Regional Catastrophic Earthquake Mass Transportation / Evacuation Plan

Annex to the San Francisco Bay Area Regional Emergency Coordination Plan

August 2011

Prepared by:
California Emergency Management Agency

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 within 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 San Francisco Bay Area's vulnerability to earthquakes is well known. According to the 2008 Uniform California Earthquake Rupture Forecast,[1] the probability of a magnitude 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 immediately overwhelms local, regional, and State emergency response capabilities. The region needs massive, rapid support from the Federal Government, other local governments in California, other states, and nonprofit and private-sector organizations. How quickly and effectively the region can respond to the disaster affects 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 12 counties and two cities[2] in the Bay Area. The UASI Program used RCPGP funding to prepare plans in seven functional areas: Debris Removal, Donations Management, Interim Housing, Mass Care and Sheltering, Mass Fatality, Mass Transportation/Evacuation and Volunteer Management.

This document, the Regional Catastrophic Earthquake Mass Transportation/ Evacuation Plan, has been prepared under the RCPGP, with the assistance of the California Emergency Management Agency (Cal EMA). Addressing mass transportation/evacuation issues is a critical component of the response to a major earthquake. Large portions of the Bay Area transportation network will be severely damaged, including airports, ports, rail systems, bridges, tunnels, freeways, and local roads; public transit services will be severely disrupted. Several hundred thousand people in the region will need to use mass transportation resources for movement to reduce the risk of harm, to travel to shelters, or to return home.

This document is an annex to the 2008 San Francisco Bay Area Regional Emergency Coordination Plan (RECP). The Plan is consistent with:

[1] Edward H. Field, et al., *The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2)*, (U.S. Geological Survey Open File Report 2007-1437, 2008). Available at http://pubs.usgs.gov/of/2007/1437/of2007-1437_text.pdf.

[2] Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties and the cities of Oakland and San Jose.

- The RECP Transportation Subsidiary Plan
- The Regional Catastrophic Earthquake Debris Removal Plan and the Regional Catastrophic Mass Care and Sheltering Plan, both developed under the RCPGP as incident-specific and function-specific annexes to the RECP
- The San Francisco Bay Area Earthquake Readiness Response Concept of Operations Plan, prepared by FEMA and Cal EMA
- The Metropolitan Transportation Commission Regional Transportation Emergency Management Plan
- The Water Emergency Transportation Authority Emergency Water Transportation System Management Plan
- The Metropolitan Transportation Commission Trans Response Plan
- Applicable local and State plans and requirements

The Regional Catastrophic Earthquake Mass Transportation/Evacuation Plan was developed with the participation of the following:

- Alameda County Sheriff's Office
- American Medical Response
- American Red Cross
- California Department of Transportation
- California Emergency Management Agency, Coastal Region
- California Emergency Management Agency, Office for Access and Functional Needs
- California Highway Patrol
- City of Oakland Emergency Services
- City of Palo Alto
- City of San Francisco
- City of San Jose
- City of San Jose Police Department
- City of San Ramon Police Department
- City of Santa Clara Fire Department
- Contra Costa County
- Contra Costa County Office of Emergency Services
- Federal Emergency Management Agency, Region IX
- Golden Gate Division Traffic Management Center/Freeway Service Patrol
- Golden Gate National Recreation Area
- Marin County Office of Emergency Services
- Metropolitan Transportation Commission
- Oakland Police Department
- San Francisco Bay Area Rapid Transit
- San Francisco Bay Area Water Emergency Transportation Authority

- San Francisco Department of Emergency Management
- San Francisco Fire Department
- San Francisco Municipal Transportation Authority
- Santa Clara County Office of Emergency Services
- Santa Cruz Metropolitan Transit District
- Sonoma County

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Table of Contents

List of Figures

List of Tables

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Executive Summary

This document, the Regional Catastrophic Mass Transportation/Evacuation Plan (Plan),[3] is a scenario-driven, function-specific plan that describes mass transportation/evacuation operations in the aftermath of a catastrophic earthquake in the San Francisco Bay Area (Bay Area). The Plan is:

- An annex to the San Francisco Bay Area Regional Emergency Coordination Plan (RECP), prepared by the California Emergency Management Agency (Cal EMA)
- Consistent with the San Francisco Bay Area Earthquake Readiness Response, Concept of Operations Plan, prepared by the Federal Emergency Management Agency (FEMA) and Cal EMA

ES-1 Scope

This plan:

- Addresses the response to an **M** 7.9 earthquake on the San Andreas Fault
- Applies to the response during the first 60 days after the earthquake
- Applies to the 12 counties in the Bay Area
- Describes mass transportation/evacuation operations applicable at the regional level

ES-2 Catastrophic Nature of the Earthquake

The scenario event used in the development of this Plan is an **M** 7.9 earthquake on the northern segment of the San Andreas Fault. A second scenario event, an **M** 7.05 earthquake on the entire Hayward Fault, was also considered because the impacts on the transportation systems in the two scenario events would be different. The earthquakes in both scenario events are catastrophic and would have significant effects on the region, on California, and on the Nation.

Threats and hazards from the earthquake include structural and nonstructural damage to transportation and other critical infrastructure, fires, subsidence and loss of soil-bearing capacity, landslides, hazardous materials spills and incidents, dam/levee failure resulting in flooding, and civil disorder.

The earthquake would affect all regional transportation networks significantly. Large portions of the transportation infrastructure would are likely to be damaged or destroyed. There would be approximately 1,300 road closures with as many as 42 failures of key freeway sections.

[3] For simplicity, the abbreviation of the title of this document is "Plan."

The earthquake would result in:

- 7,000 fatalities
- 300,000 people seeking shelter
- 500,000 households without electricity
- 1.8 million households without potable water
- 50 million tons of debris
- More than 1 million people requiring transportation assistance because of hazardous conditions or dislocation

Because of the extent of damage and likely unavailability of local workers, in-region resources would not be sufficient to meet the immediate demand for facility inspections. Resources would be required from outside the region. As a result, many facilities and systems could be unavailable for days, weeks, or months. The time required to restore damaged infrastructure would be increased by the effects of the earthquake on employees in the region; impediments to accessing critical facilities and infrastructure; damage to transportation infrastructure; depletion of critical resources, particularly fuel; increased need for critical equipment; and other cumulative impacts.

ES-3 Regional Agency Responsibilities

Regional agencies with primary roles in mass transportation/evacuation operations are the Metropolitan Transportation Commission (MTC) and the Water Emergency Transportation Authority (WETA).

The MTC serves as the coordinating entity for transportation planning and investment in a nine-county region of the Bay Area. MTC has the following responsibilities:

- Activating its Emergency Operations Center (EOC) and implementing the Regional Transportation Emergency Management Plan (RTEMP) and the Trans Response Plan (TRP) during a disaster or at the request of Cal EMA or two or more Bay Area transportation agencies
- Coordinating the Bay Area transit resources among the mass transportation agencies
- Coordinating with Cal EMA to identify transit resources for the response
- Coordinating activities under the San Francisco Bay Area Transit Operators Mutual Aid Agreement

WETA is a regional agency that operates a Bay Area-wide ferry system for the Bay Area. WETA has the following responsibilities:

- Operating emergency activities of all water transportation and related facilities in the Bay Area, except those provided and owned by the Golden Gate Bridge, Highway and Transportation District (GGBHTD)

- Coordinating with Cal EMA and MTC regarding the availability and allocation of water transportation and related facilities
- Implementing the Emergency Water Transportation System Management Plan

ES-4 State Agency Responsibilities

The State agencies with primary roles in mass transportation/evacuation operations are Cal EMA, the California Department of Transportation (Caltrans), and the California Highway Patrol (CHP). These agencies have the responsibilities listed below.

- Cal EMA:
  - Coordinating mass transportation/evacuation operations by other State agencies
  - Approving all mission taskings to State agencies
  - Coordinating requests for Emergency Management Assistance Compact and Federal assistance and participating with the Federal Government when Federal assistance is provided
- Caltrans:
  - Assessing the conditions of State highways and bridges and estimating the time needed to repair damage
  - Establishing alternate routes in coordination with CHP
  - Determining potential road restrictions or closures
  - In coordination with Cal EMA, responding to requests from the affected Operational Areas for essential, supportive services related to the State highway infrastructure to help emergency service workers access affected sites
- CHP:
  - Securing routes, regulating traffic flow, and enforcing safety standards for evacuation and re-entry into evacuated areas
  - Coordinating interstate highway movement on regulated routes with adjoining states
  - Establishing highway safety regulations consistent with location, type, and extent of event conditions
  - Supporting Caltrans with traffic route re-establishment and continuing emergency traffic regulation and control procedures as required

ES-5 Federal Agency Responsibilities

The Federal agencies with primary roles in mass transportation/evacuation operations are FEMA, the U.S. Coast Guard (USCG), the U.S. Department of Transportation (DOT), and the Federal Aviation Administration (FAA). These agencies have the responsibilities listed below.

- FEMA:
  - Coordinating requests for direct Federal assistance from Cal EMA and mission assigning other Federal agencies to conduct mass transportation/evacuation operations
- USCG:
  - Maintaining, monitoring, and reporting on the safety and navigability of Bay Area waterways
  - Making and enforcing decisions regarding the use of Bay Area waterways, including the opening or closing of waterways to vessel traffic
  - Activating, if required, a mutual assistance plan in which ferry operators in the region have agreed to respond to disasters that threaten the safety of passengers and crew aboard vessels in the Bay Area and the Sacramento–San Joaquin River Delta
- DOT:
  - Implementing response and recovery functions under DOT statutory authorities, including the prioritization and allocation of civil transportation capacity and funding for repairing Federal Aid highways
- FAA:
  - Evaluating information provided by airports regarding conditions (e.g., damage to runways and communications, navigation, and air traffic control systems) and restricting air traffic at airports depending on conditions

ES-6 Operational Priorities

The priorities for mass transportation/evacuation operations are:

- Developing situational awareness and determining mass transportation requirements and capabilities for real-time communication and information exchanges
- Establishing a regional authority or one that coordinates mass transportation/ evacuation operations and movement of emergency service workers, resources, and affected populations by integrating local, State, and Federal resources and operations
- Establishing a priority for movement of affected populations based on life-safety concerns
- Developing a service plan of operations to support movement of emergency service workers into the affected area
- Identifying appropriate message systems and provide guidance to the evacuating public
- Acquiring and deploying appropriate transportation resources to move outbound evacuees and inbound emergency service workers
- Managing mass transportation networks and resources to conduct initial movement of evacuees and emergency service workers

- Providing mass transportation resources and management to support follow-on movement of evacuees from shelters to interim housing and other locations
- Supporting re-entry of evacuated populations
- Supporting ongoing transportation of response workers into and within the region
- Supporting restoration of basic transportation services

ES-7 Mass Transportation/Evacuation Operations

The time frame for the Plan begins with the occurrence of the earthquake and ends 60 days after the earthquake.

In general, the populations to which the Plan is applicable consist of individuals who must evacuate but are unable to provide their own transportation, including:

- Residents who must leave their homes because of life-safety concerns generated by the earthquake, such as release of hazardous materials
- Residents who must leave their homes because the homes are damaged or lack potable water, wastewater and/or power service, or because the residents are fearful of remaining in their homes
- Residents who have access and functional needs that prohibit them from self-evacuating
- Commuters who are unable to travel back to their homes via normal means because of damaged transportation infrastructure
- Visitors to the region who are unable to leave the region by normal means because of damaged transportation infrastructure and require evacuation

ES-8 Time-Based Objectives for Response Operations

The mass transportation/evacuation objectives are listed in the following subsections. They are organized into three time frames and listed under the time frame during which they are most likely to occur.

ES-8.1 Event (E) to E+72 Hours

The first 72 hours after an earthquake are associated closely with the first of seven evacuation phases: Incident Analysis and Evaluation. In this phase, the affected areas, infrastructure status, and mass transportation needs are determined. The objectives from to E+72 hours are to:

- Establish an Incident Command System structure that coordinates mass transportation/evacuation operations by integrating local, State, and Federal operations
- Establish interoperable emergency communications among public- and private-sector transportation entities involved in mass transportation/evacuation operations
- Determine impacts to transportation infrastructure

- Identify the locations and sizes of affected populations that require evacuation, including people who have access and functional needs, and develop an estimate of the number of companion and service animals that accompany evacuees
- Identify a preliminary list of destinations for evacuees
- Identify the number of, and destinations for, emergency service workers to be brought into affected areas
- Determine priority transportation routes for mass transportation/evacuation activities to enable the initiation of debris clearance and infrastructure inspection/repair
- Support initial restoration activities (e.g., debris clearance) of the transportation network
- Identify priorities for the use of available transportation resources to assist in mass transportation/evacuation efforts
- Identify additional resources required to support mass transportation efforts
- Track and, to the extent possible, support ad hoc evacuations out of affected areas and inbound movement of response resources

ES-8.2 E+72 Hours to E+14 Days

The period from E+72 hours to E+14 days is most closely associated with the following five of the seven evacuation phases: Decision to Evacuate, Notification, Preparation to Move, Movement and En-Route Support, and Reception and Support. The objectives from E+72 hours to E+14 days are to:

- Finalize the list of priority transportation routes being used and coordinate with debris clearance and public works agencies to confirm availability of routes
- Identify feasible evacuee pickup points and coordinate with local government to support the operation of the pickup points
- Coordinate with mass care service providers and Operational Areas to identify the destinations for evacuees
- Establish and support a Joint Information Center to coordinate evacuation information and notification
- Provide public notification of evacuation orders and evacuation guidance for those requiring mass transportation
- Develop and execute a mass transportation service plan for the outbound movement of evacuees based on regional priority needs
- Develop and execute a mass transportation service plan for the movement of emergency service workers into the affected region
- Acquire and deploy additional mass transportation resources, including vehicles to move people with access and functional needs, from local, State, Federal, and private sources as the resources become available
- Acquire, maintain, and deploy mass transportation support logistics such as fuel distribution systems, maintenance support, and law enforcement staff

- Coordinate evacuation routes that result in movement through another Operational Area or State, based on coordination with the appropriate emergency, law enforcement, and transportation agencies in the relevant jurisdictions
- Develop and execute a transportation service plan for supporting the follow-on routing of sheltered populations, including those with access and functional needs, either to interim housing or returning to their homes in affected areas

ES-8.3 E+14 Days to E+60 Days

Although the time frame for the Plan extends only through the first 60 days of the event, the Plan recognizes that mass transportation operations extend well after 60 days. The objectives from E+14 days to E+60 days are to:

- Continue implementation of the transportation service plan for the movement of emergency service workers into and within the region
- Continue implementation of the transportation service plan that supports moving evacuees from shelters to interim housing
- Continue implementation of the transportation service plan to support the return of evacuees from shelters to their residences
- Develop and execute a transportation service plan to support consolidation of shelters, including shelters supporting access and functional needs populations that need specialized transportation support
- Restore normal public transit services

ES-9 Response Timeline

The operational direction provided by the Plan is in **Table 5-23**, which identifies the tasks needed to support the time-based objectives. Each task is identified under its corresponding objective, along with the time frame in which it is expected to occur, the entities likely to be involved in accomplishing the task, and any additional details. The timeline is designed for use by regional and State-level emergency managers to execute mass transportation/evacuation operations after the earthquake**.**

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1 Introduction

The Regional Catastrophic Earthquake Mass Transportation/Evacuation Plan (Plan)[4] is a scenario-driven, function-specific operations plan for the 12 counties of the San Francisco Bay Area region that describes mass transportation/evacuation operations in the aftermath of a catastrophic earthquake on the San Andreas Fault. Additionally, the Plan addresses mass transportation/evacuation operations that would ensue after a similarly catastrophic earthquake caused by rupture of the Hayward Fault. The Plan is an earthquake-specific annex to the San Francisco Bay Area Regional Emergency Coordination Plan (RECP).

1.1 Purpose

The purpose of the Plan is to provide a guide for (1) using mass transportation resources in regional operations that are needed to support the movement of populations affected by the earthquake both initially out of the region and then eventually back into the region, and (2) using the same resources to move emergency service workers into the affected area.

In the first several days after the earthquake, a large portion of Bay Area residents leave the area using their own resources (e.g., private automobile) and stay with friends or family outside the affected area. This Plan does not address large-scale self-evacuation except to the extent that self-evacuation and mass transportation/ evacuation operations require the same resources (e.g., roadway capacity, fuel), which are insufficient.

The target populations for the Plan are individuals who must evacuate but are unable to provide their own transportation, including:

- Residents who must leave their homes because of life-safety concerns generated by the earthquake, such as release of hazardous materials
- Residents who must leave their homes because the homes are damaged or lack potable water, wastewater and/or power service, or because the residents are fearful of remaining in their homes
- Residents who have access and functional needs that prohibit them from self-evacuating (see **Section 5.15** and **Appendix A** for a description of access and functional needs populations)
- Commuters who are unable to travel back to their homes via normal means because of damaged transportation infrastructure
- Visitors to the region who are unable to leave the region by normal means because of damaged transportation infrastructure and require evacuation

[4] For simplicity, the abbreviation of the title of this document is "Plan."

The Plan provides information on:

- The staging, command, control, and deployment of local, Operational Area, State, and Federal resources in the region
- Application of the Standardized Emergency Management System (SEMS) and Incident Command System (ICS) for managing mass transportation/evacuation operations, including integrating regional transportation operations and management centers
- Coordinating with local, regional, State, Federal, and nongovernmental organizations (NGOs) that have a role in mass transportation/evacuation operations
- Supporting mass transportation/evacuation operations on a regional level

1.2 Objectives

Objectives for the Plan are to:

- Project the catastrophic impacts of the earthquake
- Define planning assumptions
- Identify overarching priorities
- Identify time-based objectives to guide response operations
- Identify the appropriate authority to declare a coordinated evacuation
- Identify agencies with a role in mass transportation/evacuation operations and define their roles
- Establish a clear system of coordination among agencies and levels of government
- Describe resources required for mass transportation/evacuation operations and mechanisms for integrating State and Federal resources into those operations in the region
- Establish a response timeline for mass transportation/evacuation operations, including movement of emergency service workers into the area

1.3 Scope

The Plan describes regional mass transportation/evacuation operations in response to the earthquake. The response is limited to the timeline under which response and recovery operations can be implemented practicably in the region and, for this Plan, extends to 60 days after the event.

This Plan does not address the evacuation of the entire region. Evacuations may involve hundreds of thousands of people across the region during the response to the earthquake. This Plan addresses evacuation operations only for those who need to use mass transportation resources to evacuate in response to the earthquake. The Plan recognizes that evacuation requirements vary over time and geographically across the region and that the capability to return evacuees occurs as conditions permit in specific areas. The Plan also does not account for continual

transportation movement, such as movement from shelter location to shelter location as shelters open and close, or the need for medical appointment transportation.

For definitions of the acronyms and key terms that are used in the Plan, see **Appendix A**.

1.3.1 Nature and Duration of the Earthquake

The scenario event 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 2.1** for more information about impacts of the earthquake.

As described in the National Response Framework (NRF), a catastrophic event is any natural or human-caused incident, including an act of terrorism, 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.

1.3.2 Geographic Scope

The Plan includes the following 12 counties (see **Appendix B, Map B-1**).

- 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

These counties are affected directly by damage from the earthquake, regional disruption of critical infrastructure systems, and the short- and long-term impacts to the economy. Adjacent counties such as Mendocino, Sacramento, San Joaquin, and Stanislaus may be affected directly by damage or indirectly by evacuations and other response actions. An **M** 7.9 earthquake also has significant effects on the rest of California and the Nation as a whole.

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 given in hours and days after the event (E) occurrence.

The Plan does not address preparedness activities that may occur before the earthquake or long-term activities that occur after 60 days. However, **Section 5.20** provides guidance on long-term mass transportation/evacuation objectives.

1.4 Applicability

The Plan is consistent with the regional plans described below.

1.4.1 RECP

As stated above, the Plan is a function-specific, incident-specific annex to the RECP, prepared by the Bay Area Urban Area Security Initiative (UASI) Program and Cal EMA. The Plan is consistent with the RECP Transportation Subsidiary Plan.

The RECP provides an all-hazards framework for collaboration among responsible entities and coordination during events that affect the San Francisco Bay Area counties as a region. The RECP defines procedures for regional coordination, collaboration, decision-making, and resource sharing among emergency response agencies in the Bay Area within the framework of SEMS.

The RECP describes the formation of a Regional Coordination Group among the Cal EMA Coastal Region, as represented by the Regional Emergency Operations Center (REOC). Members may include the REOC Director, REOC staff, representatives from the Operational Areas within the Coastal Region, lead agencies for the Bay Area counties, and subject matter experts. Additionally, the RECP Base Plan and Transportation Subsidiary Plan describe the coordinating role of the REOC in regional transportation operations. As described in **Section 2** of this Plan, the catastrophic nature of the earthquake may disrupt REOC operations. However, Cal EMA implements alternative measures to maintain the regional function of SEMS to support Operational Area response activities.[5]

1.4.2 CONOP

The Federal Emergency Management Agency (FEMA) Catastrophic Incident Base Plan, Concept of Operations (CONOP) establishes the framework for a joint Federal and State response to a catastrophic incident in California and defines the joint State/Federal organization and operations that support the affected local governments and other entities in the affected area.

[5] To eliminate confusion regarding the physical locations at which State operations will occur, this Plan uses the term "Cal EMA Regional Level" instead of "REOC" and "Cal EMA State Level" instead of "State Operations Center."

1.4.3 CONPLAN

The Plan is also consistent with the San Francisco Bay Area Catastrophic Earthquake Readiness Response: Concept of Operations Plan (CONPLAN), prepared by FEMA and Cal EMA. 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 annexes describing care and sheltering and temporary housing operations. The CONPLAN describes the establishment of a Joint Field Office (JFO) with a Unified Coordination Group (UCG)[6] that coordinates joint State/Federal operations in support of the response in the Bay Area.

1.4.4 RTEMP and TRP

The Regional Transportation Emergency Management Plan (RTEMP) was prepared by the Metropolitan Transportation Commission (MTC) and describes coordination among public transit agencies to recover operations and deliver basic transportation services after a regional event.

The Trans Response Plan (TRP) prepared by the MTC is a subordinate plan that functions as part of the RTEMP. It defines the functions, responsibilities, and procedures for developing a multimodal response to a regional event.

1.4.5 Emergency Water Transportation System Management Plan

The Emergency Water Transportation System Management Plan was prepared by the Water Emergency Transportation Authority (WETA). It describes the coordination of public transportation ferry operations for response after an event.

1.5 Authorities, Regulations, and Requirements

As an annex to the RECP, the Plan reflects the following:

- California Emergency Services Act
- California State Emergency Plan (SEP)
- SEMS
- Americans with Disabilities Act

1.6 Plan Organization

The Plan comprises a primary text and 13 appendices. The body of the Plan presents the core planning principles and operational elements for mass transportation/evacuation operations in the response to the earthquake. Because the scope of operations is so broad, the information in the Plan body is intended to be general with more detailed information provided in the appendices.

[6] As described in the CONPLAN, the JFO will be in or adjacent to one of the affected Bay Area counties. The UCG will include the Federal Coordinating Officer, State Coordinating Officer, and other State and Federal senior leaders representing agencies with significant response and recovery roles.

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

Section 2 contains a description of the earthquake and its projected impacts and the assumptions underlying the earthquake and the response to it.

Section 3 contains a description of the roles and responsibilities for coordination between agencies and the different levels of SEMS and for management of the response agencies that respond to the earthquake.

Section 4 contains the response coordination system, activation, and communications for agencies responding to the earthquake.

Section 5 contains the priorities for the response, the objectives that support the priorities, the actions and resources necessary to achieve the objectives and a response timeline for the earthquake.

Section 6 describes how the Plan is maintained, updated, and exercised.

Appendix A is a glossary of acronyms, abbreviations, and specialized terms used throughout the Plan.

Appendix B contains maps displaying information at the regional and county levels for various scenario and operational elements of the Plan.

Appendix C lists transit agencies in the region.

Appendix D presents critical information collection requirements in connection with coordination and communication.

Appendix E contains examples of public alerts and information messaging.

Appendix F describes delivery systems for public information messages.

Appendix G lists ferry vessels in the region.

Appendix H presents transportation resource needs, by mode and time frame.

Appendix I describes transportation resource needs to support daily operations.

Appendix J presents assumptions about operations mileages.

Appendix K presents assumptions about transportation modes.

Appendix L is a sample Mutual Aid Assistance Agreement from the American Public Transportation Association (APTA).

Appendix M presents planning and operational variances addressing how to adapt the Plan to a Hayward Fault earthquake scenario.

2 Situation and Assumptions

The description of the San Andreas Fault earthquake effects and the associated assumptions provided in this section frame the scenario event. This allows for development of event-specific response priorities, objectives, and an operational timeline in following sections of the Plan.

An **M** 7.05 earthquake on the Hayward Fault presents an alternate scenario that is likely to affect populations and transportation infrastructure differently than a San Andreas Fault earthquake and may require evacuations of different areas. Adjustments to the scenario and response operations in this Plan, which may be necessary in a Hayward Fault earthquake, are presented in **Appendix M**.

2.1 Scenario Event

The scenario event is an **M** 7.9 earthquake on the northern segment of the San Andreas Fault. The basis for the scenario is a Hazards U.S. (HAZUS) analysis[7] performed by the Earthquake Engineering Research Institute, with support from the U.S. Geological Survey and Cal EMA, beginning in 2005 and modified in 2009 by URS Corporation for the Regional Catastrophic Preparedness Grant Program (RCPGP).

The characteristics of the scenario event and its impacts on the region are as follows:

1. The earthquake occurs in January on a weekday at 1400 hours Pacific Standard Time.
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 (MM) intensity 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 MM X (extreme shaking/very heavy damage), particularly areas immediately adjacent to the Fault and areas where liquefaction is likely to occur. The shaking intensity and

[7] HAZUS-MH is a loss estimation software program that was developed by the National Institute of Building Sciences for FEMA. The version used for this analysis (HAZUS-MH MR3) was developed by the institute in 2003.

areas where liquefaction is likely to occur are shown in **Appendix B**, **Maps B-2** and **B-3**, 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 to the east.
9. Damage is catastrophic in the areas that experience shaking intensities of MM IX and X and in areas with high or very high levels of susceptibility for liquefaction, which are the 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 immediately by evacuations and other response actions.
12. The rest of California and the Nation are affected significantly by the need to respond; the deaths, injuries, and relocations of Bay Area residents; 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 (see **Appendix B**, **Maps B-4a** through **B-4l**), 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
    - 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 2-1**, based on the estimated damage to potable water pipelines and facilities and

derived using HAZUS. The number of households without electricity after the earthquake is provided in **Table 2-2**.

Table 2-1. 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: HAZUS analysis conducted by URS in 2009. Estimates have been adjusted, by county, for population increases since 2000.
E = event
N/A = Not available (HAZUS results are unreliable)

2.2 General Planning Assumptions

The general planning assumptions that drive the transportation/evacuation response are:

1. Within 24 hours:
   - Local governments proclaim a Local Emergency. The Governor of California 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.
   - The U.S. Department of Homeland Security and FEMA implement the Catastrophic Incident Supplement to NRF and begin mobilizing Federal resources.

Table 2-2. 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**	**34,300**

Source: 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 = event occurrence
N/A = Not available (HAZUS results are unreliable)

2. Because of extensive damage to buildings and transportation infrastructure in Oakland, the REOC, which is in Oakland, may not be functional. The regional function within SEMS may be assumed by:
   - An alternate REOC
   - The State Operations Center (SOC)
   - The UCG established by Cal EMA and FEMA at the Joint Field Office, once it is established

   Cal EMA notifies the Operational Areas of the appropriate channels for communication with the regional function once it has been established.
3. On a statewide basis, all elements of SEMS are functional, including communications and mutual aid systems.
4. The response capabilities and resources of the local governments and the State in the region are quickly overwhelmed or exhausted.
5. 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 detailed and complete situational or critical needs assessments.
6. 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 the damaged transportation infrastructure. First responders who are on duty may be held over for additional shift coverage.

7. Once the President declares a disaster and commits Federal resources, the State and Federal governments establish joint operations to provide assistance to local governments.
8. Massive assistance in the form of response teams, equipment, materials, and volunteers begins to flow toward the region, providing urgently needed resources but creating coordination and logistical support challenges.
9. Because of damage to the 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.
10. Operational Area Emergency Operations Centers (EOCs) experience some damage but are partially operational.

2.3 Mass Transportation/Evacuation Plan Assumptions

The assumptions described in this section are related to the impacts of the earthquake on the regional transportation systems and networks, operational limitations and constraints, the number of evacuees who are expected to require mass transportation assistance to evacuate, and the availability of mass transportation vehicles and operators.

2.3.1 Damage to Transportation Systems

This section contains the assumptions about damage from the earthquake to the transportation systems in the region. For the assumptions related to infrastructure damage from a Hayward Fault earthquake, see **Appendix M**. An earthquake of any significant magnitude causes extensive damage to the transportation networks, greatly impairing their utility during response activities, including evacuation.

The assumptions are as follows:

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 for evacuation.
2. Public and private transportation system operators begin initial damage assessments of critical infrastructure immediately following the earthquake. Because of the extent of damage and potential unavailability of local workers, in-region resources are not sufficient to meet immediate demand for inspection of facilities. Resources are required from outside the region. As a result, many facilities and systems may be unavailable for days, weeks, or months.
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.

2.3.1.1 Functionality of Roads and Bridges

The assumptions about the effect of the earthquake on the functionality of roads and bridges are as follows:

1. There are approximately 1,300 road closures, with as many as 42 failures of key freeway sections. **Appendix B**, **Maps B-4a** through **B-4l,** show the projected damage to the transportation infrastructure.
2. The California Department of Transportation (Caltrans) completes initial inspections of State-owned roads and bridges within 72 hours. During this period, Caltrans may close State-owned roads and bridges, including transbay bridges, pending inspections and debris clearance.
3. The routes which Caltrans has identified as Lifeline routes are the focus of evacuation efforts following the earthquake (see **Table 2-3**). Caltrans and other agencies make restoring these routes a top priority. The routes are reopened as soon as possible to allow for movement of evacuees and emergency workers and supplies in the region. **Table 2-3** provides the expected functionality of the Lifeline routes after the earthquake. High functionality means the roadway/structure is likely to be useable; medium functionality means the roadway/structure is likely to have sustained some damage and requires some repair but can be reopened in time to support evacuation efforts; and low functionality means the roadway/structure may have sustained major damage and may be unusable until repaired.

2.3.1.2 Functionality of Transbay Bridges

The assumptions about the effects of the earthquake on the functionality of transbay bridges are:

1. The earthquake triggers landslides that may close priority transportation routes and other roads.[8]
2. The expected functionality of the transbay bridges is as shown in **Table 2-4**.
3. Caltrans District 4 Transportation Management Center remains operational after the earthquake. However, Intelligent Transportation System field equipment on freeways, including traffic detectors and cameras, may be damaged or lose communication with the Traffic Management Center, affecting Caltrans ability to monitor or control traffic electronically.

2.3.1.3 Functionality of Surface Road Transit Systems

The assumptions about the effect of the earthquake on the functionality of surface road transit systems are listed below:

1. Mass transit operations are limited by the damage to the transportation network, the diminished functionality of critical facilities, and the reduced number of available assets (buses and demand response vehicles) and workers.

[8] The potential for landslides will be taken into consideration when evacuation routes are selected during the process of developing the service plan after the earthquake.

Table 2-3. Expected functionality of Caltrans Lifeline routes after the earthquake.

			Functionality Immediately after the Scenario Event	
Route	**Segment**	**Location**	**Roadways**	**Bridges**
SR 24	Contra Costa County	From Interstate I-680 in Walnut Creek to SR 13/I-580 in Oakland	• High • Caldecott Tunnel: Low	• Low to high
SR 24	Alameda County	From I-680 in Walnut Creek to SR 13/I-580 in Oakland	• Low	• Low
I-80	San Francisco and Alameda counties	From U.S. 101 in San Francisco to I-580 in Oakland	• Low to high (San Francisco side) • Low (Oakland side)	• San Francisco–Oakland Bay Bridge (Bay Bridge): High • Bay Bridge approaches: Low
I-80	Solano County	From I-780 in Vallejo to the Nevada state border	• High	• Low (Vallejo) • Low to high (North of Vallejo to Solano county line)
SR 92	San Mateo County	From U.S. 101 to I-280	• High	• Low
U.S. 101	Monterey County	From SR 170 in Los Angeles to I-280 in San Jose	• High	• Low (Salinas) • Medium to high (remainder of county)
U.S. 101	San Jose– San Benito County	From SR 170 in Los Angeles to I-280	• High	• Mainly high
U.S. 101	San Jose– Santa Clara County	From SR 170 in Los Angeles to I-280	• Medium (south of San Jose to county line) • Low (San Jose)	• Low
U.S. 101	San Francisco	From I-280 to I-80	• Medium	• Low
U.S. 101	Del Norte County– Marin County	From the Golden Gate Bridge in Marin County to U.S. 199	• Medium to high (north of Golden Gate Bridge to SR 1) • Low (SR 1 to Novato) • High (Novato to county line)	• Medium to high (north of Golden Gate Bridge to SR 1) • Mainly low (SR 1 to county line)
U.S. 101	Del Norte County– Sonoma County	From the Golden Gate Bridge in Marin County to U.S. 199	• Low to medium (southern County Line to Santa Rosa) High (Santa Rosa to county line–north)	• Low (southern County Line to SR 128) • Low to high (SR 128 to county line–north)

Table 2-3. Expected functionality of Caltrans Lifeline routes after the earthquake.

			Functionality Immediately after the Scenario Event	
Route	**Segment**	**Location**	**Roadways**	**Bridges**
SR 12 SR 29 SR 116 SR 121	Sonoma County	From U.S. 101 in Petaluma through Napa to I-80 in Solano County	• High	• Low
SR 12 SR 29 SR 116 SR 121	Solano County– Napa County	From U.S. 101 in Petaluma through Napa to I-80	• Low (western County Line to American Canyon) • High (American Canyon to southern County Line and eastern County Line)	• Low to medium
SR 12 SR 29 SR 116 SR 121	Sonoma County– Solano County	From U.S.101 in Petaluma through Napa to I-80	• High	• Medium
I-280	San Francisco– Santa Clara County	From U.S. 101 in San Jose to U.S. 101 in San Francisco	• Low	• Low
I-280	San Francisco– San Mateo County	From U.S.101 in San Jose to U.S. 101	• Medium	• Low
I-280	San Francisco	From U.S. 101 in San Jose to U.S. 101 in San Francisco	• Medium	• Low
I-238 SR 580	Alameda County	From I-880 in Alameda County east to I-5	• High	• Low to high (San Leandro to Castro Valley) • High (Castro Valley to Pleasanton) • Low to high (Pleasanton to Livermore) • Medium to high (Livermore to eastern county line)
I-238 I-580	Alameda County	From I-80 to SR 24	• Low	• Low
I-680	Benicia– Santa Clara County	From I-280 in San Jose to I-780	• Medium	• Low
I-680	Alameda County	From I-280 in San Jose to I-780 in Benicia	• High	• Low to medium

Table 2-3. Expected functionality of Caltrans Lifeline routes after the earthquake.

			Functionality Immediately after the Scenario Event	
Route	**Segment**	**Location**	**Roadways**	**Bridges**
I-680	Contra Costa County	From I-280 in San Jose to I-780 in Benicia	• High	• Low (Walnut Creek and Pleasant Hill) • Low to high (rest of county)
I-680	Solano County	From I-280 in San Jose to I-780 in Benicia	• High	• Benicia Bridge: High • Benicia Bridge approaches: Low
I-780	Solano County	From I-680 in Benicia to I-80 in Vallejo	• Medium	• Low to high

Source: URS analysis (2009)
I = interstate
SR = State Route
U.S. = U.S. highway
High = roadway/structure is likely usable
Medium = roadway/structure is likely to have sustained some damage and requires some repair but can be reopened in time to support evacuation efforts
Low = roadway/structure may have sustained major damaged and may be unusable until repaired

Table 2-4. Expected functionality of transbay bridges after the earthquake.

Bridge/Route	Condition	Description of Damage
Benicia–Martinez Bridge (I-680)	Open	No major damage
Carquinez Bridge (I-80)	Open	No major damage
Richmond–San Rafael Bridge (I-580)	Closed	Damage to access
Golden Gate Bridge (U.S 101)	Span open	Damage to access, particularly Doyle Drive in San Francisco
San Francisco–Oakland Bay Bridge (I-80)	Closed	Damage to eastern span and access from San Francisco
San Mateo–Hayward Bridge (SR 92)	Span open	Damage to routes at western approach
Dumbarton Bridge (SR 84)	Closed	Damage to access from Newark and East Palo Alto

Source: CONPLAN (2008)
I = interstate
SR = State Route
U.S. = U.S. Highway

2. Mass transportation agencies restore service as quickly as possible. Because of the need to inspect facilities and assets, have staff return to work, establish operational "bus bridges" to mass transportation sites in lieu of normal rail service (depending on the mass transit agency), and because of the damage to the transportation infrastructure, mass transportation agencies are not able to start providing even limited service for emergency operations until E+72 hours to E+5 days.

2.3.1.4 Functionality of Rail Systems

The assumptions about the effect of the earthquake on the functionality of rail systems are listed below.

1. 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.
2. Light and heavy rail systems that rely on electrical propulsion are initially inoperable because of loss of power in large portions of the region. Many rail systems remain inoperable after power is restored because of damaged alignments and other support systems or because of collapsed or blocked rail sections.
3. The Bay Area Rapid Transit (BART) transbay tube, Caltrain commuter lines on the San Francisco Peninsula, and Amtrak services are suspended for an undetermined period until inspections are completed. Damaged segments are inoperable until emergency repairs to the infrastructure have been made.
4. Damage to rail systems that share track with freight operations (Caltrain) or operate on shared freight track (Capital Corridor and Altamont Commuter Express) is repaired and the operation of the rail system is restored by

E+30 days. However, some areas of the freight rail system (Richmond to Rodeo) are so damaged that these segments are inoperable for an undetermined period.

2.3.1.5 Functionality of Water Transportation Systems

The assumptions about the effect of the earthquake on the functionality of water transportation systems are listed below.

1. The functionality of ferry systems is limited by damage to the structural integrity of piers and ferry terminals, the unavailability or limited availability of fuel, the inability of workers to return to work, the inability of crews to reach their workstations, and obstructed channels for navigation.
2. Ferry terminals and piers suffer moderate to severe damage, significantly reducing the operating capacity of these facilities. Alternate facilities for boarding vessels are established from E+3 days to E+5 days.
3. Port facilities suffer moderate to severe damage, reducing or eliminating the ability to move cargo or freight through these facilities.
   - Facilities at the ports of Oakland, San Francisco, and Redwood City suffer damage and may be inoperable.
   - The ports of Richmond, Benicia, and at the former Concord Naval Weapons Station may remain operable, but damage to nearby infrastructure, including road approaches, may incapacitate the ports.
   - Damage may make the existing ferry facilities and waterways unusable for evacuation and deliveries and may require the identification of temporary landings.
   - Loss of power at marine terminals is prolonged, and truck and rail access routes are damaged.
4. Although port facilities may be damaged, the ports may offer passenger evacuation points and facilities to berth ships and off-load relief supplies.

2.3.1.6 Functionality of Airports

The assumptions about the effect of the earthquake on the functionality of airports are as follows:

1. 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 one 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.

2. 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.
3. Travis Air Force Base (Solano County) is the only active military air field in the Bay Area. The CONPLAN calls for the use of this facility as a Federal staging area to support Federal response operations.
4. Moffett Field (Santa Clara County), a former military installation and currently operated by the National Aeronautics and Space Administration, and the access roads to the field are in a liquefaction area and are likely to be severely damaged, limiting the utility of the field for transportation operations.
5. Regional and municipal airports in the 12-county region may provide locations for evacuation, landings by fixed-wing and rotary-wing aircraft, and staging. Facilities at regional and municipal airports are damaged. Some runways are operational after temporary repairs have been made.

2.3.2 Operational Assumptions

The operational assumptions are:

1. Extensive damage to 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 evacuation
2. The decision to order an evacuation is based on local conditions, including threats to life and safety of the population, capacity of communities to care for and shelter people, and the capacity of the transportation network.
3. Local law enforcement agencies manage evacuation activities at the local level, but:
   - Local and regional mass transportation agencies are overwhelmed. Out-of-region resources, including State, Federal, and private-sector resources, are required to re-establish essential mass transportation operations.
   - Local officials require State and Federal support to assess the status of transportation systems, determine evacuation requirements, and provide support for resource allocations and decisions regarding routing for transportation operations that have regional and out-of-region impacts.

4. Evacuations and transportation of emergency service workers take priority over debris removal activities in terms of the allocation of transportation network pathways and resource allocation, except where debris removal is critical to opening evacuation routes.
5. Mass transportation agencies restore service as quickly as possible. However, because of the need to inspect facilities and assets, have staff return to work, establish operational "bus bridges" (depending on the mass transportation agency), and because of the damage to the transportation infrastructure, the agencies are not able to start providing even limited service for emergency operations until E+72 hours to E+5 days.
6. Roadways are the primary networks for mass transportation/evacuation. Water and rail networks are also used where conditions allow.
7. Evacuations occur across county boundaries and out of the region. Receiving counties/jurisdictions, upon notification of the need for mass care and sheltering, establish clear routes for transport of evacuees.
8. A sufficient communications capability exists to enable communication between mass transit vehicles and dispatch centers/EOCs after E+96 hours.

2.3.3 Evacuation Assumptions

The assumptions in this section pertain to the conditions that create the need for evacuation, the behavior and projected number of evacuees, the evacuation of household pets and other animals, the number of evacuations that are needed because of levee damage in the Sacramento–San Joaquin Delta, and the evacuation needs for emergency service workers.

2.3.3.1 Conditions Resulting in the Need for Evacuation

The assumptions about the conditions that create the need for evacuation are as follows:

1. Local conditions drive the need for evacuation. The entire region does not need to be evacuated nor even entire counties. Conditions that are likely to require evacuation include the following:
   - Residences are damaged or destroyed.
   - People with access and functional needs do not have sufficient resources to evacuate.
   - Commuters cannot travel to their homes because the transportation infrastructure is damaged or inoperable for other reasons.
   - Visitors to the region cannot leave the region because the transportation infrastructure is damaged or inoperable for other reasons.
   - People are without access to critical services over an extended period, particularly potable water and sanitary systems.
2. Inadequate shelter capacity in the region requires movement of evacuees to shelters in counties outside the region, within California, and in other states.

3. Secondary effects, such as hazardous materials release and loss of potable and waste water systems, force a second wave of evacuations by residents who might otherwise be able to stay in their residences.
4. A portion of the population housed at shelters needs periodic transportation between the shelters and sites for specialized care (e.g., renal dialysis every three days).

2.3.3.2 Behavior of Evacuees

The assumptions about the behavior of the evacuees are as follows:

1. Most people who suffer loss of housing or secondary effects in the affected areas evacuate willingly when instructed and if able to do so.
2. Some people in the affected areas refuse to evacuate, even if given direct orders to do so, regardless of the risk.

2.3.3.3 Number of Evacuees

The assumptions about the number of evacuees are as follows:

1. Approximately 80 percent of the people who evacuate do not need to use mass transportation or public shelters.
2. Within the evacuation population receiving mass transportation assistance, 80 percent are able to travel on conventional transit vehicles, and 20 percent need to be transported in demand response and accessible vehicles capable of transporting people with access and functional needs or durable medical equipment.

   Table 2-5 shows the total population in the 12-county region, the estimated population seeking shelter, evacuees needing mass transportation assistance, and the type of vehicle used to provide mass transportation assistance from E to E+72 hours.

2.3.3.4 Animals

The assumptions about the animals that need to be evacuated are as follows:

1. Local public and nongovernmental resources for animal care are overwhelmed by requirements for transporting and caring for as many as 218,000 animals, including companion animals (pets) that accompany evacuees who are seeking shelter and animals that are abandoned and require rescue.
2. Mass transit vehicles are not used to transport animals.
3. As described in the CONPLAN, livestock and poultry are not evacuated and are sheltered in place.
4. Restricted species, such as those that require special ownership permits and are typically housed at public zoos, are not addressed in this Plan.

Table 2-5. Estimates of evacuees seeking shelter, evacuees needing mass transportation assistance, and type of vehicle in the 12-county Bay Area region from E to E+72 hours.

		Seeking Shelter				Evacuees Needing Mass Transportation Assistance[1]						
County	Overall Population[2]	General Population[3]	Homeless[4]	Visitors/ Tourists[5]	Inter-County Commuters[6]	General Population[7]	Homeless[7]	Visitors/ Tourists[8]	Inter-County Commuters[9]	Total	Evacuees in Mass Transit[10]	Evacuees in Demand Response Vehicles[11]
Alameda	1,556,500	67,300	4,000	24,900	206,700	33,600	2,000	12,400	103,300	151,300	121,000	30,300
Contra Costa	1,060,400	12,800	3,300	17,000	82,300	6,400	1,600	8,500	41,100	57,600	46,100	11,500
Marin	258,600	4,900	1,400	4,200	44,300	2,400	700	2,100	11,000	16,200	13,000	3,200
Monterey	431,900	2,300	1,100	15,000	9,200	1,100	500	7,500	2,300	11,400	9,100	2,300
Napa	137,600	2,400	200	2,300	15,100	1,200	100	1,100	3,700	6,100	4,900	1,200
San Benito	58,000	300	0	1,000	4,600	100	0	500	1,100	1,700	1,400	300
San Francisco	845,600	64,500	5,100	75,000	273,800	32,200	2,500	56,200	205,300	296,200	237,000	59,200
San Mateo	745,800	26,000	1,400	11,900	144,300	13,000	700	5,900	72,100	91,700	73,400	18,300
Santa Clara	1,857,600	64,700	5,700	42,500	210,500	32,300	2,800	21,200	105,200	161,500	129,200	32,300
Santa Cruz	268,600	2,900	2,200	7,500	13,700	1,400	1,100	3,700	3,400	9,600	7,700	1,900
Solano	426,300	2,600	1,600	7,800	16,600	1,300	800	3,900	4,100	10,100	8,100	2,000
Sonoma	486,600	9,400	1,000	6,900	12,400	4,700	500	3,400	3,100	11,700	9,400	2,300
Total	**8,133,500**	**260,100**	**27,000**	**216,000**	**1,033,500**	**129,700**	**13,300**	**126,400**	**555,700**	**825,100**	**660,300**	**164,800**

Source: URS analysis (2009)

[1] Projected numbers for E to E+72 hours include residents seeking shelter because of immediate loss of housing but do not include residents seeking shelter because of secondary effects (e.g., lack of water, power, sewer).

[2] 2000 U.S. Census; updated to 2009 figures using California Department of Finance data. Includes access and functional needs populations.

[3] URS HAZUS analysis 2009 and county sources, 2007–2009.

[4] Human Services Agency in each county 2007; updated to 2009 figures using California Department of Finance data. Assumption is that 80% of homeless seek shelter.

[5] URS analysis using visitor totals provided by HVS Lodging Services and Monterey County Convention and Visitors Bureau.

[6] 2000 U.S. Census; updated to 2009 figures using California Department of Finance data.

[7] Assumption is that 50% of the residents/homeless seeking shelter need to use mass transportation resources.

[8] Assumption is that 75% of visitors in San Francisco and 50% of visitors in the rest of the counties need mass transportation to evacuate.

[9] Assumption is that 75% of commuters in San Francisco are from other counties, 50% of commuters in Santa Clara are from other counties,

[10] Assumption is that 80% of total evacuees needing transportation use regular mass transportation resources (e.g., standard transit buses) for evacuation. This includes the access and functional needs population that can access a standard transit bus.

[11] It is assumed that 20% of total evacuees needing transportation need demand response vehicles for evacuation. These are access and functional needs evacuees that require specialized transportation equipment.

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5. Shelters that are managed by the American Red Cross (ARC) allow only service animals (animals trained to assist people with access and functional needs), not pets or restricted species.
6. Operational Areas and local governments establish separate shelters for animals in areas near the shelter sites for people, in coordination with the United Animal Nations (UAN).
7. Residents who have their own means of transportation evacuate with their small household pets. Residents who do not have access to vehicles secure their pets in cages or carriers, if possible, before they arrive at pickup points. Residents who do not have cages or carriers are asked to secure their animals in their homes. This strategy places responsibility on individual owners and requires a public education component to inform the public that carriers, cages, or trailers are required for pet evacuations and to recommend that pet owners have microchips implanted in their animals for identification purposes. Animal control officers work with animal services agencies and volunteers to develop an animal tracking methodology.
8. Pet owners may refuse to evacuate if required to leave their pets behind.
9. Individual jurisdictions identify strategies to address pet evacuations. Jurisdictions do not assume that owners have their own means of transporting large animals, such as trailers. Local Humane Societies and county animal services departments provide support for the transportation of large animals. Memoranda of understanding are formalized with other agencies/organizations for the transportation of large animals, such as horses. In addition, potential volunteer resources and private groups are identified and tasked appropriately.
10. In the 12-county region, 60 percent of all households have animals and 50 percent of those households have two or more animals. Total number of displaced pet animals is 363,900, but only 10 percent (36,390) need transportation to animal shelters. The rest of the displaced pet animals either evacuate with their owners in private vehicles or are placed in shelters directly by the owners and therefore do not require transportation assistance. See **Table 2-6**.

Table 2-6. Estimated number of household pet animals (other than livestock) expected to need shelter.

Assumption	Number
Number of displaced households	404,300
60% of households have animals	242,600
50% of households with animals have 2 or more animals	121,300
Total displaced animals	**363,900**
Displaced animals needing mass transportation to shelters (estimated 10% of total displaced animals)	36,390

Source: CONPLAN (2008), using updated population figures from U.S. Census

2.3.3.5 Evacuations Required by Levee Damage in the Sacramento–San Joaquin River Delta

The assumptions about the evacuations that are necessary in the Sacramento–San Joaquin River Delta after the earthquake are as follows:

- As described in the Delta Risk Management Strategy, prepared by the California Department of Water Resources, the earthquake causes levee failures and flooding in the Sacramento–San Joaquin River Delta, resulting in the need to evacuate island residents. Although only part of the Delta islands and population are in either Contra Costa County or Solano County, the entire potential evacuation requirement is provided in Table 2-7 because of the likelihood of coordinated, cross-jurisdictional island evacuation operations. The islands listed in Table 2-7 can be isolated by floodwaters and then require specialized support for evacuation.

Table 2-7. Estimated number of people expected to require evacuation because of levee failures in the Sacramento–San Joaquin River Delta.

Island/Tract	Potential Evacuations
Bacon Island	200
Bethel Island	2,300
Bouldin Island	0
Bradford Island	50
Brannan–Andrus Island	1,800
Byron Tract 1	6,200
Holland Tract	30
Jersey Island	10
Jones Tract—Upper and Lower	300
Mandeville Island	0
McDonald Tract	100
Orwood Tract	400
Palm Tract	—[1]
Quimby Island	0
Sherman Island	200
Twitchell Island	100
Venice Island	5
Victoria Island	200
Webb Tract	0
Woodward Island	0
Total	**11,895**

Source: California Department of Water Resources, Delta Risk Management Strategy (2009)
— = Not available
[1] Included with Orwood Tract

2.3.3.6 Emergency Service Worker Transportation Demand

The assumptions related to the transportation needs for emergency service workers are as follows:

1. The number of emergency service workers needed to provide mass care and other ARC services is 10,000 to 12,000, according to the ARC. In the first two or three weeks, many of the personnel are spontaneous community volunteers and local and State government personnel, allowing time for the ARC to recruit and deploy out-of-area personnel through its Disaster Services Human Resources system. The ARC normally deploys personnel in three-week shifts, so the need to transport out-of-area workers tends to occur in waves.
2. The number of emergency service workers deployed during the first 60 days is approximately 78,000 people.
3. An estimated 20,000 to 25,000 emergency service workers commute daily to locations in the 12-county Bay Area region.

2.3.4 Transportation Resource Assumptions

The assumptions related to transportation resources are as follows:

1. All available transportation modes are deployed to assist in the transportation of evacuees, including demand response vehicles and vehicles capable of transporting people with mobility needs or durable medical equipment.
2. For the purpose of estimating the capacity of transit assets:
   - Seventy-five percent of an asset's rated capacity can be used to evacuate people and their belongings.
   - People with specialized transportation needs are accommodated to the extent possible in conventional transit vehicles or transported in specialized, accessible vehicles.
3. For the availability of mass transit resources immediately after the earthquake:
   - Twenty percent of existing road-based mass transit vehicles are unavailable because of damage to the vehicles caused by the earthquake.
   - Twenty percent of existing fuel-powered rail-based vehicles are unavailable because of damage caused by the earthquake.
   - All electric rail-based vehicles are initially unavailable because of widespread loss of electricity in Alameda, Contra Costa, San Mateo, San Francisco, and Santa Clara counties. Electric rail service is restored as power is restored and other system damage is repaired.
   - All water transportation vessels are available. Service is limited by damage to passenger loading facilities and fuel availability.
   - The number of transit workers is reduced because the workers are affected by the earthquake. By E+30 days, 30 percent of transportation agency operations staffs are available. By E+60 days, 50 percent are available.

Table 2-8 lists the estimated number of transit vehicles and operators available for deployment after the earthquake, based on the available resources in the 12-county region.

2.3.5 Fuel Availability and Usage Assumptions

The assumptions related to fuel availability and usage are:

1. The following facilities and operations are damaged by the earthquake:
   - Refining facilities
   - Tank farms and other storage facilities
   - Pipelines and other distribution facilities
   - Local government agency fuel facilities, including mass transportation agencies
   - Commercial retail fuel operations, including bulk fuel delivery and pump operations.
2. Transportation agencies normally have 1 to 3 days of fuel on hand.
3. Fuel consumption rates for road-based mass transit vehicles vary by model and size of vehicle. Estimated average consumption is 6 miles per gallon for buses and 13 miles per gallon for demand response vehicles.
4. Fuel consumption rates for heavy rail vehicles vary by locomotive model and train weight. Estimated average consumption is 1.6 to 3.9 gallons per train mile for passenger trains (four trailing bi-level coaches, to 12 to 14 trailing bi-level coaches), and 6.2 to 8.8 gallons per train mile for freight trains (5,000 to 6,000 tons gross weight per train).
5. Fuel consumption rates for ferries vary by ship model and sea conditions. According to WETA, estimated average consumption is 190 gallons per hour for 300-passenger high-speed ferries and 100 gallons per hour for 300-passenger conventional ferries.

Table 2-8. Transit resources available for deployment in the 12-county region after the earthquake.

	Available Transit Vehicles[1]					Available[3] Operations Staff[4] E+30 Days					Available Operations Staff E+60 Days				
County	**Bus**	**Demand Response**	**Light Rail**	**Heavy Rail[2]**	**Ferry**	**Bus**	**Demand Response**	**Light Rail**	**Heavy Rail[6]**	**Ferry**	**Bus**	**Demand Response**	**Light Rail**	**Heavy Rail[6]**	**Ferry**
Alameda	562	322[5]	0	63	5	440	51[5]	0	64	N/A	728	106[5]	0	64	N/A
Contra Costa	192	239[5]	0	0	0	112	51[5]	0	0	0	187	106[5]	0	0	0
Marin	189	88	0	0	5	97	N/A	0	0	49	162	N/A	0	0	81
Monterey	79	18	0	0	0	45	N/A	0	0	0	75	N/A	0	0	0
Napa	24	15	0	0	0	15	7	0	0	0	26	11	0	0	0
San Benito	6	13	0	0	0	N/A	N/A	0	0	0	N/A	N/A	0	0	0
San Francisco	399	99	0	0	0	554	18	0	0	0	924	30	0	0	0
San Mateo	301	102	0	22	0	103	2	0	14	0	172	3	0	24	0
Santa Clara	442	325	0	0	0	316	N/A	72[7]	0	0	527	N/A	72[7]	0	0
Santa Cruz	86	43	0	0	0	51	13	0	0	0	86	22	0	0	0
Solano	66	64	0	0	4	45	9	0	0	12	71	14	0	0	20
Sonoma	75	50	0	0	0	54	N/A	0	0	0	91	N/A	0	0	0
Total	**2,421**	**1,378**	**0**	**85**	**14**	**1,832**	**151**	**72**	**78**	**61**	**3,049**	**292**	**72**	**88**	**101**

Sources: National Transit Database (2007); Metropolitan Transportation Commission Statistical Summary of Bay Area Transit Operators (2008); California Department of Transportation (2009)
ACE = Altamont Commuter Express
BART = San Francisco Bay Area Rapid Transit
E = event
LRT = light rail transit
MTC = Metropolitan Transportation Commission
N/A = Not available

[1] Assumption: 20% of the assets are unavailable because of damage, and 80% are available.

[2] Heavy rail includes traditional heavy rail and commuter rail. For San Francisco, this includes cable cars, which are not operational after the earthquake. Heavy rail also includes ACE rail cars at 100% availability and Caltrans, Division of Rail, rail cars at 50% availability (33 cars); these rail cars have been included in Alameda County because of their geographic location.

[3] The assumption is that from E to E+30 days, 30% of staff are available and return to work, based on anecdotal information from the MTC work conducted by URS.

[4] Operations staff includes drivers, operators, ferry captains, and other personnel who are intended to operate a vehicle or ferry.

[5] The regional demand response category was divided evenly and added to Alameda and Contra Costa counties demand response vehicles and operations staff categories because the service is provided by East Bay Paratransit Consortium, a paratransit operator serving both counties.

[6] Operations staff for the heavy rail category reflects the ACE system at 100% availability; these staff have been included in Alameda County. BART staff are unavailable from E to E+60 days.

[7] The available LRT operator numbers have been added to the available bus operator number because LRT is unavailable, and LRT operators are licensed to drive a bus in the State of California.

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3 Roles and Responsibilities

This section outlines the roles and responsibilities of local, State, and Federal agencies during a regional disaster. This information is consistent with the roles and responsibilities identified in the Transportation Annex of the RECP.

3.1 Local Government Agencies

3.1.1 Local Governments

In accordance with SEMS, local governments include the county, cities, towns, special districts, and authorities within an Operational Area. These entities have a wide range of roles during a disaster:

- All local government EOCs coordinate through the Operational Area EOC.
- Local governments initiate localized activities in support of life-safety efforts and restoration of critical infrastructure, including the activation and operation of pickup points for evacuees.
- Special districts, as appropriate, work within their areas of expertise to support mass transportation/evacuation activities as appropriate.
- Authorities with transportation responsibilities, such as transit agencies and bridge authorities, coordinate through their Operational Area EOC and MTC to best support operations. See **Section 3.1.2**.

More information on local governments' responsibilities is provided in local and Operational Area Emergency Operations Plans and Mass Transportation/ Evacuation Plans.

3.1.2 Mass Transportation Agencies

Approximately 30 mass transportation agencies in the 12-county region provide mass public transportation services via bus, rail, ferry, or some combination of those modes. See **Appendix C** for a complete list of the mass transportation agencies in the 12-county region. During a disaster, these agencies are essential to the regional transportation response because they provide emergency transportation and restore basic transportation services.

The ten largest Bay Area mass transportation agencies have entered into a mutual aid agreement to streamline the provision of voluntary mutual assistance among those agencies to help ensure that public transportation services continue to the maximum practical extent in a disaster. Assistance is generally in the form of resources, such as equipment, supplies, and personnel. Assistance is provided only when the lender determines that its own emergency and basic transportation needs can be met.

3.1.3 Service Providers to Access and Functional Needs Populations

There are many organizations that assist access and functional needs populations during and after the disaster. The following are some of the organizations that may assist access and functional needs populations to either travel from home to a pickup point, or from a pickup point to a shelter or other destination.

East Bay Paratransit is a public transit service for people who are unable to use regular buses or trains because of a disability or a disabling health. East Bay Paratransit was established by AC Transit and BART to meet requirements of the Americans with Disabilities Act, and uses vans equipped with a wheelchair lift or sedans.

San Francisco Paratransit is a van and taxi program for people unable to independently use public transit because of a disability or disabling health. The San Francisco Municipal Railway provides the service to meet the meet requirements of the Americans with Disabilities Act. The San Francisco Municipal Railway contracts with a paratransit broker (Veolia Transportation) to manage the service that identifies and matches potential user needs with available transportation services. The paratransit broker then contracts with van and taxi companies to provide the transportation.

Outreach Paratransit is a public service for persons unable to use fixed route bus and light rail services as a result of their situation. The Santa Clara Valley Transportation Authority provides the service to meet the requirements of the Americans with Disabilities Act. The Santa Clara Valley Transportation Authority contracts with a paratransit broker (Outreach Paratransit) to manage the service that identifies and matches potential user needs with available transportation services. The paratransit broker then contracts with taxi and van companies to provide the transportation.

Community Emergency Response Teams (CERTs) are teams of citizens who are educated about emergency preparedness for hazards that may impact their area and educated in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT members can assist others in their neighborhood or workplace following an event when first responders are not immediately available to help. In San Francisco City and County, Neighborhood Emergency Response Team (NERT) is the parallel organization. Following an emergency, CERT/NERT teams can assist in the transportation of access and functional needs populations from their homes to pickup points, if trained in the process.

Independent Living Centers are community-based, non-residential private nonprofit agencies that are designed and operated within a local community by individuals with disabilities. The intent is to maximize a person's ability to live independently in the environment of their own choosing. Independent living centers exist throughout the 12-county San Francisco Bay Area region. Following an emergency, independent living centers can assist in the transportation of access and functional needs populations from their homes to pickup points.

NorCal Voluntary Organizations Active in Disaster (VOAD) is a regional group of nonprofit entities that respond to disasters as part of their overall mission. They coordinate with FEMA, the ARC, and other agencies to provide support to access and functional needs populations during disaster response and recovery.

The following access and functional needs providers were included when estimating vehicles and staff available to transport access and functional need populations from pickup points to their ultimate destination.

Alameda County:

- Alzheimer's Services of the East Bay
- Bay Area Community Services
- Berkeley Paratransit Services
- Center for Elders Independence
- City of Berkeley, Division on Aging
- City of Fremont Paratransit
- City of Hayward Paratransit Program
- City of Oakland
- City of Pleasanton Paratransit Services
- Easy Bay Paratransit Consortium (serves Alameda and Contra Costa Counties)
- LIFE ElderCare, Inc.
- Regional Center of the East Bay
- Spanish Speaking Unity Council (“Unity Council”)

Contra Costa County:

- City of Antioch Senior Bus
- City of Lafayette
- City of San Ramon
- Contra Costa ARC
- Contra Costa County Employment & Human Services Department
- Golden Rain Foundation/Rossmoor
- Guardian Adult Day Health Center
- Mt. Diablo Adult Day Health Center
- Richmond Paratransit
- Veterans Administration, Contra Costa County

Marin County:

- Marin County Transit District
- Senior Access

- Senior Access/Kentfield
- Whistlestop

Napa County:

- Milestones ADC

San Francisco County

- San Francisco Paratransit

San Mateo County:

- City of Foster City
- Coastside Opportunity Center
- San Mateo County Aging and Adult Services
- Senior Coastsiders

Santa Clara County:

- Achievekids
- Agnews Developmental Services
- Avenidas
- Gardner Family Health Network, Inc.
- Outreach and Escort, Inc.
- Pacific Autism Center for Education
- San Andreas Regional Center
- Veterans Administration (Santa Clara County)

Santa Cruz County:

- Community Bridges

Solano County:

- City of Dixon
- Pace Solano
- Rio Vista Delta Breeze
- Solano Transportation Authority

3.2 Operational Area

Operational Areas are the intermediate level of the state emergency service organization, responsible for emergency response within a county, including all political subdivisions in the county area (e.g., cities, special districts) and unincorporated areas in the county.

Affected Operational Areas have the following transportation-related responsibilities in a disaster:

- Transmitting requests for emergency and basic transportation resources directly to local mass transportation agencies in the Operational Area. Mass transportation agencies request mutual aid as needed and as available. If local agencies are unable to provide the requested resources, the Operational Area forwards the requests to the REOC in coordination with MTC.
- Communicating directly with the REOC or with the SOC if the REOC is inoperable.
- Providing information and updates about the condition of the affected jurisdictions, including reports on status of the disaster, damaged areas and infrastructure, affected populations, and other pertinent information.
- Issuing evacuation orders (via authority held by the County Sheriff's Department) for areas within the county, as appropriate for life safety.
- Supporting evacuation orders issued by local governments as applicable, such as by requesting resource requests from mass transportation agencies.
- Supporting activities for life-safety efforts and restoration of critical infrastructure, including the possible activation and operation of pickup points for evacuees.

3.3 Regional Organizations

An administrative Region is a function of Cal EMA that provides centralized coordination of resources among Operational Areas in their respective regions and between the Operational Area and State level. The three Cal EMA administrative regions in the State of California are Coastal, Inland, and Southern. All 12 counties that are addressed in this Plan are in the Coastal Region.

An administrative Region is also one of the five levels of SEMS. SEMS guidance for the regional level is primarily but not exclusively directed at regional facilities and systems that administer or coordinate mutual aid. These include Cal EMA REOCs and discipline-specific mutual aid systems (e.g., fire, law, medical), which coordinate mutual aid in mutual aid regions.

3.3.1 REOC

The operational role of the REOC during a disaster is to:

- Act as the State's primary point of contact for Operational Areas within a Cal EMA region.
- Coordinate the regional response to disasters, including collection, verification, and evaluation of situation information, for all resources dispatched under the California Disaster and Civil Defense Master Mutual Aid Agreement, and for the allocation of available resources.
- Coordinate mutual aid requests for emergency services among Operational Areas within the region, including the direct coordination of all mutual aid requests made to the State such as the Medical/Health, Law Enforcement, Coroner, and Fire and Rescue Mutual Aid Systems.

- Coordinate with the SOC on all Federal assistance and Emergency Management Assistance Compact (EMAC) assistance that enters the region.
- Maintain communication and coordination with Operational Areas, the SOC, and with State and Federal agencies in the region as required.
- Provide assistance to Operational Areas.
- Establish a Transportation Branch in the Operations section of the REOC to include transportation agencies as needed (including Caltrans, CHP, MTC, USCG, and WETA)
- Receive and disseminate information regarding emergency alerts and warnings.

3.3.2 MTC

MTC serves as the coordinating entity for transportation planning and investment in a nine-county region[9] of the Bay Area. In a disaster that requires mass transportation/evacuation, MTC's operational role is to:

- Coordinate the response of Bay Area transit resources among mass transportation agencies
- Coordinate with Cal EMA to identify regional transportation needs
- Implement the TRP, which defines the regional functions, responsibilities, and procedures for developing a multimodal response to an emergency, and the RTEMP, which focuses on restoration of basic transportation services to the general public
- 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.
- Manage the 511 Traveler Information System, a free phone and Internet service that provides current information to the public on:
  - Bay Area traffic conditions
  - Incidents
  - Detour routes
  - Driving times
  - Schedules, routes, and fares for public transit services
  - Transportation alternatives
  - Park-ride facilities

MTC does not currently have jurisdiction in the three southernmost counties (Santa Cruz, Monterey, and San Benito) covered in this Plan. In a regional disaster, a

[9] The MTC jurisdiction covers 9 of the 12 counties that are covered in this Plan but does not include Santa Cruz, Monterey, or San Benito counties. MTC may be tasked by Cal EMA to support coordination of transit resources for Santa Cruz, San Benito, and Monterey counties to provide overall regional coordination of mass transportation operations.

mechanism would be needed to enable MTC to facilitate coordination of mass transportation resources between the three-county area and MTC's nine-county jurisdiction. This is accomplished either through a relationship with an entity such as the Association of Monterey Bay Area Governments (AMBAG) or with the individual mass transportation agencies to facilitate transportation in Monterey, Santa Cruz, and San Benito counties. No formal coordination mechanism currently exists, but the relevant entities have made arrangements for communication and coordination after a disaster.

3.3.3 WETA

WETA is a regional agency that operates a Bay Area-wide ferry system, except for the ferries that are owned and operated by the Golden Gate Bridge, Highway and Transportation District (GGBHTD). WETA supersedes the San Francisco Bay Area Water Transit Authority (WTA). In a disaster, WETA's operational role is to:

- Plan, manage, and operate the emergency activities of all water transportation and related facilities in the San Francisco Bay Area, except those provided and owned by GGBHTD
- Coordinate with the REOC and MTC regarding the availability and allocation of water transportation and related facilities
- Implement the Emergency Water Transportation System Management Plan[10]

3.3.4 GGBHTD

Based in San Francisco, the GGBHTD operates the Golden Gate Bridge and two public transit systems: Golden Gate Transit buses and Golden Gate Ferry. GGBHTD plans, manages, operates, and coordinates the emergency activities of water transportation and related facilities within its jurisdiction, except for those provided and owned by WETA.

3.3.5 BATA

The Bay Area Toll Authority (BATA) was created by the California Legislature in 1997 to administer the auto toll on the seven State-owned toll bridges in the Bay Area (not including the Golden Gate Bridge): Antioch, Benicia–Martinez, Carquinez, Dumbarton, Richmond–San Rafael, San Francisco–Oakland Bay and San Mateo–Hayward. In 2005, the California Legislature expanded BATA's responsibilities to include the administration of all toll revenue and, together with Caltrans and the California Transportation Commission, the joint oversight of the toll bridge construction program. BATA manages revenues from all tolls levied on the seven State-owned toll bridges.

[10] The Emergency Water Transportation System Management Plan replaced the Regional Maritime Contingency Plan, which was intended to provide guidelines and recovery phases of a regional disaster. The Regional Maritime Contingency Plan was never formally adopted by the older WTA, and a new document may be necessary to reflect WETA policies and current conditions. For this Plan, it was assumed that the Emergency Water Transportation System Management Plan is a response and recovery document that WETA will activate automatically in a regional disaster.

BATA, a component of MTC, has developed partnerships with Caltrans, the CHP, and Cal EMA to provide regional emergency response. Through the 511 System, BATA can facilitate access to information on transportation alternatives, respond to media inquiries, and prepare and disseminate press releases.

3.4 State Agencies

During a disaster, the Governor coordinates statewide emergency operations through Cal EMA and its administrative and mutual aid regions. The California Emergency Services Act states: “During a state of emergency the Governor shall, to the extent he deems necessary, have complete authority over all agencies of the state government and the right to exercise within the area designated all police power vested in the state.”

3.4.1 Cal EMA

The Governor delegates authority to Cal EMA to implement the California Emergency Services Act and perform executive functions assigned by the Governor to support and enhance all phases of emergency management. Responsibilities include the promulgation of guidelines and assignments to the State government and its political subdivisions to support California’s emergency management system.

During a proclaimed State of Emergency or Local Emergency, the Cal EMA Secretary coordinates the response activities of all State agencies and has the authority to use any State government resource to fulfill mutual aid requests or to support emergency operations. Cal EMA operates the California State Warning Center 24 hours a day, 7 days a week, to receive and disseminate emergency alerts and warnings. When needed, the SOC and the REOCs are activated to coordinate emergency management information and resources. Cal EMA also coordinates the delivery of Federal grant programs under Presidential Emergency Declarations and Disaster Declarations.

3.4.2 Office for Access and Functional Needs

The Cal EMA Office for Access and Functional Needs was created to identify the needs of people with disabilities before, during, and after a disaster and to integrate disability needs and resources into all aspects of emergency management systems. During an emergency, this office assists the SOC in helping to meet the needs of access and functional needs populations. An Access and Functional Needs Evacuation Planning Toolkit was produced as part of a pilot project to support counties in planning for the evacuation and transportation needs of citizens during an emergency. The Office for Access and Functional Needs releases planning guidance on the transportation of access and functional needs populations as needed.

3.4.3 Caltrans

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 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 that include 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. District 4 also operates the region's Transportation Management Center (TMC) in its Oakland office in partnership with CHP. The TMC is co-situated with the District EOC and operates 24 hours a day. Similarly, District 5 operates the region's TMC located in its San Luis Obispo office in partnership with the CHP.

Each regional TMC contains functional sections such as communications, traffic management, 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 initial determination about the open/close status of State highway system roads resides with the TMC, but when the Caltrans District EOCs are staffed, the TMC serves to support the corresponding District EOC.

The SEP states that Caltrans is the lead agency to "coordinate all aspects of transportation, including ground, air, and waterway." In the San Francisco Bay Area, this responsibility is shared with MTC and WETA. In a catastrophic earthquake that affects the 12 counties addressed in this Plan, Districts 4 and 5 coordinate the emergency response activities.

3.4.4 CHP

CHP is responsible for law enforcement, security, and safety on California highways and bridges. CHP has Emergency Resource Centers in each of its eight divisions throughout the State, including the Golden Gate Division that serves the same nine Bay Area counties that Caltrans District 4 serves (see **Section 3.4.3**) and the Coastal Division that serves Santa Cruz, Monterey, and San Benito counties. CHP Emergency Resource Centers supply resources to CHP Incident Commanders. In the Bay Area, CHP is the primary source of information for highway conditions, capacity, and delays in conjunction with the 511 Traveler Information System and Caltrans.

3.4.5 National Guard

The California National Guard (National Guard) is the component of the U.S. National Guard in the State of California and comprises 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 National Guard may also be called into Federal service by the President or Congress.

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

The National Guard participates in statewide law enforcement, security, and evacuation activities through coordination with Cal EMA Law Enforcement Branch, CHP, California Department of Justice, California Department of Corrections, California Department of Forestry and Fire Protection, and other State agencies.

3.4.6 CDFA

The California Department of Food and Agriculture (CDFA) is the primary department for coordinating emergency activities related to food and agriculture, including animals during an evacuation.

During an evacuation, the CDFA coordinates with organizations that provide transportation resources and animal care personnel for affected animals. CDFA also coordinates with private-sector organizations dedicated to providing food, water, shelter, and care to animals. CDFA also oversees the California Animal Response Emergency Systems (CARES).

CARES is a system that coordinates resources and decisions once an incident escalates to a state-level emergency. As a county or local area exhausts its resources, it contacts the REOC to request assistance for additional resources and to make decisions on how best to respond. The REOC coordinates with the CDFA to identify and approve requested resources.

The CARES Plan describes the CARES emergency management organization; response goals, priorities, and strategies; direction, control, and coordination; alert and warning; intelligence gathering and situation reporting; public information; resource management; the sequence of events during disasters; and assignment of roles and responsibilities for the lead and supporting state agencies, supporting federal agencies, and supporting organizations. The CARES participants activate and respond to animal rescue, emergency care and shelter, veterinary care, and general assistance for animals at or near the facilities sheltering and caring for people.

3.5 Federal Agencies

3.5.1 FEMA

FEMA is the agency designated by the Stafford Act to manage the Federal response to major disasters in support of states. FEMA has ten regional offices, each headed by a regional administrator. The regional field structures are FEMA's permanent presence for communities and states across the Nation. The FEMA Region IX office has a staffed Watch Center to provide situational awareness and incident reporting. The office also supports three Incident Management Assistance Teams (IMATs) that provide initial support of response operations. The FEMA national IMAT is in Mather, California, and is deployed to provide Federal support for SOC operations, establish the UCG, and form the core of the Federal presence of the JFO.

3.5.2 Federal Emergency Support Functions

A Federal agency may support State and local response either under its own authority or as part of a coordinated Federal response under the NRF. Under the NRF, Emergency Support Functions (ESFs) provide the structure for coordinating Federal interagency support for a Federal response to an event. ESFs are mechanisms for grouping functions most frequently used to provide Federal support to states for declared disasters and emergencies under the Stafford Act and for non-Stafford Act events. Although ESFs are typically assigned to a specific section at the National Response Coordination Center (NRCC) or in the JFO/Regional Response Coordination Center (RRCC) for management purposes, resources may be assigned anywhere in the UCG structure. Regardless of the section in which an ESF may reside, that entity works in conjunction with other JFO sections to ensure that appropriate planning and execution of missions occur. Federal support for mass transportation operations is coordinated by ESF #1, Transportation, employing staff from the U.S. Department of Transportation (DOT) and other agencies.

3.5.3 Federal Agencies with Regional Representation

In addition to FEMA, numerous Federal agencies that have a role in mass transportation/evacuation efforts are represented in the region.

Within the framework of this Plan, Federal agencies in the region may respond by:

- Taking immediate action to protect their own facilities and personnel or respond to emergencies on lands for which they are responsible (e.g., Federal law enforcement personnel may take action to secure Federal buildings)
- Taking immediate action to save lives, protect public safety, and protect property
- Providing emergency services or resources when there are agreements between the agencies and local jurisdictions to do so
- Taking action under their own emergency response authority

The agencies that are relevant to mass transportation/evacuation operations and that have a presence in the region are discussed in the subsections below.

3.5.3.1 DOT

DOT is the coordinating agency for ESF #1, Transportation. 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 disaster on transportation operations, nationally and regionally, and report promptly to emergency management agencies 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, including safety- and security-related actions concerning movement restrictions, closures, quarantines, and evacuations.

3.5.3.2 FAA

- 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 disasters. In a disaster, the FAA evaluates information provided by airports regarding conditions (e.g., damage to runways, communications, navigation, and air traffic control systems) and may restrict traffic at airports depending on the conditions.

3.5.3.3 MARAD

The DOT Maritime Administration has 13 ships in the Bay Area that may be available for use in a disaster. The ships are currently located as follows:

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

3.5.3.4 DoD

The Department of Defense (DoD) has a broad range of capabilities that may be used to support the response to a disaster. Although the availability of resources is subject to competing missions that may take priority over disaster response, large numbers of vehicles, aircraft, ships, and other equipment may be requested through the Defense Coordinating Officer. Basic capabilities include:

- **Air.** DoD can provide heavy- and medium-lift rotary-wing aircraft, short-field fixed-wing aircraft, specially configured medical evacuation aircraft, maintenance crews, and logistical support for air operations.
- **Sea.** DoD can provide ships for transportation, movement of resources across the Bay, movement of cargo to shore via cranes and ramps, bases for helicopter operations, support for other small boat operations, berthing for emergency service workers, pier-side water and power generation, and medical care.

- **Land.** DoD can provide trucks, material-handling equipment, and construction equipment.

3.5.3.5 USCG

The 11th USCG District's jurisdiction covers the State of California, including the ports in the San Francisco Bay Area and the Sacramento–San Joaquin River Delta. The 11th USCG District command with jurisdiction over the Bay Area is USCG Sector San Francisco, headquartered on Yerba Buena Island.

In a disaster, the USCG:

- 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 opening or closing 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 Sacramento–San Joaquin River Delta

3.5.3.6 USACE

The U.S. Army Corps of Engineers (USACE) has responsibility for maintaining the serviceability of navigable waters in the United States. In a disaster, USACE directs and coordinates debris removal and other channel-clearing operations to restore water access to ports and ferry landings. USACE also assists with restoration of other critical infrastructure and general relief efforts such as the distribution of food, water, and other critical supplies.

3.5.3.7 Department of the Interior, National Park Service

Charged with protecting America's natural and cultural resources, the Department of Interior and its Bureaus, such as the National Park Service, U.S. Fish and Wildlife Service, and U.S. Geological Survey, have a broad range of capabilities to support emergency response and recovery efforts. The Golden Gate National Recreation Area's jurisdiction in the Bay Area includes lands in Marin, San Francisco, and San Mateo counties. In a disaster, a large number of emergency service workers—law enforcement, maintenance, air operations, boat operations, and scientific and engineering personnel—can be provided, including self-supporting Incident Management Teams through the National Emergency Incident Coordination Center. The Golden Gate National Recreation Area's law enforcement and U.S. Park Police are members of the Golden Gate Bridge Security Coalition in partnership with the GGBHTD, CHP, USCG, Joint Terrorism Task Force, and others.

3.6 Private-Sector Entities and NGOs

Some private-sector entities, such as privately owned utilities and transit companies, have a direct role in the response to a disaster. Others may assist by providing response and recovery resources to help their communities in general or their customers in particular. NGOs also have roles in the response to a disaster under the NRF and through agreements with local emergency management agencies.

Among the responsibilities of private-sector entities and NGOs are:

- Transporting goods, providing equipment, removing debris, and performing other response and recovery functions under contracts with local and State governments.
- For organizations that perform a vital public service, such as private-sector utilities, providing status reports through private-sector liaisons to local EOCs, Operational Area EOCs, the REOC, or the SOC.
- Coordinating with government agencies engaged in the emergency response to facilitate effective restoration of services.
- Upon request, sending liaisons to local EOCs, Operational Area EOCs, the REOC, or the SOC to coordinate response and recovery activities.
- Providing response and recovery services as designated through memoranda of understanding or other agreements. For example, the ARC, which is represented in the REOC Care and Shelter Branch, the SOC, and most Operational Area EOCs, may provide care and shelter for displaced persons during a regional disaster.
- Providing resources in response to a Governor's Order, as authorized by Section 10.7.5 of the State of California Emergency Plan (2009).

3.6.1 Private and Nonprofit Transportation Providers

Numerous transportation providers may be able to assist in mass transportation operations, including the following:

- Greyhound Lines
- Coach America
- Bayline Tours
- Veolia Transportation
- Bay Area Ski Bus
- Privately-owned taxi companies
- Pre-qualified private contractors, such as Amtrak, etc.
- School buses (contracts with school districts must be modified)
- Smaller nonprofit paratransit operators in the 12-county region

3.6.2 UAN

Founded in 1987, UAN is an NGO that focuses on bringing animals out of crisis and strengthening the bond between people and animals through a variety of programs, including emergency sheltering, disaster relief services, financial assistance, and education. Through its volunteer-driven Emergency Animal Rescue Service, UAN shelters and cares for animals displaced by natural disasters and other crises in the United States and Canada, such as criminal seizures and hoarding cases.

The primary role and responsibility of UAN in a disaster is to put up temporary animal shelters and provide care for displaced animals or animals rescued from mass cruelty situations at temporary shelters. UAN also provides financial assistance to pet owners, Good Samaritans, and rescue organizations to obtain urgent veterinary care. UAN works with the Humane Society of the United States (HSUS) to accept pets at their shelters. UAN does not rescue or transport pets in a disaster.

3.6.3 HSUS

HSUS is an NGO and the largest animal protection organization in the United States. It was established in 1954. HSUS seeks a humane and sustainable environment for all animals and operates its own network of sanctuaries, providing care and homes to animals. HSUS provides evacuation guidance to pet owners, is able to deploy animals rescue teams to assist in emergency pet evacuations, and responds to urgent requests from other organizations to help move homeless animals out of the shelters. HSUS is the primary organization for transporting animals to temporary shelters in a disaster.

3.6.4 CUEA

The California Utilities Emergency Association (CUEA) was chartered in 1952 as part of the state's Civil Defense Plan. CUEA was created by a Joint Powers Agreement to represent California utilities on utility disaster-related issues.

CUEA provides structure for communications and coordination among government agencies and public and private utilities throughout the State of California. CUEA's job is to provide disaster responses support, wherever practicable, for gas, electric, water wastewater, telecommunications (including wireless), and petroleum pipeline utilities. The purposes of support are to preserve lives and property and protect California's economic infrastructure.

CUEA provides a structure for efficient communications and coordination among government agencies, public and private utilities, and community-based organizations throughout the State. The association's activities focus on emergency preparedness, response, restoration and recovery as well as mitigation activities. The association assists with operational and business continuity for gas, electric, water, wastewater, telecommunications, and pipeline utilities in California.

3.6.5 California Resiliency Alliance

The California Resiliency Alliance is a public-private partnership to improve disaster response and community resiliency across California. The intent of the organization is to mobilize California's businesses in advance to improve community resiliency through the Operational Areas. This provides four main areas of collaboration between the public and private sectors during a disaster:

- Cross-sector coordination, where businesses link to state and local government emergency operations centers and information "fusion centers" to improve communication and coordination during disasters.
- Public health collaboration, where companies assist public health departments in a pandemic or biological attack.
- Disaster resource collaboration, where businesses pledge resources such as facilities, equipment, and transportation through a web-based disaster asset registry.
- Expertise and technology collaboration, where businesses offer best practices and civic leadership to help government improve prevention, response, and recovery.

Numerous public- and private-sector companies are involved in this partnership, including the MTC, Bank of America, East Bay Municipal Utilities District, eBay, Kaiser Permanente, Santa Clara Water District, Wells Fargo Bank, Alameda County Public Health, Cal EMA, Santa Clara University, ARC Bay Area, and ARC Silicon Valley.

4 Coordination and Communication

This section provides guidance for coordinating the many agencies responding to the disaster. It also addresses the collection, management, and distribution of critical information, both among agencies and to the general public.

Figure 4-1 depicts the regional transportation emergency management organization as it relates to inter-agency coordination and command.

4.1 Activation and Incident Coordination

This section describes the process used to manage evacuations by organizations at the various levels of government. It explains how levels of government responsible for managing mass transportation systems activate for incident response and coordinate with each other during a disaster. This section also provides a summary of the relevant guidance in reference documents such as the SEP, the CONPLAN, the Regional Transportation Emergency Management Plan, and the RECP.

4.1.1 Local and County Governments

California's system for incident management and for providing support and resources to local governments is governed by SEMS. Local governments are generally responsible for disaster response such as ordering and managing evacuations within their boundaries. Some local governments contract with other agencies for some of the municipal services required for evacuation operations. Operational Areas are responsible for coordinating evacuation operations between governments within the county.

4.1.1.1 Local Governments

In accordance with SEMS, decisions about responding to and recovering from a disaster such as a catastrophic earthquake are made at the lowest possible level. To support general disaster response and manage evacuation operations, local and regional mass transportation agencies have developed their own emergency operations plans that address internal procedures, operations, and response protocols to be implemented during a disaster. The processes and procedures described in these plans are activated after a catastrophic earthquake.

Transit agencies and special transit districts such as Transportation Authorities have primary responsibility in disasters for restoring the services they normally provide and for responding to requests for assistance with emergency transportation. They are also responsible for the safety of people at their facilities and on their property and for warning about the hazards at their facilities or operations. Transit agencies have their own emergency response plans to support restoration of service. As the agencies restore systems and reconstitute capability, they assist local and county governments with mass transportation/evacuation operations.

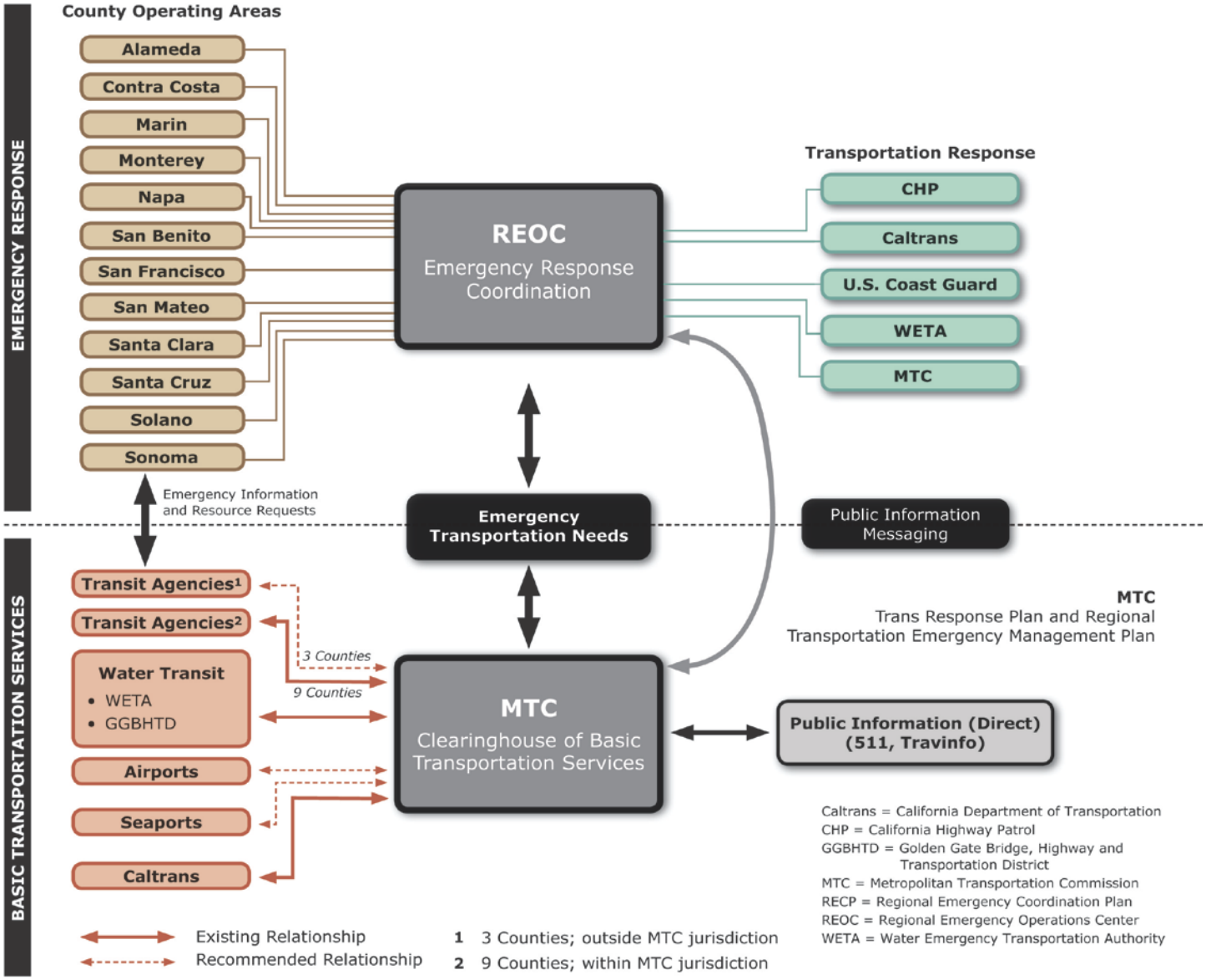

Figure 4-1. Transportation emergency management organization.

4.1.1.2 Operational Areas

Operational Areas are the jurisdictions that are responsible for coordinating emergency response within the county area, including cities, special districts, and unincorporated areas of the county. Operational Areas activate their EOCs as soon as practicable in a disaster. In response to a disaster, the affected Operational Areas:

- Assess the need to conduct evacuation operations, the status of transportation networks, and the resources available to support evacuation of populations unable to evacuate on their own
- Transmit requests for emergency and basic transportation resources to local mass transportation agencies directly
- Forward requests to the REOC when local transportation agencies are unable to provide needed resources, either directly or through mutual aid in coordination with MTC
- Communicate directly with the SOC in Sacramento until the REOC is activated or if the REOC is incapacitated (the SOC assumes responsibility for REOC functions when the REOC is not operational)
- Provide information and updates about the condition of their affected jurisdictions, including reports on the status of the event, damaged areas and infrastructure, affected populations, and other pertinent information
- Support evacuation orders, as applicable, issued by cities or counties

4.1.2 Regional Organizations

A number of organizations at the regional level support mass transportation/ evacuation operations as part of the overall response.

4.1.2.1 REOC

When activated during a disaster that requires mass transportation/evacuation operations, the Coastal REOC coordinates information, resources, and response activities of State and regional agencies. Because of extensive damage to building and transportation infrastructure in Oakland, the REOC facility may not be functional. Its functions are immediately assumed by the Regional Duty Officer until activation of the alternate REOC. If an alternate REOC cannot be established in the Coastal Region, the Duty Officer works with the Cal EMA Executive Duty Officer to identify an alternate REOC location. Activation procedures in support of mass transportation/evacuation operations include:

- Notifying the affected Operational Areas, MTC, Caltrans, WETA, CHP, and the USCG that the Transportation Branch within the Operations Section of the REOC has been activated
- Confirming the names and contact information of emergency response liaisons for these agencies and establishing their means of coordinating with the REOC

- Evaluating needs and priorities in the region to serve as arbiter between competing requests (see Appendix D of the RECP Transportation Subsidiary Plan for procedures on regional decision-making)
- Directing its staff on the response underway (restoration of basic transportation services is addressed by MTC, WETA, and mass transportation agencies)
- Maintaining communication with MTC, Caltrans, WETA, and CHP regarding the status of the regional transportation system, including damage, incapacitation, or closure of facilities; casualties sustained on transportation systems; and capabilities available to respond to the transportation needs of affected Operational Areas
- Maintaining communication with Operational Areas regarding transportation capabilities and needs, including their efforts to move resources into the affected portions of each county, to move people who are injured or in danger out of the affected area, and to move access and functional needs populations in need of medical care
- Coordinating the prioritization of transportation resource requirements (both land and water resources) with MTC, Caltrans, WETA, and other State and Federal agencies
- Maintaining communication with Operational Areas regarding basic transportation capabilities and needs
- Receiving communications from MTC, WETA, Caltrans, or others, as appropriate, about the prioritization of transportation resource requirements for the restoration of basic transportation service
- Coordinating with MTC, WETA, and the State Joint Information Center (JIC), if necessary, on the compilation and distribution of transportation-related information to be released to the public and media

During a regional disaster, MTC, WETA, Caltrans, CHP, and the USCG are transportation entities that coordinate directly with the Cal EMA Coastal Region to provide information and respond to requests for resources. In addition, these entities are part of the Transportation Branch of the Operations Section. Regional entities activation processes are described in the subsections below.

4.1.2.2 MTC

MTC automatically activates its EOC, the RTEMP, and the TRP during a disaster or at the request of Cal EMA or two or more Bay Area transportation agencies. During regional disasters, the RTEMP and the TRP provide the means of informing responding agencies and the general public about the changing transportation situation and facilitate the coordination of the transportation component of the response. MTC follows procedures detailed in the RTEMP. Key activation steps include:

- Activating the MTC EOC
- Providing an agency representative to the Transportation Branch of the Operations Section of the REOC (either physical or virtual) as needed

- Activating the RTEMP and TRP
- Establishing communication with major mass transportation agencies via conventional means (such as through the Internet and telephone lines) and/or via satellite telephone system
- Activating the coordination mechanism—established with AMBAG or Santa Cruz Metro, Monterey–Salinas Transit, and San Benito County Transit—for sharing information via phone calls, submitting status reports to MTC and/or other means and sharing resources (if applicable)
- Notifying the REOC and the mass transportation agencies of those activations and establishing the schedule for collecting the MTC Status Reports from the mass transportation agencies (for all 12 counties, if applicable) to compile into a Regional Summary Report

4.1.2.3 WETA

WETA is a regional agency that operates a Bay Area-wide ferry system, except for the ferries that are owned and operated by GGBHTD. After the earthquake, bridges and tunnels serving transbay corridors are closed because of damage or for assessment of damage. Ferries and other maritime assets may play a vital role in the response and also by providing basic transportation services. During the response and recovery, ferries are an essential resource for the following:

- Transporting emergency service workers to affected areas
- Transporting supplies and equipment to affected areas (not including cargo such as containers)
- Responding to Operational Area requests for assistance with evacuations
- Providing the public with basic transportation, especially where portions of highways or passenger rail systems are closed to the public

Ferries are also a resource for both response-related and basic regional transportation via expanded services on existing routes and temporary service in relief of other damaged or otherwise closed transportation facilities. Response-related transportation is given a higher priority than basic transportation.

In a disaster, WETA follows the procedures of the Emergency Water Transportation System Management Plan. Key steps are:

- Activating the WETA command, control, and coordinating facility
- Establishing communications with MTC, the REOC, and the GGBHTD ferry operations
- Providing an agency representative to the Transportation Branch of the Operations Section of the REOC (either physical or virtual) as needed
- Communicating directly with the USCG, GGBHTD, private passenger vessel operators, ports, and the Marine Exchange to establish the nature of the disaster and the status of area vessels, facilities, and other maritime assets that may be deployed in response to the event

- Establishing the types and levels of ferry services that it provides and identifying the types and levels of ferry service that the GGBHTD can and will provide

4.1.3 State Government

As described in the SEP, California responds to disasters through an existing statewide emergency management infrastructure that operates according to SEMS. To support the implementation of SEMS, Cal EMA has established REOCs in three administrative regions. The REOC in the region affected by the disaster coordinates with the Operational Area EOCs to obtain situation status, coordinate requests for resources, and communicate resource requests to the SOC when the requests cannot be met at the regional level.

The Governor may direct State agencies, including the National Guard, to provide resources in support of field-level Incident Command. Lead and support State agencies for specific functions are identified in the SEP. Cal EMA issues mission tasks to direct State agencies to undertake response operations.

California may obtain out-of-state resources through state-to-state arrangements or through the EMAC, to which California is a signatory.

State transportation-specific agencies that support State and regional response operations and that provide direct staff liaisons to the REOC include Caltrans and CHP.

4.1.3.1 Caltrans

In accordance with the SEP, Caltrans is the lead agency in coordinating all aspects 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. Caltrans District 4 is responsible for State highways and bridges (with the exception of the Golden Gate Bridge) in its 9-county jurisdiction in the Bay Area. During a disaster, Caltrans:

- Providing an agency representative to the Transportation Branch of the Operations Section of the REOC (either physical or virtual) as needed
- Establishes communications between Caltrans Districts 4 and 5 TMCs and the REOC
- Communicates directly with the SOC as needed
- Assesses the conditions of State highways and bridges
- Estimates the time required for repair of State highways and bridges, if necessary
- Determines potential road restrictions or closures
- Establishes alternate routes in coordination with CHP
- Transmits information about the condition of the State highway system to the REOC, MTC, and WETA

- Responds to requests from the affected Operational Areas for essential, supportive services related to the State highway infrastructure to help emergency service workers access affected sites, coordinating through Cal EMA

4.1.3.2 CHP

CHP is responsible for law enforcement, security, and safety on California highways and bridges. In the Bay Area, in conjunction with the 511 Traveler Information System and Caltrans, CHP is the primary source of information for highway conditions, capacity, and delays. CHP is responsible for the following required evacuation-related activities:

- Providing an agency representative to the REOC (either physical or virtual) and staffing the Transportation Branch of the Operations Section as needed
- Securing routes, regulating traffic flow and enforcing safety standards for evacuation and re-entry into an evacuated area
- Coordinating interstate highway movement on regulated routes with adjoining states
- Establishing highway safety regulations consistent with location, type and extent of event conditions
- Supporting Caltrans with traffic route re-establishment and continuing emergency traffic regulation and control procedures as required

4.1.4 State Government and Military Resources

The Governor, either directly or through mission taskings assigned by Cal EMA, may deploy the National Guard to support the response and recovery. Similarly, DoD resources may be activated through mission assignments from FEMA to the Defense Coordinating Officer (DCO) and Defense Coordinating Element (DCE), which are activated to support the DCO. As described above, the DCO and the Adjutant General may represent the DoD and National Guard, respectively, in the UCG to ensure effective coordination of, and use of, State and Federal military resources. DoD and National Guard operations in the field are directed by one or more task forces or joint task forces operating under proper State and Federal authority. Although military resources operate under the authority of a task force or joint task force commander, the commander works with and supports the UCG to achieve unity of effort.

Commanders of DoD installations may act for a limited time under their own authorities to assist local governments in saving lives, protecting public health and safety, and protecting property in the immediate response to a disaster for a limited period. Individual commanders are required by DoD policy to exercise their authorities under “imminent serious” conditions and deploy available resources to save and sustain lives in the immediate vicinity of the installation. However, as for other State and Federal agencies, once the UCG is established, response activity

directed under a local commander's authority is replaced by the mission assignment process and folded into the overall Federal response.

4.1.5 Federal Government

When Federal assistance is required, Cal EMA coordinates requests for assistance and participates with the Federal Government to establish a UCG and operate the JFO. JFO operations are conducted in accordance with the CONOP.

To meet the response needs of a catastrophic event as effectively as possible, the CONOP calls for State and Federal governments to form a UCG to consolidate disaster-related operational elements of the REOC, the SOC, and the IMAT at the JFO. Forming the UCG is a decisive task that is aimed at achieving effective incident management. The UCG does not assume responsibility for field-level Incident Command activities but provides a structure for the command, control, and coordination of State and Federal resources not yet delivered to the Operational Areas, field-level Incident Command, or end users. The UCG directs coordinated, combined State and Federal operations in accordance with Unified Command principles.

Upon notification that a disaster has occurred, FEMA immediately activates its nationwide logistics system including standby mass transportation contracts to mobilize resources required for the response. The FEMA/California resource response system includes the following components:

- **Federal Mobilization Centers.** Temporary Federal facilities established for the incident at which commodities, equipment, and personnel can be received and pre-positioned for deployment as required. Resources at these centers remain under the control of the FEMA NRCC until deployment to the affected area is required.
- **National Logistic Staging Areas.** 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 resources may be supplied from Logistics Centers, Mobilization Centers, or vendors and are under the control of the Operations Section of the JFO. For the scenario earthquake, the following are potential National Logistic Staging Areas:
  - Travis Air Force Base in Solano County
  - Beale Air Force Base in Yuba County
  - Lemoore Naval Air Station in Kings County
- **State Staging Areas.** Temporary facilities where Federal commodities, equipment, and personnel are received following State requests and the point at which cost-sharing is initiated. For the scenario earthquake, State Staging Areas for transportation resources are not anticipated. Mass transportation resources are routed from operable transportation yards based on availability of services such as fuel.

As the State identifies mass transportation resource requirements in the affected area, FEMA may deliver resources and transfer them to State control at any one of the following:

- Where the resource is needed
- Incident Command Post in a local jurisdiction
- Transportation Depots
- State Staging Area
- National Logistic Staging Area
- Mobilization Center

Determining the prioritization and allocation of Federal resources is accomplished as part of the Action Plan process under the direction of the UCG and is based on requests made to Cal EMA by the affected Operational Areas.

4.1.5.1 USCG

The 11th USCG District command with jurisdiction over the Bay Area is USCG Sector San Francisco, headquartered on Yerba Buena Island. During a disaster, the USCG:

- Provides an agency representative to the REOC
- Coordinates activities undertaken through the Emergency Water Transportation System Management Plan with the REOC and WETA
- 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, and notifies the REOC and WETA of these decisions
- 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 Sacramento–San Joaquin River Delta
- Maintains communications with WETA regarding waterway navigability and security

4.1.5.2 FAA

The FAA oversees the operation and regulation of the U.S. National Airspace System, including the operation of that system during disasters. Under certain conditions, the FAA may delegate the use of specified airspace for national defense, homeland security, law enforcement, and response (such as search and rescue) missions but retains control of the airspace at all times. FAA may also implement air traffic and airspace management measures such as temporary flight restrictions in conjunction with these missions. During a disaster, the FAA evaluates information provided by airports regarding conditions (e.g., damage to runways,

communications, navigation, and air traffic control systems) and may restrict traffic at airports depending on these conditions.

4.1.6 Tribal Governments

There are 32 federally recognized Native American tribes in the Cal EMA Coastal Region. Under the Stafford Act (42 U.S.C. § 5122[B]), Indian tribes and other authorized tribal organizations are categorized as local governments. Within SEMS, tribal governments may coordinate their efforts and requests for resources through Operational Area EOCs in their respective counties. Consequently, coordination with the tribes follows that of coordination with other local governments.

4.1.7 Governments of Other States

California may obtain out-of-state resources through state-to-state arrangements or through the EMAC, to which California is a signatory. Initially, this process occurs at the SOC where decisions to request resources from other states or through EMAC are made based on whether local, mutual aid, or State agency resources are otherwise available. As the joint State/Federal organization shifts to the JFO, the decision to request resources from other states or through EMAC is made by Cal EMA in concert with the joint Operations Section as part of the process for evaluating the availability of resources to carry out operational objectives.

4.2 Information, Coordination, and Resource Requests

Communications between the Operational Areas, mass transportation agencies, regional authorities, State and Federal agencies, and with other organizations engaged in the response follow protocols and procedures established for existing State and Federal systems, with modifications necessary to account for disruptions caused by the event. California has established essential communications support procedures between the Operational Area EOCs, the Cal EMA Regions, the SOC, and other State agencies to provide the information links for elements of the California emergency organization. The communications infrastructure includes the use of the Response Information Management System (RIMS), the Operational Area Satellite Information System, and the California portion of the National Warning System.

The existing systems are supplemented through the establishment of systems necessary to support event-specific facilities such as the JFO and Federal staging areas. Through agreement with Cal EMA, FEMA defines requirements for the systems required at these sites and provides resources to establish them. Once the UCG transfers operations to the JFO, communications links are established through Cal EMA to allow implementation of State functions, such as communications with the Operational Areas.

Details of the State and Federal emergency management communications systems are described more fully in the CONPLAN Annex C, Operations, and the RECP Communications Subsidiary Plan.

4.2.1 Emergency Communication Systems

Operational Areas, local governments, transportation agencies and other entities involved in mass transportation/evacuation operations use a variety of systems to maintain communications during a disaster, including:

- California Emergency Services Radio System
- CHP Statewide Land Mobile Radio (LMR) System
- Caltrans Trunked LMR System
- San Francisco Bay Area MTC Satellite Radio Network
- BART Regional Trunked LMR Simulcast System
- Amateur Radio Emergency Service

Additionally, most mass transportation agencies rely on radio systems or cell technology push-to-talk systems for communications from dispatch centers to vehicle operators. WETA has the additional capability of using marine band very high frequency radio communications to direct operations of the ferries that it can place into service for emergency transportation operations during a disaster.

See the RECP Communications Subsidiary Plan and the CONPLAN for detailed information regarding the capabilities and protocols for operations to establish and sustain emergency communications following an earthquake.

Many communications systems may have limited or no operational capability after an earthquake because of damage to system components.

4.2.2 Intelligence and Information Sharing

“Intelligence” can be defined as information with value. Intelligence is information that has been collected, analyzed, vetted, and disseminated in a timely fashion. To be useful to decision-makers, intelligence is tailored to meet articulated requirements. Intelligence is provided to decision-makers in a simple, understandable, and focused manner. Intelligence collection and analysis are among the most critical components of formulating an effective response to a disaster.

During a disaster, the degree to which key decision-makers at all levels of government and within interagency structures are able to gain and maintain a situational awareness on the scene determines, to a great degree, their ability to anticipate requirements and provide appropriate resources. Real-time situational awareness also facilitates timely and knowledgeable information-sharing with elected and appointed officials, the public, and the media. It is also imperative that leaders at all levels of government and within the interagency structures not only have the same information but also focus on obtaining and maintaining situational awareness based on established priorities. All appropriate sources of information must be included in a comprehensive collection plan. The information collection plan is initially promulgated by the REOC, if functional, and may later move to the joint Planning Section of the JFO.

4.2.2.1 Critical Information

Critical information can be generally defined as data focused on the operational objectives established by the UCG. The CONPLAN identifies critical items of information that are needed by leadership by a particular time for response-related decision-making. For example, critical information necessary during the immediate response may relate to the status of transportation system damage, number and categories of evacuees, status of transit agency resources systems, and status of transportation-associated EOCs and department operation centers. To assist the REOC and the UCG in formulating appropriate joint objectives based on a common operating picture, a formal reporting methodology must be provided to all levels, including Operational Areas, Branches, Divisions, and any State or Federal organizations, to focus collection efforts on critical information.

Appendix D contains critical information requirements for mass transportation/ evacuation operations after an earthquake.

4.2.2.2 Sources of Information

People who are in the affected areas are able to provide the most accurate information. Incident Commanders and the Planning Sections in their Incident Management Teams are often the most reliable source of information. Planning Sections at various levels analyze information and turn the information into useful intelligence for managers and senior leaders. This step is vital in terms of providing data that decision-makers need to be able to prioritize activities and to deploy and use critical, but often limited, resources.

Immediately after an earthquake, mass transportation agency personnel begin reporting on the effects of the earthquake, often spontaneously. The reports flow to dispatch centers, EOCs, and other points of collection. All transportation agency personnel deployed in the field at the time of the earthquake:

- Assess the situation and identify any possible threats to life and safety
- Make note of critical information such as damage to facilities and equipment, casualties, location of stranded transit vehicles, number of stranded passengers, status of roadways and rail tracks, geographic areas of concentrated damage, and status of service
- Report time-sensitive life-safety information to their dispatcher and/or EOC immediately
- Report non-life-safety information to the dispatcher and/or EOC as soon as possible

Additional sources of information may include:

- Information from local governments, through RIMS and other means of communication
- National technical sources
- Media monitoring

4.2.2.3 Situation Reporting

The REOC initially serves as the point of collection for information on the status of transportation networks based on the operational period it selects. In the first four hours after an earthquake, MTC collects initial damage assessments from transportation agencies, and develops a Regional Summary Report that is documented in the Situation Report. The Situation Report is input into RIMS, where transportation agencies, Operational Areas, the REOC, and WETA can read the Situation Report if they have access to RIMS. Other agencies such as USCG, WETA, Caltrans, and CHP have similar plans for providing input to the Situation Report. Information obtained from local governments, Operational Areas, regional agencies, the REOC, and the SOC is shared through RIMS and other means of communication. Initial reports are submitted at E+12 hours and E+24 hours, with regular updates following a schedule to be determined based on the scope of the disaster.

4.3 Communication with the Public

During a disaster, affected local government agencies disseminate information to keep the public informed about what has happened, the actions of response agencies, and the expected outcomes of the actions. For mass transportation/ evacuation operations, the information includes road closures, status of mass transportation systems, and hazardous materials spills/responses procedures.

Information about the State highway system is included in these announcements as information is received and disseminated by MTC and other transportation authorities.

The Cal EMA Office of Public Information and Media Relations coordinates the State emergency public information efforts and provides support to other State agencies (e.g., Caltrans) to ensure that the State government issues timely, clear, concise, and consistent messages. After formation of the UCG, the functions of the Public Information Office at Cal EMA Headquarters are transferred from the SOC to the JFO.

Once formed, the JIC distributes public information at the local government level when:

- The local government is overwhelmed
- Critical information needs to be disseminated quickly
- Consistent emergency information, such as highway and local road closures, is critical for the multiple response agencies and levels of government that are involved in the response

4.3.1 Public Messages: Alerts and Information

Disasters generate immense, sustained messaging needs that are likely to overwhelm local public messaging resources and require a coordinated effort from all levels of government. Public messaging activities during a mass transportation/

evacuation disaster are designed to provide the public with the information and instructions they need to evacuate safely and efficiently.

The target audiences for public messaging are evacuating populations, those sheltering in place, members of the public in pass-through communities and host jurisdictions, and the public at large.

Public messaging requires coordination among affected and unaffected jurisdictions; activities occur concurrently through local, State and Federal governments. Agencies work together to ensure that messages are consistent, timely, and disseminated through multiple channels.

During a disaster, government agencies disseminate two types of messages to the public: alerts and information. This Plan defines an alert as an urgent message regarding an imminent threat to human life or safety. All other messages are considered information. Classification as an alert or information determines not only the entities responsible for and involved in message development and dissemination but also the channels through which the message is delivered. See **Table 4-1**.

Table 4-1. Public messages: alerts and information.

Message Component	Type of Message	
	Alert	**Public Information**
Content	Information and instructions for members of the public to protect themselves from imminent threats to their lives and/or safety. Messages may direct receiver to additional sources for information.	• Less urgent than an alert. May include information about: • Actions the public should take • The event (what has happened) • Current and anticipated emergency response activities • Rationale supporting response decisions • Projected outcomes from the event and response activities May direct receiver to additional sources for information.
Length	May be limited to ensure that: • The public can act quickly on information and instructions • Information and instructions can be delivered through multiple warning systems	Contains as much detail as needed
Primary delivery	• Alert and warning systems (e.g., EAS, EDIS) • Traditional media (dissemination is managed by the SOC JIC)	• Traditional media • Social media The SOC JIC manages dissemination for both traditional media and social media.

Source: URS analysis (2009)
EAS = Emergency Alert System
EDIS = Emergency Digital Information System
JIC = Joint Information Center
SOC = State Operations Center

4.3.1.1 Coordination: Message Development

Operational Area Responsibilities

Public messaging is the responsibility of all levels of government. In accordance with SEMS/NIMS guidelines, messaging is managed at the lowest possible level. Operational Areas and local governments are responsible for determining priorities for public alerts and information within their own jurisdictions and for disseminating messages appropriately through their own mechanisms and the media.

The Operational Area EOC JIC coordinates public information message development for all the local governments it represents. Additionally, to manage public information at the field level, the Operational Area EOC JIC identifies critical information venues and deploys Public Information Officers (PIOs) to those venues as staff becomes available. Because State and Federal agencies may also deploy PIOs to these sites, it may be necessary to coordinate public information and alerting activities from these venues with the State/Federal JIC.

State Responsibilities

The SOC collects information from evacuating, pass-through, and host Operational Areas regarding evacuation, operations, and event impacts in those areas. The SOC JIC compiles this information along with information about State-level response activities. The SOC JIC disseminates these comprehensive messages statewide.

Cal EMA and other State agencies coordinate public alerts and information on a regional and statewide basis. The SOC JIC, led by the Cal EMA Office of Public Information and Media Relations, coordinates the State emergency public alert and information efforts and provides support to other State agencies (e.g., MTC, Caltrans) to ensure that State government issues timely, clear, concise, and consistent messages. During an event of this type, MTC operates its own JIC to coordinate specific information among transportation regional agencies. The MTC JIC also functions as an entity within the SOC JIC.

Cal EMA initially carries out public alert and information functions through the JIC at the SOC in Mather, California. When possible, the SOC provides a representative to the REOC to help coordinate messaging in the region.

Accordingly, the SOC JIC coordinates with the evacuating, pass-through, and host Operational Areas via the REOC to gather situational and response information. The Lead PIO at the Operational Area EOC JIC provides information to the SOC PIO representative at the REOC, who in turn coordinates with the SOC to develop and disseminate to the general public comprehensive messages that emphasize a holistic perspective on the situation.

Additional support, as needed and available, is drawn from other State agencies, volunteers, or participants in the Emergency Managers Mutual Aid Program.

Federal Responsibilities

Through the SOC JIC, FEMA and other Federal Agencies work with the State to ensure that messaging by the Federal government is consistent with local, Operational Area, and State operations. When individuals are evacuated outside the State, FEMA Region IX representatives coordinate with the SOC PIO at the SOC JIC to develop and deliver messages to those evacuees.

After formation of the UCG, the functions of the Office of Public Information and Media Relations at Cal EMA Headquarters are transferred from the SOC to the JFO. Once formed, the JFO JIC distributes public alerts and information at the Operational Area or local government level when:

- The Operational Area or local government is overwhelmed
- Critical information needs to be disseminated quickly

4.3.1.2 Key Public Information Elements

In a mass evacuation, public messaging is the primary means of getting the public to take recommended protective actions. Messages are written in a way that accurately conveys information, relevant risks, and recommended actions. The efficacy of the messages depends largely on the way they are constructed and the channels through which they are communicated.

Priorities and content for public information and messaging evolve as the response to the disaster proceeds. For the purpose of this Plan, general themes for public messaging have been defined for three phases: Initial Notification, Evacuation Informational Updates, and Post-evacuation Informational Updates. See **Appendix E** for messaging guidance for the three phases and sample messages.

Initial Notification

Because evacuation orders are issued by local governments, Initial Notification originates from within the evacuating Operational Area. Evacuating, pass-through, and host Operational Areas disseminate the public messaging coordinated by the SOC and REOC, to members of the public within their respective jurisdictions. They are also likely to develop and disseminate their own messages to the public within their jurisdictions.

If the evacuation route takes evacuees beyond their home Operational Area, Cal EMA is responsible for coordinating information across multiple Operational Areas so local governments can develop consistent, comprehensive messages for evacuees, including any necessary instructions for evacuees regarding evacuation routes through other Operational Areas and instructions upon arriving in the host Operational Areas.

The SOC collects evacuation information from evacuating, pass-through, and host Operational Areas via the REOC to craft and disseminate holistic situational and response messages to the general public. Messages are tailored to capture a

holistic perspective of evacuation efforts and include State agency response activities.

Evacuation Informational Updates

Messages communicated along evacuation routes during inter-Operational Area evacuations are the responsibility of the REOC and SOC, which coordinates messaging with the involved Operational Areas through the appropriate REOCs. Messages along evacuation routes are delivered primarily through Caltrans road signage, EAS, and EDIS. CHP officers may play a field role in sharing information, instructions, and directions to evacuees during evacuation.

Operational Areas continue to develop and disseminate messages to evacuees along the evacuation route in their jurisdiction and to the general public in the Operational Area.

The SOC JIC continues to gather evacuation information from evacuating, pass-through, and host Operational Areas via the REOC to create and disseminate holistic situational and response messages to the general public in California. Messages also include information about State agency response activities.

Post-Evacuation Informational Updates

Within California, Cal EMA may develop messages for evacuees and coordinate message delivery with authorities in the host jurisdiction. Individuals evacuated out-of-State receive this information through Federal communication channels.

The SOC JIC continues to gather information from evacuating, pass-through, and host Operational Areas via the REOC to craft and disseminate holistic situational and response messages to the general public in California. Messages also include State response activities.

4.3.2 Communications Methods and Systems

Multiple systems at all levels of government are used to enhance the likelihood that target audiences simultaneously receive messaging from both the Operational Area and the State. For this reason, it is especially important that message delivery be coordinated effectively between Operational Area and State representatives for consistency.

The State uses all available delivery systems to disseminate messages to the public during the evacuation.

When there is imminent threat to human life or safety, the SOC JIC disseminates public alerts using the following systems and channels:

- Emergency Alert System (EAS)
- Emergency Digital Information System (EDIS)
- National Weather Radio
- Highway Advisory Radio

- Social media
- Traditional media
- Emergency vehicles with public address systems

The SOC JIC uses the some of the above and other delivery channels to communicate public information:

- 511 (operated by Caltrans)
- Agency websites
- Changeable message signs (operated by Caltrans)

For public information, traditional and social media outlets are the most appropriate channels through which to disseminate messages.

For more information about message delivery systems, see **Appendix F**.

4.3.3 Communicating with Access and Functional Needs Populations

Messaging to access and functional needs populations is an integral component of the overall public alerting and information effort. Specific approaches may be necessary when developing and disseminating messages to ensure access and functional needs populations can receive, understand, and take appropriate action in response to the alerts and information.

The JIC coordinates message development and delivery with Operational Areas and the community-based organizations that have specific knowledge of, and connections to, local access and functional needs populations.

Volunteers and disability and older adult service system providers may be able to assist first responders with providing face-to-face communication to populations that are evacuating.

To the extent possible, the following strategies may be used to address access and functional needs populations in public messaging:

- All public communications include any information specifically for access and functional needs populations.
- Messages are at or below a third-grade reading level.
- Messages are developed and disseminated in multiple languages in addition to English. This may be accomplished by direct translation or through outreach to media that operate in those languages.
- Messages are delivered in a completely aural manner and, when possible, in Braille. Messages are also delivered in a completely visual manner, which may require multiple communications channels (e.g., EAS, EDIS).
- Press conferences include American Sign Language interpreters who are visible at all times. The Disaster Response Interpreter program is a statewide effort through Cal EMA to provide American Sign Language interpreters quickly

and efficiently during a disaster. If needed, interpreters can be requested and assigned through standard SEMS channels.

- Any information posted on web sites is readable through standard text readers. PDF-format files, which are generally not as readable as HTML or Rich Text Formats, are not used. Maps and other visuals presented online include full text descriptions of all information.
- Evacuation message delivery is comprehensive—messaging is not limited to aural announcements via public address systems or vehicles. Communication tactics include visual methods of communication, such as door-to-door outreach and printed materials as capabilities permit.

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5 Operations

The time frame for the operational framework described in this section is E to E+60 days. The framework does not include preparedness activities that take place before a disaster. It also does not include long-term recovery activities that take place after E+60 days, although some activities that begin during the time frame may extend past E+60 days, particularly recovery-related activities.

5.1 Operational Priorities

The overall operational priorities for mass transportation/evacuation operations are to:

- Develop situational awareness and determine mass transportation requirements and capabilities for real-time communication and information exchanges
- Establish a regional authority or organization that coordinates mass transportation/evacuation operations and movement of emergency service workers by integrating local, State, and Federal resources and operations
- Establish a priority for movement of affected populations based on life-safety concerns
- Develop a service plan of operations to support movement of emergency service workers into the affected area
- Identify appropriate message systems and provide guidance to the evacuating public
- Acquire and deploy appropriate resources to move outbound evacuees and inbound emergency service workers
- Manage mass transportation networks and resources to conduct initial movement of evacuees and emergency service workers
- Provide mass transportation resources and management to support follow-on movement of evacuees from shelters to interim housing or to other locations
- Support re-entry of evacuated populations
- Support ongoing transportation of emergency service workers into and within the region
- Support restoration of basic transportation services

5.2 Evacuation Phases

Evacuation efforts follow seven generally accepted evacuation phases. Although the overall effort to use mass transportation to evacuate populations is coordinated regionally, local evacuation efforts may be temporally and spatially diverse and may overlap with the three time frames of the response identified in **Section 5.3**. The seven evacuation phases are therefore not used as an organizing principle in this

Plan, but the objectives associated with each of the seven phases are incorporated into the appropriate time frames.

The seven evacuation phases are:

- **Incident Analysis and Evaluation.** Efforts focus on developing situational awareness of the impacts of the event, supporting evacuation decision-making by senior leaders, and allowing initial planning for developing evacuation operations.
- **Decision to Evacuate.** The situational awareness developed previously is used to determine the location of populations who need to be evacuated and the priority for conducting evacuations.
- **Notification.** After a decision has been made to evacuate populations, notification messages are developed, coordinated, and delivered, from initial evacuation operations to return operations.
- **Preparation to Move.** Includes the re-establishment of the transportation system to facilitate movement of affected populations out of affected areas and the movement of resources into affected areas.
- **Movement and En-Route Support.** This phase encompasses the movement of evacuees within and outside the affected area. Operations address the provision of transportation services to those requiring mass transit, targeted transportation services for people with access and functional needs, traffic management on priority transportation routes, and the provision of support services (e.g., fuel, food, water) along designated routes.
- **Reception and Support.** After initial evacuation, various populations have follow-on transportation needs, primarily tourists who require transportation outside the area to return home, and individuals with access and functional needs who require transportation to obtain support services. Additionally, because many of the evacuees may not be able to return to their residences, they need follow-on transportation to interim housing.
- **Return and Recovery.** Operations support the gradual movement of evacuees back into affected areas once the areas and homes are habitable.

5.3 Objectives for Response

The mass transportation/evacuation objectives are provided in the subsections below. They are listed in the time frame during which they are most likely to occur. The three time frames are E to E+72 hours, E+72 hours to E+14 days, and E+14 days to E+60 days. Although these time frames are meant to capture a picture of the regional-scale transportation/evacuation activities, localized activities are very likely to occur during varying time frames because of local circumstances.

5.3.1 E to E+72 Hours

The first 72 hours are closely associated with the evacuation phase of Incident Analysis and Evaluation, in which the affected areas, infrastructure status, and mass

transportation needs are determined (see **Section 5.2**). Other evacuation activities probably also occur during this phase.

The operational priorities are to:

- Develop situational awareness
- Establish and operate an organization to conduct mass transportation evacuation operations and support movement of emergency service workers and affected populations by integrating local, State, and Federal resources and operations
- Establish a priority for movement of affected populations based on life-safety concerns

The response objectives are to:

- Establish an Incident Command System structure that coordinates mass transportation/evacuation operations by integrating local, State, and Federal operations
- Establish interoperable emergency communications among public- and private-sector transportation entities involved in mass transportation/evacuation operations
- Determine impacts to transportation infrastructure
- Identify the locations and sizes of affected populations that require evacuation, including people who have access and functional needs, and develop an estimate of the number of companion and service animals that accompany evacuees
- Identify a preliminary list of destinations for evacuees
- Identify the number of, and destinations for, emergency service workers to be brought into affected areas
- Determine priority transportation routes for mass transportation/evacuation activities to enable the initiation of debris clearance and infrastructure inspection/repair
- Support initial restoration activities (e.g., debris clearance) of the transportation network
- Identify priorities for the use of available transportation resources to assist in mass transportation/evacuation efforts
- Identify additional resources required to support mass transportation/ evacuation efforts
- Track and, to the extent possible, support ad hoc evacuations out of affected areas and inbound movement of emergency service workers

5.3.2 E+72 Hours to E+14 Days

The time frame from E+72 hours to E+14 days is most closely associated with the following five of the seven evacuation phases: Decision to Evacuate, Notification, Preparation to Move, Movement and En-Route Support, and Reception and Support

(see **Section 5.2**). These evacuation phases may also occur outside the time frame, as noted earlier.

The operational priorities are to:

- Develop a service plan of operations to support movement of emergency service workers into the affected area
- Acquire and deploy appropriate transportation resources to move outbound evacuees and inbound emergency service workers
- Manage mass transportation networks and resources to conduct initial movement of evacuees and emergency service workers
- Provide mass transportation resources and management to support follow-on movement of evacuees from shelters to interim housing and other locations

The response objectives are to:

- Finalize the list of priority transportation routes being used, and coordinate with debris clearance and public works agencies to confirm availability of routes
- Identify evacuee pickup points and coordinate with local government to support the operation of the pickup points
- Coordinate with mass care service providers and Operational Areas to identify the destinations for evacuees
- Establish and support a JIC to coordinate evacuation information and notification
- Provide public notification of evacuation orders and evacuation guidance for those requiring mass transportation
- Develop and execute a mass transportation service plan for the outbound movement of evacuees based on regional priority needs
- Develop and execute a mass transportation service plan for the movement of emergency service workers into the affected region
- Acquire and deploy additional mass transportation resources, including vehicles to move people with access and functional needs, from local, State, Federal, and private sources as the resources become available
- Acquire, maintain, and deploy mass transportation support logistics such as fuel distribution systems, maintenance support, and law enforcement staff
- Coordinate evacuation routes that result in movement through another Operational Area or State, based on coordination with the appropriate emergency, law enforcement, and transportation agencies in the relevant jurisdictions
- Develop and execute a transportation service plan for supporting the follow-on routing of sheltered populations, including those with access and functional needs, either to interim housing or returning to their homes in affected areas.

5.3.3 E+14 Days to E+60 Days

Although the Plan timeline extends through only the first 60 days of the event, the Plan recognizes that mass transportation operations extend well beyond that point. The priorities and objectives identified here are consistent with Return and Recovery goals (see **Section 5.2**).

The operational priorities are to:

- Provide mass transportation resources and management to support follow-on movement of evacuees from shelters to interim housing and other locations
- Support re-entry of evacuated populations
- Support ongoing transportation of emergency service workers into and within the region
- Support restoration of basic transportation services

The response objectives are to:

- Continue implementation of the transportation service plan for the movement of emergency service workers into and within the region
- Continue implementation of the transportation service plan that supports moving evacuees from shelters to interim housing
- Continue implementation of the transportation service plan to support the return of evacuees from shelters to their residences
- Develop and execute a transportation service plan to support consolidation of shelters, including shelters supporting access and functional needs populations that need specialized transportation support
- Restore normal public transit services

5.4 Resources for Mass Transportation/Evacuation Operations

This section describes the processes for management of the initial resources available in the region and for obtaining additional resources to support mass transportation/evacuation operations. It also provides an overview of the estimated demand levels for the major categories of transportation resources.

5.4.1 Management of Mass Transportation Resources

California's system for managing emergencies and for providing resources in support of response operations is governed by the SEP and SEMS. In general, requests for resources must be made to the next level. Requests for assistance from State agencies, other States, or the Federal Government are to be made at the State level by Cal EMA.

Transportation and logistics are the joint responsibility of the State and FEMA as supported by other State and Federal departments and agencies. State and Federal integration is accomplished through the creation of joint Planning, Operations, and Logistics sections at the SOC and later at the JFO. Air and maritime transportation

operations are integrated in the Transportation Support Branch of the Operations Section of the JFO.

This Transportation Support Branch in the JFO manages and allocates mass transportation resources for the region and includes representatives from the REOC Transportation Branch: CHP, Caltrans, the USCG, MTC, and WETA. The Transportation Support Branch works through the REOC to the Operational Areas to ensure that mass transportation resources are available.

The integration of mass transportation resources within the Transportation Support Branch ensures unity of effort and efficient use of transportation assets. In addition, the Transportation Support Branch prioritizes resources to support mass transportation/evacuation operations, and to de-conflict competing requests. As necessary, the UCG issues mission assignments to Federal departments and agencies, including mass transportation agencies, to provide additional assets and support.

5.4.1.1 Regional Coordination

MTC facilitates the coordination among the mass transportation agencies in the 9 Bay Area counties within its jurisdiction. MTC coordinates with Cal EMA to identify additional transit resources for emergency response. MTC also facilitates activities under the San Francisco Bay Area Transit Operators Mutual Aid Agreement, through which mass transportation agencies provide requested support in the event that the need for resources or capabilities exceed those of an individual agency.

WETA performs services similar to MTC for the Bay Area publicly owned ferry fleet and has the ability to contract for additional water-based passenger resources. Both MTC and WETA receive mission tasks to provide transportation resources to support mass transportation/evacuation efforts.

5.4.1.2 Integration of State and Federal Resources

When Federal assistance is required, Cal EMA coordinates requests for assistance and participates with the Federal Government to establish a UCG and operate the JFO.

If the FEMA Region IX Regional Response Coordination Center is not operational, the NRCC initiates establishing the Federal logistics support network and directs the FEMA Region IX backup region, Region X, to activate its RRCC to support the joint State/Federal response. The NRCC and the IMAT at the SOC coordinate logistics support until the JFO has been established. Transportation and logistics for the Federal operations are then coordinated by the JFO in coordination with the NRCC. The UCG directs planning and implementation of land, air, and water transportation support through the joint Operations Transportation Support Branch. A Maritime Operations Division is established to coordinate requirements for and operation of water transportation elements.

If additional mass transportation resources are needed and are not available from regional mass transportation entities, FEMA, through the JFO, provides resources by implementation of existing transportation services contracts and federally procured assets or through mission assignments to other Federal departments and agencies. The Operations Section coordinates through ESF #1 and other ESFs to determine availability of other Federal transportation assets available to support operations and issues mission assignments as needed. The UCG then coordinates all transportation resources (public and private) to be used for evacuation efforts.

5.4.1.3 Fuel Management

The California Energy Commission implements its Energy Emergency Response Plan after the earthquake. As part of this Plan, the Energy Commission activates an Energy Emergency Management Center to provide a centralized management location for the coordination of energy emergencies. The purpose of the Energy Emergency Management Center is to ensure that the Energy Commission can respond quickly to emergency fuel distribution missions and situation reports at the request of Cal EMA. In addition, the Operations Section has a section for petroleum in the Energy Emergency Management Center.

Because of the nature of the disaster and the overwhelming need for fuel on a daily basis, the Energy Emergency Manager is included in the JFO operations. Communication needs to occur frequently to ensure the delivery of fuel for mass transportation/evacuation operations because evacuation operations are curtailed if fuel is not available.

5.4.2 Movement of Resources

Movement of resources into and movement of people out of the affected area is significantly affected by damage to the transportation infrastructure. To complete the mass transportation/evacuation missions, Cal EMA executes 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, land transport, 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 selected priorities. Possible priorities include:

- 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 transportation routes
- Teams and supplies for sheltering and commodity distribution
- Teams to assess damage to structures

Access facilitates the evacuation of the affected population to areas where services can be provided (generally, outside the most severely affected areas).

The joint State/Federal operation emphasizes the re-establishment of the transportation system to facilitate the effective movement of resources into the most severely affected areas from National Logistic Staging Areas, regional and local staging areas, and other sources, and to move evacuees out of the affected areas. Lines of supply and transportation include land, air, and water routes.

To supplement regional and State resources, the Federal Government provides resources and support in response to requests from State. In accordance with the NRF, the Federal Coordinating Officer, on behalf of the President, is responsible for coordinating the Federal response. Federal agencies and departments, working through ESFs and mission assignments from FEMA, take action in accordance with the objectives identified by the UCG.

If military-held resources are requested, the resources of the National Guard are typically used before DoD resources are deployed. If National Guard resources are fully deployed or unavailable, the State requests direct Federal assistance through the UCG. If a Federal agency can meet the need, FEMA may execute a mission assignment to do so. Otherwise, FEMA assigns DoD through the DCO/DCE to respond.

5.4.3 Resource Typing

Resource typing is an important part of resource management but is beyond the scope of this Plan. The resource typology needs to account for the variations in each general type of mass transportation asset. For example, the lengths of buses range from 30 to 40 feet, and buses can have high or low floors, lifts, or air conditioning—all factors that affect the numbers and types of passengers they can transport. Ferry boats also have variations, including passenger capacity, speed, length, beam, draft, and free board (the distance between the hull and the passenger loading deck). Variations in passenger rail cars include the number of passengers, number of decks, and configuration of the passenger cabin.

5.4.4 Available Mass Transportation Resources

The available mass transportation resources are listed **Table 2-8**. Most of the resources reside with the regional transit agencies (see **Appendix C**). In a disaster, individual vehicles and vehicle operators are tasked by MTC (see **Section 5.4.1**).

If needed, FEMA coordinates and provides additional resources beyond those in the region, such as aircraft and additional surface transportation resources (buses, demand response vehicles, water craft, and passenger rail cars and locomotives) in support of evacuation operations. This is done only if the scale of the evacuation overwhelms the ability of the State to shelter evacuees in the region.

5.4.4.1 Buses and Demand Response Vehicles

Road-based transportation assets are sourced from local transit agencies and transportation service providers. The number of bus assets shown in **Table 2-8** is

based on the National Transit Database; agencies report this data on a yearly basis to the Federal Transit Administration. The number of demand response vehicles is also based on the National Transit Database, in addition to a database from Caltrans based on the Federal Transit Administration Rural and Small Urban Area Sponsored Agencies grant program. This database includes additional information not found in the National Transit Database.

5.4.4.2 Ferry Boats

Ferry boats available in the Bay Area include boats currently operated by contractors that are being transitioned to WETA or operated by the GGBHTD. In addition to these ferry boats, other vessels in the region can be used by WETA under a contract arrangement. A total of 41 vessels in the Bay Area can be used to support evacuations (see **Appendix G**). When using these vessels, WETA matches vessel characteristics to the landing site. There are a limited number of docks available for use, and not all vessels are able to use every ferry landing location.

The number of crew to operate the ferry boats is partially available for the existing ferry boat operators (see **Table 2-8**) but unavailable for the private contractors. At E+30 days, 61 staff are available for ferry operations; by E+60 days, 101 staff are available for ferry operations. However, in the region, WTEA has the ability to request additional ferry boat staff through the International Organization of Masters, Mates, and Pilots.

5.4.4.3 Passenger Rail Cars and Locomotives

The passenger rail cars and locomotives available in the Bay Area region (see **Table 2-8**) include passenger rail cars and locomotives from Caltrans Division of Rail, ACE, and Caltrain. Only locomotives that rely on diesel fuel (as opposed to electricity) are included in the estimates of available vehicles because of the likelihood of interruptions to electrical power supply, precluding the use of electric trains.

Caltrans Division of Rail has 66 cars available from the Capital Corridor and San Joaquin service and owns 15 locomotives. It is assumed that 50 percent of the rail assets are available for evacuation operations.

ACE operates passenger service from Stockton to San Jose, and based on the HAZUS data, it is assumed that service is unavailable from Pleasanton to San Jose. Therefore, it is assumed that all of the passenger cars and locomotives are available to support evacuation operations until service is restored to San Jose.

The Caltrain rail system, based on HAZUS data, is substantially damaged, and roadway bridge structures fall on the tracks, leading to further damage. A majority of the passenger rail cars and locomotives, if not damaged, are trapped on the existing rail system. It is assumed that 20 percent of the Caltrain fleet is available to support evacuation operations.

5.4.5 Demand Levels for Transportation Resources

Mass transportation resources are needed to transport evacuees. These resources include assets (vehicles), staff, and fuel for rail, bus/demand response vehicles, and ferry service.

Although resource typing is beyond the scope of this Plan, the quantities of needed resources are estimated for the various modes (e.g., buses and demand response vehicles, ferry boats, rail). No modeling was conducted to determine the information because the intent is to provide a high-level estimate of the number of resources to accommodate the affected population. This Plan does not address self-evacuees or take into account private transportation resources.

From E+72 hours to E+14 days, on a regional basis, there is a severe shortfall of sheltering capacity. As a result, mass transportation resources are used to transport evacuees to a transportation facility (airport, ferry terminal, rail station or other pickup location) for onward transportation to an out-of-region shelter. Visitors and tourists are transported to airports to enable their return to their places of residence.

The greatest need for transportation resources occurs from E+72 hours to E+14 days when the largest number of evacuees need to be transported. This transportation movement is challenging for the region, and if not accomplished successfully, can affect the safety of evacuees.

This section presents an assessment of the mass transportation resources needed to support operations. More detailed information is provided in the following appendices:

- **Appendix H** provides information on transportation resources needed, by transportation mode, for the three time frames. This information allows the evaluation of a particular transportation mode, for a particular time frame and for a particular direction (inbound or outbound). However, this information does not provide a regional snapshot of transportation resources needed to support evacuations for inbound and outbound travel.
- **Appendix I** summarizes the transportation resources needed on a daily basis to support evacuations and the available resources. The summary information identifies the transportation resources needed from E+72 hours to E+60 days and the resource surpluses and shortfalls.
- **Appendix J** lists the mileage assumptions used as the basis for calculations regarding the use of transportation resources.
- **Appendix K** lists general operating assumptions on which the estimates of transportation resource use are based.

5.4.5.1 Transportation Assets and Staff

The severe shortfall of sheltering capacity and the need to transport many evacuees to out-of-region shelters leads to an overwhelming shortfall of mass transportation resources to transport evacuees from E+72 hours to E+14 days. As a result, FEMA and the UCG need to contract for additional mass transportation resources (assets

and staff) within hours of the earthquake. Without these additional resources, the safety of affected populations is compromised, leading to an increase in sickness, disease, and death.

Evacuees returning to the region from E+14 days to E+60 days need transportation to the initial pickup locations. **Table 5-1** identifies the vehicles that are needed on a daily basis and the surpluses/shortfalls, based on the high-level analysis in this Plan. **Table 5-2** provides information on surpluses/shortfalls in staff.

Table 5-1. Transit vehicle needs and surpluses/shortfalls in the 12-county region post-event.

	E+72 Hours to E+14 Days		E+14 Days to E+60 Days[1]		E+14 Days to E+60 Days[2]	
Transportation Asset	**Needed per Day**	**Surplus/ Shortfall**	**Needed per Day**	**Surplus/ Shortfall**	**Needed per Day**	**Surplus/ Shortfall**
Bus	3,930	–1,509	150	+2,271	150	+2,271
Demand response	2,220	–842	130	+1,248	240	+2,815
Ferry	63	–22	0	+41	0	+41
Rail car	790	–705	60	+25	60	+25
Locomotive	79	–64	6	+10	6	+10

Source: URS analysis (2009)
E = event occurrence
[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

Table 5-2. Transportation staff needs and surpluses/shortfalls in the 12-county region post-event.

	E+72 Hours to E+14 Days		E+14 Days to E+60 Days[1]		E+14 Days to E+60 Days[2]	
Transportation Asset	**Needed per Day**	**Surplus/ Shortfall**	**Needed per Day**	**Surplus/ Shortfall**	**Needed per Day**	**Surplus/ Shortfall**
Bus	7,500	–5,662	240	+1,598	240	+2,815
Demand response	3,110	–2,384	200	+526	200	+655
Ferry	280	–219	0	+61	0	+61
Rail car/locomotive	230	–152	60	+18	60	+28

Source: URS analysis (2009)
E = event
[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

From E+72 hours to E+14 days, all modes of mass transportation assets are in shortfall, but the shortfall in staff needed to transport evacuees to shelter is more important. Assets may be available, but if staff are not available to operate them, the vehicles are not useful. The shortfall of operators needed to drive standard buses is significant, estimated at approximately 5,700. This severe shortfall needs to be

addressed in order to transport evacuees to shelter and safety. The first week after the event is critical for regional emergency managers because the number of evacuees overwhelm the region's resources. After the UCG forms and after intelligence gathering, mass transportation resources from other public agencies and private companies become critical. The UCG also needs to prioritize resources based on the greatest need.

5.4.5.2 Fuel

Unlike electricity and natural gas, primary sources of transportation fuel are present in the affected area, but these sources may be heavily affected by the earthquake. Transportation fuel is needed to meet the demand both within and outside the affected area, such as the rest of northern California, northern Nevada, the Central Valley to Fresno, and portions of southern California. As roadway damage is repaired and traffic increases, it is difficult to meet the rising demand for transportation fuel in the affected area, assuming the refineries and distribution infrastructure have not been fully restored within 5 to 7 days. In addition, demand outside the affected area increases from panic buying, which further strains the supply and distribution systems.

On a total basis, it is estimated that approximately 2.5 million gallons of transportation fuel are needed by mass transportation resources to support mass transportation/evacuation operations. Mass transportation agencies, logistical centers for private carrier mass transportation resources, and emergency service workers all need fuel.

Table 5-3 identifies the estimated daily requirements for fuel, by transportation mode and time frame, needed to support transportation operations, based on the numbers of vehicles needed, as identified in **Table 5-1**.

Table 5-3. Summary of daily fuel requirement for standard buses, demand response vehicles, ferries, and locomotives in the region.

	Daily Fuel Requirement (gallons)		
Mode	**E+72 Hours to E+14 Days**	**E+14 Days to E+60 Days[1]**	**E+14 Days to E+60 Days[2]**
Standard bus	334,160	8,720	8,720
Demand response vehicle	121,800	3,290	3,290
Ferry	76,000	0	0
Locomotive	14,200	1,080	1,080
Total	**546,160**	**13,090**	**13,090**

Source: URS analysis (2009)
E = event
[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

The types of fuel are indicated in **Table 5-4**. Generally buses, ferry boats, and locomotives use diesel fuel and demand response vehicles use gasoline.

Table 5-4. Daily fuel requirement for standard buses, demand response vehicles, ferries, and locomotives in the region, by fuel type.

	Daily Fuel Requirement (gallons)		
Fuel Type	**E+72 Hours to E+14 Days**	**E+14 Days to E+60 Days[1]**	**E+14 Days to E+60 Days[2]**
Diesel	424,360	9,800	9,800
Gasoline	121,800	3,290	3,290

Source: URS analysis (2009)
E = event
[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

Additional information on the number of miles traveled and fuel consumption for transportation operations per time frame is provided in **Appendix J**.

5.5 Operations Framework

This high-level operations Plan addresses the processes for evacuating populations who cannot be provided basic life-safety needs in their community and who are unable to self-evacuate. The Plan also addresses providing a system for moving emergency service workers into the region.

This operational framework has been developed with an overarching consideration for the large number of people in the region who need to rely on mass transportation services to be safe and receive needed care. Movement of evacuees to a shelter is a life-safety issue and a priority for the region. Therefore, this Plan is developed based on the need to move evacuees to a shelter as soon as possible (within 7 days of the event).

The severity of the impacts to Bay Area populations from the earthquake is greater than those that have been dealt with previously in other similar planning efforts. The no-notice nature of the event, coupled with the massive amounts of damage to infrastructure, particularly transportation networks, presents unique planning challenges.

Local governments in the Bay Area and agencies providing assistance from outside the region are likely to face a similar situation. Significant numbers of the population are without life-safety resources, including care and sheltering, until they can either be evacuated or provided with resources from outside the area. Efforts to bring in resources and evacuate populations are hindered by damage to the transportation system. Assessing and reconstituting transportation networks and organizing and moving resources takes days to accomplish. Likewise, requesting, moving, and staging evacuation resources require a number of days in the parts of the region that are most affected.

5.5.1 Mass Transportation/Evacuation Operations Time Frames

Transportation planning addresses activities that occur from E to E+60 days in the following evacuation time frames:

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

For this Plan, organized transportation services do not begin until E+72 hours at the earliest. Organized transportation services end at E+60 days. Because of the need to return residents to their homes, this Plan considers the period E+14 days to E+60 days to extend across two overlapping, approximate periods:

- E+14 days to E+30 days
- E+14 days to E+60 days to account for returning evacuees

As a result, this Plan was developed based on three time frames:

- E+72 hours to E+14 days
- E+14 days to E+60 days (up to approximately E+30 days)
- E+14 days to E+60 days (up to approximately E+60 days)

5.5.2 Movement of Evacuees

This Plan is based on residents, visitors, and tourists evacuating one or two times each, either to shelters or transportation hubs for onward travel (e.g., airports). It also addresses the return of inter-county commuters to their home counties. For these reasons, each displaced person may be moved more than once, and the total number of trips identified in the Plan is not necessarily equal to the number of affected people. For the same reasons, the numbers of affected people and numbers of trips identified in this Plan are not equal to the number of affected people identified in the Regional Catastrophic Earthquake Mass Care and Sheltering Plan.

The Plan does not account for continual transportation movement, such as movement from shelter location to shelter location as shelters open and close, or the need for medical appointment transportation. The Plan also does not address the movement of people who self-evacuate through the use of personal vehicles or other means. Instead, the Plan is focused solely on evacuating people through the use of mass transportation.

The Plan identifies the estimated population that is affected, develops a high-level transportation plan, and identifies the resources needed to move the affected population. After the actual event, a service plan is developed to accommodate the daily movement of people. To prepare an actual service plan at this time is premature, and that level of transportation planning is beyond the scope of this Plan.

In **Table 5-5**, evacuees who seek shelter are divided into multiple categories. These categories have been used for the Plan because the transportation needs of

evacuees vary by category, and the transportation needs affect the resulting transportation patterns. For example, visitors and tourists need to be returned home, while residents may be transported to a shelter outside the region.

Table 5-5. Estimated number of evacuees needing mass transportation assistance at E+72 hours.

	Evacuees Needing Mass Transportation at E+72 Hours				
County	**General Population**	**Homeless**	**Visitors/ Tourists**	**Inter-County Commuters**	**Total**
Alameda	33,600	2,000	12,400	103,300	**151,300**
Contra Costa	6,400	1,600	8,500	41,100	**57,600**
Marin	2,400	700	2,100	11,000	**16,200**
Monterey	1,100	500	7,500	2,300	**11,400**
Napa	1,200	100	1,100	3,700	**6,100**
San Benito	100	N/A	500	1,100	**1,700**
San Francisco	32,200	2,500	56,200	205,300	**296,200**
San Mateo	13,000	700	5,900	72,100	**91,700**
Santa Clara	32,300	2,800	21,200	105,200	**161,500**
Santa Cruz	1,400	1,100	3,700	3,400	**9,600**
Solano	1,300	800	3,900	4,100	**10,100**
Sonoma	4,700	500	3,400	3,100	**11,700**
Total	**129,700**	**13,300**	**126,400**	**555,700**	**825,100**

Source: URS analysis (2009)
N/A = not available
E = event

5.6 Evacuee Transportation Demand

5.6.1 Immediately Affected Population

This Plan addresses the movement of approximately 825,100 evacuees seeking mass transportation to shelters after the earthquake, as identified in **Table 2-5**. Population categories seeking shelter are the general population, homeless, visitors/tourists, and inter-county commuters. The general population estimates include access and functional needs populations.

The estimated affected population of evacuees using mass transportation assistance to reach a shelter is identified in **Table 5-5**. It is assumed that the following percentages per population type need to use mass transportation for evacuation:

- 50 percent of the general population and homeless
- 75 percent of the visitors/tourists in San Francisco
- 50 percent of visitors/tourists in the remaining counties
- 75 percent of inter-county commuters in San Francisco

- 50 percent of inter-county commuters in Santa Clara, San Mateo, Alameda, and Contra Costa counties
- 25 percent of inter-county commuters in the remaining counties

5.6.2 Additional Affected Populations

As the catastrophic nature of the earthquake becomes evident, additional evacuees need to be transported out of the affected areas. Within the first 14 days, it is assumed that additional populations evacuate as they determine that the potable water supply is not rapidly restored, emergency water sources are inadequate, or they run out of stored water. Additional evacuees have been identified as seeking shelter from E+72 hours to E+14 days. This estimate is based on the assumption that 10 percent of the additional population without water seeks shelter.

It is further assumed that of the additional people seeking shelter because of a lack of potable water, 50 percent of these evacuees need to be transported by mass transportation.

The numbers of residents who seek shelter and need mass transportation because of a lack of potable water from E+72 hours to E+14 days are listed in **Table 5-6**.

Table 5-6. Estimated number of residents without potable water, number of those who seek shelter, and the number of those who need mass transportation assistance from E+72 hours to E+14 days.

County	Residents without Potable Water	Number Seeking Shelter	Number Needing Mass Transportation Resources
Alameda	1,142,900	114,200	57,100
Contra Costa	110,400	11,000	5,500
Marin	74,300	7,400	3,700
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	815,900	81,500	40,700
San Mateo	589,900	58,900	29,400
Santa Clara	1,292,500	129,200	64,600
Santa Cruz	0	0	0
Solano	0	0	0
Sonoma	177,000	17,700	8,800
Total	**4,202,900**	**419,900**	**209,800**

Source: HAZUS and URS analysis (2009)
E = event

The additional evacuees are moved using mass transportation in accordance with the modes and quantities shown in **Table 5-7**. This table identifies the number of evacuees by type of vehicle: standard bus or demand response vehicle.

By E+72 hours to E+5 days, organized mass transportation resources are available to transport evacuees.

Table 5-7. Estimated number of evacuees needing mass transportation assistance from E+72 hours to E+14 days, by type of vehicle.

	Evacuees Needing Mass Transportation		
County	**Standard Bus**	**Demand Response Vehicle**	**Total**
Alameda	166,700	41,600	208,300
Contra Costa	50,400	12,600	63,000
Marin	15,900	3,900	19,800
Monterey	9,100	2,200	11,300
Napa	4,800	1,200	6,000
San Benito	1,300	300	1,600
San Francisco	269,500	67,300	336,800
San Mateo	96,800	24,200	121,000
Santa Clara	180,800	45,200	226,000
Santa Cruz	7,600	1,900	9,000
Solano	8,000	2,000	10,000
Sonoma	16,400	4,100	20,500
Total	**827,300**	**206,500**	**1,033,800**

Source: URS analysis (2009)
E = event

5.7 Status of the Transportation Infrastructure

In **Section 2.2**, the functionality of the post-earthquake transportation network is identified, but information in this section is intended to be used for planning purposes only and could substantially differ from actual events.

Appendix B, Maps B-4a through **B-4l**, depict highway and bridge infrastructure damage for E+24 hours for the 12 counties in the region. Functionality of less than 90 percent indicates significant damage to the infrastructure.

5.8 Restoration of the Transportation Infrastructure

Restoration of the transportation network is critical to response operations including mass transportation/evacuation. Transportation systems are restored in accordance with the priorities established in prior Bay Area emergency management documents such as the CONPLAN. The restoration priorities are listed in **Table 5-8**.

Table 5-8. Transportation restoration priorities.

Time Frame	Transportation Restoration Priority
E to E+7 days	• Major transportation routes, including routes pre-identified by Caltrans as Lifeline routes and additional routes identified in **Section 5.11**, Priority Transportation Routes • Public safety facilities • Fuel distribution
E+7 days to E+14 days	• Ports and airports • Mass transportation systems, including transit, rail, and water

Source: CONPLAN (2008)
E = event

5.8.1 Damage Assessments

Public- and private-sector owners/operators of critical transportation facilities perform initial damage assessments during the first 72 hours to develop situational awareness of the functionality of the transportation network. Damage assessment teams are initially composed of employees of the company who are employed in the region or mass transportation agency personnel and/or mutual assistance arrangements.

Because of the extent of the damage to the transportation network and the potential unavailability of local workers, assessment teams from other parts of the region, other regions and/or from Federal agencies are likely to be needed to assist and/or augment local teams.

State and Federal resources also begin assessments immediately, either under existing authorities or through mission tasks/assignments. The assessments are likely to include:

- Assessments by mass transportation agency-trained staff of their own infrastructure
- FEMA/Cal EMA damage assessments (e.g., the Cal EMA Safety Assessment Program)
- Assessments by other Federal agencies of damage to transportation infrastructure such as airports, ports, roadways, and bridges
- State assessments of critical transportation facilities, such as Caltrans for critical roadways and bridges
- Safety assessment teams for safety inspections of mass transportation agency buildings
- Qualified Cal EMA volunteers for inspections of all transportation infrastructure

Potential constraints are:

- The number of required contractors for assessments and repairs exceeds the number of available contractors.
- Damage to transportation routes delays assessment teams and may prevent some employees from getting to their places of employment.

- The number of available workers for public and private entities that operate critical facilities and infrastructure is reduced because these employees are also affected by the earthquake.

5.8.2 Emergency Repairs and Temporary Restoration

State and Federal resources may also be used for immediate action to restore services provided by critical facilities and infrastructure such as emergency repairs and temporary restoration. Examples are:

- Temporary repairs to port facilities by USACE to restore use of the facilities
- Installation of generators by USACE to restore power to critical facilities
- Procurement and installation of modular structures to serve as temporary facilities for essential mass transportation government functions
- Emergency repairs to restore mass transportation systems, such as airports, water, and mass transportation systems
- Transportation of equipment, parts, and crews essential to restoring mass transportation capabilities

FEMA Public Assistance Program funding may be used for:

- Procurement of equipment and rental of facilities to restore essential mass transportation government functions
- Emergency repairs

Emergency Relief Program funding may be used to complete emergency repairs and shoring operations for highways, bridges, piers, runways, and other transportation facilities.

5.9 Sheltering of Evacuees

This section considers the sheltering of evacuees as it pertains to mass transportation/evacuation operations. Additional information on sheltering evacuees, animals, and regional shelter capacities is provided in the Regional Catastrophic Earthquake Mass Care and Sheltering Plan.

Table 5-9 is a list of the projected post-earthquake evacuation capacities in shelters in the region by county, taking into account projected damage to pre-identified shelter facilities. Projections suggest that the counties of San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, and Sonoma have very little or no post-event shelter capacity because of severe physical damage to all the identified shelter facilities. The limited sheltering capacity affects the transportation plan because it necessitates the movement of larger numbers of evacuees to shelter facilities in other counties or outside the region.

Table 2-5 shows an estimated general population of 260,100 and an estimated homeless population of 27,000 seeking shelter. As shown in **Table 5-6**, an additional 419,900 evacuees eventually seek shelter. As shown in **Table 5-9**, the evacuation

sheltering capacity is 19,300. It is clear that there is not enough sheltering capacity in the region for evacuees.

Table 5-9. Post-earthquake evacuation capacity in shelters in the 12-county region.

County	Evacuation Capacity in Shelters
Alameda	4,100
Contra Costa	2,600
Marin	400
Monterey	5,300
Napa	600
San Benito	N/A
San Francisco	N/A
San Mateo	N/A
Santa Clara	800
Santa Cruz	N/A
Solano	5,400
Sonoma	N/A
Total	**19,200**

Source: URS analysis (2009)
N/A = Data not available

In this Plan, it is assumed that the people who are able to transport themselves to a shelter immediately consume the available sheltering capacity, and once organized transportation occurs, remaining evacuees need to be transported to shelters outside the region. From E to E+14 days, the number of people using shelters fluctuates, but the sheltering capacity in the region remains inadequate, and mass transportation operations are needed to move people out of the region to safety.

5.10 Modes of Transportation and Mutual Aid

The primary mode of transportation that is used by evacuees during the evacuation effort is privately owned automobiles, which are outside of the scope of this Plan. However, it is critical for the jurisdictions in the region to understand that other modes of transportation are available for evacuations. These may include buses and demand response vehicles (both public and private carriers), passenger rail cars, ferry boats, and aircraft. Acquisition of aircraft is the responsibility of the State or Federal government, but the REOC coordinates with Operational Areas as needed to arrange localized transportation to airports.

Jurisdictions in the region that have pre-existing memoranda of agreement or understanding with local mass transportation agencies for the use of buses, demand response vehicles, rail resources, bus drivers, rail operators, demand response

operators and mechanics should be able to engage the transportation resources of local mass transportation agencies during an evacuation. However, because of the overwhelming and catastrophic nature of the earthquake, pre-existing memoranda of agreement or understanding may be superseded by the Governor.

A sample Mutual Aid Assistance Agreement from the American Public Transit Association is provided in **Appendix L**. The purpose of the agreement is to share resources among local mass transportation operators, but it can be revised to reflect an agreement between an Operational Area and the local mass transportation operator.

Agreements with private school and charter bus companies can also be pursued by jurisdictions as part of the preparation for the earthquake. Jurisdictions can work on establishing and maintaining working relationships with partner organizations, including advocacy organizations, agencies that serve the transportation-dependent populations, and faith and community-based organizations.

5.11 Priority Transportation Routes

Cal EMA and Caltrans designate priority transportation routes to serve as the principal transportation routes for critical movement of evacuees and emergency service workers through the region. They are identified and coordinated across jurisdictional boundaries between evacuated communities and host communities along or near the priority transportation routes. To assist in this effort, regional priority transportation routes are identified based on the location and extent of the event and include as many alternate transportation routes as possible. These routes have a priority for inspection, debris removal, and re-opening. The routes are selected based on the HAZUS-projected functionality of roads and bridges, as discussed in **Section 2.3.1.1**, and in part on the Caltrans-identified Lifeline routes. Some Caltrans Lifeline routes are not included as priority transportation routes in this Plan because of projected incapacity from damage or destruction after the earthquake.

Appendix B, Map B-5, and **Table 5-10** identify the designated potential regional priority transportation routes. **Table 5-10** lists the priority transportation routes that are to be restored as quickly as possible to assist in evacuation and movement of emergency service workers. The priority transportation routes enable the cardinal movement of evacuees out of the affected areas: for the northern counties (Marin, Sonoma, Napa, and Solano), movement north or east where possible; for the southern counties (Santa Clara, Monterey, San Benito, and Santa Cruz), movement south and east where possible; for the peninsula counties (San Francisco and San Mateo), movement south and east where possible; and for the central counties (Alameda and Contra Costa), movement east where possible.

Table 5-10. Regional priority transportation routes in the 12-county Bay Area region.

County	Regional Priority Transportation Routes
Alameda	• North or south on I-880 to I-580 via I-238 or alternative surface streets and east towards the Livermore Valley or the Altamont • North or south on I-880 to I-580 to SR 84 and east towards the Livermore Valley or the Altamont • South on I-880 to I-580 and east towards the Livermore Valley or the Altamont • North or south on I-680 to I-580 or SR84 and east towards the Livermore Valley or the Altamont
Contra Costa	• I-680 (north) to Benicia-Martinez Bridge and north to I-80 towards Sacramento (central to eastern Contra Costa County) • I-80 to the Carquinez Bridge and north towards Sacramento (western Contra Costa County) • SR 4 from I-80 east to the San Joaquin County Line
Marin	• U.S. 101 north • Difficult to identify alternative route due to terrain of the county
Monterey	• SR 68 south to U.S. 101 and south on U.S. 101 to a point where travel can occur to the east • County G17 south to U.S. 101 and south on U.S. 101 to a point where travel can occur to the east
Napa	• SR 12/SR 121 east to SR 29 south to either I-80 or east on SR 12 to I-80 and north towards Sacramento • SR 128 east to I-505 and north towards Sacramento
San Benito	• SR 25 south and south on U.S. 101 to a point where travel can occur to the east • SR 152 east to Los Banos
San Francisco	• SR 82 south to U.S. 101 and south on U.S. 101 to a point where it could cross east • U.S. 101 south to a point where travel can occur to the east
San Mateo	• SR 82 (El Camino Real) south to U.S. 101 and south on U.S. 101 to a point where travel can occur to the east
Santa Clara	• U.S. 101 south to a point where travel can occur to the east • Monterey Road (parallel route to U.S. 101) to SR-152 east to Los Banos • Monterey Road to U.S. 101 and south on U.S. 101 to a point where travel can occur to the east • North on I-880 to SR 84 and east towards the Livermore Valley or the Altamont • South on I-880 to U.S. 101 and south on U.S. 101 to a point where travel can occur to the east
Santa Cruz	• U.S. 101 south to a point where travel can occur to the east East on SR 129 to U.S. 101 and south on U.S. 101 to a point where travel can occur to the east
Solano	• SR 29 north to SR 37 and east to I-80
Sonoma	• U.S. 101 north • SR 116 east to SR 12/SR 121 east to SR 29 south to either I-80 or east on SR 12 to I-80 and north towards Sacramento

Source: Input from counties (2009) and URS analysis (2009)
I = Interstate
SR = State Route
U.S. = U.S. highway

Important roadway characteristics and factors that were considered when identifying the regional priority transportation routes included:

- Shortest route to the designated destination areas (possible shelter locations)
- Roadways that are not expected to become disabled after the earthquake or while the evacuation is in progress
- Ability to increase capacity and traffic flow using traffic control strategies
- Maximum capacity and number of lanes that provide continuous flow through the evacuation area
- Availability of infrastructure to disseminate real-time conditions and messages to evacuees en route, such as changeable message signs
- Minimal number of potentially hazardous points and bottlenecks, such as bridges, tunnels, and lane reductions
- Location of affected populations

Some of the Caltrans Lifeline routes are likely to have impaired functionality, based on HAZUS maps and data. Alternate routes that would serve pockets of evacuees are identified. However, Lifeline routes are restored first, and, if necessary, temporary repairs may consist of bulldozing debris away and compacting the soil to provide a hard-packed surface.

To ensure that the regional priority transportation routes are functional and remain open to transport evacuees out of affected areas (and to bring emergency service workers into the region), the REOC, CHP, and other agencies monitor traffic conditions along the priority transportation routes and make operational adjustments or take action as necessary to maximize throughput. These measures may include identifying alternative routes, staging tow trucks to move disabled vehicles out of the way, providing law enforcement services, positioning traffic signs and other devices to control and facilitate traffic flow, and staging bulldozers to clear and open priority transportation routes.

In addition, regional priority transportation routes are also used by evacuees who are self-evacuating with personal vehicles, and there is a high likelihood of the two populations competing for fuel resources and use of the roadways.

To assist in evacuation operations, Cal EMA coordinates the establishment and maintenance of support areas along the priority transportation routes where evacuees can obtain emergency fuel, water, medical aid, vehicle maintenance, restrooms, and information. These locations are placed where drivers can exit the roadway without impeding traffic. The sites need to have space to accommodate disabled vehicles for people who would then need public transportation to a public shelter.

Law enforcement escorts are used to provide protection and maintain control over transportation resources. Law enforcement vehicles maintain communications with authorities via radio. These escorts are used to coordinate real-time information on road conditions, evacuation and transportation points, and other critical information.

5.11.1 Selection Criteria for Pickup Points

Important characteristics and factors to consider in the selection of pickup points include:

- Proximity to the priority transportation routes
- Proximity to impacted populations
- Distance from damaged infrastructure
- Availability of shelter from weather
- Availability of restroom facilities
- Easy vehicle ingress/egress for mass transportation resources
- Large flat surfaces or parking lots to allow for the operations of the pickup point (such as processing of evacuees)

5.11.2 Operations of Pickup Points

Pickup points are used to facilitate the transport of evacuees to shelters or intermodal pickup locations. Each county coordinates with its respective local governments to determine when and what pickup locations become operational, and to support the operation of those pickup points. Ideally, operational pickup points include the following services, if possible, to assist evacuees.

- Provision of basic food and water
- Restroom facilities
- Medical care
- Public safety/law enforcement presence to provide safety and security
- Information to assist the evacuees in understanding the emergency and likely end destinations of the transportation
- Evacuee registration and pet registration in order to facilitate the identification, location, and re-unification of evacuees

5.11.3 Potential Pickup Locations for Bus Service

Potential pickup locations for evacuees being transported to a shelter are listed in **Table 5-11** and shown in **Appendix B**, **Maps B-6a** through **B-6l**. Operational Area emergency managers work with local law enforcement agencies and care and shelter providers as appropriate to establish and support designated pickup points. These locations may also be used as points of distribution for emergency support commodities, but services are physically segregated at each site between the two functions.

Operational Areas pre-position equipment used in an evacuation, such as portable radios, communication systems, trailers, signs, portable changeable signs, vests, and security items, at the pickup locations as they are able to do so.

For planning purposes, it is assumed that mass transportation resources are overwhelmed and unavailable to provide local transportation service in the community. People therefore need to transport themselves to the pickup locations.

5.11.4 Potential Pickup Locations for Intermodal Transfer

Intermodal transfer points are established to support evacuation operations. Potential pickup points for ferry and rail service are identified in Table **5-12** and shown in **Appendix B, Maps B-6a** through **B-6l**. For both ferry and rail service, evacuees either walk to the locations or arrive by bus. The ferry locations of Vallejo and Mare Island Naval Shipyard are destination points for evacuees arriving by ferry service, but they are also identified as pickup locations since they can be used to transport emergency workers back into impacted areas.

Potential airports are also identified in **Table 5-12** and shown in **Appendix B, Maps B-6a through B-6l**. Evacuees arrive by bus to the airports for flights out of the region.

The same conditions and operational considerations that apply for other pickup points apply to these sites as well.

5.12 Evacuee Transportation Patterns

The regional transportation movements by evacuees identified in this section of the Plan represent one proposal for transporting the affected populations. These patterns are not intended to be the only method but are suggested based on knowledge of the transportation network in the region and experience working with various transportation agencies in the region. When the service plan is developed in the Action Plan, actual transportation patterns are established. When those transportation patterns are established, this Plan should be used as a guide.

Table 5-11. County pickup locations for bus service.

County	Potential Pickup Locations	Pickup Location Address	Latitude	Longitude
Alameda	State Route 61 mall parking lot	121 98th Avenue, Oakland, CA 94603	37.729258	-122.197953
	I-238 parking lot	22253 Foothill Boulevard, Hayward, CA 94541	37.678692	-122.085275
	I-880 Coliseum Way parking lot	5200 Coliseum Way, Oakland, CA 94601	37.761183	-122.212317
	Newpark Mall	2086 Newpark Mall, Newark, CA 94560-2011	37.526050	-122.001219
	Oakland Coliseum parking lot	7000 Coliseum Way, Oakland, CA 94621	37.750981	-122.202003
	Safeway Grocery parking lot (Piedmont)	5130 Broadway, Oakland, CA 94611	37.834136	-122.250011
	Southland Mall	1 Southland Mall Drive, Hayward, CA 94545	37.651756	-122.102742
	I-580 parking lot	Northeast corner of Willow Road and Owens Drive, Pleasanton, CA 94588	37.700475	-121.896903
	Industrial Parkway parking lot	29900 Auction Court, Hayward, CA 94544-6914	37.615272	-122.070322
	Off-airport parking	80 Swan Way, Oakland, CA 94621-1438	37.730092	-122.206386
	Big Lots parking lot	5453 Thornton Avenue, Newark, CA 94560-3238	37.543658	-122.026367
	Wal-Mart Shopping Center parking lot, Union City	30600 Dyer Street, Union City, CA 94587	37.602092	-122.067986
	Stoneridge Mall	1 Stoneridge Mall Road, Pleasanton, CA 94588	37.695711	-121.928802
	Altamont Commuter Express station in Pleasanton	Intersection of Bernal Ave and Pleasanton Avenue, Pleasanton, CA 94566	37.956985	-121.279014
	Central Park, City of Fremont	1950 Stevenson Boulevard, Fremont, CA 94538-2319	37.550647	-121.961531
	Ohlone College, Fremont	43600 Mission Boulevard, Fremont, CA 94539	37.530010	-121.914599
	West Dublin/Pleasanton BART Station parking lot	Intersection of De Marcus Boulevard and Campbell Lane, Dublin, CA 94568	37.703518	-121.898500
	East Dublin/Pleasanton BART Station parking lot	Intersection of Owens Drive and De Marcus Boulevard, Pleasanton, CA 94588	37.700582	-121.894765
	Castro Valley BART Station parking lot	3301 Norbridge Drive, Castro Valley, CA 94546	37.691760	-122.075403
	Bay Fair BART Station parking lot	Intersection of Coelho Drive and Mooney Avenue, San Leandro, CA 94577	37.697718	-122.125700
	Coliseum/Oakland Airport BART Station parking lot	Intersection of 71st Avenue and Hawley Street, Oakland, CA 94621	37.754629	-122.195591
	Fruitvale BART Station parking lot	Intersection of East 12th Street and Fruitvale Avenue, Oakland, CA 94601	37.775614	-122.226196
	West Oakland BART Station parking lot	Intersection of Mandela Parkway and 5th Street, Oakland, CA 94607	37.804421	-122.295273
	Hayward BART Station parking lot	Intersection of Grand Street and B Street, Hayward, CA 94541	37.669630	-122.088155
	South Hayward BART Station parking lot	Intersection of Dixon Street and Tennyson Road, Hayward, CA 94544	37.634746	-122.056315

Table 5-11. County pickup locations for bus service.

County	Potential Pickup Locations	Pickup Location Address	Latitude	Longitude
Alameda (cont.)	Union City BART Station parking lot	Intersection of Decoto Road and Union Square, Union City, CA 94587	37.590101	-122.018044
	Fremont BART Station parking lot	Intersection of Mowry Avenue and Waterside Circle, Fremont, CA 94538	37.559121	-122.283882
	North Berkeley BART Station parking lot	Intersection of Delaware Street and Sacramento Street, Berkeley, CA 94702	37.874026	-122.252732
	Ashby BART Station parking lot	Intersection of Ashby Avenue and Martin Luther King Jr Way, Berkeley, CA 94703	37.853460	121.977552
	Rockridge BART Station parking lot	Intersection of Miles Avenue and Forrest Street, Oakland, CA 94618	37.844184	-122.27051
Contra Costa	Contra Costa College, San Pablo	2600 Mission Bell Drive, San Pablo, CA 94806-3195	37.968628	-122.336326
	Diablo Valley College, Pleasant Hill	312 Golf Club Road, Pleasant Hill, CA 94523-1529	37.968908	-122.068298
	Los Medanos College, Pittsburg	2700 East Leland Road, Pittsburg, CA 94565-5197	38.005425	-121.861208
	Hilltop Mall, Richmond	2200 Hilltop Mall Drive, Richmond, CA 94806	37.981817	-122.329289
	Buchanan Airport, Concord	550 Sally Ride Drive, Concord, CA 94520-5550	37.987663	-122.058265
	Amtrak Station, Martinez	603 Marina Vista Avenue, Martinez, CA 94553	38.018924	-122.138684
	Fairgrounds, Antioch	1201 W 10th Street, Antioch, CA 94509-1406	38.008186	-121.822560
	Sun Valley Mall, Concord	341 Sun Valley Mall, Concord, CA 94520-5801	37.964736	-122.061292
	Lone Tree Plaza, Brentwood	Northeast corner of Canada Valley Road and Lone Tree Way, Brentwood, CA 94513	37.962013	-121.747014
	Orinda Library, Orinda	26 Orinda Way, Orinda, CA 94563	37.883240	-122.188012
	Veteran's Hall, Lafayette	3780 Mount Diablo Boulevard, Lafayette, CA 94549	37.888733	-122.142436
	Broadway Plaza, Walnut Creek	1460 South Main Street, Walnut Creek, CA 94596-5383	37.891241	-122.056756
	St. Mary's College, Moraga	1928 Saint Mary's Road, Moraga, CA 94556	37.843190	-122.112093
	San Ramon Valley High School, Danville	501 Danville Boulevard, Danville, CA 94526-2498	37.825671	-122.007299
	Central Park, San Ramon Valley	12501 Alcosta Boulevard, San Ramon, CA 94583	37.768144	-121.955889
	County East Mall	2504 Somersville Road, Antioch, CA 94509	38.000294	-121.842296
	Byron Airport	15031 Byron Highway, Byron, CA 94514	37.867148	-121.638007
	Ambrose Recreation Center	3105 Willow Pass Road, Bay Point, CA 94565-3217	38.025388	-121.949473
	San Ramon Transit Center	Intersection of Executive Parkway and Camino Ramon, San Ramon, CA 94583	37.770176	-121.960334

Table 5-11. County pickup locations for bus service.

County	Potential Pickup Locations	Pickup Location Address	Latitude	Longitude
Contra Costa (cont.)	Bishop Ranch Transit Center	One Annabel Lane, San Ramon, CA 94583	37.773331	-121.971396
	Orinda BART Station parking lot	Intersection of Camino Pablo and Highway 24, Orinda, CA 94563	37.877388	-122.185483
	Lafayette BART Station parking lot	Intersection of Deer Hill Road and North Thompson Road, Lafayette, CA 94549	37.894239	-122.124032
	Walnut Creek BART Station parking lot	Intersection of Hillside Avenue and Oakland Boulevard, Walnut Creek, CA 94596	37.905660	-122.068342
	Pleasant Hill/Contra Costa Center BART Station parking lot	Intersection of Wayne Court and Oak Road, Walnut Creek, CA 94597	37.928838	-122.056811
	Concord BART Station parking lot	Intersection of Oak Street and Grant Street, Concord, CA 94520	37.973767	-122.029970
	North Concord/Martinez BART Station parking lot	3700 Port Chicago Highway, Concord, CA 94520	38.000247	-122.023927
	Pittsburgh/Bay Point BART Station parking lot	1700 West Leland Road, Pittsburg, CA 94565	38.016872	-121.945868
	El Cerrito Plaza BART Station parking lot	Intersection of Liberty Street and Central Avenue, El Cerrito, CA 94530	37.902397	-122.299678
	El Cerrito Del Norte BART Station parking lot	Intersection of San Pablo Avenue and Cutting Boulevard., El Cerrito, CA 94530	37.925651	-122.317219
	Richmond BART Station parking lot	Intersection of MacDonald Avenue and 16th Street, Richmond, CA 94801	37.937170	-122.353400
Marin	Fireman's Fund Parking Lot	777 San Marin Drive, Novato, CA 94945	38.122081	-122.569144
	Bay Model Parking Lot	2100 Bridgeway, Sausalito, CA 94965	37.864439	-122.495030
	100 Ebbtide Ave	100 Ebbtide Avenue, Sausalito, CA 94965	37.870483	-122.503689
	Best Buy Parking Lot	180 Donahue Street, Marin City, CA 94965	37.872862	-122.510074
	Tamalpias High/Safeway Parking Lot	700 Miller Avenue, Mill Valley, CA 94941-2991	37.891653	-122.530307
	Strawberry Village Safeway Parking Lot	110 Strawberry Town, Mill Valley, CA 94941	37.898648	-122.513097
	Corte Madera Mall East side	1618 Redwood Highway, Corte Madera, CA 94925	37.929403	-122.513255
	Corte Madera Mall West side	431 Corte Madera Town Center, Corte Madera, CA 94925	37.927568	-122.517310
	Larkspur Landing South side, Bay	101 East Sir Francis Drake Boulevard, Larkspur, CA 94939-1803	37.944611	-122.510621
	Larkspur Landing North Side, Marin Brewing Company	1809 Larkspur Landing Circle, Larkspur, CA 94939-1801	37.947662	-122.510267
	Northgate Mall, 3 parking lots	1000 Northgate Mall, San Rafael, CA 94903-3629	38.005712	-122.543640
	San Rafael High	185 Mission Avenue, San Rafael, CA 94901-3589	37.971635	-122.513594
	Rowland exit Park & Ride	100 Vintage Way, Novato, CA 94945-5003	38.091847	-122.555323

Table 5-11. County pickup locations for bus service.

County	Potential Pickup Locations	Pickup Location Address	Latitude	Longitude
Marin (cont.)	Former Air Force Commissary parking at Hamilton Field	Aberdeen Road, Novato, CA 94949	38.061838	-122.523657
	101 Golden Gate Transit stop	121 Marinwood Avenue, San Rafael, CA 94903-1521	38.033365	-122.539590
	101 Golden Gate Transit stop	280 Smith Ranch Road, San Rafael, CA 94903-1927	38.019124	-122.532837
	Golden Gate Transit/Marin Airporter Parking Lot	Intersection of Shoreline Highway (101) and Redwood Highway, Mill Valley, CA 94941	37.880094	-122.517248
Monterey	Big Sur River Inn	Highway One at Pheneger Creek, Big Sur, CA 93920-9507	36.269803	-121.808146
	Carmel High School	3600 Ocean Avenue, Carmel, CA 93923	36.554149	-121.909286
	Marina Transit Exchange	3100 De Forest Road, Marina, CA 93933-3104	36.684153	-121.794370
	MST-Monterey Salinas Transit parking lot	23 Ryan Ranch Road, Monterey, CA 93940-5703	36.584968	-121.828406
	Monterey - Transit Plaza Bus Stop	Simoneau Plaza, Monterey, CA 93940	36.597702	-121.894066
	Salinas Transit Center	121 Lincoln Avenue, Salinas, CA 93901-2667	36.676442	-121.656878
	Edgewater Transit Exchange	990 Playa Avenue, Sand City, CA 93955-3179	36.619064	-121.843350
Napa	Napa Shopping Center	211 Soscol Avenue, Napa, CA 94559	38.282931	-122.276156
	Justin Siena High School	4026 Maher Street, Napa, CA 94558	38.331811	-122.320292
	Trader Joes parking lot	3654 Bel Aire Plaza, Napa, CA 94558	38.322625	-122.307125
	Redwood Middle School	13925 Fruitvale Avenue, Saratoga, CA 95070	38.323250	-122.313500
	Temescal High School	2447 Old Sonoma Road, Napa, CA 94558-6006	38.285708	-122.302606
San Benito	Briggs Lawn, Hollister	365 4th Street, Hollister, CA 95023-3830	36.852207	-121.402328
	Safeway Parking Lot, Hollister	591 Tres Pinos Road, Hollister, CA 95023	36.838940	-121.392110
	Community Center on West Street, Hollister	300 West Street, Hollister, CA 95023-3717	36.853578	-121.405641
	Nob Hill Parking Lot, Hollister	1700 Airline Highway, Hollister, CA 95023	36.837469	-121.390611
	Post Office, Hollister	100 Maple Street, Hollister, CA 95023-9998	36.858682	-121.399264
	Hospital, Hollister	911 Sunset Drive, Hollister, CA 95023	36.834277	-121.386368
	Target Parking Lot, Hollister	1790 Airline Highway, Hollister, CA 95023-5621	36.835892	-121.389873
	San Benito High School, Hollister	1220 Monterey Street, Hollister, CA 95023-4799	36.841254	-121.404650

Table 5-11. County pickup locations for bus service.

County	Potential Pickup Locations	Pickup Location Address	Latitude	Longitude
San Benito (cont.)	Hollister Supermarket, Hollister	1280 San Juan Highway, San Juan Bautista, CA 95045	36.853110	-121.420385
	RO Hardin, Hollister	881 Line Street, Hollister, CA 95023-4599	36.846393	-121.412713
	Windmill Market, San Juan Bautista	301 The Alameda, San Juan Bautista, CA 95045-9746	36.841422	-121.533970
	Abbe Park, San Juan Bautista	Polk St, San Juan Bautista, CA 95045	36.844501	-121.539254
	Anzar High School, San Juan Bautista	2000 San Juan Highway, San Juan Bautista, CA 95045-9558	36.881182	-121.556125
	Tres Pinos Church, Tres Pinos	7290 Airline Highway, Tres Pinos, CA 95075	36.786736	-121.315991
	Mini Mart, Tres Pinos	6851 Airline Highway, Tres Pinos, CA 95075	36.790559	-121.321874
San Francisco (all in City of San Francisco)	China Basin parking lot	Channel Street and 3rd Street, San Francisco, CA 94158	37.774258	-122.389850
	Fisherman's Wharf parking lot	160 Jefferson Street, San Francisco, CA 94133	37.808817	-122.414531
	Presidio Trust Operations Department parking lot	Intersection of Lincoln Boulevard and Howard Road, San Francisco, CA 94129	37.788331	-122.481339
	Good Hope Baptist Church parking lot	100 Alemany Boulevard, San Francisco, CA 94110-6221	37.736042	-122.410347
	Lakeshore School	220 Middlefield Drive, San Francisco, CA 94132-1418	37.728942	-122.482153
	Marina Middle School	3500 Fillmore Street, San Francisco, CA 94123-2199	37.801881	-122.434581
	Mervyns Shopping Plaza	2675 Geary Boulevard, San Francisco, CA 94118	37.781831	-122.446044
	Presidio Trust parking lot	104 Montgomery Street, San Francisco, CA 94129	37.800461	-122.458219
	Port of San Francisco	698 The Embarcadero, San Francisco, CA 94111	37.801508	-122.398328
	San Francisco State University	1600 Holloway Avenue, San Francisco, CA 94132	37.720858	-122.476619
	Stonestown Mall	1 Stonestown Mall, San Francisco, CA 94132-1905	37.728722	-122.476983
	Washington High School	600 32nd Avenue, San Francisco, CA 94121-2794	37.776722	-122.490956
	Pier 28	Pier 28, San Francisco, CA 94105-1251	37.786644	-122.387008
	Glen Park BART Station parking lot	Intersection of Diamond Street and O'Shaughnessy Boulevard, San Francisco, CA 94131	37.732941	-122.434114
	Balboa Park BART Station parking lot	401 Geneva Avenue, San Francisco, CA 94112 CA 94112	37.720436	-122.447289
	McCovey Cove at China Basin Park	Intersection of Geneva Avenue and San Jose Avenue, San Francisco, CA 94112	37.775393	-122.388880
	China Basin ballpark/ferry terminal	Intersection of Channel Street and 3rd Street, San Francisco, CA 94107	37.775525	-122.387364

Table 5-11. County pickup locations for bus service.

County	Potential Pickup Locations	Pickup Location Address	Latitude	Longitude
San Francisco (cont.)	Cruise ship terminal, Pier 35	297 Terry Francois Boulevard, San Francisco, California 94158	37.807411	-122.406321
	Pier 48/50 parking lot	1454 The Embarcadero, San Francisco, California 94133	37.806690	-122.405644
San Mateo	Albertsons parking lot, San Carlos	1133 Old County Road, San Carlos, CA 94070-4009	37.500286	-122.250150
	Foodsco parking lot, Redwood City	1401 Broadway Street, Redwood City, CA 94063-2500	37.486475	-122.215986
	State Route 380 Office Complex parking lot	1150 Bayhill Drive , San Bruno, CA 94066-3004	37.628775	-122.422150
	State Route 92 Kmart Shopping Complex	1700 South Delaware, San Mateo, CA 94402	37.554494	-122.308181
	Metro Center parking lot	1001 Metro Center Boulevard, Foster City, CA 94404	37.560822	-122.276103
	Ravenswood High School	1775 E Bayshore Road, East Palo Alto, CA 94303-2523	37.459878	-122.136942
	Serramonte Shopping Center, East	5001 Junipero Serra Boulevard, Colma, CA 94014	37.673381	-122.465389
	Strawflower Shopping Center parking lot, Half Moon Bay	70 Cabrillo Highway, Half Moon Bay, CA 94019	37.469436	-122.435336
	Daly City BART Station parking lot	Intersection of Hill Street and D Street, Daly City, CA 94014	37.706120	-122.469081
	Colma BART Station parking lot	Intersection of John Daly Boulevard and De Long Street, Daly City, CA 94015	37.683213	-122.468682
	Millbrae BART Station parking lot	Intersection of Rollins Street and East Millbrae Avenue, Millbrae, CA 94030	37.601100	-122.384619
	San Bruno BART Station parking lot	Intersection of Huntington Avenue and Sneath Lane, San Bruno, CA 94066	37.638804	-122.417415
	South San Francisco BART Station parking lot	Intersection of Mission Road and McLellan Drive, South San Francisco, CA 94080	37.664330	-122.443990
Santa Clara	Lucky Supermarket parking lot #2, San Jose,	1048 South White Road, San Jose, CA 95127-3812	37.357586	-121.819314
	Lucky Supermarket parking lot #3, San Jose,	400 El Paseo De Saratoga, San Jose, CA 95130-1619	37.289528	-121.992003
	Lucky Supermarket parking lot, Milpitas	25 North Milpitas Boulevard, Milpitas, CA 95035-4402	37.433397	-121.900772
	Bollinger Road parking lot	965 South De Anza Boulevard, San Jose, CA 95129-2707	37.310850	-122.032944
	Capitol Flea Market	3630 Hillcap Avenue, San Jose, CA 95136-1344	37.279650	-121.840558
	Flea Market Inc, parking lot #2	1590 Berryessa Road, San Jose, CA 95133	37.365547	-121.874783
	JCPenney Company	2200 Eastridge Loop, San Jose, CA 95122	37.326128	-121.814747

Table 5-11. County pickup locations for bus service.

County	Potential Pickup Locations	Pickup Location Address	Latitude	Longitude
Santa Cruz	Capitola Mall	1855 41st Avenue, Capitola, CA 95010-2553	36.976031	-121.966953
	CVS Drug Store parking lot, Watsonville	1966 Main Street, Watsonville, CA 95076-3066	36.918961	-121.781692
	Harvey West Park	275 Harvey West Boulevard, Santa Cruz, CA 95060	36.983483	-122.038918
	Fairgrounds, Watsonville	2601 East Lake Avenue, Watsonville, CA 95076-1419	36.951366	-121.736278
Solano	Marina Vista Memorial Park parking lot	Intersection of Mare Island Way and Florida Street, Vallejo, CA 94590	38.101717	-122.262969
	99 Cents Only Shopping Center parking lot	551 Peabody Road, Vacaville, CA 95687-5821	38.105403	-122.216733
	Fairfield Shopping Center parking lot 2	2059 Cadenasso Drive, Fairfield, CA 94533	38.247256	-122.068892
	Fairfield Shopping Center parking lot	5101 Business Center Drive, Fairfield, CA 94534	38.214747	-122.144428
Sonoma	Petaluma Boulevard North parking lot	2200 Petaluma Boulevard North, Petaluma, CA 94952	38.256078	-122.650692
	Petaluma Marina parking lot	2090 Marina Avenue, Petaluma, CA 94954-6714	38.231469	-122.612686
	Petaluma Shopping Center parking lot 2	Intersection of N. McDowell Boulevard and E. Washington Street, Petaluma, CA 94954	38.248778	-122.623406
	Cotati parking lot	1500 Valley House Drive Rohnert Park, CA 94928	38.324497	-122.681586
	Rohnert Park parking lot	Intersection of Rohnert Park Expressway and Labath Avenue, Rohnert Park, CA 94928	38.347772	-122.722928
	Santa Rosa parking lot	Intersection of Santa Rosa Avenue and Kawana Spring Road, Santa Rosa, CA 95407	38.418533	-122.710714

Source: CONPLAN (2008) and input from counties (2009)
I = Interstate
SR = State Route
U.S. = U.S. highway

Appendix B, Maps B-7a through **B-7d,** identify the cardinal directions of movement of evacuees using all modes of transportation. Movement is either from a pickup location or a transportation facility (ferry terminal or rail station) to shelters outside the region or to an airport. The following subsections contain information on transportation patterns, by time frame.

5.12.1 E+72 Hours to E+14 Days

From E+72 hours to E+14 days, the evacuees identified in **Table 5-13** are moved out of the affected areas (outbound). A combination of air, bus/demand response vehicle, ferry, and rail are used to transport evacuees. The use of the term "residents" refers to residents who need to use mass transportation resources to evacuate. Each category of evacuees has slightly different transportation patterns.

Table 5-12. Potential pickup locations for ferry, rail facilities, and airports.

County	Ferry	Rail	Airport
Alameda	• Oakland/Alameda • Future – Berkeley	Livermore / Pleasanton	Stockton Metropolitan
Contra Costa	• Port of Richmond /U.S. Army Military Ocean Terminal Concord	Antioch / Martinez / Richmond	Buchanan Field, Concord Byron Airport
Marin	• Larkspur Landing • Fort Baker Pier	—	—
Monterey	—	—	Monterey Peninsula
Napa	—	—	Charles M. Schulz (Sonoma County)
San Benito	—	—	Monterey Peninsula
San Francisco	• San Francisco Ferry Building • Fort Point Pier	—	—
San Mateo	• Port of Redwood City • Future—Oyster Point	—	—
Santa Clara	—	Gilroy	—
Santa Cruz	—	—	Watsonville Airport
Solano	• Vallejo • Mare Island Naval Shipyard • Benicia Port	Suisun City/Fairfield	—
Sonoma	—	—	Charles M. Schulz (Sonoma County)

Source: URS analysis (2009)
— = none
E = event

Table 5-13. Estimated number of evacuees needing mass transportation assistance, by transportation pattern, from E+72 hours to E+14 days.

	Visitors/Tourists	Residents and Inter-County Commuters			Total Evacuees Needing Mass Transportation Assistance
County	Bus/DRV to Airport	Ferry to Bus/DRV to Out-of-Region Shelter	Bus/DRV to Out-of-Region Shelter	Bus/DRV to Rail to Out-of-Region Shelter	
Alameda	12,400	0	98,000	98,000	208,400
Contra Costa	8,500	0	27,200	27,400	63,100
Marin	2,100	0	17,800	0	19,900
Monterey	7,500	0	3,100	800	11,400
Napa	1,100	0	2,500	2,500	6,100
San Benito	500	0	600	600	1,700
San Francisco	56,200	224,600	28,000	28,100	336,900
San Mateo	5,900	0	57,600	57,600	121,100
Santa Clara	21,200	0	102,500	102,400	226,100
Santa Cruz	3,700	0	4,200	1,700	9,600
Solano	3,900	0	3,100	3,100	10,100
Sonoma	3,400	0	8,500	8,600	20,500
Total	**126,400**	**224,600**	**353,100**	**330,800**	**1,034,900**

Source: URS analysis (2009)
DRV = demand response vehicle

5.12.1.1 Visitors/Tourists

Visitors and tourists are transported to airports by bus/demand response vehicle to fly home. Visitors and tourists are spread throughout the Bay Area but are more concentrated in San Francisco and Santa Clara counties. By returning visitors and tourists home, the counties are relieved of the need to provide care and shelter for them. Before being transported, visitors and tourists shelter in place at their accommodations, seek short-term mass care services as available, or, if transported to an airport, seek temporary shelter there.

5.12.1.2 Inter-County Commuters

Inter-county commuters have multiple transportation patterns.

- Inter-county commuters who work in San Francisco County
  - Approximately 80 percent of the inter-county commuters who work in San Francisco are directed to walk or otherwise transport themselves to a ferry facility in San Francisco from which ferry operations transport them to the ferry terminal in Vallejo. At that location, buses and/or demand response vehicles are used to transport the evacuees to a shelter outside the region.
  - The remaining 20 percent of inter-county commuters who work in San Francisco are stranded, unable to find transportation to a ferry facility or to reach a ferry facility. These evacuees find their own transportation to a pickup location and at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.
- Inter-county commuters who work in Marin County
  - The inter-county commuters in Marin County are directed to walk or otherwise transport themselves to a pickup location and at that location, 100 percent are transported by bus/demand response vehicle to a shelter outside the region.
- Inter-county commuters who work in the remaining counties
  - The inter-county commuters in the remaining counties are directed to walk or otherwise transport themselves to a pickup location; at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.

Transportation between the destination rail station and the out-of-region shelter is to be addressed by out-of-region resources and is not addressed in this Plan.

Before being transported, inter-county commuters shelter in place at their work locations or seek shelter near their work locations.

5.12.1.3 Residents

Residents have multiple transportation patterns.

- Residents of San Francisco
  - Approximately 80 percent of the residents of San Francisco who evacuate are directed to walk or otherwise transport themselves to a ferry location in the city/county, are transported by ferry to Vallejo, and then placed on a bus/demand response vehicle to a shelter outside the region.
  - Approximately 10 percent of the residents of San Francisco who evacuate are directed to walk or otherwise transport themselves to a pickup location and placed on a bus/demand response vehicle to an out-of-region shelter.
  - Approximately 10 percent of the residents of San Francisco who evacuate are directed to walk or otherwise transport themselves to a pickup location and placed on a bus/demand response vehicle to a rail station for further transportation by passenger rail service to an out-of-region shelter.
- Residents of Marin County
  - In Marin County, all evacuating residents are directed to walk or otherwise transport themselves to a pickup location and are transported by bus/demand response vehicle to a shelter outside the region.
- Residents of remaining counties
  - Approximately 50 percent of evacuating residents are directed to walk or otherwise transport themselves to a pickup location and then be transported by bus/demand response vehicle to a shelter that is outside the region.
  - Approximately 50 percent of evacuating residents are directed to walk or otherwise transport themselves to a pickup location and then be transported by bus/demand response vehicle to a rail station, where they board a passenger train to a shelter location outside the region.

Transportation from the destination rail station to the out-of-region shelter is addressed by out-of-region resources and is not addressed in this Plan.

Before being transported, evacuating residents shelter in place at their residences, seek shelter close to their residences, or seek shelter near a rail station or ferry facility while awaiting transport.

5.12.1.4 Total Evacuees

The total number of evacuees who are transported using mass transportation services, by category of evacuee and transportation pattern for E+72 hours to E+14 days, is provided in **Table 5-13**.

5.12.2 E+14 Days to E+60 Days (Up to Approximately E+30 Days)

From E+14 days to E+60 days (up to approximately E+30 days), many evacuees travel back into the region and return to their residences (inbound travel) because water and power have been restored. This Plan addresses only the period up

through E+60 days, and it is unlikely that all evacuees return by that time. A combination of bus/demand response vehicle and rail services are used to transport returning evacuees. Ferry service is not anticipated to transport returning residents during this time frame because residents are either in shelters away from ferry facilities or in shelters outside the region. Bus/demand response vehicle and rail service are able to accommodate the transportation pattern of these evacuees.

5.12.2.1 Additional Evacuees Because of Lack of Water: Residents—Outbound Travel

No significant number of additional outbound evacuees is anticipated.

5.12.2.2 Returning Residents Because of Restoration of Water: Residents—Inbound Travel

Returning residents are transported according to several patterns.

- Returning residents: Marin County
  - 100 percent of the returning residents are picked up by buses at the out-of-region shelters and returned to pickup locations in the county. Residents arrange their own transportation back to their residences.
- Returning residents: Remaining counties
  - Approximately 50 percent of the returning residents are picked up by buses at the out-of-region shelters and returned to pickup locations in their respective counties. Residents arrange their own transportation back to their residences.
  - Approximately 50 percent of the returning residents are transported by out-of-region resources from shelters outside the region to the initial rail station (also located outside the region) and are transported by rail back to a county rail station. Buses/demand response vehicles provide transportation from the county rail station to pickup locations in their respective counties. Residents arrange their own transportation back to their residences.

5.12.2.3 Total Evacuees

The total number of evacuees needing mass transportation assistance, and transportation patterns for E+14 days to E+60 days (up to approximately E+30 days) is provided in **Table 5-14**.

5.12.3 E+14 Days to E+60 Days (Up to Approximately E+60 Days)

From E+14 days to E+60 days (up to approximately E+60 days), evacuees generally move back into the region and return to their residences (inbound travel). A combination of bus/demand response vehicle and rail is used to transport returning evacuees. Ferry service is not used to transport residents during this time frame because residents are either in shelters away from ferry facilities or in shelters outside the region. **Table 5-15** shows the bus/demand response vehicle service and rail service for transporting these evacuees.

Table 5-14. Estimated number of returning evacuees needing mass transportation assistance, by transportation patterns from E+14 days to E+60 days (up to approximately E+30 days).

County	Number of Returning Evacuees Needing Mass Transportation Assistance		Total Evacuees Needing Mass Transportation Assistance
	Bus to Shelter	Rail to Bus to Shelter	
Alameda	8,600	8,600	**17,200**
Contra Costa	800	800	**1,600**
Marin	1,100	0	**1,100**
Monterey	0	0	**0**
Napa	0	0	**0**
San Benito	0	0	**0**
San Francisco	6,100	6,100	**12,200**
San Mateo	4,400	4,400	**8,800**
Santa Clara	9,600	9,600	**19,200**
Santa Cruz	0	0	**0**
Solano	0	0	**0**
Sonoma	1,300	1,300	**2,600**
Total	**31,900**	**30,800**	**62,700**

Source: URS analysis (2009)
E = event

5.12.3.1 Additional Evacuees Because of Lack of Water: Residents—Outbound Travel

No significant number of additional outbound evacuees is anticipated.

5.12.3.2 Returning Residents Because of Restoration of Water: General Population and Homeless (Residents)—Inbound Travel

- Returning residents: Marin County
  - All returning residents are picked up by buses at the out-of-region shelters and returned to pickup locations in the county. Residents arrange their own transportation back to their residences.
- Returning residents: Remaining counties
  - Approximately 50 percent of the returning residents are picked up by buses at the out-of-region shelters and returned to pickup locations in their respective counties. Residents arrange their own transportation back to their residences.
  - Approximately 50 percent of the returning residents are transported by out-of-region resources from shelters outside the region to the initial rail station

(also located outside the region) and are transported by rail back to a county rail station. Buses/demand response vehicles provide transportation from the county rail station to pickup locations in their respective counties. Residents arrange their own transportation back to their residences.

5.12.3.3 Total Evacuees

The total number of evacuees needing mass transportation assistance, and the transportation patterns for E+14 days to E+60 days (up to approximately E+60 days) is provided in **Table 5-15**.

Table 5-15. Estimated number of returning evacuees needing mass transportation assistance, by transportation patterns from E+14 days to E+60 days (up to approximately E+60 days).

	Number of Returning Evacuees Needing Mass Transportation Assistance		Total Evacuees Needing Mass Transportation Assistance
County	**Bus to Shelter**	**Rail to Bus to Shelter**	
Alameda	8,600	8,500	17,100
Contra Costa	800	800	1,600
Marin	1,100	0	1,100
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	6,100	6,100	12,200
San Mateo	4,400	4,400	8,800
Santa Clara	9,700	9,600	19,300
Santa Cruz	0	0	0
Solano	0	0	0
Sonoma	1,300	1,300	2,600
Total	**32,000**	**30,700**	**62,700**

Source: URS analysis (2009)
E = event

5.12.4 Summary Transportation Movement (Inbound/Outbound Evacuees) from E+72 Hours to E+60 Days

Table 5-16 identifies by time frame and number of inbound and outbound evacuees transported using mass transportation resources.

Table 5-16. Summary of transportation movement for evacuees needing mass transportation assistance from E+3 days to E+60 days.

	E+72 Hours to E+14 Days			E+14 Days to E+60 Days Up to Approximately E+30 Days			E+14 Days to E+60 Days Up to Approximately E+60 Days		
County	**Outbound Evacuees**	**Returning Evacuees**	**Total Estimated Evacuees Transported**	**Outbound Evacuees**	**Returning Evacuees**	**Additional Estimated Evacuees Transported**	**Outbound Evacuees**	**Returning Evacuees**	**Additional Estimated Evacuees Transported**
Alameda	208,400	0	208,400	0	17,100	17,100	0	17,100	17,100
Contra Costa	63,100	0	63,100	0	1,600	1,600	0	1,600	1,600
Marin	19,900	0	19,900	0	1,100	1,100	0	1,100	1,100
Monterey	11,400	0	11,400	0	0	0	0	0	0
Napa	6,100	0	6,100	0	0	0	0	0	0
San Benito	1,700	0	1,700	0	0	0	0	0	0
San Francisco	336,900	0	336,900	0	12,200	12,200	0	12,200	12,200
San Mateo	121,100	0	121,100	0	8,800	8,800	0	8,800	8,800
Santa Clara	226,100	0	226,100	0	19,300	19,300	0	19,300	19,300
Santa Cruz	9,600	0	9,600	0	0	0	0	0	0
Solano	10,100	0	10,100	0	0	0	0	0	0
Sonoma	20,500	0	20,500	0	2,600	2,600	0	2,600	2,600
Total	**1,034,900**	**0**	**1,034,900**	**0**	**62,700**	**62,700**	**0**	**62,700**	**62,700**

Source: URS Analysis (2009)
E = event

5.13 Access and Functional Needs Populations

Individuals with access and functional needs require assistance in the functional areas that are described below. Access and functional needs populations are populations whose members may have these needs before, during, and after the earthquake. The functional areas include, but are not limited to, the following:

- **Communication.** Individuals who have limitations that interfere with the receipt of and response to information need that information provided in ways they can understand and use. They may not be able to hear verbal announcements, see directional signs, or understand how to get assistance due to hearing, vision, speech, cognitive, or intellectual limitations, and/or limited English proficiency.
- **Medical care.** Individuals who are not self-sufficient or who do not have adequate support from caregivers, family, or friends may need assistance with managing unstable, terminal or contagious conditions that require observation and ongoing treatment; managing intravenous therapy, tube feeding, and vital signs; receiving dialysis, oxygen, or suction administration; managing wounds; or operating power-dependent equipment to sustain life. These individuals require the support of trained medical professionals.
- **(Maintaining) Independence.** Individuals who require support to be independent in daily activities may lose this support during an emergency or a disaster. Such support may include consumable medical supplies (diapers, formula, bandages, and other supplies), durable medical equipment (wheelchairs, walkers, or scooters), service animals, and attendants or caregivers. Supplying needed support to these individuals enables them to maintain their pre-disaster level of independence.
- **Supervision.** Individuals may lose the support of caregivers, family, or friends or may be unable to cope in a new environment (particularly if they have dementia, Alzheimer's, or psychiatric conditions, such as schizophrenia or intense anxiety). If separated from their caregivers, as they would be during the scenario event, young and school-age children may be unable to identify themselves, and when in danger, they may lack the cognitive ability to assess the situation and react appropriately.
- **Transportation.** Individuals who cannot drive or who do not have a vehicle—including the children at school when the scenario event occurs—may require transportation support for successful evacuation. This support may include accessible vehicles (such as lift-equipped or vehicles suitable for transporting individuals who use oxygen) or information about how and where to access mass transportation during an evacuation.

5.13.1 Support for Populations with Access and Functional Needs

Approximately 20 percent of the residents (general population, homeless, and additional population because of lack of potable water) and visitors/tourists who need to be evacuated have access and functional needs that require the use of demand response vehicles (see **Table 2-5**) for their transport.

A portion of evacuating residents may be unable to walk or otherwise provide their own transportation to a local pickup location for access to mass transportation. For that portion of the population, transportation is provided from their residential facilities to the pickup locations via door-to-door service to the extent possible, but this element of transportation is beyond the scope of this regional-scale Plan. Local mass transportation/evacuation plans address this through the development of memoranda of understanding and other agreements with access and functional needs transportation service providers. To the extent possible, the Cal EMA Office for Access and Functional Needs and the REOC assist local governments in coordinating support for access and functional needs populations.

Service providers transporting access and functional needs populations can provide specialized passenger assistance techniques and are prepared for some members of the population not having their needed durable medical equipment (e.g., walkers, wheelchairs) to assist them in evacuating.

Some evacuees travel with service animals. These animals are accommodated on all vehicles.

To estimate the required number of transportation resources to transport access and functional needs populations, assumptions are provided in **Appendices J** and **K**. Ferry boats and rail cars are accessible to people with access and functional needs, and no additional special equipment is available.

5.13.2 Schoolchildren

On any given day, thousands of children attend school during normal school hours. When a disaster occurs, schools activate their evacuation plans.

The school evacuation plans are meant to cover a broad range of evacuation issues (e.g., flooding of the school, school shootings) but do not appear to cover a catastrophic event such as an earthquake. Parents are expected to pick up their children and children are reunified with their parents or guardians using an identification system, but this may not be possible after an earthquake.

Based on a review of school evacuation plans, the schools do not use mass transportation resources to evacuate students; parents are responsible for picking up their children. The transportation of the parent to the schools is beyond the scope of this Plan.

5.13.3 Inmate Populations

Inmates may need to be moved from damaged correctional facilities to other secure facilities. A review of jail evacuation plans indicates that the plans do not account for the need to evacuate and transport the entire inmate population after an earthquake.

Estimated damage to county and State correctional facilities in the region has not been assessed and is beyond the scope of this Plan. It is assumed that several of these facilities are damaged and that the inmates require evacuation. For

transportation planning purposes, all identified facilities are subject to evacuation. **Table 5-17** shows the inmate population that is subject to evacuation. For transportation planning purposes, either the estimated population or capacity was used, depending on which number was higher.

Table 5-17. Inmate population in county and State correctional facilities in the region.

County/State		Inmates
County	Alameda	4,800
	Contra Costa	2,300
	Marin	400
	Monterey	1,200
	Napa	N/A
	San Benito	200
	San Francisco	2,200
	San Mateo	1,100
	Santa Clara	6,000
	Santa Cruz	400
	Solano	1,100
	Sonoma	1,600
State (county location of facility)	Marin	5,200
	Monterey	11,600
	Solano	9,100
	Total	**47,200**

Source: County and State Department of Corrections data (2009)
N/A = not available

To estimate the number of transportation resources that are needed to transport inmates, the following assumptions were made:

- An average one-way trip length is 150 miles, and a total round-trip length is 300 miles. The mileage estimate was used because the destination jail facility is unknown. A 150-mile one-way trip and 300-mile round-trip was used as a surrogate for an average transportation trip of inmates regardless of the location of the destination jail facility.
- The average trip speed is 45 miles per hour because of road conditions in and outside the region and to account for loading and unloading vehicles. The average round-trip time is 20 hours.
- Operations are carried out 23 hours a day with 1 hour for fueling and light maintenance of the vehicles, resulting in 1 round-trip per vehicle per day.

- Retired school buses or retired public transit vehicles that are customized for security are used. Additional considerations may be required for high-risk prisoners.
- Inmate populations and non-inmate populations are not transported together in mass transportation vehicles.
- Transportation uses road-based vehicles. Inmates are not transported by air.
- The applicable law enforcement entity is responsible for transporting inmates.
- The State is responsible for the security for State prisoners. If State prisons are damaged, the counties currently hosting those facilities may not initially be able to depend on State law enforcement agencies to provide security.
- The maximum number of allowable hours per day per driver is 10.
- Vehicle capacity per bus is 50 inmates.
- Fuel consumption is 6 miles per gallon for standard buses.

Table 5-18 identifies the number of drivers, buses, and fuel needed to evacuate inmates.

Table 5-18. Drivers, buses, and fuel needed to transport inmates in county and State correctional facilities in the region.

County/State		Drivers	Buses	Fuel (gallons)
County	Alameda	40	40	6,000
	Contra Costa	20	20	3,000
	Marin	10	10	1,500
	Monterey	10	10	1,500
	Napa	0	0	0
	San Benito	10	10	1,500
	San Francisco	20	20	3,000
	San Mateo	10	10	1,500
	Santa Clara	40	40	6,000
	Santa Cruz	10	10	1,500
	Solano	10	10	1,500
	Sonoma	20	20	3,000
State (county location of facility)	Marin	40	40	6,000
	Monterey	80	80	12,000
	Solano	70	70	10,500
	Total	**390**	**390**	**58,500**

Source: URS analysis (2009)

5.14 Operations for Inbound Emergency Service Workers

This Plan addresses the movement of emergency service workers and other personnel into the affected region. Movement of general equipment and supplies is beyond the scope of this Plan and should be addressed in separate logistics and

resource management planning. Emergency service workers from outside the region are initially deployed into logistical staging areas in the vicinity of the affected areas. The staging areas are temporary and have the ability to handle commodities, equipment, and inbound emergency service workers.

Emergency service workers are further distributed to base camps for inbound emergency service workers. Proposed base camps for emergency service workers are identified in **Appendix B**, **Map B-8**. **Appendix B**, **Map B-9,** identifies the axes of movement for emergency service workers coming into the region. The daily deployment of inbound emergency service workers is based on the Action Plan. Transportation is provided between the various base camps and the work sites.

The inbound movement of emergency service workers is coordinated through communication from the SOC and REOC to the Operational Area EOCs and corresponding local governments. The REOC informs each Operational Area of the number of inbound emergency service workers, according to availability and projected need. Emergency service workers are directed to the appropriate base camp(s) in each Operational Area.

On a daily basis, between 20,000 and 25,000 emergency service workers need to be transported within the 12-county Bay Area region. The organized transportation of emergency service workers using mass transportation resources begins at approximately E+72 hours and continues through E+60 days.

For transportation planning purposes, the population of emergency service workers using mass transportation resources is estimated at 25,000 per day and divided among the counties in proportion to the amount of damage in each county. The amount of damage or debris generated on a tonnage basis is identified in the HAZUS data. This information is used to allocate the distribution of emergency service workers on a regional basis. **Table 5-19** identifies the number of emergency service workers per county on a daily basis. Final selection of transportation modes occurs when the service plan is developed for the Action Plan. However, for this Plan, it is assumed that emergency service workers reside at a base camp in the county and need transportation within the county.

To estimate the number of mass transportation resources that are needed on a daily basis for the transportation of the emergency service workers, the following assumptions were made:

- An average one-way trip length is 40 miles, and a total round-trip length is 80 miles. This estimate was used because base camp locations and places of work are unknown. A 40-mile one-way trip was used as a surrogate for an average transportation trip of emergency service workers regardless of the location and number of base camps and work destinations.

Table 5-19. Number of daily emergency service workers per county.

County	Emergency Service Workers
Alameda	5,442
Contra Costa	899
Marin	649
Monterey	250
Napa	300
San Benito	35
San Francisco	6,491
San Mateo	3,196
Santa Clara	5,842
Santa Cruz	399
Solano	250
Sonoma	1,248
Total	**25,000**

Source: American Red Cross estimates and URS analysis (2009)

- The average trip speed is 15 miles per hour because of road conditions and to account for loading and unloading vehicles. The average round trip time is 5 hours.
- Operations are carried out 23 hours per day with 1 hour for fueling and light maintenance of the vehicles, resulting in 4 round-trips per vehicle per day.
- Standard buses or possibly school buses are used.
- The maximum allowable number of hours per day per driver is 10.
- Vehicles are used at 75 percent capacity to accommodate first emergency service workers and their equipment/supplies/gear, resulting in 38 passengers per bus based on an average bus capacity of 50 people.
- Fuel consumption is 6 miles per gallon for standard buses.
- Base camps are in the county, and transportation occurs within the county. No cross-county transportation is anticipated.

Vehicles used to transport emergency service workers may be the same vehicles used to transport evacuees. The intent is to load the vehicles on the return trip to the county with emergency service workers because these vehicles would otherwise be empty for their return trip. However, vehicles may at times be unavailable because of the need to transport evacuees out of the region. Because evacuee transport may eventually not be needed, to ensure that available resources are identified, resources (drivers, vehicles, and fuel) are identified as if transportation of emergency service workers is a stand-alone operation.

Transportation for emergency service workers is accomplished predominantly through bus service in each county, but other services may be used. For example, it may be advantageous to use the ferry system to move emergency service workers. To accommodate daily emergency service workers, **Table 5-20** identifies the number of drivers and vehicles and the amount of fuel consumed.

Table 5-20. Estimated number of drivers and buses and gallons of fuel needed to transport emergency service workers per day, by county.

	Needed To Transport Emergency Service Workers per Day		
County	**Drivers**	**Buses**	**Fuel (gallons)**
Alameda	40	40	2,140
Contra Costa	10	10	540
Marin	10	10	540
Monterey	10	10	540
Napa	10	10	540
San Benito	1	1	60
San Francisco	50	50	2,670
San Mateo	30	30	1,600
Santa Clara	40	40	2,140
Santa Cruz	10	10	540
Solano	10	10	540
Sonoma	10	10	540
Total	**231**	**231**	**12,390**

Source: URS analysis (2009)

5.15 Access Control and Security

Access to evacuated areas is controlled by local governments for security reasons, for the safety of emergency service workers, and to keep individuals out of hazardous areas. Inner and outer perimeter control is established through staffed check points, road blocks, or road closures, supplemented by suitably equipped mobile patrols.

Outer perimeter control is used to provide information to the public and to reduce sight-seeing traffic. Inner perimeter control restricts traffic to emergency response vehicles and personnel. When possible, law enforcement personnel also conduct periodic patrols in the secured areas to deter looting of abandoned residences.

Access to evacuated areas is initially limited to:

- Emergency service workers and public works personnel
- Utility companies engaged in restoring utility services

- Damage assessment teams
- Contractors restoring damaged buildings, clearing roads, and removing debris
- Commercial vehicles delivering food, essential supplies, and life support equipment
- Construction supplies and other related materials
- Media

Law enforcement establishes protocols for allowing critical employees, including essential emergency service workers, and medical and volunteer staff through roadblocks. Law enforcement makes allowances at blockades, shelters, and other affected areas for attendants, home health aides, visiting nurses, guide animals, and other individuals who are crucial to the immediate health-care needs of people with access and functional needs.

Law enforcement is present at designated pickup locations and shelter sites for security and crowd control and to deter criminal activity. Local law enforcement agencies can request mutual aid for staffing using established agreements.

5.16 Animal Evacuations

Ensuring the transportation, care, and sheltering of animals is a key component of the RCPGP mass transportation/evacuation planning. Many residents who have companion animals (pets) refuse to evacuate if they cannot take their pets. Many also refuse to either board mass transportation to evacuate or go to shelters if they have to be separated from their pets. In addition, the region has a considerable number of livestock and poultry that need to be sheltered in place. Addressing pet and livestock evacuation and sheltering procedures guarantees protection of both human and animal health and safety.

After Hurricane Katrina, the Pets Evacuation and Transportation Standards Act of 2006 was created, amending the Stafford Act, to support the evacuation needs of individuals with companion animals (pets) and service animals before, during, and after a major disaster or emergency.

The CDFA oversees the CARES program and provides food, water, shelter and care to animals during an emergency and coordinates with organizations that provide transportation resources and animal care personnel for affected animals during evacuations.

The HSUS has plans in place to rescue and transport pet animals in a disaster in the San Francisco Bay Area. The UAN, California Chapter, and private animal care shelters assist in sheltering small and large companion animals. Only non-emergency resources and personnel, such as public and private animal services agencies, are used to rescue and transport animals during an evacuation effort.

Table 5-21 shows the animal population per county that are subject to evacuation and the transportation resources that are required.

Table 5-21. Scenario event animal transportation plan for outbound animal evacuation from E+72 hours to E+14 days.

County	Pet Population[1]	Average Trip Length (One-Way in Miles)[2]	Trip Time (Hours)[3]	Number of Drivers Needed[4]	Number of Round Trips per Vehicle[5]	Total Vehicles Required to Transport Pets[6]	Total Miles for Vehicles	Total Fuel Consumed for Vehicles[7]
Alameda	8,600	250	13	1,920	1	960	480,000	28,240
Contra Costa	1,600	250	13	360	1	180	90,000	5,300
Marin	800	250	13	180	1	90	45,000	2,650
Monterey	300	250	13	80	1	40	20,000	1,180
Napa	400	250	13	100	1	50	25,000	1,480
San Benito	100	250	13	40	1	20	10,000	590
San Francisco	10,600	250	13	2,360	1	1,180	590,000	34,710
San Mateo	3,800	250	13	860	1	430	215,000	12,650
Santa Clara	8,800	250	13	1,960	1	980	490,000	28,830
Santa Cruz	400	250	13	100	1	50	25,000	1,480
Solano	400	250	13	100	1	50	25,000	1,480
Sonoma	1,400	250	13	320	1	160	80,000	4,710
Total	**36,400**	**N/A**	**N/A**	**8,380**	**N/A**	**4,190**	**2,095,000**	**123,300**

Source: URS analysis (2009)
E = event

1 FEMA CONPLAN (2008) using updated population figures, rounded to the nearest 100.
2 The destination or pet shelter locations are unknown. The analysis assumes that animal shelters are 250 miles away.
3 Bus speed is estimated at 40 miles per hour because of the condition of the roadways and to account for loading and unloading. Trip time also includes the return trip of the bus to the trip origin.
4 The number of drivers based on the maximum allowable drive time of 10 hours per day.
5 Based on operating a vehicle 23 hours per day with one hour for fueling, light maintenance, etc.
6 Average capacity of pet transportation is estimated at 9 animals per vehicle. For this analysis, the mode of transportation is special temperature-controlled trucks. It is assumed that Dodge Splinter cargo vans are used for evacuations.
7 Fuel consumption of 17 miles per gallon for trucks (diesel). It is assumed that Dodge Splinter cargo vans are used for evacuations.

To estimate the number of transportation resources that are needed to transport animals, the following assumptions were made:

- The average one-way trip length to an out-of-region shelter is of 250 miles. This estimate was used because the destinations for the animal shelter facilities are unknown.
- The average trip speed is 40 miles per hour for the vehicles because of road conditions and to account for loading and unloading vehicles, resulting in an average round-trip time of 13 hours.
- The maximum allowable hours per day per driver is of 10 hours.
- Operations are carried out 23 hours per day with 1 hour for fueling and light maintenance of the vehicles, resulting in one round-trip per vehicle per day.
- Climate-controlled vans or trucks are used.
- Average capacity is 9 animals (or animal carriers) per vehicle. Dodge Sprinter cargo vans are used.
- Fuel consumption is 17 miles per gallon for animal evacuation vehicles.

Based on the assumptions and the analysis, in the region 421 vans and 842 drivers are required to transport 36,400 animals to animal shelters. Pet evacuations are estimated to require total of 7,571 gallons of fuel.

After the earthquake, there are not enough regional transportation resources to evacuate pets to animal shelters. Additional resources, such as vans, fuel, and drivers from outside the region are required to transport animals.

5.17 Re-Entry

People who evacuated eventually begin to return to their homes when evacuated areas are determined to be safe and water, power, and sewer have been restored. Recovery and the process of restoring normal routines for their citizens begin.

5.17.1 Decision To Allow Re-Entry

The decision to open an affected area for re-entry is made at the city and/or Operational Area level. The decision to allow re-entry is communicated to the REOC and to the UCG.

Criteria considered in the decision to re-enter an affected area include:

- Safety
- Security
- Damage assessments
- Restoration of critical services such as water, power, and sewer

Affected areas are investigated to ensure the areas are safe for residents and critical utilities have been restored. This assessment includes verification that:

- Structures and trees are deemed safe.
- Damage assessments have been completed.
- No leaking or ruptured gas lines or downed power lines are present.
- Water and sewer lines have been repaired.
- Search and rescue operations have been completed.
- No hazardous materials that could threaten public safety are present or appropriate warnings have been issued.
- Water service has been restored.
- Major transportation routes are passable and debris has been removed from the public right-of-way.
- Threats to public safety and other significant hazards have been eliminated.

At the Operational Area level, the Operations Section Chief designates a Re-Entry Coordinator. The Re-Entry Coordinator is responsible for coordinating the re-entry procedures with all involved agencies and for ensuring effective communication. The Re-Entry Coordinator develops a logistical plan for returning evacuees to affected areas.

5.17.2 Returning Evacuees

Some evacuees are able to return to their residences from E+14 days to E+30 days. This estimate is based on the projected restoration of potable water to residences.[11] Thirty percent of the evacuees transported to shelters because of a lack of potable water return to their residences by E+30 days and an additional 30 percent by E+60 days. Evacuees are returned to pickup locations and not to their actual residences. The estimated number of returning residents needing mass transportation back to their residences is identified in **Table 5-22**.

At E+60 days, evacuees who are unable to return to their residences remain in shelters or transfer to interim housing. Mass transportation to interim housing after E+60 days is beyond the scope of this Plan.

5.17.3 Notification of Re-Entry Process

The Re-Entry Coordinator develops a public information strategy. The strategy may include providing information about conditions and the status of the affected areas, thus allowing evacuees to decide whether they wish to return once the decision has been made to allow re-entry. The public may also be notified of re-entry status through emergency broadcast radio, television, press releases, Internet, informational phone lines such as 211, community briefings, and informational updates at shelters.

[11] It is impossible to determine whether the evacuee residences will be habitable; therefore, restoration of potable water is used as a surrogate for this information.

Table 5-22. Estimated number of returning residents who need transportation to residences at E+30 days and E+60 days.

	Number of Returning Residents Needing Transportation	
County	**E+30 Days**	**E+60 Days**
Alameda	17,100	17,100
Contra Costa	1,600	1,600
Marin	1,100	1,100
Monterey	0	0
Napa	0	0
San Benito	0	0
San Francisco	12,200	12,200
San Mateo	8,800	8,800
Santa Clara	19,300	19,300
Santa Cruz	0	0
Solano	0	0
Sonoma	2,600	2,600
Total	**62,700**	**62,700**

Source: URS analysis (2009)
E = event

Information disseminated to the public about re-entry procedures to the public includes:

- Routes that are available to evacuees
- Vehicle restrictions, if any, on those routes
- Periods during which evacuees can re-enter an affected area
- Services that are available in the affected re-entry area
- Which utilities are functional in the affected re-entry area
- Whether evacuees require identification to reenter the affected area
- Security checkpoints, if any
- The media sources that provide the most up-to-date information on re-entry procedures

5.17.4 Managing Re-Entry

Once evacuees are permitted to return, procedures are established to properly identify residents and critical support personnel and ensure the legitimacy of contractors, insurance adjustors, and other personnel.

Transportation resources are coordinated to return evacuees who require mass transportation assistance from shelters back to their communities. Traffic management plans are established for the return of evacuees, including the

identification of preferred travel routes. Relief agencies such as the ARC and County Transportation Departments work closely with residents to provide information material and assistance.

Each city and/or Operational Area is responsible for determining that re-entry has been completed for its jurisdiction and for promptly informing the REOC that the re-entry process is complete.

5.18 Long-Term Recovery

The focus of this Plan is to support mass transportation/evacuation activities during the first 60 days after an earthquake or comparable event. Depending on the severity of the event, transportation operations may continue well beyond 60 days, and the recovery of the transportation system may take months or years.

Beyond the first 60 days, the following objectives guide transportation planning and operations:

- Continue response-oriented mass transportation/evacuation activities as needed to support life safety. This is likely to include continued transportation of emergency response workers and the relocation of evacuees from short-term shelter facilities to interim housing.
- To the extent possible, restore normal transportation and transit services in the region. Road-, rail-, and water-based transportation systems that have been tasked to emergency transportation functions can eventually be released to return to conventional service, depending on ongoing response needs and the condition of the region's transportation networks.
- Restore the region's transportation networks. Many of the road, rail, air and water networks and affiliated infrastructure are incapacitated. As part of long-term recovery, the condition of the transportation network is assessed, and necessary repairs are identified and prioritized for attention. Evaluation criteria include both ongoing emergency transportation needs and long-term habitability and economic vitality factors.

5.19 Response Tasks Timeline

This section of the Plan identifies the tasks needed to support the time-based objectives identified in **Section 5.3**. Each task is identified under its corresponding objective, along with the time frame in which it is expected to occur, the entities likely involved in coordinating and accomplishing the task, and any additional details. Many tasks are likely to span multiple time frames and may start and stop at different times in localities throughout the region because of local circumstances. **Table 5-23** identifies the likely starting point for most occurrences of each task.

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
A1. Establish an incident command system structure that coordinates mass transportation/evacuation operations by integrating local, State, and Federal operations	1	E to E+72h	**Activate** SOC and the REOC	Cal EMA	—	SEMS determines activation levels in California; the REOC site may not be operational; the REOC duty officer reconstitutes functionality based on availability of other sites
	2	E to E+72h	**Activate** Operational Area and local government EOCs	Operational Areas, local governments	—	Assume all Operational Area EOCs have some level functionality; some local EOCs may not be functional
	3	E to E+72h	**Activate** other regional EOCs	MTC, CHP, Caltrans, WETA	—	Some EOCs may not be functional
	4	E to E+72h	**Activate** Mass transportation agencies' EOCs	Transportation agencies	—	Some transportation agency EOCs may not be functional
	5	E to E+72h	**Provide** liaisons to REOC	Cal EMA	MTC, CHP, Caltrans, WETA, USCG	Liaisons may be physically or virtually present
	6	E to E+72h	**Designate** primary entity for coordinating regional mass transportation activities	Cal EMA, UCG/JFO	Operational Areas, MTC, transportation agencies, WETA, USCG, CHP, Caltrans	Transportation Branch of the REOC is primary designated entity (assuming functionality of the REOC); this covers both public and private resources
A2. Establish interoperable emergency communications among public- and private-sector transportation entities involved in mass transportation/evacuation operations	7	E to E+72h	**Activate** EOCs and test communications systems	Cal EMA	Operational Areas, MTC, WETA, CHP, Caltrans, transportation agencies	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 EMA	All jurisdictions	Interoperability among agencies' systems may be an issue, even if systems are fully functional
	9	E to E+72h	**Establish** communications among relevant facilities	Cal EMA	Caltrans Districts 4 and 5 EOCs, CHP, MTC, WETA, Operational Areas, transportation agencies	MTC, WETA, and transportation agencies have satellite phone systems for use
	10	E to E+72h	**Compile** regular status reports on transportation network and resources	Cal EMA, MTC	Caltrans, CHP, WETA, transportation agencies, Operational Areas	Addressing infrastructure, operations, vehicle/vessel availability, service status
	11	E to E+72h	**Activate** MTC Emergency Satellite UHF Communications System	MTC	Operational Areas, transportation agencies	This system does not include counties outside MTC jurisdiction
	12	E to E+72h	**Activate** WETA communications protocols	WETA	USCG, Marine Exchange, GGBHTD, contractors	Based on MARSEC Level
	13	E to E+72h	**Designate** appropriate communications protocols for individual transportation providers	Transportation agencies	MTC, Operational Areas	Subject to each agency's systems and communications plan, and post-event functionality
A3. Determine impacts to transportation infrastructure	14	E to E+72h	**Assess** condition of critical infrastructure and Lifeline routes through initial reports	Caltrans	CHP, Operational Areas, local governments	Initial assessments based on reports from transit agencies, local governments, safety inspections, and media reports
	15	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
	16	E to E+72h	**Assess** other transportation systems' status immediately following event	All transportation agencies	Amtrak	Address facilities and equipment, casualties, vehicles, and roadways/tracks; data needed for MTC's regional summary
	17	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
	18	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
	19	E to E+72h	**Compile** MTC Status 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 w/in four 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 EMA can designate MTC to support them as well or MTC may activate a mechanism to coordinate with the three southern counties' mass transportation agencies
	20	E to E+72h	**Compile** regular status reports on transportation infrastructure and resources	Cal EMA	MTC, Caltrans, CHP, Operational Areas	—

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
A4. Identify the locations and sizes of affected populations that require evacuation, including people who have access and functional needs, and develop an estimate of the number of companion and service animals that accompany evacuees	21	E to E+72h	**Develop** projections of affected populations based on event estimate and modeling	Cal EMA, FEMA	Operational Areas	Projections are subject to initial analysis of event location and magnitude
	22	E to E+72h	**Conduct** aerial survey of region to determine damage	CHP, National Guard	—	Local media with helicopters may provide additional information
	23	E to E+72h	**Event Observed:** Determine affected populations based on windshield surveys and media reports	Operational Areas	Local governments	Transportation network may not be operational, and could affect ability to collect information
	24	E to E+72h	**Compile** locally collected information to estimate and map affected populations	Cal EMA	Operational Areas	Transportation network may not be operational, and could affect ability to collect information
	25	E to E+72h	**Determine** priorities for evacuation efforts	Cal EMA	Operational Areas	Based on severity of risk to life and general public safety, and facilities/supplies for sheltering in place; may also be influenced by operability of associated sections of transportation network
A5. Identify a preliminary list of destinations for evacuees	26	E to E+72h	**Event Observed:** Local governments and CBOs open evacuation facilities and shelters	Local governments, CBOs	—	Facilities open on ad-hoc basis as spontaneous shelters
	27	E to E+72h	**Compile** reports regarding local shelter capacities, and identify shortfalls	Cal EMA	ARC, local governments, facility operators	Data needed to prepare transportation service plan
	28	E to E+72h	**Identify** additional destinations outside the region	Cal EMA, FEMA	ARC	Data needed to prepare transportation service plan
	29	E to E+72h	**Select** preliminary destinations in the region for evacuees needing shelter	Cal EMA, Operational Areas	Local governments	Shorter transport distances are preferable, but shelters in region likely to be at capacity soon after event
	30	E to E+72h	**Select** preliminary destinations outside the region for evacuees needing shelter	Cal EMA, FEMA	ARC, satellite Operational Areas, other states	Prioritize destinations accessible from priority transportation routes or major highways
	31	E to E+72h	**Identify** airports within and outside the region for transport of tourists, visitors and other transient populations	Cal EMA, FEMA	ARC, satellite Operational Areas, other states	Focus on larger commercial and general aviation facilities that can accommodate commercial airliners
A6. Identify the number of, and destinations for, emergency service workers to be brought into affected areas	32	E to E+72h	**Solicit** data from response agencies regarding staffing levels	Cal EMA, FEMA JFO	ARC, State and Federal agencies, EMAC, NGOs, CBOs	Some agencies may handle their own transportation needs, but most need transportation support
	33	E to E+72h	**Determine** priorities for assignment of incoming first emergency service workers	Cal EMA	Operational Areas	Based on severity of effects to population and infrastructure; may also be influenced by operability of associated sections of transportation network
	34	E to E+72h	**Identify** base camp locations and capacities	Cal EMA, FEMA JFO	Operational Areas	Many base camps are pre-identified; determine if still viable
	35	E to E+72h	**Identify** locations of emergency service workers' duty stations	Cal EMA, FEMA JFO	Operational Areas	This may vary on a daily basis
A7. Determine priority transportation routes for mass transportation/evacuation activities to enable the initiation of debris clearance and infrastructure inspection/repair	36	E to E+72h	**Analyze** the ability Lifeline routes and other priority transportation routes to support mass transportation/ evacuation activities	Caltrans, Cal EMA	CHP, Operational Areas, local governments	Routes need to be re-assessed continuously after event
	37	E to E+72h	**Analyze** the ability of rail systems to support mass transportation/evacuation activities	Rail-based transportation agencies and private rail operators	—	Based on condition of rail systems, and available rolling stock
	38	E to E+72h	**Analyze** ability of marine-based systems to support mass transportation/evacuation activities	Port authorities	WETA, port facility operators, USACE, USCG	Based on condition of docking facilities and landside infrastructure, navigability of waterways, and availability of vessels
	39	E to E+72h	**Analyze** ability of air-based systems to support mass transportation/evacuation activities	Airport authorities	FAA	Based on condition of runways, airport infrastructure, and fuel supply
	40	E to E+72h	**Analyze** size and locations of affected populations in relation to priority transportation routes and shelter destinations	Cal EMA	MTC, ARC/shelter operators, Operational Areas	—
	41	E to E+72h	**Select** and designate appropriate routes to be used for mass transportation/evacuation activities	Cal EMA	CHP, Caltrans, MTC, Operational Areas, WETA, USCG, FAA, transportation agencies	Based on condition of routes, locations of affected populations, and shelter destinations

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
A8. Support initial restoration activities (debris clearance, etc.) of the transportation network	42	E to E+72h	**Identify** priorities for debris removal from regional highways and bridges (State)	Cal EMA, Caltrans	Operational Areas	Based on pre-identified priority transportation routes and Caltrans' Lifeline routes
	43	E to E+72h	**Event Observed:** Identify priorities for debris removal from local roads	Operational Areas, local governments	—	Based on pre-identified priority transportation routes
	44	E to E+72h	**Coordinate** essential, supportive services related to restoration of priority transportation routes	Caltrans, Operational Areas	Local public works agencies, private contractors	Private contractors may be used to assist restoration
	45	E to E+72h	**Identify** priorities for repair to rail systems	Cal EMA, private rail operators	Rail-based transportation agencies, Amtrak	Private contractors may be used to assist restoration
	46	E to E+72h	**Coordinate** essential, supportive services related to restoration of rail systems	Cal EMA, private rail operators	MTC, transportation agencies	Private contractors may be used to assist restoration
	47	E to E+72h	**Event Observed:** Identify priorities for repair to port and ferry facilities	USCG, WETA	WETA, USACE, port authorities	Private contractors may be used to assist restoration
	48	E to E+72h	**Coordinate** essential, supportive services related to restoration of port and ferry facilities	Cal EMA, USCG, WETA	Port authorities, WETA, USACE	Private contractors may be used to assist restoration
	49	E to E+72h	**Identify** priorities for repair to airports	Cal EMA, airport authorities	FAA	Private contractors may be used to assist restoration
	50	E to E+72h	**Coordinate** essential, supportive services related to restoration of airport facilities	Cal EMA, airport authorities	MTC	Private contractors may be used to assist restoration
A9. Identify priorities for the use of available transportation resources to assist in mass transportation/evacuation efforts	51	E to E+72h	**Evaluate** and prioritize competing transportation needs, in relation to finite resources	Cal EMA, MTC	WETA, Operational Areas, local governments	Based on life-safety concerns and availability of transportation resources; determine availability of demand response vehicles to serve access and functional needs populations
	52	E to E+72h	**Evaluate** road-based transportation support requests, and identify resources to be tasked	Cal EMA, MTC	Transportation agencies	Based on life-safety concerns and availability of transportation resources
	53	E to E+72h	**Evaluate** rail-based transportation support requests, and identify resources to be tasked	Cal EMA, private rail companies	MTC, Rail-based transportation agencies, Amtrak	Based on life-safety concerns and availability of transportation resources
	54	E to E+72h	**Evaluate** waterborne transportation support requests, and identify resources to be tasked	Cal EMA, USCG	WETA, MTC	Based on life-safety concerns and availability of transportation resources
	55	E to E+72h	**Evaluate** air-based transportation support requests, and identify resources to be tasked	Cal EMA, FEMA	Private air carriers	Based on life-safety concerns and availability of transportation resources
A10. Identify additional resources required to support mass transportation/evacuation efforts	56	E to E+72h	**Identify** and establish sites for fuel distribution	Cal EMA	Operational Areas, local governments	Current sites are preferable, but may not be viable
	57	E to E+72h	**Activate** Petroleum Fuels Set Aside Program	Cal EMA, California Energy Commission	Operational areas, private fuel suppliers	—
	58	E to E+72h	**Evaluate** transportation demand types and levels against available resources	Cal EMA	MTC, WETA, Operational Areas, transportation agencies	Identify any shortfalls, including demand response vehicles to serve access and functional needs populations
	59	E to E+72h	**Identify** sources outside the region for additional vehicles, operators and supplies	Cal EMA, FEMA	EMAC	Consider both public- and private-sector entities
A11. Track and, to the extent possible, support ad hoc evacuations out of affected areas, and inbound movement of emergency service workers	60	E to E+72h	**Activate** State's Emergency Highway Traffic Regulation Plan	CHP	—	Details of CHP plan are not for distribution
	61	E to E+72h	**Initiate** traffic control activities	CHP	Local law enforcement agencies	Initial staffing levels and competing responsibilities make this difficult
	62	E to E+72h	**Establish** control of priority transportation routes	CHP	Local law enforcement agencies	Initial staffing levels and competing responsibilities make this difficult
	63	E to E+72h	**Event Observed:** Manage waterborne emergency transportation activities	USCG	WETA	Based on requests from Cal EMA, MTC, and Operational Areas
	64	E to E+72h	**Inform** the evacuating public of how to move themselves out of affected areas safely and quickly	Cal EMA PIO	Operational Areas, MTC, Caltrans, CHP	Include information regarding what evacuees should bring and not bring, recommended preparations as evacuees leave their homes, and routes and hazards to avoid (see **Appendix E**)

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
B1. Finalize the list of priority transportation routes being used, and coordinate with debris clearance and public works agencies to confirm availability of routes	65	E+72h to E+14d	**Re-evaluate** condition of transportation network	REOC	Caltrans, MTC, WETA, CHP, port authorities, airport authorities, transportation agencies, private rail operators, Operational Areas, local governments	Includes all modes of transportation
	66	E+72h to E+14d	**Update** estimates of affected populations needing transportation	Cal EMA, FEMA	Operational Areas	Estimates may increase or decrease, depending on circumstances
	67	E+72h to E+14d	**Revise** list of priority transportation routes to be used, based on latest situational analysis	REOC	Caltrans, MTC, WETA, CHP, port authorities, airport authorities, transportation agencies, private rail operators, Operational Areas, local governments	Includes all modes of transportation
B2. Identify evacuee pickup points and coordinate with local government to support the operation of the pickup points	68	E to E+72h	**Evaluate** functionality of pre-designated pickup points	Cal EMA, Operational Areas	Local governments, facility owners	Potential pickup points are pre-identified; proximity to functional routes also to be assessed.
	69	E to E+72h	**Identify** additional potential sites based on assessed conditions	Cal EMA	Operational Areas, local governments, facility owners	—
	70	E+72h to E+14d	**Select** sites to be used based on functionality and locations of affected populations	Cal EMA	Operational Areas, local governments, facility owners	Potential pickup points are pre-identified; proximity to functional routes also to be assessed.
	71	E+72h to E+14d	**Event Observed:** Coordinate with Mass Care and Shelter providers to arrange for essential services at sites	Operational Areas, local governments, facility owners	ARC, NGOs, CBOs	Includes food, water, sanitation, security, and basic medical care
	72	E+72h to E+14d	**Event Observed:** Activate pickup points for use	Operational Areas, local governments, facility owners	ARC, NGOs, CBOs	Requires coordination among local governments and facility owners
B3. Coordinate with mass care service providers and the Operational Areas to identify the destinations for evacuees	73	E to E+72h	**Determine** numbers of displaced persons to be sheltered outside the community or the region	Cal EMA	ARC, Operational Areas	Subject to shelter space availability and size of affected populations
	74	E+72h to E+14d	**Identify** specific shelter destinations for specific groups of affected populations	Cal EMA, Operational Areas	ARC, satellite counties, local governments	Based on location, transportation routes, and shelter capacities; also determine which shelters can accommodate access and functional needs populations
	75	E+72h to E+14d	**Identify** specific shelter destinations for inter-county commuters	Cal EMA	ARC, Operational Areas, satellite counties, local governments	Temporary shelter until they can return to their home counties
	76	E+72h to E+14d	**Identify** specific shelter destinations for tourists, visitors, and other transient populations that are transported out of the region	Cal EMA	ARC, Operational Areas, satellite counties, local governments	Temporary shelter until they can return to their home counties
	77	E+72h to E+14d	**Track** destination assignments to estimate remaining shelter capacities	Cal EMA	ARC, Operational Areas, satellite counties, local governments	Information is used to open additional shelters or to close existing ones.
B4. Establish and support a JIC to coordinate evacuation information and notification	78	E to E+72h	**Event Observed:** JIC established at SOC	Cal EMA	UCG, MTC, WETA, transportation agencies Operational Areas, other supporting agencies	Multiple agencies are represented
	79	E to E+72h	**Event Observed:** JIS established after JIC activation	Cal EMA	UCG, other supporting agencies	Network between SOC and outside facilities (other EOCs and DOCs) with their own public information functions
	80	E+72h to E+14d	**Provide** Transportation Service Plan to JIC, when available	REOC	MTC, Caltrans, CHP, Operational Areas, transportation agencies	In accordance with SEMS
	81	E+72h to E+14d	**Develop** appropriate evacuation notification messages	JIC	MTC, Caltrans, CHP, Operational Areas, transportation agencies	Ensure messages are consistent, and available in appropriate media for all target audiences, including people with access and functional needs

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
B5. Provide public notification of evacuation orders and evacuation guidance for those requiring mass transportation	82	E+72h to E+14d	**Event Observed:** Determine locations for evacuation orders	Operational Areas, local governments	Cal EMA	—
	83	E+72h to E+14d	**Event Observed:** Prepare evacuation orders using standardized language and appropriate media	Operational Areas, local governments	JIC	Include relevant information regarding timing, routes, destinations, and other guidance
	84	E+72h to E+14d	**Event Observed:** Announce evacuation orders	Operational Areas, local governments	JIC	Ensure media suitable for all intended audiences, including people with access and functional needs
	85	E+72h to E+14d	**Assess** ongoing public information needs regarding mass transportation	JIC	MTC, Operational Areas, local governments	Consider updates regarding pickup points, modes, destinations, and other logistics
	86	E+72h to E+14d	**Compile** and **distribute** updates of transportation-related information to public and media	JIC	MTC, Operational Areas, local governments	Update frequently—update schedule determined by the JIC
	87	E+72h to E+14d	**Inform** evacuating populations so that they can evacuate safely and effectively	JIC	MTC, Operational Areas, local governments	Include information regarding what evacuees should bring and not bring, recommended preparations as evacuees leave their homes, and instructions and local resources for individuals who need assistance in moving to pickup points and during evacuation (see **Appendix E**)
B6. Develop and execute a mass transportation service plan for the outbound movement of evacuees based on regional priority needs	88	E+72h to E+14d	**Compile** and **distribute** elements of the plan to appropriate entities	REOC	MTC, Caltrans, CHP, WETA, Operational Areas, transportation agencies	Based on assessments of needs and capabilities determined from E to E+72 hours
	89	E+72h to E+14d	**Activate** pickup points	REOC, Operational Areas	ARC, local governments, facilities owners	Ensure transportation agencies know the locations
	90	E+72h to E+14d	**Support** local governments in movement of access and functional needs populations from homes/offices to pickup points	REOC, MTC	Operational Areas, local governments	Many people with access and functional needs are not able to travel to pickup points without assistance
	91	E+72h to E+14d	**Stage** and **deploy** transportation assets for moving people to shelter destinations	REOC, Operational Areas	MTC, WETA, transportation agencies	Includes vehicles appropriate for the transportation of people with access and functional needs
	92	E+72h to E+14d	**Stage** and deploy transportation assets for moving pets to shelter destinations	REOC, Operational Areas	NGOs, CBOs	Resources include animal transport vans and trucks, and other means of land or waterborne transport with animal transport containers
	93	E+72h to E+14d	**Activate** reception and **support** functions at shelter destinations	REOC, Operational Areas	ARC, local governments, facilities owners	Reception and support functions to be established before first evacuees arrive
	94	E+72h to E+14d	**Implement** traffic control and law enforcement on priority transportation routes	CHP	Local law enforcement agencies	Continual traffic control and law enforcement needed to ensure flow of traffic
	95	E+72h to E+14d	**Activate** in-route support systems on priority transportation routes	REOC, Operational Areas	Local governments	Facilities can include provisions for fuel, water, food, sanitary facilities, etc.
	96	E+72h to E+14d	**Initiate** and **monitor** evacuation of persons to counties with excess shelter capacity	REOC	Caltrans, CHP, MTC, WETA, transportation agencies, Operational Areas	Shelter occupancy levels to be monitored continuously, and new shelter locations to be identified based on need
B7. Develop and execute a mass transportation service plan for the movement of emergency service workers into the affected region	97	E+72h to E+14d	**Compile** and **distribute** elements of plan to appropriate entities	REOC	MTC, Caltrans, CHP, WETA, response agencies, Operational Areas, transportation agencies	Based on assessments of needs and capabilities determined from E to E+72 hours
	98	E+72h to E+14d	**Activate** reception points to collect inbound emergency service workers	REOC, Operational Areas	NGOs, local governments, facilities owners	Inbound emergency service workers to be collected at reception points before being transported to base camps
	99	E+72h to E+14d	**Stage** and **deploy** transportation assets for moving emergency service workers to base camps	REOC, Operational Areas	MTC, WETA, transportation agencies	Include vehicles appropriate for the transportation of emergency service workers' equipment to staging areas
	100	E+72h to E+14d	**Event Observed:** Activate base camps	FEMA, Cal EMA	Operational Areas, local governments, facilities owners	In accordance with CONPLAN
	101	E+72h to E+14d	**Implement** traffic control and law enforcement on priority transportation routes	CHP	Local law enforcement agencies	Continual traffic control and law enforcement needed to ensure flow of traffic

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
B7. (cont.)	102	E+72h to E+14d	**Activate** in-route support systems on priority transportation routes	REOC, Operational Areas	Local governments	Facilities can include provisions for fuel, water, food, sanitary facilities, etc.
	103	E+72h to E+14d	**Initiate** and **monitor** movement of emergency service workers from reception points to base camps	REOC	Caltrans, CHP, MTC, WETA, transportation agencies, Operational Areas	REOC to resolve any conflicts among allocation of limited transportation resources
	104	E+72h to E+14d	**Develop** and **implement** service plan for daily movement between base camps and work sites	REOC, Operational Areas	Caltrans, CHP, MTC, WETA, transportation agencies	REOC to resolve any conflicts among allocation of limited transportation resources
B8. Acquire and deploy additional mass transportation/evacuation resources, including vehicles to move people with access and functional needs, from local, State, Federal, and private sources as the resources become available.	105	E+72h to E+14d	**Determine** resource gaps for transportation requirements	Cal EMA, MTC	Caltrans, WETA, transportation agencies, Operational Areas	Identify types and quantities of vehicles, including demand response vehicles for access and functional needs populations
	106	E+72h to E+14d	**Request** additional emergency mass transportation resources	Cal EMA, UCG, MTC	Caltrans, WETA, transportation agencies, Operational Areas	Implemented through San Francisco Bay Area Transit Operators Mutual Aid Agreement, and other agreements; consider both public- and private-sector resources
	107	E+72h to E+14d	**Acquire** and **allocate** additional emergency transportation resources	Cal EMA	FEMA, EMAC participants, MTC, transportation agencies, Operational Area	This includes vehicles for people with access and functional needs
	108	E+72h to E+14d	**Acquire** and **deploy** additional resources to support the movement of pets and stray/abandoned animals	Cal EMA	FEMA, NGOs	Additional resources to be monitored continually and reassigned as needed
	109	E+72h to E+14d	**Inform** the public of the plan for deployment of mass transportation resources to accommodate access and functional needs populations, including how to access those resources	JIS	Operational Areas	Include instructions and local resources for individuals who need assistance in moving to pickup points and during evacuation (see **Appendix E**)
B9. Acquire, maintain, and deploy mass transportation support logistics such as fuel distribution systems, maintenance support, and law enforcement staff	110	E+72h to E+14d	**Estimate** resource needs (types and quantities) for planned level of service	Cal EMA, California Energy Commission	MTC, WETA, Operational Areas, transportation agencies	Includes fuel, maintenance support, and additional security capabilities
	111	E+72h to E+14d	**Identify** sources for needed resources	Cal EMA	FEMA	Consider both public- and private-sector sources, inside and outside the region
	112	E+72h to E+14d	**Identify** storage locations and staging areas for needed resources	Cal EMA	Operational Areas	Consider storage and distribution capabilities of sites, and proximity to priority transportation routes and staging areas
	113	E+72h to E+14d	**Acquire** and deploy mobile fuel distribution systems	Cal EMA, California Energy Commission	Operational Areas, private-sector suppliers	Consider storage and distribution capabilities of sites, and proximity to priority transportation routes and staging areas
	114	E+72h to E+14d	**Deploy** portable electrical power systems and fuel for the operation of key facilities	Cal EMA	FEMA, Operational Areas, private-sector suppliers	Consider storage and distribution capabilities of sites, and proximity to priority transportation routes and staging areas
	115	E+72h to E+14d	**Track** consumption rates and arrange for timely re-supply of necessary resources	Cal EMA, California Energy Commission	MTC, WETA, Operational Areas, transportation agencies	This requires continual monitoring of supply status
B10. Coordinate evacuation routes that result in movement through another Operational Area or State, based on coordination with the appropriate emergency, law enforcement, and transportation agencies in the relevant jurisdictions	116	E+72h to E+14d	**Identify** cross-jurisdictional routes and evaluate potential conflicts	Cal EMA	MTC, Caltrans, Operational Areas	MTC's jurisdiction does not include three southern counties, and would require direction from Cal EMA
	117	E+72h to E+14d	**Set** overarching routings to guide use of roads and highways	Cal EMA, Operational Areas	CHP, other law enforcement agencies	Requires coordination both within and outside of region
	118	E+72h to E+14d	**Implement** routing plan consistently across jurisdictions	Cal EMA, CHP, Operational Areas	Neighboring states, other law enforcement agencies	Is likely to require state-to-state cooperation
	119	E+72h to E+14d	**Inform** public in pass-through and host Operational Areas of what to expect during the evacuation process	Cal EMA PIO, Regional JIC	Operational Areas	Describe anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure (see **Appendix E**)

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
B11. Develop and execute a transportation service plan for supporting the follow-on routing of sheltered populations, including those with access and functional needs, either to interim housing or returning to their homes in affected areas	120	E+72h to E+14d	**Prioritize** movement of sheltered populations against movement of emergency service workers and continued evacuations	REOC, Operational Areas	MTC, WETA	Based on current demands and availability of transportation resources
	121	E+72h to E+14d	**Develop** and implement service plan to transport visitors and tourists to follow-on transportation	Cal EMA, REOC, Operational Areas	FEMA, MTC, WETA, NGOs	Based on estimated demand levels of people who require assistance to be moved out of the region and returned home
	122	E+72h to E+14d	**Develop** and implement service plan to transport inter-county commuters back to home counties in the region	REOC, Operational Areas	FEMA, MTC, WETA	Based on estimated demand levels of people who are temporarily displaced in the region
	123	E+72h to E+14d	**Event Observed:** Develop and implement service plan to transport affected persons from shelters to interim housing or to return home	FEMA	Cal EMA, MTC, WETA, Operational Areas	Based on estimated demand levels of people who require interim housing and transportation assistance
	124	E+72h to E+14d	**Inform** sheltered populations of procedures to route them to interim housing or return them to their homes	Cal EMA PIO (in-State evacuation) UCG/JFO JIC (out-of-State evacuation)	Operational Areas	Include information/instructions regarding available support services for evacuated populations; provide information on status of evacuated OA and reentry procedures ((see **Appendix E**))
C1. Continue implementation of the transportation service plan for the movement of emergency service workers into and within the region	125	E+14d to E+60d	**Re-assess** ongoing needs for movement of emergency service workers	Cal EMA, FEMA JFO	ARC, State and Federal agencies, EMAC, NGOs, CBOs	Identify excesses or inefficiencies in current plan, as well as any new needs
	126	E+14d to E+60d	**Re-assess** ongoing transportation capabilities	REOC	MTC, Caltrans, CHP, WETA, response agencies, Operational Areas, transportation agencies	Arrival of additional resources may have expanded capabilities; changing needs may require fewer transportation assets
	127	E+14d to E+60d	**Update** and distribute revised elements of plan to appropriate entities	REOC	MTC, Caltrans, CHP, WETA, response agencies, Operational Areas, transportation agencies	Based on re-assessed needs and capabilities
C2. Continue implementation of the transportation service plan that supports moving evacuees from shelters to interim housing	128	E+14d to E+60d	**Re-assess** ongoing needs for movement of evacuees	Cal EMA, FEMA JFO	ARC, State and Federal agencies, EMAC, NGOs, CBOs	Identify changes in evacuee numbers, destinations, and travel logistics
	129	E+14d to E+60d	**Re-assess** ongoing transportation capabilities	REOC	MTC, Caltrans, CHP, WETA, response agencies, Operational Areas, transportation agencies	Arrival of additional resources may have expanded capabilities; changing needs may require fewer transportation assets
	130	E+14d to E+60d	**Update** and distribute revised elements of plan to appropriate entities	REOC	MTC, Caltrans, CHP, WETA, response agencies, Operational Areas, transportation agencies	Based on re-assessed needs and capabilities
	131	E+14d to E+60d	**Inform** evacuees intending to move from shelters to their residences of the transportation service plan and how to safely move from shelters to interim housing	Cal EMA PIO (in-State evacuation), Regional JIC UCG/JFO JIC (out-of-State evacuation)	Operational Areas	Include information/instructions regarding available support services for evacuated populations (see **Appendix E**)
C3. Continue implementation of the transportation service plan to support return of evacuees from shelters to their residences	132	E+14d to E+60d	**Re-assess** ongoing needs for movement of evacuees	Cal EMA, FEMA JFO	ARC, State and Federal agencies, EMAC, NGOs, CBOs	Identify changes in number and location of evacuees, and restoration of essential services in residential areas
	133	E+14d to E+60d	**Re-assess** ongoing transportation capabilities	REOC	MTC, Caltrans, CHP, WETA, response agencies, Operational Areas, transportation agencies	Arrival of additional resources may have expanded capabilities; changing needs may require fewer transportation assets
	134	E+14d to E+60d	**Update** and distribute revised elements of plan to appropriate entities	REOC	MTC, Caltrans, CHP, WETA, response agencies, Operational Areas, transportation agencies	Based on re-assessed needs and capabilities
	135	E+14d to E+60d	**Inform** evacuees intending to move from shelters to their residences of the transportation service plan and how to safely move from shelters to their residences	Cal EMA PIO (in-State evacuation), Regional JIC UCG/JFO JIC (out-of-State evacuation)	Operational Areas	Provide information on status of evacuated OA and reentry procedures (see **Appendix E**)

Table 5-23. Response task timeline in mass transportation/evacuation.

Objective	Line	Time Frame	Operations	Coordinating Entity	Supporting Entity	Details and Comments
C4. Develop and execute a transportation service plan to support consolidation of shelters, including shelters supporting access and functional needs populations that need specialized transportation support	136	E+14d to E+60d	**Coordinate** with Mass Care and Shelter regarding capacities and sheltering needs	Cal EMA	ARC, Operational Areas	Identify origins/destinations and population sizes
	137	E+14d to E+60d	**Calculate** transportation needs based on scope of relocation effort	Cal EMA	MTC, Operational Areas, transportation agencies	Consolidate information into a transportation service plan; includes specialized transportation services for access and functional needs populations
	138	E+14d to E+60d	**Transport** shelter populations as needed between shelters	REOC	MTC, WETA, Operational Areas, transportation agencies	Update status information and plan as needed; includes access and functional needs populations
	139	E+14d to E+60d	**Inform** evacuees residing in shelters of the transportation service plan to support the consolidation of shelters	Cal EMA PIO (in-State evacuation), Regional JIC UCG/JFO JIC (out-of-State evacuation)	Operational Areas	Include information/instructions regarding available support services for evacuated populations and resources for individuals who need assistance in specialized transportation support (see **Appendix E**)
C5. Restore normal public transit services	140	E+14d to E+60d	**Evaluate** ongoing emergency mass transportation needs against ability to task assets for normal transit service	Cal EMA	MTC, WETA, Operational Areas, transportation agencies	Life-safety concerns take priority over normal transit service
	141	E+14d to E+60d	**Release** resources from emergency mass transportation services to support resumption of public transit capabilities	REOC	WETA, Operational Areas, transportation agencies	Resources are released back to public- and private-sector entities
	142	E+14d to E+60d	**Acquire** additional mass transportation assets to supplement available resources in supporting normal mass transportation services	SOC	MTC, WETA, Operational Areas, transportation agencies	Increase transit capabilities to account for damage to automobile infrastructure (e.g., roads, bridges, parking garages); Increase routes, schedules, capacity, intersystem transfers
	143	E+14d to E+60d	**Deploy** resources to re-establish normal mass transportation services, as able to do so	MTC	WETA, Operational Areas, transportation agencies	Provide regional service to compensate for closures of bridges, BART and regional rail services; re-establish cross-bay and intercity routes
	144	E+14d to E+60d	**Inform** the public of the status of public transit services	MTC	Operational Areas (Operational Area/Local public transit providers)	Include information regarding which public transit services are operational, as well as their routes and schedules (see **Appendix E**)

Source: URS analysis (2009)
— = Not applicable
ARC = American Red Cross
Cal EMA = California Emergency Management Agency
Caltrans = California Department of Transportation
CBO = community-based organization
CHP = California Highway Patrol
d = days
DOC =Department Operation Center
EMAC = Emergency Management Assistance Compact
EOC = Emergency Operations Center
FAA = Federal Aviation Administration
FEMA = Federal Emergency Management Agency
GGBHTD = Golden Gate Bridge, Highway and Transportation District
h = hours
JFO = Joint Field Office
JIC = Joint Information Center
JIS = Joint Information System
MARSEC = Maritime security
MTC = Metropolitan Transportation Commission
NGO = nongovernmental organization
PIO = Public Information Officer
REOC = Regional Emergency Operations Center
SEMS = Standardized Emergency Management System
SOC = State Operations Center
UCG = Unified Command Group
UHF = ultra high frequency
USACE = U.S. Army Corps of Engineers
USCG = U.S. Coast Guard
WETA = Water Emergency Transportation Authority
WETA = Water Emergency Transportation Authority

6 Plan Maintenance

This section describes the process for maintaining this Plan. It identifies who receives and reviews the Plan, how updates are integrated into the Plan, how the Plan is tested, what type of training is developed to learn the Plan, and how After-Action Reviews are conducted after the Plan has been implemented, whether as part of an exercise or in response to a real emergency.

6.1 Plan Distribution

Once completed and approved, the Plan is distributed to the Mass Transportation and Evacuation Steering Committee and the Bay Area UASI Management Team. Electronic versions of the Plan are also distributed to the 12 counties and core cities in the RCPGP area.

6.2 Plan Updates

Cal EMA Region II is responsible for the maintenance, revision, and distribution of the Plan. In coordination with the Mutual Aid Regional Advisory Committee, Cal EMA Region II annually assesses the need for revisions to the RECP and subsidiary plans based on the following considerations:

- Changes to State or Federal regulations, requirements, or organization
- The need for additional subsidiary plans to develop regional response capabilities or eliminate gaps in capabilities, as suggested by Mutual Aid Regional Advisory Committee members and coordinated with the Bay Area UASI Management Team
- Implementation of tools or procedures that alter or improve on plan components

Cal EMA Region II maintains a record of amendments and revisions and executable versions of all documents and is responsible for distributing the Plan to all applicable agencies.

6.3 Plan Testing, Training, and Exercises

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

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

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

6.4 After-Action Review

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

Appendix A:
Glossary

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Table of Contents

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Appendix A: Glossary

A.1 Acronyms and Abbreviations

AAR..... After-Action Report
ACE..... Altamont Commuter Express
APTA..... American Public Transportation Association
ARC ..... American Red Cross
BART ..... Bay Area Rapid Transit
BAT ..... Bay Area Transportation
BATA..... Bay Area Toll Authority
Cal EMA..... California Emergency Management Agency
Caltrans..... California Department of Transportation
CBO ..... community-based organization
C.F.R..... Code of Federal Regulations
CHP ..... California Highway Patrol
CONOP..... FEMA Catastrophic Incident Base Plan, Concept of Operations
CONPLAN..... San Francisco Bay Area Catastrophic Earthquake Readiness Response: Concept of Operations Plan
CSWC..... California State Warning Center
CUEA..... California Utilities Emergency Association
DCE ..... Defense Coordinating Element
DCO ..... Defense Coordinating Officer
DGS ..... Department of General Services
DoD..... Department of Defense
DOT ..... U.S. Department of Transportation
E..... event
EAS..... Emergency Alert System
EDIS..... Emergency Digital Information System
EEI ..... Essential Elements of Information
EMAC ..... Emergency Management Assistance Compact
EOC ..... Emergency Operations Center
ESF..... Emergency Support Function
FAA..... Federal Aviation Administration
FEMA..... Federal Emergency Management Agency
GEO ..... Geosynchronous Earth Orbit
GGBHTD..... Golden Gate Bridge, Highway and Transportation District
HAZUS..... Hazards U.S.

HSUS ..... Humane Society of the United States
ICS ..... Incident Command System
IP ..... Improvement Plan
IMAT ..... Incident Management Assistance team
JFO ..... Joint Field Office
JIC ..... Joint Information Center
JIS ..... Joint Information System
JTTF ..... Joint Terrorism Task Force
LMR ..... land mobile radio
LRT ..... light rail transit
M ..... moment magnitude
MARAD ..... Maritime Administration
MARSEC ..... maritime security
MM ..... Modified Mercalli
MTC ..... Metropolitan Transportation Commission
National Guard .... California National Guard
NGO ..... non-governmental organization
NIBS ..... National Institute of Building Sciences
NIMS ..... National Incident Management System
NRCC ..... National Response Coordination Center
NRF ..... National Response Framework
NWR ..... National Weather Radio
OASIS ..... Operational Area Satellite Information System
PIO ..... Public Information Officer
Plan ..... Regional Catastrophic Earthquake Mass Transportation/ Evacuation Plan
RCPGP ..... Regional Catastrophic Preparedness Grant Program
RECP ..... Regional Emergency Coordination Plan
REOC ..... Regional Emergency Operations Center
RIMS ..... Response Information Management System
RRCC ..... Regional Response Coordination Center
RTEMP ..... Regional Transportation Emergency Management Plan
SEMS ..... Standardized Emergency Management System
SEP ..... California State Emergency Plan
SOC ..... State Operations Center
Stafford Act ..... Robert T. Stafford Disaster Relief and Emergency Assistance Act
TMC ..... Traffic Management Center

TRP..... Trans Response Plan
UAN ..... United Animal Nations
UASI..... Bay Area Urban Area Security Initiative
UCG ..... Unified Coordination Group
USACE..... U.S. Army Corps of Engineers
U.S.C. ..... U.S. Code
USCG..... U.S. Coast Guard
VHF..... very high frequency
WETA..... Water Emergency Transportation Authority
WTA..... San Francisco Bay Area Water Transit Authority

A.2 Key Terms

Access and functional needs population. At-risk populations that include people with access and/or functional needs that fall into five categories: Communication, Medical, Independence, Supervision and/or Transportation. (See **Section 5.15** for a full definition.)

Animal shelter. A facility used to temporarily house animals evacuated from their homes or other locations.

Asset. See "mass transportation asset."

Catastrophic event. Any natural or manmade incident, including terrorism that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions.

Communication. In the context of this Plan, all exchange and/or broadcast of information among governmental and/or non-governmental agencies.

Demand response vehicle. A vehicle used for transit service operating based on response to calls from passengers, rather than on fixed routes and schedules. A demand response vehicle is typically a smaller passenger car or van that is likely to be able to accommodate people with access and functional needs.

Emergency service worker. Any person who, under the guidance of an emergency management agency or emergency services agency, is involved in coordinated response operations or activities after the earthquake. Emergency service workers include government agency employees, private-sector employees, and registered volunteers,

Entity. Governmental unit. An entity may be a local jurisdiction or the REOC.

Evacuation. Moving people a safe distance from an event or ordering persons with the capability to move on their own from a high-risk area to a lower risk area.

Evacuee. A person for whom it is unsafe, or who is unwilling, to remain in the area where they are at the time of the earthquake, and who seeks to travel to a shelter

or out of the county/region. This category includes displaced residents, homeless people, and tourists/visitors in affected areas. Within the scope of this Plan, unless specified otherwise, this term refers to a person who will rely on mass transportation services to accomplish this travel (as opposed to a self-evacuee who arranges his/her own transportation).

Inter-county commuter. A resident of one county in the region, whose daily work location is in a different county in the region (e.g., a person who lives in Alameda County and works in San Francisco County). After the earthquake, many inter-county commuters will need transportation assistance to travel from the county where they work to the county where they live, even though they may not be seeking mass care or shelter.

Joint Information Center (JIC). As described in NIMS, a Joint Information Center coordinates all event-related public information activities and is the central point of contact for all news media. Joint Information Centers may be established locally, regionally, or nationally depending on the size and magnitude of the event.

Joint Information System (JIS). As described in NIMS, a Joint Information System integrates event information and public affairs into a cohesive organization designed to provide consistent, coordinated, accurate, accessible, timely, and complete information during crisis or event operations.

Lifeline route. Caltrans-identified route on highways that are expected to provide critical transportation capabilities during a post-incident response.

Livestock. Any cattle, sheep, swine, goat, horse, mule or other equine, whether living or dead.

Local jurisdiction. Local cities, counties, and special districts.

Mass transportation agency. Public or nonprofit entity that provides regular transportation services to large numbers of people on a scheduled basis.

Mass transportation asset. Vehicle for air, public water transportation (passenger ferry), passenger rail, and public bus and demand response/paratransit system.

Mass transportation resources. Mass transportation assets (vehicle) or vehicle operators.

Pet. Any household animal including, but not limited to, cats, dogs, or other carnivores whether or not for public exhibition.

Pickup location. See “pickup point.”

Pickup point. A location in a safe place where people will be directed to gather after an event in order to be transported to care and sheltering facilities or to a subsequent transportation hub. Locations where evacuees will be picked up and transported to shelter locations. May be co-located with potential points of distribution for resources into the region, but these functions will have separate and distinct spaces within the physical location.

Priority transportation route. Regional route on a highway or State road that is expected to provide critical transportation capabilities in the region. Includes Caltrans' Lifeline routes except those that are expected to be destroyed or otherwise incapacitated by an earthquake. Priority transportation routes receive top priority for debris removal and other restoration efforts.

Public information. Public information and public affairs of local, regional, tribal, State Federal, and private-sector organizations. Includes communication with the general public to provide information on evacuations.

Public information critical venue. Location in the disaster area that is likely to attract significant media attention. Possible venues are active rescue sites, shelters, Emergency Medical Services Field Treatment Sites, and temporary morgues.

Resident. Denotes the evacuee categories of the general population and the homeless population who reside in the affected area.

Resources. See "mass transportation resources."

Restricted species. Any animal requiring a license or permit from the Department of Fish and Game.

Self-evacuee. A person for whom it is unsafe, or who is unwilling, to remain in the area where they are at the time of the earthquake, and who seeks to travel to a shelter or out of the county/region by their own means (e.g., personal car, bicycle, etc.). For the purposes of this Plan, a self-evacuee leaves the affected area, but does not use mass transportation services to do so.

Service animal. Animal trained to guide, signal, or assist people with disabilities or special needs.

Shelter. A school, church, recreational facility or other non-resident public or private building used to temporarily lodge and feed people and to provide medical care and welfare services for persons evacuated from their homes or other locations.

Shortfall/surplus. The difference between the types and quantities of resources needed for transportation operations, and the actual types and quantities of available resources. A shortfall (represented as a negative number) indicates an impediment to operations due to a lack of sufficient resources.

Standard bus. A transit mode comprised of rubber-tired passenger vehicles operating on fixed routes and schedules over roadways. Passenger vehicles are powered by diesel, gasoline, battery, or alternative fuel engines contained within the vehicle. Buses vary in configuration and length, typically from 30 feet to 40 feet long, and can be articulated. Standard buses are widely used by public transit agencies.

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Appendix B:
Maps

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Table of Contents

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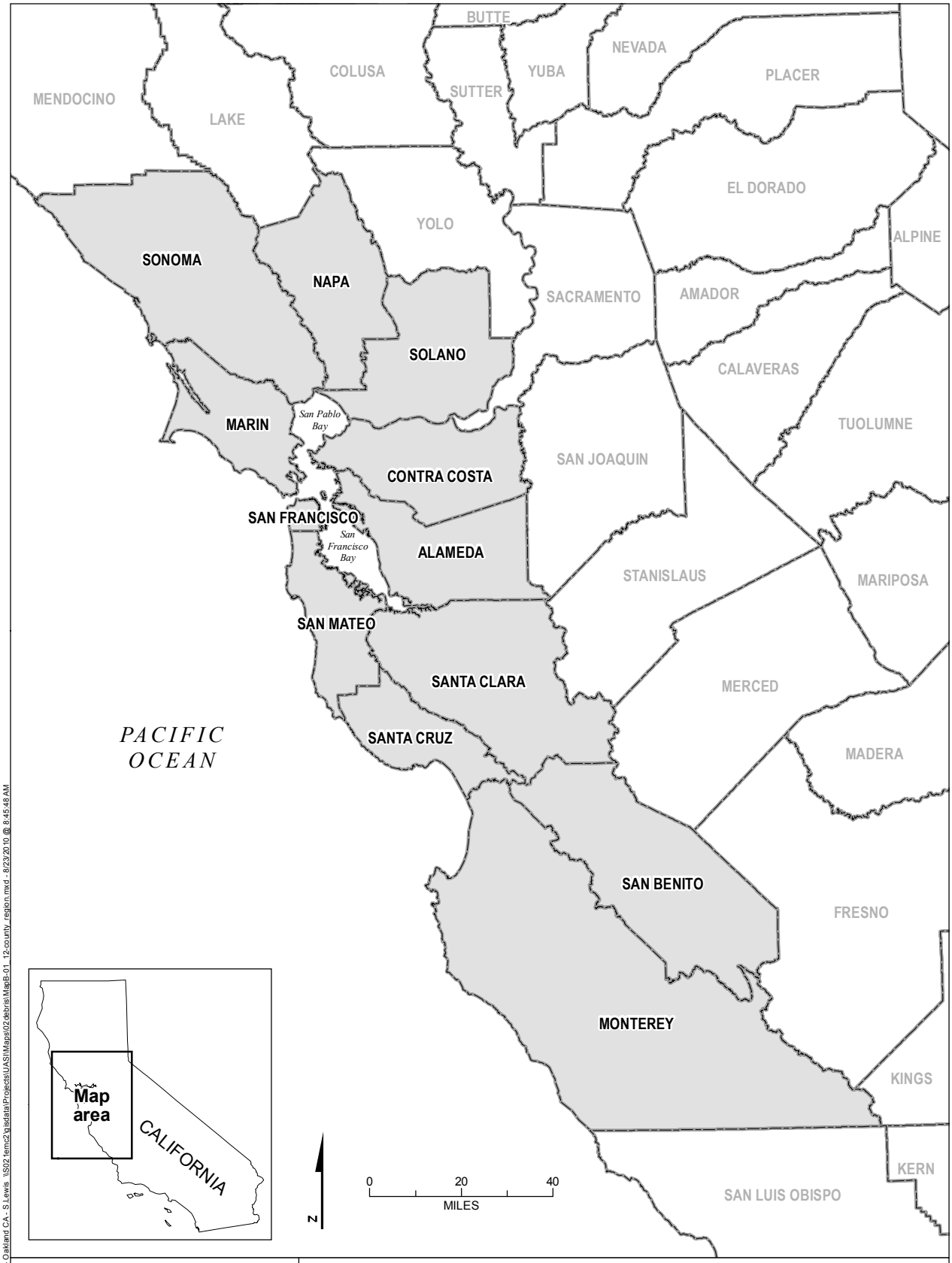

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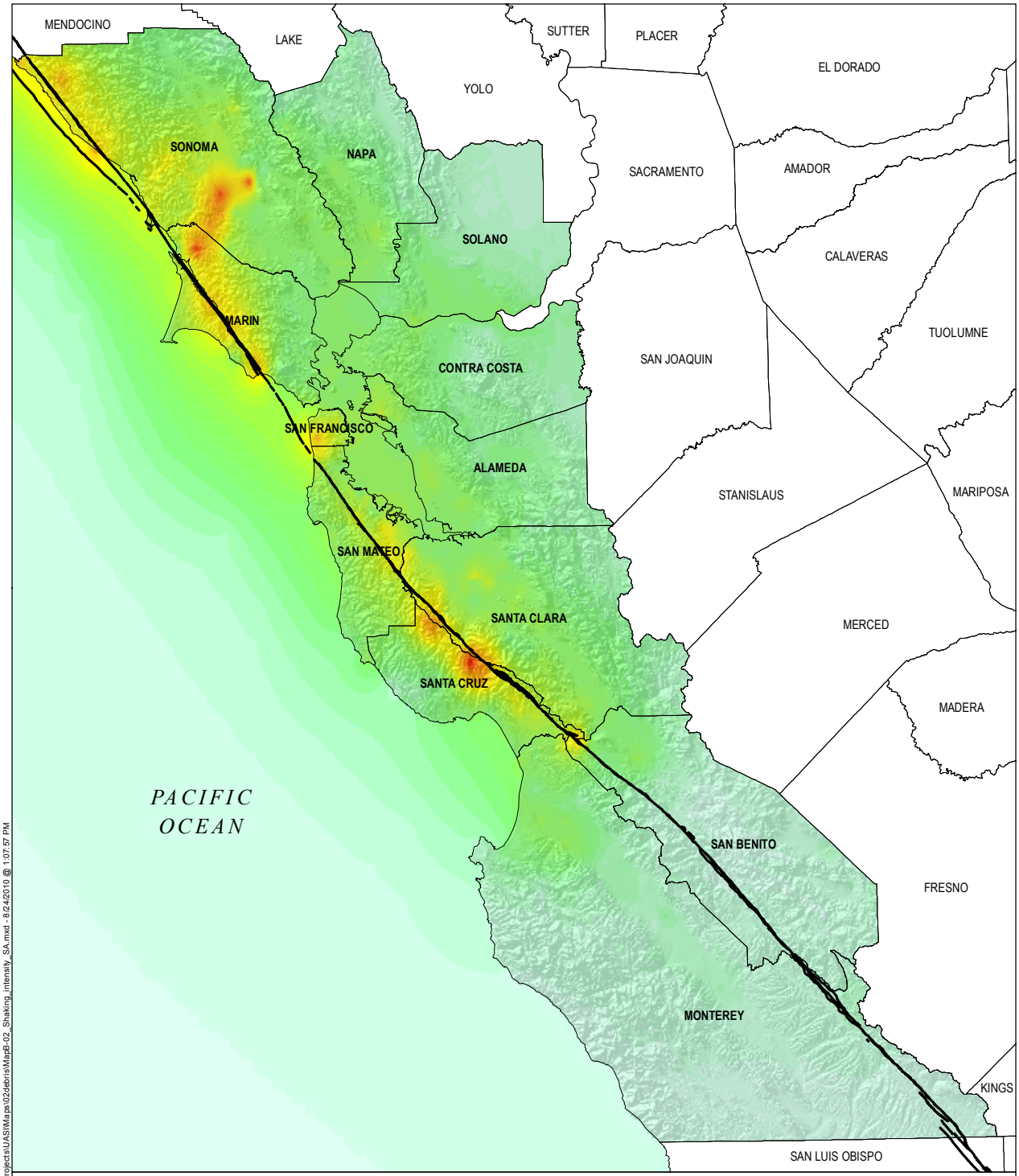
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-1
Twelve-county San Francisco Bay Area region



*g = 980 centimeters/second/second (units of gravitational acceleration)
Topographic data source: USGS NED
Fault data source: USGS, 2006

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-2. Shaking intensity
Peak ground acceleration; Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity

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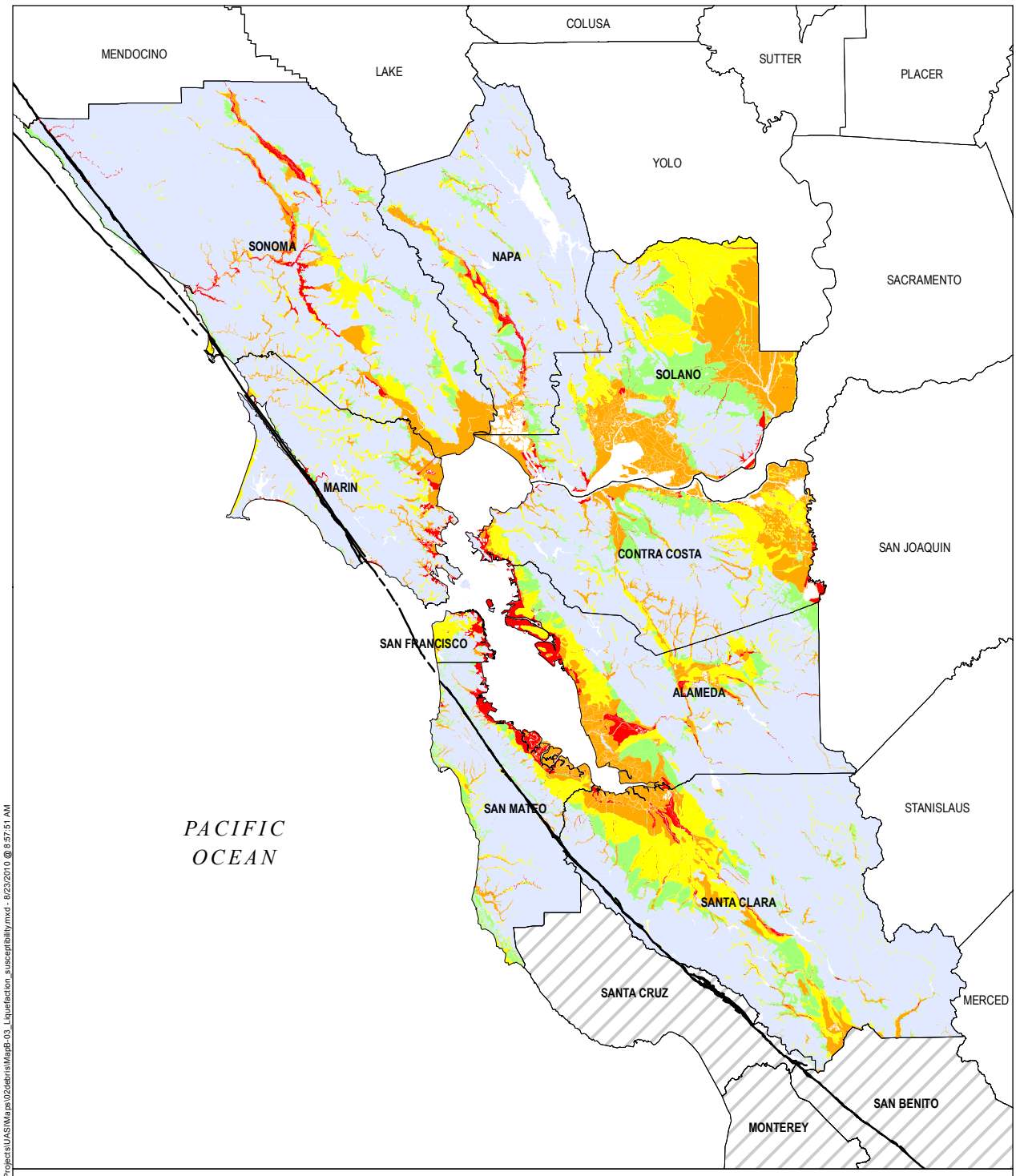

0 20 40
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N

Liquefaction data source: URS, Knudsen et al. (in progress)
Fault data source: USGS, 2006

Liquefaction susceptibility level

- 5 - high
- 4
- 3
- 2
- 1 - low
- no data

San Andreas fault zone

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-3
Liquefaction susceptibility

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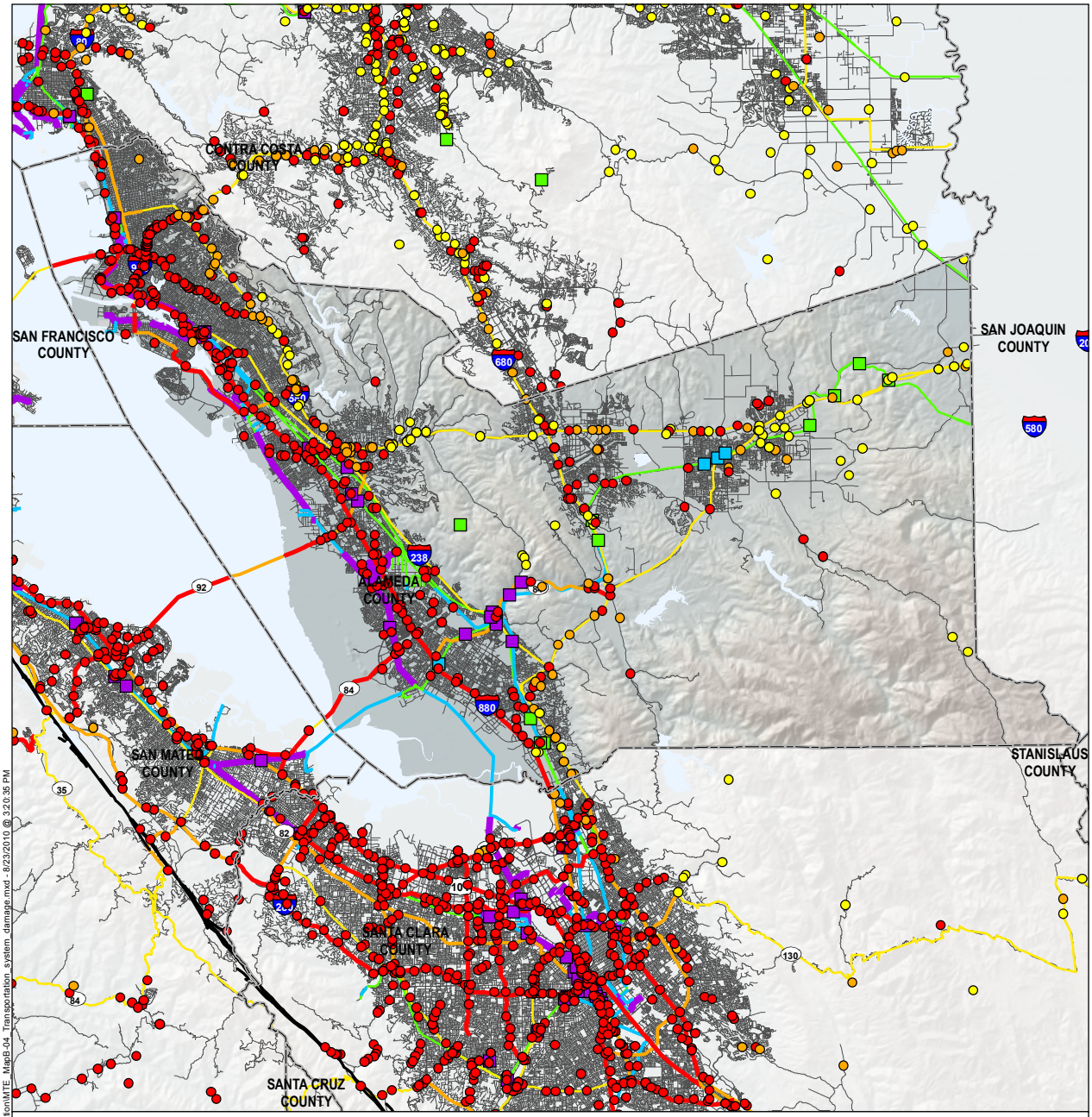

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Notes:
1. Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.
2. HAZUS default transportation
3. Road data source: HCIP Gold, 2007
4. Fault data source: USGS, 2006
5. Topographic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

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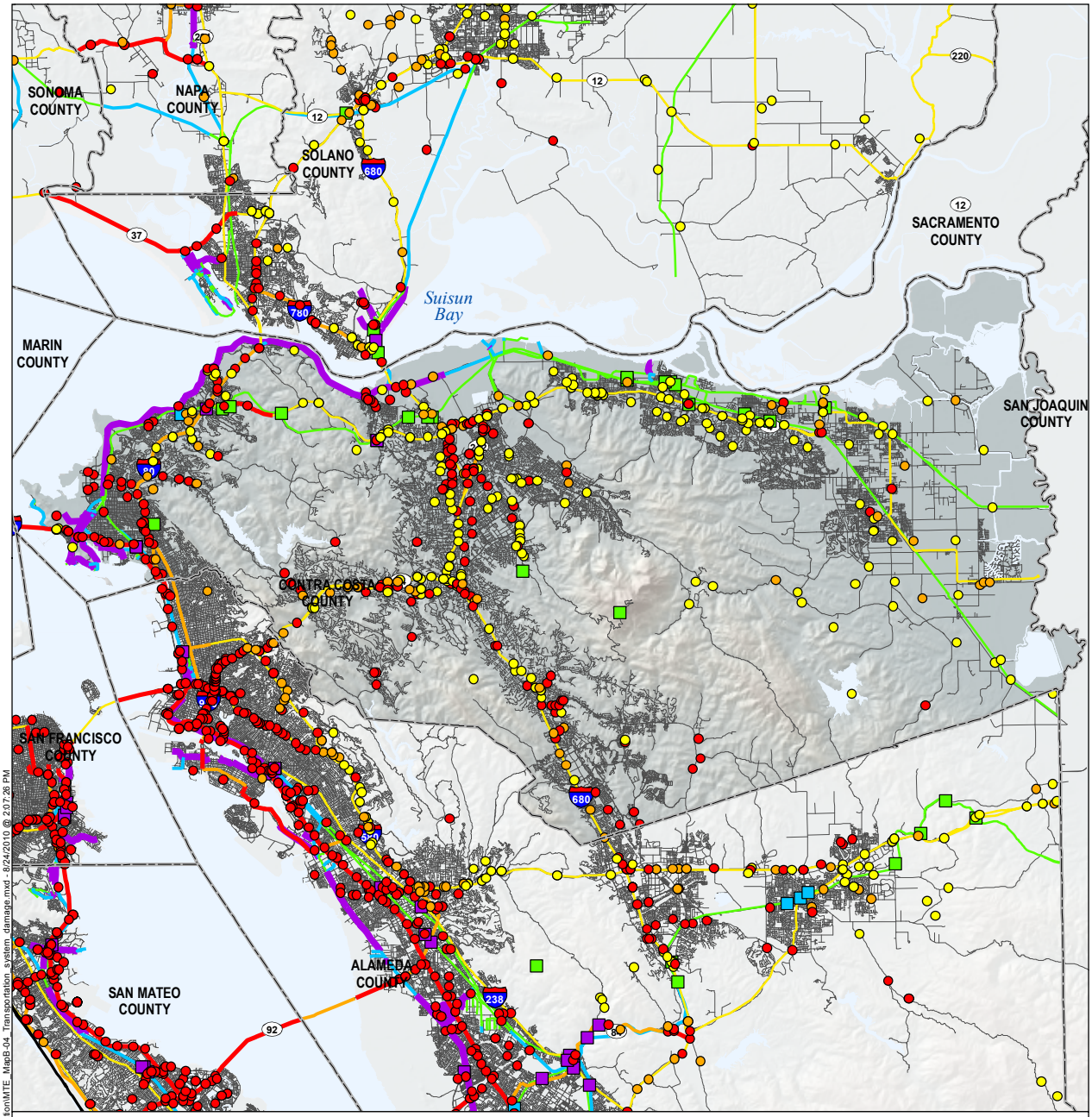
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4a
Surface transportation system damage: Alameda County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



N

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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
- San Andreas fault zone

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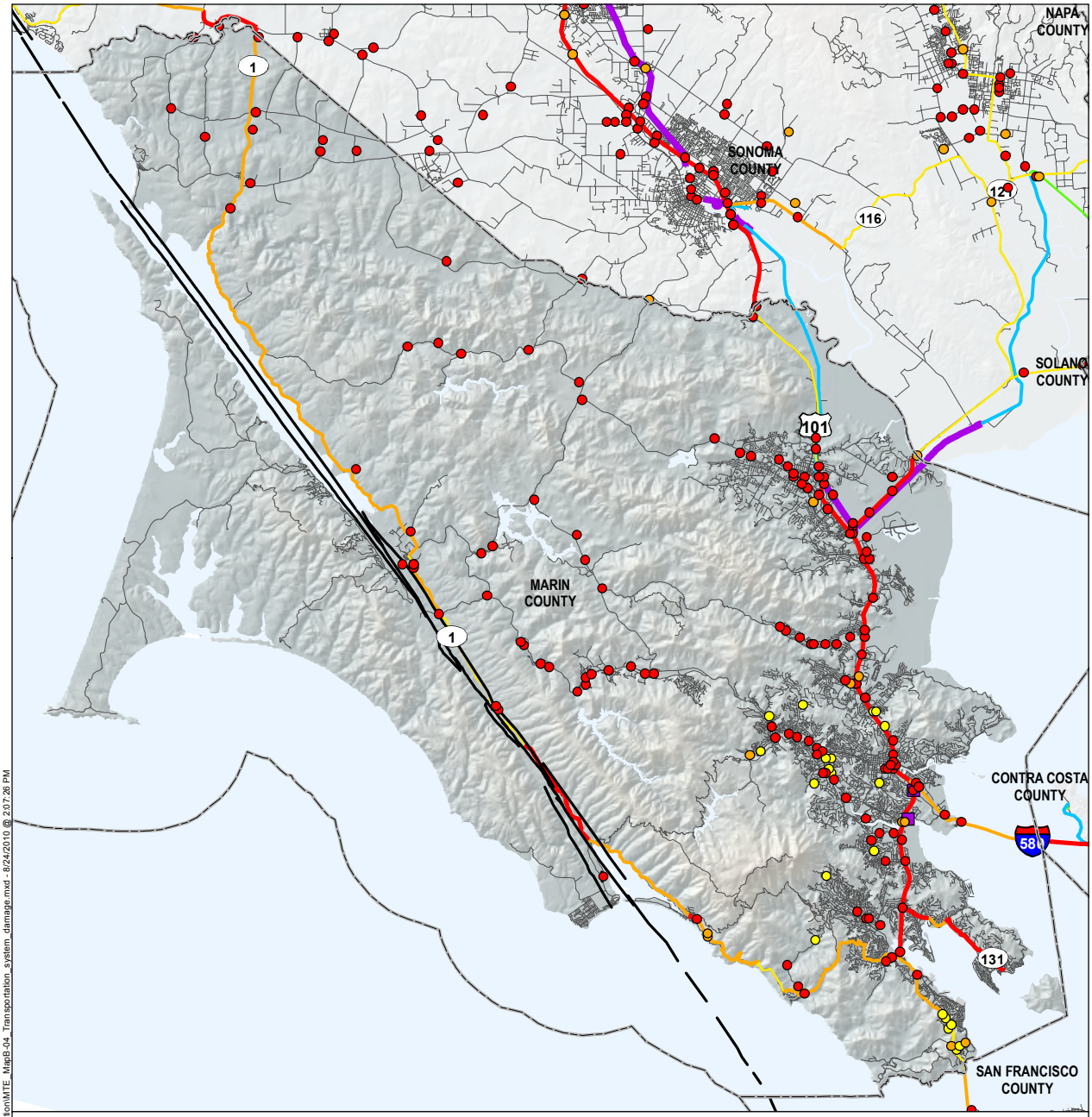
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4b
Surface transportation system damage: Contra Costa County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



N

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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%

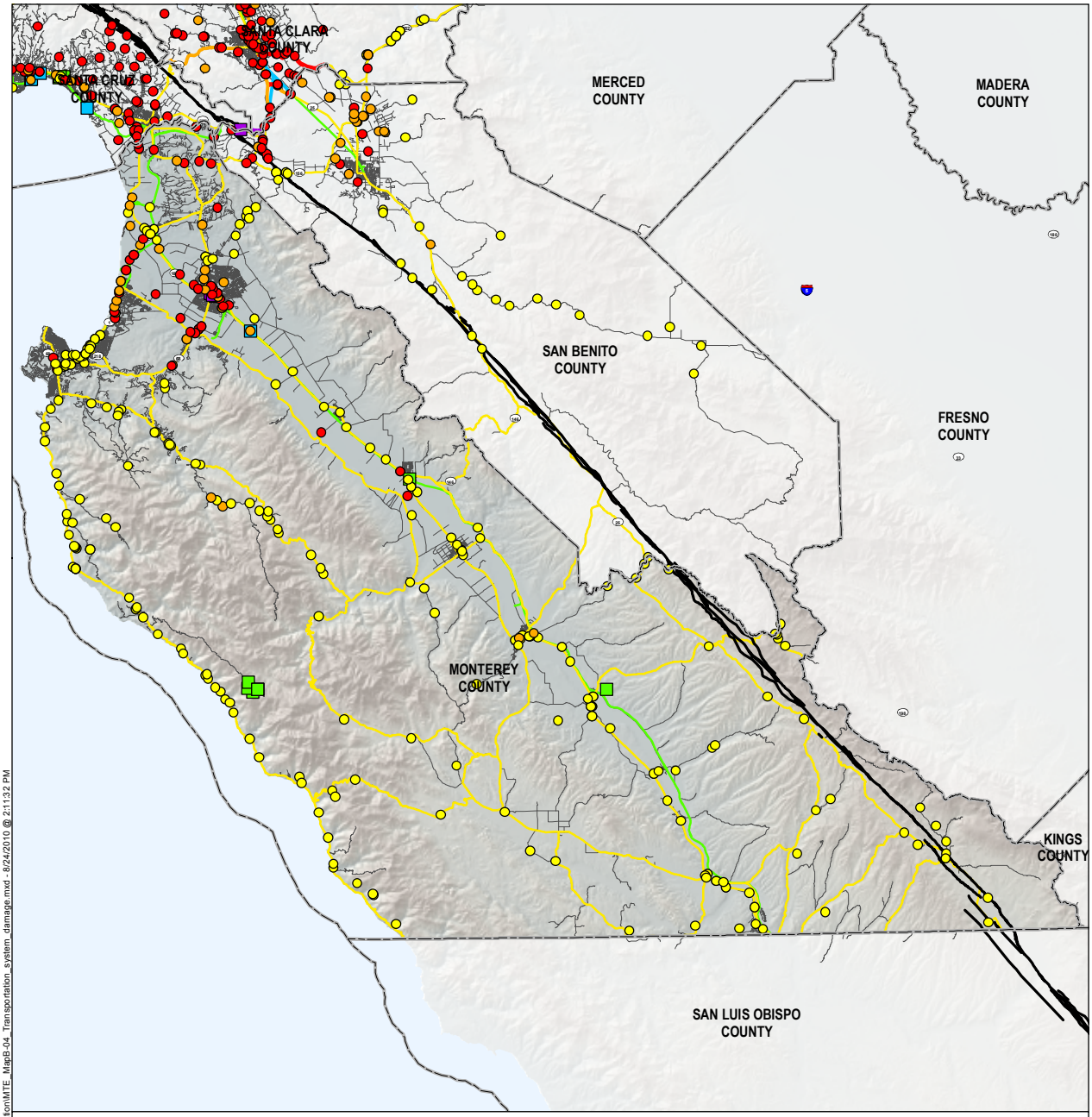
Highways
- < 90%
- 90 - 95%
- 95 -100%

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

- County boundary
- Road
- San Andreas fault zone

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4c
Surface transportation system damage: Marin County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



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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%

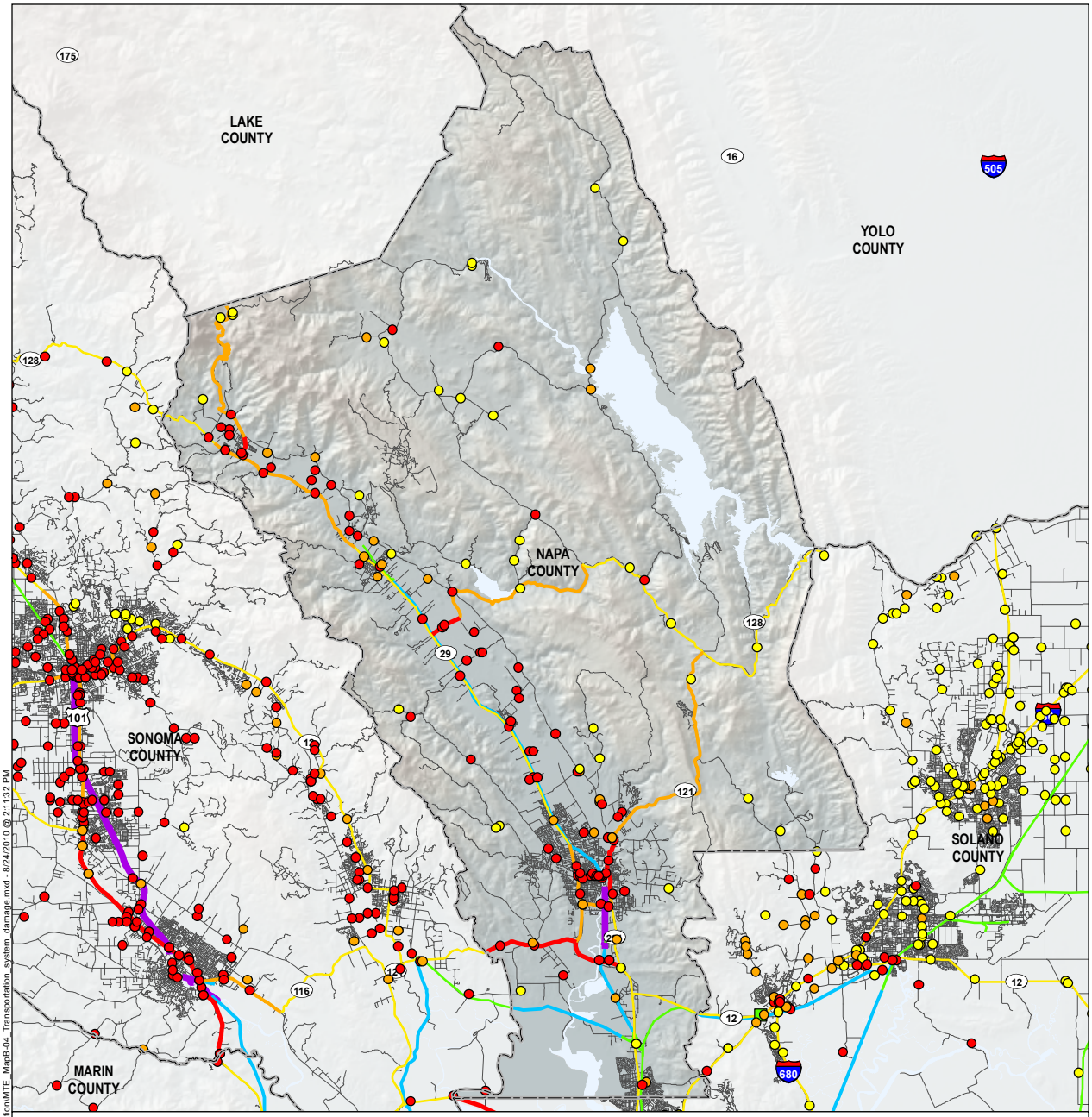
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

URS Corp - Oakland CA - C:\Raumann\SI02\emc2\gis\data\Projects\UASI\Maps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4d
Surface transportation system damage: Monterey County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



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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%

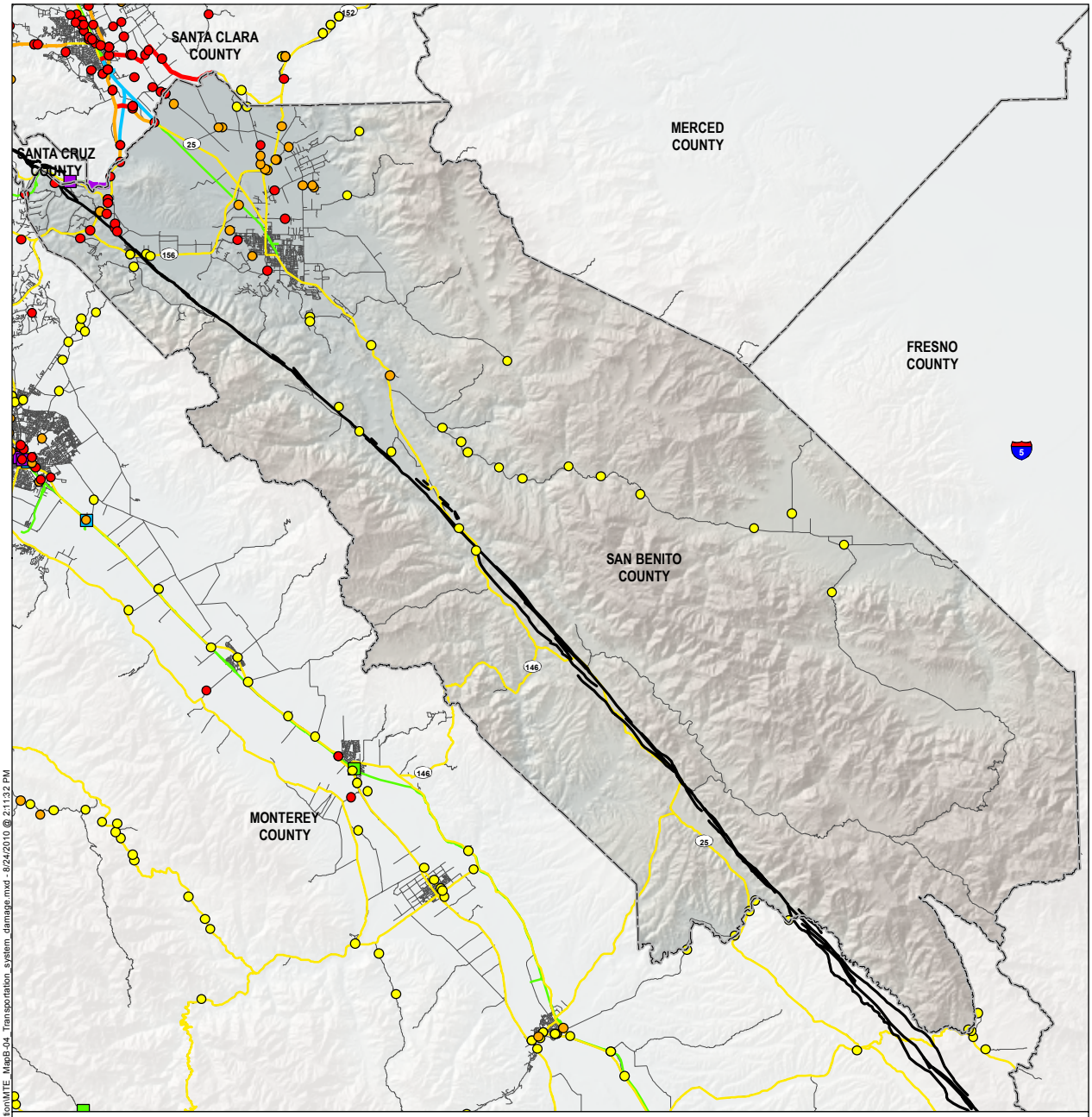
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

URS Corp - Oakland CA - C:\Raumann\SI02\emc2\gis\data\Projects\UASI\Maps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4e
Surface transportation system damage: Napa County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



N

0 5 10
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%

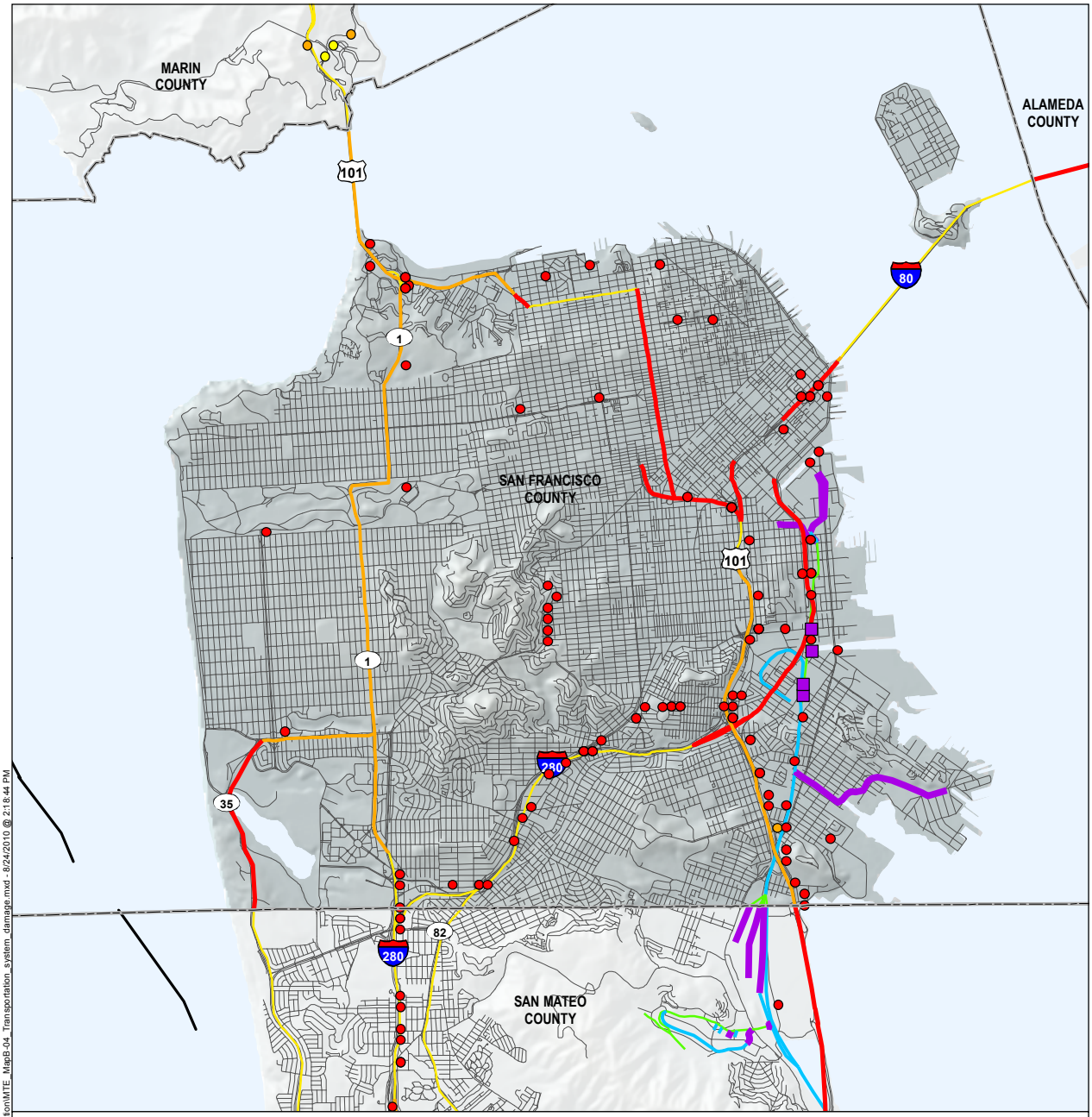
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

URS Corp - Oakland CA - C:\Raumann\SI02\emc2\gis\data\Projects\UASIMaps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4f
Surface transportation system damage: San Benito County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



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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%

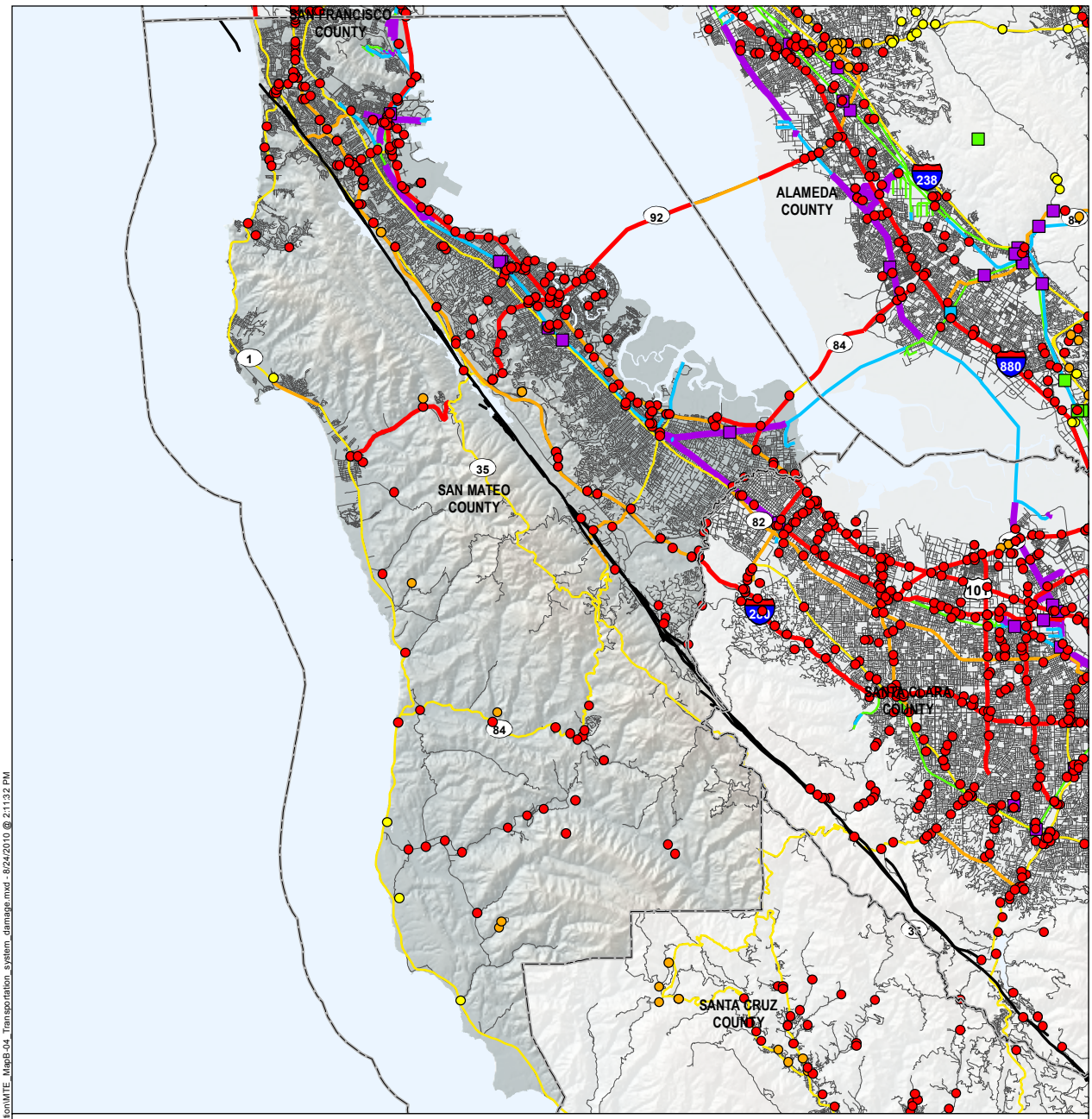
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4g
Surface transportation system damage: San Francisco County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity

URS Corp - Oakland CA - C:\Raumann\IS02\emc2\gis\data\Projects\UASIMaps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:18:44 PM



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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%

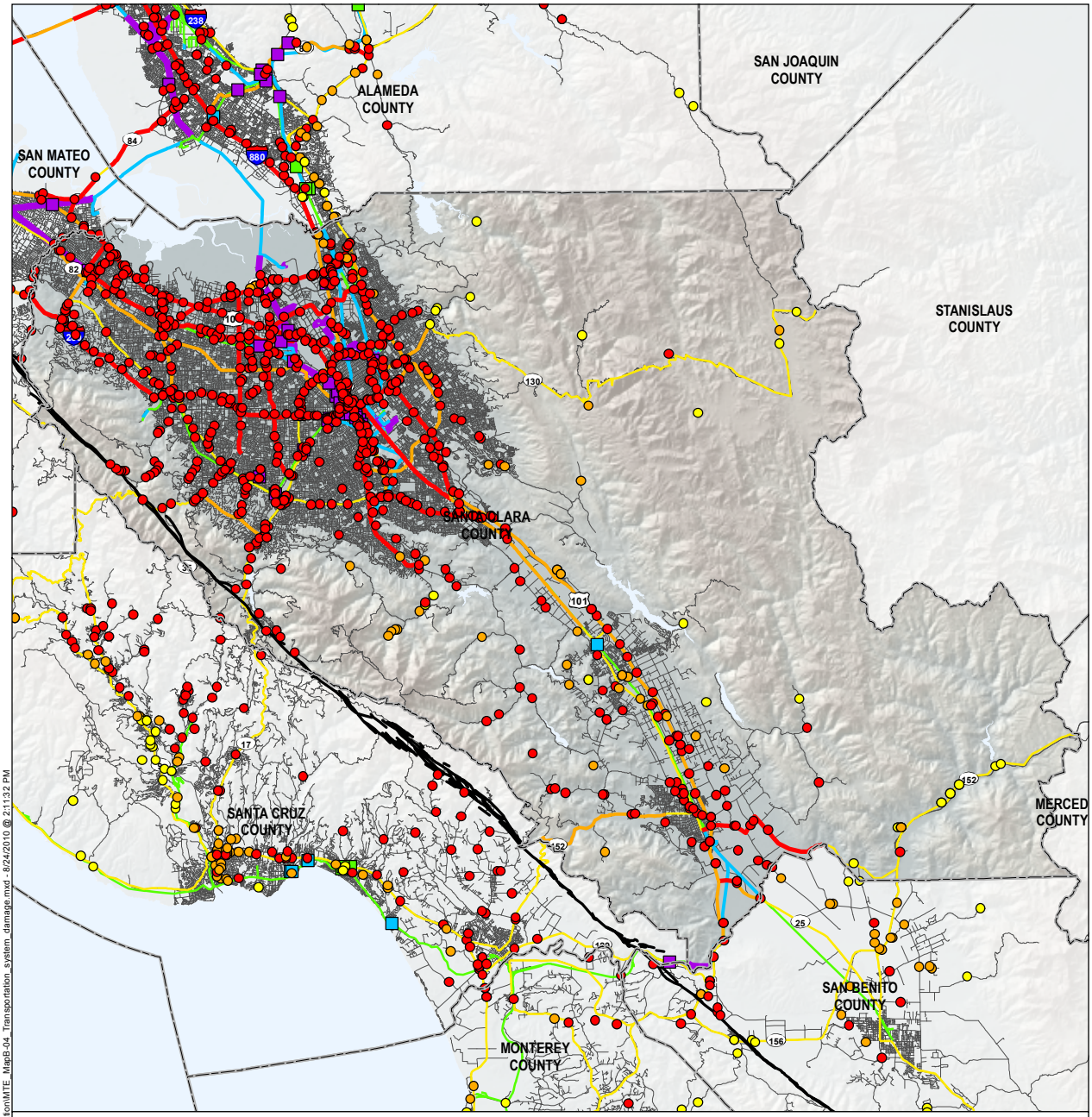
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4h
Surface transportation system damage: San Mateo County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity

URS Corp - Oakland CA - C:\Raumann\USI2\emc2\gis\data\Projects\UASIMaps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM



N

0 5 10
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%

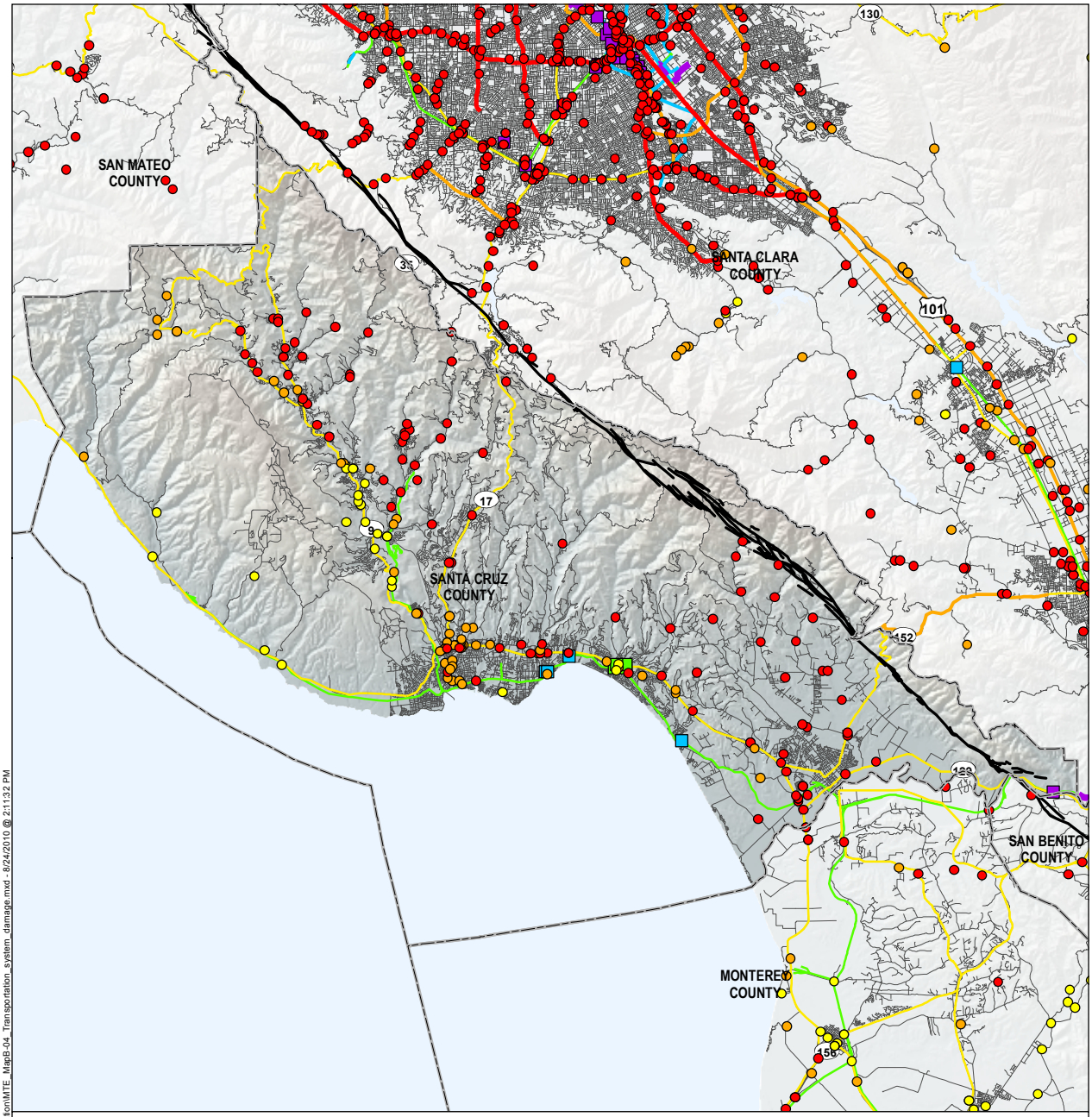
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

URS Corp - Oakland CA - C:\Raumann\SI02\emc2\gis\data\Projects\UASIMaps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4i
Surface transportation system damage: Santa Clara County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



N

0 5 10
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%

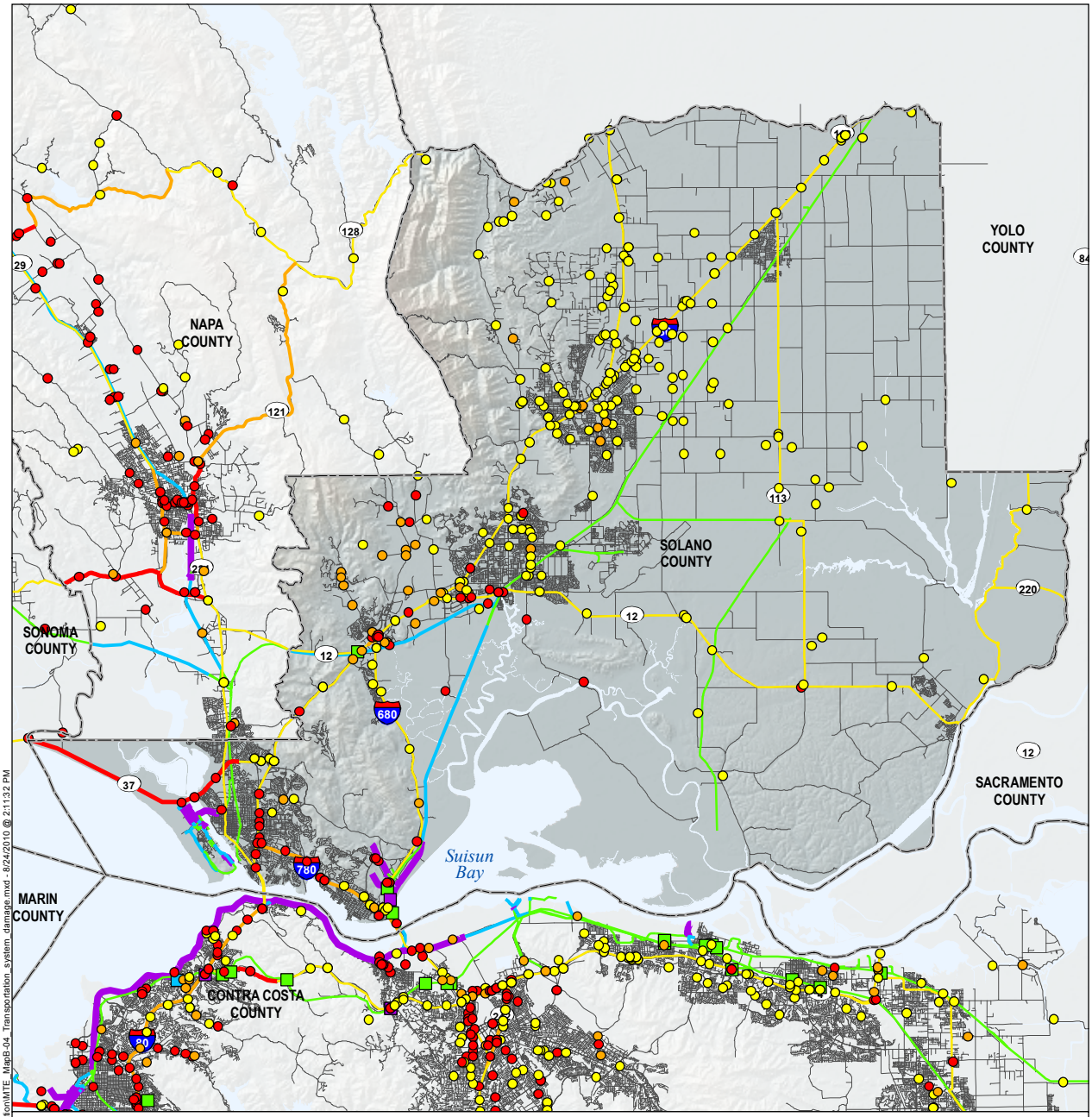
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4j
Surface transportation system damage: Santa Cruz County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity

URS Corp - Oakland CA - C:\Raumann\SI02\emc2\gis\data\Projects\UASIMaps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM



N

0 5 10
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%

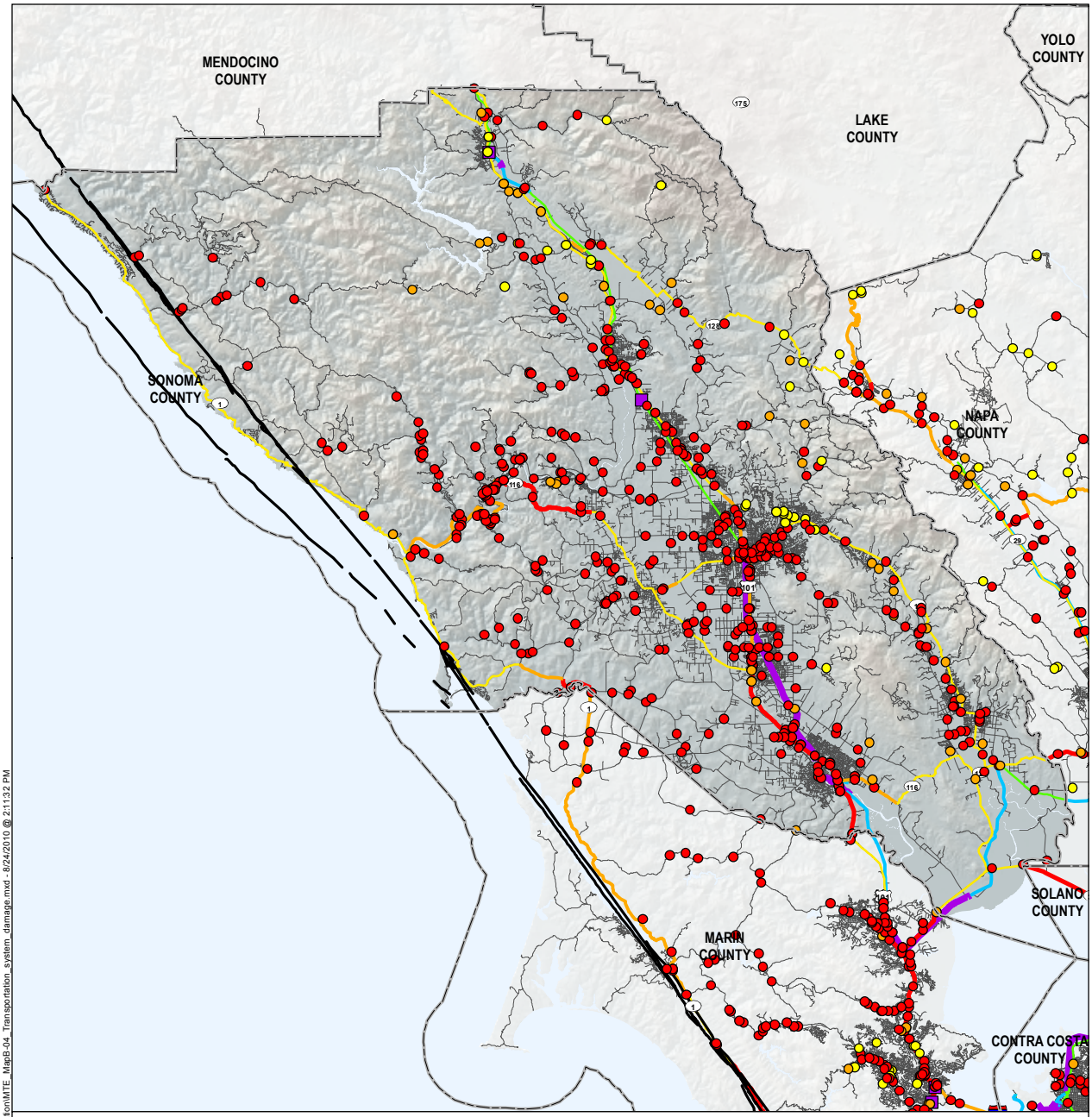
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

URS Corp - Oakland CA - C:\Raumann\SI02\emc2\gis\data\Projects\UASIMaps\04transportationMTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4k
Surface transportation system damage: Solano County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity



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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%

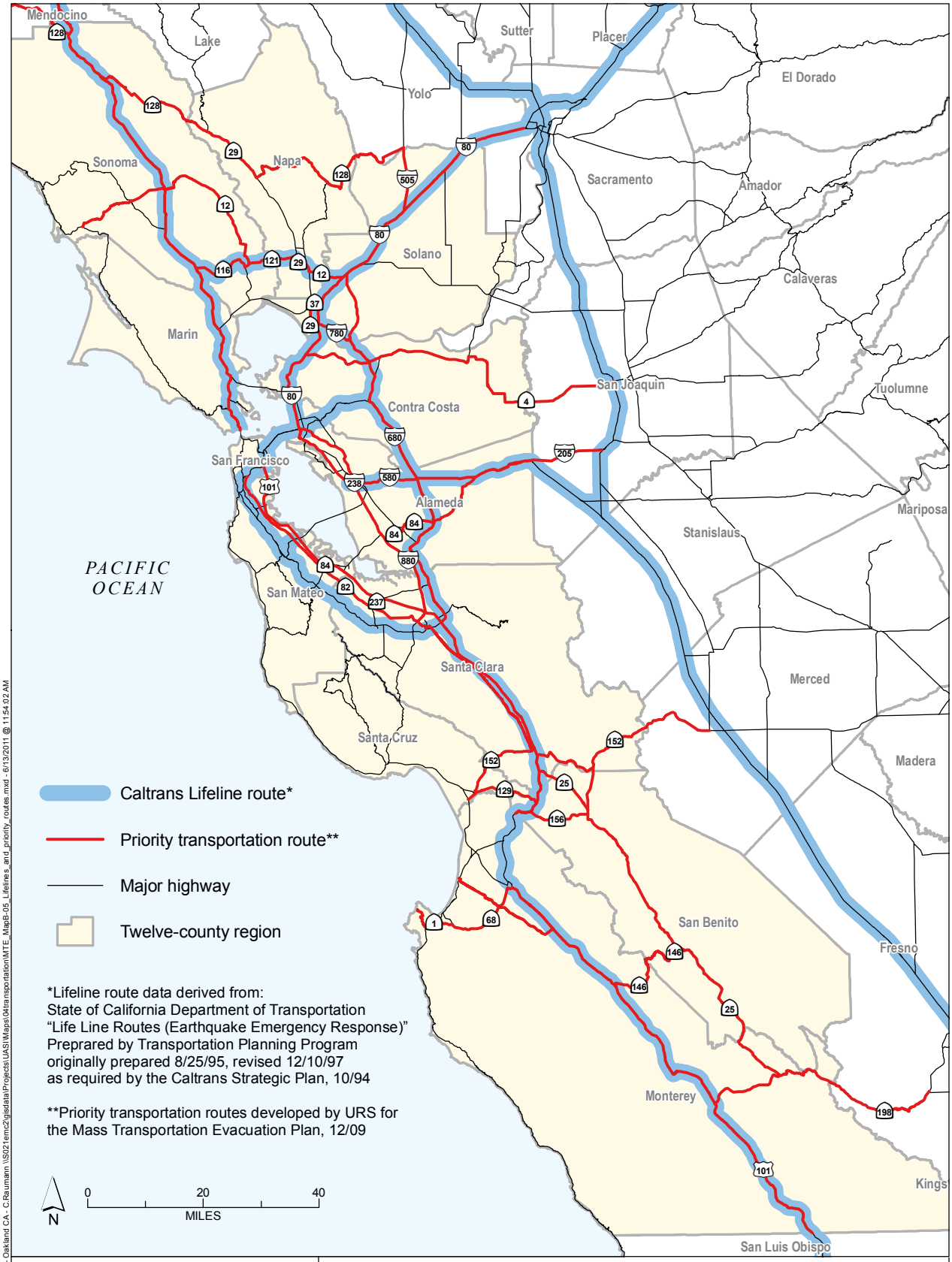
Railways
- < 90%
- 90 - 95%
- 95 - 100%

- County boundary
- Road
- San Andreas fault zone

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-4l
Surface transportation system damage: Sonoma County
Scenario: **M** 7.9 San Andreas fault earthquake
1906 Modified Mercalli Intensity

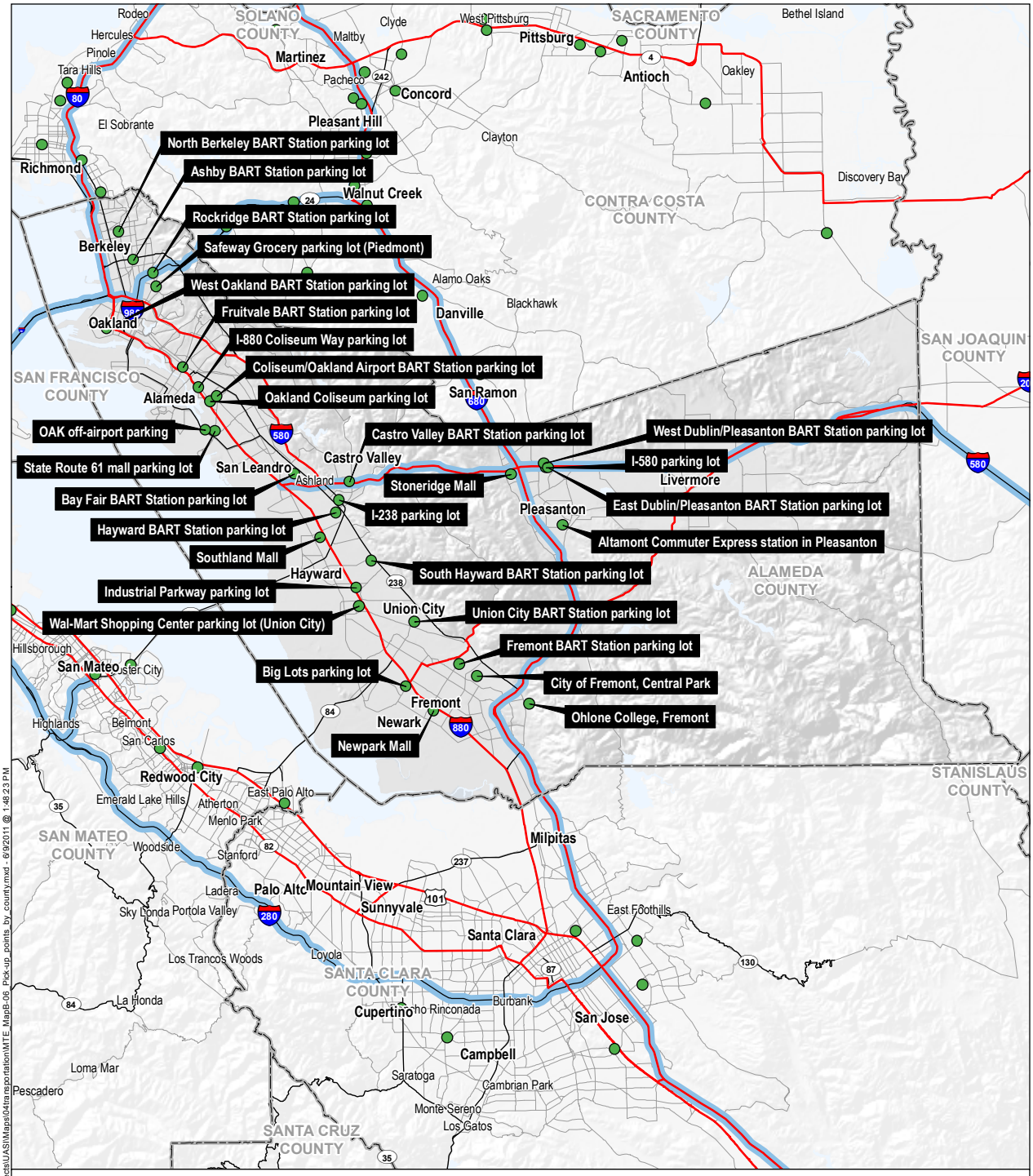
URS Corp - Oakland CA - C:\Raumann\IS02\emc2\gis\data\Projects\UASI\Maps\04transportation\MTE_MapB-04_Transportation_system_damage.mxd - 8/24/2010 @ 2:11:32 PM



URS Corp - Oakland CA - C:\Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-05_Lifelines_and_priority_routes.mxd - 6/13/2011 @ 11:54:02 AM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-5
Caltrans Lifeline routes and priority transportation routes



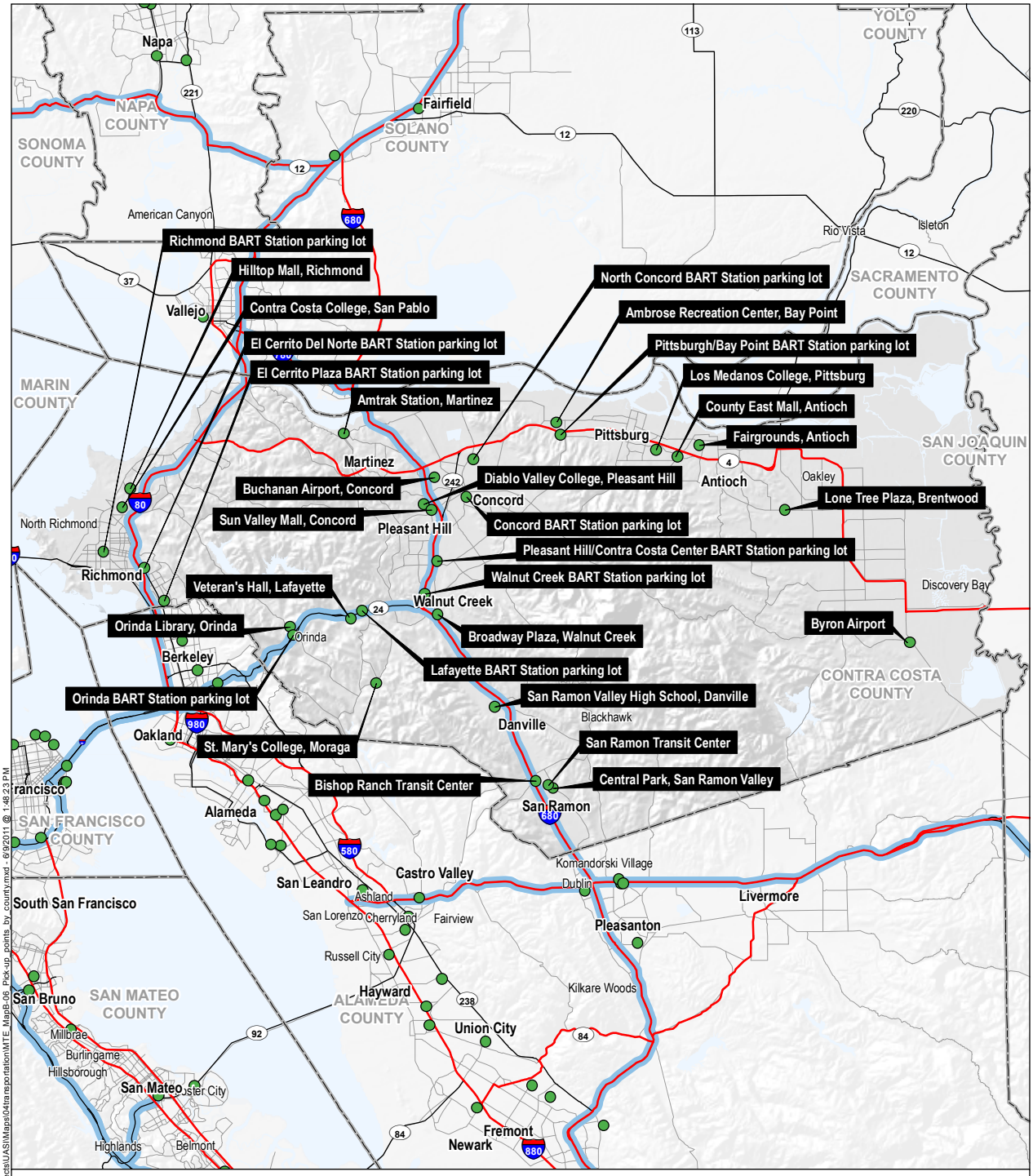
*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/9/2011 @ 1:48:23 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6a
Proposed pickup points: Alameda County



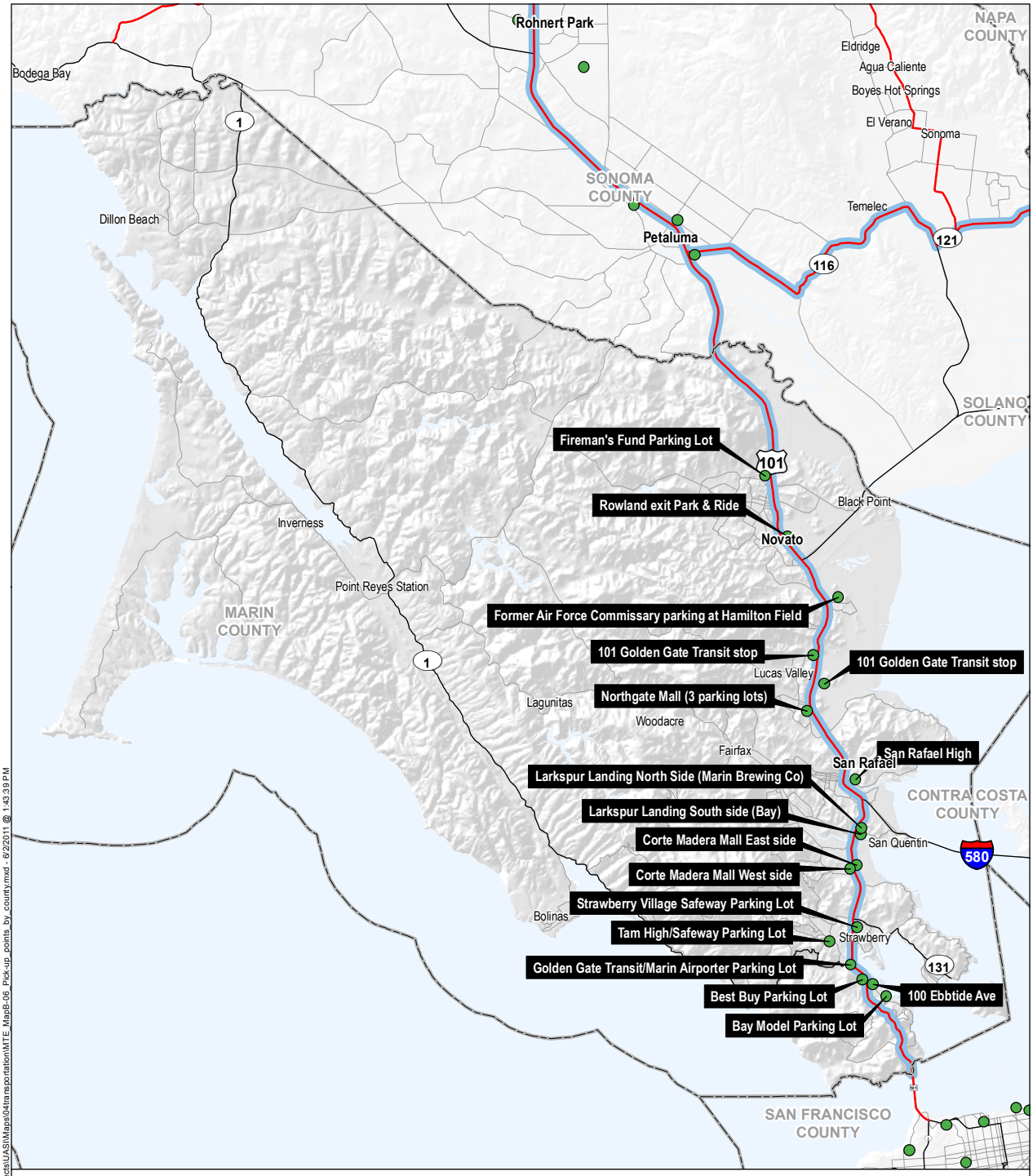
*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6b
Proposed pickup points: Contra Costa County

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/9/2011 @ 1:48:23 PM



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MILES

*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

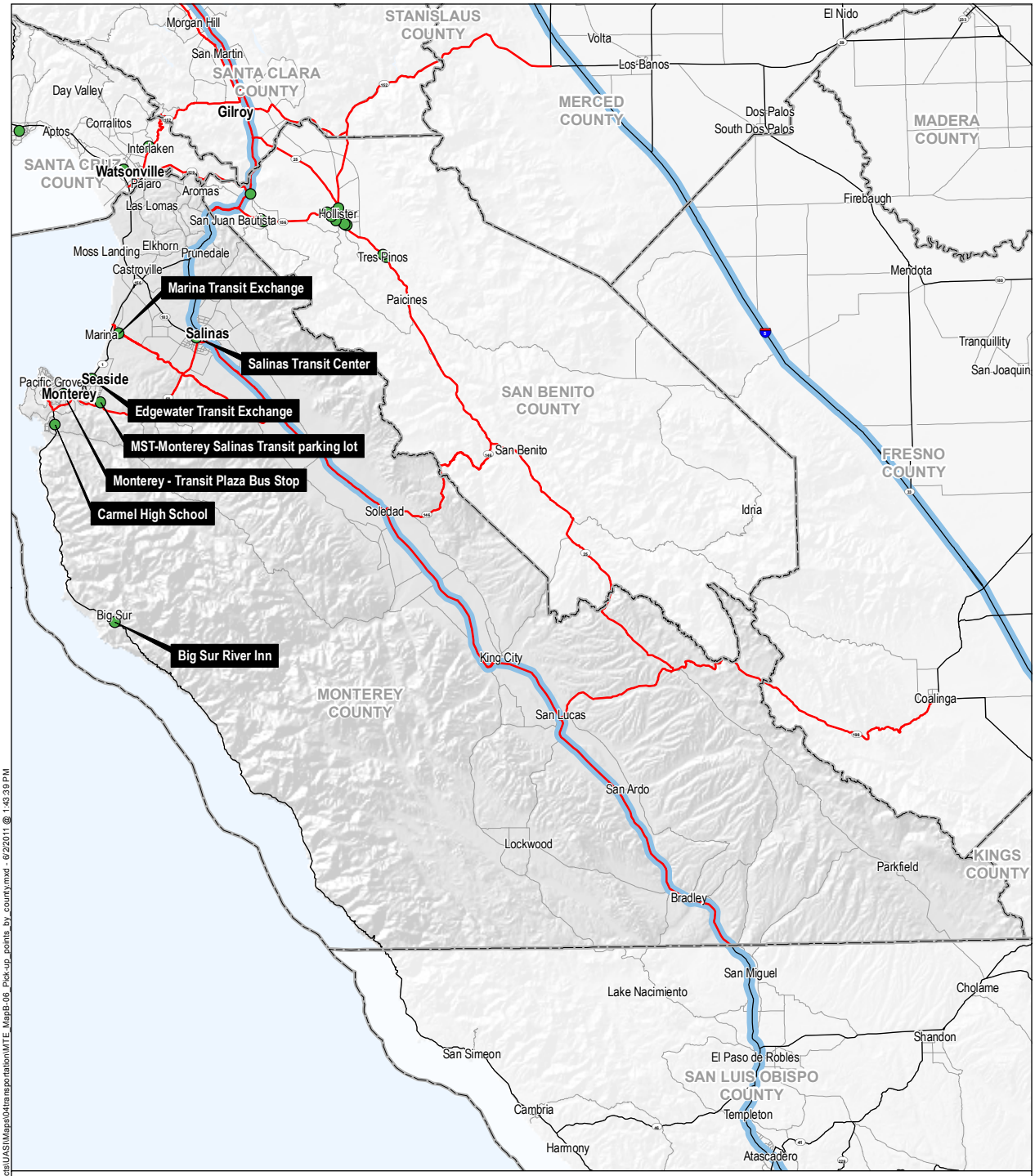
**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

- Proposed pickup point
- Caltrans Lifeline route*
- Priority transportation route**
- County boundary
- Highway
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6c
Proposed pickup points: Marin County

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASIMaps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/2/2011 @ 1:43:39 PM

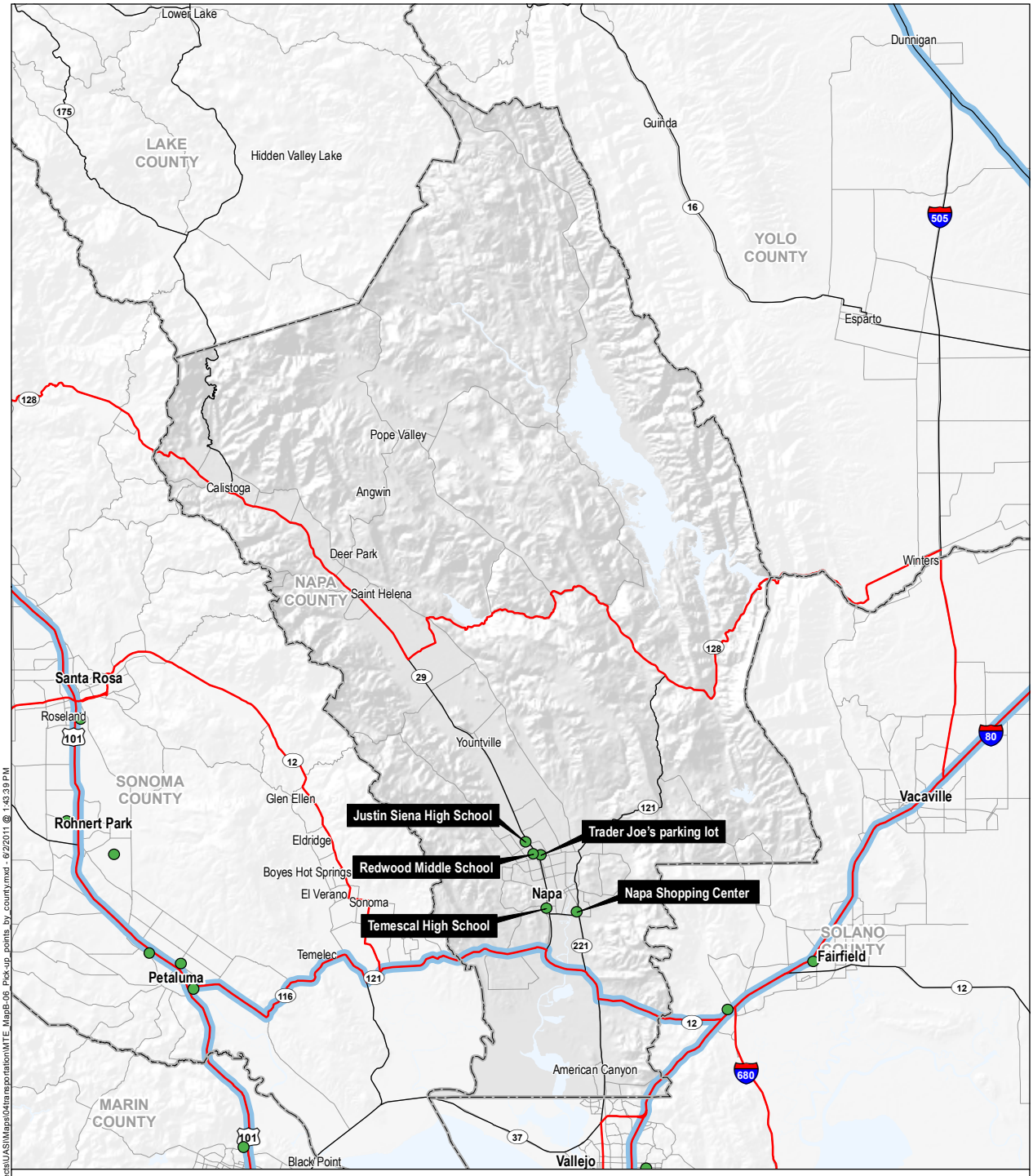


*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6d
Proposed pickup points: Monterey County



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*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

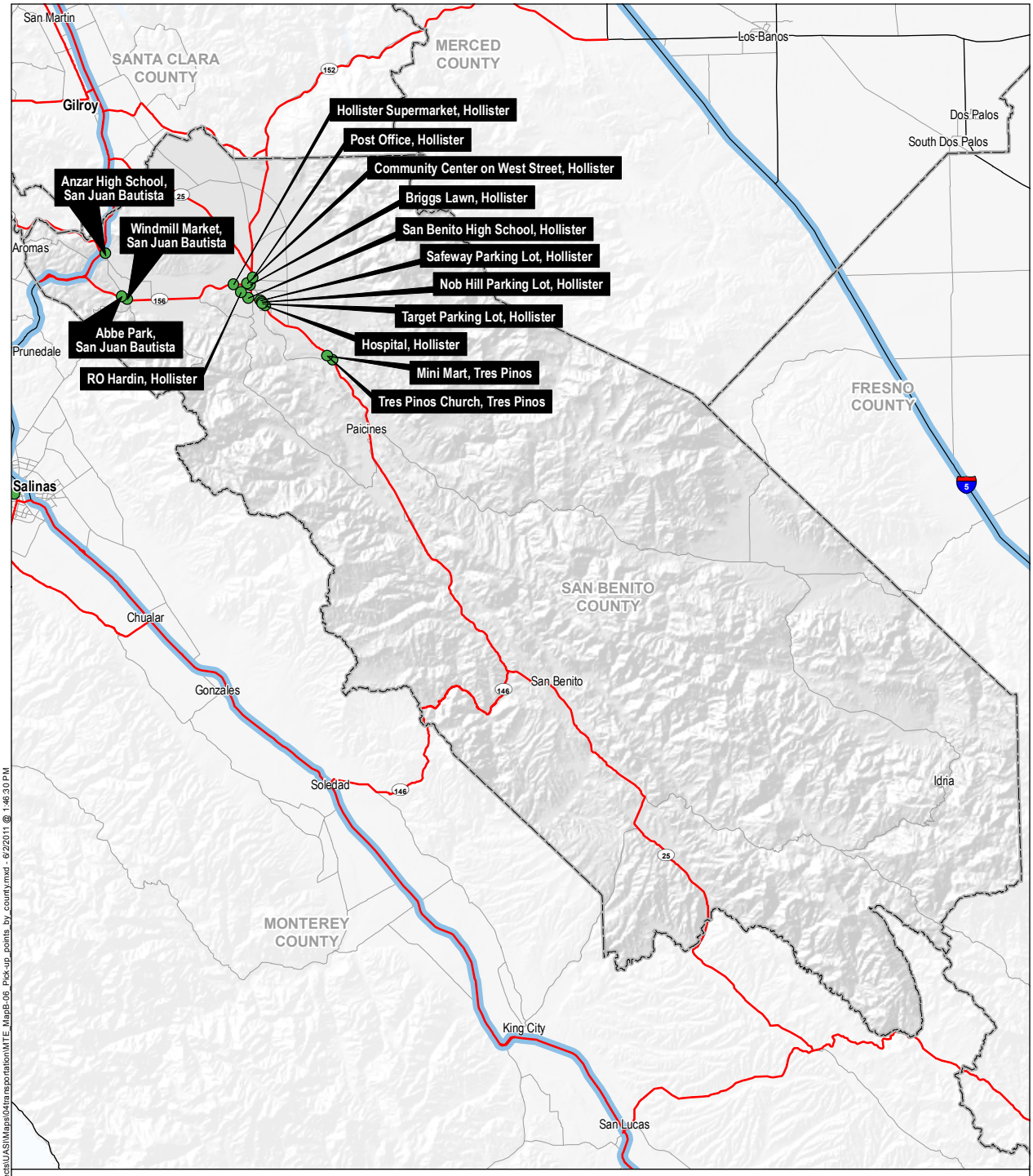
**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

- Proposed pickup point
- Caltrans Lifeline route*
- Priority transportation route**
- County boundary
- Highway
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6e
Proposed pickup points: Napa County

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/2/2011 @ 1:43:39 PM



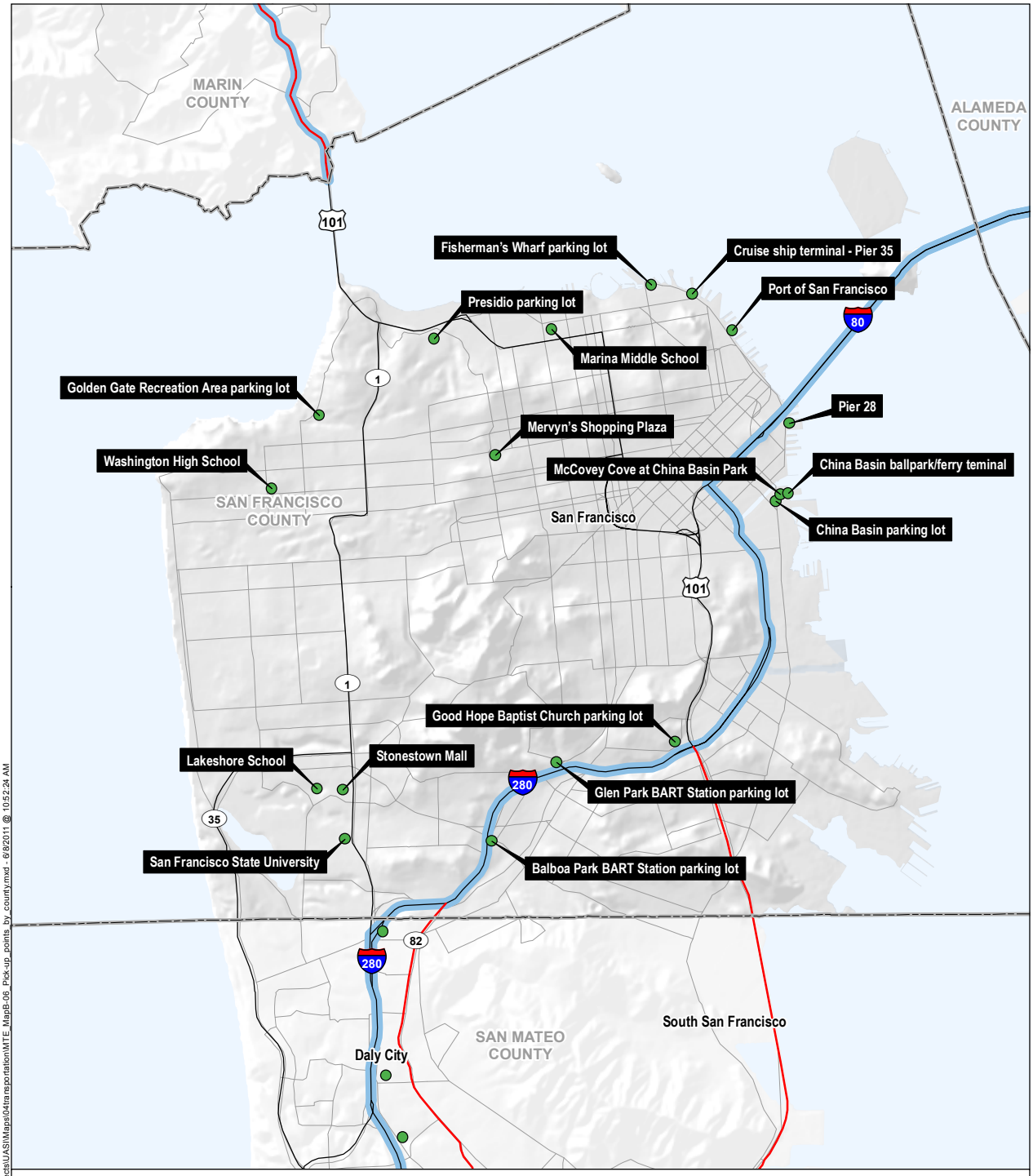
*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6f
Proposed pickup points: San Benito County

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/2/2011 @ 1:46:30 PM



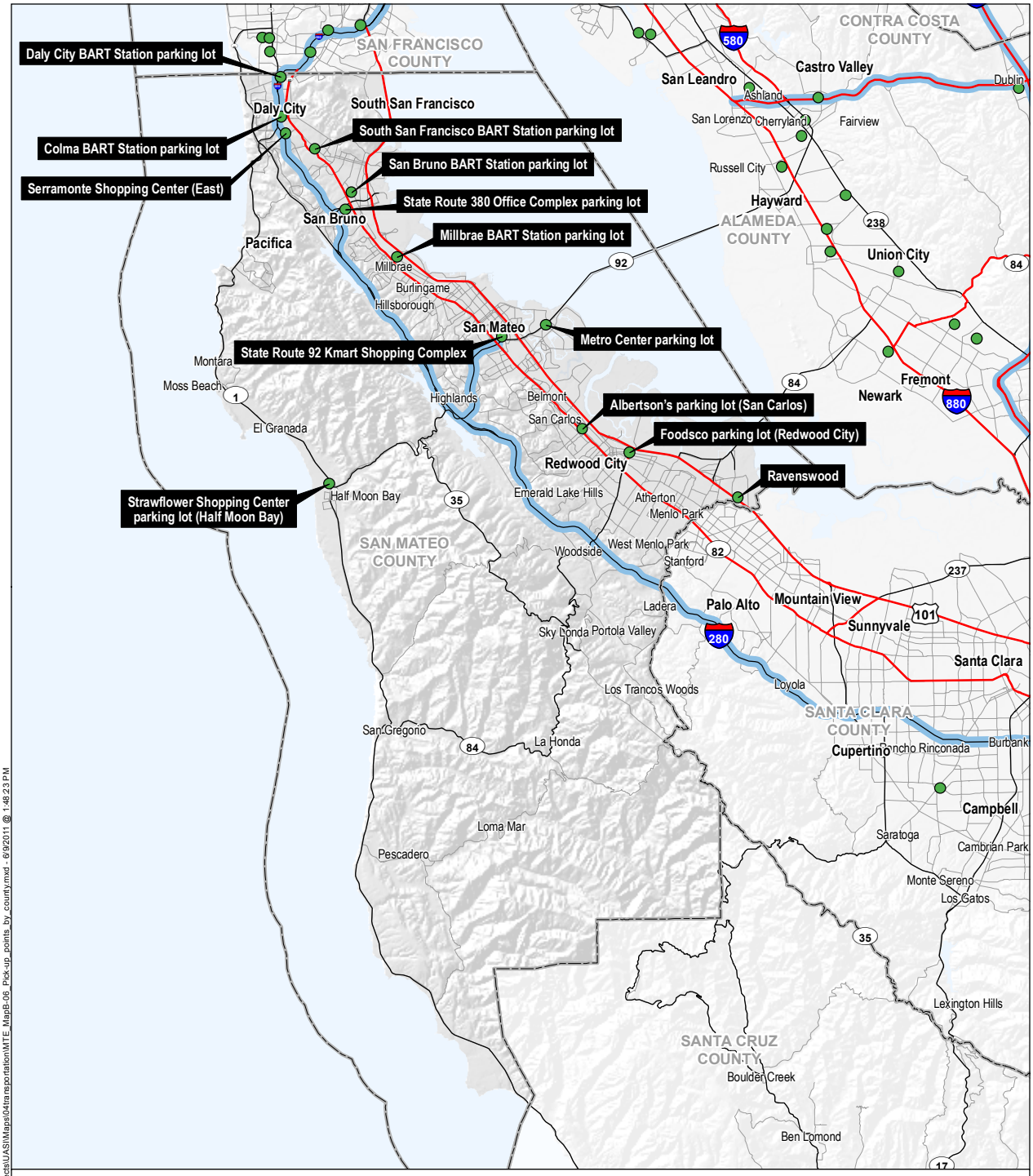
*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

URS Corp - Oakland CA - Raumann \\S021orm2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/9/2011 @ 10:52:24 AM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6g
Proposed pickup points: San Francisco County



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MILES

*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

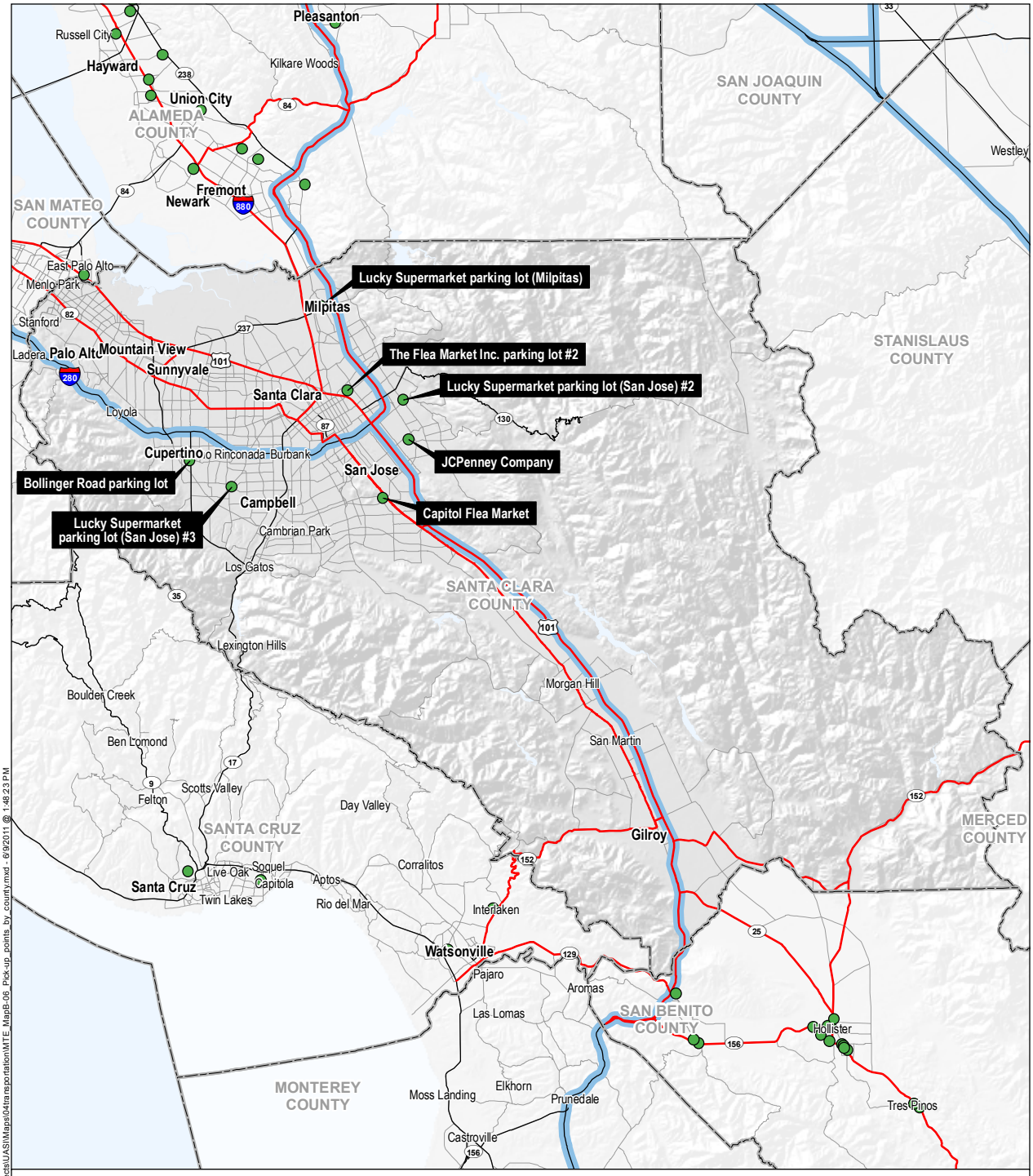
**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

- Proposed pickup point
- Caltrans Lifeline route*
- Priority transportation route**
- County boundary
- Highway
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6h
Proposed pickup points: San Mateo County

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/9/2011 @ 1:48:23 PM



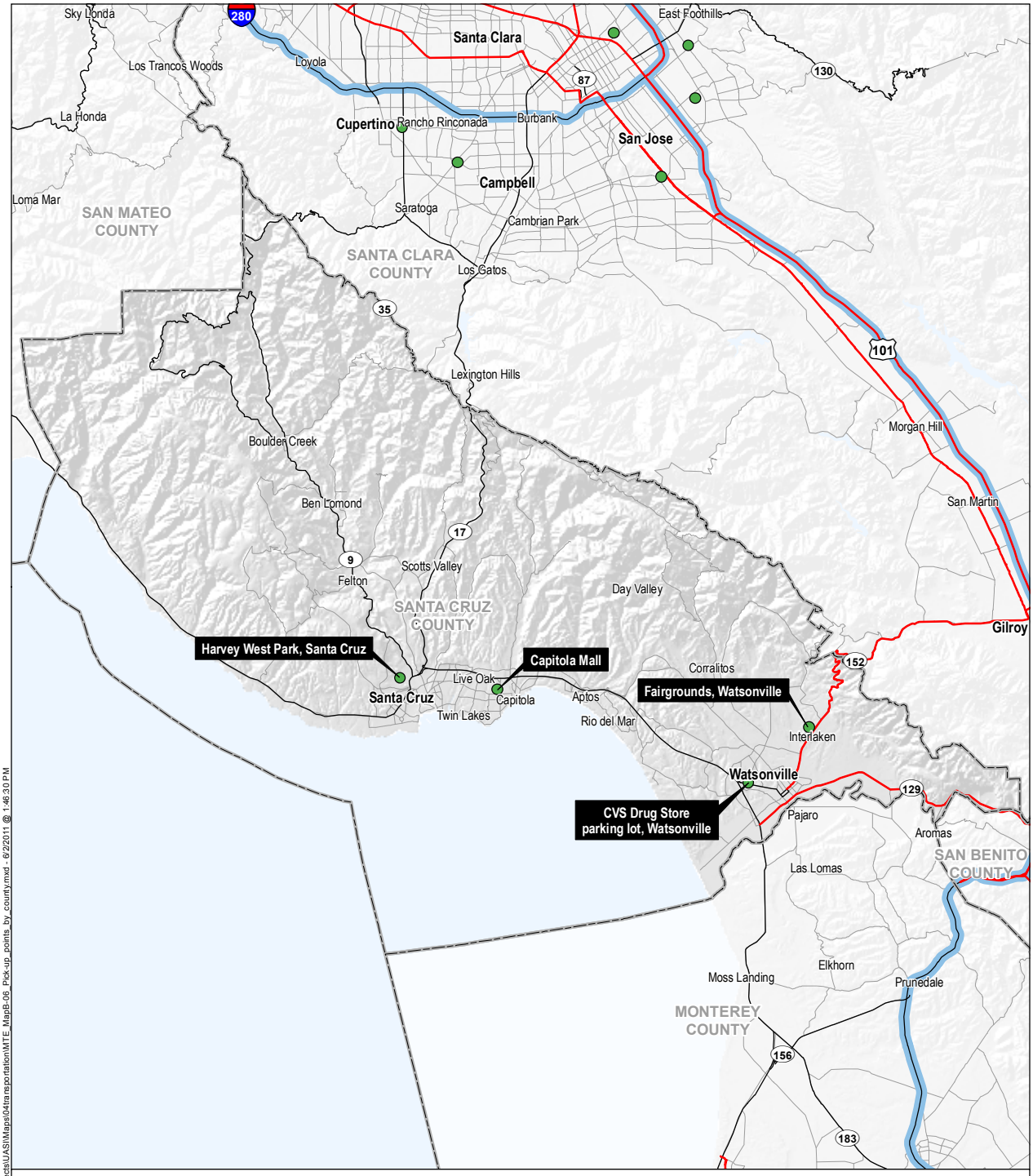
*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/9/2011 @ 1:48:23 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6i
Proposed pickup points: Santa Clara County



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MILES

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*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

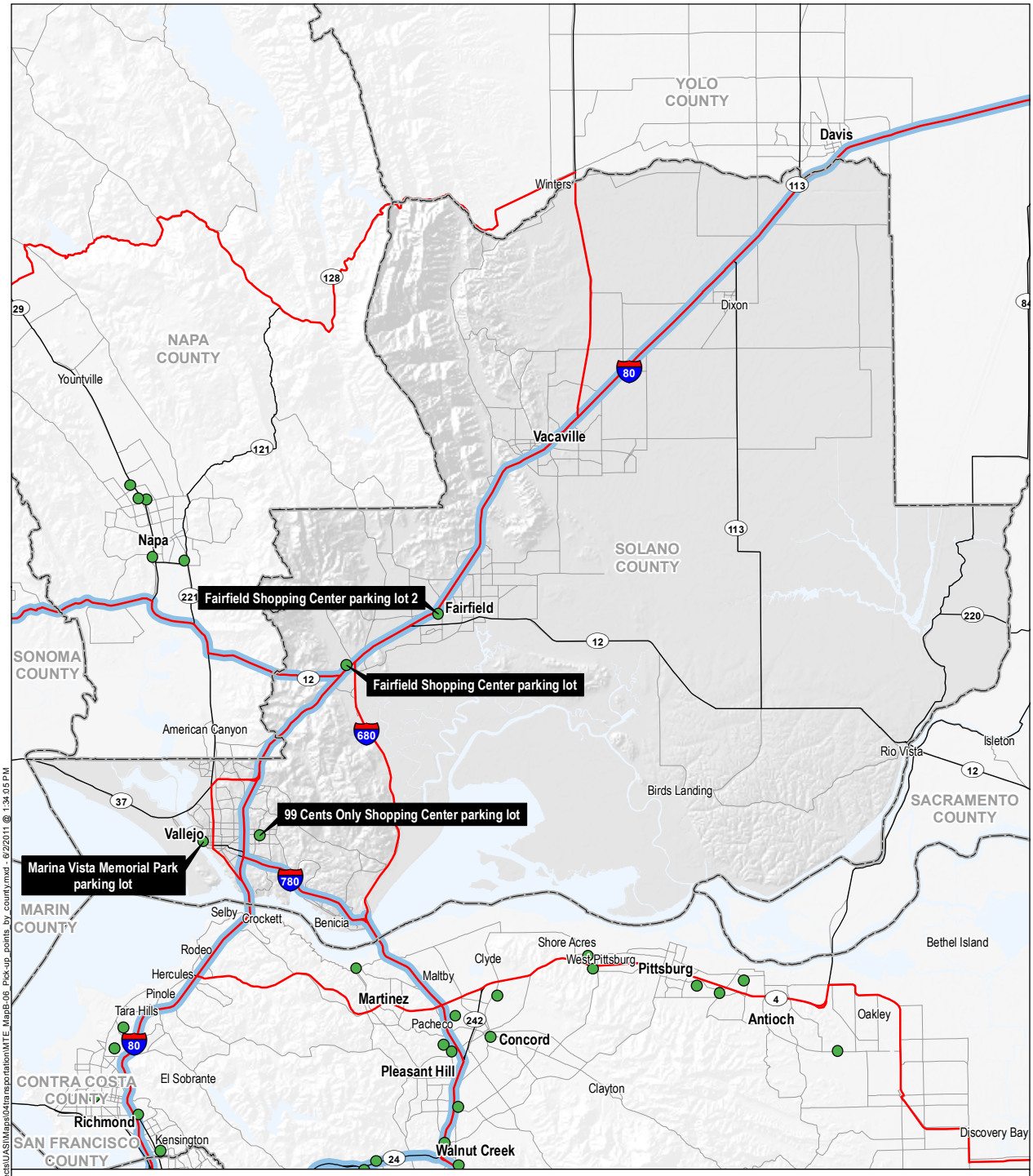
**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

- Proposed pickup point
- Caltrans Lifeline route*
- Priority transportation route**
- County boundary
- Highway
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6j
Proposed pickup points: Santa Cruz County

URS Corp - Oakland CA - Raumann \\S021em2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/2/2011 @ 1:46:30 PM



N

0 4 8

MILES

*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

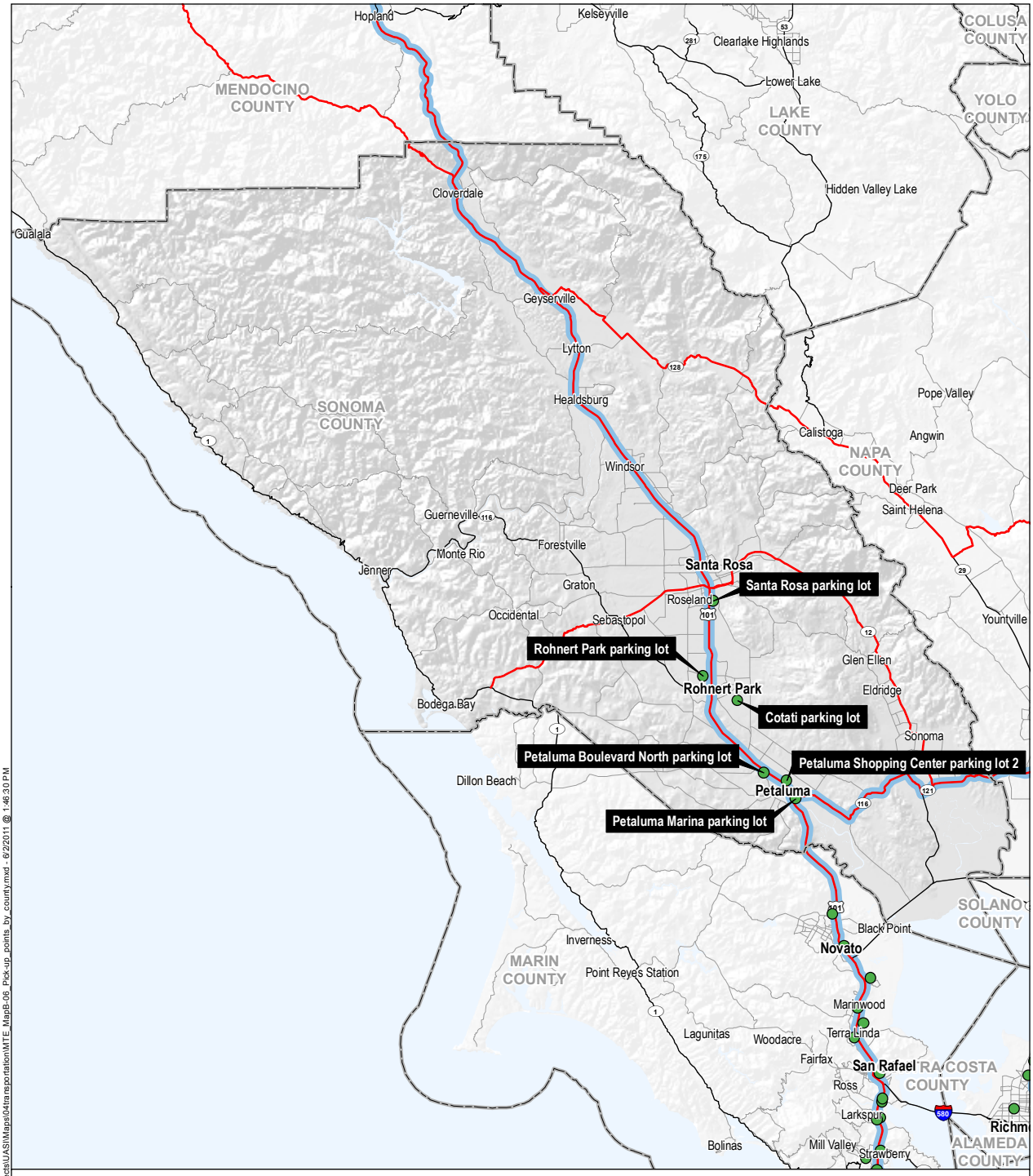
**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

- Proposed pickup point
- Caltrans Lifeline route*
- Priority transportation route**
- County boundary
- Highway
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6k
Proposed pickup points: Solano County

URS Corp - Oakland CA - Raumann \\S021orm2\gis\data\Projects\UASI\Maps\04transportation\MTE_MapB-06_Pick-up_points_by_county.mxd - 6/2/2011 @ 1:34:05 PM



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MILES

- Proposed pickup point
- Caltrans Lifeline route*
- Priority transportation route**
- County boundary
- Highway
- Road

*Lifeline route data derived from:
State of California Department of Transportation
"Life Line Routes (Earthquake Emergency Response)"
originally prepared 8/25/95, revised 12/10/97

**Priority transportation routes developed by URS for the Mass Transportation Evacuation Plan, 12/09

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-6l
Proposed pickup points: Sonoma County

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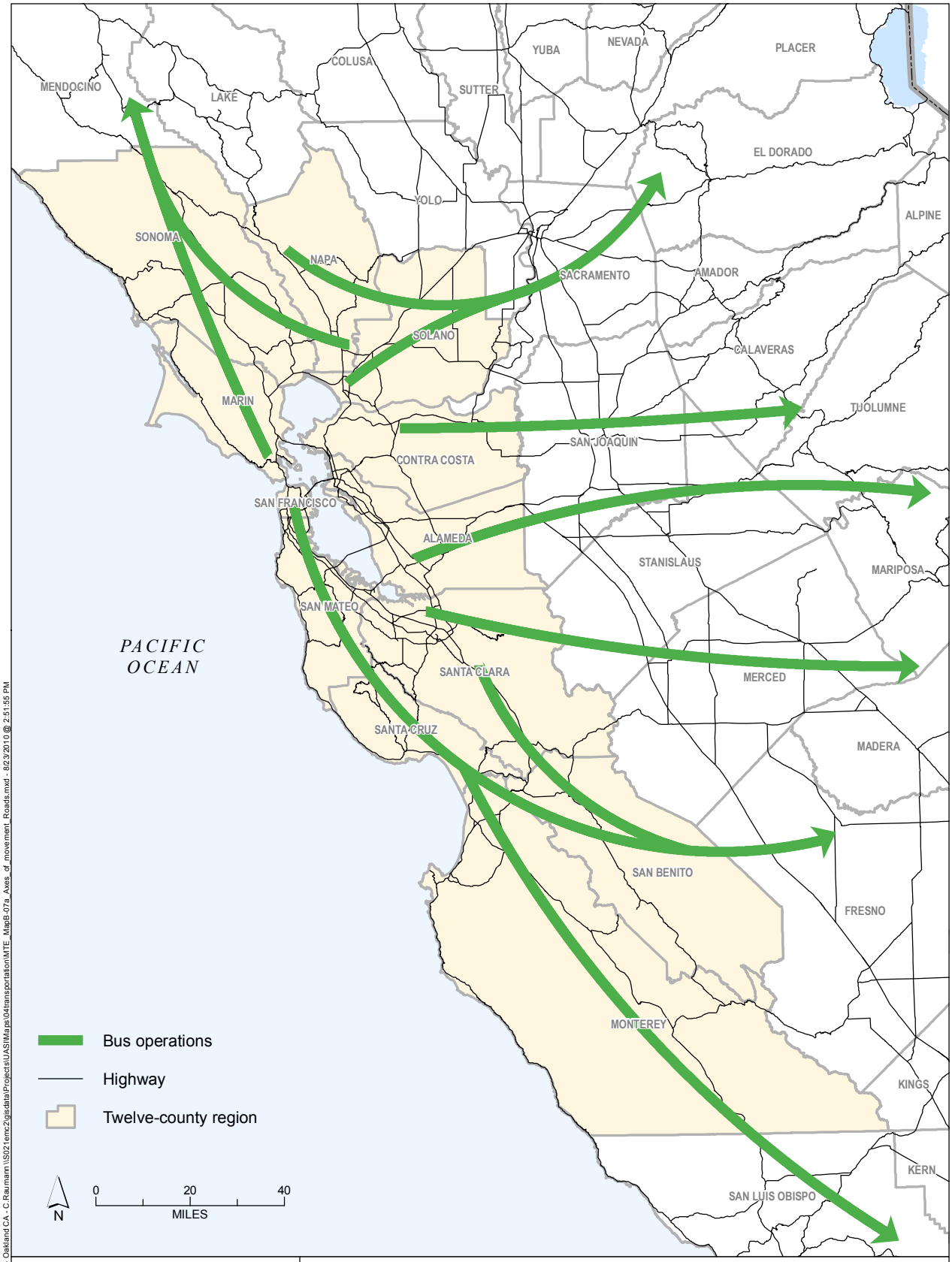

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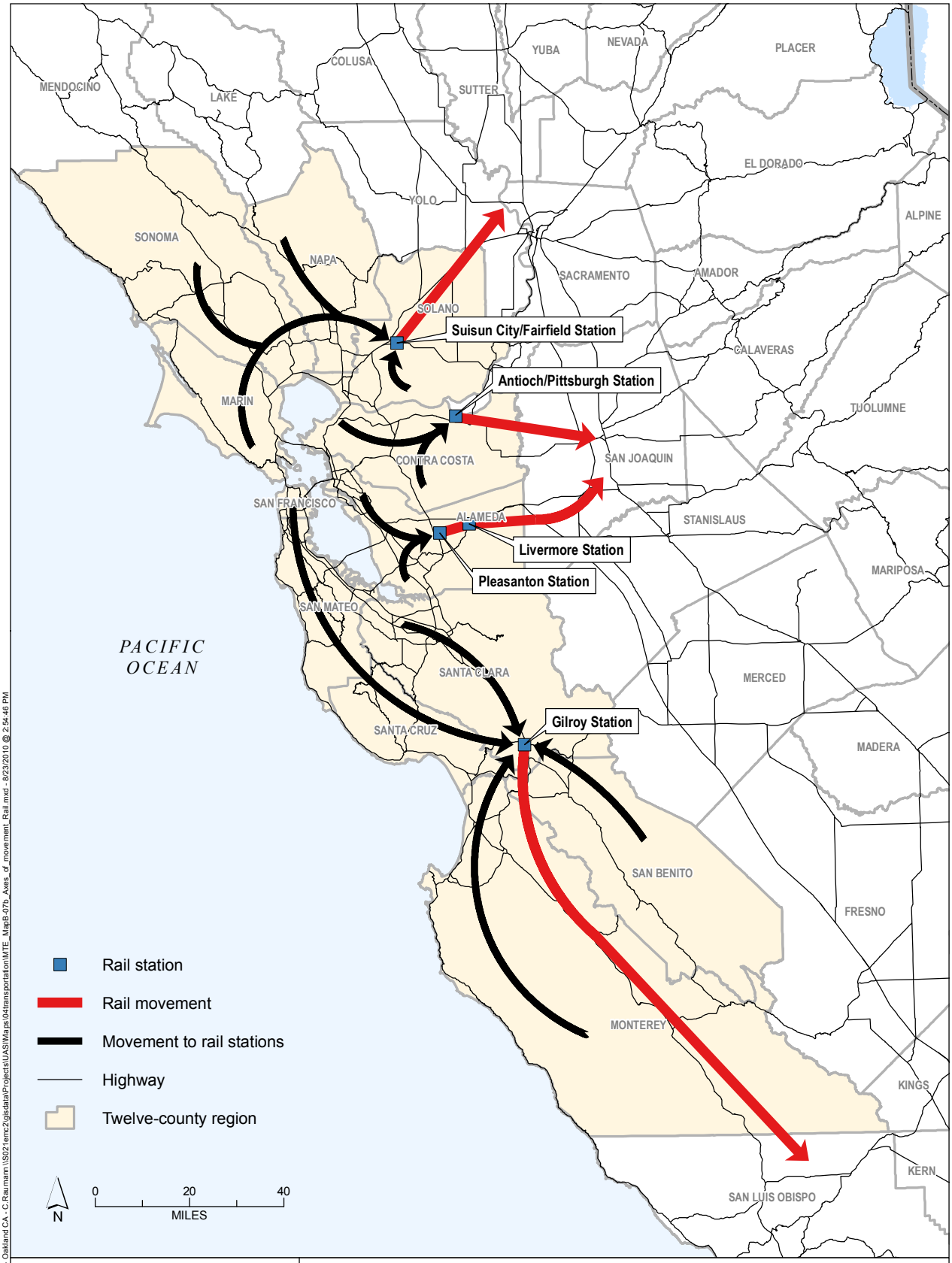
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-7a
Axes of movement for mass transportation/evacuation operations: Roads and highways



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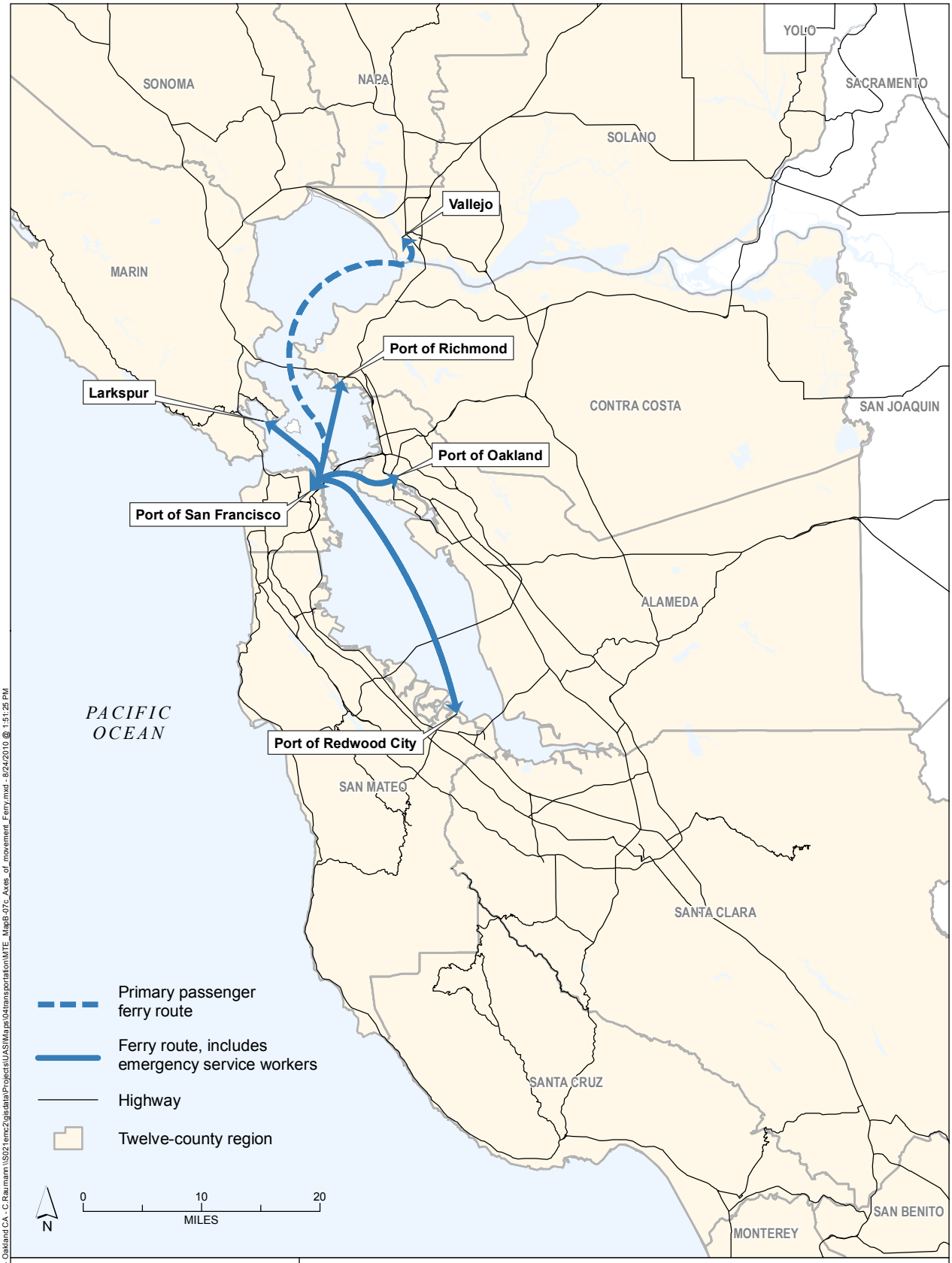
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-7b
Axes of movement for mass transportation/evacuation operations: Rail



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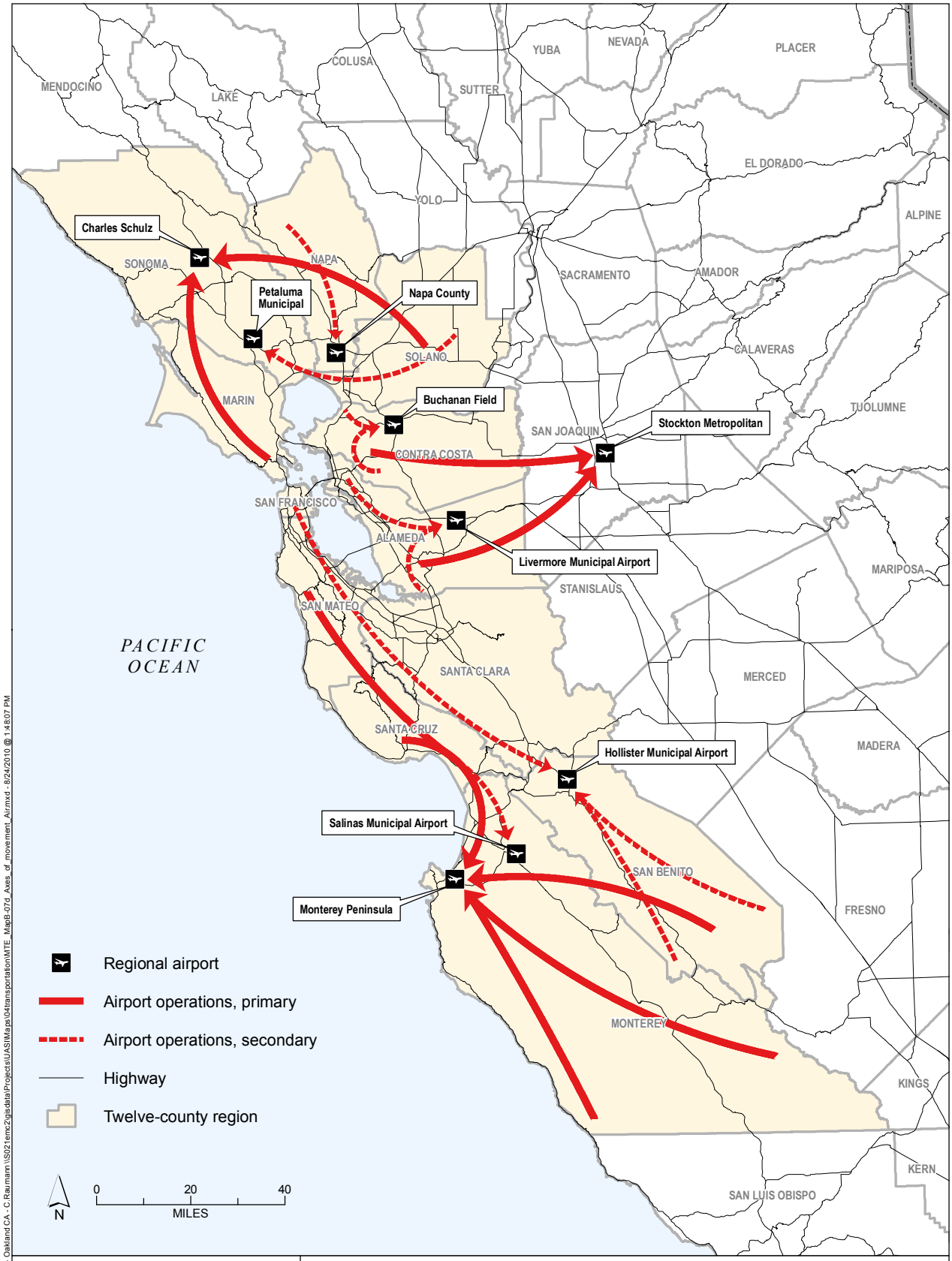
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-7c
Axes of movement for mass transportation/evacuation operations: Ferry



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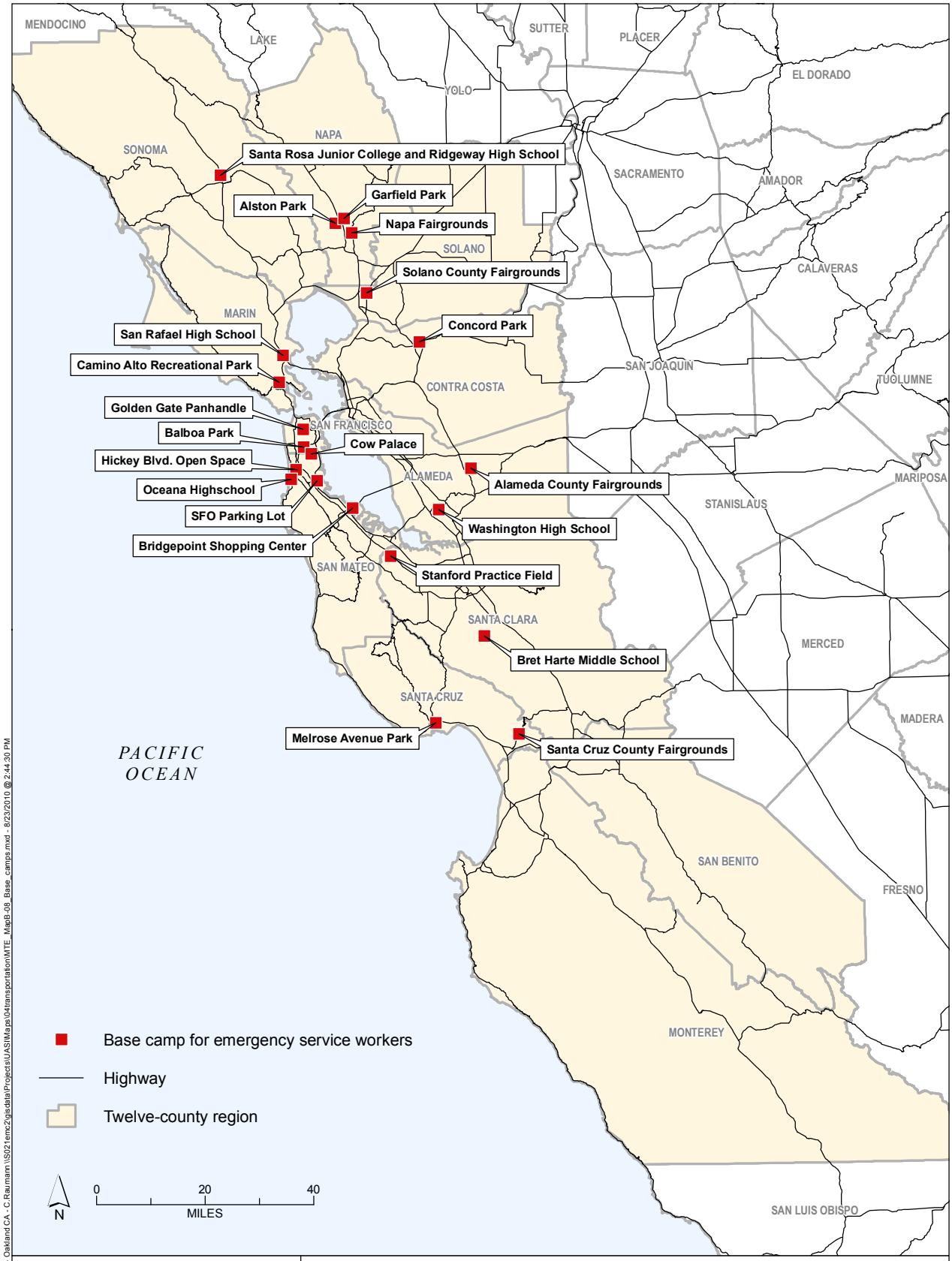
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-7d
Axes of movement for mass transportation/evacuation operations: Air



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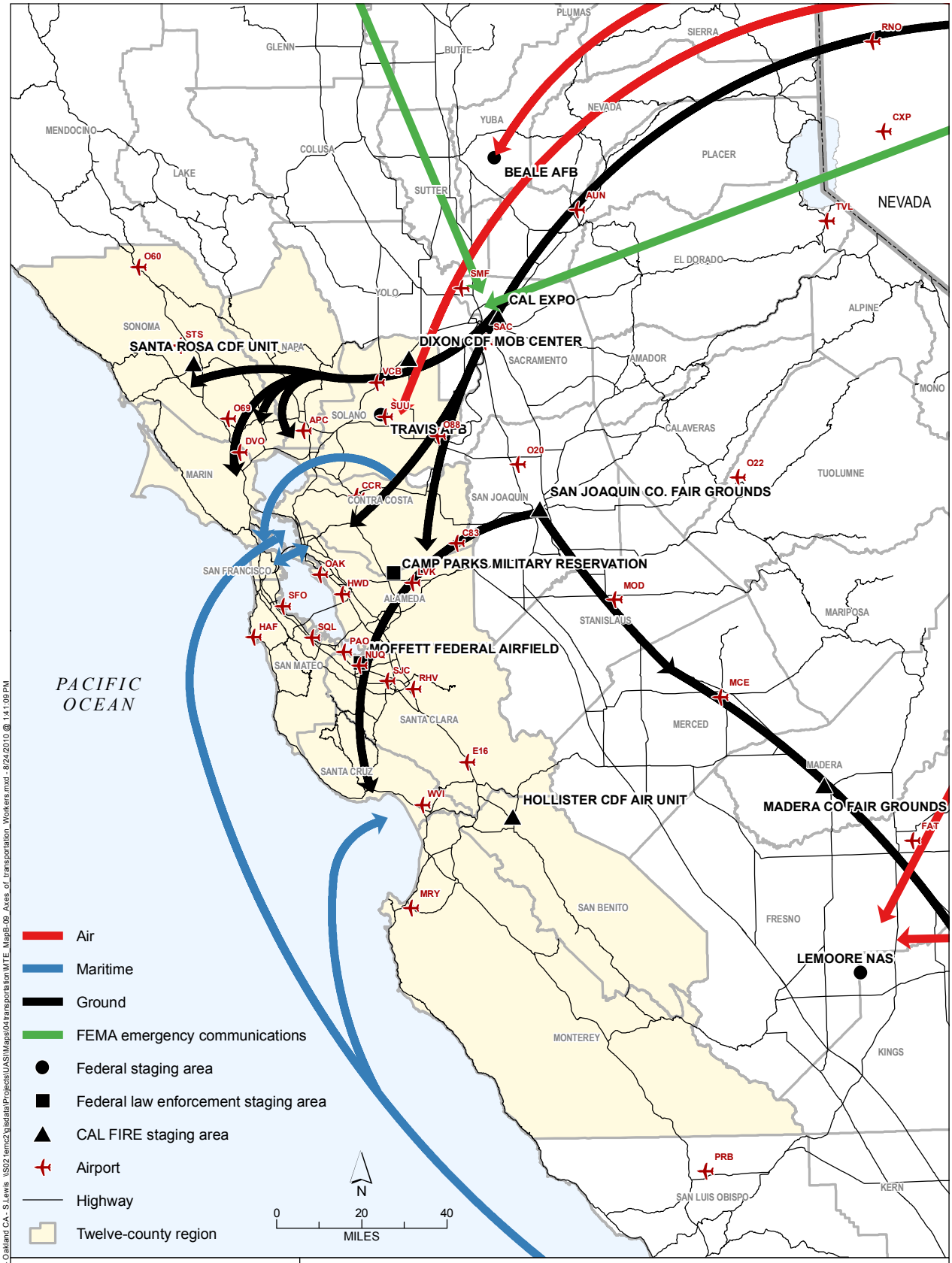
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-8
Base camps for emergency service workers



URS Corp - Oakland CA - S.Lewis \\SI02-lemc2\gisdata\Projects\UASI\Maps\04transportation\MTE_MapB-09_Axes_of_transportation_Workers.mxd - 8/24/2010 @ 1:41:09 PM

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map B-9
Axes of transportation: Emergency service workers

Appendix C:
Transit Agencies in the Bay Area Region

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Table of Contents

List of Tables

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Appendix C: Transit Agencies in the Bay Area Region

Table C-1. Transit agencies in the Bay Area region.

Region/ County	Agency	Street Address	City	State	Zip Code	Contact	Title	Phone
Region	Altamont Commuter Express (ACE)	949 East Channel Street	Stockton	CA	95202	Stacey Mortensen	Executive Director	(209) 944-6221
	Peninsula Corridor Joint Powers Board (Caltrain)	1250 San Carlos Avenue	San Carlos	CA	94070	Martha Martinez	Executive Manager	(650) 508-6242
	San Francisco Bay Area Rapid Transit District (BART)	300 Lakeside Dr.	Oakland	CA	94604	Dorothy Dugger	General Manager	(510) 464-6060
	Water Emergency Transportation Authority (WETA)	Pier 9 Suite 111 The Embarcadero	San Francisco	CA	94111	Keith Stahnke	Manager of Operations	(415) 291-3377
Alameda County	Alameda-Contra Costa Transit District (AC Transit)	1600 Franklin Street	Oakland	CA	94612	Richard Fernandez	General Manager	(510) 891-4753
	City of Alameda Ferry Services	2263 Santa Clara Avenue	Alameda	CA	94501	Debra Kurita	City Manager	(510) 748-4505
	City of Union City Transit Division	34009 Alvarado-Niles Road	Union City	CA	94587	Mintze Cheng	Director of Public Works	(510) 675-5308
	Livermore/Amador Valley Transit Authority	1362 Rutan Court, Suite 100	Livermore	CA	94551	Barbara Duffy	Executive Director	(925) 455-7555
Contra Costa County	Central Contra Costa Transit Authority	2477 Arnold Industrial Way	Concord	CA	94520	Rick Ramacier	General Manager	(925) 676-1976
	Eastern Contra Costa Transit Authority	801 Wilbur Avenue	Antioch	CA	94509	Jeanne Krieg	CEO	(925) 754-6622
	Western Contra Costa Transit Authority	601 Walter Avenue	Pinole	CA	94564	Charles Anderson	General Manager	(510) 724-3331

Table C-1. Transit agencies in the Bay Area region.

Region/ County	Agency	Street Address	City	State	Zip Code	Contact	Title	Phone
Marin County	Golden Gate Bridge, Highway and Transportation District	Presidio Station	San Francisco	CA	94129	Celia Kupersmith	General Manager	(415) 923-2203
Monterey County	Monterey-Salinas Transit	One Ryan Ranch Rd.	Monterey	CA	93940	Carl Sedoryk	GM/CEO	(831) 899-2558
Napa County	Napa County Transportation Planning Agency	707 Randolph Str. Suite 100	Napa	CA	94559	Jim Leddy	Executive Director	(707) 259-8631
San Benito County	San Benito County Local Transportation Authority	330 Tres Pinos Road Suite C7	Hollister	CA	95023	Betty LiOwen	Transportation Planner	(831) 637-7665
San Francisco County	San Francisco Municipal Railway (Muni)	1 S. Van Ness Ave.	San Francisco	CA	94103	Nathaniel Ford, Sr.	Executive Director/CEO, MTA	(415) 701-4720
	San Francisco Paratransit (ATC)	68 12th St.	San Francisco	CA	94103	Mike Griffus	President and CEO	(630) 382-1120
San Mateo County	San Mateo County Transit District (SamTrans)	1250 San Carlos Ave.	San Carlos	CA	94070	Martha Martinez	Manager, Executive & Board Support	(650) 508-6242
Santa Clara County	Santa Clara Valley Transportation Authority (VTA)	3331 North First St.	San Jose	CA	95134	Michael Burns	General Manager	(408) 321-5559
Santa Cruz County	Santa Cruz Metropolitan Transit District	370 Encinal Suite 100	Santa Cruz	CA	95060	Leslie White	General Manager	(831) 426-6080
Solano County	City of Benicia	250 East L St.	Benicia	CA	94510	Melissa Andersen	Transit Services Manager	(707) 746-4300
	City of Fairfield – Fairfield-Suisun Transit	Fairfield Transportation Center, 2000 Cadenasso Dr.	Fairfield	CA	94533	Sean Quinn	City Manager	(707) 428-7768
	City of Vacaville	650 Merchant St.	Vacaville	CA	95688	Brian McLean	Transit Manager	(707) 449-5170

Table C-1. Transit agencies in the Bay Area region.

Region/ County	Agency	Street Address	City	State	Zip Code	Contact	Title	Phone
Solano County (cont.)	City of Vallejo Transportation Program	555 Santa Clara St.	Vallejo	CA	94590	Crystal Odum Ford	Transportation Superintendent	(707) 648-5241
Sonoma County	City of Petaluma	555 North McDowell Blvd.	Petaluma	CA	94954	Vincent Marengo	Public Works Director	(707) 778-4593
	City of Santa Rosa (Santa Rosa City Bus)	100 Santa Rosa Ave.	Santa Rosa	CA	95404	Robert Dunlavey	Director, Transit and Parking	(707) 543-3325
	Sonoma County Transit	355 West Robles Ave.	Santa Rosa	CA	95407	Bryan Albee	Transit Services Manager	(707) 585-7516

Source: National Transit Database (2007)
CA = California
GM = General Manager
MTA = Metropolitan Transportation Authority

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Appendix D:
Critical Information Collection Requirements

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Table of Contents

List of Tables

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Appendix D: Critical Information Collection Requirements

Table D-1. Critical information collection requirements.

Critical Information	Specific Information	Methodology/Source	Responsible Entity	Product	Timeline
1 Boundaries of disaster area (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	• 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 Hazard-specific information Hazardous, toxic, and radiological issues Safety hazards	• Extent of fires • Potential for (or extent of) flooding • Number/estimate of collapsed structures potentially requiring Urban Search and Rescue • Actual or potential for release of hazardous materials • Actual or potential radiological incidents • Affected locations and what they contain • Actions being taken under the National Contingency Plan, if any • Personal safety issues • Public health concerns	• Assessment Team reports • EOC Reports • Predictive modeling • State REOC and SOC Reports • Nuclear Regulatory Commission • U.S. Environmental Protection Agency • Coast Guard	• Local jurisdictions • Operational Areas • CDFG • USCG • Cal EPA • EPA	• GIS product depicting actual or potential threats • Situation report • Status briefing • Daily intelligence summary • Safety briefings/ messages	Initial estimate within 4 hours and updated every 12 hours
6 Seismic and/or other geophysical information	• Location of epicenter • Location of mud flows and land slides • Potential magnitude of aftershocks • Location of ground liquefaction sites	• Remote sensing • USGS reports • State SOC reports	• SOC • USGS	• GIS maps of affected areas • Situation briefings • Situation reports	Initial estimate within 4 hours and updated every 6 hours
7 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

Table D-1. Critical information collection requirements.

Critical Information	Specific Information	Methodology/Source	Responsible Entity	Product	Timeline
8 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 1% 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
9 Predictive modeling	• What HAZUS models show for damage impacts and casualties	• HAZUS outputs	• SOC • FEMA	• GIS products	No later than 2 hours post-event
10 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 Federal support from the State	• Rapid needs assessment and preliminary damage assessment team reports • State REOC and SOC Reports • HAZUS outputs • Open 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
11 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 • REOC	• Situation briefings • Situation reports	Initial estimate within 4 hours and updated every 12 hours
12 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
13 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
14 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

Table D-1. Critical information collection requirements.

Critical Information	Specific Information	Methodology/Source	Responsible Entity	Product	Timeline
15 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 • REOC	• Situation briefings • Situation reports • GIS products	Initial estimate within 4 hours and updated every 12 hours
16 Status of remote sensing operations	• Remote sensing missions that have been requested • Target areas • Data availability • Whether a rapid assessment is being conducted • Areas that are being assessed • Report availability and format • Whether the Civil Air Patrol has been activated • Where over-flights are being conducted • Other aerial reconnaissance missions in progress • Commercial remote sensing sources availability	• USCG • USGS • DoD • NASA • Private-sector entities	• FEMA	• Remote sensing imagery derived products	Ongoing
17 Status of key personnel/ personnel issues	• Staffing needs for response operations	• Operational Areas • REOC • Other EOCs	• SOC • FEMA	—	Within 2 hours following disaster declaration and updated every operational period
18 Status of declarations	• Local Emergency declarations • Governor's State of Emergency declaration • Presidential Disaster Declaration • Jurisdictions that are included • Types of assistance authorized • Special cost-share provisions regarding direct Federal assistance	• State SOC reports • FEMA declarations • The White House	• Operational Areas • SOC • FEMA	—	As soon as information becomes available and updated every operational period
19 Priorities for response—upcoming activities	• Operational priorities • Priorities: water, food, power, medical, search and rescue, 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
20 Major issues/shortfalls	• Actual or potential resource shortfalls of the affected counties • Anticipated requirements • Potential or actual shortfalls • 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)
Cal EPA = California Emergency Management Agency
Caltrans = California Department of Transportation
CDFG = California Department of Fish and Game
CDPH = California Department of Public Health
CHP = California Highway Patrol
CPUC = California Public Utilities Commission
CUEA = California Utilities Emergency Association
DGS = Department of General Services
DoD = Department of Defense
DWR = California Department of Water Resources
EOC = Emergency Operations Center
EPA = (U.S.) Environmental Protection Agency
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
NASA = National Aeronautics and Space Administration
NOAA = National Oceanic and Atmospheric Administration
NRC = Nuclear Regulatory Commission
PG&E = Pacific Gas and Electric
REOC = Regional Emergency Operations Center
RRCC = Regional Response Coordination Center
SOC = State Operations Center
USCG = U.S. Coast Guard
USGS = U.S. Geological Survey
WETA = Water Emergency Transportation Authority

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Appendix E:
Public Alert and Information Messaging

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Table of Contents

List of Tables

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Appendix E: Public Alert and Information Messaging

This appendix provides information and sample templates for the three phases of public messaging discussed in **Section 4.3.1.2** of the main document. The three phases are Initial Notification, Evacuation Information Updates, and Post-Evacuation Information Updates.

E.1 Initial Notification

Because evacuation orders are authorized in local jurisdictions and Operational Areas, initial evacuation notification originates from the evacuating Operational Area. Evacuating, pass-through and host Operational Areas will disseminate the coordinated public messaging from the Regional Emergency Operations Center (REOC) to the public within their jurisdictions. They are also likely to develop and disseminate their own messages to the public in their jurisdictions.

If the evacuation route takes evacuees beyond their home Operational Area, the REOC is responsible for coordinating information to develop comprehensive messages for evacuees, including any necessary instructions for evacuees regarding evacuation routes through other Operational Areas and instructions upon arriving in the host Operational Areas.

The SOC collects evacuation information from evacuating, pass-through and host Operational Areas via the REOC to craft and disseminate situational and response messages to the general public. Messages are tailored to capture a holistic perspective of evacuation efforts and include State agency response activities. Messages may include the information provided in **Table E-1**.

E1.1 Template: Initial Evacuation Notice from State to Evacuees

Because of [hazard, entity] has ordered an evacuation for [community/area] in [county]. Those in the area are advised to leave [immediately/by specified time] by [means of travel] to [destination]. The recommended evacuation route is [route]. [Operational Area instructions regarding what evacuees should bring with them]. Evacuees are advised to lock windows and doors on leaving and to [additional instructions from the Operational Area]. Parents need to contact their children's schools to determine where and when to pick up their children. [Any hazards to be aware of during evacuation].

Those without their own transportation should report to [pickup points] for transportation assistance. Evacuees using mass transportation will be taken to the nearest interim transportation point or mass care facility, which may be outside the county or region.

Table E-1. Public communication elements: Initial Notification.

Target Audience	Topic	Message Content
Evacuating populations	Evacuating Operational Area instructions	• What evacuees should bring and not bring and any other recommended preparations as evacuees leave their homes • Instructions and local resources for individuals who will need assistance in moving to pickup points and during evacuation • Routes that those who are evacuating themselves should follow and hazards of which to be aware • Instructions for evacuees with pets, including: – Clear definitions of policies regarding the transportation of animals on publicly-provided transportation • References to systems the State and evacuating Operational Areas use to communicate evacuation information to evacuees
General public	Evacuation information	• Specific hazard necessitating evacuation and the authority that made that decision • Estimate of how many people are evacuating, from and to where, and by what means and route(s)
	Anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure	—
	Situational awareness information	• Background information and timeline of incident events – Event description – Affected areas • Government response efforts and plans – State agencies engaged in event response – Current and planned event response activities
	Anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure	—
	Information for California residents who would like to volunteer or donate resources to assist evacuees	—
	References to systems that evacuating, pass-through, and host Operational Areas and the State use to communicate further information and updates	—

[Policies regarding the transportation of animals on publicly provided transportation].

Those who need assistance in moving to pickup points and during evacuation should [Operational Area instructions for access and functional needs populations].

Evacuees in [evacuating jurisdiction] are advised to refer to [jurisdiction public alert/information channels] for further information and instructions. Refer to [State communication channel(s)] for further updates on the status of the emergency response effort.

E.1.2 Template: Initial Evacuation Notice to General Public

Because of [hazard in affected jurisdiction], the [authority] has ordered the evacuation of approximately [estimated number] people from [community or area]. The recommended evacuation route is [route]. Others are advised to avoid the area around the evacuation route. Evacuees needing transportation assistance will be transported by [means] provided by [agency/ies], and should report to [pickup points].

[Anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure].

After a [magnitude] magnitude earthquake on [day] [general description of general earthquake impacts], State agencies will assist the affected jurisdictions in the response. [Description of state agencies engaged and how they are supporting/will support affected jurisdictions].

To offer donations or volunteer assistance for the response effort, please contact [agency] at [URL] and [phone number].

Evacuees in [evacuating jurisdiction] are advised to refer to [jurisdiction public alert/information channel(s)] for further information and instructions. Refer to [State communication channel(s)] for further updates on the status of the emergency response effort.

E.2 Evacuation Information Updates

Messages communicated along evacuation routes during inter-Operational Area evacuations are the responsibility of the SOC, which coordinates messaging with the involved Operational Areas through the appropriate REOC(s). State entities deliver messages along evacuation routes primarily through Caltrans road signage, the Emergency Alert System, and the Emergency Disaster Information System. California Highway Patrol officers may play a field role in sharing information, instructions and directions to evacuees during evacuation.

Operational Areas continue to develop and disseminate messages to evacuees along the evacuation route in their jurisdiction, and to the general public in the Operational Area.

The SOC Joint Information Center continues to gather evacuation information from evacuating, pass-through and host Operational Areas via the REOC to create and disseminate holistic situational and response messages to the general public in California. Messages also include information about State agency response activities. Messages may include the information provided in **Table E-2**.

E.2.1 Template: Evacuation Information Updates to Evacuees

[Authority] advises those evacuating from [evacuating jurisdiction] to [continue on [route]/change their course of travel to [new route]] because of [hazard/reason]. Evacuees passing through [jurisdiction] can [directions to available food, gas, water, supplies and other relevant support services]. Individuals who are separated from loved ones are advised to continue along the evacuation route. [Available information about reunification procedures].

Transportation services for evacuees without their own transportation [are/are not] still being provided. [Pickup point locations and instructions if service still being provided.]

Evacuees passing through [pass-through jurisdiction] are advised to refer to [pass-through jurisdiction public alert/information channel(s)] for further information and instructions. Refer to [State communication channel(s)] for further updates on the status of the emergency response effort.

E.2.2 Template: Evacuation Information Updates for the Public

Because of [hazard] in [evacuated jurisdiction], the [authority] has ordered the evacuation of approximately [updated estimated of number] people from [community or area]. [Authority] advises those evacuating from [evacuating jurisdiction] to [continue along [route]/change their course of travel to[new route] due to [hazard/reason]]. Others are advised to avoid the area around the evacuation route. Evacuees needing transportation assistance are being transported by [means] provided by [agency/ies].

It is currently estimated that [number] animals are being evacuated from the area.

It is anticipated that evacuees [will/will not] be able to return to [evacuated jurisdiction] because of [available information/reason].

[Realized and anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure].

The [magnitude] magnitude earthquake on [day] [description of general earthquake impacts]. State agencies are assisting affected jurisdictions in the response. [Description of State agencies engaged and how they are supporting/will support impacted jurisdictions].

To offer donations or volunteer assistance for the response effort, please contact [agency] at [URL] and [phone number].

Table E-2. Public communication elements: Evacuation Information Updates.

Target Audience	Topic	Message Content
Evacuating populations	Evacuation information	• Status/safety of available routes • Directions to available gas, food, water, supplies and other relevant support services available on evacuation routes • Reunification process for separated parties • References to systems the State and pass-through Operational Areas use to communicate evacuation information to evacuees
General public	Evacuation information	• Specific hazard necessitating evacuation and the authority that made that decision • Updated estimate of how many people are evacuating, from and to where, and by what means and route(s) – Any adjustments to and the status of evacuation procedures • Estimated number of animals evacuated and sheltered, where, by what means and for how long • Estimated timeline and plans for evacuees' return home (if available) • Realized and anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure
	Situational awareness information	• Background information and timeline of incident events – Event description – Affected areas • Government response efforts and plans – State agencies engaged in event response • Current and planned event response activities
	Information for California residents who would like to volunteer or donate resources to assist evacuees	—
	References to systems that evacuating, pass-through and host Operational Areas and the State are using to communicate further information and updates	—

Evacuees passing through [pass-through jurisdiction] are advised to refer to [jurisdiction public alert/information channel(s)] for further information and instructions. Refer to [State communication channel(s)] for further updates on the status of the emergency response effort.

E.3 Post-Evacuation Information Updates

Within California, the California Emergency Management Agency (Cal EMA) may develop messages for evacuees and coordinate message delivery with authorities in the host jurisdiction. Individuals evacuated out-of-State will receive this information through Federal communication channels.

The SOC Joint Information Center continues to gather information from evacuating, pass-through and host Operational Areas via the REOC to craft and disseminate holistic situational and response messages to the general public in California. Messages will also include State response activities. Messages may include the information provided in **Table E-3**.

E.3.1 Template: Post-evacuation Information Updates for Evacuees

[Authority] advises evacuees arriving in [host jurisdiction] to [instructions regarding available support services in host Operational Area].

Individuals who are separated from their loved ones should [available information about reunification procedures].

[information about status of evacuated jurisdiction, including infrastructure and areas of damage]. The [authority from evacuated jurisdiction] advises evacuees [to remain in [host jurisdiction] until [time or circumstances]/that it is safe to return to [evacuated jurisdiction]].

[If safe to return to evacuated jurisdiction: Returning evacuees are advised to use [route]. [information regarding transportation services for re-entry, including any procedures for access and functional needs populations. insert instructions for safely accessing homes on arrival.]

[Information regarding available support services for returning evacuees.]

Evacuees passing through [pass-through jurisdiction] are advised to refer to [pass-through jurisdiction public alert/information channel(s)] for further information and instructions. Refer to [State communication channel(s)] for further updates on the status of the emergency response effort.

E.3.2 Template: Post-evacuation Information Updates for the Public

Because of [hazard] in [evacuated jurisdiction], approximately [updated estimate of number] people are evacuated from [community or area]. [Known information about current evacuee locations].

Table E-3. Public communication elements: Post-Evacuation Information Updates.

Target Audience	Topic	Message Content
Evacuated populations	Host Operational Area information/instructions regarding available support services for evacuated populations	—
	Evacuated Operational Area information/instructions	• Status of evacuated Operational Area (including information regarding): – Current infrastructure status (utilities, roadways, communications) – Areas of damage and overall damage estimates – Available support services for returning evacuees • If, when and how evacuees can return to their home
	Reunification process for separated parties	—
	Status/safety of available routes for re-entry	—
General public	Reunification process for separated parties	—
	Evacuation information	• Updated estimate of how many people have evacuated, from where, and to where • Estimated number of animals evacuated and sheltered, where, by what means and for how long • Estimated timeline, plans and routes for evacuees' return home (when available)
	Realized and anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure	—
	Situational awareness information	• Background information and timeline of incident events – Event description – Impacted areas • Government response efforts and plans – State agencies engaged in event response – Current and planned event response activities
	Information for California residents who would like to volunteer or donate resources to assist evacuees	—
	References to systems that evacuating, pass-through and host Operational Areas and the State use to communicate further information and updates	—

It is currently estimated that [number] animals have been evacuated from the area and are being sheltered [procedures for animal care and sheltering].

Individuals who are separated from their loved ones should [available information about reunification procedures].

[Current information about status of evacuees' return to the evacuated jurisdiction.]

[Realized and anticipated impacts from evacuation on pass-through and host jurisdictions' residents, supply chains and infrastructure].

After a [magnitude] magnitude earthquake on [day] [description of general earthquake impacts], State agencies will assist affected jurisdictions in the response. [Description of state agencies engaged and how they are supporting/will support impacted jurisdictions].

To offer donations or volunteer assistance for the response effort, please contact [agency] at [URL] and [phone number].

Evacuees residing in [host jurisdiction] are advised to refer to [jurisdiction public alert/information channel(s)] for further information and instructions. Refer to [State communication channel(s)] for further updates on the status of the emergency response effort.

Appendix F:
Public Information
Message Delivery Systems

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Table of Contents

List of Tables

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Appendix F: Public Information Message Delivery Systems

Table F-1. Public information message delivery systems.

System Name	System Operator	Description	Content Providers[1]	Audiences/Receivers and Channels	Message Content	Notes and Limitations	Sensory/ Comprehension Requirements of Audience
Emergency Alert System (EAS)	Cal EMA	Network of public broadcast stations and interconnecting facilities that can be operated by the President during a national emergency when immediate action is required; alert messages will take over most AM, FM, and cable TV channels when activated. The federal government mandates that every AM, FM, and cable television channel in the nation belong to the EAS on a State level. Within each state, State and local authorities may transmit messages through EAS within a specified geographic area, but area radio and television stations are not required to interrupt programming for emergency alerts (however, most stations agree to do so).	Cal EMA, NWS, California State Warning Center, and State, Operational Area, and local emergency response agencies	Anyone who is currently tuned in and paying attention to AM/FM radio or to local or cable television stations	Emergency warnings and immediate action messages	Only broadcasts audio messages, and an accompanying clear text message on television. Audience members must be paying attention to programming to receive message. Electrical or battery power and television/radio hardware are required to receive EAS messages.	Auditory abilities and English language comprehension
Emergency Digital Information System (EDIS)	Cal EMA	Delivers text versions of messages to mobile phones and pagers, e-mail accounts, and RSS feeds to members of the public who register their contact information with EDIS. Though it supplements EAS, EDIS is not a component of EAS.	Cal EMA, NWS, California State Warning Center, and State, Operational Area and local emergency response agencies. EDIS can be accessed by any computer with a telephone modem or via the OASIS satellite system.	Anyone who is currently tuned in and paying attention to cable television channels, or who has registered their contact information and subscribed to the free alerts	Emergency warnings, immediate action messages and emergency information	Only broadcasts visual (text) messages. Audience members must be paying attention to programming to receive message through television. Electrical or battery power and television/cell phone/computer hardware required to receive EDIS messages. For e-mails and text messages, message receipt depends on Internet connectivity and server availability, and intact cell towers, circuit capacity and phone reception.	Vision and reading abilities, as well as English language comprehension
National Weather Radio	NOAA	A nationwide network of radio stations broadcasting continuous weather information directly from the nearest NWS office. Special hardware is required to receive NWR messages, but hardware is available for purchase by the public at a low cost.	NOAA, Emergency Managers, and other public officials	Anyone who owns an NWR receiver and is paying attention to the NWR receiver when an alert is broadcast	Weather and emergency information, 24 hours per day. Includes warning and post-event information for all types of hazards-including natural (such as earthquakes or avalanches), environmental (such as chemical releases or oil spills), and public safety (such as AMBER alerts or 911 telephone outages)	Only broadcasts audio messages. Audience members must be paying attention to programming to receive message. Electrical or battery power and television/radio hardware required to receive messages.	Auditory abilities and English language comprehension
Highway Advisory Radio	Caltrans	Low-power AM radio stations that broadcast extensive roadway-specific information and public safety information within a small range. Permanent or portable extinguishable message signs (messages on light-up signs; lighted only when needed) are usually activated to alert motorists to tune their radios to the specified station.	Caltrans, Operational Area-level Emergency Managers	Motoring public who is tuned in and listening to broadcast	Extensive highway information under normal and emergency conditions; public safety and emergency information	Message receipt is dependent on the reach of the broadcast signal and radios' functional power supply. Broadcast signal reach is limited. Extinguishable message signs are dependent on functionality of hardware components. Also, appropriate access to power source is needed to operate the signs.	Vision and reading abilities, as well as English language comprehension for extinguishable message signs. Auditory abilities and English language comprehension for radio messages

Table F-1. Public information message delivery systems.

System Name	System Operator	Description	Content Providers[1]	Audiences/Receivers and Channels	Message Content	Notes and Limitations	Sensory/ Comprehension Requirements of Audience
Caltrans Highway Information Network	Caltrans	Phone number and Web site providing current highway-specific information	Caltrans	Motoring public	Extensive highway information under normal and emergency conditions	The functionality of this system depends on phone line infrastructure (landlines, cell towers) being intact, including phone device power (electricity, cell phone batteries), phone circuit capacity, and reception for cell phones. The Web site relies on Internet-capable devices (computers, cell phones, etc.) having power and reception, as well as servers remaining intact and not becoming overloaded as many people try to access the same pages at once.	Vision and reading abilities, as well as English language comprehension for users visiting the Web site. Auditory capabilities are necessary to use phone service.
Emergency vehicles with public address systems	State-level law enforcement and fire vehicles posted along evacuation route	Emergency vehicles equipped with public address systems may be posted or driven along evacuation route to disseminate a message redundantly or when other channels are disabled.	State agencies	Anyone within earshot of the vehicles' public address systems	Immediate-action emergency messages	Vehicles, vehicle operators, and fuel are required to use this communication method. Sufficient fuel will be needed to get vehicles to target areas, through target areas, and returned to a designated location. Each vehicle relies on a driver, so emergency response agencies must have available staff to assign to the operation.	Auditory abilities and English language comprehension (for messages delivered only in English)
Traditional media	SOC JIC	JIC staff invites the media to set up in the designated media center area near the JIC. Parking, electrical power, and canopy-like shelter may be provided to members of the media. JIC PIOs may provide hourly media updates, copies of documentation to get out to the public, interviews with subject matter experts, tours of affected areas, and other assistance as necessary to ensure public information is widely disseminated.	JIC PIOs, SOC participants, public officials	Anyone who is currently tuned in and paying attention to a radio or cable television station broadcasting the emergency messages or who is reading a publication carrying the emergency messages	*Broadcast*: Day-to-day news, entertainment, and educational programming; may include emergency information and directives in news coverage of disaster events or interrupt other programming for breaking news or to otherwise disseminate messages *Print*: Day-to-day news, entertainment, and educational content; may include emergency information and directives in stories about disaster events	*Broadcast*: Emergency messages are broadcast at the discretion of individual media channels and may be altered before delivery. Audience members must be paying attention to programming to receive message. Electrical power and television/radio hardware are required to receive messages. *Print*: Emergency messages are printed at the discretion of individual media outlets and may be altered before delivery. Audience members must obtain publications and locate and read story containing emergency messages in order to receive them.	*Broadcast*: Auditory abilities (or vision and reading abilities for those using closed captioning on television), as well as English language comprehension and/or other languages broadcast, as available *Print*: Vision and reading abilities, as well as comprehension of the language in which the story is printed
Social Media	Individual State entities	A means for entities to provide information online through a number of unmediated platforms, such as blogs, Wiki entries, YouTube and other video- or photo-sharing sites, social networking sites like Facebook or MySpace, mashups, and microblogs	State agencies may update only respectively owned content	Public—anyone who visits the posted content	Day-to-day information about individual entity (typically used as a public relations/outreach tool), public alerts, and information.	Access to these channels is dependent on Internet-capable devices (computers, cell phones, etc.) having power and reception, as well as servers remaining intact and not becoming overloaded as many people try to access the same pages at once.	Vision and reading abilities, as well as English language comprehension. Audio content may also be posted on these Web sites.
Agency Web Sites	Individual State entities	Entity-owned and -focused Web site	State agencies may update only respective Web sites.	Public—anyone who visits the Web sites	Day-to-day information about individual entity (typically used as an informational, business support, or public relations/outreach tool), public alerts, and information	Access to these channels is dependent on Internet-capable devices (computers, cell phones, etc.) having power and reception, as well as servers remaining intact and not becoming overloaded as many people try to access the same pages at once.	Vision and reading abilities, as well as English language comprehension. Audio content may also be posted on these sites.

Table F-1. Public information message delivery systems.

System Name	System Operator	Description	Content Providers[1]	Audiences/Receivers and Channels	Message Content	Notes and Limitations	Sensory/ Comprehension Requirements of Audience
511	Caltrans	Phone number and Web site providing information regarding Bay Area public transportation services and roadways	MTC, Caltrans, transportation services agencies, CHP	Public—anyone who calls 511 or visits 511.org	Transportation-related information (day-to-day and emergency)	The functionality of this system depends on phone line infrastructure (landlines, cell towers) being intact, including phone device power (electricity, cell phone batteries), phone circuit capacity, and reception for cell phones. The Web site relies on Internet-capable devices (computers, cell phones, etc.) having power and reception, as well as servers remaining intact and not becoming overloaded as many people try to access the same pages at once.	Vision and reading abilities, as well as English language comprehension for users visiting the Web site. Auditory capabilities are necessary to use phone service.
Changeable Message Signs	Caltrans	A collection of portable and fixed signs placed along roadways that display customized digital messages. Messages can be changed at any time.	Local/Operational Area and State agencies	Motoring public	Under normal conditions, signs display information associated with unexpected conditions or nonrecurrent congestion, including travel times, AMBER Alerts, and approved safety messages. May be used to display evacuation information. Message length is limited.	These signs are dependent on functionality of disks, lamps, and panels. Also, appropriate access to solar energy is needed to power the signs. Message changeability is passcode-protected. A clear path to the implementation site is needed to use portable signs. Messages should be readable at prevailing traffic speed.	Vision and reading abilities, as well as English language comprehension

Source: CirclePoint Analysis (2010)
[1] Information from content providers may be disseminated through any of the identified systems

Cal EMA = California Emergency Management Agency
Caltrans = California Department of Transportation
CHP =California Highway Patrol
EAS = Emergency Alert System
EDIS = Emergency Digital Information System
JIC = Joint Information Center
MTC = Metropolitan Transportation Commission
NOAA = National Oceanic and Atmospheric Administration
NWR = National Weather Radio
NWS = National Weather Service
OASIS = Operational Area Satellite Information System
PIO = Public Information Officer
SOC = State Operations Center

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Appendix G:
Ferry Vessels in the Region

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Table of Contents

List of Tables

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Appendix G: Ferry Vessels in the Region

Table G-1. Ferry vessels in the region.

Ferry Vessel	Passenger Capacity	Ferry Vessel	Passenger Capacity
Admiral Hornblower	77	Intintoli	300
Angel Island	396	Islander	500
Bay Breeze	250	Mare Island	300
Bay Clipper	693	Marin	742
Bay Flyer	687	Mendocino	407
Bay Monarch	787	Monte Carlo Hornblower	550
Bonita	112	Old Blue	396
California Hornblower	1,000	Oski	396
Captain Hornblower	77	Peralta	318
Commodore Hornblower	122	Ranger	500
Del Norte	325	Respect	500
Empress Hornblower	500	Royal Star	650
Encinal	400	San Francisco	742
Escape	304	San Francisco Spirit	700
Freedom	456	Solano	300
Golden Bear	396	Sonoma	742
Harbor Bay Express II	149	Sunset Hornblower	140
Harbor Emperor	500	Tamalpais	123
Harbor King	400	Vallejo	300
Harbor Princess	444	Zelinsky	388
Harbor Queen	444		

Source: Water Emergency Transportation Authority (2010)

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Appendix H:
Transportation Resource Needs
by Mode and Time Frame

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Table of Contents

List of Tables

Appendix H: Transportation Resource Needs by Mode and Time Frame

The tables in this appendix provide detailed information on the resources that are needed to support outbound and inbound travel for evacuees. The needed resources are listed by transportation mode and time frame. This information can be used to isolate resources during an evacuation.

H.1 Air Operations

H.1.1 Outbound Travel from Event (E) +72 Hours to E+14 Days

Table H-1 identifies the number of drivers and vehicles needed to transport evacuees to airports.

Table H-1. Resources to support bus/demand response vehicle service to airports, outbound travel, from E+72 hours to E+14 days.

	Number of Drivers per Day		Number of Vehicles per Day	
County	Standard Bus	Demand Response Vehicle	Standard Bus	Demand Response Vehicles
Alameda	140	80	70	40
Contra Costa	100	60	50	30
Marin	10	10	10	10
Monterey	10	10	10	10
Napa	10	10	10	10
San Benito	10	10	10	10
San Francisco	600	300	300	150
San Mateo	80	40	40	20
Santa Clara	60	30	60	30
Santa Cruz	10	10	10	10
Solano	10	10	10	10
Sonoma	10	10	10	10
Total	**1,050**	**580**	**590**	**340**

Source: URS analysis (2009)
E = event

H.2 Rail Operations

H.2.1 Outbound Travel by Bus/Demand Response Vehicle from E+5 Days to E+14 Days

Table H-2 identifies the number of drivers and vehicles needed to transport evacuees to rail stations.

Table H-2. Resources to support bus/demand response vehicle service to rail stations, outbound travel, from E+5 days to E+14 days.

	Number of Drivers per Day		Number of Vehicles per Day	
County	**Standard Bus**	**Demand Response Vehicle**	**Standard Bus**	**Demand Response Vehicles**
Alameda	40	70	40	70
Contra Costa	20	10	20	10
Marin	0	0	0	0
Monterey	0	10	0	10
Napa	10	10	10	10
San Benito	10	10	10	10
San Francisco	30	20	30	20
San Mateo	50	60	50	60
Santa Clara	40	70	40	70
Santa Cruz	10	0	10	0
Solano	10	10	10	10
Sonoma	10	10	10	10
Total	**230**	**280**	**230**	**280**

Source: URS analysis (2009)
E = event

H.2.2 Outbound Travel by Rail from E+5 Days to E+14 Days

Table H-3 identifies the number of staff and assets needed to transport evacuees from rail stations to out-of-region shelters by rail.

Table H-3. Resources to support rail service to shelter, outbound travel, from E+5 days to E+14 days.

County	Number of Train Operators Needed per Day	Daily Passenger Rail Cars Required	Daily Locomotives Required
Alameda	50	220	22
Contra Costa	20	70	7
Marin	0	0	0
Monterey	10	10	1
Napa	10	10	1
San Benito	10	10	1
San Francisco	20	70	7
San Mateo	30	130	13
Santa Clara	50	230	23
Santa Cruz	10	10	1
Solano	10	10	1
Sonoma	10	20	2
Total	**230**	**790**	**79**

Source: URS analysis (2009)
E = event

H.2.3 Inbound Travel by Bus from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Table H-4 identifies the number of drivers and vehicles needed to transport evacuees back into the region from rail stations to regional pickup locations by bus service.

Table H-4. Resources to support bus/demand response vehicle service from rail operations, inbound travel, from E+14 days to E+60 days up to approximately E+30 days.

	Number of Drivers per Day		Number of Vehicles per Day	
County	**Standard Bus**	**Demand Response Vehicle**	**Standard Bus**	**Demand Response Vehicles**
Alameda	10	10	10	10
Contra Costa	10	10	10	10
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	10	10	10	10
San Mateo	10	10	10	10
Santa Clara	10	10	10	10
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	10	10	10	10
Total	**60**	**60**	**60**	**60**

Source: URS analysis (2009)
E = event

H.2.4 Inbound Travel by Rail from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Table H-5 identifies the number of staff and assets needed to transport evacuees from out-of-region shelters to regional rail stations.

Table H-5. Resources to support rail service to regional railroads, inbound travel, from E+14 days to E+60 days up to approximately E+30 days.

County	Number of Train Operators Needed per Day	Daily Passenger Rail Cars Required	Daily Locomotives Required
Alameda	10	10	1
Contra Costa	10	10	1
Marin	0	0	0
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	10	10	1
San Mateo	10	10	1
Santa Clara	10	10	1
Santa Cruz	0	0	0
Solano	0	0	0
Sonoma	10	10	1
Total	**60**	**60**	**6**

Source: URS analysis (2009)
E = event

H.2.5 Inbound Travel by Bus/Demand Response Vehicle from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

Table H-6 identifies the number of drivers and vehicles needed to transport evacuees back into the region from rail stations to regional pickup locations.

Table H-6. Resources to support bus/demand response vehicle service from rail stations, inbound travel, from E+14 days to E+60 days (up to approximately E+60 days).

	Number of Drivers per Day		Number of Vehicles per Day	
County	**Standard Bus**	**Demand Response Vehicle**	**Standard Bus**	**Demand Response Vehicles**
Alameda	10	10	10	10
Contra Costa	10	10	10	10
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	10	10	10	10
San Mateo	10	10	10	10
Santa Clara	10	10	10	10
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	10	10	10	10
Total	**60**	**60**	**60**	**60**

Source: URS analysis (2009)
E = event

H.2.6 Inbound Travel by Rail from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

Table H-7 identifies the number of staff and assets needed to transport evacuees who from out-of-region shelters to regional rail stations.

Table H-7. Resources to support rail service, inbound travel, from E+14 days to E+60 days up to approximately E+60 days.

County	Number of Train Operators Needed per Day	Daily Passenger Rail Cars Required	Daily Locomotives Required
Alameda	10	10	1
Contra Costa	10	10	1
Marin	0	0	0
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	10	10	1
San Mateo	10	10	1
Santa Clara	10	10	1
Santa Cruz	0	0	0
Solano	0	0	0
Sonoma	10	10	1
Total	**60**	**60**	**6**

Source: URS analysis (2009)
E = event

H.3 Ferry Operations

H.3.1 Outbound Travel by Bus/Demand Response Vehicle from E+72 Hours to E+14 Days

Table H-8 identifies the number of drivers and vehicles needed to transport evacuees from ferry facilities to shelters.

Table H-8. Resources to support ferry operations to bus/demand response vehicle service to shelters, outbound travel, from E+72 hours to E+14 days.

	Number of Drivers per Day		Number of Vehicles per Day	
County	**Standard Bus**	**Demand Response Vehicle**	**Standard Bus**	**Demand Response Vehicles**
Alameda	0	0	0	0
Contra Costa	0	0	0	0
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	0	0	0	0
San Mateo	0	0	0	0
Santa Clara	0	0	0	0
Santa Cruz	0	0	0	0
Solano	2,380	1,200	1,190	600
Sonoma	0	0	0	0
Total	**2,380**	**1,200**	**1,190**	**600**

Source: URS analysis (2009)
E = event

H.3.2 Outbound Travel by Ferry from E+72 Hours to E+14 Days

Table H-9 identifies the number of staff and assets needed to transports evacuees from ferry facilities to locations where buses provide service to a shelter.

Table H-9. Resources to support ferry operations to bus/demand response vehicle service, outbound travel, from E+72 hours to E+14 days.

County	Number of Crew Needed Per Day	Number of Daily Ferries Required
Alameda	0	0
Contra Costa	0	0
Marin	0	0
Monterey	0	0
Napa	0	0
San Benito	0	0
San Francisco	280	63
San Mateo	0	0
Santa Clara	0	0
Santa Cruz	0	0
Solano	0	0
Sonoma	0	0
Total	**280**	**63**

Source: URS analysis (2009)
E = event

H.4 Bus/Demand Response Vehicle Operations

H.4.1 Outbound Travel E+72 Hours to E+14 Days

Table H-10 identifies the number of drivers and vehicles needed to transport evacuees to shelters outside the region.

Table H-10. Resources to support bus/demand response vehicle service to shelters, outbound travel, from E+72 Hours to E+14 days.

	Number of Drivers per Day		Number of Vehicles per Day	
County	**Standard Bus**	**Demand Response Vehicle**	**Standard Bus**	**Demand Response Vehicles**
Alameda	1,040	520	520	260
Contra Costa	300	160	150	80
Marin	200	100	100	50
Monterey	40	20	20	10
Napa	40	20	20	10
San Benito	20	20	10	10
San Francisco	300	160	150	80
San Mateo	620	320	310	160
Santa Clara	1,080	560	540	280
Santa Cruz	60	40	30	20
Solano	40	20	20	10
Sonoma	100	60	50	30
Total	**3,840**	**2,000**	**1,920**	**1,000**

Source: URS analysis (2009)
E = event

H.4.2 Inbound Travel from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Table H-11 identifies the number of drivers and vehicles to transport evacuees who back into the region from out-of-region shelters.

Table H-11. Resources to support bus /demand response vehicle service to shelters, inbound travel, from E+14 days to E+60 days approximately up to E+30 days.

	Number of Drivers per Day		Number of Vehicles per Day	
County	**Standard Bus**	**Demand Response Vehicle**	**Standard Bus**	**Demand Response Vehicles**
Alameda	40	20	20	10
Contra Costa	20	20	10	10
Marin	20	20	10	10
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	20	20	10	10
San Mateo	20	20	10	10
Santa Clara	40	20	20	10
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	20	20	10	10
Total	**180**	**140**	**90**	**70**

Source: URS analysis (2009)
E = event

H.4.3 Inbound Travel from E+14 Days to E+60 Days (Up to Approximately E+60 Days

Table H-12 identifies the number of drivers and vehicles needed to transport evacuees from airports.

Table H-12. Resources to support bus /demand response vehicle service to shelters, inbound travel, from E+14 days to E+60 days up to approximately E+60 days.

	Number of Drivers per Day		Number of Vehicles per Day	
County	**Standard Bus**	**Demand Response Vehicle**	**Standard Bus**	**Demand Response Vehicles**
Alameda	40	20	20	10
Contra Costa	20	20	10	10
Marin	20	20	10	10
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	20	20	10	10
San Mateo	20	20	10	10
Santa Clara	40	20	20	10
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	20	20	10	10
Total	**180**	**140**	**90**	**70**

Source: URS analysis (2009)
E = event

Appendix I:
Transportation Resources Needed
to Support Daily Evacuation Operations

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Table of Contents

List of Tables

Appendix I: Transportation Resources Needed to Support Daily Evacuation Operations

This appendix summarizes, by time frame, the transportation resources needed on a daily basis to support evacuations. The information includes the transportation resources needed from Event (E)+72 hours to E+60 days, on a daily basis, to support the high-level transportation plan contained in the main document. Surpluses and shortfalls are identified by comparing the resources needed with the available resources.

The greatest need for transportation resources occurs from E+72 hours to E+14 days when the largest number of evacuees need to be transported and the transportation resources are limited. This transportation movement will be challenging for the region and if not done successfully, can affect the safety of evacuees.

I.1 E+72 Hours to E+14 Days: Outbound Evacuees by Standard Bus

Overall, not enough resources (either assets or staff) are available in the region for the high-level transportation plan, as identified in **Table I-1**. Additional assets are needed, but the greatest need is for staff to operate standard buses. Mutual aid requested from other mass transportation agencies in the region is not sufficient to fill the shortfall.

Assets appear to be available in a few counties, such as Marin or Monterey, but those counties do not have enough staff to provide the bus service.

Solano County is severely affected in terms of the need for staff because of the need to evacuate out-of-county commuters and residents coming from San Francisco. To accomplish this movement of evacuees, critical transportation resources are needed at the Vallejo ferry terminal to transport evacuees to out-of-region shelters. The Unified Coordination Group (UCG) would need to acquire transportation resources from private or other public mass transportation agencies to accomplish this transportation operation.

I.2 E+72 Hours to E+14 Days: Outbound Evacuees by Demand Response Vehicle

Overall, not enough resources (either assets or staff) are available in the region for E+72 hours to E+14 days for the high-level transportation plan, as identified in **Table I-2**.

Additional assets are needed, but the greatest need is for staff to operate the demand response vehicles. Mutual aid requested from other mass transportation agencies in the region is not sufficient to fill the shortfall. The UCG would need to acquire transportation resources from private or other public mass transportation agencies accomplish this transportation operation.

Table I-1. Summary of transportation resources for outbound evacuees traveling by standard bus from E+72 hours to E+14 days.

County	Standard Buses for Outbound Evacuees			Standard Bus Staff for Outbound Evacuees		
	Needed per Day	Available Daily	Surplus/ Shortfall	Needed per Day	Available Daily	Surplus/ Shortfall
Alameda	630	562	–68	1,220	440	–780
Contra Costa	220	192	–28	420	112	–308
Marin	110	189	+79	210	97	–113
Monterey	30	79	+49	50	45	–5
Napa	40	24	–16	60	15	–45
San Benito[1]	30	6	–24	40	6	–34
San Francisco	480	399	–81	930	554	–376
San Mateo	400	301	–99	750	103	–647
Santa Clara	640	442	–198	1,180	316	–864
Santa Cruz	50	86	+36	80	51	–29
Solano	1,230	66	–1,164	2,440	45	–2,395
Sonoma	70	75	+5	120	54	–66
Total	**3,930**	**2,421**	**–1,509**	**7,500**	**1,838**	**–5,662**

Source: URS analysis (2009)
[1] The bus operations staff numbers for San Benito were not available; the number of buses was used to estimate staff available.
E = event

I.3 E+72 Hours to E+14 Days: Outbound Evacuees by Ferry

Ferry boats are considered a regional resource because they are not associated with a particular county. Overall, not enough ferry boats are available in the region to meet the demand from E+72 hours to E+14 days for the high-level transportation plan, as indicated in **Table I-3**.

The Water Emergency Transportation Authority or the UCG would need to acquire additional ferry boats from private or other public mass transportation agencies. This could include ferry boats in southern California or elsewhere on the West Coast.

On the surface, there appears to be a shortage of ferry crew. However, it is assumed that enough ferry staff are available to operate the ferry boats (1) through using the existing ferry operators, (2) by specifying staff to operate the additional contracted ferry boats, or (3) by using staff from the International Organization of Masters, Mates, and Pilots based in San Francisco.

Table I-2. Summary of transportation resources for outbound evacuees traveling by demand response vehicle from E+72 hours to E+14 days.

	Demand Response Vehicles for Outbound Evacuees			Demand Response Vehicles Staff for Outbound Evacuees		
County	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Alameda	370	322	–48	670	51	–619
Contra Costa	120	239	+119	230	51	–179
Marin[1]	60	88	+28	110	88	–22
Monterey[1]	30	18	–12	40	18	–22
Napa	30	15	–15	40	7	–33
San Benito[1]	30	13	–17	40	13	–27
San Francisco	250	99	–151	730	99	–631
San Mateo	240	102	–138	420	2	–418
Santa Clara[1]	380	325	–55	660	325	–335
Santa Cruz	30	43	+13	50	13	–37
Solano	630	64	–566	40	9	–31
Sonoma[1]	50	50	0	80	50	–30
Total	**2,220**	**1,378**	**–842**	**3,110**	**726**	**–2,384**

Source: URS analysis (2009)
[1] Demand response operations staff numbers for Marin, Monterey, San Benito, Santa Clara, and Sonoma were not available; the number of demand response vehicles was used to estimate staff available.
E = event

Table I-3. Summary of regional transportation resources for outbound evacuees traveling by ferry from E+72 hours to E+14 days.

	Ferries and Staff for Outbound Evacuees		
Ferries/ Staff	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Ferries	63	41	–22
Staff	280	61	–219

Source: URS analysis (2009)
E = event

I.4 E+5 Days to E+14 Days: Outbound Evacuees by Passenger Rail Cars and Locomotives

Rail cars are considered a regional resource because the majority of them are from outside the region. For example, the Altamont Commuter Express is based in San Joaquin County, and the assets of the California Department of Transportation, Division of Rail, are distributed around California.

Overall, not enough passenger rail cars and locomotives are present in the region to meet the high-level transportation plan from E+5 days to E+14 days, as indicated in **Table I-4**.

Table I-4. Summary of regional transportation resources for outbound evacuees traveling by passenger rail car from E+5 days to E+14 days.

	Passenger Rail Car/Locomotive and Staff for Outbound Evacuees		
Mode/Staff	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Passenger rail car	790	85	–705
Locomotive	79	16	–64
Staff	230	78	–152

Source: URS analysis (2009)
E = event

Additional passenger rail cars and locomotives need to be acquired by the UCG to support evacuation operations. Rail cars are used extensively because of the multiple locations of rail stations and because 113 passengers can be transported per passenger rail car, and a single locomotive can transport 10 cars (1,130 passengers).

I.5 E+14 Days to E+60 Days (Up to Approximately E+30 Days): Inbound Evacuees by Standard Bus

Overall, the region should have enough resources to meet the transportation need from E+14 days to E+60 days (up to approximately E+30 days), in terms of both assets and staff, as indicated in **Table I-5** and based on the high-level transportation plan.

During this period, outbound evacuations are concluding, and there is a need to accommodate some inbound evacuees. The number of available assets increases over time, and the need for transportation resources to support evacuations starts to decrease.

During this period, mass transportation providers may be able to initiate some normal transportation service. However, the transportation infrastructure in the region is still affected. Mass transportation providers on the periphery of the region are more likely to be able to start resuming normal transportation service. When to resume service is a decision best made by the mass transportation providers.

Table I-5. Summary of transportation resources for inbound evacuees traveling by standard bus from E+14 days to E+60 days (up to approximately E+30 days).

	Standard Buses for Inbound Evacuees			Standard Bus Staff for Inbound Evacuees		
County	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Alameda	30	562	+532	50	440	+390
Contra Costa	20	192	+172	30	112	+82
Marin	10	189	+179	20	97	+77
Monterey	0	79	+79	0	45	+45
Napa	0	24	+24	0	15	+15
San Benito[1]	0	6	+6	0	6	+6
San Francisco	20	399	+379	30	554	+524
San Mateo	20	301	+281	30	103	+73
Santa Clara	30	442	+412	50	316	+266
Santa Cruz	0	86	+86	0	51	+51
Solano	0	66	+66	0	45	+45
Sonoma	20	75	+55	30	54	+24
Total	**150**	**2,421**	**+2,271**	**240**	**1,838**	**+1,598**

Source: URS analysis (2009)
E = event

[1] Bus operations staff numbers for San Benito were unavailable; the number of buses was used to estimate staff available.

I.6 E+14 Days to E+60 Days (Up to Approximately E+30 Days): Inbound Evacuees by Demand Response Vehicles

Overall, there should be enough resources in the region both in terms of assets and staff to meet the need from E+14 days to E+60 days (up to approximately E+30 days), as indicated in **Table I-6** and based on transportation operations assumptions in the main plan. During this period, mass transportation providers may be able to initiate some normal transportation service. When to resume service is a decision best made by the mass transportation providers.

I.7 E+14 Days to E+60 Days (Up to Approximately E+30 Days): Inbound Evacuees by Ferry Boat

Ferry service is not anticipated to be used to transport evacuees from E+14 days to E+60 days (up to approximately E+30 days) because residents are either in shelters away from ferry facilities or at shelters outside the region.

Table I-6. Summary of transportation resources for inbound evacuees traveling by demand response vehicle from E+14 days to E+60 days (up to approximately E+30 days).

County	Demand Response Vehicles for Inbound Evacuees			Demand Response Vehicle Staff for Inbound Evacuees		
	Needed per Day	Available Daily	Surplus/ Shortfall	Needed per Day	Available Daily	Surplus/ Shortfall
Alameda	20	322	+302	30	51	+21
Contra Costa	20	239	+219	30	51	+21
Marin[1]	10	88	+78	20	88	+68
Monterey[1]	0	18	+18	0	18	+18
Napa	0	15	+15	0	7	+7
San Benito[1]	0	13	+13	0	13	+13
San Francisco	20	99	+79	30	99	+69
San Mateo	20	102	+82	30	2	–28
Santa Clara[1]	20	325	+305	30	325	+295
Santa Cruz	0	43	+43	0	13	+13
Solano	0	62	+64	0	9	+9
Sonoma[1]	20	50	+30	30	50	+20
Total	**130**	**1,378**	**+1,248**	**200**	**726**	**+526**

Source: URS analysis (2009)
E = event
[1] Demand response operations staff numbers for Marin, Monterey, San Benito, Santa Clara, and Sonoma County were not available; the number of demand response vehicles was used to estimate staff available.

I.8 E+14 Days to E+60 Days (Up to Approximately E+30 Days): Inbound Evacuees by Passenger Rail Cars and Locomotives

Overall, there should be enough resources in the region from E+14 days to E+60 days (up to approximately E+30 days) in terms of both assets and staff, as indicated in **Table I-7** and based on the high-level transportation plan and operations assumptions. During this time, mass transportation providers may be able to initiate some normal transportation service. When to resume service is a decision best made by the mass transportation providers.

I.9 E+14 Days to E+60 Days (Up to Approximately E+60 Days): Inbound Evacuees by Standard Bus

Overall, there should be enough resources in the region from E+14 days to E+60 days (up to approximately E+60 days), in terms of both assets and staff, as indicated in **Table I-8** and based on transportation operations assumptions from the high-level transportation. During this period, mass transportation providers may be able to initiate some normal transportation service. When to resume service is a decision best made by the mass transportation providers.

Table I-7. Summary of regional transportation resources for inbound evacuees traveling by passenger rail car and locomotive from E+14 days to E+60 days (up to approximately E+30 days).

	Passenger Rail Car/Locomotive and Staff for Inbound Evacuees		
Mode/Staff	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Passenger rail car	60	85	+25
Locomotive	6	16	+10
Staff	60	78	+18

Source: URS analysis (2009)
E = event

Table I-8. Summary of transportation resources inbound and outbound evacuees traveling by standard bus from E+14 days to E+60 days (up to approximately E+60 days).

	Standard Buses for Outbound and Inbound Evacuees			Standard Bus Staff for Outbound and Inbound Evacuees		
County	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Alameda	30	562	+532	50	728	+678
Contra Costa	20	192	+172	30	187	+157
Marin	10	189	+179	20	162	+142
Monterey	0	79	+79	0	23	+23
Napa	0	24	+24	0	26	+26
San Benito[1]	0	6	+6	0	6	+6
San Francisco	20	399	+379	30	924	+894
San Mateo	20	301	+281	30	172	+142
Santa Clara	30	442	+412	50	527	+477
Santa Cruz	0	86	+86	0	86	+86
Solano	0	66	+66	0	71	+71
Sonoma	20	75	+55	30	91	+61
Total	**150**	**2,421**	**+2,271**	**240**	**3,003**	**+2,763**

Source: URS analysis (2009)
E = event

[1] Bus operations staff numbers for San Benito were unavailable; number of buses was used to estimate staff available.

I.10 E+14 Days to E+60 Days (Up to Approximately E+60 Days): Inbound and Outbound Evacuees by Demand Response Vehicles

Overall, there should be enough resources in the region from E+14 days to E+60 days (up to approximately E+30 days) , in terms of both assets and staff, as indicated in **Table I-9** and based on transportation operations assumptions from the main plan. During this period, mass transportation providers may be able to initiate some normal transportation service. When to resume service is a decision best made by the mass transportation providers.

Table I-9. Summary of transportation resources for outbound and inbound evacuees traveling by demand response vehicle from E+14 days to E+60 days (up to approximately E+30 days).

	For Outbound and Inbound Evacuees					
	Demand Response Vehicles			Demand Response Vehicles Staff		
County	Needed per Day	Available Daily	Surplus/ Shortfall	Needed per Day	Available Daily	Surplus/ Shortfall
Alameda	20	322	+302	30	106	+76
Contra Costa	20	239	+219	30	106	+76
Marin[1]	10	88	+78	20	88	+68
Monterey[1]	0	18	+18	0	18	+18
Napa	0	15	+15	0	11	+11
San Benito[1]	0	13	+13	0	13	+13
San Francisco	20	99	+79	30	99	+69
San Mateo	20	102	+82	30	3	–27
Santa Clara[1]	20	325	+305	30	325	+295
Santa Cruz	0	43	+43	0	22	+22
Solano	0	62	+64	0	14	+14
Sonoma[1]	20	50	+30	30	50	+20
Total	**130**	**1,378**	**+1,248**	**200**	**855**	**+655**

Source: URS analysis (2009)
E = event

[1] Demand response operations staff numbers for Marin, Monterey, San Benito, Santa Clara, and Sonoma counties were not available; the number of demand response vehicles was used to estimate staff available.

I.11 E+14 Days to E+60 Days (Up to Approximately E+30 Days): Inbound Evacuees by Ferry Boat

Ferry service is not anticipated to transport evacuees from E+14 days to E+60 days (up to approximately E+30 days) because residents will either be in shelters away from ferry facilities or at shelters outside the region.

I.12 E+14 Days to E+60 Days (Up to Approximately E+30 Days): Inbound Evacuees by Passenger Rail Cars and Locomotives

Overall, there should be enough resources in the region from E+14 days to E+60 days (up to approximately E+30 days), in terms of both assets and staff, as indicated in **Table I-10** and based on the transportation operations assumptions from the main plan. During this time, mass transportation providers may be able to initiate some normal transportation service. When to resume service is a decision best made by the mass transportation providers.

Table I-10. Summary of regional transportation resources for inbound evacuees traveling by passenger rail car and locomotive from E+14 days to E+60 days (up to approximately E+30 days).

	Passenger Rail Car/Locomotive and Staff for Inbound Evacuees		
Mode/Staff	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Passenger rail car	60	85	+25
Locomotive	6	16	+10
Staff	60	88	+28

Source: URS analysis (2009)
E = event

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Appendix J:
Mileage for Transportation Operations

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Table of Contents

List of Tables

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Appendix J: Mileage for Transportation Operations

The source for the data in Tables J-1 through J-6 is URS analysis (2009).

J.1 Air Operations

Table J-1. Mileage estimates for bus/demand response vehicle service to support air operations.

County	Airport Destination	Average One-Way Trip Length (miles)
Alameda	Stockton	100
Contra Costa	Stockton	100
Marin	Charles M. Schulz	35
Monterey	Monterey	20
Napa	Charles M. Schulz	20
San Benito	Monterey	60
San Francisco	Monterey	100
San Mateo	Monterey	85
Santa Clara	Monterey	65
Santa Cruz	Monterey	35
Solano	Charles M. Schulz	35
Sonoma	Charles M. Schulz	20

Source: URS analysis (2009)

J.2 Rail Operations

Table J-2. Mileage estimate for rail service to shelter.

County	Destination	Average One-Way Trip Length (miles)
All counties	Out-of-region shelter	350

Source: URS analysis (2009)

Table J-3. Mileage estimates for bus/demand response vehicle service to support rail operations.

County	Rail Station	Average One-Way Trip Length (miles)
Alameda	Livermore/Pleasanton	35
Contra Costa	Antioch/Pittsburg	30
Marin	Suisan City/Fairfield	50
Monterey	Gilroy	40
Napa	Suisan/Fairfield	20
San Benito	Gilroy	15
San Francisco	Gilroy	65
San Mateo	Gilroy	45
Santa Clara	Gilroy	25
Santa Cruz	Gilroy	40
Solano	Suisan City/Fairfield	20
Sonoma	Suisan City/Fairfield	30

Source: URS analysis (2009)

J.3 Ferry Operations

Table J-4. Mileage estimate for ferry service to support ferry operations.

County	Ferry Destination	Average One-Way Trip Length (miles)
San Francisco	Vallejo	25

Source: URS analysis (2009)

Table J-5. Mileage estimate for bus/demand response vehicle service to support ferry operations.

Origin	Destination	Average One-Way Trip Length (miles)
Vallejo ferry docks	Out-of-region shelter	250

Source: URS analysis (2009)

J.4 Bus/Demand Response Vehicle Operations

Table J-6. Mileage estimates for bus/demand response vehicle service to shelter.

County	Destination	Average One-Way Trip Length (miles)
All counties	Out-of-region shelter	250

Source: URS analysis (2009)

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Appendix K:
Assumptions about Transportation Modes

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Table of Contents

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Appendix K: Assumptions about Transportation Modes

K.1 Bus/Demand Response Operations

Bus/demand response vehicle operations in the region are supported by providing bus/demand response vehicle service from pickup locations in the region to shelters outside the region. See **Map B-7a** for the major axes of road-based transportation.

To estimate the number of transportation resources that need to be provided to support bus/demand response vehicle operations, the following assumptions were made:

- The average one way bus/demand response vehicle trip length is 250 miles; resulting in a round trip of 500 miles. This estimate of mileage was used because the specific shelter destination for each trip outside the region is unknown. The trip distance is used as a surrogate for an average transportation trip between a pickup location and a destination shelter location.
- The average trip speed is 40 miles per hour for the bus/demand response vehicle because of conditions of the roadways within and outside the region and to account for loading and unloading vehicles. This results in an average round trip time of 13 hours. Trip time also includes the return trip of the bus/demand response vehicle to the origin to account for the use of the resources again.
- Operations proceed 23 hours per day with 1 hour for fueling, light maintenance, etc., of the bus/demand response vehicle. This results in, depending on the destination, one round trip per standard bus/demand response vehicle.
- Use of standard buses and demand response type vehicles: Approximately 80 percent of the evacuation population is able to use a standard bus, and 20 percent needs to use a demand response vehicle.
- Maximum allowable hours per day per driver is 10 hours.
- Crews change in the field.
- Vehicles are at 75 percent capacity to accommodate residents and their belongings, resulting in 38 passengers per standard bus based on the average bus capacity of 50 seats, and 19 passengers per demand response vehicle based on the average vehicle capacity of 25 seats.
- Fuel consumption is 6 miles per gallon for standard buses and 13 miles per gallon for demand response vehicles.
- Operations are for 4 days during E+72 hours to E+14 days, 15 days during E+14 days to E+60 days (up to approximately E+30 days), and 15 days during E+14 days to E+60 days (up to approximately E+60 days).

K.2 Rail Operations

Rail operations in the region will be supported by providing bus/demand response vehicle service to rail stations for residents and rail service to shelters outside the region. See **Map B-7b** for the major axes of rail-based transportation.

To estimate the number of transportation resources that are needed to support rail operations, the following assumptions were made:

- The average one-way bus/demand response vehicle trip length is between 15 miles and 65 miles, depending on the county and location of the rail station. This results in a round trip ranging from 30 miles up to 130 miles. This estimate of mileage was used because the specific pickup location is unknown for each trip. The trip distances are used as a surrogate for an average transportation trip between pickup locations and rail stations.
- The average one-way rail trip length is 350 miles, resulting in a round trip of 700 miles. This estimate of mileage was used because the specific rail station destination is unknown for each trip. The trip distance is used as a surrogate for an average transportation trip between rail stations in the region and a destination rail station outside the region.
- The average trip speed is 15 miles per hour for the bus/demand response vehicle because of conditions of the roadways in the region and to account for loading and unloading vehicles. Depending on the destination, this results in average round-trip times ranging from 2 hours to 9 hours. Trip time also includes the return trip of the bus/demand response vehicle to the origin destination to account for the use of the resources again.
- The average trip speed is 50 miles per hour for the train because of the condition of the track in the region and outside the region and to account for loading and unloading. This results in an average round-trip time of 14 hours. Trip time also includes the return trip of the train to the origin to account for the use of the resources again.
- Operations proceed 23 hours per day, with 1 hour for fueling, light maintenance, etc., of the vehicles/passenger rail cars/locomotives/cab cars. Depending on the destination, this results in 1 to 5 round trips by buses/demand response vehicles for each round trip by passenger train.
- Use of standard buses and demand response vehicles: Approximately 80 percent of the evacuation population is able to use a standard bus, and 20 percent needs a demand response vehicle.
- Use of passenger rail cars and 1 locomotive/cab car: Up to 10 cars.
- Transportation to a rail station: Stations include Pleasanton/Livermore, Antioch/Pittsburgh, Suisan City/Fairfield, and Gilroy.
- Maximum allowable hours per day per bus and demand response driver is 10 hours and 12 hours per day for rail staff.
- Crews change in the field.

- Three staff are provided per train: one to operate the locomotive and two to assist evacuees with loading and unloading.
- Passenger rail cars are accessible to people with access and functional needs.
- Vehicles are at 75 percent capacity to accommodate residents and their belongings. This results in 38 passengers per standard bus based on the average bus capacity of 50 seats, 19 passengers per demand response vehicle based on the average vehicle capacity of 25 seats, and 113 passengers per passenger rail car based on the average passenger rail car capacity of 150 seats.
- Fuel consumption is 6 miles per gallon for standard buses, 13 miles per gallon for demand response vehicles, and 3.9 gallons per train mile.
- Operations are for 4 days during E+5 days to E+14 days, 15 days during E+14 days to E+60 days (up to approximately E+30 days) and 15 days during E+14 days to E+60 days (up to approximately E+60 days).
- Damage to the rail network, including freight tracks, is repaired during E+5 days to E+14 days for rail sections that are not heavily damaged, thus accounting for operations starting on E+5 days.
- Freight railroads allow passenger train service to use their rail tracks. The Unified Coordination Group seeks permission.
- Roadways are available to reach rail station locations.
- Transportation is available at the destination to transport evacuees to out-of-region shelters.

K.3 Ferry Operations

Ferry operations in the region are supported by providing ferry service from ferry facilities in the region and providing bus/demand response vehicle service at the destination ferry facility to shelters outside the region. See **Map B-7c** for the major axes of water-based transportation.

To estimate the number of transportation resources that need to be provided to support ferry operations, the following assumptions were made:

- The average one-way ferry trip length is 25 miles to Vallejo, resulting in a round trip of 50 miles.
- The average one-way bus/demand response vehicle trip length is 250 miles, resulting in a round trip of 500 miles. This estimate of distance was used because for each trip, the specific shelter destination outside the region is unknown. The trip distance is used as a surrogate for an average transportation trip between a ferry facility and a destination shelter.
- The average trip speed is 13 knots or 15 miles per hour for the ferry, to account for loading and unloading. Depending on the destination, this results in an average round trip of 4 hours. Trip time also includes the return trip of the ferry to the origin to account for the use of the resources again.

- The average trip speed is 40 miles per hour for the bus/demand response vehicle because of conditions of the roadways in the region and outside the region and to account for loading and unloading vehicles. This results in an average round trip time of 13 hours. Trip time also includes the return trip of the bus/demand response vehicle to the origin destination (e.g., Vallejo).
- Operations proceed 23 hours per day with 1 hour for fueling, light maintenance, etc., of the bus/demand response vehicle/ferry boats. This results in one round trip per bus/demand response vehicle and three round trips per ferry.
- The ferry boats that are used are either owned by Water Emergency Transportation Authority (WETA) or Golden Gate Bridge, Highway and Transportation District or contracted for by WETA.
- Waterways are open to navigation.
- Use of standard buses and demand response vehicles: Approximately 80 percent of the evacuation population is able to use a standard bus, and 20 percent needs to use a demand response vehicle.
- Ferry boats are accessible to people with access and functional needs.
- Transportation to and from a ferry facility: Facilities include San Francisco and Vallejo.
- Docking can occur next to existing or temporary ferry facilities, and loading and unloading can be done at each ferry facility. Methods for accomplishing this can include the use of makeshift gangways, barge platforms, or floating docks.
- The use of ferry facilities in Vallejo: Outbound passengers can be unloaded at Mare Island and the City of Vallejo dock can be used to load inbound first responders and relief workers.
- The maximum allowable hours per day for ferry staff is 12 hours.
- Crews change in the field.
- Four staff per ferry: One captain and three crew to assist evacuees with loading and unloading.
- Vessels are at 75 percent capacity to accommodate residents and their belongings, resulting in 300 passengers per ferry based on the average ferry capacity of 400 seats.[1]
- Vehicles are at 75 percent capacity to accommodate residents and their belongings resulting in 38 passengers per standard bus based on the average bus capacity of 50 seats, and 19 passengers per demand response vehicle based on the average vehicle capacity of 25 seats.
- Fuel consumption is 100 miles per service hour for a ferry.
- Fuel consumption is 6 miles per gallon for standard buses and 13 miles per gallon for demand response vehicles.

1 Average capacity calculated on ferry boats and vessels available to assist in evacuation operations. See Appendix G for additional information about ferries.

- Operations are for 4 days during E+72 hours to E+14 days, 15 days for E+14 days to E+60 days (up to approximately E+30 days), and 15 days during E+14 days to E+60 days (up to approximately E+60 days).

K.4 Air Operations

Air operations in the region will be supported by providing bus service to transport visitors and tourists to airports that are functional. The acquisition and deployment of airplanes is the responsibility of the Federal Government. See **Map B-7d** for the major axes of air-based transportation.

To estimate the number of transportation resources that are needed to support air operations, the following assumptions were made:

- An average one-way trip length is between 20 miles and 100 miles depending on the county and location of the airport, resulting in a round trip ranging from 40 miles up to 200 miles. This estimate of mileage was used because the specific pickup location for each trip is unknown. The trip distances are used as a surrogate for an average transportation trip between pickup locations and airports.
- The average trip speed is 15 miles per hour for the vehicles because of conditions of the roadways and to account for loading and unloading vehicles. Depending on the destination, this results in average round-trip times ranging from 3 hours to 14 hours. Trip time also includes the return trip of the bus/demand response vehicle to the origin to account for the use of the resources again.
- Operations proceed 23 hours per day, with 1 hour for fueling the vehicles, light maintenance, etc. Depending on the destination, this results in 1 to 7 round trips per vehicle.
- Use of standard buses and demand response vehicles: Approximately 80 percent of the evacuation population is able to use a standard bus, and 20 percent needs a demand response vehicle.
- Transportation to an airport: Airports for mass transportation operations include Monterey Peninsula, Charles M. Schulz (Sonoma County), and Stockton Metropolitan.
- Maximum number of allowable hours per day per driver is 10 hours.
- Crews change in the field.
- Vehicles are at 75 percent capacity to accommodate residents and their belongings. This results in 38 passengers per standard bus based on the average bus capacity of 50 seats, and 19 passengers per demand response vehicle based on the average vehicle capacity of 25 seats.
- Fuel consumption is 6 miles per gallon for standard buses and 13 miles per gallon for demand response vehicles.

- Operations are for 4 days during E+72 hours to E+14 days, 15 days during E+14 days to E+60 days (up to approximately E+30 days), and 15 days during E+14 days to E+60 days (up to approximately E+60 days)

Appendix L:
Sample American Public Transportation Association / Public Transit Industry Mutual Aid Assistance Agreement

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Table of Contents

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Appendix L: Sample American Public Transportation Association / Public Transit Industry Mutual Aid Assistance Agreement

APTA / Public Transit Industry
Mutual Aid Assistance Agreement

SUGGESTED GOVERNING PRINCIPLES COVERING
EMERGENCY ASSISTANCE ARRANGEMENTS
BETWEEN APTA EMERGENCY RESPONSE PROGRAM MEMBERS

Transit agencies or other entities may have occasion to call upon other transit agencies or entities for emergency assistance in the form of personnel or equipment to aid in evacuation or maintaining continuity of service, when such service has been disrupted by acts of the elements, equipment malfunctions, accidents, sabotage, or any other occurrences where the parties deem emergency assistance to be necessary or advisable. While it is acknowledged that a transit entity is not under any obligation to furnish such emergency assistance, experience indicates that companies are willing to furnish such assistance when personnel or equipment is available.

In the absence of a continuing formal contract between a transit agency or other entity requesting emergency assistance ("Requesting Entity") and a transit agency willing to furnish such assistance ("Responding Entity"), the following principles are suggested as the basis for a contract governing emergency assistance to be established at the time such assistance is requested:

1. The emergency assistance period shall commence when personnel and/or equipment expenses are initially incurred by the Responding Entity in response to the official request of the Requesting Entity. (This would include any request for the Responding Entity to prepare its employees and/or equipment for transport to the Requesting Entity's location but to await further instructions before departing.) The emergency assistance period shall terminate when such employees and/or equipment have returned to the Responding Entity, and shall include any mandated DOT [Department of Transportation] rest time resulting from the assistance provided and reasonable time required to prepare the equipment for return to normal activities (e.g., cleaning off/repair of vehicles, restocking parts, etc.).

2. To the extent possible, the Requesting Entities and Responding Entities should reach a mutual understanding and agreement in advance on the anticipated length, in general, of the emergency assistance period. For extended assistance periods, there should be agreement on the process for replacing or providing extra rest for the Responding Entity's employees. It is understood and agreed that if in the Responding Entity's judgment such action becomes necessary, the decision to terminate the assistance and recall employees, contractors, and equipment lies solely with the Responding Entity. The Requesting Entity will take the necessary action to return such employees, contractors, and equipment promptly.

3. Employees of the Responding Entity shall at all times during the emergency assistance period continue to be employees of the Responding Entity and shall not be deemed employees of the Requesting Entity for any purpose. The Responding Entity shall be an independent contractor of the Requesting Entity; and wages, hours, and other terms and conditions of employment of the Responding Entity shall remain applicable to its employees during the emergency assistance period.

4. The Responding Entity shall make available at least (__) supervisor(s) in addition to operators and maintenance personnel. All instructions for work to be done by Responding Entity's personnel shall be given by Requesting Entity to Responding Entity supervisor(s); or when Responding Entity personnel are to work in widely separate areas, to such of Responding Entity's supervisors as may be designated for the purpose by Responding Entity's management.

5. Unless otherwise agreed, the Requesting Entity shall be responsible for supplying and/or coordinating support functions such as lodging, meals, materials, etc., when it is reasonably able to do so. As an exception to this, the Responding Entity shall normally be responsible for arranging lodging and meals en route to the Requesting Entity and for the return trip home. The Requesting Entity agrees to seek appropriate reimbursement for expenses incurred by the Requesting Entity.

6. The Responding Entity's safety rules shall apply to all work done by their employees, unless as mutually agreed otherwise. Any questions or concerns arising about any safety rules and/or procedures should be brought to the proper level of management for prompt resolution between management of the Requesting Entities and Responding Entities.

7. All time sheets and work records pertaining to the Responding Entity's employees furnishing emergency assistance shall be kept by the Responding Entity.

8. The Requesting Entity shall indicate to the Responding Entity the types of vehicles and other equipment desired as well as the number of job function employees requested, but the extent to which the Responding Entity makes available such equipment and employees shall be at the Responding Entity's sole discretion.

9. The Requesting Entity shall reimburse the Responding Entity for all costs and expenses incurred by the Responding Entity as a result of furnishing emergency assistance. The Responding Entity shall furnish documentation of expenses to the Requesting Entity. Such costs and expenses shall include, but not be limited to, the following:

   a. Employees' wages and salaries for paid time spent in Requesting Entity's service area and paid time during travel to and from such service area, plus the Responding Entity's standard payable additives to cover all employee benefits and allowances for vacation, sick leave and holiday, pay, social and retirement benefits, all payroll taxes, workmen's compensation, employer's

liability insurance, and other contingencies and benefits imposed by applicable law or regulation.

b. Employee travel and living expenses (meals, lodging, and reasonable incidentals).

c. Replacement cost of materials and supplies expended or furnished.

d. Repair or replacement cost of equipment damaged or lost.

e. Charges, at rates internally used by the Responding Entity, for the use of vehicles and other equipment requested.

f. Administrative and general costs which are properly allocated to emergency assistance, to the extent such costs are not chargeable pursuant to the foregoing subsections.

10. The Requesting Entity shall pay all costs and expenses of the Responding Entity within sixty days after receiving an invoice.

11. The Requesting Entity shall indemnify, hold harmless, and defend the Responding Entity from and against any and all liability for loss, damage, cost, or expense which the Responding Entity may incur by reason of bodily injury, including death, to any person or persons, or by reason of damage to or destruction of any property, including the loss of use thereof, which result from furnishing emergency assistance and whether or not due in whole or in part to any act, omission, or negligence of the Responding Entity, except to the extent that such death or injury to person, or damage to property, is caused by the willful or wanton misconduct and/or gross negligence of the Responding Entity, its employees, officers, contractors, or agents. Where payments are made by the Responding Entity under a workmen's compensation or disability benefits law or any similar law for bodily injury or death resulting from furnishing emergency assistance, the Requesting Entity shall reimburse the Responding Entity for such payments, except to the extent that such bodily injury or death is caused by the willful or wanton misconduct and/or gross negligence of the Responding Entity, its employees, officers, contractors, or agents.

12. In the event any claim or demand is made, or suit or action is filed against the Responding Entity alleging liability for which the Requesting Entity shall indemnify and hold harmless the Responding Entity under paragraph (11) above, the Responding Entity shall promptly notify the Requesting Entity thereof; and the Requesting Entity, at its sole cost and expense, shall settle, compromise, or defend the same in such manner as it deems necessary or prudent. The Requesting Entity shall consult the Responding Entity on all such litigation and will not compromise any issue or claim without the concurrence of the Responding Entity, which will not be unreasonably withheld. The Responding Entity shall cooperate with the Requesting Entity's reasonable efforts to investigate, defend, and settle the claim or lawsuit.

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Appendix M:
Hayward Fault Earthquake Scenario

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Table of Contents

Attachments

List of Maps

List of Tables

Appendix M: Hayward Fault Earthquake Scenario

M.1 Overview

Appendix M provides information about the transportation/evacuation operations associated with the potential damage from a Hayward fault earthquake scenario (Hayward scenario), as they are projected to be different from the requirements associated with the San Andreas fault earthquake scenario used as the basis for the Regional Catastrophic Earthquake Mass Transportation/Evacuation Plan (Plan).1

This appendix describes the mass transportation/evacuation operations that are pertinent to the Hayward scenario and that are different from the operations required for the San Andreas fault earthquake scenario. While a substantial portion of the Plan applies to both earthquake scenarios—most assumptions, roles and responsibilities, the basic concept of operations, resource integration, and communications are consistent for similar catastrophic earthquakes in the Bay Area region—there are some differences. The significant differences are primarily in the locations of affected populations, the impacts to transportation systems, and the logistics of transportation operations that are needed to transport evacuees. Unless otherwise specified, information in Sections 1 through 6 of the Plan and the other appendices to the Plan are applicable to the Hayward fault earthquake scenario.

This appendix presents a high-level operational approach to transporting evacuees out of the affected area and transporting responders and resources into the affected area. Because the impacts of an actual event may differ from the projected impacts, the intent was not to produce a specific service plan but to provide the region with information about the resources needed for emergency mass transportation operations after a Hayward fault earthquake. The high-level analysis was guided by the overarching consideration that people in the region who need to use mass transportation resources will need to be safe and cared for. Movement of evacuees to shelters is a life-safety issue and a priority for the region. Therefore, the analysis was based on the need to move evacuees to a shelter as soon as possible (by Event [E]+7 days) and not back to their residences.

M.2 Scenario Event Description and Assumptions

The Hayward fault earthquake scenario was developed by a working group of U.S. Geological Survey, academic, and consulting scientists as part of the Hayward Fault Scenario Earthquakes Project.2 Hayward fault earthquake scenario ground-motion maps were developed using a numerical three-dimensional ground-motion modeling approach and a Bay Area three-dimensional velocity model. The modeling approach also incorporated sedimentary basin effects and fault rupture directivity. The resulting ground motions were validated using the empirical Next Generation of Attenuation relationships. Results for several Hayward fault earthquake simulations

1 For simplicity, the abbreviation of the title of this document is “Plan.”

2 U.S. Geological Survey, Hayward Fault Scenario Earthquakes Project, 2009.

showed sensitivity to the location of the hypocenter, especially at longer periods (greater than 1.0 second spectral acceleration). The most conservative scenario with a hypocenter at San Pablo Bay[3] was therefore selected.

The Hazards U.S. (HAZUS) analysis of a moment magnitude (**M**) 7.05 earthquake on the Hayward fault was performed using the previously mentioned liquefaction susceptibility map and ShakeMap version of the Hayward fault earthquake scenario[4] as input. The characteristics of the ShakeMap scenario based on a HAZUS analysis for an **M** 7.05 earthquake on the northern and southern segments of Hayward fault are as follows:

- Moment magnitude: 7.05
- Depth: 8 kilometers
- Latitude: 38.91 degrees
- Longitude: –112.41 degrees
- Rupture length: 83 kilometers

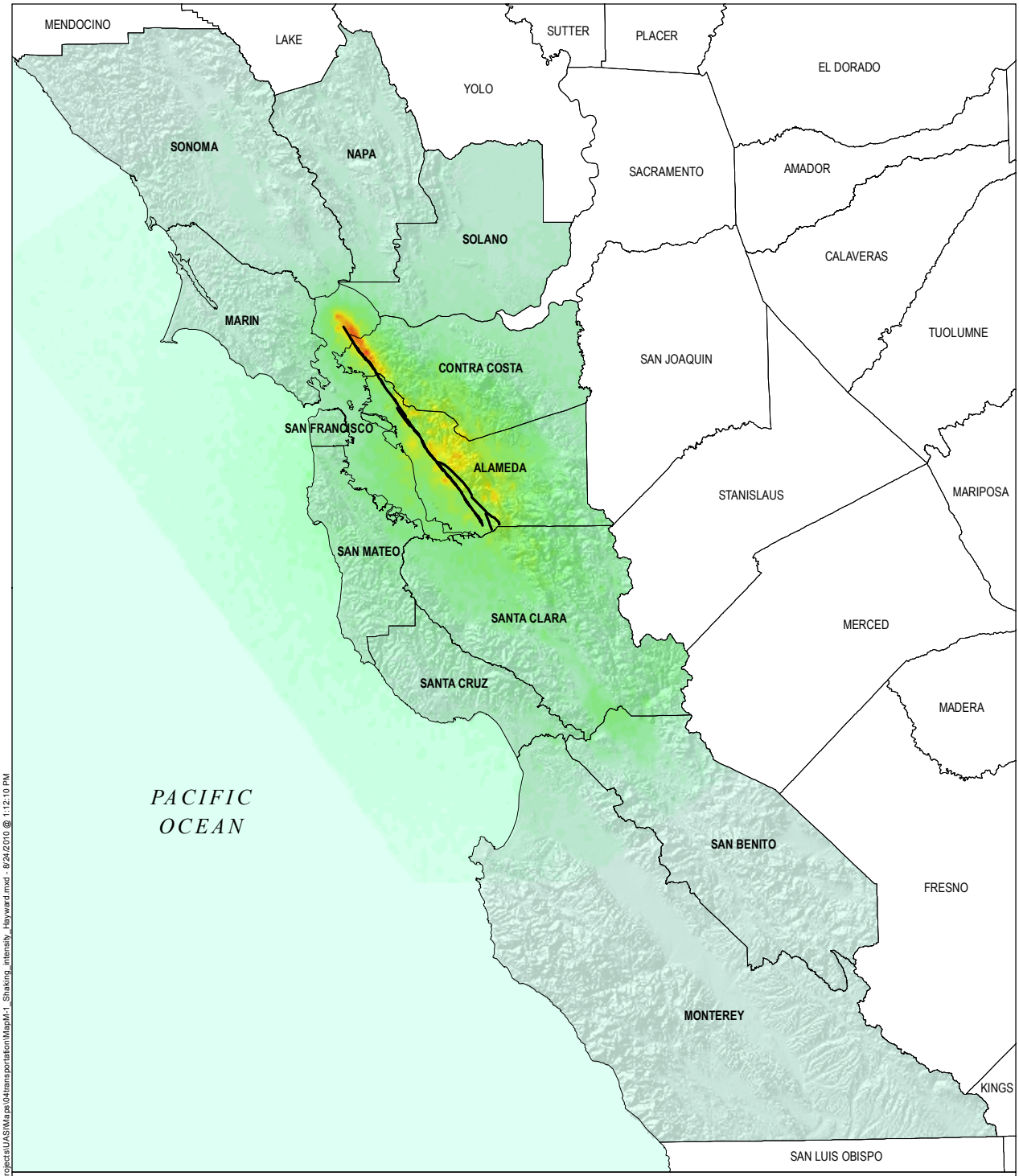
Map M-1 shows the peak shaking intensity (as defined by peak ground acceleration) for the **M** 7.05 Hayward fault earthquake.

M.2.1 Limitations

The most important sources of uncertainty in the analysis were the input ground-shaking parameters and possible structural fragilities. The HAZUS results have limitations from the following:

- HAZUS does not include effects from the earthquake such as fires, landslides, or flooding.
- HAZUS does not address damage to infrastructure networks, such as water systems, that enter and leave the Bay Area region
- Level of detail for analysis is only to the Census tract level.
- The ShakeMap for the Hayward fault earthquake scenario is based on ground-motion simulations, not on actual earthquake observations. The resolution is about 1/60 of a degree (0.0166667 degree).[5]
- The ShakeMap used in the Hayward fault earthquake scenario is only one possible scenario. Other combinations of faulting, direction of rupture, magnitude, and hypocenter location would produce different ground motions.

3 Ibid.
4 Ibid.
5 Ibid.



*g = 980 centimeters/second/second (units of gravitational acceleration)
Topographic data source: USGS NED
Fault data source: USGS, 2006

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map M-1. Shaking intensity for the Hayward fault earthquake scenario
Peak ground acceleration
M 7.05 Hayward fault earthquake; hypocenter San Pablo Bay

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M.2.2 Damage to Transportation Infrastructure

The Hayward fault earthquake scenario would have an impact on the regional transportation network similar to that of the **M** 7.9 San Andreas fault earthquake scenario, although certain facilities, particularly in the eastern part of the region, would be more severely affected by a Hayward fault earthquake. Other parts of the region, farther from the Hayward fault, would experience less severe direct effects. Monterey, San Benito, and Santa Cruz counties are not expected to experience severe damage from a Hayward fault earthquake.

Table M-1 lists the expected functionality of the California Department of Transportation (Caltrans) Lifeline routes in the 12-county region after the Hayward fault scenario earthquake. The routes that have to be closed because of damage from the earthquake would be re-opened as soon as possible to allow for the movement of evacuees, emergency workers, and supplies.

Maps showing potential damage to transportation infrastructure in the 12 counties in the Bay Area region from the Hayward fault earthquake scenario are provided in **Attachment 1**.

M.2.3 Affected Populations

On a regional level, the Hayward fault earthquake scenario is expected to result in fewer people who will seek shelter or leave the area than in the San Andreas fault earthquake scenario. Fewer people would therefore require mass transportation services for evacuation. Some jurisdictions, particularly those immediately adjacent to the Hayward fault, would be more severely affected than others.

The estimated affected populations by category for a Hayward fault earthquake scenario are identified in **Table M-2**. Population categories seeking shelter are the general population, homeless, visitors/tourists, and inter-county commuters. The general population numbers include an estimate of the access and functional needs population.

M.2.4 Transportation Resources

Table M-3 shows the number of transit vehicles projected to be available in the 12-county region after the Hayward fault earthquake scenario event.

M.3 Transportation/Evacuation Operations

A substantial portion of the Plan applies to both earthquake scenarios. Most assumptions, roles and responsibilities, the basic concept of operations, resource integration, and communications are the same for similar catastrophic earthquakes in the region. The significant differences are primarily in the location and extent of transportation network damage and in the locations of affected populations.

This section provides the mass transportation/evacuation operations that are pertinent to the Hayward fault earthquake scenario. Unless otherwise specified,

information in **Sections 1 through 6** of the Plan and the other appendices to the Plan are applicable to the Hayward fault earthquake scenario.

Table M-1. Expected functionality of Caltrans Lifeline routes after the Hayward fault earthquake scenario event.

			Functionality Immediately after the Scenario Event	
Route	**Segment**	**Location**	**Route**	**Bridge**
SR 24	Contra Costa County	From Interstate (I)-680 in Walnut Creek to SR 13/I-580 in Oakland	• High • Caldecott Tunnel: Low	Low
SR 24	Alameda County	From I-680 in Walnut Creek to SR 13/I-580 in Oakland	Low	Low
I-80	San Francisco and Alameda counties	From U.S. 101 in San Francisco to I-580 in Oakland	• Low to high (San Francisco side) • Low (Oakland side)	• San Francisco–Oakland Bay Bridge (Bay Bridge): High • Bay Bridge approaches: Low
I-80	Solano County	From I-780 in Vallejo to the Nevada border	High	• Low (Vallejo) • High (North of Vallejo to Solano county line)
SR 92	San Mateo County	From U.S. 101 to I-280	High	High
U.S. 101	Monterey County	From SR 170 in Los Angeles to I-280 in San Jose	High	High
U.S. 101	San Benito County	From SR 170 in Los Angeles to I-280 in San Jose	High	Mainly high
U.S. 101	Santa Clara County	From SR 170 in Los Angeles to I-280 in San Jose	• Medium (south of San Jose to county line) • Low (San Jose)	• Low to high (south of San Jose) • Low (San Jose)
U.S. 101	San Francisco	From I-280 to I-80	Medium	Low to high
U.S. 101	Marin County	From the Golden Gate Bridge in Marin County to U.S. 199 in Del Norte County	• Medium to high (north of Golden Gate Bridge to SR 1) • Low (SR 1 to Novato) • High (Novato to county line)	• Low to high (north of Golden Gate Bridge to Novato) • High (Novato to county line)
U.S. 101	Sonoma County	From the Golden Gate Bridge in Marin County to U.S. 199 in Del Norte County	• Low (southern County Line to SR 116) • High (SR 116 to county line – north)	High
SR 12 SR 29 SR 116 SR 121	Sonoma County	From U.S. 101 in Petaluma through Napa to I-80 in Solano County	High	High

Table M-1. Expected functionality of Caltrans Lifeline routes after the Hayward fault earthquake scenario event.

			Functionality Immediately after the Scenario Event	
Route	**Segment**	**Location**	**Route**	**Bridge**
SR 12 SR 29 SR 116 SR 121	Napa County	From U.S. 101 in Petaluma through Napa to I-80 in Solano County	• Low (western County Line to American Canyon) • High (American Canyon to southern County Line and eastern County Line)	High
SR 12 SR 29 SR 116 SR 121	Solano County	From U.S.101 in Petaluma through Napa to I-80 in Solano County	High	High
I-280	Santa Clara County	From U.S.101 in San Jose to U.S. 101 in San Francisco	Low	Low
I-280	San Mateo County	From U.S.101 in San Jose to U.S. 101	Medium	Mainly low
I-280	San Francisco	From U.S. 101 in San Jose to U.S. 101 in San Francisco	Medium	Low to high
I-238 I-580	Alameda County	From I-880 in Alameda County east to I-5	High	• Low (San Leandro to Livermore) • Medium to high (Livermore to eastern county line)
I-580	Alameda County	From I-80 to SR 24	Low	Low
I-680	Santa Clara County	From I-280 in San Jose to I-780 in Benicia	Medium	Low
I-680	Alameda County	From I-280 in San Jose to I-780 in Benicia	High	Low
I-680	Contra Costa County	From I-280 in San Jose to I-780 in Benicia	High	• Low • Low to high (north of Pleasant Hill)
I-680	Solano County	From I-280 in San Jose to I-780 in Benicia	High	Benicia Bridge and approaches: High
I-780	Solano County	From I-680 in Benicia to I-80 in Vallejo	Medium	High

Source: URS analysis (2009)

I = interstate
SR = State Route

Table M-2. Expected number of evacuees requiring transportation assistance in the 12-county Bay Area region in the Hayward fault earthquake scenario at E+72 hours.

County	Overall Population[2]	Evacuees Seeking Shelter[3]	Homeless Seeking Shelter[4]	Visitors/ Tourists[5]	Inter-County Commuters[6]	Evacuees Needing Transportation[1]					Evacuees in Mass Transit[10]	Evacuees in Demand Response Vehicles[11]
						General Population[7]	Homeless[7]	Visitors/ Tourists[8]	Inter-County Commuters[9]	Total		
Alameda	1,556,500	72,100	4,000	24,900	206,700	36,000	2,000	12,400	155,000	**205,400**	164,300	41,100
Contra Costa	1,060,400	17,500	3,300	17,000	82,300	8,700	1,600	3,400	41,100	**54,800**	43,800	11,000
Marin	258,600	2,100	1,400	4,200	44,300	1,000	700	400	11,000	**13,100**	10,400	2,700
Monterey	431,900	10	1,100	15,000	9,200	0	500	0	0	**500**	400	100
Napa	137,600	10	200	2,300	15,100	0	100	0	0	**100**	80	20
San Benito	58,000	40	N/A	1,000	4,600	0	N/A	0	0	**N/A**	0	0
San Francisco	845,600	8,500	5,100	75,000	273,800	4,200	2,500	15,000	205,300	**227,000**	181,600	45,400
San Mateo	745,800	10,300	1,400	11,900	144,300	5,100	700	2,300	72,100	**80,200**	64,100	16,100
Santa Clara	1,857,600	33,900	5,700	42,500	210,500	16,900	2,800	21,200	105,200	**146,100**	116,800	29,300
Santa Cruz	268,600	50	2,200	7,500	13,700	0	1,100	0	0	**1,100**	800	300
Solano	426,300	700	1,600	7,800	16,600	300	800	700	4,100	**5,900**	4,700	1,100
Sonoma	486,600	10	1,000	6,900	12,400	0	500	1,700	3,100	**5,300**	4,200	1,000
Total	**8,133,500**	**145,220**	**27,000**	**216,000**	**1,033,500**	**72,200**	**13,300**	**57,100**	**596,900**	**739,500**	**591,180**	**148,320**

N/A = Not available, Source: URS analysis (2009)

[1] E+72 hours does not include potential evacuees due to sanitary/health issues (e.g., lack of water, power, sewer).
[2] 2000 U.S. Census; updated to 2009 figures using California Department of Finance data. Includes access and functional needs populations. See the associated Scenario Data and Assumptions Report (2009).
[3] HAZUS (2009) and county sources, 2007–2009 (run date of August 13, 2009).
[4] Human Services Agency in each county 2007; updated to 2009 figures using California Department of Finance data. See the associated Scenario Data and Assumptions Report (2009). Assumption is that 80% of the homeless will seek shelter.
[5] URS analysis using visitor totals provided by HVS Lodging Services, and Monterey County Conventions and Visitors Bureau. See the associated Scenario Data and Assumptions Report (2009).
[6] 2000 U.S. Census; updated to 2009 figures using California Department of Finance data.
[7] Assumption that 50% of the general population/homeless seeking shelter will need to use mass transportation resources.
[8] Assumption per county that a certain percentage of visitors will need mass transportation to evacuate. Alameda (50%), Contra Costa (20%), Marin (10%), Monterey (0%), Napa (0%), San Benito (0%), San Francisco (20%), San Mateo (20%), Santa Clara (50%), Santa Cruz (0%), Solano (10%), and Sonoma (25%).
[9] Assumption per county that a certain percentage of inter-county commuters will need mass transportation to evacuate. Alameda (75%), Contra Costa (50%), Marin (25%), Monterey (0%), Napa (0%), San Benito (0%), San Francisco (75%), San Mateo (50%), Santa Clara (50%), Santa Cruz (0%), Solano (25%) and Sonoma (25%).
[10] Assumption that 80% of total evacuees needing transportation will use regular mass transportation resources (i.e., standard transit buses, etc.) For evacuation. This includes access and functional needs population that can access a standard transit bus.
[11] It is assumed that 20% of total evacuees needing transportation will need demand response vehicles for evacuation. These are access and functional needs evacuees that require specialized transportation equipment.

Table M-3. Transit resources available for deployment following the Hayward fault earthquake scenario in the 12-county region.

	Number of Transit Vehicles					Available[3] Operations[4] Staff E+30 Days					Available[3] Operations[4] Staff E+60 Days				
County	**Bus[1]**	**Demand Response**	**Light Rail[2]**	**Heavy Rail[2]**	**Ferry**	**Bus**	**Demand Response**	**Light Rail**	**Heavy Rail**	**Ferry**	**Bus**	**Demand Response**	**Light Rail**	**Heavy Rail**	**Ferry**
Alameda[5,6]	562	322	0	63	5	440	51	0	64	N/A	728	106	0	64	N/A
Contra Costa[5]	192	239	0	0	0	112	51	0	0	0	187	106	0	0	0
Marin	189	88	0	0	5	97	2	0	0	49	162	N/A	0	0	81
Monterey	10	2	0	0	0	10	2	0	0	0	10	2	0	0	0
Napa	24	15	0	0	0	15	7	0	0	0	26	11	0	0	0
San Benito	1	2	0	0	0	1	2	0	0	0	1	2	0	0	0
San Francisco	399	99	0	0	0	554	18	0	0	0	924	30	0	0	0
San Mateo	287	102	0	22	0	103	2	0	14	0	172	3	0	24	0
Santa Clara	442	325	0	0	0	316	N/A	—[7]	0	0	527	N/A	—[7]	0	0
Santa Cruz	11	54	0	0	0	11	3	0	0	0	11	3	0	0	0
Solano	66	66	0	0	4	45	9	0	0	12	71	14	0	0	20
Sonoma	9	6	0	0	0	9	N/A	0	0	0	9	N/A	0	0	0
Total	**2,192**	**1,320**	**0**	**85**	**10**	**1,713**	**147**	**0**	**78**	**61**	**2,828**	**277**	**0**	**88**	**101**

Source: National Transit Database 2007; Metropolitan Transportation Commission Statistical Summary of Bay Area Transit Operators, 2008; California Department of Transportation, 2009.

N/A = Not available

[1] Assumption that 20% of the assets will be unavailable due to possible damage, etc., and 80% will be available. For counties not affected (Monterey, San Benito, Santa Cruz, Sonoma, part of Alameda and part of Solano), an assumption is 10% of the transit agency fleet would be available during the event. Transit agencies are allowed to have up to a 20% spare ratio; therefore, half of that, or 10%, is assumed to be available for the regional event. Also, an operator will accompany the vehicle.

[2] Heavy rail includes traditional heavy rail and commuter rail. For San Francisco this includes cable cars. In Alameda County, it includes the Altamont Commuter Express service.

[3] Assumption that within the first 30 days, 30% of staff will be available or return to work, based on anecdotal information from MTC work conducted by URS.

[4] Operations staff includes drivers, operators, ferry captains, etc., that are intended to operate a vehicle/ferry.

[5] The East Bay Paratransit Consortium, a paratransit operator, serves both Alameda and Contra Costa counties. These resources have been allocated evenly between Alameda and Contra Costa counties.

[6] Regional operations staff for the heavy rail category reflects the Altamont Commuter Express (ACE) system at 100% availability, while Bay Area Rapid Transit (BART) operations will be unavailable from E+30 days to E+60 days.

[7] The available light rail transit (LRT) operator numbers were added to the available bus operator number because LRT is expected to be out of service and LRT operators are licensed to drive a bus in the State of California.

M.3.1 Evacuee Transportation Demand

M.3.1.1 Outbound Transportation

The estimated population of evacuees who will need mass transportation resources to reach a shelter is identified in **Table M-2**. It is assumed that the percentages per population type shown in **Table M-4** will need mass transportation resources for evacuation.

Table M-4. Estimated percentage per population type who will need mass transportation resources for evacuation after the Hayward fault earthquake scenario event.

County	General Population Including Homeless	Visitors/ Tourists	Inter-County Commuters
Alameda	50%	50%	75%
Contra Costa	50%	20%	50%
Marin	50%	10%	25%
Monterey	50%	0%	0%
Napa	50%	0%	0%
San Benito	50%	0%	0%
San Francisco	50%	20%	75%
San Mateo	50%	20%	50%
Santa Clara	50%	50%	50%
Santa Cruz	50%	0%	0%
Solano	50%	10%	25%
Sonoma	50%	25%	25%

Source: URS analysis (2009)

As the catastrophic nature of the earthquake is realized, additional evacuees will need to be transported out of the affected areas. Within the first 14 days, it is assumed that additional populations will need transportation when potable water is not restored, emergency water sources are inadequate, and stored water runs out. Additional evacuees have been identified as seeking shelter from E+72 hours to E+14 days. This estimate is based on the assumption that 10 percent of the additional population without water will seek shelter.

It is further assumed that of the additional people seeking shelter, 50 percent of these evacuees will need to be transported by mass transportation resources.

Data for the additional population without potable water is based on HAZUS and takes into account water breaks at residential facilities, but does not take into account breaks in major water systems such as Hetch Hetchy. If the Hetch Hetchy water delivery system were to be affected, an additional 1 million people would potentially be affected by a lack of potable water, leading to an additional 100,000 people needing to use mass transportation resources for an evacuation. Damage to

the Hetch Hetchy infrastructure is difficult to ascertain and restoration of the system is likely to extend beyond the 60-day time frame of this Plan.

This additional population seeking shelter and needing to use mass transportation resources because of a lack of potable water, based on HAZUS, is identified in **Table M-5**.

Table M-5. Estimated additional evacuees needing mass transportation resources from E+72 hours to E+14 days after the Hayward fault earthquake scenario.

County	Population without Potable Water	Number Seeking Shelter	Number Needing Mass Transportation
Alameda	1,381,100	138,100	69,000
Contra Costa	874,400	87,400	43,700
Marin	0	0	0
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	0	0	0
San Mateo	159,900	15,900	7,900
Santa Clara	1,071,900	107,100	53,500
Santa Cruz	0	0	0
Solano	0	0	0
Sonoma	0	0	0
Total	**3,487,300**	**348,500**	**174,100**

Source: HAZUS and URS analysis (2009)

The number of evacuees projected to use mass transportation resources from E+72 hours to E+14 days is identified in **Table M-6**. By E+72 hours to E+5 days, it is assumed that organized mass transportation resources will start to be available to transport evacuees.

M.3.1.2 Inbound Transportation

As time passes from E+14 days to E+30 days, some evacuees are able to return to their residences. The estimate for the evacuees who return is based on the restoration of potable water to residences. It is difficult to determine whether the evacuees' residences will be habitable; therefore, the restoration of potable water is used as a surrogate. It is assumed that 30 percent of the evacuees transported to shelters because of a lack of potable water will be able to return to their residences by E+30 days, and an additional 30 percent of the evacuees transported to shelters because of a lack of potable water will be able to return to their residences by E+60 days. Evacuees will be returned to pickup locations, not to their actual residences. The estimated number of returning residents needing mass transportation resources back to their residences is identified in **Table M-7**.

Table M-6. Total evacuees needing mass transportation resources from E+3 to E+14 days after the Hayward fault earthquake scenario.

County	E+72 Hours	E+72 Hours to E+14 Days	Total
Alameda	205,400	69,000	**274,400**
Contra Costa	54,800	43,700	**98,500**
Marin	13,100	0	**13,100**
Monterey	500	0	**500**
Napa	100	0	**100**
San Benito	0	0	**0**
San Francisco	227,000	0	**227,000**
San Mateo	80,200	7,900	**88,100**
Santa Clara	146,100	53,500	**199,600**
Santa Cruz	1,100	0	**1,100**
Solano	5,900	0	**5,900**
Sonoma	5,300	0	**5,300**
Total	**739,500**	**174,100**	**913,600**

Source: URS analysis (2009)

Table M-7. Estimated number of returning residents needing transportation back to residences at E+30 and E+60 days after the Hayward fault earthquake scenario.

County	E+30 Days	E+60 Days
Alameda	20,700	20,700
Contra Costa	13,100	13,100
Marin	0	0
Monterey	0	0
Napa	0	0
San Benito	0	0
San Francisco	0	0
San Mateo	2,300	2,300
Santa Clara	16,000	16,000
Santa Cruz	0	0
Solano	0	0
Sonoma	0	0
Total	**52,100**	**52,100**

Source: URS analysis (2009)

The Plan projects that at the end of E+60 days, evacuees who are unable to return to their residences will remain in shelters and will need to be transported to interim housing. However, mass transportation operations beyond E+60 days are beyond the scope of the Plan.

M.3.2 Potential Pickup Locations for Ferry and Rail Service and Potential Airports

The majority of the potential pickup locations for ferry and rail service and airports remain the same as those for the basic Plan; revised maps for these points are not provided. Noted differences are:

- The rail evacuation point in Alameda County is the Livermore station
- The rail evacuation point in Santa Clara County is the Morgan Hill/Gilroy station

M.3.3 Post-Event Sheltering Capacity

The projected post-event sheltering capacity for the Hayward fault earthquake scenario has been calculated and is identified below in **Table M-8**. The sheltering capacity after the Hayward fault earthquake scenario is projected to be higher than for the San Andreas fault earthquake scenario.

Table M-8. Post-event sheltering capacity in the 12-county region after the Hayward fault earthquake scenario event.

County	Post-Event Sheltering Capacity
Alameda	300
Contra Costa	2,000
Marin	5,500
Monterey	7,400
Napa	1,800
San Benito	100
San Francisco	4,700
San Mateo	13,100
Santa Clara	10,400
Santa Cruz	23,600
Solano	5,900
Sonoma	23,200
Total	**98,000**

Source: URS analysis (2009)

M.3.4 Transportation Patterns

Transportation patterns identified in the Plan essentially remain the same; however, some slight changes have been made due to sheltering capacity in specific counties. See **Attachment 2**, for the underlying assumptions regarding evacuee transportation patterns. The attachment highlights the differences between assumptions used for the San Andreas fault earthquake scenario and the Hayward fault earthquake scenario.

M.3.4.1 E+72 Hours to E+14 Days

The total numbers of evacuees by category of evacuee and transportation pattern for E+72 hours to E+14 days are identified in **Table M-9**.

M.3.4.2 E+14 Days to E+60 Days (Up to Approximately E+30 Days)

From E+14 days to E+60 days (up to approximately E+30 days), the predominant movement of evacuees will be back into the region and a return to their residences. A combination of bus/demand response vehicle and rail service will be used to transport evacuees. Ferry service is not anticipated to transport residents during this time frame because residents will either be in shelters away from ferry facilities or at shelters outside the region. Bus/demand response vehicle and rail service is able to accommodate the transportation pattern of these evacuees.

The total number of residents and transportation pattern for E+14 days to E+60 days (up to approximately E+30 days) is identified in **Table M-10**.

M.3.4.3 E+14 Days to E+60 Days (Up to Approximately E+60 Days)

During the time period from E+14 days to E+60 days (up to approximately E+60 days), the predominant movement of evacuees will be back into the region and returning to their residences. A combination of bus/demand response vehicle and rail service will be used to transport evacuees. Ferry service is not anticipated to transport residents during this time frame because residents will either be in shelters away from ferry facilities or at shelters outside the region. Bus/demand response vehicle service and rail service will be able to accommodate the transportation pattern of these evacuees.

The total number of residents and the transportation pattern for E+14 days to E+60 days (up to approximately E+60 days) is identified in **Table M-11**.

M.3.4.4 Summary of Transportation Movement (Inbound/Outbound Evacuees) from E+72 Hours to E+60 Days

Table M-12 identifies by time period the number of inbound and outbound evacuees transported using mass transportation resources.

Table M-9. Evacuees by transportation pattern, from E+72 hours to E+14 days, after the Hayward fault earthquake scenario event.

County	Bus/DRV to Airport (Visitors/ Tourists)	Ferry to Bus/ DRV to Shelter (Residents + Commuters)	Bus/DRV to Local Shelter (Residents + Commuters)	Bus/DRV to Regional Shelter (Residents + Commuters)	Bus/DRV to Out-of-Region Shelter (Residents + Commuters)	Bus/DRV to Rail to Out-of-Region Shelter (Residents + Commuters)	Total Evacuees
Alameda	12,400	0	0	0	131,000	131,000	**274,400**
Contra Costa	3,400	0	0	0	47,500	47,600	**98,500**
Marin	400	0	2,000	10,500	200	0	**13,100**
Monterey	0	0	500	0	0	0	**500**
Napa	0	0	100	0	0	0	**100**
San Benito	0	0	0	0	0	0	**0**
San Francisco	15,000	169,700	0	0	21,100	21,200	**227,000**
San Mateo	2,300	0	5,600	0	40,100	40,100	**88,100**
Santa Clara	21,200	0	0	24,900	76,800	76,700	**199,600**
Santa Cruz	0	0	1,100	0	0	0	**1,100**
Solano	700	0	3,600	0	900	700	**5,900**
Sonoma	1,700	0	3,600	0	0	0	**5,300**
Total	**57,100**	**169,700**	**16,500**	**35,400**	**317,600**	**317,300**	**913,600**

Source: URS analysis (2009)
DRV = demand response vehicle

Table M-10. Estimated number of residents returning from E+14 days to E+60 days (up to approximately E+30 days) after the Hayward fault earthquake scenario event.

County	From Shelter by Bus	From Shelter to Rail to Bus	Total Evacuees
Alameda	10,400	10,300	**20,700**
Contra Costa	6,500	6,500	**13,000**
Marin	0	0	**0**
Monterey	0	0	**0**
Napa	0	0	**0**
San Benito	0	0	**0**
San Francisco	0	0	**0**
San Mateo	1,200	1,200	**2,400**
Santa Clara	12,000	4,000	**16,000**
Santa Cruz	0	0	**0**
Solano	0	0	**0**
Sonoma	0	0	**0**
Total	**30,100**	**22,000**	**52,100**

Source: URS Analysis (2009)

Table M-11. Estimated number of residents returning from E+14 days to E+60 days (up to approximately E+60 days), by county, after the Hayward fault earthquake scenario.

County	From Shelter by Bus	From Shelter to Rail to Bus	Total Evacuees
Alameda	10,400	10,300	**20,700**
Contra Costa	6,500	6,500	**13,000**
Marin	0	0	**0**
Monterey	0	0	**0**
Napa	0	0	**0**
San Benito	0	0	**0**
San Francisco	0	0	**0**
San Mateo	1,200	1,200	**2,400**
Santa Clara	12,000	4,000	**16,000**
Santa Cruz	0	0	**0**
Solano	0	0	**0**
Sonoma	0	0	**0**
Total	**30,100**	**22,000**	**52,100**

Source: URS analysis (2009)

Table M-12. Summary of transportation movement in the Hayward fault earthquake scenario.

	E+72 Hours to E+14 Days			E+14 Days to E+60 Days (Up to Approximately E+30 Days)			E+14 Days to E+60 Days (Up to Approximately E+60 Days)		
County	**Outbound Evacuees**	**Inbound Evacuees**	**Total Estimated Evacuees Transported**	**Outbound Evacuees**	**Inbound Evacuees**	**Additional Estimated Evacuees Transported**	**Outbound Evacuees**	**Inbound Evacuees**	**Additional Estimated Evacuees Transported**
Alameda	274,400	0	274,400	0	20,700	20,700	0	20,700	20,700
Contra Costa	98,500	0	98,500	0	13,100	13,100	0	13,100	13,100
Marin	13,100	0	13,100	0	0	0	0	0	0
Monterey	500	0	500	0	0	0	0	0	0
Napa	100	0	100	0	0	0	0	0	0
San Benito	0	0	0	0	0	0	0	0	0
San Francisco	227,000	0	227,000	0	0	0	0	0	0
San Mateo	88,100	0	88,100	0	2,300	2,300	0	2,300	2,300
Santa Clara	199,600	0	199,600	0	16,000	16,000	0	16,000	16,000
Santa Cruz	1,100	0	1,100	0	0	0	0	0	0
Solano	5,900	0	5,900	0	0	0	0	0	0
Sonoma	5,300	0	5,300	0	0	0	0	0	0
Total	**913,600**	**0**	**913,600**	**0**	**52,100**	**52,100**	**0**	**52,100**	**52,100**

Source: URS analysis (2009)

M.4 Mass Transportation of Inbound Responders/Relief Workers

The operational approach to transporting inbound responders and relief workers into the 12-county region remains largely unchanged from the Plan. Due to the nature of a Hayward fault earthquake and the differences in projected impacts on different areas, however, the distribution patterns of these workers will be different for the Hayward fault earthquake scenario than for the San Andreas fault earthquake scenario. **Table M-13** shows the numbers of workers to be transported and corresponding number of vehicles and operators needed from E+72 hours to E+60 days.

M.5 Resources for Mass Transportation Operations

The resources needed to support mass transportation operations essentially remain the same regardless of the location of the earthquake. For example, there will still be a need for standard buses and demand response vehicles, and the number of hours an operations staff can operate a vehicle, ferry, or locomotive remains the same. However, local and regional shelters should be available for evacuees with the use of bus/demand response vehicles able to provide flexibility of service. Information regarding air operations, rail operations, and ferry operations remains the same for both earthquake scenarios. The difference between the San Andreas fault and the Hayward fault earthquake scenarios occurs in the area of bus/demand response operations.

M.5.1 Vehicles and Staff

The assumptions used to project vehicle availability and shortfalls during evacuation operations are listed in **Attachment 3**. Additional information regarding the calculations used to project resource use is provided in **Attachments 4** and **5**.

For E+72 hours to E+14 days, there is an overwhelming shortfall of sheltering capacity within the region. As a result, mass transportation resources will be used to transport evacuees to a transportation facility (airport, ferry terminal, pick up location and/or rail station) for further transportation to a local, regional, or out-of-region shelter, or to transport visitors and tourists to an airport for a return home.

The need to transport evacuees to out-of-region shelters leads to an overwhelming shortfall of mass transportation resources. As a result, the Federal Emergency Management Agency and the Unified Coordination Group will need to contract for mass transportation resources (assets and staff) within hours of the event.

Evacuees will start returning to the region, from E+14 days to E+60 days, and many will need mass transportation. Sufficient mass transportation resources should be available at that time to provide the necessary transportation.

Table M-14 identifies the vehicles needed on a daily basis and the corresponding shortfalls. **Table M-15** provides additional information on shortfalls in staff.

Table M-13. Transportation logistics for the Hayward fault earthquake scenario, E+72 hours to E+60 days, inbound.

County	Population[1]	Average One-Way Trip (miles)[2]	Trip Time (in hours)[3]	Number of Drivers Needed per Day[4]	Number of Round Trips per Vehicle[5]	Daily Buses Required to Move Population[6]	Total Miles per Day for Vehicles	Fuel Consumed Daily for Buses (gallons)[7]
Alameda	11,369	40	5	80	4	80	25,600	4,270
Contra Costa	2,740	40	5	20	4	20	6,400	1,070
Marin	428	40	5	10	4	10	3,200	540
Monterey	5	40	5	10	4	0	20	10
Napa	5	40	5	10	4	0	20	10
San Benito	6	40	5	10	4	0	20	10
San Francisco	2,386	40	5	20	4	20	6,400	1,070
San Mateo	2,167	40	5	20	4	20	6,400	1,070
Santa Clara	5,741	40	5	40	4	40	12,800	2,140
Santa Cruz	15	40	5	10	4	0	40	10
Solano	132	40	5	10	4	10	3,200	540
Sonoma	5	40	5	10	4	0	20	10
Total	**25,000**	N/A	N/A	**250**	N/A	**200**	**64,120**	**10,750**

Source: URS analysis (2009)
N/A = Not applicable

1 Daily commuting of 25,000 responder/relief workers. Responder/relief workers distributed based on HAZUS debris data under the assumption that responder/relief workers would be in the hardest hit counties or the counties with the most debris.

2 The transportation of the responder/relief workers is difficult within the county; therefore, for planning purposes assumed 40 miles of travel to and from the base camp per day.

3 Bus speed is estimated at 15 miles per hour due to the condition of the roadways and to account for loading and unloading. Trip time also includes the return trip of the bus to the origin destination. During E + 3 Days + E + 60 Days, buses will be used to transport evacuees to shelters or out of the region and these same vehicles can be used to transport responder/relief workers. However, there will be times when buses may not be needed to evacuate people and therefore, to ensure the resources are identified, deferred to include a round trip for estimating trip time.

4 Number of drivers based on the maximum allowable drive time of 10 hours per day

5 Based on operating a vehicle 23 hours per day with 1 hour for fueling, light maintenance, etc.

6 To accommodate responder/relief workers and their equipment/supplies/gear it is assumed that 75% of an asset's capacity can be used to transport responder/relief workers. 38 passengers per bus based on the average bus capacity of 50 seats @ 75% due to equipment/supplies/gear per responder/relief workers

7 Fuel consumption of 6 miles per gallon for standard buses.

Table M-14. Transit vehicle needs and surpluses/shortfalls in the 12-county region after the Hayward fault earthquake scenario event.

	E+72 Hours to E+14 Days		E+14 Days to E+60 Days[1]		E+14 Days to E+60 Days[2]	
Transit Vehicle	Number Needed per Day	Surplus/ Shortfall	Number Needed per Day	Surplus/ Shortfall	Number Needed per Day	Surplus/ Shortfall
Bus	4,080	–1,888	130	2,062	90	2,102
Demand response	2,150	–830	90	1,230	80	1,240
Ferry	48	–7	0	41	0	41
Rail car	720	–635	40	45	40	45
Locomotive	72	–57	4	12	4	12

Source: URS analysis (2009)

[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

Table M-15. Transportation staff needs and surpluses/shortfalls in the 12-county region after the Hayward fault earthquake scenario event.

	E+72 Hours to E+14 Days		E+14 Days to E+60 Days[1]		E+14 Days to E+60 Days[2]	
Transit Vehicle	Number Needed per Day	Surplus/ Shortfall	Number Needed per Day	Surplus/ Shortfall	Number Needed per Day	Surplus/ Shortfall
Bus	6,960	–5,247	180	1,533	140	2,688
Demand response	2,930	–2,285	130	515	120	645
Ferry	200	–139	0	61	0	61
Rail car/ locomotive	170	–92	40	38	40	48

Source: URS analysis (2009)

[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

From E+72 hours to E+14 days, all modes of mass transportation assets are in shortfall, but more important is the shortfall in staff needed to transport evacuees to shelter. Assets may be available, but if staff is not available; this asset will not be useful. A significant shortfall is the number of operators to drive a standard bus; this is estimated at approximately 5,200 operators. This is a severe shortfall that would need to be addressed in order to transport evacuees to shelter and safety. Without adequate staff, the life and safety of evacuees is compromised, leading to sickness, disease, and possibly death.

M.5.2 Fuel Supplies

A total of approximately 2 million gallons is estimated to be needed to support mass transportation operations. Mass transportation agencies, logistical centers for

private-carrier mass transportation resources, and first responders will all need to be provided fuel. Mass transportation providers, both public and private, will need to be provided fuel on a daily basis.

Table M-16 identifies the estimated daily requirements for fuel to support transportation operations, by transportation mode and time frame.

The type of fuel is indicated in **Table M-17**. Generally buses, ferries, and locomotives will use diesel fuel, and demand response vehicles will use gasoline.

Table M-16. Summary of daily fuel requirement for standard buses, demand response vehicles, ferries, and locomotives in the region after the Hayward fault earthquake scenario.

	Daily Fuel Requirement (in gallons)		
Mode	**E+72 Hours to E+14 Days**	**E+14 Days to E+60 Days[1]**	**E+14 Days to E+60 Days[2]**
Standard bus	289,950	5,780	4,950
Demand response vehicle	99,540	2,030	1,920
Ferry	58,000	0	0
Locomotive	12,950	720	720
Total	**460,440**	**8,530**	**7,590**

Source: URS analysis (2009)

[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

Table M-17. Daily fuel requirement for standard buses, demand response vehicles, ferries, and locomotives in the region by fuel type after the Hayward fault earthquake scenario.

	Daily Fuel Requirement (in gallons)		
Fuel Type	**E+72 Hours to E+14 Days**	**E+14 Days to E+60 Days[1]**	**E+14 Days to E+60 Days[2]**
Diesel	360,900	6,500	5,670
Gasoline	94,540	2,030	1,920

Source: URS analysis (2009)

[1] E+14 days to approximately E+30 days
[2] E+14 days to approximately E+60 days

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Appendix M:
Attachments 1 to 5

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Attachment 1:
Maps

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Table of Contents

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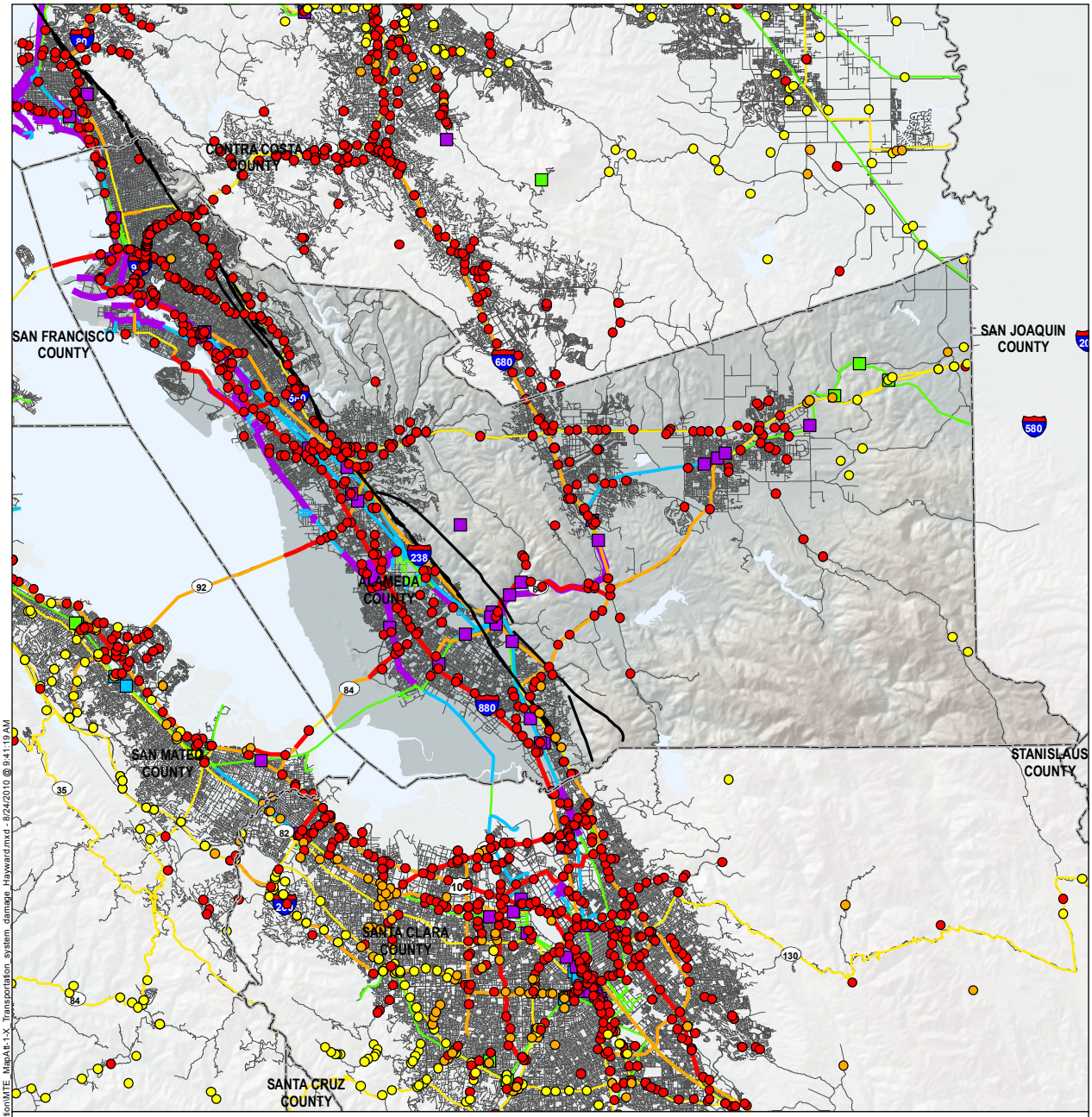

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Notes:
1. Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.
2. HAZUS default transportation
3. Road data source: HCIP Gold, 2007
4. Fault data source: USGS, 2006
5. Topographic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

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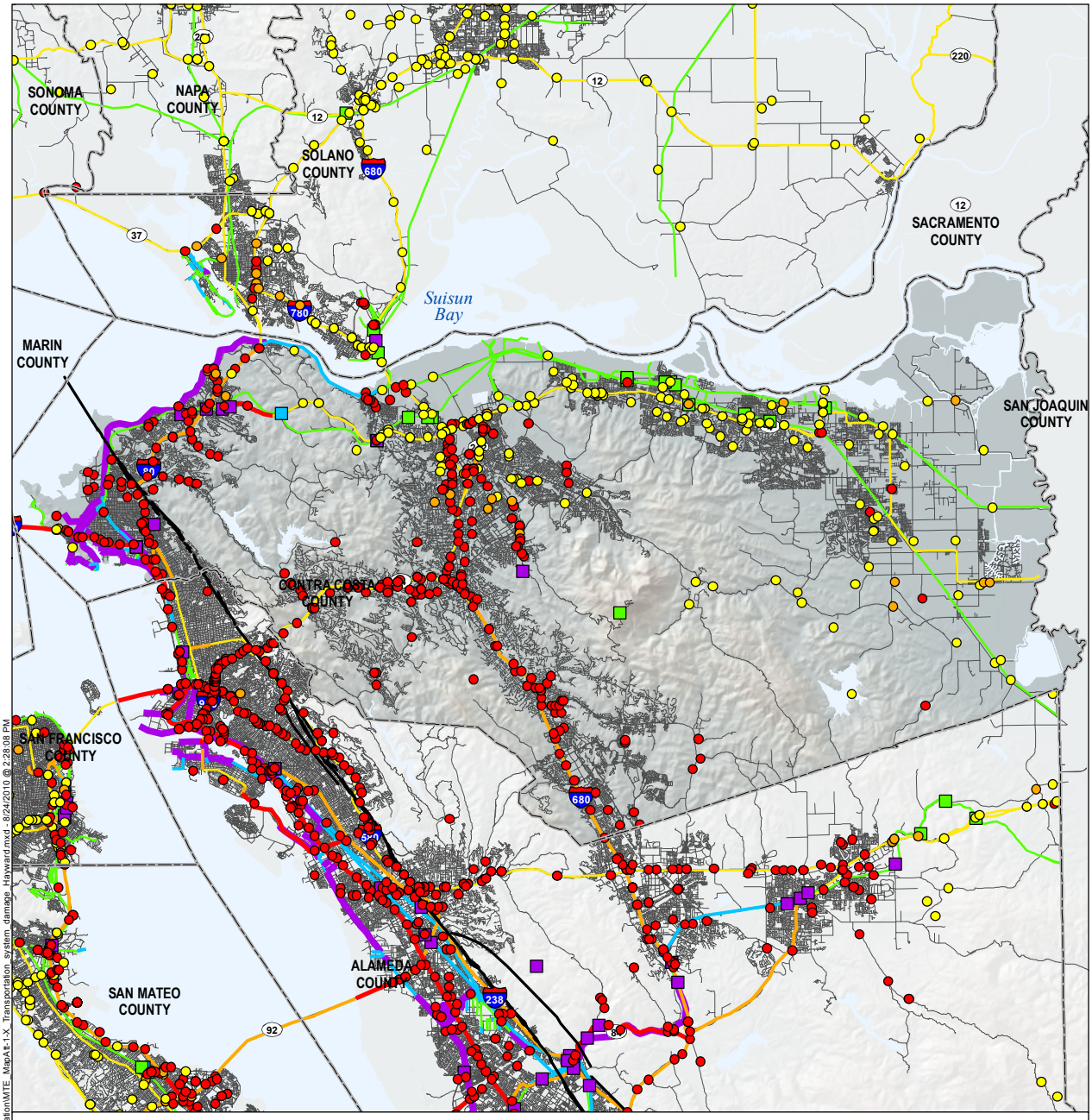
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-1
Surface transportation system damage: Alameda County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay



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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
- Hayward fault zone
- Road

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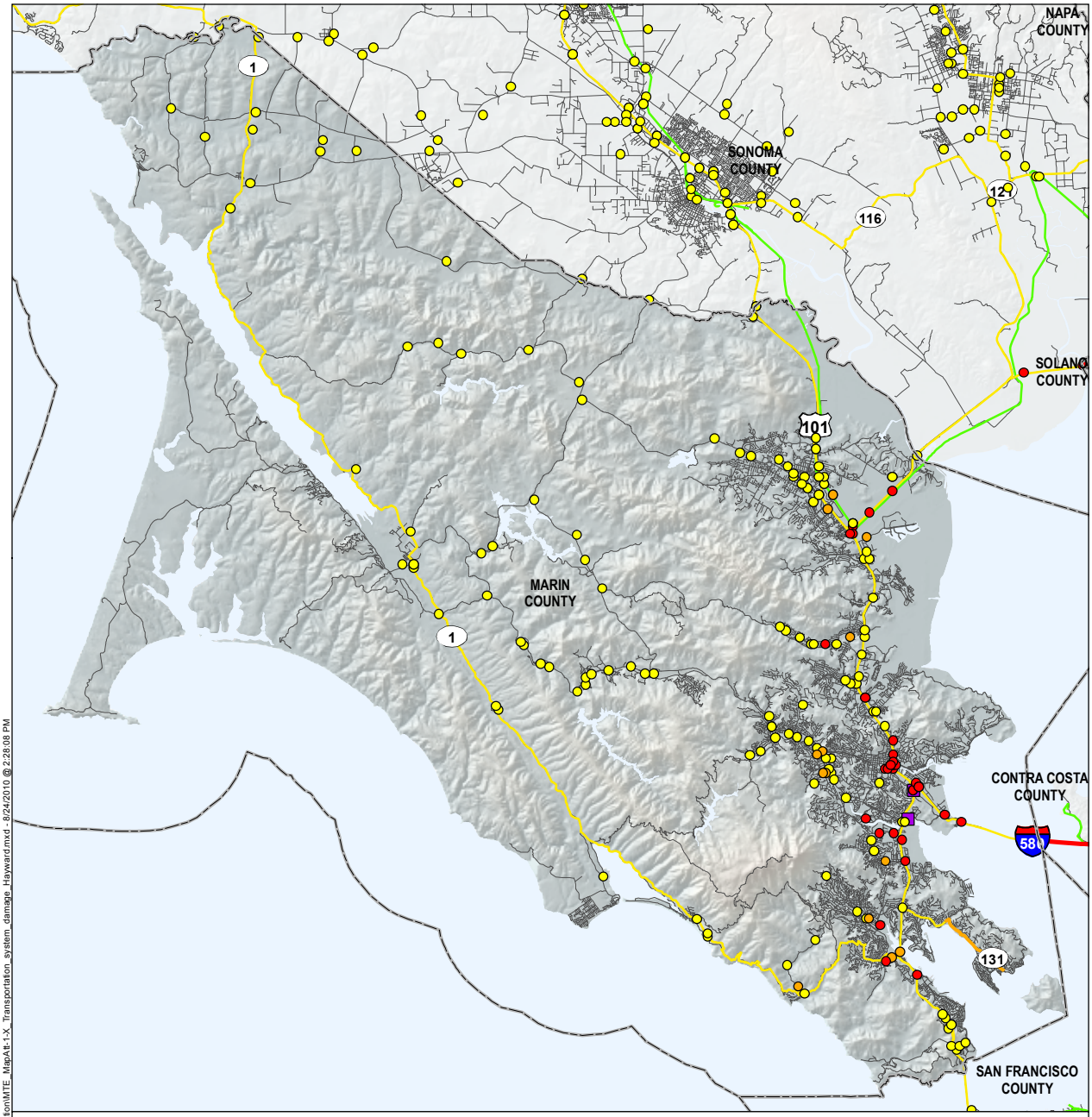
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-2
Surface transportation system damage: Contra Costa County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay



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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
- Hayward fault zone
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-3
Surface transportation system damage: Marin County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay

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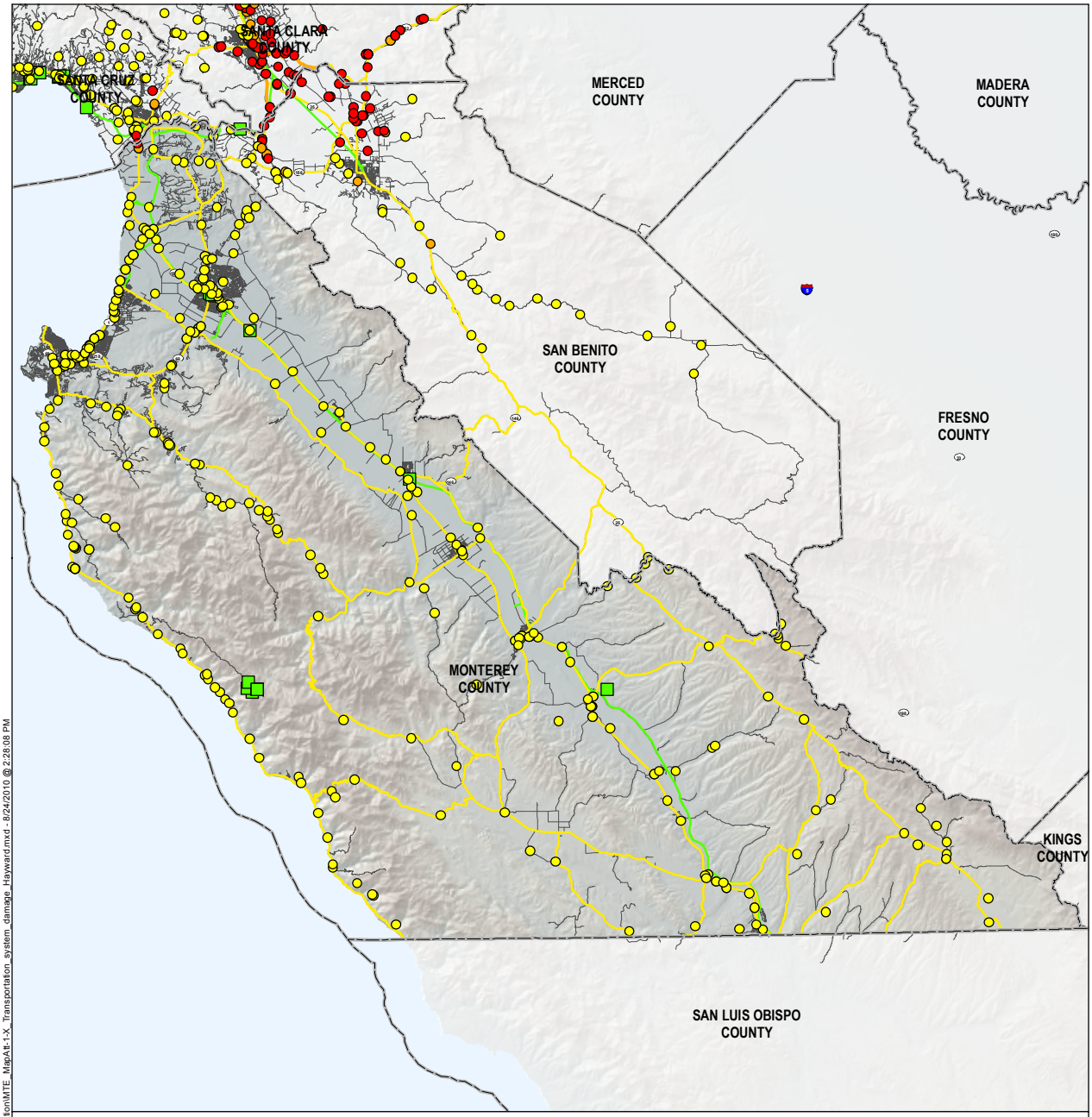

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Notes:
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2. HAZUS default transportation
3. Road data source: HCIP Gold, 2007
4. Fault data source: USGS, 2006
5. Topographic data source: USGS NED

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
- Hayward fault zone
- Road

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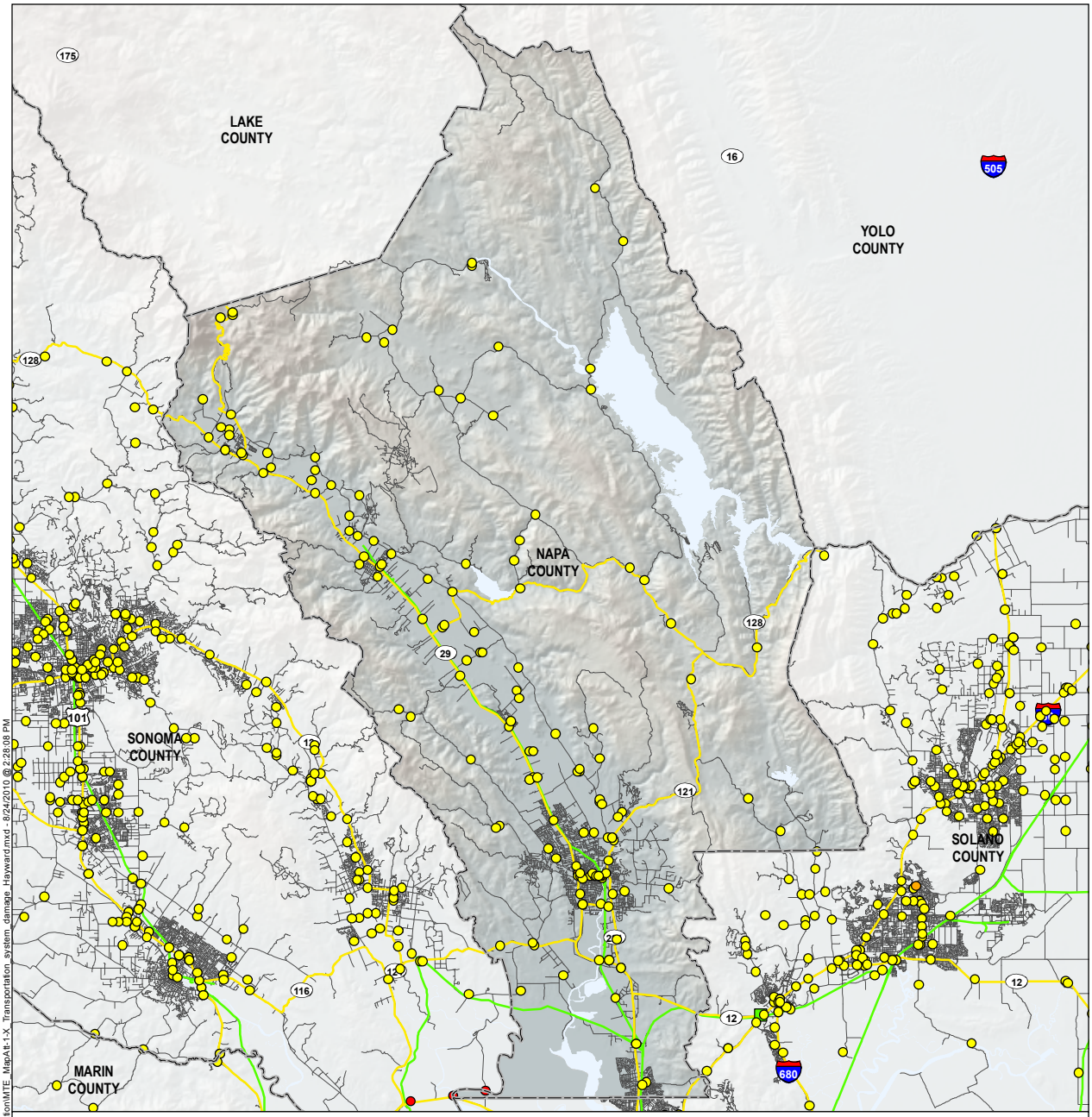
Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-4
Surface transportation system damage: Monterey County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay



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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
- Hayward fault zone
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-5
Surface transportation system damage: Napa County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay

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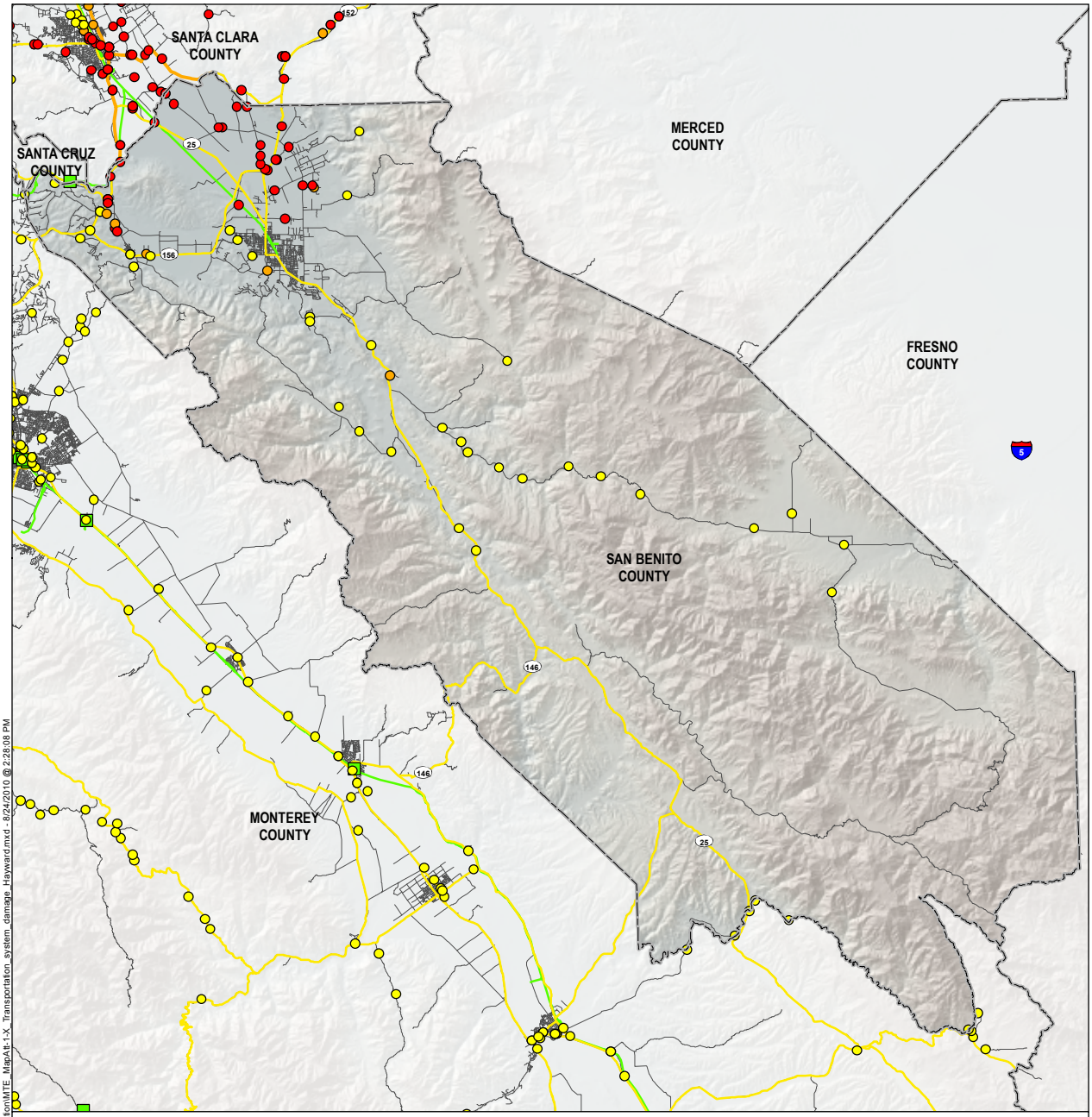

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Notes:
1. Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.
2. HAZUS default transportation
3. Road data source: HCIP Gold, 2007
4. Fault data source: USGS, 2006
5. Topographic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

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-6
Surface transportation system damage: San Benito County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay

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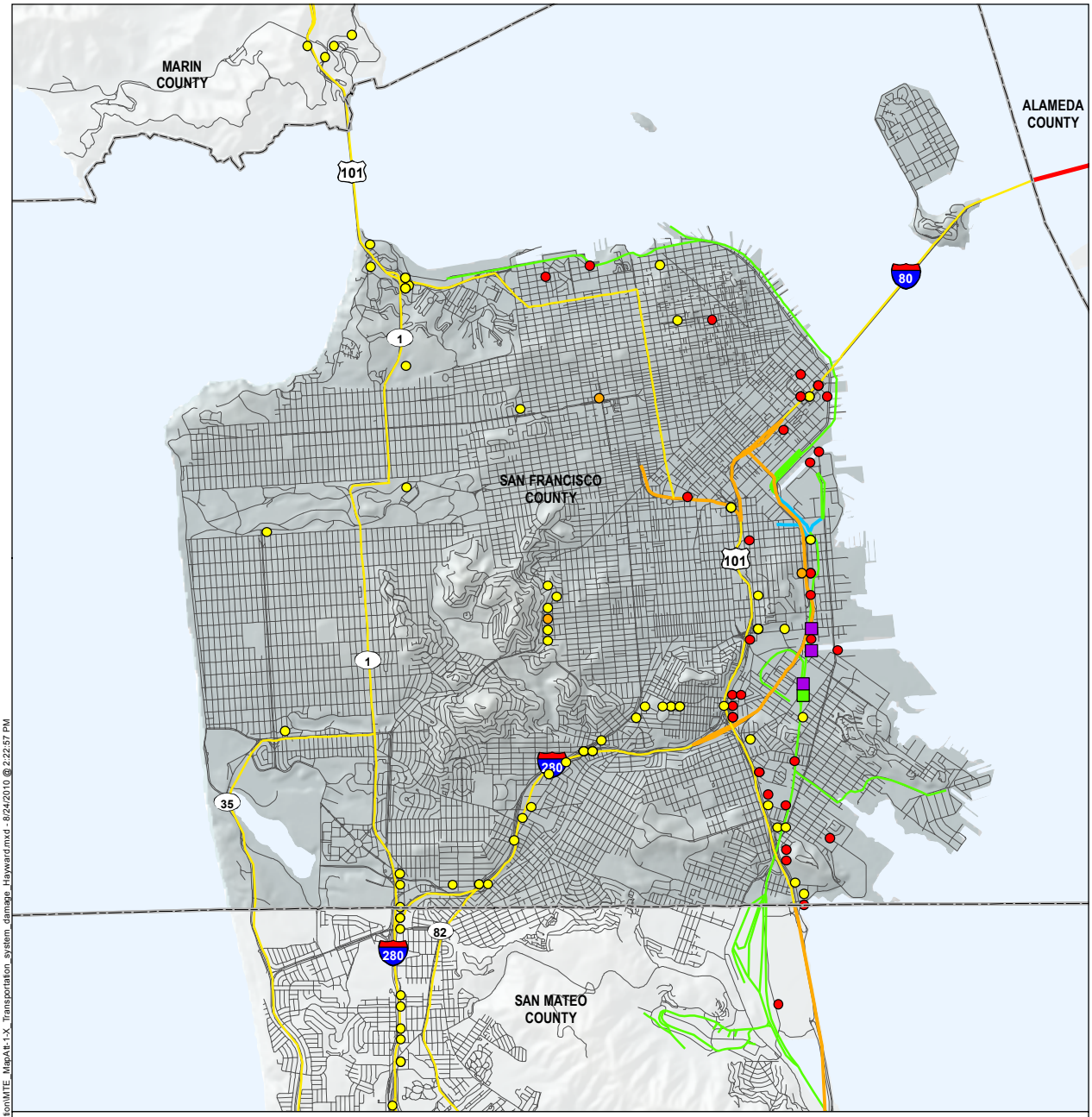

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Notes:
1. Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.
2. HAZUS default transportation
3. Road data source: HCIP Gold, 2007
4. Fault data source: USGS, 2006
5. Topographic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

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-7
Surface transportation system damage: San Francisco County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay

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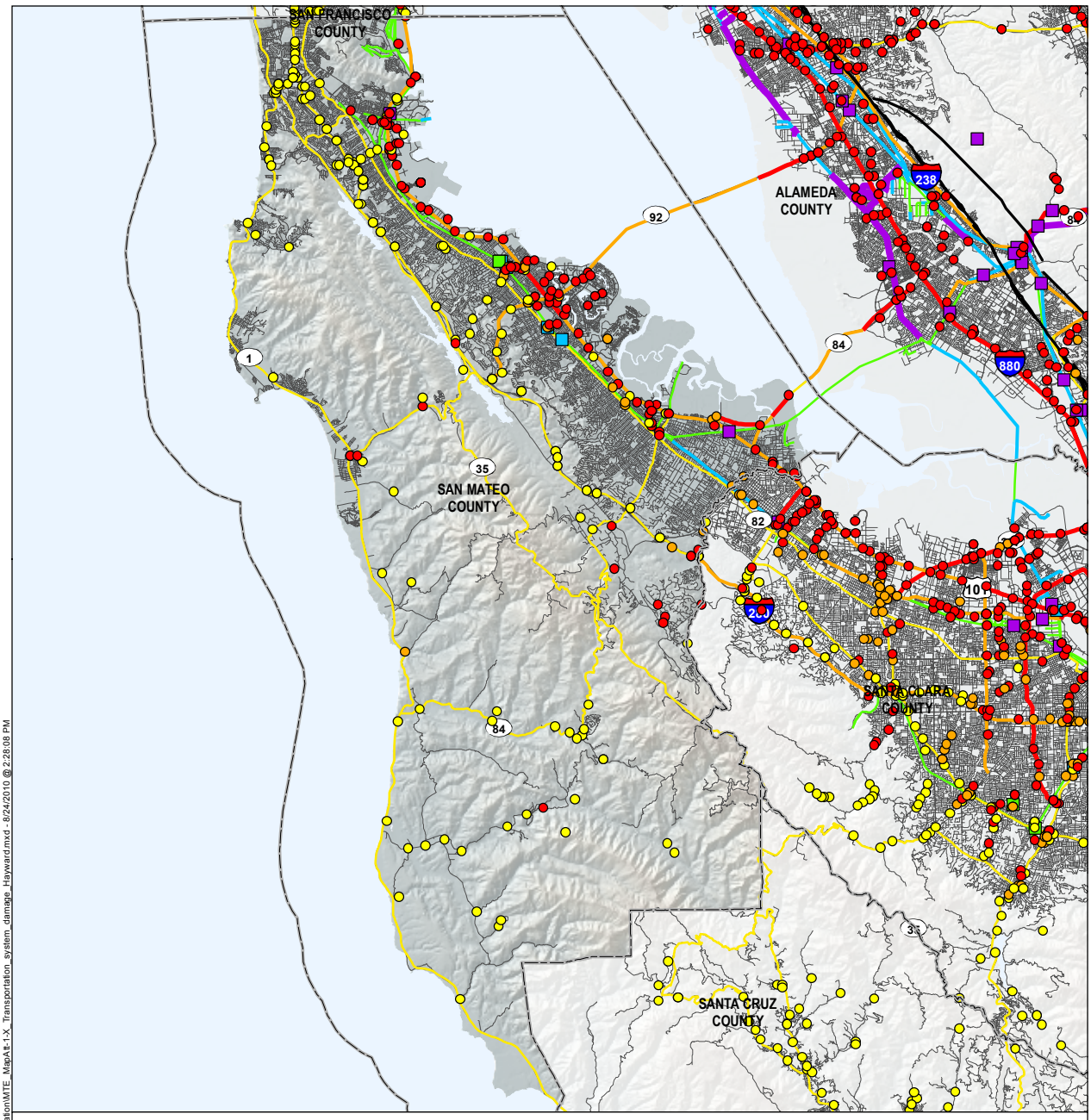


Notes:
1. Functionality, Day 1 is expressed as the probability that a given highway, railway, or bridge segment will be functional at Day 1.
2. HAZUS default transportation
3. Road data source: HCIP Gold, 2007
4. Fault data source: USGS, 2006
5. Topographic data source: USGS NED

Functionality, Day 1

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

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

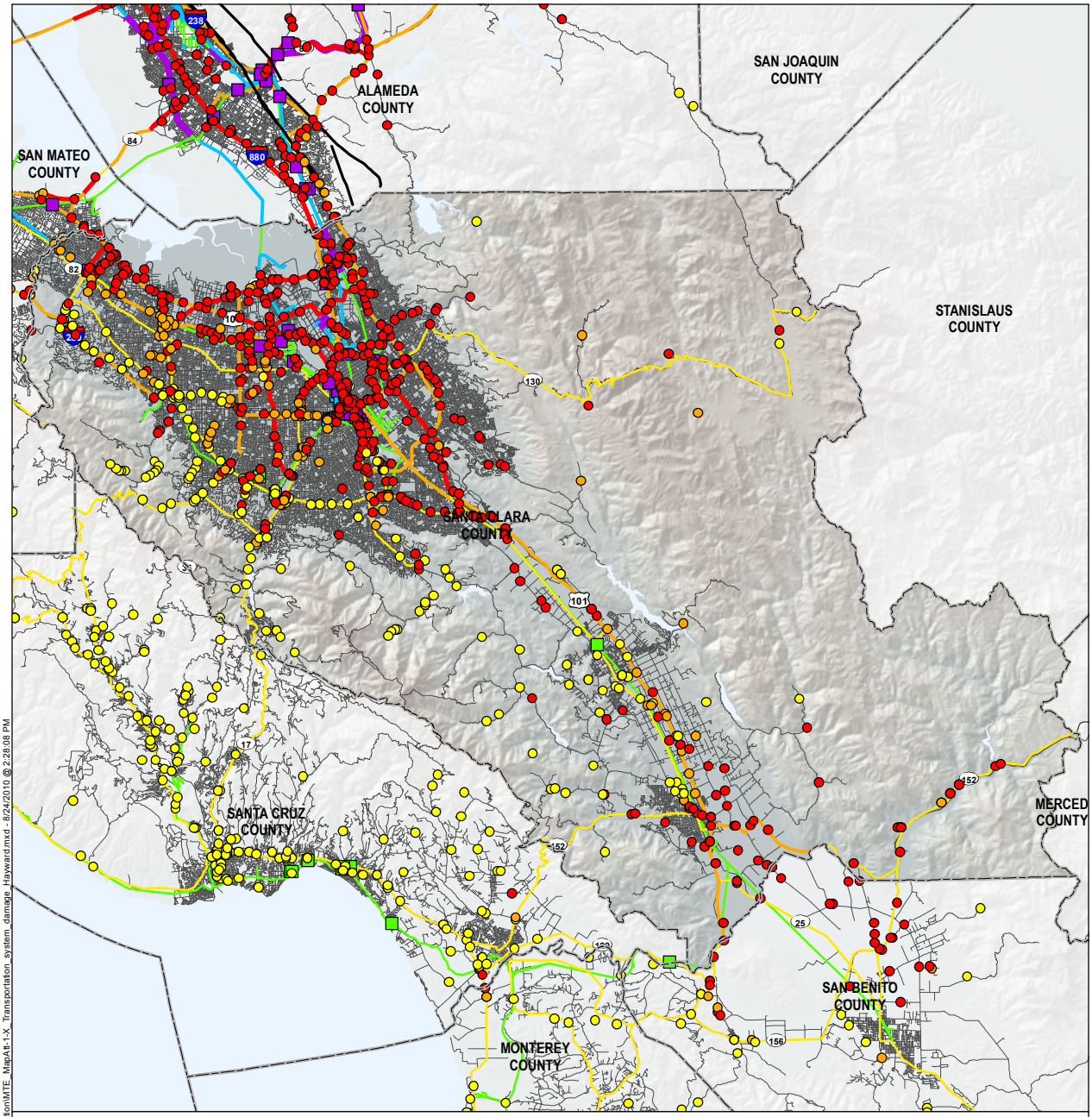
Highways
- < 90%
- 90 - 95%
- 95 -100%

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

- County boundary
- Hayward fault zone
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-8
Surface transportation system damage: San Mateo County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay



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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
- Hayward fault zone
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-9
Surface transportation system damage: Santa Clara County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay

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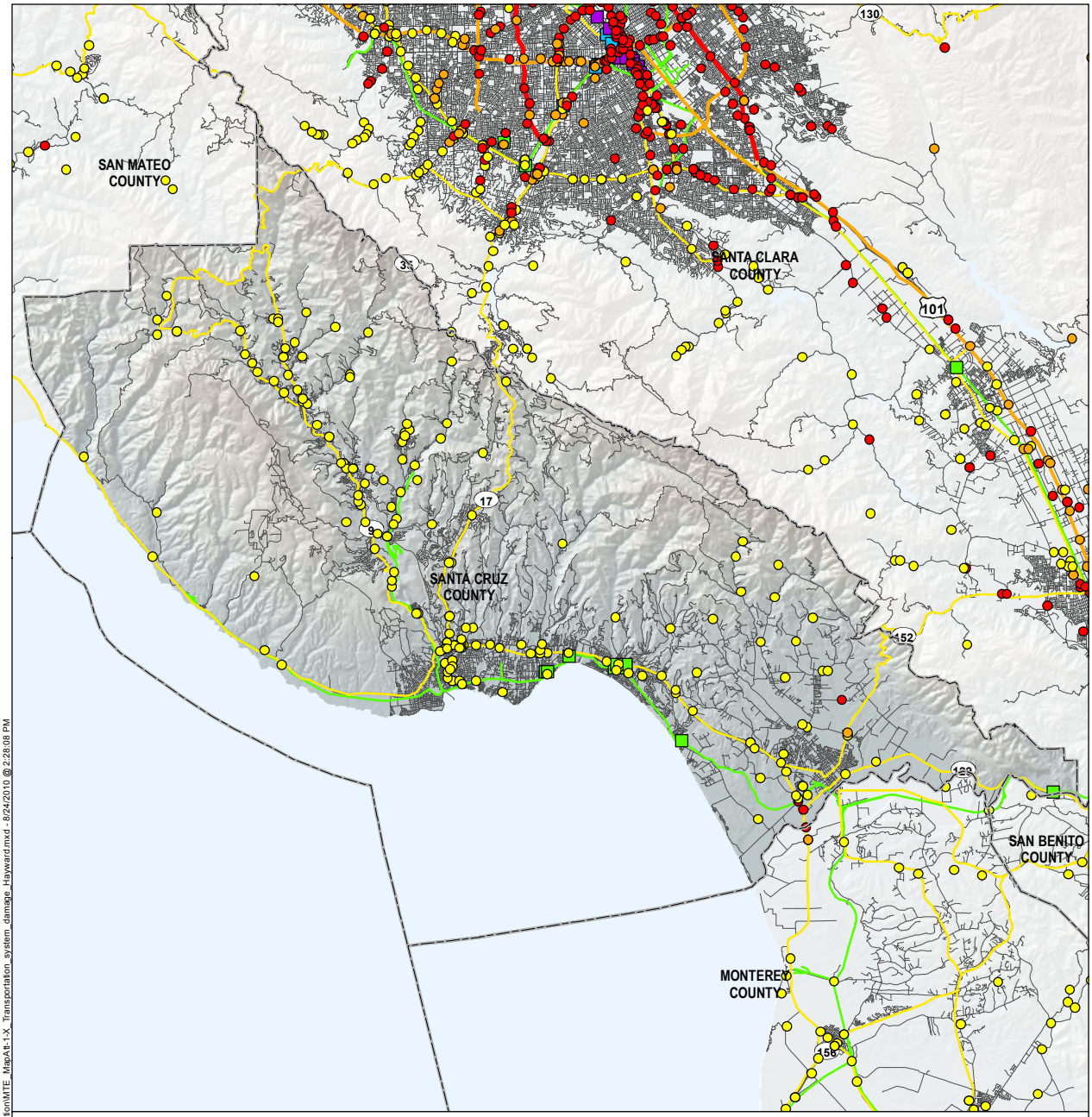

N

0 4 8
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
- Hayward fault zone
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-10
Surface transportation system damage: Santa Cruz County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay

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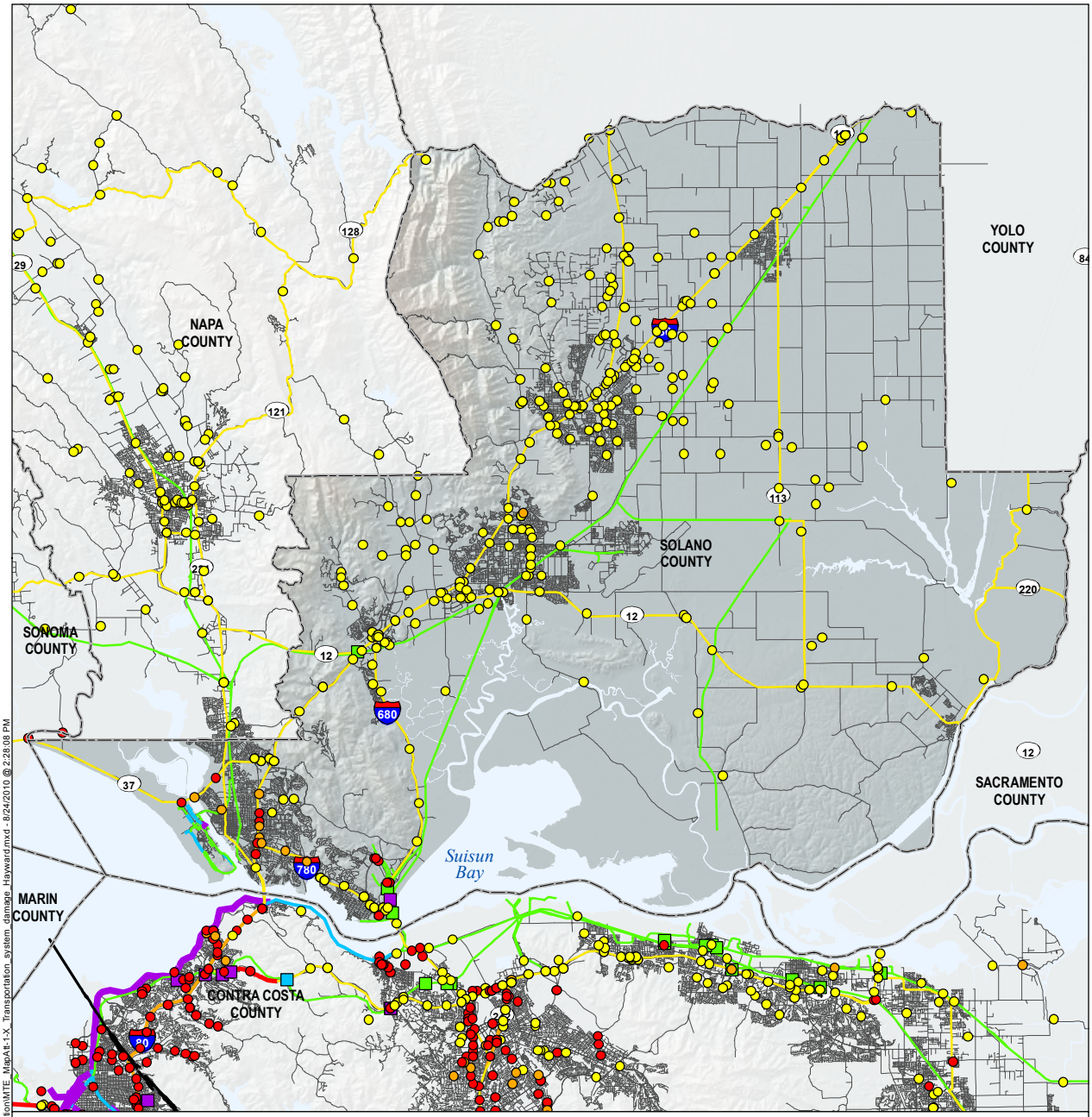

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0 4 8
MILES

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%

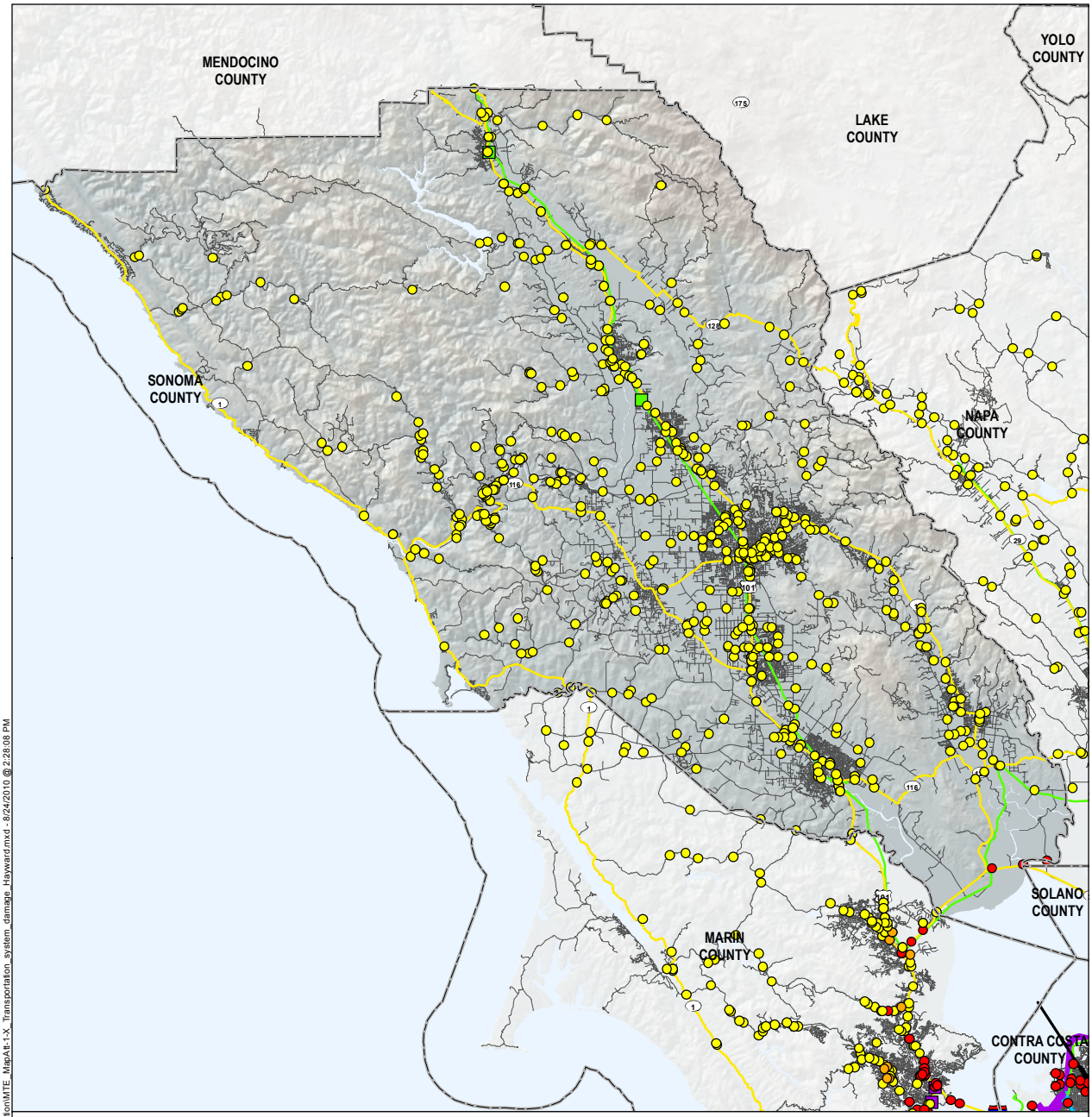
Highways
- < 90%
- 90 - 95%
- 95 -100%

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

- County boundary
- Hayward fault zone
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-11
Surface transportation system damage: Solano County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay



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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
- Hayward fault zone
- Road

Bay Area UASI Program
Regional Catastrophic Preparedness Grant Program

Map Att-1-12
Surface transportation system damage: Sonoma County
Scenario: **M** 7.05 Hayward fault earthquake
Hypocenter San Pablo Bay

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Attachment 2:
Evacuee Movement Assumptions

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Table of Contents

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Attachment 2: Evacuee Movement Assumptions

The transportation patterns in the Hayward fault earthquake scenario are essentially the same as in the San Andreas fault earthquake scenario; the differences are due primarily to sheltering capacities in specific counties.

Sheltering capacity for the Hayward fault earthquake scenario is higher than for the San Andreas fault earthquake scenario because fewer designated shelters will be damaged by the earthquake. As a result, there is a possibility for some sheltering capacity in the counties and in the region.

To determine this capacity, the population needing shelter (general population, homeless, and commuters) was subtracted from the sheltering capacity. If any sheltering capacity remained, it was assumed that (a) residents of that county could be placed into that county's shelters (identified as local shelters), and (b) if there was still additional sheltering capacity, residents and/or commuters of surrounding counties could be transported to that county for sheltering (identified as regional shelters). As a result, sheltering for the Hayward fault earthquake scenario resulted in residents being transported to local shelters/regional shelters and out-of-the region shelters.

Att-2.1 Assumptions for E+72 Hours to E+14 Days

Att-2.1.1 Visitors/Tourists

Visitors/tourists are transported to airports by bus/demand response vehicle to fly home. By arranging for visitors and tourists to return home, the counties are relieved of the need to care for and shelter them. Before being transported, visitors/tourists are assumed to shelter in place at their accommodations and to seek out short-term shelter as available; or, if transported to an airport, they seek shelter there.

Most counties in the Bay Area region rely on shelters managed by the American Red Cross to meet the needs of displaced residents.

Att-2.1.2 Inter-County Commuters

Inter-county commuters have multiple transportation patterns:

- Inter-county commuters who work in San Francisco County
  - Approximately 80 percent of the inter-county commuters who work in San Francisco walk to a ferry facility in San Francisco, and ferry operations transport them to the ferry terminal in Vallejo. At that location, (a) 5 percent board a bus/demand response vehicle that is used to transport them to a regional shelter in Sonoma County, and (b) 95 percent board a bus/demand response vehicle that is used to transport them to a shelter out of the region.

  - The remaining 20 percent of inter-county commuters who work in San Francisco are unable to reach a ferry facility due to distance or lack of transportation. These evacuees go to a nearby pickup location and, at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of -region shelter by passenger rail service.
- Inter-county commuters who work in Marin County
  - Approximately 3 percent of the inter-county commuters needing mass transportation resources in Marin County walk or have transportation to a pick-up location and, at that location, are transported by bus/demand response vehicle to a local shelter within the county.
  - Approximately 96 percent of the inter-county commuters needing mass transportation resources in Marin County walk or have transportation to a pickup location and, at that location, are transported by bus/demand response vehicle to a regional shelter in Napa and Sonoma counties.
  - The remaining 1 percent of inter-county commuters needing mass transportation resources in Marin County walk or have transportation to a pickup location and, at that location, are transported by bus/demand response vehicle to an out-of-region shelter. Since the percentage is so low, impacting about 100 commuters, it was determined to use bus only to transport to an out-of-region shelter.
- Inter-county commuters who work in Solano County

  Approximately 61 percent of the inter-county commuters needing mass transportation resources and who work in Solano County walk or have transportation to a pickup location and, at that location, are transported by bus/demand response vehicle to a local shelter within the county.

  The remaining 39 percent of inter-county commuters who work in Solano County walk or have transportation to a pickup location and, at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.
- Inter-county commuters who work in Sonoma County
  - All inter-county commuters needing mass transportation resources and who work in Sonoma County walk or have transportation to a pickup location and, at that location, are transported by bus/demand response vehicle to a local shelter within the county.
- Inter-county commuters who work in San Mateo County
  - Approximately 6 percent of the inter-county commuters needing mass transportation resources and who work in San Mateo County walk or have transportation to a pickup location and, at that location, are transported by bus/demand response vehicle to a local shelter within the county.

  - The remaining 94 percent of inter-county commuters who work in San Mateo County walk or have transportation to a pickup location and, at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.
- Inter-county commuters who work in the remaining counties (Alameda, Contra Costa, and Santa Clara)
  - The inter-county commuters in the remaining counties walk or have transportation to a pickup location and, at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.
  - Transportation at the destination rail station is to be provided by others and is not included in this Plan.
  - Before being transported inter-county commuters are assumed to shelter in place at their work locations or to seek out shelter close to their work location.

Att-2.1.3 Residents

Residents also have multiple transportation patterns:

- Residents of San Francisco
  - Approximately 80 percent of the residents of San Francisco needing to use mass transportation resources provide their own transportation to a ferry location in the city/county and then are transported by ferry to Vallejo or placed on a bus/demand response vehicle to a shelter outside the region.
  - The remaining 20 percent of the residents of San Francisco needing to use mass transportation resources walk or have transportation to a pickup location and, at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.
- Residents of Marin County
  - All residents needing to use mass transportation resources provide their own transportation to a pickup location and then are transported by bus/demand response vehicle to a local shelter within the county.
- Residents of San Mateo County
  - Approximately 10 percent of the residents needing mass transportation resources in San Mateo County walk or have transportation to a pickup location and, at that location, are transported by bus /demand response vehicle to a shelter in that county.

  - The remaining 90 percent of the residents of San Mateo County needing to use mass transportation resources walk or have transportation to a pickup location and, at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.
- Residents of Santa Clara County
  - Approximately 34 percent of residents needing mass transportation resources in Santa Clara County walk or have transportation to a pickup location and, at that location, are transported by bus/demand response vehicle to regional shelters in Monterey and Santa Cruz counties.
  - The remaining 66 percent of the residents of Santa Clara County needing to use mass transportation resources walk or have transportation to a pickup location and, at that location, 50 percent are transported by bus/demand response vehicle to a shelter outside the region, and 50 percent are transported by bus/demand response vehicle to a rail station for transportation to an out-of-region shelter by passenger rail service.
- Residents of remaining counties (Alameda and Contra Costa)
  - Approximately 50 percent of residents needing to use mass transportation resources provide their own transportation to a pickup location and then are transported by bus/demand response vehicle to a shelter that is outside the region.
  - Approximately 50 percent of residents needing to use mass transportation resources provide their own transportation to a pickup location and then are transported by bus/demand response vehicle to a rail station where they board a passenger train to a shelter outside the region.
  - Transportation at the destination rail station is to be provided by others and is not included in this Plan.
  - Before being transported, residents are assumed to shelter in place at their residences, seek shelter close to their residences, seek shelter near a rail station, or seek shelter near a ferry facility.

Att-2.2 Assumptions for E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Att-2.2.1 Outbound Travel: Additional Residents Evacuating Because of Lack of Water Supply

The number of additional outbound evacuees is not expected to be significant.

Att-2.2.2 Inbound Travel: Residents Returning Because of Restoration of Water Supply

Returning residents also have multiple transportation patterns. This is based on returning residents who were transported using mass transportation resources.

- Returning residents – Alameda, Contra Costa, and San Mateo counties
  - Buses pick up an estimated 50 percent of the residents transported to out-of-region shelters and return them to a pickup location in their respective counties. Residents find their own transportation back to their residences.
  - For an estimated 50 percent of the residents transported to out-of-region shelters, transportation is provided by others from a shelter outside the region to the initial rail station also outside the region and by rail back to a county rail station. Bus/demand response vehicle travel is from the county rail station to a pickup location in the county. Residents find their own transportation back to their residences.
  - Transportation to the initial rail station is provided by other agencies outside the scope of this Plan and is not accounted for in this Plan.
- Returning residents – Santa Clara County
  - Buses pick up an estimated 50 percent of the residents at a regional shelter and return them to a pickup location in their county. Residents find their own transportation back to their residences.
  - Buses pick up an estimated 25 percent of the residents at the out-of-region shelter and return them to a pickup location in their county. Residents find their own transportation back to their residences.
  - For an estimated 25 percent of the residents, transportation is provided from a shelter outside the region to the initial rail station also outside the region, and by rail back to a county rail station. Bus/demand response vehicle travel is from the county rail station to a pickup location in the county. Residents find their own transportation back to their residences.
  - Transportation to the initial rail station is provided by others and is not accounted for in this high-level transportation Plan.

Att-2.3 Assumptions for E+14 Days to E+60 Days (Up to Approximately E+60 Days)

Att-2.3.1 Outbound Travel: Additional Residents Evacuating Because of Lack of Water Supply

The number of additional outbound evacuees is not expected to be significant.

Att-2.3.2 Inbound Travel: Residents Returning Because of Restoration of Water Supply – General Population and Homeless (Residents)

Returning residents also have multiple transportation patterns, based on returning residents who were transported using mass transportation resources.

- Returning residents – Alameda , Contra Costa, and San Mateo counties
  - Buses pick up an estimated 50 percent of residents at the out-of-region shelter and return them to a pickup location in their respective counties. Residents find their own transportation back to their residences.
  - For an estimated 50 percent of the residents, transportation is provided by others from a shelter outside the region to the initial rail station also outside the region or by rail back to a county rail station. Bus/demand response vehicle travel is from the county rail station to a pickup location within the county. Residents find their own transportation back to their residences.
  - Transportation to the initial rail station is provided by others and is not included in this regional Plan.
- Returning residents – Santa Clara County
  - Buses pick up an estimated 50 percent of the residents at a regional shelter and return them to a pickup location in their county. Residents find their own transportation back to their residences.
  - Buses pick up an estimated 25 percent of the residents at the out-of-region shelter and return them to a pickup location in their county. Residents find their own transportation back to their residences.
  - For an estimated 25 percent of the residents, transportation is provided by others from a shelter outside the region to the initial rail station also outside the region, and by rail back to a county rail station. Bus/demand response vehicle travel is from the county rail station to a pickup location within the county. Residents find their own transportation back to their residences.
  - Transportation to the initial rail station is provided by others and is not accounted for in this high-level transportation Plan.

Attachment 3:
Mass Transportation Operations Assumptions

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Table of Contents

List of Tables

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Attachment 3: Mass Transportation Operations Assumptions

A number of assumptions are made regarding the use of vehicles to support mass transportation operations. These assumptions support the projections regarding numbers of available vehicles and levels of service and shortfalls corresponding to projected demand levels.

To make it easier for the reader to identify differences, the text from the Plan is included here with italics used to identify differences.

Att-3.1 Bus/Demand Response Vehicle Operations Assumptions

The following assumptions are made to estimate the number of transportation resources that must be provided to support bus/demand response vehicle operations:

- An average one-way bus/demand response vehicle trip length of 40 miles for transportation to a local shelter, 80 miles to a regional shelter and 250 miles to a shelter outside the region; this results in round trips of 80, 160, and 500 miles, respectively. This estimate of mileage is used because the specific shelter destination for each trip outside the region is unknown. The trip distance is used as a surrogate for an average transportation trip between a pickup location and a destination shelter.
- Average trip speed of 15 miles per hour for transportation in the county and the region and 40 miles per hour for transportation to an out-of-region shelter for the bus/demand response vehicle due to conditions of the roadways in the region and outside the region and to account for the loading and unloading of vehicles. This results in average round trip times of 6 hours per trip for transportation to a local shelter, 11 hours per trip to a regional shelter, and 13 hours per trip for transportation to an out-of-region shelter. Trip time also includes the return trip of the bus/demand response vehicle to the origin destination to account for the use of the resources again.
- Operations proceeding 23 hours per day with 1 hour for fueling, light maintenance, etc., of the bus/demand response vehicle. Depending on the destination, this results in three round trips for transportation to a local shelter, two round trips for transportation to a regional shelter, and one round trip to an out-of- region shelter per standard bus/demand response vehicle.
- Use of standard buses and demand/response type vehicles. Approximately 80 percent of the evacuation population is able to use a standard bus, and 20 percent of the evacuation population needs to use a demand response vehicle.
- Maximum allowable hours of 10 hours per day per driver.
- Crew changes in the field.
- Vehicles at 75 percent capacity to accommodate residents and their belongings, resulting in 38 passengers per standard bus based on the average

bus capacity of 50 seats and 19 passengers per demand response vehicle based on the average vehicle capacity of 25 seats.

- Fuel consumption of 6 miles per gallon for standard buses and 13 miles per gallon for demand response vehicles.
- Operations for 4 days for E+72 hours to E+14 days, 15 days for E+14 days to E+60 days (up to approximately E+30 days), and 15 days for E+14 days to E+60 days (up to approximately E+60 days).

Att-3.2 Additional Assumptions Regarding Mileage for Transportation Operations

Mileage estimates for other transportation operations assumptions are provided as follows: **Table Att-3-1** provides mileage estimates for a bus/demand response vehicle to an airport; **Tables Att-3-2** and **Att-3-3** provide mileage estimates for rail operations; **Tables Att-3-4** and **Att-3-5** provide mileage estimates for ferry operations; and **Table Att-3-6** provides mileage estimates for bus/demand response vehicle services.

Table Att-3-1. Mileage estimates for a bus/demand response vehicle to an airport.

County	Airport Destination	Average One-Way Trip (miles)
Alameda	Stockton	100
Contra Costa	Stockton	100
Marin	Charles M. Schulz	35
Monterey	Monterey	20
Napa	Charles M. Schulz	20
San Benito	Monterey	60
San Francisco	Monterey	100
San Mateo	Monterey	85
Santa Clara	Monterey	65
Santa Cruz	Monterey	35
Solano	Charles M. Schulz	35
Sonoma	Charles M. Schulz	20

Source: URS Analysis (2009)

Table Att-3-2. Mileage estimates for rail service to a shelter.

County	Destination	Average One-Way Trip (miles)
All counties	Out-of-region shelter	350

Source: URS Analysis (2009)

Table Att-3-3. Mileage estimates for bus/demand response vehicle service to support rail operations.

County	Rail Station	Average One-Way Trip (miles)
Alameda	Livermore/Pleasanton	35
Contra Costa	Antioch/Pittsburg	30
Marin	Suisan City/Fairfield	50
Monterey	Gilroy	40
Napa	Suisan/Fairfield	20
San Benito	Gilroy	15
San Francisco	Gilroy	65
San Mateo	Gilroy	45
Santa Clara	Gilroy	25
Santa Cruz	Gilroy	40
Solano	Suisan City/Fairfield	20
Sonoma	Suisan City/Fairfield	30

Source: URS Analysis (2009)

Table Att-3-4. Mileage estimates for ferry service to support evacuation operations

County	Ferry Destination	Average One-Way Trip (miles)
San Francisco	Vallejo	25

Source: URS Analysis (2009)

Table Att-3-5. Mileage estimates for bus/demand response vehicle service to support ferry operations

County	Route	Average One-Way Trip (miles)
All applicable counties	From a ferry terminal to a local shelter	40
All applicable counties	From a ferry terminal to a regional shelter	80
All applicable counties	From a ferry terminal to an out-of-region shelter	250

Source: URS analysis (2009)

Table Att-3-6. Mileage estimates for bus/demand response vehicle service to a shelter.

County	Destination	Average One-Way Trip (miles)
All counties	Local shelter (within county)	40
All counties	Regional shelter	80
All counties	Out-of-region shelter	250

Source: URS Analysis (2009)

Attachment 4:
Summary of Transportation Resources Needed for Mass Transportation/Evacuation Operations

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Table of Contents

List of Tables

Attachment 4: Summary of Transportation Resources Needed for Mass Transportation/Evacuation Operations

Attachment 4 is a summary of transportation resources needed. The transportation resources needed on a daily basis to support evacuations are summarized by time frame. The summary information identifies the transportation resources needed from E+72 hours to E+60 days, on a daily basis, to support the high-level transportation Plan and identifies the resources available to flag resource surpluses or shortfalls.

The greatest need for transportation resources is during E+72 hours to E+14 days, when the largest number of evacuees are to be transported with limited transportation resources. This transportation movement is challenging for the region; if not done successfully, it can affect the safety of evacuees.

Att-4.1 Outbound Evacuees by Standard Bus from E+72 Hours to E+14 Days

Overall, not enough resources (assets and staff) are available in the region based on the transportation operations assumptions in the Plan, as shown in **Table Att 4-1**.

Table Att-4-1. Summary of transportation resources for outbound evacuees traveling by standard bus from E+72 hours to E+14 days.

	Standard Buses for Outbound Evacuees			Standard Bus Staff for Outbound Evacuees		
County	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Alameda	1,110	562	–548	1,870	440	–1,430
Contra Costa	400	192	–208	670	112	–558
Marin	60	189	+129	100	97	–3
Monterey	10	10	0	10	10	0
Napa	10	24	+14	10	15	+5
San Benito[1]	0	1	+1	0	1	+1
San Francisco	320	399	+79	520	554	+34
San Mateo	470	287	–183	710	103	–607
Santa Clara	750	442	–308	1,230	316	–914
Santa Cruz	10	11	+1	10	11	+1
Solano	920	66	–854	1,810	45	–1,765
Sonoma	20	9	–11	20	9	–11
Total	**4,080**	**2,192**	**–1,888**	**6,960**	**1,713**	**–3,247**

Source: URS Analysis (2009)

[1] Because the bus operations staff numbers for San Benito County were not available, the number of buses was used to calculate available staff.

Additional assets are needed, but the greatest need is for staff to operate standard buses. Mutual aid provided by other mass transportation agencies in the region is not sufficient to fill this shortfall in staff.

A few counties (such as Marin or San Francisco) appear to have available assets. However, in Marin County, the number of staff is not sufficient to provide bus service. In San Francisco, getting buses out of the area could be problematic due to the damaged transportation infrastructure.

Solano County is severely affected: staff is needed to evacuate inter-county commuters coming from San Francisco and residents from San Francisco. In order to accomplish this movement of evacuees, critical transportation resources are needed at the Vallejo ferry terminal to transport evacuees to an out-of-region shelter. The Unified Coordination Group needs to acquire transportation resources from private or other public mass transportation agencies in order to accomplish this transportation operation.

Att-4.2 Outbound Evacuees by Demand Response Vehicle from E+72 Hours to E+14 Days

Overall, not enough resources (assets and staff) are available in the region based on transportation operations assumptions in the high-level transportation Plan, as shown in **Table Att-4-2**.

As with standard buses, a few counties, such as Marin, appear to have available assets but not enough staff to drive all of the vehicles.

Att-4.3 Outbound Evacuees by Ferry from E+3 Days to E+14 Days

Ferries are considered a regional resource because they are not associated with a particular county. Overall, there are not enough ferries in the region based on transportation operations assumptions in the high-level transportation Plan, as shown in **Table Att-4-3**.

The Unified Coordination Group needs to acquire additional ferries from private or other public mass transportation agencies. This could include ferries in southern California or elsewhere on the west coast.

On the surface, there appears to be a shortage of ferry crew. It is assumed that enough ferry staff are available to operate the ferries either through (1) using the existing ferry operators, (2) specifying staff to operate the additional contracted ferries, or (3) using staff from the International Organization of Masters, Mates, and Pilots based in San Francisco.

Table Att-4-2. Summary of transportation resources for outbound evacuees traveling by demand response vehicles from E+72 hours to E+14 days.

County	Demand Response Vehicles for Outbound Evacuees			Demand Response Vehicles Staff for Outbound Evacuees		
	Needed per Day	Available Daily	Surplus/ Shortfall	Needed per Day	Available Daily	Surplus/ Shortfall
Alameda	570	322	–248	960	51	–909
Contra Costa	210	239	+29	350	51	–299
Marin[1]	40	88	+48	70	88	18
Monterey [1]	10	2	–8	10	2	–8
Napa	10	15	+5	10	7	–3
San Benito[1]	0	2	+2	0	2	2
San Francisco	160	99	–61	450	99	–351
San Mateo	240	102	–138	360	2	–358
Santa Clara[1]	390	325	–65	640	325	–315
Santa Cruz	10	54	+44	10	3	–7
Solano	490	66	–424	50	9	–41
Sonoma[1]	20	6	–14	20	6	–41
Total	**2,150**	**1,320**	**–830**	**2,930**	**645**	**–2,285**

Source: URS analysis, 2009

[1] Because demand response operations staff numbers were not available for Marin, Monterey, San Benito, Santa Clara, or Sonoma counties, the number of demand response vehicles was used to calculate available staff.

Table Att-4-3. Summary of regional transportation resources for outbound evacuees traveling by ferry from E+72 hours to E+14 days.

Ferries/ Staff	Ferries and Staff for Outbound Evacuees		
	Needed per Day	Available Daily	Surplus/ Shortfall
Ferries	48	41	–7
Staff	200	61	–139

Source: URS analysis, 2009

Att-4.4 Outbound Evacuees by Passenger Rail Cars and Locomotives from E+5 Days to E+14 Days

Rail cars are considered a regional resource because the majority of them are from outside the region (i.e., the Altamont Commuter Express is in San Joaquin County and Caltrans, Division of Rail, assets are distributed around California).

Overall, not enough passenger rail cars and locomotives are available in the region based on transportation operations assumptions in the high-level transportation Plan, as shown in **Table Att-4-4**.

Table Att-4-4. Summary of regional transportation resources for outbound evacuees traveling by passenger rail car or locomotive from E+5 days to E+14 days.

	Passenger Rail Car/Locomotive and Staff for Outbound Evacuees		
Mode/Staff	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Passenger rail car	720	85	–635
Locomotive	72	16	–57
Staff	170	78	–92

Source: URS analysis (2009)

Additional passenger rail cars and locomotives need to be acquired by the Unified Coordination Group in order to support evacuation operations. Rail cars are used extensively because of the multiple locations of rail stations and because each passenger rail car can transport 113 passengers. A single locomotive can transport ten cars for a total of 1,130 passengers.

Att-4.5 Inbound Evacuees by Standard Bus from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Overall, there appear to be enough resources in the region both in terms of assets and staff as indicated in **Table Att-4-5** for standard bus service based on the high-level transportation Plan.

By this time, outbound evacuations should be concluding, and there will be a need to accommodate some inbound evacuees. As time passes after the event, the number of available assets will increase, and the need for transportation resources to support evacuations will start to decrease.

If possible, during this time, mass transportation providers are able to start to recover and to initiate some normal transportation service. However, the transportation infrastructure in the region is still affected. Mass transportation providers on the periphery of the region may be able to start resuming normal transportation service. This is a decision best made by the mass transportation providers.

Table Att-4-5. Summary of transportation resources for inbound evacuees traveling by standard bus from E+14 days to E+60 days (up to approximately E+30 days).

	Standard Buses for Inbound Evacuees			Standard Bus Staff for Inbound Evacuees		
County	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Alameda	50	562	+512	70	440	+370
Contra Costa	30	192	+162	40	112	+72
Marin	0	189	+189	0	97	+97
Monterey	0	10	+10	0	10	+10
Napa	0	24	+24	0	15	+15
San Benito[1]	0	1	+1	0	1	+1
San Francisco	0	399	+399	0	554	+554
San Mateo	20	287	+267	30	103	+73
Santa Clara	30	442	+412	40	316	+276
Santa Cruz	0	11	+11	0	11	+11
Solano	0	66	+66	0	45	+45
Sonoma	0	9	+9	0	9	+9
Total	**130**	**2,192**	**+2,062**	**180**	**1,713**	**+1,533**

Source: URS analysis (2009)

[1] Because the bus operations staff numbers for San Benito were not available, the number of buses was used to calculate available staff.

Att-4.6 Inbound Evacuees by Demand Response Vehicle from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Overall, it appear that there are enough resources in the region both in terms of assets and staff, as indicated in **Table Att-4-6** based on the transportation operations assumptions in the high-level transportation Plan. During this time, mass transportation providers may be able to start to recover and to initiate some normal transportation service. This is a decision best made by the mass transportation providers.

Table Att-4-6. Summary of transportation resources for inbound evacuees traveling by demand response vehicle from E+14 days to E+60 days (up to approximately E+30 days).

County	Demand Response Vehicles for Inbound Evacuees			Demand Response Vehicle Staff for Inbound Evacuees		
	Needed per Day	Available Daily	Surplus/ Shortfall	Needed per Day	Available Daily	Surplus/ Shortfall
Alameda	30	322	+292	40	51	+11
Contra Costa	20	239	+219	30	51	+21
Marin[1]	0	88	+88	0	88	+88
Monterey[1]	0	2	+2	0	2	+2
Napa	0	15	+15	0	7	+7
San Benito[1]	0	2	+2	0	2	+2
San Francisco	0	99	+99	0	99	+99
San Mateo	20	102	+82	30	2	-28
Santa Clara[1]	20	325	+305	30	325	+295
Santa Cruz	0	54	+54	0	3	+3
Solano	0	66	+66	0	9	+9
Sonoma[1]	0	6	+6	0	6	+6
Total	**90**	**1,320**	**+1,230**	**130**	**645**	**+515**

Source: URS analysis (2009)

[1] Demand response operations staff numbers for Marin, Monterey, San Benito, Santa Clara, and Sonoma County were not available; the number of demand response vehicles was used to calculate resources available.

Att-4.7 Inbound Evacuees by Ferry from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Ferry service is not anticipated to transport residents during this time frame because residents are either in shelters away from ferry facilities or at shelters outside the region.

Att-4.8 Inbound Evacuees by Passenger Rail Car and Locomotive from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Overall, it appears that there are enough passenger rail car and locomotive resources in the region both in terms of assets and staff, as shown in **Table Att-4-7** based on the transportation operations assumptions in the high-level transportation Plan. During this time, mass transportation providers may be able to start to recover and to initiate some normal transportation service. This is a decision best made by the mass transportation providers.

Table Att-4-7. Summary of regional transportation resources for inbound evacuees traveling by passenger rail car and locomotive from E+14 days to E+60 days (up to approximately E+30 days).

	Passenger Rail Car/Locomotive and Staff for Inbound Evacuees		
Mode/Staff	**Needed per Day**	**Available Daily**	**Surplus/ Shortfall**
Passenger rail car	40	85	+45
Locomotive	4	16	+12
Staff	40	78	+38

Source: URS analysis (2009)

Att-4.9 Inbound Evacuees by Standard Bus from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

Overall, it appears that there are enough resources in the region both in terms of assets and staff as indicated in **Table Att-4-8** based on the transportation operations assumptions in the high-level transportation Plan. During this time, mass transportation providers may be able to start to recover and to initiate some normal transportation service. This is a decision best made by the mass transportation providers.

Att-4.10 Inbound Evacuees by Ferry from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Ferry service is not anticipated to transport residents during this time frame because residents are either in shelters away from ferry facilities or at shelters outside the region.

Att-4.11 Inbound Evacuees by Passenger Rail Car and Locomotive from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

Overall, it appears that there are be enough passenger rail car and locomotive resources in the region both in terms of assets and staff as indicated in **Table Att-4-9** based on the transportation operations assumptions in the high-level transportation Plan. During this time, mass transportation providers may be able to start to recover and to initiate some normal transportation service. This is a decision best made by the mass transportation providers.

Table Att-4-8. Summary of transportation resources for inbound and outbound evacuees traveling by standard bus from E+14 days to E+60 days (up to approximately E+60 days).

County	Standard Buses for Outbound and Inbound Evacuees			Standard Bus Staff for Outbound and Inbound Evacuees		
	Needed per Day	Available Daily	Surplus/ Shortfall	Needed per Day	Available Daily	Surplus/ Shortfall
Alameda	30	562	+532	50	728	+678
Contra Costa	20	192	+172	30	187	+157
Marin	0	189	+189	0	162	+162
Monterey	0	10	+10	0	10	+10
Napa	0	24	+24	0	26	+26
San Benito[1]	0	1	+1	0	1	+1
San Francisco	0	399	+399	0	924	+924
San Mateo	20	287	+267	30	172	+142
Santa Clara	20	442	+422	30	527	+497
Santa Cruz	0	11	+11	0	11	+11
Solano	0	66	+66	0	71	+71
Sonoma	0	9	+9	0	9	+9
Total	**90**	**2,192**	**+2,102**	**140**	**2,828**	**+2,688**

Source: URS analysis (2009)

[1] Bus operations staff numbers for San Benito were unavailable; number of buses was used to calculate resources available.

Table Att-4-9. Summary of regional transportation resources for inbound evacuees traveling by passenger rail car and locomotive from E+14 days to E+60 days (up to approximately E+60 days).

Mode/Staff	Passenger Rail Car/Locomotive and Staff for Inbound Evacuees		
	Needed per Day	Available Daily	Surplus/ Shortfall
Passenger rail car	40	85	+45
Locomotive	4	16	+12
Staff	40	88	+48

Source: URS analysis (2009)

Att-4.12 Inbound and Outbound Evacuees by Demand Response Vehicle from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

Overall, it appears that there are enough resources in the region both in terms of assets and staff as indicated in **Table Att-4-10** based on the transportation

operations assumptions in the high-level transportation Plan. During this time, mass transportation providers may be able to start to recover and to initiate some normal transportation service. This is a decision best made by the mass transportation providers.

Table Att-4-10. Summary of transportation resources for outbound and inbound evacuees traveling by demand response vehicle from E+14 days to E+60 days (up to approximately E+60 days).

	For Outbound and Inbound Evacuees					
	Demand Response Vehicles			Demand Response Vehicles Staff		
County	Needed per Day	Available Daily	Surplus/ Shortfall	Needed per Day	Available Daily	Surplus/ Shortfall
Alameda	20	322	+302	30	106	+76
Contra Costa	20	239	+219	30	106	+76
Marin[1]	10	88	+78	20	88	+68
Monterey[1]	0	18	+18	0	18	+18
Napa	0	15	+15	0	11	+11
San Benito[1]	0	13	+13	0	13	+13
San Francisco	20	99	+79	30	99	+69
San Mateo	20	102	+82	30	3	–27
Santa Clara[1]	20	325	+305	30	325	+295
Santa Cruz	0	43	+43	0	22	+22
Solano	0	64	+64	0	14	+14
Sonoma[1]	20	50	+30	30	50	+20
Total	**130**	**1,378**	**+1,248**	**200**	**855**	**+655**

Source: URS Analysis (2009)

[1] Demand response operations staff numbers for Marin, Monterey, San Benito, Santa Clara, and Sonoma counties were not available; the number of demand response vehicles was used to calculate resources available.

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Attachment 5:
Detailed Analysis of Resources Needed for Mass Transportation and Evacuation Operations

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Table of Contents

List of Tables

Attachment 5: Detailed Analysis of Resources Needed for Mass Transportation and Evacuation Operations

This attachment provides information on transportation resources needed by transportation mode for the three time frames identified in the basic Plan. This information allows the evaluation of a particular transportation mode, for a particular time frame and for a particular direction (inbound or outbound). However, this individual information does not provide a regional snapshot of transportation resources needed to support evacuations for inbound and outbound travel. For example, bus/demand response vehicles are used to support air, ferry, rail, and bus/demand response vehicle operations and are associated with a particular transportation operation. Looking at only one transportation mode may convey an inaccurate picture of the outlook for transportation resources, but the information is presented here in case it is needed.

Att-5.1 Air Operations

Att-5.1.1 Outbound Travel: Bus/Demand Response Vehicle to Airport from E+72 Hours to E+14 Days

The numbers of bus/demand response vehicle drivers and vehicles needed to accommodate the number of evacuees who are transported to airports are listed in **Table Att-5-1**.

Att-5.2 Rail Operations

Att-5.2.1 Outbound Travel: Bus/Demand Response Vehicle to Rail Station from E+5 Days to E+14 Days

The numbers of bus/demand response vehicle drivers and vehicles needed to accommodate the number of evacuees who are transported to rail stations are listed in **Table Att-5-2**.

Att-5.2.2 Outbound Travel by Rail Service from E+5 Days to E+14 Days

The numbers of staff and assets needed to accommodate the number of evacuees who are transported from rail stations to shelters by rail are listed in **Table Att-5-3**.

Table Att-5-1. Resources for bus/demand response vehicle service to airports from E+72 hours to E+14 days.

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	70	140	40	80
Contra Costa	20	40	10	20
Marin	10	10	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	80	160	40	80
San Mateo	20	40	10	20
Santa Clara	60	60	30	30
Santa Cruz	0	0	0	0
Solano	10	10	10	10
Sonoma	10	10	10	10
Total	**280**	**470**	**150**	**250**

Source: URS Analysis (2009)

Table Att-5-2. Resources for bus/demand response vehicle service to rail stations from E+5 days to E+14 days.

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	350	350	180	180
Contra Costa	130	130	70	70
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	120	120	60	60
San Mateo	220	220	110	110
Santa Clara	210	210	110	110
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	0	0	0	0
Total	**1,040**	**1,040**	**540**	**540**

Source: URS Analysis (2009)

Table Att-5-3. Resources for rail service to shelters from E+5 days to E+14 days.

	Number Needed per Day		
County	**Train Operators**	**Passenger Rail Cars**	**Locomotives**
Alameda	60	290	29
Contra Costa	30	110	11
Marin	0	0	0
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	10	50	5
San Mateo	20	90	9
Santa Clara	40	170	17
Santa Cruz	0	0	0
Solano	10	10	1
Sonoma	0	0	0
Total	**170**	**720**	**72**

Source: URS Analysis (2009)

Att-5.2.3 Inbound Travel from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

Bus

The numbers of bus/demand response vehicle drivers and vehicles needed to accommodate the number of evacuees who are transported back into the region from rail stations to pickup locations are listed in **Table Att-5-4**.

Rail Service

The numbers of rail operations staff and assets needed to accommodate the number of evacuees who are transported from shelters to regional rail stations are listed in **Table Att-5-5**.

Att-5.2.4 Inbound Travel by Bus/Demand Response Vehicle from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

The numbers of drivers and vehicles needed to accommodate the number of evacuees who are transported back into the region from rail stations to pickup locations are listed in **Table Att-5-6**.

Table Att-5-4. Resources needed for travel from rail stations back into the region by bus/demand response vehicle from E+14 days to E+60 days (up to approximately E+30 days).

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	30	30	20	20
Contra Costa	20	20	10	10
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	0	0	0	0
San Mateo	10	10	10	10
Santa Clara	20	20	10	10
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	0	0	0	0
Total	**80**	**80**	**50**	**50**

Source: URS Analysis (2009)

Table Att-5-5. Resources to support rail operations from E+14 days to E+60 days (up to approximately E+30 days).

	Number Needed per Day		
County	**Train Operators**	**Passenger Rail Cars**	**Locomotives**
Alameda	10	10	1
Contra Costa	10	10	1
Marin	0	0	0
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	0	0	0
San Mateo	10	10	1
Santa Clara	10	10	1
Santa Cruz	0	0	0
Solano	0	0	0
Sonoma	0	0	0
Total	**40**	**40**	**4**

Source: URS Analysis (2009)

Table Att-5-6. Resources needed for travel from rail stations back into the region by bus/demand response vehicle from E+14 days to E+60 days (up to approximately E+60 days).

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	30	30	20	20
Contra Costa	20	20	10	10
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	0	0	0	0
San Mateo	10	10	10	10
Santa Clara	20	20	10	10
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	0	0	0	0
Total	**80**	**80**	**50**	**50**

Source: URS Analysis (2009)

Att-5.2.5 Inbound Travel by Rail Service from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

The numbers of staff and assets needed to accommodate evacuees who are transported from shelters to regional rail stations are listed in **Table Att-5-7**.

Att-5.3 Ferry Operations

Att-5.3.1 Outbound Travel by Bus/Demand Response Vehicle Service from E+72 Hours to E+14 Days

The numbers of drivers and vehicles needed to accommodate the number of evacuees who are transported from ferry facilities to shelters are listed in **Table Att-5-8**.

Table Att-5-7. Resources to support rail operations for movement of evacuees from E+14 days to E+60 days (up to approximately E+60 days).

	Number Needed per Day		
County	**Train Operators**	**Passenger Rail Cars**	**Locomotives**
Alameda	10	10	1
Contra Costa	10	10	1
Marin	0	0	0
Monterey	0	0	0
Napa	0	0	0
San Benito	0	0	0
San Francisco	0	0	0
San Mateo	10	10	1
Santa Clara	10	10	1
Santa Cruz	0	0	0
Solano	0	0	0
Sonoma	0	0	0
Total	**40**	**40**	**4**

Source: URS Analysis (2009)

Table Att-5-8. Resources needed for travel from ferries to shelters by bus/demand response vehicle from E+14 days to E+60 days (up to approximately E+60 days).

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	0	0	0	0
Contra Costa	0	0	0	0
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	0	0	0	0
San Mateo	0	0	0	0
Santa Clara	0	0	0	0
Santa Cruz	0	0	0	0
Solano	880	1,740	450	900
Sonoma	0	0	0	0
Total	**880**	**1,740**	**450**	**900**

Source: URS Analysis (2009)

Att-5.3.2 Outbound Travel by Ferry Service from E+72 Hours to E+14 Days

The numbers of staff and assets needed to accommodate the number of evacuees who are transported from ferry facilities to a location where buses provide service to a shelter are listed in **Table Att-5-9**.

Table Att-5-9. Resources to support ferry operations—ferry service to bus/demand response vehicle location from E+72 hours to E+14 days.

	Needed per Day	
County	**Crew**	**Ferries**
Alameda	0	0
Contra Costa	0	0
Marin	0	0
Monterey	0	0
Napa	0	0
San Benito	0	0
San Francisco	200	48
San Mateo	0	0
Santa Clara	0	0
Santa Cruz	0	0
Solano	0	0
Sonoma	0	0
Total	**200**	**48**

Source: URS Analysis (2009)

Att-5.4 Bus/Demand Response Vehicle Operations

Att-5.4.1 Outbound Travel from E+72 Hours to E+14 Days

The numbers of drivers and vehicles needed to accommodate the number of evacuees who are transported to shelters are listed in **Table Att-5-10**.

Att-5.4.2 Inbound Travel: from E+14 Days to E+60 Days (Up to Approximately E+30 Days)

The numbers of drivers and vehicles needed to accommodate the number of evacuees who are transported back into the region from shelters are listed in **Table Att-5-11**.

Table Att-5-10. Resources for travel by bus/demand response vehicle to shelters from E+72 hours to E+14 days.

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	690	1,380	350	700
Contra Costa	250	500	130	260
Marin	50	90	40	70
Monterey	10	10	10	10
Napa	10	10	10	10
San Benito	0	0	0	0
San Francisco	120	240	60	120
San Mateo	230	450	120	230
Santa Clara	480	960	250	500
Santa Cruz	10	10	10	10
Solano	20	30	20	30
Sonoma	20	10	20	10
Total	**1,880**	**3,690**	**1,010**	**1,950**

Source: URS Analysis (2009)

Table Att-5-11. Resources for travel by bus/demand response vehicle from shelters from E+14 days to E+60 days (up to approximately E+30 days).

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	20	40	10	20
Contra Costa	10	20	10	20
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	0	0	0	0
San Mateo	10	20	10	20
Santa Clara	10	20	10	20
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	0	0	0	0
Total	**50**	**100**	**40**	**80**

Source: URS Analysis (2009)

Att-5.4.3 Inbound Travel from E+14 Days to E+60 Days (Up to Approximately E+60 Days)

The numbers of drivers and vehicles needed to accommodate the number of evacuees who are transported back into the region from shelters are listed in **Table Att-5-12**.

Table Att-5-12. Resources for travel by bus/demand response vehicle from shelters from E+14 days to E+60 days (up to approximately E+60 days).

	Standard Bus		Demand Response Vehicles	
County	**Buses Needed Daily**	**Drivers Needed Daily**	**Vehicles Needed Daily**	**Drivers Needed Daily**
Alameda	20	40	10	20
Contra Costa	10	20	10	20
Marin	0	0	0	0
Monterey	0	0	0	0
Napa	0	0	0	0
San Benito	0	0	0	0
San Francisco	0	0	0	0
San Mateo	10	20	10	20
Santa Clara	10	20	10	20
Santa Cruz	0	0	0	0
Solano	0	0	0	0
Sonoma	0	0	0	0
Total	**50**	**100**	**40**	**80**

Source: URS Analysis (2009).

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