each kind and type of POD. Signage requirements are also provided separately in **Section 4.4.2**.

H.4.4.1 Equipment

Table H.4-7 lists required equipment for each kind and type of POD. **Table H.4-8** lists equipment that is preferred or that may be helpful but is not required.

Table H.4-7. Required equipment by POD type.

Equipment	Unit	Vehicular			Pedestrian	
		Type I	Type II	Type III	Type I	Type II
Barricade tape (rolls of 1,000 feet)	Roll	4	4	2	4	4
Batteries (assorted sizes based on equipment needs)	Box of 12	4	4	2	4	4
Batteries, portable radio	Each	4	4	2	4	4
Box cutter	Each	4	4	2	4	4
Chalk	Box	10	10	5	10	10
Dumpster, open top (30 cubic yards) with service	Each	4	2	1	4	4
Electrical distribution (spider box), 50 amp	Each	2	2	1	2	2
Forklift (4,000 pound capacity)*	Each	1	1	1	1	1
Fire extinguisher (ABC type, 5-pound)	Each	3	2	1	2	2
First aid kit (ANSI-compliant for up to 50 persons)	Each	3	2	1	2	2
Gasoline/diesel	Gallon	TBD	TBD	TBD	TBD	TBD
Hand truck	Each	6	6	6	6	6
Index cards (blue)	Pack	15	15	7	15	15
Index cards (pink)	Pack	15	15	7	15	15
Pallet jack (hand-operated)	Each	3	2	1	2	2
Paper	Ream	10	10	5	10	10
Pens	Dozen	36	36	18	36	36
Portable light tower/generator	Each	4	4	4	4	4
Portable radio, Public safety	Each	4	4	2	4	4
Portable toilet with service	Each	6	4	2	4	4
Safety vest (for all staff, standard ANSI 207)	Each	79	43	25	50	28
Support belts or vests for loading/ration point and off-loading supply crews (medium, for the back)	Each	25	13	7	18	9
Talkabout two-way radios	Dozen	16	16	8	16	16
Traffic cones	Each	30	15	10	15	15
Trash bags (18 to 20 per box)	Box	10	10	5	10	10
Work gloves**	Pair	14	10	6	14	10
Whistle	Each	4	4	2	4	4

*Additional forklifts recommended, per **Table H.4-8**

Required for off-loading/supply personnel, additional work gloves recommended for other personnel, per **Table H.4-8

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics

ANSI = American National Standards Institute
C-POD = Commodity Point of Distribution
DOC = Departmental Operations Center
ICP = Incident Command Post
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

Table H.4-8. Preferred equipment by POD type.

Equipment	Unit	Vehicular			Pedestrian	
		Type I	Type II	Type III	Type I	Type II
Barricades	Each	12	12	6	12	12
Bus, 40-passenger (cooling station or rain shelter, based on whether conditions)	Each	1	1	1	1	1
Calculator	Each	2	2	1	1	1
Chocks, vehicle (for each piece of rolling equipment)	Pair	4	2	1	2	2
Copier/scanner/printer	Each	2	2	1	1	1
Duct tape	Roll	4	4	2	4	4
Ear plugs (all staff)	Pair	79	43	25	50	28
Extension cords, 12/3 gauge (50 feet)	Each	10	10	5	10	10
Flashlight, industrial	Each	12	12	6	12	12
Folding chair (17 x 31 inch)	Each	79	43	25	50	28
Folding table (30 x 96 x 29 inch)	Each	10	10	5	10	10
Forklift (4,000-pound capacity)*	Each	2 (3 total)	1 (2 total)	N/A (1 total)	1 (2 total)	1 (2 total)
Glasses, safety	Each	79	43	25	50	28
Glow sticks (orange or red)	Pack of 2	45	30	15	30	30
Hand/tally counter	Each	4	4	2	4	4
Hand-washing station/hand sanitizer (with daily service)	Each	3	2	1	2	2
Hard hat	Each	79	43	25	50	28
HazMat spill kit	Each	1	1	1	1	1
Hole punch	Each	2	2	1	2	2
Ink cartridges (for printer)	Each	3	3	1	3	3
Laptop (heavy-duty preferred)	Each	2	2	1	1	1
Marker (black)	Each	15	15	7	15	15
Megaphone	Each	1	1	1	1	1
Measuring tape (300 feet)	Each	1	1	1	1	1
Nametag	Each	400	400	200	400	400
Pallet grabbers	Set	1	1	1	1	1
Recycle bin (with service contract)	Each	2	2	1	2	2
Stop/Slow sign; handheld, two-sided	Each	8	5	3	0	0
Sunscreen	TBD	TBD	TBD	TBD	TBD	TBD
Tent, shade (20 x 40 feet)	Each	2	2	1	2	2
Tire repair kit	Each	2	2	2	2	2
Trash can, wheeled (96-gallon)	Each	2	2	1	2	2
Warehouse fan (26 inch)	Each	2	2	1	2	2
White board	Each	2	2	1	2	2
White board marker	Each	10	10	5	10	10
Work gloves*	Pair	65 (79 total)	33 (43 total)	19 (25 total)	36 (50 total)	18 (28 total)
Zip ties	Each	50	50	25	50	50

*In addition to those listed under Required Equipment; total quantity preferred is provided in parentheses.
Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics
N/A = Not applicable
C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program
TBD = to be determined

H.4.4.2 Signage

Table H.4-9 lists required signage. Signage requirements are the same for all PODs, regardless of kind or type.

Table H.4-9. POD signage requirements.

Sign	Quantity
About the POD*	2
Administrative Area	8
Meals	6
Water	6
Point of Distribution	4
Deliveries	15
Hours of Operation	2
Distribution Guidelines	8
Do Not Enter	8
Entrance (Forward Arrow)	2
Entrance (Right Arrow)	2
Entrance (Left Arrow)	2
Exit	10
Lane**	12
Loading Point***	12
No Parking	6
Off-Loading Area	2
Please Keep Moving	20
Restrooms (Men)	2
Restrooms (Women)	2
Staff Only	4
Storage Area	2

* Includes hours of public distribution and rules of the POD (members of the public should not return same day, etc.)

** Lane signs will be numbered (1-6) with two signs per lane, for use at Pedestrian PODs

***Loading-Point signs will be numbered (1-6) with two signs per lane, for use at vehicle sites.

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics

C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

H.4.5 Commodity Requirements

The forecasting model identified in **Section H.5.1** is used to determine commodity requirements. **Table H.4-10** provides ration guidelines per person (for Pedestrian PODs) and per household (for Vehicular PODs). Rations are provided to

individuals/households on a daily basis. However, rations at Vehicular PODs are typically distributed to vehicles on a household basis, whereas rations at Pedestrian PODs are typically distributed to persons on an individual basis. Additional information is provided in the POD FOG.

Table H.4-10. Per-person and per-household[a] rations.

Commodity	Per Person (Pedestrian PODs)	Per Household (Vehicular PODs)
Shelf-Stable Meal	2 meals	6 meals
Bottled Water	4 liters (or 1 gallon)	9 to 12 liters (or 1 case)
Baby Formula (if applicable)	48 ounces	48 ounces
Ice (if applicable)	1 (8-pound) bags	3 (8-pound) bag

Source: C-POD Plan, developed by the NY-NJ-CT-PA RCPGP Regional Logistics

[a] Households are determined to include an average of 2.5 persons based on U. S. Census data. For this table, households have been rounded up to 3 persons.

C-POD = Commodity Point of Distribution
NY-NJ-CT-PA = New York-New Jersey-Connecticut-Pennsylvania
POD = Point of Distribution
RCPGP = Regional Catastrophic Preparedness Grant Program

Analysis conducted during the development of the CONPLAN estimated a per-person requirement of four liters of water and two MREs per day.

H.5 POD Planning

This section describes planning considerations for POD operations following an incident. This includes a model for forecasting the type and quantity of PODs required (**Section H.5.1**), sequential steps for strategic planning required to initiate POD operations (**Section H.5.2**), strategic planning considerations to meet the needs of individuals with access and functional needs (**Section H.5.3**), and incident action planning (**Section H.5.4**). In addition, considerations for pre-incident planning are also described (**Section H.5.5**).

H.5.1 Forecasting

An Excel spreadsheet for forecasting the number of PODs required—as well as basic staff, equipment, and commodity requirements—is provided separately as "Commodity Forecasting Model." [5]

The forecasting model may be helpful in determining the appropriate combination of kind, type, and quantity of PODs. For example, the model will calculate how many resources will be needed to supply a Type I POD that serves as many as 20,000 in a 12-hour period.

H.5.2 Strategic Planning

The following sequential steps outline strategic planning considerations necessary to initiate POD operations. This includes estimating the demand for PODs; determining physical requirements and locations; and estimating staffing, equipment, and commodity requirements.

H.5.2.1 Estimate Demand

The following steps should be taken to estimate the demand for PODs based on geographic and population impacts and other strategies that address the need for life-sustaining commodities.

- Review damage assessments from impacted areas
- Use census data or other population data to estimate the impacted population in impacted areas
- Use forecasting models if they can assist in estimating demand
- Of the affected population, approximate the population that will be provided access to life-sustaining commodities through other mass feeding strategies, such as mobile feeding and fixed-site feeding at shelters or other locations, consistent with the Regional Mass Care and Shelter Plan[6]

[5] Developed by USACE and used by the State of Florida, Division of Emergency Management. Available online at:: http://floridadisaster.org/Response/Logistics/Index.htm

[6] The ARC coordinates the provision of meals to evacuees at ARC shelters and may provide limited mobile feeding.

H.5.2.2 Determine Physical Requirements/Locations

Based on estimated demand, the number of PODs required can be approximated using the Commodity Forecasting Model referenced in **Section H.5.1**. Consider:

- Transportation infrastructure disruptions
- Available routes to supply POD locations
- Available routes for pedestrian and/or vehicular access to potential POD locations

Determine the quantity, kind, type, and location of PODs required. This may result in a combination of Vehicular and Pedestrian PODs.

Considerations for selecting a site that is level, graded, and preferably paved are provided in the layout schematics in **Section H.4.2** and are also provided in the POD FOG.

H.5.2.3 Determine Staffing Requirements and Assess Staffing Capability

Staffing requirements are determined based on the quantity of PODs required by kind and type. Once the quantity, kind, and type of PODs are determined, use the tables in **Section H.4.3** to:

- Determine skilled staff required
- Determine unskilled staff required

The following are potential sources of paid and volunteer staff to meet unskilled staff needs.

- American Red Cross (ARC)[7]
- AmeriCorps
- California Conservation Corps
- California National Guard
- California Volunteers Disaster Corps
- Community Emergency Response Team Program
- Non-governmental organizations
- Convoy of Hope
- Northern California Voluntary Organizations Active in Disaster
- Private businesses
- Spontaneous volunteers
- The Salvation Army

[7] ARC will prioritize staffing of ARC shelters first and may not be available to staff PODs.

H.5.2.4 Determine Equipment Requirements and Capabilities

Equipment requirements are determined based on the expected quantity of PODs required by kind and type. Based on this information, use the tables in **Section H.4.4** to:

- Inventory equipment available in the jurisdiction
- Conduct a gap analysis and identify shortfalls
- Identify potential partner sources for equipment
- Request equipment to meet shortfalls

H.5.2.4 Determine Commodity Requirements and Capabilities

Commodity requirements can be determined using the forecasting model mentioned in **Section H.5.1**. FEMA is familiar with commodity requirements for each POD type; it can partially anticipate commodity needs based on aggregate information on the quantity of PODs by type. However, more complete information is desirable to maximize the chances of meeting actual commodity needs.

H.5.3 Access and Functional Needs

The following factors may limit access of an individual to PODs:

- Functional needs, including mobility impairment
- Lack of access to a vehicle
- Serious or chronic health conditions
- Language barriers
- Age (65 years or older or 4 years and younger)

The following strategies should be considered to address access and functional needs:

- Mobile feeding and/or mobile distribution of critical commodities (consider partnering with Meals on Wheels, ARC, and other community-based organizations)
- Direct mobile delivery of critical commodities[8]
- Bus and paratransit service to transport individuals to and from PODs
- Language assistance at PODs

H.5.4 Incident Action Planning

The POD Operations Center's Planning Section Chief is responsible for developing a POD Incident Action Plan (IAP) for each operational period. The information contained in the POD Operations Report is to be used by the POD Operations Center's Planning Section to develop the IAP. A POD Operations Report is

[8] Commodities may be delivered directly to residences, hospitals, long-term care facilities, and other sites as deemed appropriate.

provided in **Section H.7.5**. The POD Operations Report is completed by the POD Manager/Task Force Leader by the end of each operational period and is immediately provided to the next level of command.

H.5.5. Pre-Incident Planning

H.5.5.1 Planning Assumptions

Catastrophic scenario-specific planning assumptions, based on HAZUS analysis, are provided in **Appendix B**. The assumptions include estimates of the number of households without electricity and potable water. This information can be used to estimate needs for food, water, and other life-sustaining commodities to be distributed at PODs. Additionally, assumptions about transportation system disruptions are helpful in identifying potential routes to supply PODs as well as public access to potential Vehicular POD sites.

H.5.5.2 Pre-Incident Planning

Pre-incident planning should be conducted based on catastrophic scenario-specific assumptions and should include:

- Determination of neighborhood-specific impacts based on the scenario and POD requirements by kind and type, to meet the consequent needs
- Identification of a sufficient number of POD sites capable of supporting the appropriate actions to meet these needs
- Identification of potential staffing resources for the EOC and POD Operations Center and skilled and unskilled personnel to staff PODs
- Where appropriate, establishing and maintaining agreements with partner governments, organizations, and vendors to secure staffing and equipment resources

H.6 POD Training

This section provides training guidelines for various positions in the POD organizational structure, as described in **Section H.3.2**.

PODs require both skilled and unskilled staff positions, as described in **Section H.4.3**. Skilled staff positions require specialized training in advance of an incident. Unskilled positions do not require specialized training in advance of an incident. Therefore, if there is not sufficient trained and available staff immediately following an incident, the unskilled positions listed in **Section H.6.4** may be staffed with volunteers with no prior training. Recommended training and experience are listed below in **Sections H.6.1** through **H.6.4** for those positions.

The Bay Area Regional Catastrophic Logistics Plan POD Operations Training Course is a POD train-the-trainer program developed for emergency managers, the POD Operations Center Team, POD managers, and POD Task Force leadership. This training is available through the Bay Area Urban Areas Security Initiative (UASI) via the Bay Area UASI website.

Just-in-time training guidelines are provided in the POD FOG. Just-in-time training is conducted by skilled and unskilled POD personnel (the Deputy POD Manager and Crew Leaders) for their staffs and can be performed onsite at PODs or at mobilization centers for staff/volunteers. The POD FOG also contains Job Action Sheets specific to each position.

H.6.1 Emergency Managers

The following training is recommended for emergency management and EOC personnel who will support PODs:

- Independent Study (IS) 26, Guide to Points of Distribution
- IS 27, FEMA Logistics
- Bay Area Regional Catastrophic Earthquake Logistics Plan POD Operations Training Course

H.6.2 POD Operations Center Team

The following training is recommended for the POD Operations Center Commander, Safety Officer, and General Staff, as well as Division Supervisors or Branch Directors, if used:

- IS 26, Guide to Points of Distribution
- IS 27, FEMA Logistics
- Bay Area Regional Catastrophic Earthquake Logistics Plan POD Operations Training Course

H.6.3 POD Task Force Leadership

The following training is recommended for POD Task Force Leadership, including the POD Manager/Task Force Leader, Deputy POD Manager, and Safety Officer:

- IS 26, Guide to Points of Dispensing
- Bay Area Regional Catastrophic Earthquake Logistics Plan POD Operations Training Course

H.6.4 POD Staff

The following training, experience, and teamwork requirements are recommended for POD staff, including the Loading/Ration Point, Flow, and Off-Loading/Supply Crew Leaders; Loading/Ration Point, Flow and Off-Loading Supply Crew staff; and Off-Loading Supply Crew members who are assigned as forklift operators.

H.6.4.1 Crew Leaders

Crew Leaders should have the following combination of training and experience:

- Just-in-time training, provided in the POD FOG
- Discipline-specific experience such as materials handling and traffic/crowd control (helpful)
- Experience managing a team (helpful)
- Ability to work as part of a team (required)

H.6.4.2 Crew Members

Crew Members should have the following combination of training and experience:

- Just-in-time training, provided in the POD FOG
- Discipline-specific experience such as materials handling and traffic/crowd control (helpful)
- Ability to work as part of a team (required)

H.6.4.3 Forklift Operators

One or more members of the Off-Loading/Supply Crew should possess forklift training. Although there is no specific curriculum for individuals to operate a forklift, the Occupational Safety and Health Administration and the California Department of Industrial Relations, Division of Occupational Safety and Health, require that training on the operation of a forklift be conducted by a qualified person, and that the training be documented. Training may be conducted on a just-in-time basis by qualified personnel; it generally takes several hours.

H.7 POD Forms

This section presents forms to be used in the field to track resources and communicate information in the POD organization structure. These forms are provided on the disk accompanying this plan; they are also referenced in the POD FOG.

H.7.1 ICS 211, Check-in/Check-out

Check-in/Check-out (In Lieu of ICS Form 211)

	POD Site Name and Number: _____	**Operational Period:** _____
	Type of Site: _____	**Date:** _____
	POD Manager: _____	**Hours:** _____

Name	Time IN	Initials	Time OUT	Initials	Agency/ Organization *(Volunteer?)*	Registered DSW? *(Y or N)*	Previously Managed a Team? *(Y or N)*	Experience with Pallet Jack or Forklift? *(Y or N)*	Experience Controlling Crowds or Directing Traffic? *(Y or N)*	Can lift 30 lbs.? *(Y or N)*	Languages Spoken *(List)*

H.7.2 ICS 213, General Message

General Message Log (ICS 213)

GENERAL MESSAGE			
TO:		POSITION:	
FROM:		POSITION:	
SUBJECT:		DATE:	TIME:
MESSAGE:			
SIGNATURE:		POSITION:	
REPLY:			
DATE:	TIME:	SIGNATURE/POSITION:	

H.7.3 ICS 259, Resource Order Log

INCIDENT/PROJECT ORDER NUMBER

RESOURCE ORDER | INITIAL DATE/TIME | 2. INCIDENT/PROJECT NAME | 3. INCIDENT /PROJECT ORDER NUMBER | 4. OFFICE REFERENCE NUMBER

5. DESCRIPTIVE LOCATION/RESPONSE AREA | 6. SEC. | TWN | RNG | Base MDM | 7. MAP REFERENCE | 8. INCIDENT BASE/PHONE NUMBER | 9. JURISDICTION/AGENCY | 10. ORDERING OFFICE

11. AIRCRAFT INFORMATION | LAT. | LONG.

BEARING	DISTANCE	BASE OR OMNI	AIR CONTACT	FREQUENCY	Ground Contact	FREQUENCY	RELOAD BASE	OTHER AIRCRAFT/HAZARDS

12. Request Number	Ordered Date/Time	From / To	QTY	RESOURCE REQUESTED	Needed Date/Time	Deliver To	To / From	Time	Agency ID	RESOURCE ASSIGNED	ETD / ETA	RELEASED Date	RELEASED To	Time ETA

13. ORDER RELAYED Req. No.	Date	Time	To/From	ACTION TAKEN	ORDER RELAYED Req. No.	Date	Time	To/From	ACTION TAKEN

ICS 259-3 (7/87) NFES 2202

H.7.4 Gate Log

GATE LOG

POD Site Name and Number: _____ **Operational Period:** _____
Type of Site: _____ **Date:** _____
POD Manager: _____ **Hours:** _____
Delivery Location: _____

#	Date/Time	Truck Number	Resource/ Commodity	Shipper's # (Bill of Lading Verification)	Driver's Last Name	Driver's First Name	Driver's Company	Driver's Cell Phone
1								
2								
3								
4								
5								
6								
7								
8								

H.7.5 POD Operations Report

(page 1 of 5)

POD OPERATIONS REPORT

POD Site Name and Number: _____ **Operational Period:** _____

Type of Site: _____ **Date:** _____

POD Manager: _____ **Hours:** _____

Progress Report: *Include brief summary of activities during last operational period.*

Special/Security Considerations:

Local Needs Assessment: *Have stores opened? Is there still a need for a POD? What is the chief complaint of those waiting at the POD?*

Other Items:

1

POD Operations Report (page 2 of 5)

POD OPERATIONS REPORT

POD Site Name and Number: _____ **Operational Period:** _____

Type of Site: _____ **Date:** _____

POD Manager: _____ **Hours:** _____

Distribution Guidelines

	Water	Shelf Stable Meals/MREs	Baby Formula *(if applicable)*	Other Commodities
Pedestrians (Per Person)	Four (4) liters or one (1) gallon (3.79 liters per gallon)	Two (2)	Equivalent of 48 ounces	
Vehicles (Per Vehicle)	One (1) case of water (9-12 liters)	Six (6)	Equivalent of 144 ounces	
Total Served: (Pedestrians)				
Total Served: (Vehicles)				

POD Operations Report (page 3 of 5)

POD OPERATIONS REPORT

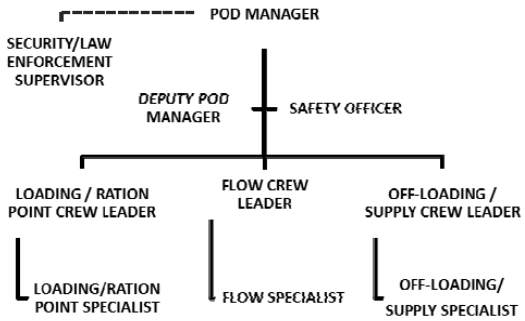
POD Site Name and Number: _____ **Operational Period:** _____

Type of Site: _____ **Date:** _____

POD Manager: _____ **Hours:** _____

Staff Assignments

POD ORG CHART – Local Organization



Position	Name
POD Manager	
Deputy POD Manager	
Security/Law Enforcement Supervisor	
Safety Officer	
Loading/Ration Point Crew Leader	
Loading/Ration Point Specialist	

3

POD Operations Report (page 4 of 5)

POD OPERATIONS REPORT

POD Site Name and Number: _____ **Operational Period:** _____

Type of Site: _____ **Date:** _____

POD Manager: _____ **Hours:** _____

Flow Crew Leader	
Flow Specialist	

Off-Loading/Supply Crew Leader	
Off-Loading Supply Specialist	

Additional Positions	

4

POD Operations Report (page 5 of 5)

POD OPERATIONS REPORT

POD Site Name and Number: _____ **Operational Period:** _____

Type of Site: _____ **Date:** _____

POD Manager: _____ **Hours:** _____

Site Layout: *Sketch the current layout if changed since the previous operational period. Include entrances, exits, unloading area, storage area, distribution area, rest area, and administrative area. Note any space constraints.*

Approximate Space being used for POD Operations (sq. feet):_____

Burn Rate

	Water	Shelf Stable Meals/MREs	Baby Formula *(if applicable)*	Other Commodities
Opening Balance (a*)				
Quantity Received (b**)				
Quantity Remaining (c***)				
Total Quantity Distributed (a + b - c)				

*To calculate (a), inventory all supplies on-site at the beginning of the operational period.
**Use the total numbers from the Resource Tracking Log as values for (b).
***To calculate (c), inventory all supplies on-site at the end of the operational period.

5

H.7.6 POD Commodities Tracking Sheet

POD Commodities Tracking Sheet

POD Commodities Tracking Sheet			NAME_____		
POD Name:			Address:		
Operational Area / Jurisdiction:			GPS Coordinates:		
POC Name:			POC Telephone:		
Date:	Commodity:	Received Last 24	Distributed Last 24	On-Hand	Order for Tomorrow
	Ice (pounds)				
	Water (liters/gallons)				
	MRE/SSM (meals)				
	Baby formula (ounces)				
	Ice (pounds)				
	Water (liters/gallons)				
	MRE/SSM (meals)				
	Baby formula (ounces)				
	Ice (pounds)				
	Water (liters/gallons)				
	MRE/SSM (meals)				
	Baby formula (ounces)				

H.7.7 POD Demobilization Log

Demobilization Log

POD Site Name and Number: _____ **Operational Period:** _____
Type of Site: _____ **Date:** _____
POD Manager: _____ **Hours:** _____
Delivery Location: _____

Pallet Demob #	Commodity Type	Pallet Repacking Date / Time	Trucking Company Name and ID#	Driver Name and Cell Phone#	Pickup Date / Time	Notes

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Appendix I:
Critical Information Collection Requirements

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Appendix I: Critical Information Collection Requirements

Table I-1. Critical information collection requirements.

Critical Information	Specific Information	Methodology/Source	Responsible Entity	Product	Timeline
1 Boundaries of disaster area (e.g., shaking/liquefaction, landslides)	• Geographic limits of damage • Description of the severity of damage • Estimated percentage of population evacuated or in need of evacuation	• Predictive modeling • Remote/overhead sensing • Aerial reconnaissance • Media • Assessment teams • On-scene reports • State REOC and SOC Coordination Center reports	• Local jurisdictions • Operational Areas • REOC • SOC	• GIS impact maps • Situation report • Status briefing	Initial estimate within 4 hours and updated every operational period
2 Access points to disaster area	• Location of access points located • Credentials needed to enter • Best routes to approach the disaster area	• State REOC and SOC Reports	• Local jurisdictions • Operational Areas • CHP • Caltrans • USCG	• GIS maps • Displays • Briefings	Initial estimate within 4 hours and updated every 12 hours
3 Jurisdictional boundaries	• Cities • Counties • Tribal nations • Congressional districts • Special districts	• Existing maps • GIS database • State REOC and SOC reports	• Local jurisdictions • Operational Areas • REOC/SOC	• GIS maps • Jurisdictional profiles	Initial estimate within 4 hours and updated every operational period
4 Population/ community support impacts	• Estimated population affected • Number of shelters open/population • Potential unmet shelter requirements • Number of homes affected (destroyed, damaged) • Percentage of grocery stores open and able to meet the needs of the public • Percentage of pharmacies open and able to meet the needs of the public • Number and locations of pick up points • Location of isolated communities	• Predictive modeling • GIS • Assessment teams • Reports from other EOCs • State REOC and SOC Reports • News media and other open sources • Voluntary agency reports	• Local jurisdictions • Operational Areas • REOC • SOC • FEMA	• FEMA disaster information database Individual Assistance module • Reporting • Situation briefing • Situation reports • Displays • GIS products	Initial estimate within 4 hours and updated every operational period
5 Weather	• Forecast post-incident and implications for impeding operations	• National Weather Service	• NOAA	• Status briefings • Situation reports • Daily intelligence summaries	As soon as possible post-event and ongoing as required
6 Demographics	• Population of affected areas • Demographic breakdown of population including income levels, information on elderly and children • Number/type of housing units in impacted areas • Level of insurance coverage • Tribal nations impacted • Unemployment levels • Foreign languages spoken by more than one percent of the population	• GIS • Predictive modeling • State REOC and SOC Reports • Commercial products • Census data	• Local jurisdictions • Operational Areas • SOC	• Jurisdiction profiles • GIS analysis • Regional analysis and summary	Initial information no later than 12 hours post-event
7 Predictive modeling	• What HAZUS models show for damage impacts and casualties	• HAZUS outputs	• SOC • FEMA	• GIS products	No later than 2 hours post-event

Table I-1. Critical information collection requirements.

Critical Information	Specific Information	Methodology/Source	Responsible Entity	Product	Timeline
8 Initial needs and damage assessments	• Reports of rapid needs assessment and preliminary damage assessment teams • Damages reported by local, State and Federal agency EOCs • Requests for resources	• Rapid needs assessment and preliminary damage assessment team reports • State REOC and SOC Reports • HAZUS outputs • Publically available sources • Other Federal agency situation reports • State SOC Reports	• Local jurisdictions • Operational Areas • REOC	• Situation briefings • Situation reports • GIS products	Initial estimate within 4 hours and updated every 12 hours
9 Status of communications systems	• Status of telecommunications service (including Internet and infrastructure • Reliability of cellular service in affected areas • Potential requirement for radio/satellite communications capability • Status of emergency broadcast (TV, radio, cable) system and ability to disseminate information	• EOC reports • News media/open sources • Internet service provider/telephone companies • National Communication System member agencies	• Utility operators • Local jurisdictions • Operational Areas • UOC	• Situation briefings • Situation reports	Initial estimate within 4 hours and updated every 12 hours
10 Status of transportation systems	• Area airports • Major/primary roads, including identified priority transportation routes • Critical bridges • Railways • Ports • Evacuation routes • Public transit systems • Pipelines • Accessibility to most severely affected areas • Debris on major roadways and bridges	• State SOC reports • Caltrans • MTC • U.S. Department of Transportation • Assessment team reports • Community relations • U.S. Army Corps of Engineers • Remote sensing/aerial reconnaissance • Predictive modeling	• Operational Areas • Caltrans • CHP • Transit Agencies • WETA • MTC • REOC	• Situation briefings • Situation reports	Initial estimate within 4 hours and updated every 12 hours
11 Status of Emergency Operations Centers	• Local EOCs • State EOC • Agency EOCs • RRCC • IMAT • Back-up region RRCC	• State REOC and SOC reports • ESFs/other Federal agencies • Regional offices • RRCCs	• Local jurisdictions • Operational Areas • DGS • REOC	• Situation briefings • Situation reports • GIS products	No later than 1 hour post-event
12 Status of critical infrastructure and facilities	• Potable and non-potable water and sewage treatment plants/distribution systems • Medical facilities (hospitals and nursing homes) • Schools and other public buildings • Fire and police facilities • Levees and dams—U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, DWR	• Predictive models • Remote sensing/aerial reconnaissance • EOC reports • State REOC and SOC Reports • GIS	• Local jurisdictions • Operational Areas • Special districts • CDPH • REOC	• Situation briefings • Situation reports • GIS products	Initial estimate within 4 hours and updated every 12 hours
13 Status of energy systems	• Electricity-generating facilities and distribution grid • Households/people without electric power • Natural gas transmission facilities and distribution pipelines • Households/people without natural gas • Refineries and gasoline and oil distribution systems	• CUEA • NRC reports • Investor-owned utilities (e.g., PG&E) and municipal utility districts • Remote sensing	• CUEA • CPUC • Utility operators • UOC	• Situation briefings • Situation reports • GIS products	Initial estimate within 4 hours and updated every 12 hours
14 Status of key personnel/ personnel issues	• Staffing needs for response operations	• Operational Areas • REOC • Local EOCs	• SOC • FEMA	• Situation briefings • Situation reports	Within 2 hours following disaster declaration and updated every operational period

Table I-1. Critical information collection requirements.

Critical Information	Specific Information	Methodology/Source	Responsible Entity	Product	Timeline
15 Status of POD Operations	• Number of PODs activated • Locations of PODs • Types of PODs activated • Average distribution rates at each POD • Commodities types being distributed	• POD Status Report • POD Manager	• Local EOCs • Operational Areas	• Situation briefings • Situation reports	Initial estimate within 4 hours after the activation of the first POD, updated every 12 hours
16 Status of LSA Operations	• Number of LSA activated • Location of LSA(s) • PODs supported by LSA	• LSA Status Report	• LSA Manager	• Situation briefings • Situation reports	Initial estimate within 4 hours after the activation of the LSA, updated every 12 hours
17 Status of resource requests	• Resources requested • Requests filled/met • Description of resources being provided • Estimated time of arrival for inbound resources • Donated resources	• RIMS • Web EOC • NDMN • CRADAR	• REOC • SOC • FEMA	• Situation briefings • Situation reports	Initial 4 hours post-event and updated every operational period
18 Priorities for response—upcoming activities	• Operational priorities • Priorities: water, food, power, medical, search and rescue, and communications	• EOC reports • Rapid needs assessment ream reports • Elected officials	• Operational Areas • REOC • FEMA	• Situation briefings • Situation reports • GIS products	Initial 4 hours post-event and updated every operational period
19 Major issues/shortfalls	• Actual or potential resource shortfalls of the affected counties • Anticipated requirements • Potential sources for resource shortfalls • Resources available and where located	• EOC reports • Rapid needs assessment team reports • Community relations field reports	• Operational Areas • REOC • FEMA	• Situation briefings • Situation reports • GIS products	Initial assessment within hours post-event and updated every operational period

Source: URS analysis (2009)
Caltrans = California Department of Transportation
CDPH = California Department of Public Health
CHP = California Highway Patrol
CPUC = California Public Utilities Commission
CRADAR = California Resiliency Alliance Disaster Asset Registry
CUEA = California Utilities Emergency Association
DGS = Department of General Services
DWR = California Department of Water Resources
EOC = Emergency Operations Center
ESF = (Federal) Emergency Support Function
FEMA = Federal Emergency Management Agency
GIS = Geographic Information System
HAZUS = Hazards U.S.
IMAT = Incident Management Assistance Team
MTC = Metropolitan Transportation Commission
NDMN = National Donations Management Network
NOAA = National Oceanic and Atmospheric Administration
NRC = Nuclear Regulatory Commission
PG&E = Pacific Gas and Electric
REOC = Regional Emergency Operations Center
RIMS = Response Information Management System
RRCC = Regional Response Coordination Center
SOC = State Operations Center
UOC = Utilities Operations Center
USCG = U.S. Coast Guard
WETA = Water Emergency Transportation Authority

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