Goals for Hazard Mitigation Planning

Goals

1: Ensure reliable and resilient infrastructure for today and future generations.

2: Ensure the effective delivery of emergency services during a disaster.

3: Maintain adequate City functions and quality of life.

Hazard Identification and Prioritization

FEMA-Suggested Hazards

Avalanche	Flood	Seismic hazards
Climate change	Geological hazards	Severe winter storm
Coastal erosion	Hailstorm	Tornado
Coastal storm	Hazardous materials	Tsunami
Dam failure	Human-caused hazards	Volcano
Disease/pest management	Hurricane	Wildfire
Drought	Land subsidence	Wind
Earthquake fault rupture	Landslide and mudflow	Windstorm
Expansive soils	Liquefaction	
Extreme heat	Sea level rise	

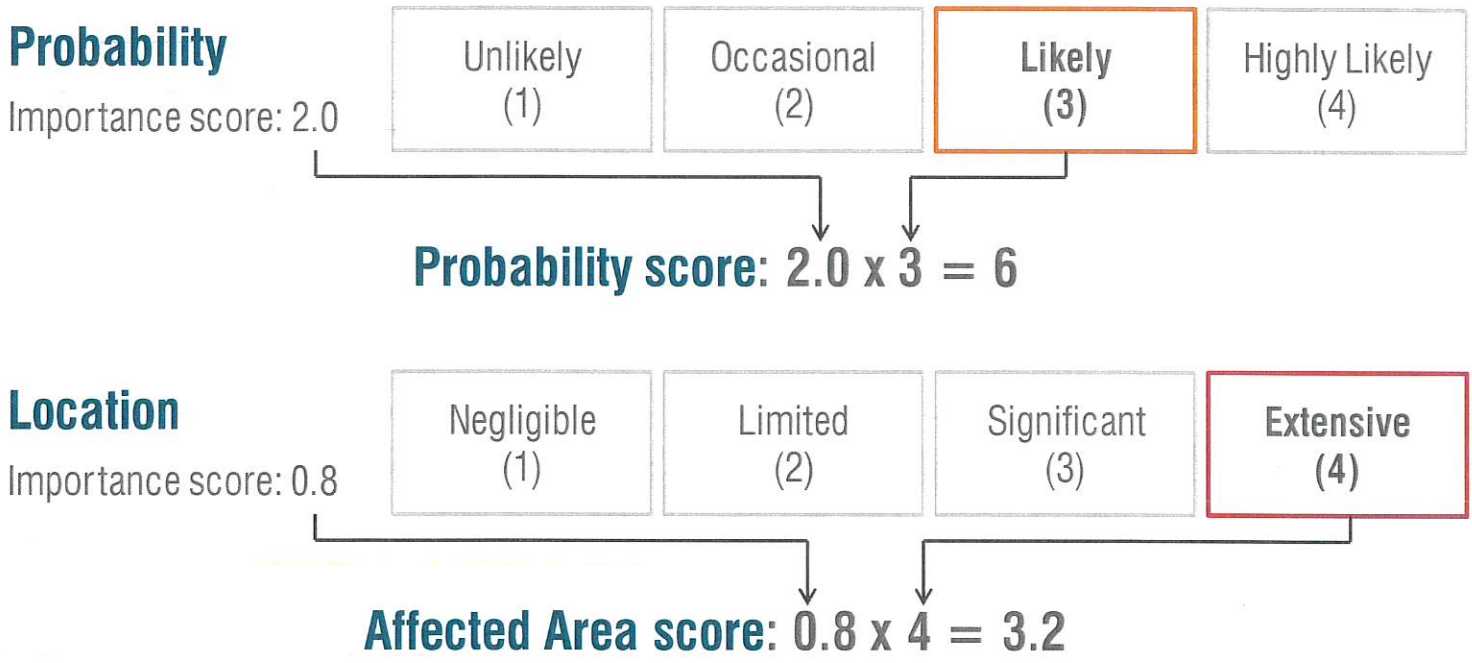
Relevant Hazards

Avalanche	Flood	Seismic hazards
Climate change	Geological hazards	Severe winter storm
Coastal erosion	Hailstorm	Tornado
	Hazardous materials	
Dam failure	Human-caused hazards	Volcano
Disease/pest management		Wildfire
Drought	Land subsidence	Wind
Earthquake fault rupture	Landslide and mudflow	Windstorm
Expansive soils	Liquefaction	
Extreme heat		

Hazard Prioritization

- Four criteria
  - Probability (likelihood of occurrence)
  - Location (size of potentially affected area)
  - Maximum Probable Extent (intensity of damage)
  - Secondary Impacts (severity of impacts to community)
- A value of 1-4 is assigned for each criteria
- Every criteria has an Importance Score
  - Can be used to weigh the influence of an individual criterion
  - Criteria and Importance values are combined to calculate a Total Score

Score Example: Windstorm



Score Example: Windstorm

Maximum Probable Extent

Importance score: 0.7

Weak (1)	**Moderate (2)**	Severe (3)	Extreme (4)

Primary Impact score: 0.7 x 2 = 1.4

Secondary Impacts

Importance score: 0.5

Negligible (1)	Limited (2)	Moderate (3)	High (4)

Secondary Impacts score: 0.5 x 4 = 0.5

Score Example: Windstorm

Impact

Affected Area Score (3.2)	Primary Impact Score (1.4)	Secondary Impact Score (0.5)

Impact score: 3.2 + 1.4 + 0.5 = 5.1

Total Score

Impact Score (5.1)	Probability Score (6)

Total Score: 5.1 x 6 = 30.6

Low: 0-12	Medium: 12.1-42	High: 42.1 and up

Hazard Prioritization Exercise

- Go to the Workbook

Plan Requirements – Planning Process

- Describe:
  - How the plan was prepared
  - Who was involved
  - Opportunities for public and stakeholder involvement
  - Review and inclusion of existing plans, reports, studies, etc.
  - Continual public participation
  - Monitoring and updating of the plan
- Stakeholders must include:
  - Local and regional agencies involved in hazard mitigation
  - Agencies that regulate development
  - Neighborhood communities

Plan Requirements – Planning Process Planning Team

- Administrative Services
- Building Division
- City Clerk
- City Manager
- Community Services
- Fire (Orange County Fire Authority)
- Housing Division
- Planning Division
- Police
- Public Works

Plan Requirements – Planning Process Technical Advisors

- California Highway Patrol
- Coastline Community College
- Garden Grove Unified School District
- Huntington Beach Union High School District
- Kindred Hospital Westminster
- Midway City Sanitation District
- Orange County Flood Control District
- Orange County Health Care Agency
- Orange County Public Administrator
- Orange County Public Libraries – Westminster Branch
- Orange County Public Works
- Orange County Sanitation District
- Orange County Sheriff's Department
- Southern California Edison
- Vietnamese Chamber of Commerce
- Westminster Chamber of Commerce
- Westminster Mall
- Westminster Memorial Park and Mortuary
- Westminster School District

FC channel @ Beach & Hazard
10th Street low-lying flooding

Facility ID	Facility Name/Description	Facility Address	Ownership
1	Westminster City Hall	8200 Wesminster Boulevard, Westminster, CA 92683	City facility
2	~~City Senior Center~~	8200 Wesminster Boulevard, Westminster, CA, 92683	City facility
3	Water Department	8200 Wesminster Boulevard, Westminster, CA, 92683	City facility
4	Police Department	8200 Wesminster Boulevard, Westminster, CA, 92683	City facility
5	Municipal Corporation Yard	14381 Olive Street, Westminster, CA 92683	City facility
6	Family Resource Center	7200 Plaza Street, Westminster, CA 92683	City facility
7	Fire Station 25	8171 Bolsa Avenue, Midway City, CA 92655	County facility
8	Fire Station 64	7351 Westminster Boulevard, Westminster, CA 92683	City ~~County~~ facility
9	Fire Station 65	6061 Hefley Street, Westminster, CA 92683	City ~~County~~ facility
10	Fire Station 66	15061 Moran Street, Westminster, CA 92683	City ~~County~~ facility
11	I-405 Overpass at Valley View Street	33.774625, -118.037716	Public infrastructure
12	I-405 Overpass at Westminster Boulevard	33.759021, -118.021945	Public infrastructure
13	SR-22 Overpass at Beach Boulevard	33.771127, -117.992398	Public infrastructure
14	DeMille Elementary School	15400 Van Buren, Midway City, CA 92655	Public facility (non-City ownership)
15	Eastwood Elementary School	13552 University Street, Westminster, CA, 92683	Public facility (non-City ownership)
16	Finley Elementary School	13521 Edwards Street, Westminster, CA 92683	Public facility (non-City ownership)
17	Fryberger Elementary School	6952 Hood Drive, Westminster, CA 92683	Public facility (non-City ownership)
18	Hayden Elementary School	14782 Eden Street, Midway City, CA 92655	Public facility (non-City ownership)
19	John Marshall Elementary School	15791 Bushard Street, Westminster, CA 92683	Public facility (non-City ownership)

Facility ID	Facility Name/Description	Facility Address	Ownership
20	Johnson Intermediate School/Finley Elementary School	13521 - 13603 Edwards Street, Westminster, CA, 92683	Public facility (non-City ownership)
21	Johnson Middle School	13603 Edwards Street, Westminster, CA 92683	Public facility (non-City ownership)
22	La Quinta High School	10372 West McFadden Avenue, Westminster, CA, 92683	Public facility (non-City ownership)
23	Land Student Services and Child Development	15151 Temple Street, Westminster, CA 92683	Public facility (non-City ownership)
24	Leo Carillo Elementary School	15270 Bushard Street, Westminster, CA 92683	Public facility (non-City ownership)
25	Post Elementary School	14641 Ward Street, Westminster, CA 92683	Public facility (non-City ownership)
26	Sarah McGarvin Intermediate School	9802 Bishop Place, Westminster, CA 92683	Public facility (non-City ownership)
27	Schmitt Elementary School	7200 Trask Avenue, Westminster, CA 92683	Public facility (non-City ownership)
28	Sequoia Elementary School	5900 Iroquois Road, Westminster, CA, 92683	Public facility (non-City ownership)
29	Star View Elementary School	8411 Worthy Drive, Midway City, CA, 92655	Public facility (non-City ownership)
30	Susan B. Anthony Elementary School	15320 Pickford Street, Wesminster, CA 92683	Public facility (non-City ownership)
31	Warner Middle School	14171 Newland Street, Westminster, CA 92683	Public facility (non-City ownership)
32	Webber Elementary School	14142 Hoover Street, Westminster, CA 92683	Public facility (non-City ownership)
33	Westminster High School	14325 Goldenwest Street, Westminster, CA, 92683	Public facility (non-City ownership)
34	Willmore Elementary School	7122 Maple Street, Westminster, CA 92683	Public facility (non-City ownership)

Facility ID	Facility Name/Description	Facility Address	Ownership
35	Cambridge Heights	7541 Wyoming Street, Westminster, CA, 92683	Private property
36	Cinnamon Creek Apartments	15123 Brookhurst Street, Westminster, CA, 92683	Private property
36	Coventry Heights	7521 Wyoming Street, Westminster, CA, 92683	Private property
38	Edison Facility	7300 Fenwick Lane, Westminster, CA 92683	Private property
39	Emeritus Assisted Living	15302 Brookhurst Street, Westminster, CA, 92683	Private property
40	Huntington Westminster	13810 - 13960 Hoover Street, Westminster, CA, 92683	Private property
41	Kindred Hospital Westminster	200 Westminster Circle, Westminster, CA, 92683	Private property
42	Little Saigon Plaza	14841 Moran Street, Westminster, CA 92683	Private property
43	Los Alisos Mobile Home Park	5772 Garden Grove Boulevard, Westminster, CA, 92683	Private property
44	Magnolia Plaza	14014-14085 Magnolia Street, Westminster, CA 96283	Private property
45	Orange Gate Plaza	5405 Garden Grove Boulevard, Westminster, CA 92683	Private property
46	Pacific Royale	15200 Pacific Street, Midway City, CA, 92655	Private property
47	Springdale Villa Apartments	6000 Garden Grove Boulevard, Westminster, CA, 92683	Private property
48	U-Haul	15182 Beach Boulevard, Westminster, CA, 92683	Private property
49	Westminster Center	6611 - 6971 Westminster Boulevard, Westminster, CA, 92683	Private property
50	Westminster Gateway	13225 - 13441 Beach Boulevard, Westminster, CA, 92683	Private property
51	Westminster Mall	1025 Westminster Mall, Westminster, CA, 92683	Private property
52	Westminster Senior Apartments	7632 21st Street, Westminster, CA, 92683	Private property
53	Westminster Terrace	7571 Westminster Boulevard, Westminster, CA, 92683	Private property

SIGN-IN SHEET

City of Westminster Local Hazard Mitigation Plan Technical Advisory Committee
Wednesday, November 12, 2014 9:30 - 11:30 am

Name	Organization/ Dept.	Phone	Email address	Attendance (Initial)
Robert Acosta	Orange County Fire Authority	(714) 483-0911	robertacosta@ofca.org	
Art Bashmakian	Community Development	(714) 548-3484	abashmakian@westminster-ca.gov	
Diana Dobbert	Community Services	(714) 548-8665	ddobbert@westminster-ca.gov	
Jim Kingsmill	Police Department	(714) 548-3846	jkingsmill@westminster-ca.gov	
Soroosh Rahbari ✓	Building Division	(714) 548-3468	srahbari@westminster-ca.gov	
Amanda Jensen for Robin Roberts	City Clerk's Office	714 548-3174 (714) 548-3177	ajensen@westminster-ca.gov rroberts@westminster-ca.gov	
Chet Simmons	City Manager's Office	(714) 548-3169	csimmsons@westminster-ca.gov	
Michael Solorza	Administrative Services	(714) 548-3190	msolorza@westminster-ca.gov	

Marwan Youssef Public Work (714)548-3460 myoussef@ ——

Name	Organization/ Dept.	Phone	Email address	Attendance (Initial)
Marc Stone	Orange County Fire Authority	(714) 319-4657	marcstone@ofca.org	
Marwan Youssef	Public Works	(714) 548-3860	myoussef@westminster-ca.gov	
Craig Herrick	OC Public Works	(714) 955-0208	Craig.Herrick@ocpw.ocgov.com	
Sue Stoffel	OC Public Works	(714) 955-0241	sue.stoffel@ocpw.ocgov.com	SS
AL PANELLA	POLICE	714-552-8771	APANELLA@WESTMINSTER-CA.GOV	
KEN CRUZ	OCFA	(714) 616-2321	Kencruz@ocfa.org	KC
RYAN FREERKS	OCFA	(714) 397-7916	RYANFREERKS@OCFA.ORG	
Penny Lew	OC Public Works/Flood	714-647-3998	Penny.Lew@ocpw.ocgov.com	
Diana Dobbert	City of Westminster	714 548-3405	ddobbert@westminster-ca.gov	
Chet Simmons	City of Westminster	714 548-3169	csimmons@westminster-ca.gov	

Meeting Materials

Westminster Hazard Mitigation Planning Technical Advisory Committee

Meeting 2: January 21, 2015

Included Materials:

- Meeting agenda
- Meeting presentation
- Sign-in sheet

City of Westminster Hazard Mitigation Planning Team

Meeting Agenda

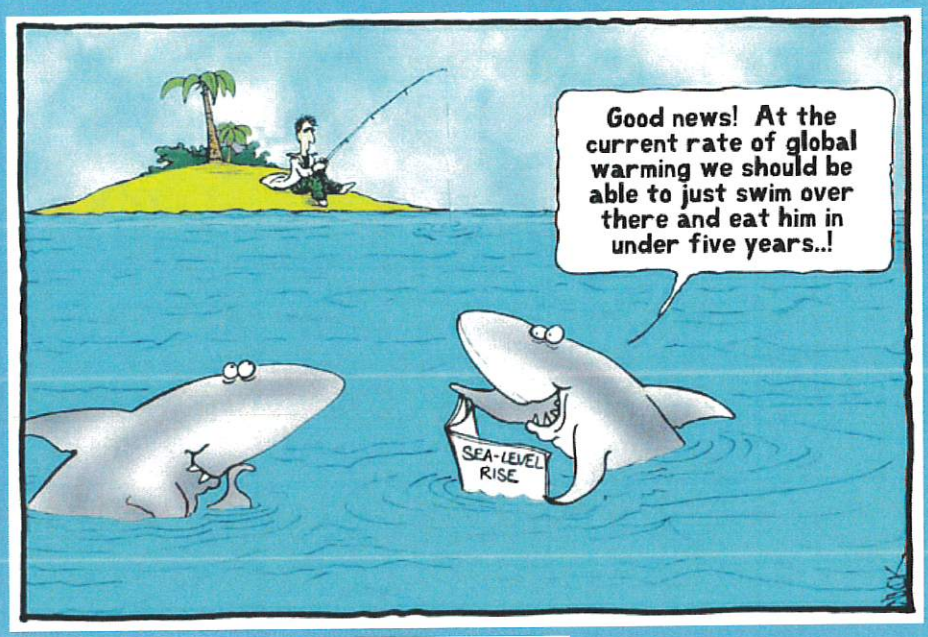
Subject:	Hazard Mitigation Plan Team Meeting 2	**Date:** **Time:**	January 21, 2015 9:30 AM -11:30 AM
Leader:	Aaron Pfannenstiel Project Manager	**Location:**	Emergency Operations Center 8200 Westminster Blvd. Westminster, CA 92683
Purpose:	Overview of Hazard Profiles and Risk Assessment Methodology		
Attendees:	Refer to Sign-In Sheet		
Primary POC	City of Westminster – Sgt. Jim Kingsmill, (714) 548-3846, jkingsmill@westminster-ca.gov PMC – Aaron Pfannenstiel, 909-806-0450, ajp@pmcworld.com		

Item	Description	Lead	Est. Time
1	Welcome and Introductions	Aaron/ Jim Kingsmill	5-10 Minutes
2	Overview of hazard profiles	Aaron	30-45 minutes
3	Overview of Risk Assessment Methodology	Aaron	20-30 minutes
4	Action Items / Closing	Aaron/ Jim Kingsmill	5-10 minutes

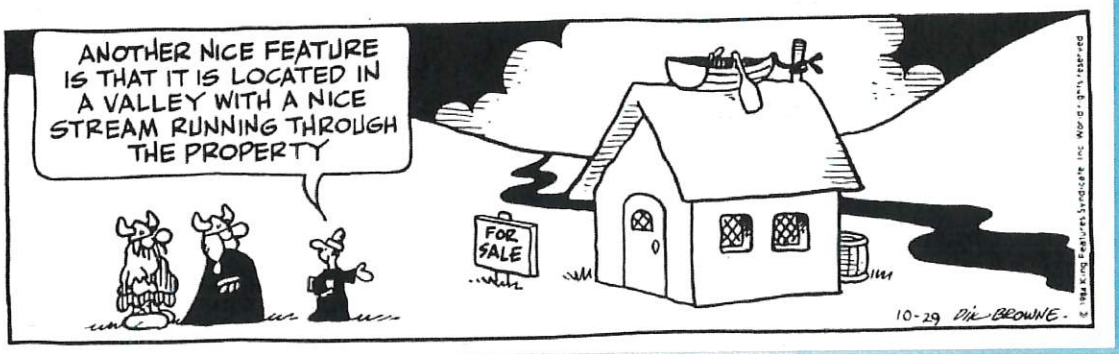
City of Westminster Hazard Mitigation Plan

Hazard Mitigation Planning Team Meeting 2

January 21, 2015 9:30 am
Westminster Emergency Operations Center



HÄGAR the Horrible ® **By Dik Browne**



Meeting Agenda

- Present Summary of Westminster Hazard Profiles
- Methodology for Risk Assessment

City of Westminster
Hazard Profiles

Anatomy of a Hazard Profile

- Identification of the Hazard
- Profile of the Hazard
  - Location
  - Extent
- Past Occurrences
- Probability of Future Occurrences
- Climate Change Considerations
- Vulnerabilities/ Risk Assessment
- Utilities Considerations

Westminster Hazard Ranking

Hazard Type	Probability	Impact			Total Score	Hazard Planning Consideration
		Affected Area	Primary Impact	Secondary Impacts		
Drought	4	4	4	4	64.00	High
Seismic Hazards	4	4	4	4	64.00	High
Flood	4	3	3	3	48.00	High
Liquefaction	3	4	4	4	48.00	High
Hazardous Materials	3	2	4	4	38.40	Medium
Extreme Heat	3	3	3	3	36.00	Medium
Severe Weather (wind/rain)	3	3	3	3	36.00	Medium
Disease/Pest Management	2	4	2	2	22.40	Medium
Dam Failure	1	4	4	4	16.00	Medium

Note: Scores are based on a scale of 1 to 4, where 4 is the highest score, and 1 is the lowest score. See Table 3.3 for more information.

Note: Total score is based on an equation that weights categories by importance. See Table 3.3 for more information.

Climate Change Considerations

- Since many of the effects associated with climate change can exacerbate current conditions we discussed Climate Change considerations in applicable hazard profiles

  - Example: Increased temperatures and changes in precipitation regimes throughout southern California, could exacerbate drought hazards affecting the City.

Utilities Considerations

- Many of the hazards identified within the City could affect utilities in a number of ways. As part of the mitigation strategy development, actions that address particular hazards and safeguard utilities will be identified

  – Example: Appropriate and timely tree trimming activities should be conducted prior to Santa Ana wind season to reduce potential power failures associated with down trees and falling limbs.

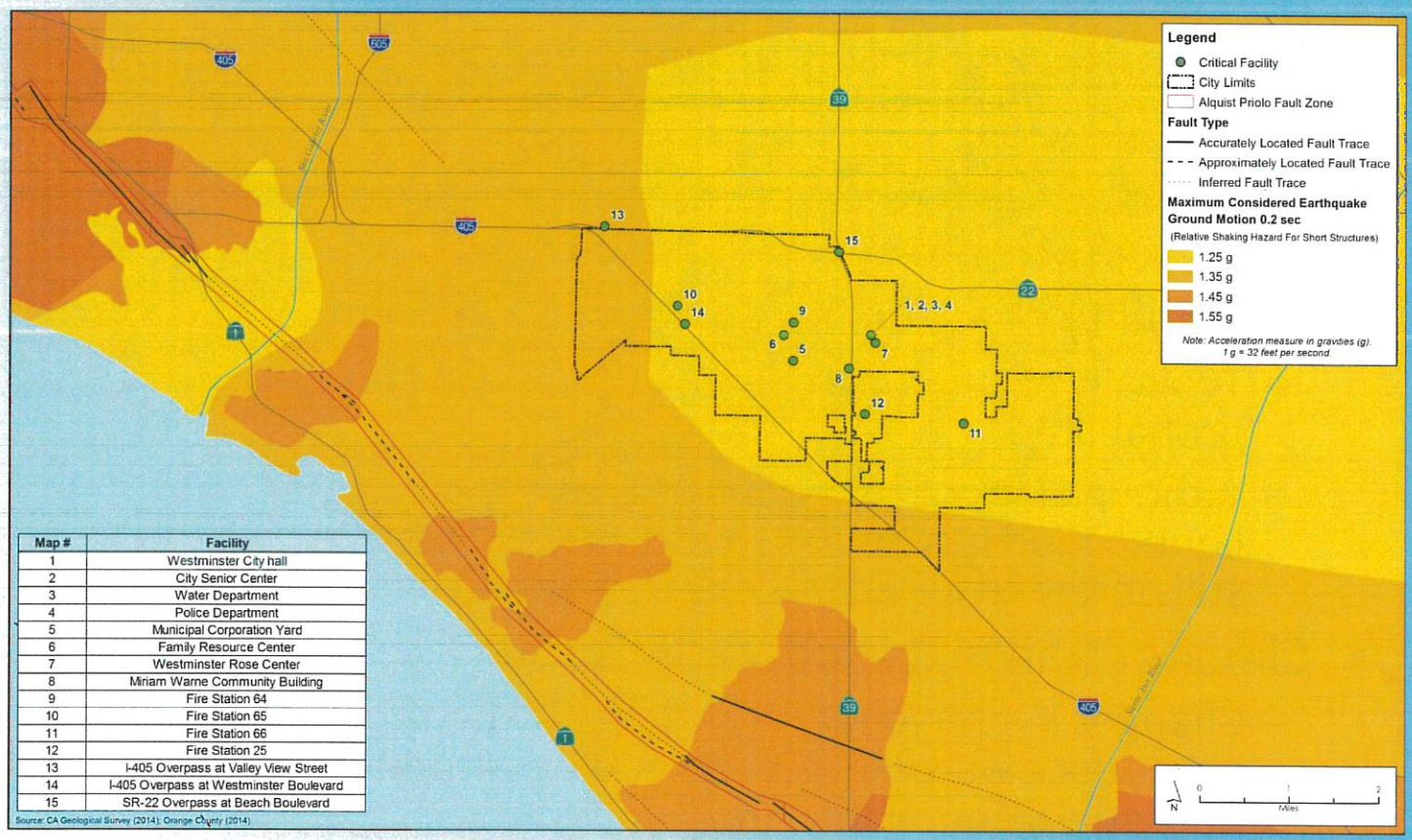
Drought

- Location and Extent
  - The entire City
- Past Occurrences
  - 10 events since 1917, average three to five years in duration.
- Probability of Future Occurrences
  - High probability given the prevalence of drought throughout the state over the last 100 years.
- Climate Change Considerations
  - Anticipated changes in precipitation regimes may reduce groundwater levels within the City, further increasing risks to drought.

Seismic Hazards (Seismic Shaking)

- Location and Extent – The entire City
- Past Occurrences – Most Notable
  - San Fernando(2-9-1971, M 6.6)
  - Northridge(1-17-1994, M 6.7)
- Probability of Future Occurrences
  - Over 97% chance of a M≥ 6.7 in next 30 years
- Climate Change Considerations
  - N/A

Seismic Hazards (Seismic Shaking)



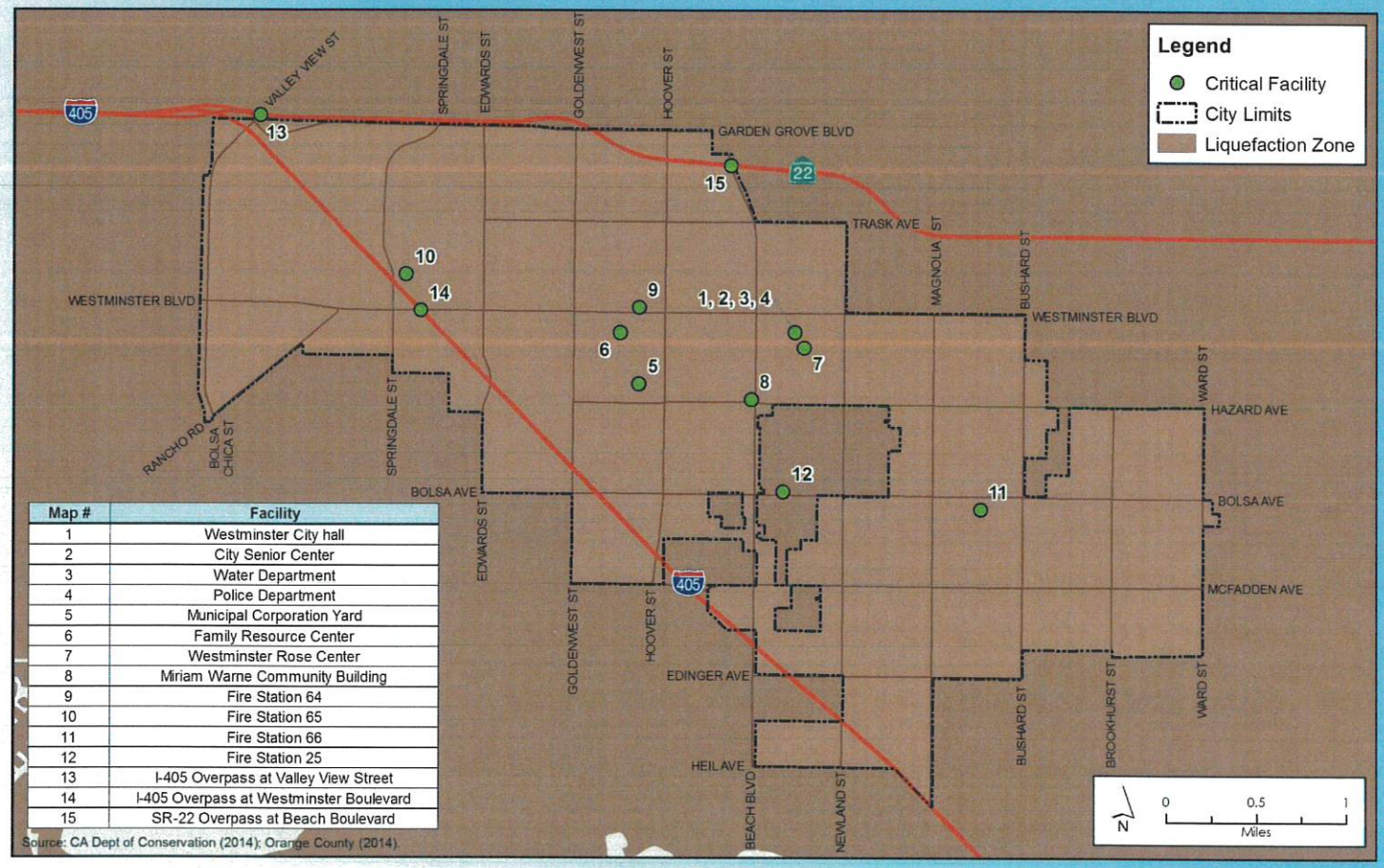
Map #	Facility
1	Westminster City hall
2	City Senior Center
3	Water Department
4	Police Department
5	Municipal Corporation Yard
6	Family Resource Center
7	Westminster Rose Center
8	Miriam Warne Community Building
9	Fire Station 64
10	Fire Station 65
11	Fire Station 66
12	Fire Station 25
13	I-405 Overpass at Valley View Street
14	I-405 Overpass at Westminster Boulevard
15	SR-22 Overpass at Beach Boulevard

Source: CA Geological Survey (2014); Orange County (2014)

Seismic Hazards (Liquefaction)

- Location and Extent
  - The entire City is underlain by loose soils and shallow groundwater.
- Past Occurrences
  - No past occurrences identified to date.
- Probability of Future Occurrences
  - Typically occurs with a large earthquake (see EQ probability).
  - Although lack of past occurrences indicates that liquefaction has not been an issue for Westminster there is still potential for liquefaction to occur.
- Climate Change Considerations
  - Changes in precipitation regimes in the future could affect subsurface water levels, expanding saturation zone and potentially liquefiable areas within the City.

Seismic Hazards (Liquefaction)



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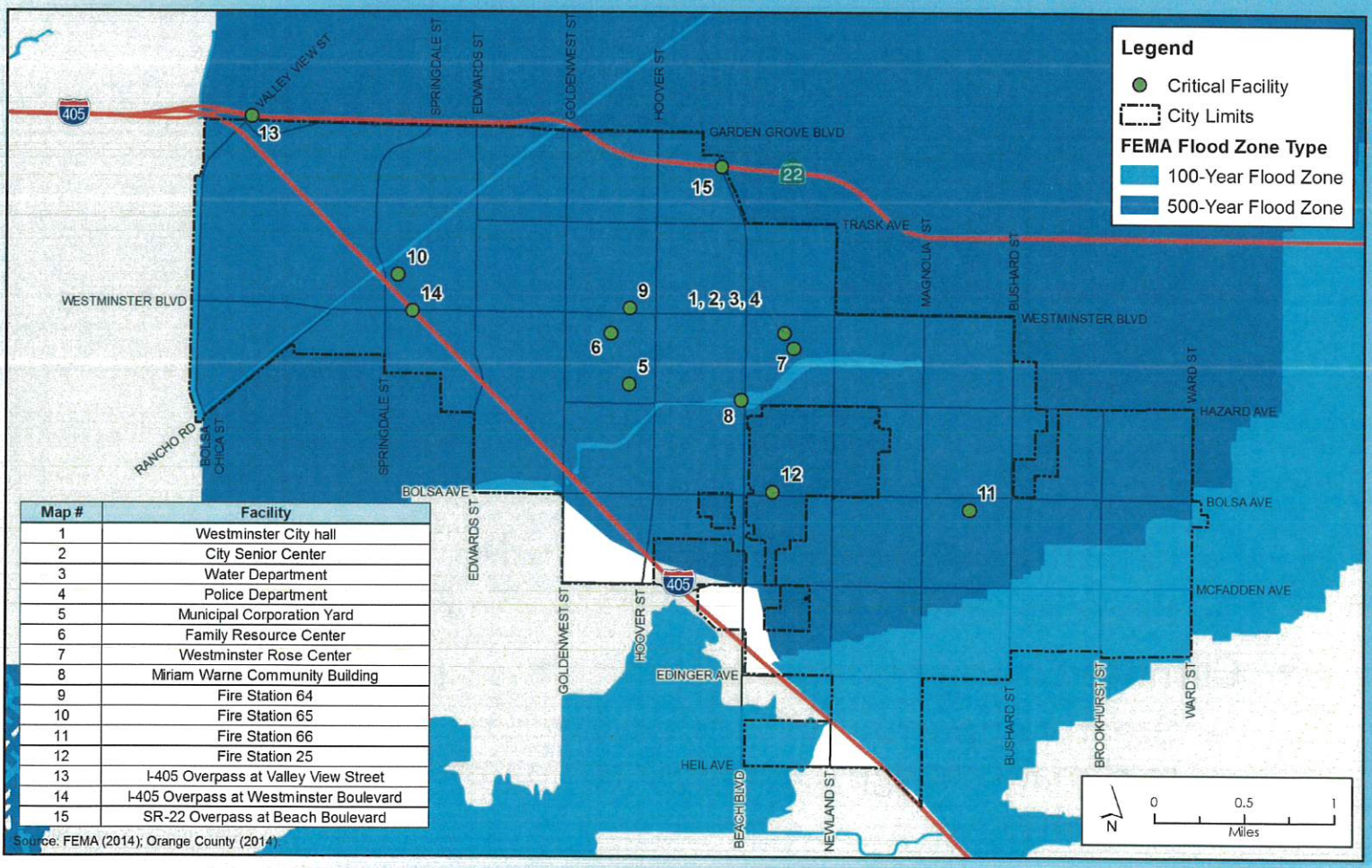
Source: CA Dept of Conservation (2014); Orange County (2014)

Flood

- Location and Extent
  - Nearly entire City located in 500-year floodplain. Portions of City located in 100-year floodplain.
- Past Occurrences
  - Between 1950 and 2012, 18 major events have impacted Orange County. Many of these events contributed to the urban flooding that typically occurs during wet winter storms.
- Probability of Future Occurrences
  - It is anticipated that urban flooding will continue to occur during wet winter storms.
- Climate Change Considerations
  - Increase storm intensity could increase urban flooding issues within the City.

Flood



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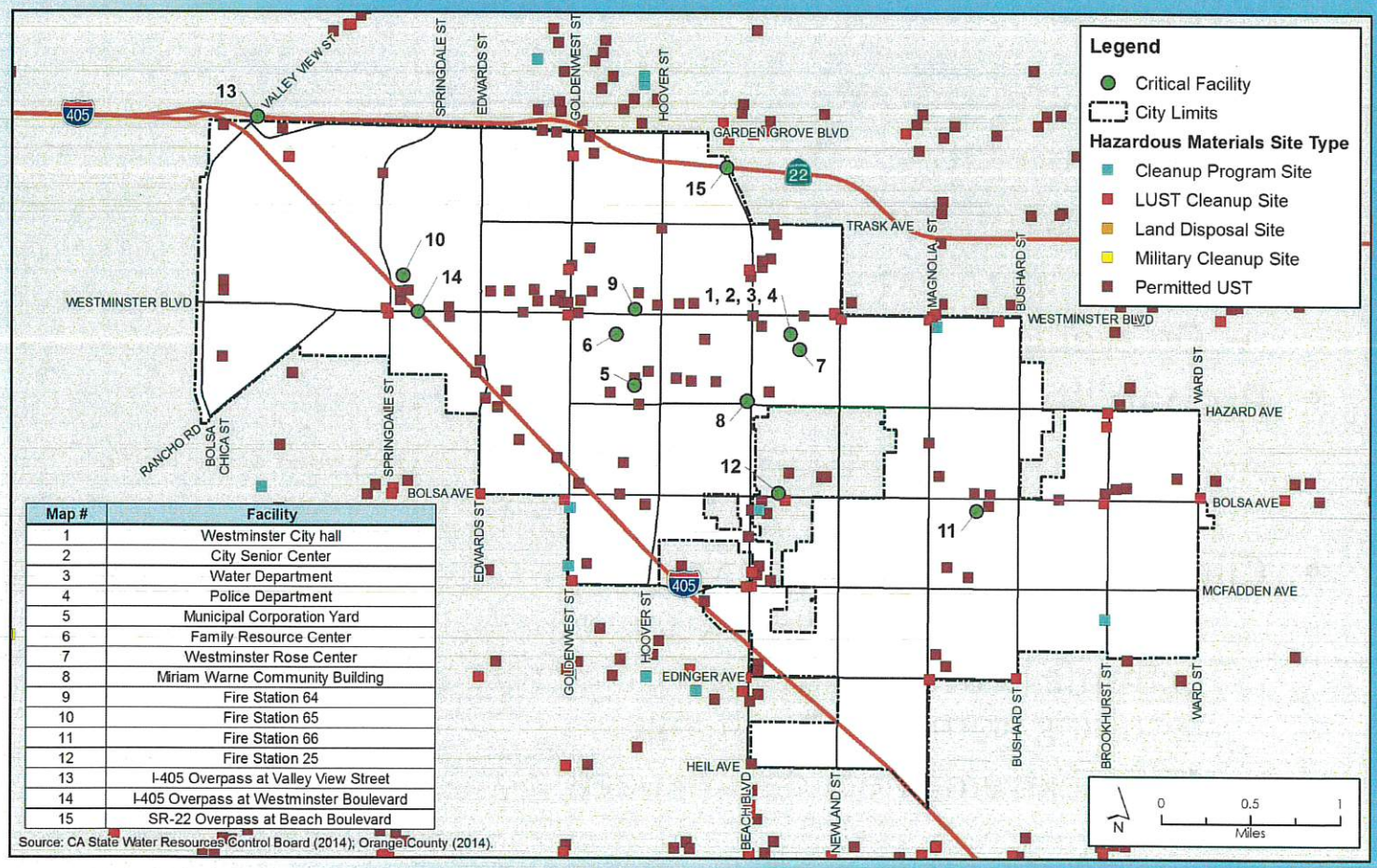
Source: FEMA (2014); Orange County (2014)

Hazardous Materials

- Location and Extent
  - A majority of the City contains locations that manufacture, store, and/or dispose of hazardous materials.
- Past Occurrences
  - 94 reported incidents reported between 1993 and 2014 within the City.
- Probability of Future Occurrences
  - On average approximately nine incidents occur in Westminster every two years.
  - Infrastructure age could increase risk
  - New regulations and technologies can reduce risk
- Climate Change Considerations
  - Greater opportunity for release of hazardous materials due to climate change (i.e. higher temperatures, greater storm intensity)

Hazardous Materials



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Source: CA State Water Resources Control Board (2014); Orange County (2014).

Extreme Heat

- Location and Extent
  - The entire City
- Past Occurrences
  - On average 4 extreme heat days per year
  - On average 0-1 heat wave per year
- Probability of Future Occurrences
  - High certainty that extreme heat conditions will occur in the future.
- Climate Change Considerations
  - Future climatic conditions could increase the number of extreme heat events based on increased temperatures resulting from climate change.
  - 15-35 extreme heat days expected by 2050.

Severe Weather

- Location and Extent
  - Citywide/ Countywide hazard
- Past Occurrences (Tornado, High Winds, Strong Winds)
  - 18 major windstorm (Santa Ana) events recorded in Southern California between (1956 and 2007)
  - 5 of these events caused significant damage within Orange County
- Probability of Future Occurrences
  - Future occurrences are expected
    - Santa Ana conditions occur on a yearly basis
- Climate Change Considerations
  - Changes in atmospheric conditions could change the frequency, severity, and duration of future windstorm events, however to what degree is uncertain.

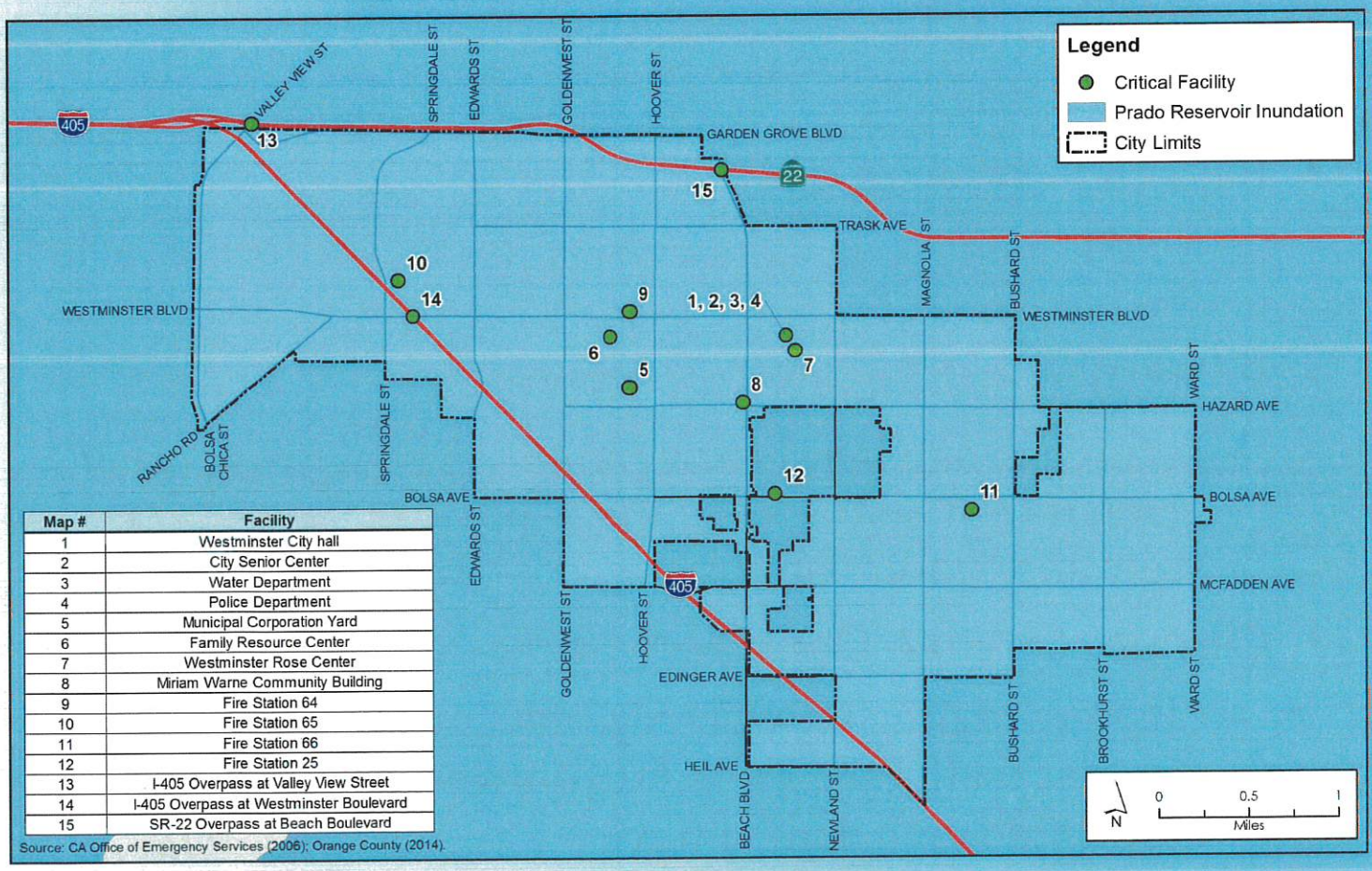
Disease/ Pest Management

- Location and Extent
  - The entire City
- Past Occurrences
  - No major occurrences identified.
- Probability of Future Occurrences
  - High probability of future occurrence associated with the favorable climatic conditions that allow diseases and insects to propagate.
- Climate Change Considerations
  - It is anticipated that a warmer climate would not only stress native plants and animals but could also create favorable conditions for existing and new invasive species/diseases to be introduced into southern California.

Dam Failure

- Location and Extent
  - The entire City
- Past Occurrences
  - No dam failure incidents have affected Westminster in the past.
- Probability of Future Occurrences
  - Future probability is anticipated to be low, especially given recent upgrades to the Santa Ana River main stem and Prado Dam.
- Climate Change Considerations
  - Changes in precipitation regimes could increase stresses on flood control facilities increasing the risk associated with dam failure.

Dam Failure



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Source: CA Office of Emergency Services (2006); Orange County (2014).

City of Westminster
Critical Facilities

Critical Facilities List

Map #	Facility
1	Westminster City Hall
2	City Senior Center
3	Water Department
4	Police Department
5	Municipal Corporation Yard
6	Family Resource Center
7	Westminster Rose Center
8	Miriam Warne Community Building
9	Fire Station 64
10	Fire Station 65
11	Fire Station 66
12*	Fire Station 25
13	I-405 Overpass at Valley View Street
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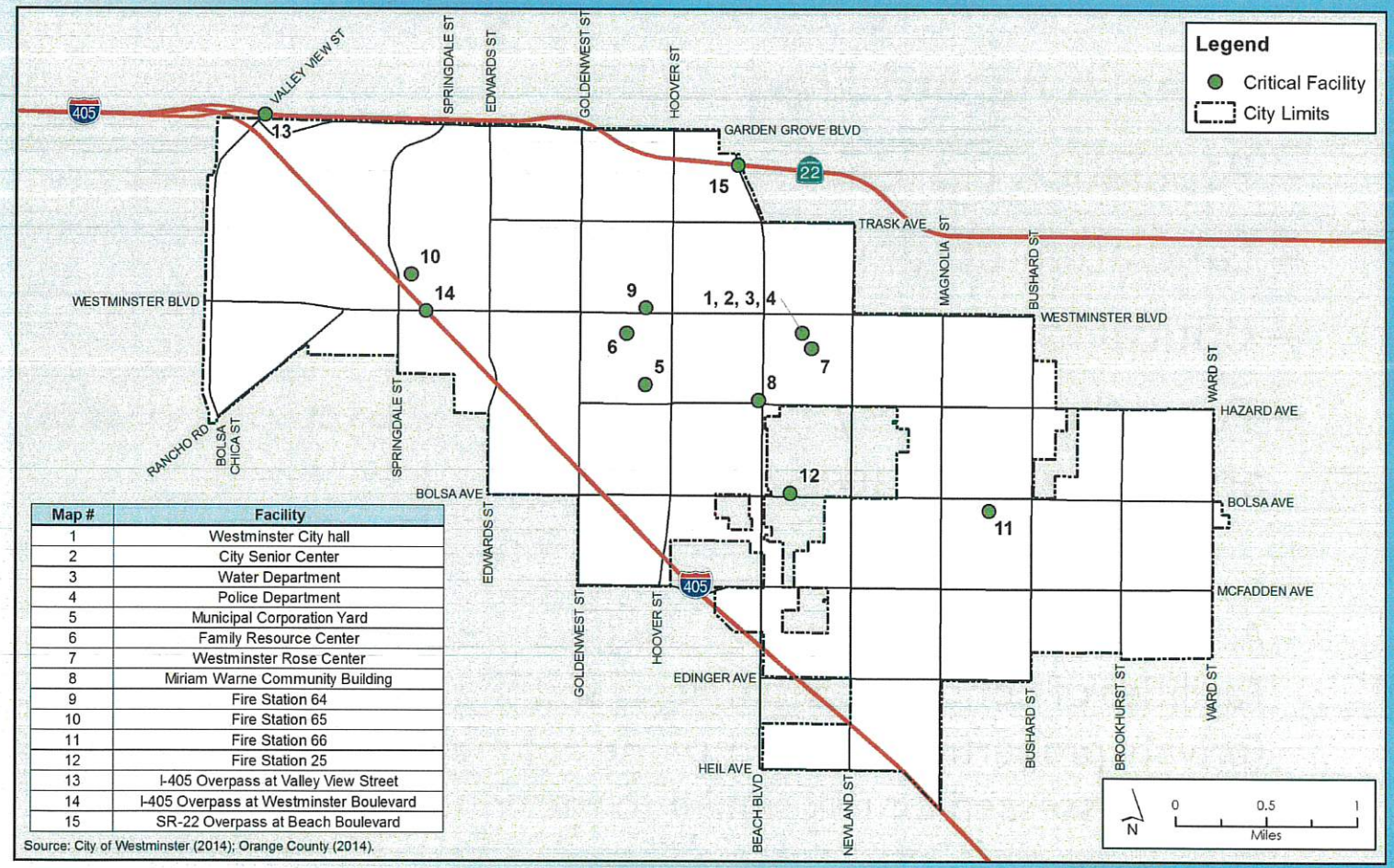
**Fire Station 66 is in Midway City, which is in the City of Westminster's sphere of influence.*

Critical Facilities List



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Source: City of Westminster (2014); Orange County (2014).

Methodology for Risk Assessment

Within each hazard area:

- Population (based on an average population factor)
- Land area (portion of City affected by hazard)
- Critical Facilities
- Potential damage / loss estimations (based on building and content replacement values)

- An appendix will be added to the document that will contain the Facilities of Concern (school sites) and the Facilities of Interest (private properties). As part of the appendix, these facilities will also be assessed for risk similar to the critical facilities.

Risk Assessment

	Facility	Drought	Seismic Hazards		Flood (500 ft of 100 year flood zone)	Hazardous Materials (1,000 ft)	Extreme Heat	Severe Weather (Wind)	Disease and Pest Mgmt	Dam Failure
			Ground Shaking	Liquefaction						
1	Westminster City Hall	Y	Y	Y	N	Y	Y	Y	Y	Y
2	City Senior Center	Y	Y	Y	N	Y	Y	Y	Y	Y
3	Water Department	Y	Y	Y	N	Y	Y	Y	Y	Y
4	Police Department	Y	Y	Y	N	Y	Y	Y	Y	Y
5	Municipal Corporation Yard	Y	Y	Y	N	Y	Y	Y	Y	Y
6	Family Resource Center	Y	Y	Y	N	N	Y	Y	Y	Y
7	Westminster Rose Center	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Miriam Warne Community Building	Y	Y	Y	Y	Y	Y	Y	Y	Y
9	Fire Station 64	Y	Y	Y	N	Y	Y	Y	Y	Y
10	Fire Station 65	Y	Y	Y	Y	Y	Y	Y	Y	Y
11	Fire Station 66	Y	Y	Y	N	Y	Y	Y	Y	Y
12	Fire Station 25	Y	Y	Y	N	Y	Y	Y	Y	Y
13	I-405 Overpass at Valley View Street	Y	Y	Y	N	Y	Y	Y	Y	Y
14	I-405 Overpass at Westminster Boulevard	Y	Y	Y	N	Y	Y	Y	Y	Y
15	SR-22 Overpass at Beach Boulevard	Y	Y	Y	N	Y	Y	Y	Y	Y

Y denotes that the critical facility intersects the hazard layer

N denotes that the critical facility does not intersect the hazard layer

Questions/ Comments

- Additional thoughts, data, information, and suggestions can be provided to:
  - Jim Kingsmill – Emergency Services Coordinator
    jkingsmill@westminster-ca.gov
  - Aaron Pfannenstiel – LHMP Project Manager
    ajp@pmcworld.com

SIGN-IN SHEET

City of Westminster Local Hazard Mitigation Plan Team Meeting
Wednesday, January 21, 2015 9:30 - 11:30 am

Name	Organization/ Dept.	Phone	Email address	Attendance (Initial)
Robert Acosta	Orange County Fire Authority	(714) 483-0911	robertacosta@ocfa.org	
Art Bashmakian	Community Development	(714) 548-3484	abashmakian@westminster-ca.gov	
Diana Dobbert	Community Services	(714) 548-8665	ddobbert@westminster-ca.gov	
Jim Kingsmill	Police Department	(714) 548-3846	jkingsmill@westminster-ca.gov	
Soroosh Rahbari	Building Division	(714) 548-3468	srahbari@westminster-ca.gov	
Megan Ducat Robin Roberts	City Clerk's Office	(714) 548-3177	rroberts@westminster-ca.gov	
Chet Simmons	City Manager's Office	(714) 548-3169	csimmsons@westminster-ca.gov	
Michael Solorza	Administrative Services	(714) 548-3190	msolorza@westminster-ca.gov	

Name	Organization/ Dept.	Phone	Email address	Attendance (Initial)
Marc Stone	Orange County Fire Authority	(714) 319-4657	marcstone@ocfa.org	
Marwan Youssef	Public Works	(714) 548-3860	myoussef@westminster-ca.gov	
Vanessa Johnson	Community Services	(714) 548 3067	VJohnson@westminster-CA.gov	
Tracy McClellan	OCFA	(714) 824-0219	TracyMcClellan@ocfa.org	
Mika Takayasu	Housing	(714) 548- 3493	MTakayasu@westminster-ca.gov	

Meeting Materials

Westminster Hazard Mitigation Planning Technical Advisory Committee

Meeting 3: March 11, 2015

Included Materials:

- Sign-in sheet

SIGN-IN SHEET

City of Westminster Local Hazard Mitigation Plan Team Meeting 3
Wednesday, March 11, 2015 9:30 - 11:30 am

Name	Organization/ Dept.	Phone	Email address	Attendance Initial
Robert Acosta	OCFA	714-483-0911	robertacosta@ocfa.org	
Art Bashmakian	Community Development	714-548-3484	abashmakian@westminster-ca.gov	
Ken Cruz	OCFA	714-616-2321	kencruz@ocfa.org	
Diana Dobbert	Community Services	714-548-3665	ddobbert@westminster-ca.gov	
Megan Ducat	City Clerk's Office		mducat@westminster-ca.gov	
~~Ryan Freerks~~	OCFA	714-397-7916	ryanfreerks@ocfa.org	
Craig Herrick	OC Public Works	714-955-0208	Craig.herrick@ocpw.ocgov.com	
Amanda Jensen	City Clerk's Office	714-548-3174	ajensen@westminster-ca.gov	
Vanessa Johnson	Community Services	714-548-3667	vjohnson@westminster-ca.gov	
Jim Kingsmill	Police Department	714-548-3846	jkingsmill@westminster-ca.gov	
Penny Lew	OC Public Works/Flood	714-647-3998	Penny.Lew@ocpw.ocgov.com	
Tracy McClelland	OCFA	714-824-0219	tracymcclelland@ocfa.org	
Al Panella	Police Department	714-552-8771	apanella@westminster-ca.gov	

Name	Organization/ Dept.	Phone	Email address	Attendance Initial
Soroosh Rahbari	Building Division	714-548-3468	srahbari@westminster-ca.gov	
Robin Roberts	City Clerk's Office	714-548-3177	rroberts@westminster-ca.gov	
Chet Simmons	City Manager's Office	714-548-3169	csimmsons@westminster-ca.gov	
Michael Solorza	Administrative Services	714-548-3190	msolorza@westminster-ca.gov	
Sue Stoffel	OC Public Works	714-955-0241	Sue.stoffel@ocpw.ocgov.com	
Marc Stone	OCFA	714-319-4657	marcstone@ocfa.org	
Mika Takayasu	Housing	714-548-3493	mtakayasu@westminster-ca.gov	MT
Marwan Youssef	Public Works	714-548-3460	myoussef@westminster-ca.gov	M.Y.
Kevin Bass	OCFA	714 527 9431	kevinbass@ocfa.org	KB

APPENDIX A – LHMP TEAM DOCUMENTS

2. MASTER FACILITIES LIST

Westminster Master Facilities List

	Facility ID	Facility Name/Description	Facility Address	Ownership
Critical Facilities	1	Westminster City Hall	8200 Wesminster Boulevard, Westminster, CA 92683	City facility
	2	City Senior Center	8200 Wesminster Boulevard, Westminster, CA, 92683	City facility
	3	Police Department	8200 Wesminster Boulevard, Westminster, CA, 92683	City facility
	4	Municipal Corporation Yard	14381 Olive Street, Westminster, CA 92683	City facility
	5	Family Resource Center	7200 Plaza Street, Westminster, CA 92683	City facility
	6	Westminster Rose Center	14140 All American Way, Westminster, CA 92683	City facility
	7	Miriam Warne Community Building	14491 Beach Boulevard, Westminster, CA 92683	City facility
	8	Fire Station 64	7351 Westminster Boulevard, Westminster, CA 92683	City facility
	9	Fire Station 65	6061 Hefley Street, Westminster, CA 92683	City facility
	10	Fire Station 66	15061 Moran Street, Westminster, CA 92683	City facility
	11	Fire Station 25	8171 Bolsa Avenue, Midway City, CA 92655	County facility
	12	I-405 Overpass at Valley View Street	33.774625, -118.037716	Public infrastructure
	13	I-405 Overpass at Westminster Boulevard	33.759021, -118.021945	Public infrastructure
	14	SR-22 Overpass at Beach Boulevard	33.771127, -117.992398	Public infrastructure

Westminster Master Facilities List

	Facility ID	Facility Name/Description	Facility Address	Ownership
Facilities of Concern (City of Westminster)	15	Le-Jao Coastline Community College	14120 All American Way, Westminster, CA 92683	Public facility (non-City ownership)
	16	DeMille Elementary School	15400 Van Buren, Midway City, CA 92655	Public facility (non-City ownership)
	17	Eastwood Elementary School	13552 University Street, Westminster, CA, 92683	Public facility (non-City ownership)
	18	Finley Elementary School	13521 Edwards Street, Westminster, CA 92683	Public facility (non-City ownership)
	19	Fryberger Elementary School	6952 Hood Drive, Westminster, CA 92683	Public facility (non-City ownership)
	20	Hayden Elementary School	14782 Eden Street, Midway City, CA 92655	Public facility (non-City ownership)
	21	John Marshall Elementary School	15791 Bushard Street, Westminster, CA 92683	Public facility (non-City ownership)
	22	Johnson Intermediate School/Finley Elementary School	13521 - 13603 Edwards Street, Westminster, CA, 92683	Public facility (non-City ownership)
	23	Johnson Middle School	13603 Edwards Street, Westminster, CA 92683	Public facility (non-City ownership)
	24	La Quinta High School	10372 West McFadden Avenue, Westminster, CA, 92683	Public facility (non-City ownership)
	25	Land Student Services and Child Development	15151 Temple Street, Westminster, CA 92683	Public facility (non-City ownership)
	26	Leo Carillo Elementary School	15270 Bushard Street, Westminster, CA 92683	Public facility (non-City ownership)
	27	Post Elementary School	14641 Ward Street, Westminster, CA 92683	Public facility (non-City ownership)
	28	Sarah McGarvin Intermediate School	9802 Bishop Place, Westminster, CA 92683	Public facility (non-City ownership)
	29	Schmitt Elementary School	7200 Trask Avenue, Westminster, CA 92683	Public facility (non-City ownership)
	30	Sequoia Elementary School	5900 Iroquois Road, Westminster, CA, 92683	Public facility (non-City ownership)
	31	Star View Elementary School	8411 Worthy Drive, Midway City, CA, 92655	Public facility (non-City ownership)
	32	Susan B. Anthony Elementary School	15320 Pickford Street, Wesminster, CA 92683	Public facility (non-City ownership)
	33	Warner Middle School	14171 Newland Street, Westminster, CA 92683	Public facility (non-City ownership)
	34	Webber Elementary School	14142 Hoover Street, Westminster, CA 92683	Public facility (non-City ownership)
	35	Westminster High School	14325 Goldenwest Street, Westminster, CA, 92683	Public facility (non-City ownership)
	36	Willmore Elementary School	7122 Maple Street, Westminster, CA 92683	Public facility (non-City ownership)

Westminster Master Facilities List

	Facility ID	Facility Name/Description	Facility Address	Ownership
Facilities of Interest (OCFA)	37	Cambridge Heights	7541 Wyoming Street, Westminster, CA, 92683	Private property
	38	Cinnamon Creek Apartments	15123 Brookhurst Street, Westminster, CA, 92683	Private property
	39	Coventry Heights	7521 Wyoming Street, Westminster, CA, 92683	Private property
	40	Edison Facility	7300 Fenwick Lane, Westminster, CA 92683	Private property
	41	Emeritus Assisted Living	15302 Brookhurst Street, Westminster, CA, 92683	Private property
	42	Huntington Westminster	13810 - 13960 Hoover Street, Westminster, CA, 92683	Private property
	43	Kindred Hospital Westminster	200 Westminster Circle, Westminster, CA, 92683	Private property
	44	Little Saigon Plaza	14841 Moran Street, Westminster, CA 92683	Private property
	45	Los Alisos Mobile Home Park	5772 Garden Grove Boulevard, Westminster, CA, 92683	Private property
	46	Magnolia Plaza	14014-14085 Magnolia Street, Westminster, CA 96283	Private property
	47	Orange Gate Plaza	5405 Garden Grove Boulevard, Westminster, CA 92683	Private property
	48	Pacific Royale	15200 Pacific Street, Midway City, CA, 92655	Private property
	49	Springdale Villa Apartments	6000 Garden Grove Boulevard, Westminster, CA, 92683	Private property
	50	U-Haul	15182 Beach Boulevard, Westminster, CA, 92683	Private property
	51	Westminster Center	6611 - 6971 Westminster Boulevard, Westminster, CA, 92683	Private property
	52	Westminster Gateway	13225 - 13441 Beach Boulevard, Westminster, CA, 92683	Private property
	53	Westminster Mall	1025 Westminster Mall, Westminster, CA, 92683	Private property
	54	Westminster Senior Apartments	7632 21st Street, Westminster, CA, 92683	Private property
	55	Westminster Terrace	7571 Westminster Boulevard, Westminster, CA, 92683	Private property

APPENDIX A – LHMP DOCUMENTS

3. LHMP TEAM INVITATIONS

City of W stminster
8200 Westminster Boulevard, Westminster, CA 92683 714.898.3311
www.westminster-ca.gov

October 31, 2014

Westminster School District
14121 Cedarwood Avenue
Westminster, CA 92683
ATTN: Dr. Marian Kim-Phelps, Superintendent

RE: EMERGENCY PREPAREDNESS

Dear Ms. Kim-Phelps,

The City of Westminster is in the process of preparing its first Local Hazard Mitigation Plan (LHMP) to identify and mitigate potential hazards that may impact the City and its nearby facilities. As part of the LHMP process, the City is actively reaching out to agencies that could provide critical input on identifying resources readily available to mitigate these potential hazards.

We are interested in receiving your agency's input related to the City's Local Hazard Mitigation Plan, and any recommendations you may have in addressing the potential risks to the City and community. We will be holding a meeting with City staff and outside agencies to discuss these topics, and hope that a representative of your agency can attend. We would greatly appreciate it if you could RSVP no later than November 10th, 2014 to the following email address: **mtakayasu@westminster-ca.gov**

City of Westminster: Disaster Recovery Initiative (DRI) - Local Hazard Mitigation Plan
Wednesday, November 12, 2014 - 9:30-11:30 a.m.
Location: Westminster Police Department Building (EOC Room)
8200 Westminster Boulevard
Westminster, CA 92683

Light refreshments will be provided

If you have any questions, please feel free to contact me at (714) 548-3493 or send an email to **mtakayasu@westminster-ca.gov**.

Sincerely,

Sgt. James Kingsmill

SERGEANT JAMES KINGSMILL

City of Westminster
8200 Westminster Boulevard, Westminster, CA 92683 714.898.3311
www.westminster-ca.gov

October 31, 2014

Southern California Edison
7333 Bolsa Avenue
Westminster, CA 92683
ATTN: Jenelle Godges, Region Manager Local Public Affairs

RE: EMERGENCY PREPAREDNESS

Dear Ms. Godges,

The City of Westminster is in the process of preparing its first Local Hazard Mitigation Plan (LHMP) to identify and mitigate potential hazards that may impact the City and its nearby facilities. As part of the LHMP process, the City is actively reaching out to agencies that could provide critical input on identifying resources readily available to mitigate these potential hazards.

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Sincerely,

Sgt. James Kingsmill

SERGEANT JAMES KINGSMILL

City of V stminster
8200 Westminster Boulevard, Westminster, CA 92683 714.898.3311
www.westminster-ca.gov

October 31, 2014

Kindred Hospital Westminster
200 Hospital Circle
Westminster, CA 92683
ATTN: Brooke Saunders, Chief Executive Officer

RE: EMERGENCY PREPAREDNESS

Dear Ms. Saunders,

The City of Westminster is in the process of preparing its first Local Hazard Mitigation Plan (LHMP) to identify and mitigate potential hazards that may impact the City and its nearby facilities. As part of the LHMP process, the City is actively reaching out to agencies that could provide critical input on identifying resources readily available to mitigate these potential hazards.

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Sincerely,

Sgt. James Kingsmill

SERGEANT JAMES KINGSMILL

City of W stminster
8200 Westminster Boulevard, Westminster, CA 92683 714.898.3311
www.westminster-ca.gov

October 31, 2014

Red Cross of Orange County
601 N. Golden Circle Drive
Santa Ana, CA 92705
ATTN: Pedro Ayala, Emergency Preparedness

RE: EMERGENCY PREPAREDNESS

Dear Mr. Ayala,

The City of Westminster is in the process of preparing its first Local Hazard Mitigation Plan (LHMP) to identify and mitigate potential hazards that may impact the City and its nearby facilities. As part of the LHMP process, the City is actively reaching out to agencies that could provide critical input on identifying resources readily available to mitigate these potential hazards.

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Wednesday, November 12, 2014 - 9:30-11:30 a.m.
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8200 Westminster Boulevard
Westminster, CA 92683

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If you have any questions, please feel free to contact me at (714) 548-3493 or send an email to **mtakayasu@westminster-ca.gov**.

Sincerely,

Sgt. James Kingsmill

SERGEANT JAMES KINGSMILL

City of V stminster
8200 Westminster Boulevard, Westminster, CA 92683 714.898.3311
www.westminster-ca.gov

October 31, 2014

Orange County Public Works, Flood Division
300 North Flower Street, 7th floor
Santa Ana, CA 92703
ATTN: Mehdi Sobhani

RE: EMERGENCY PREPAREDNESS

Dear Mr. Sobhani,

The City of Westminster is in the process of preparing its first Local Hazard Mitigation Plan (LHMP) to identify and mitigate potential hazards that may impact the City and its nearby facilities. As part of the LHMP process, the City is actively reaching out to agencies that could provide critical input on identifying resources readily available to mitigate these potential hazards.

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Westminster, CA 92683

Light refreshments will be provided

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Sincerely,

Sgt. James Kingsmill

SERGEANT JAMES KINGSMILL

City of V stminster

8200 Westminster Boulevard, Westminster, CA 92683 714.898.3311
www.westminster-ca.gov

October 31, 2014

Orange County Sheriff's Department
Emergency Management Division
22644 Santiago Canyon Road
Silverado, CA 92676
ATTN: Donna Boston, Director of Emergency Management

RE: EMERGENCY PREPAREDNESS

Dear Ms. Boston,

The City of Westminster is in the process of preparing its first Local Hazard Mitigation Plan (LHMP) to identify and mitigate potential hazards that may impact the City and its nearby facilities. As part of the LHMP process, the City is actively reaching out to agencies that could provide critical input on identifying resources readily available to mitigate these potential hazards.

We are interested in receiving your agency's input related to the City's Local Hazard Mitigation Plan, and any recommendations you may have in addressing the potential risks to the City and community. We will be holding a meeting with City staff and outside agencies to discuss these topics, and hope that a representative of your agency can attend. We would greatly appreciate it if you could RSVP no later than November 10th, 2014 to the following email address: **mtakayasu@westminster-ca.gov**

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8200 Westminster Boulevard
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Light refreshments will be provided

If you have any questions, please feel free to contact me at (714) 548-3493 or send an email to **mtakayasu@westminster-ca.gov**.

Sincerely,

Sgt. James Kingsmill

SERGEANT JAMES KINGSMILL

APPENDIX B – PUBLIC OUTREACH MATERIALS

1. LHMP PUBLIC OUTREACH/ENGAGEMENT SUMMARY

Westminster LHMP Public Engagement/Outreach Summary

As part of the public engagement and outreach process for the LHMP, the City of Westminster published an online survey for community members. The survey asked respondents about potential hazards facing Westminster and what steps community members have taken or are interested in taking to reduce the threats from these hazards. A link to the survey was posted on the City's website (screenshot provided), on the City's Facebook page, and on the City's Twitter feed. The survey was open from April 14, 2015 to June 8, 2014 and received 36 responses.

As part of the outreach process, Project staff also attended four public meetings conducted by the City and gave a presentation highlighting the LHMP process, the work completed by the Hazard Mitigation Planning Team, and encouraging community members to take the survey.

The following meetings were attended:

Meeting	Date	Public Attendees	Comments/ Questions received from the Public
Planning Commission	May 6, 2015	6	0
Commission on Aging	May 18, 2015	2	0
Community Services and Recreation Commission	May 13, 2015	0	0
Senior Citizens Advisory Team (SCAT)	May 15, 2015	0	0

Online Survey Questionnaire

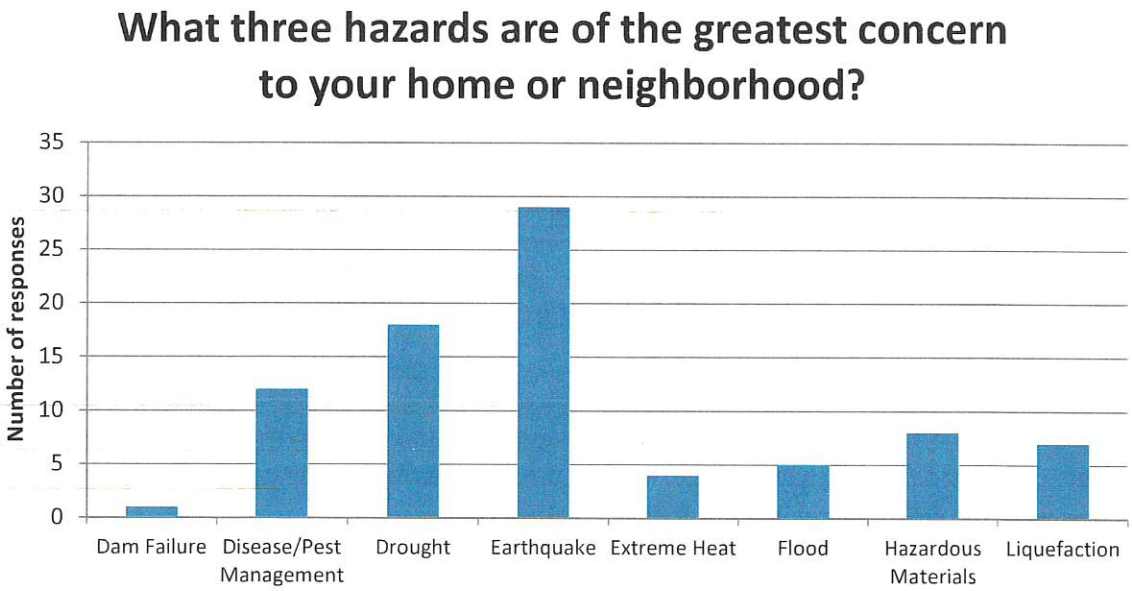
Below is a summary of the questions and results of the online questionnaire.

Potential Hazards

Community members were asked whether they felt their home or neighborhood could be impacted by a disaster. More respondents answered that such a disaster was at least somewhat likely than not likely, although a large number of respondents were uncertain.

How likely is your home or neighborhood to be impacted by a disaster?		
Response	**Number**	**Percent**
Very likely	7	19%
Somewhat likely	8	22%
Not very likely	5	14%
Don't know/Unsure	13	36%
Declined to state	3	8%
Total	36	100%

Community members were asked which disasters they were most concerned about. Earthquakes were the disaster of greatest concern, with drought and disease/pest management risks coming in second and third, respectively. Among disasters that may be exacerbated by climate change, community members were more worried about some (e.g. drought) and less worried about others (e.g. extreme heat).



Community members were also asked what structural or physical steps they have taken at their property to reduce potential damage from a future disaster. Four responders stated that they have strengthened building openings (to reduce risks from high winds), two have conducted earthquake retrofits, and one respondent installed a backflow prevention device to reduce flood risks. However, the vast majority of respondents had not taken any action.

Personal Preparedness

Respondents were asked a number of questions about what steps they have taken to respond more effectively to a disaster and to recover more quickly, including about insurance. The greatest number of community members felt that their homeowners insurance was insufficient to cover the disasters that they were worried about, although a significant number of homeowners felt that their insurance coverage was adequate.

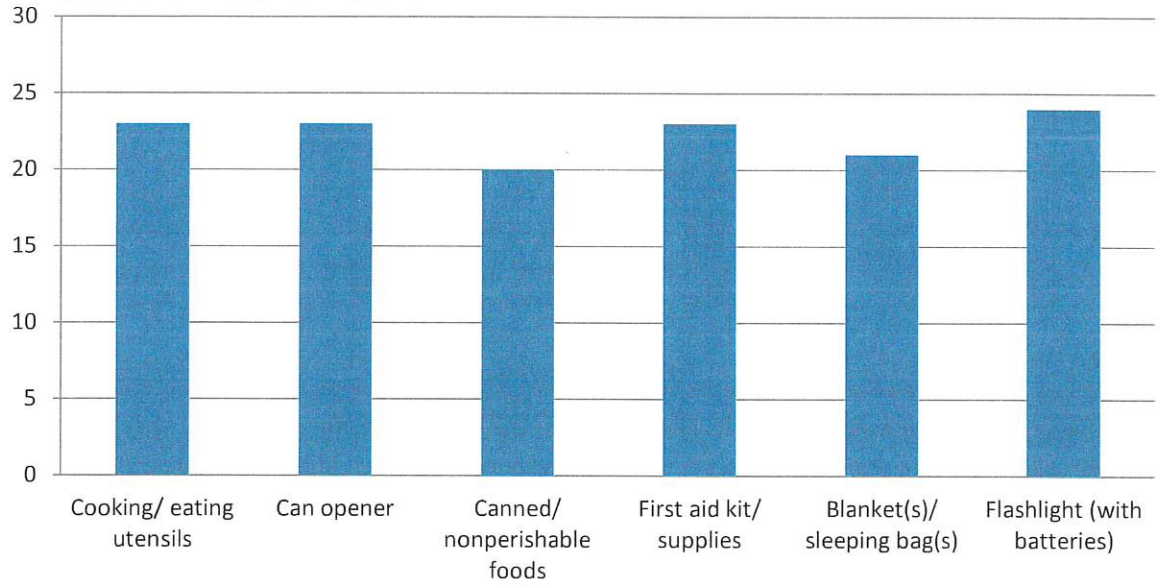
Do you have adequate basic homeowners insurance to cover the hazards that could impact your home?		
Response	**Number**	**Percent**
Yes	10	28%
No	12	33%
Unsure	3	8%
Not applicable	3	8%
Declined to state	8	22%
Total	36	100%

Virtually all of Westminster is at risk of a 500-year flood event, and some parts of the community are vulnerable to a 100-year flood event. However, among respondents who answered this question, community members without flood insurance outnumbered those with flood coverage.

Do you have flood insurance for your home?		
Response	**Number**	**Percent**
Yes (homeowner)	9	25%
Yes (renter)	2	6%
No	14	39%
Declined to state	11	31%
Total	36	100%

Most respondents have stores of some basic supplies or items that would be necessary in the 72-hour period immediately after an emergency situation. However, of the 18 items included in the survey, a majority of respondents only had access to 6 of the items. Additionally, only two-thirds of respondents had access to the most common item, a flashlight with batteries.

Which items do you have a 72-hour supply of at your home? (top six responses)



Which items do you have a 72-hour supply of at home? (all responses)		
Response	**Number**	**Percent**
Potable water (at least 3 gallons per person)	17	47%
Cooking and eating utensils	23	64%
Can opener	23	64%
Ready-to-eat canned/nonperishable foods	20	56%
Gas grill or camping stove	15	42%
Extra medication	16	44%
First aid kit or supplies	23	64%
Portable AM/FM radio	14	39%
Walkie-talkie radios	3	8%
Important family documents in a damage-resistant box	4	11%
Extra clothes and shoes	17	47%
Blankets or sleeping bags	21	58%
Cash	11	31%
Flashlight with batteries	24	67%
Gasoline	1	3%
Telephone with batteries	14	39%
Pet supplies	9	25%
Secondary source of heat	8	22%

Community Preparedness

In a disaster situation, community members can provide vital assistance to their neighbors on a short-term basis until emergency response personnel arrive. While some respondents are familiar with any special needs their neighbors might have, and therefore are able to better assist during emergency situations, close to three-quarters of respondents who answered the question were not.

Are you familiar with the special needs of your neighbors?		
Response	**Number**	**Percent**
Yes	7	19%
No	19	53%
Declined to state	10	28%
Total	36	100%

Another way to improve community preparedness is to encourage residents to participate in the Community Emergency Response Team (CERT) program. CERT volunteers are trained in basic emergency response skills, including search and rescue, team organization, and evacuation safety procedures. During an emergency, CERT volunteers can assist professional response personnel or supplement them as needed. While participation in CERT was fairly low among responders, a number of community members indicated interest in the program.

Are you a trained member of the Community Emergency Response Team (CERT)?		
Response	**Number**	**Percent**
Yes	2	6%
No, but I would like to learn more about CERT	9	25%
No, I am not interested in becoming a CERT participant	15	42%
Declined to state	10	28%
Total	36	100%

Lastly, survey respondents were asked which of three basic recommendations they had for the City of Westminster to help improve resiliency to future disasters. Respondents generally favored outreach and education over increased regulations.

What recommendations do you have for the city to increase resiliency?		
Response	**Number**	**Percent**
Perform outreach to ensure people are aware of their environment and the inherent risks	13	36%
Provide training and materials on how residents can be prepared for the identified risks	7	19%
Enforce and update building codes	3	8%
Declined to state	13	36%
Total	36	100%

APPENDIX B – PUBLIC OUTREACH MATERIALS

2. LHMP MEETING PRESENTATION

City of Westminster
Hazard Mitigation Plan

Meeting Agenda

- Overview of the Hazard Mitigation Process
- Summary of Westminster Hazard Profiles
- Community Input
- Next Steps

Development of this Plan is funded by a Community Development Block Grant (CDBG) Component Award for the 2008 Disaster Recovery Initiative (DRI) Program

Overview of the Hazard Mitigation Planning Process

1. Assemble the Planning Team (Planning Team Meetings December thru April)
2. Identify Goals
3. Identify Critical Facilities
4. Identify/Prioritize Hazards Of Concern
5. Conduct a Risk Assessment
6. Identify Potential Mitigation Actions

Outreach

7. Develop Draft Local Hazard Mitigation Plan
8. Distribute Plan for Public Review/Comment
9. Submit Draft Plan to California Office of Emergency Services/FEMA

Westminster Hazard Mitigation Planning Team

Westminster Hazard Mitigation Planning Goals

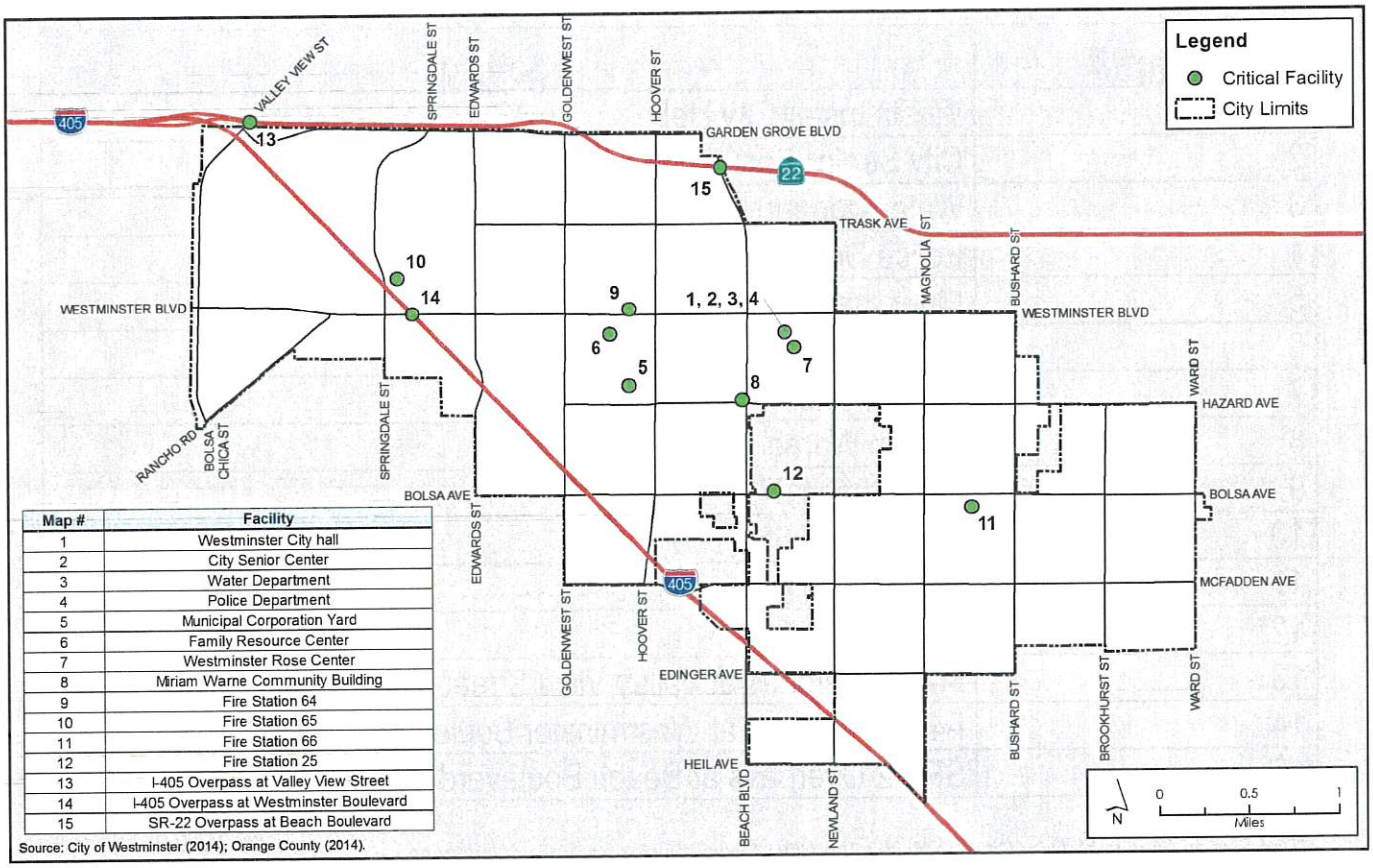
- Ensure reliable and resilient infrastructure for today and future generations.
- Ensure the effective delivery of emergency services during a disaster.
- Maintain adequate City functions and quality of life.

Critical Facilities List

Map #	Facility
1	Westminster City Hall
2	City Senior Center
3	Water Department
4	Police Department
5	Municipal Corporation Yard
6	Family Resource Center
7	Westminster Rose Center
8	Miriam Warne Community Building
9	Fire Station 64
10	Fire Station 65
11	Fire Station 66
12*	Fire Station 25
13	I-405 Overpass at Valley View Street
14	I-405 Overpass at Westminster Boulevard
15	SR-22 Overpass at Beach Boulevard

**Fire Station 66 is in Midway City, which is in the City of Westminster's sphere of influence.*

Critical Facilities List



Map #	Facility
1	Westminster City hall
2	City Senior Center
3	Water Department
4	Police Department
5	Municipal Corporation Yard
6	Family Resource Center
7	Westminster Rose Center
8	Miriam Warne Community Building
9	Fire Station 64
10	Fire Station 65
11	Fire Station 66
12	Fire Station 25
13	I-405 Overpass at Valley View Street
14	I-405 Overpass at Westminster Boulevard
15	SR-22 Overpass at Beach Boulevard

Source: City of Westminster (2014); Orange County (2014).

Relevant Hazards

Avalanche	Flood	Seismic hazards
Climate change	Geological hazards	Severe winter storm
Coastal erosion	Hailstorm	Tornado
Coastal storm	Hazardous materials	Tsunami
Dam failure	Human-caused hazards	Volcano
Disease/pest management	Hurricane	Wildfire
Drought	Land subsidence	Wind
Earthquake fault rupture	Landslide and mudflow	Windstorm
Expansive soils	Liquefaction	
Extreme heat	Sea level rise	

Westminster Hazard Ranking

Hazard Type	Probability	Impact			Total Score	Hazard Planning Consideration
		Affected Area	Primary Impact	Secondary Impacts		
Drought	4	4	4	4	64.00	High
Seismic Hazards	4	4	4	4	64.00	High
Flood	4	3	3	3	48.00	High
Liquefaction	3	4	4	4	48.00	High
Hazardous Materials	3	2	4	4	38.40	Medium
Extreme Heat	3	3	3	3	36.00	Medium
Severe Weather (wind/rain)	3	3	3	3	36.00	Medium
Disease/Pest Management	2	4	2	2	22.40	Medium
Dam Failure	1	4	4	4	16.00	Medium

Note: Scores are based on a scale of 1 to 4, where 4 is the highest score, and 1 is the lowest score. See Table 3.3 for more information.

Note: Total score is based on an equation that weights categories by importance. See Table 3.3 for more information.

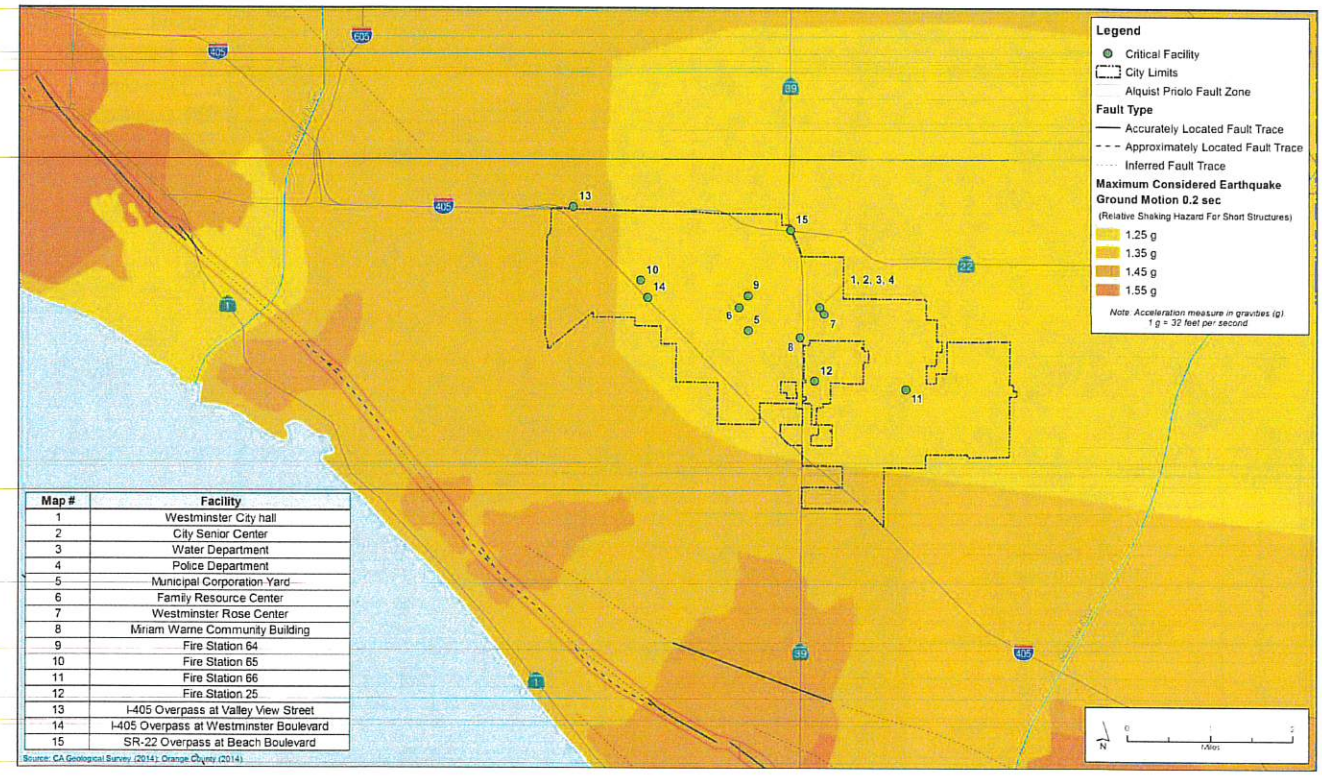
Hazard Profile

- Identification of the Hazard
- Profile of the Hazard
  - Location
  - Extent
- Past Occurrences
- Probability of Future Occurrences
- Climate Change Considerations
- Vulnerabilities/ Risk Assessment
- Utilities Considerations

Drought

- Location and Extent
  - The entire City
- Past Occurrences
  - 10 events since 1917, average three to five years in duration.
- Probability of Future Occurrences
  - High probability given the prevalence of drought throughout the state over the last 100 years.
- Climate Change Considerations
  - Anticipated changes in precipitation regimes may reduce groundwater levels within the City, further increasing risks to drought.

Seismic Hazards (Seismic Shaking)



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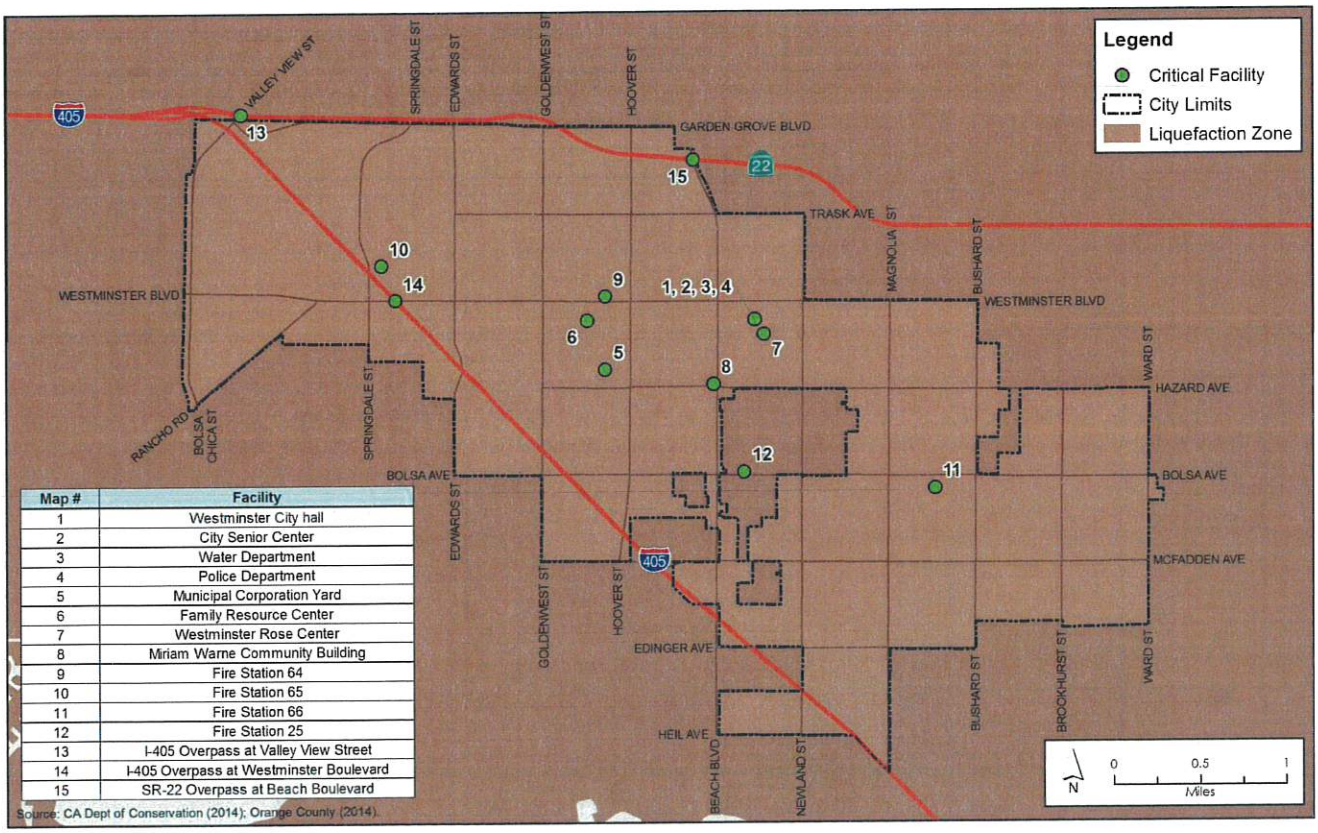
Seismic Hazards (Liquefaction)



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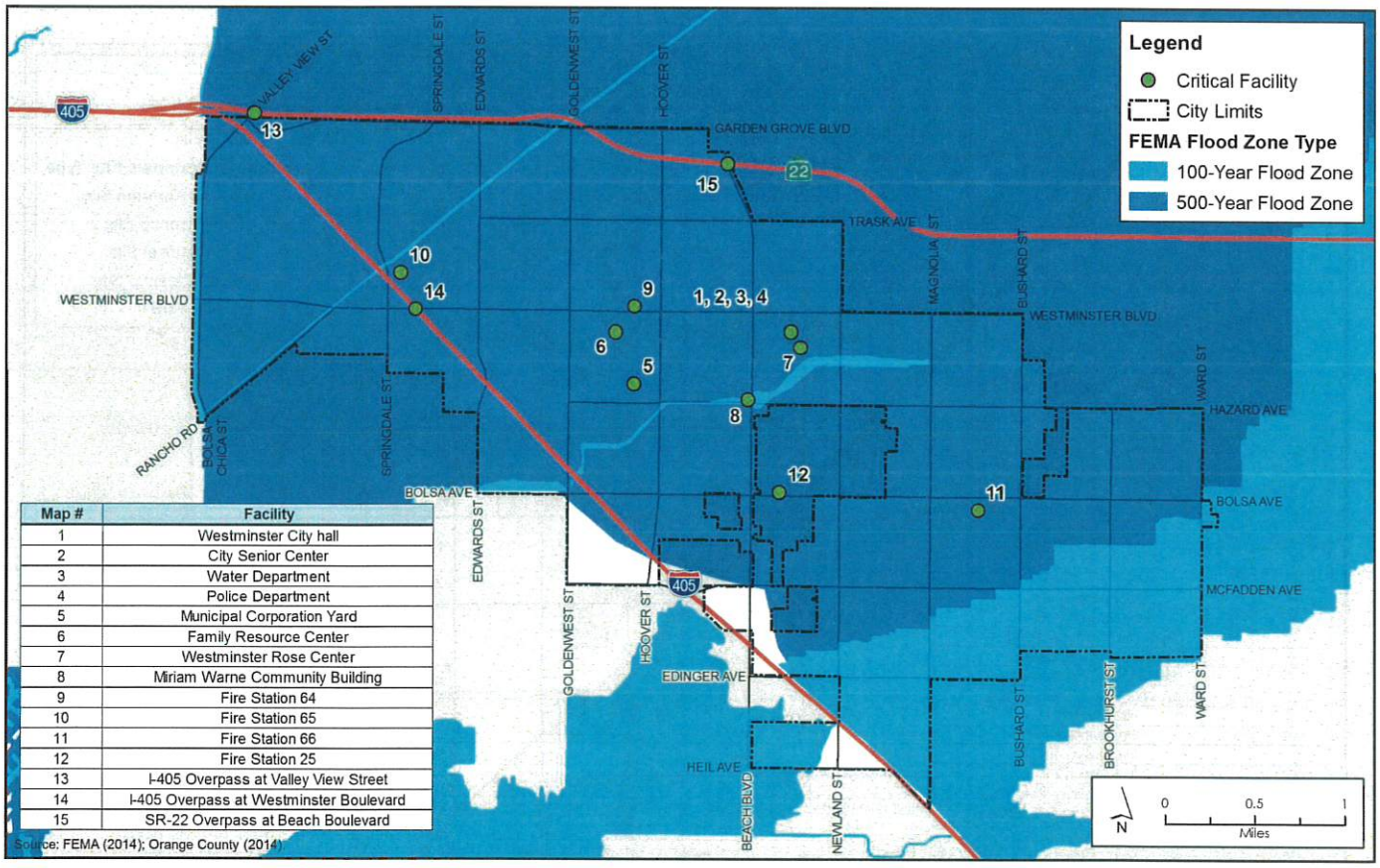
Source: CA Dept of Conservation (2014); Orange County (2014).

Flood



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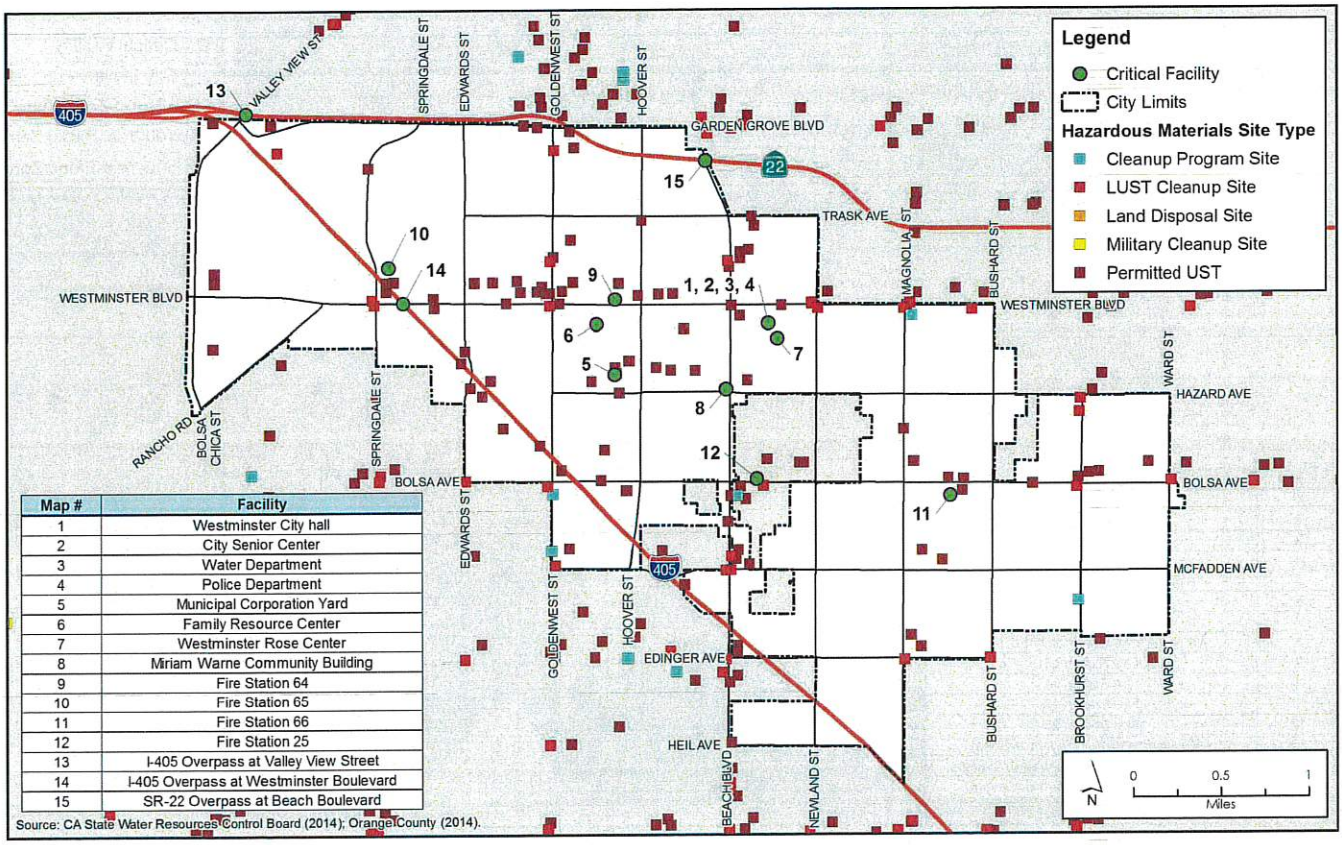
Source: FEMA (2014); Orange County (2014)

Hazardous Materials



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Source: CA State Water Resources Control Board (2014); OrangeCounty (2014).

Extreme Heat

- Location and Extent
  - The entire City
- Past Occurrences
  - On average 4 extreme heat days per year
  - On average 0-1 heat wave per year
- Probability of Future Occurrences
  - High certainty that extreme heat conditions will occur in the future.
- Climate Change Considerations
  - Future climatic conditions could increase the number of extreme heat events based on increased temperatures resulting from climate change.
  - 15-35 extreme heat days expected by 2050.

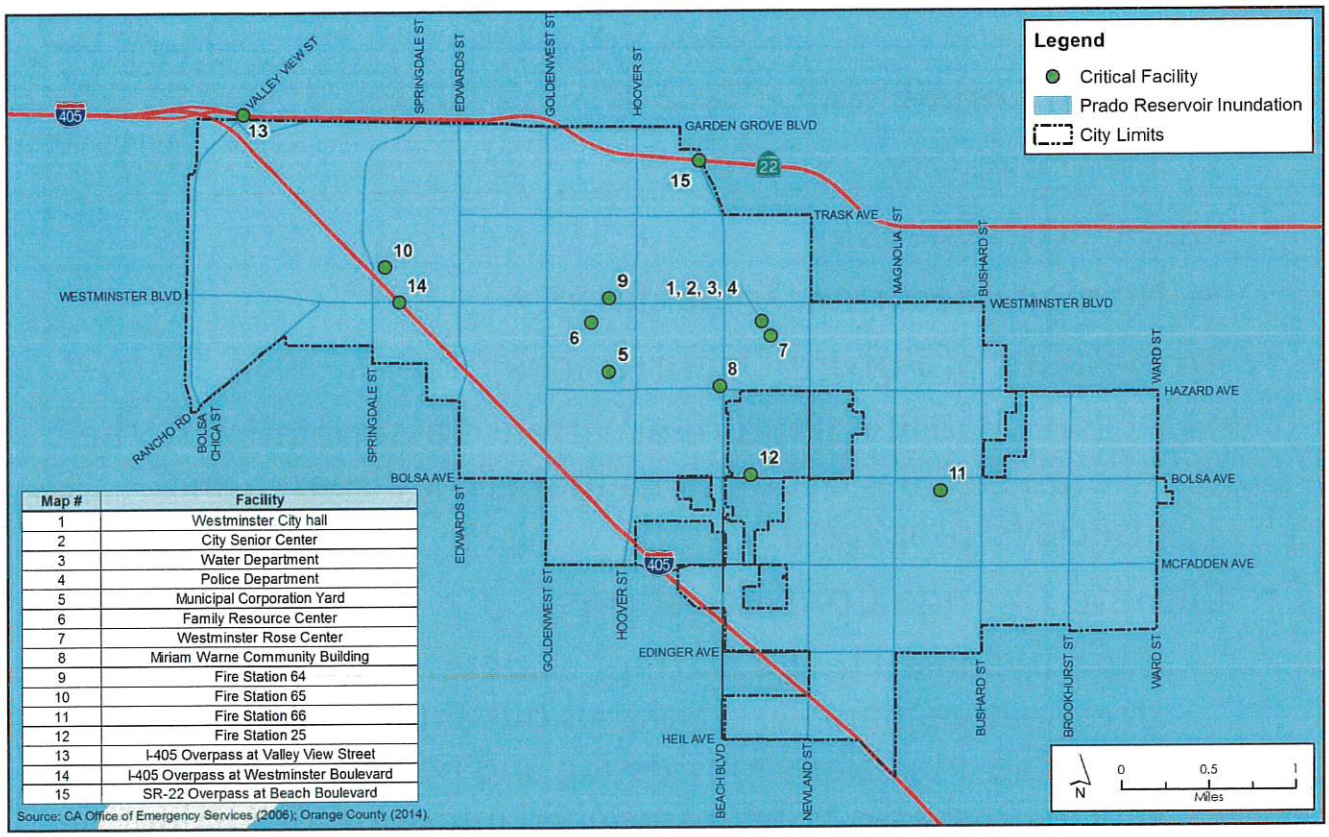
Severe Weather

- Location and Extent
  - Citywide/ Countywide hazard
- Past Occurrences (Tornado, High Winds, Strong Winds)
  - 18 major windstorm (Santa Ana) events recorded in Southern California between (1956 and 2007)
  - 5 of these events caused significant damage within Orange County
- Probability of Future Occurrences
  - Future occurrences are expected
    - Santa Ana conditions occur on a yearly basis
- Climate Change Considerations
  - Changes in atmospheric conditions could change the frequency, severity, and duration of future windstorm events, however to what degree is uncertain.

Disease/ Pest Management

- Location and Extent
  - The entire City
- Past Occurrences
  - No major occurrences identified.
- Probability of Future Occurrences
  - High probability of future occurrence associated with the favorable climatic conditions that allow diseases and insects to propagate.
- Climate Change Considerations
  - It is anticipated that a warmer climate would not only stress native plants and animals but could also create favorable conditions for existing and new invasive species/diseases to be introduced into southern California.

Dam Failure



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Source: CA Office of Emergency Services (2006); Orange County (2014).

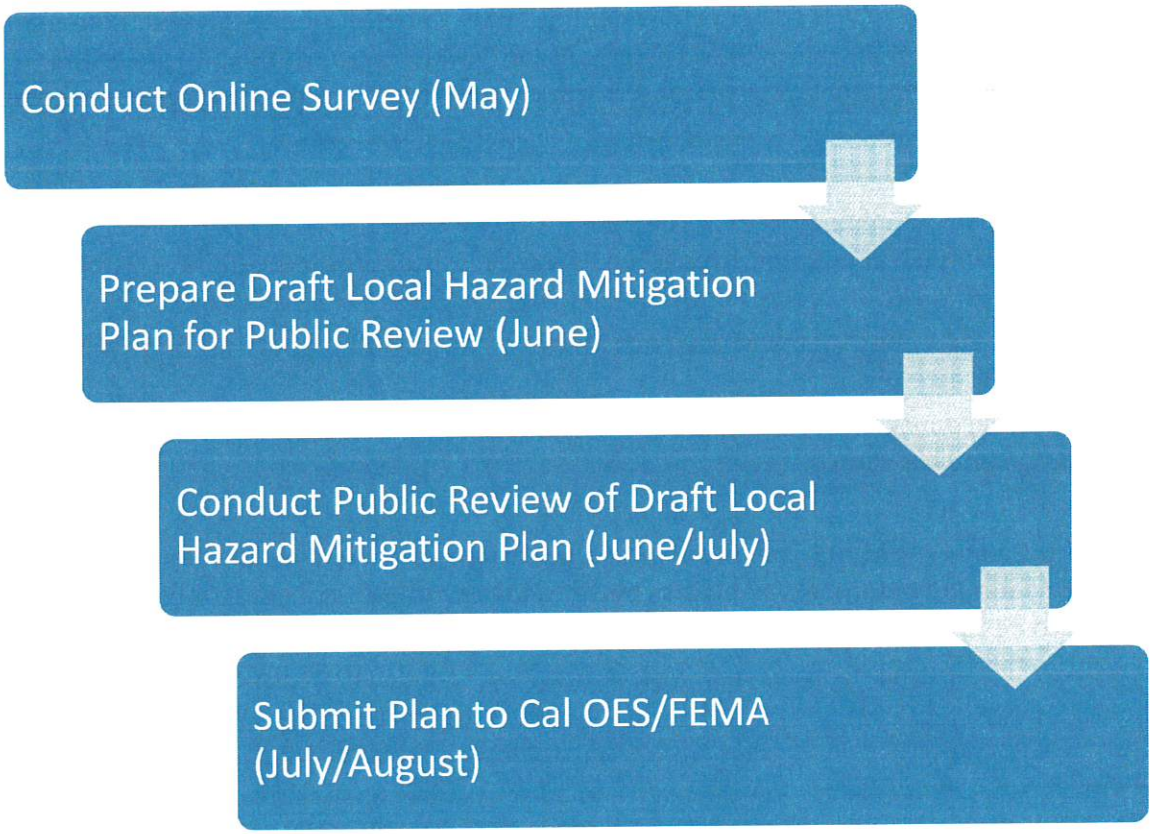
Community Feedback

The City of Westminster CA is currently developing a plan to better understand our community's risks from natural hazards. This plan will help to identify which areas of the City are prone to certain types of hazards and how the City can reduce vulnerability to them. There are several things we can do as a community to prepare for these threats and become more resilient, including:

- Creating better emergency warning systems.
- Building new infrastructure and strengthening existing structures to be more resistant to hazards.
- Developing public education and outreach programs on how to prepare for and withstand an emergency/disaster event.
- Working with county, state, and federal agencies and stakeholder groups to exchange information and assistance.

As part of this planning effort, the City wants to hear from you. We have developed an online survey for community members to help us better understand your concerns. This survey will enable us to determine how prepared our community is and where we need improvement. We also want to take this opportunity to get more citizens of Westminster involved in this process. We would greatly appreciate a few minutes of your time to help us with this important plan. To take the survey, visit https://www.surveymonkey.com/s/HVN7VJX. All answers are anonymous.

Next Steps


Conduct Online Survey (May)
Prepare Draft Local Hazard Mitigation Plan for Public Review (June)
Conduct Public Review of Draft Local Hazard Mitigation Plan (June/July)
Submit Plan to Cal OES/FEMA (July/August)

Questions/ Comments

- Additional thoughts, questions, and/or suggestions can be provided to:

  – Jim Kingsmill – Emergency Services Coordinator
  jkingsmill@westminster-ca.gov

  – Aaron Pfannenstiel – LHMP Project Manager
  ajp@pmcworld.com

APPENDIX C – HAZUS RISK ASSESSMENT

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Memorandum

To: Aaron Pfannenstiel, PMC **Date:** March 9, 2015

From: Hope Seligson, MMI

Subject: City of Westminster Local Hazard Mitigation Plan Risk Assessment
MMI Engineering Project No. MMHB071, Memo MMHB071-TM-001, Rev. 0

To support the development of a Local Hazard Mitigation Plan (LHMP) for the City of Westminster, California, MMI Engineering (MMI) has conducted earthquake and flood risk assessments for both City-owned critical facilities and community-wide building stock. The earthquake and flood risk assessments have been conducted using Hazus (HAZards U.S.) - FEMA's GIS-based nationally applicable earthquake, flood and hurricane risk assessment software. This memo presents a summary of the earthquake and flood hazards, describes the critical facility and community level data used in the assessment, and summarizes the results.

Hazards - Earthquake

Three earthquake scenarios have been modelled for the current assessment, as follows:

- A M6.9 earthquake scenario on the Newport-Inglewood Fault
- A M6.6 earthquake scenario on the San Joaquin Hills Fault
- The M7.8 "ShakeOut" Scenario on the Southern San Andreas Fault

The first two events were previously modelled in Hazus in a regional risk assessment conducted for FEMA (the Orange County Essential Facilities Risk Assessment, or OCEFRA, Project; FEMA, 2009), and are included in the 2010 Orange County Hazard Mitigation Plan. The last event, the "ShakeOut" event, was extensively studied as part of a multi-disciplinary effort spearheaded by the United States Geological Survey (USGS, see Jones et al., 2008).

Earthquake ground motion data utilized in the current Hazus assessment were developed by the USGS ShakeMap program; for each scenario developed by the USGS, a Hazus-specific zip file (HAZUS.ZIP) is created and made available on the download page. Regional ground motions for each of the three scenarios are shown in **Figures 1 - 3**.

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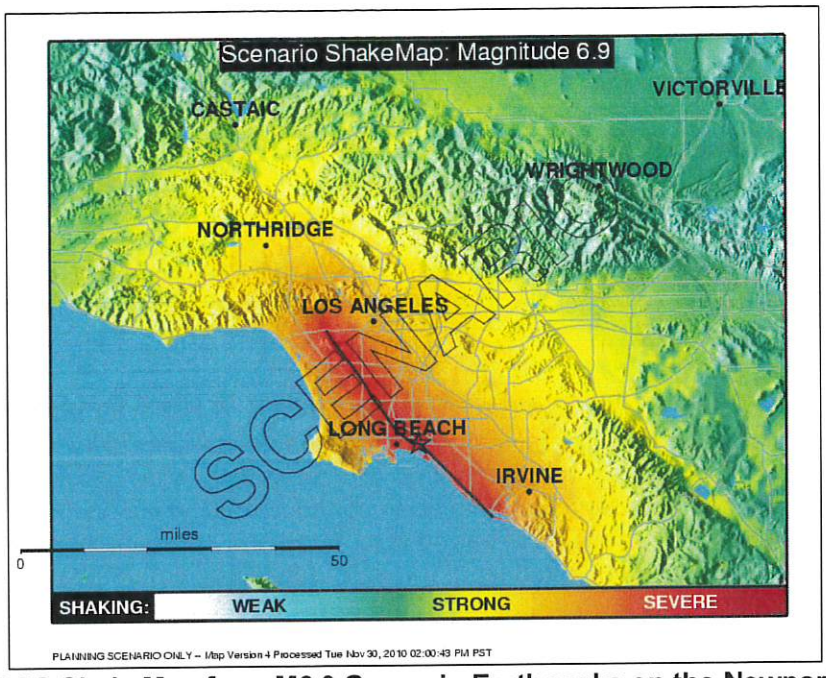

Figure 1: USGS ShakeMap for a M6.9 Scenario Earthquake on the Newport-Inglewood Fault

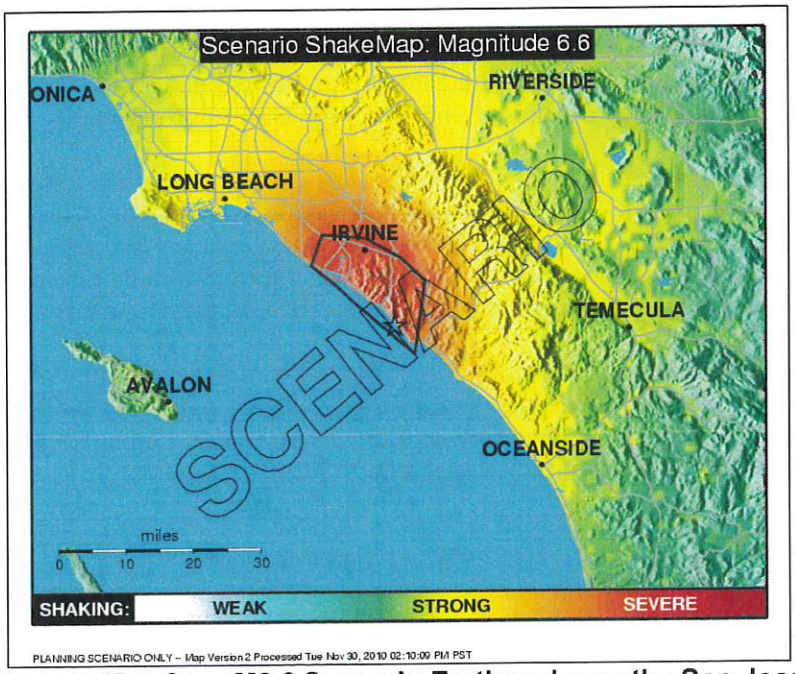

Figure 2: USGS ShakeMap for a M6.6 Scenario Earthquake on the San Joaquin Hills Fault

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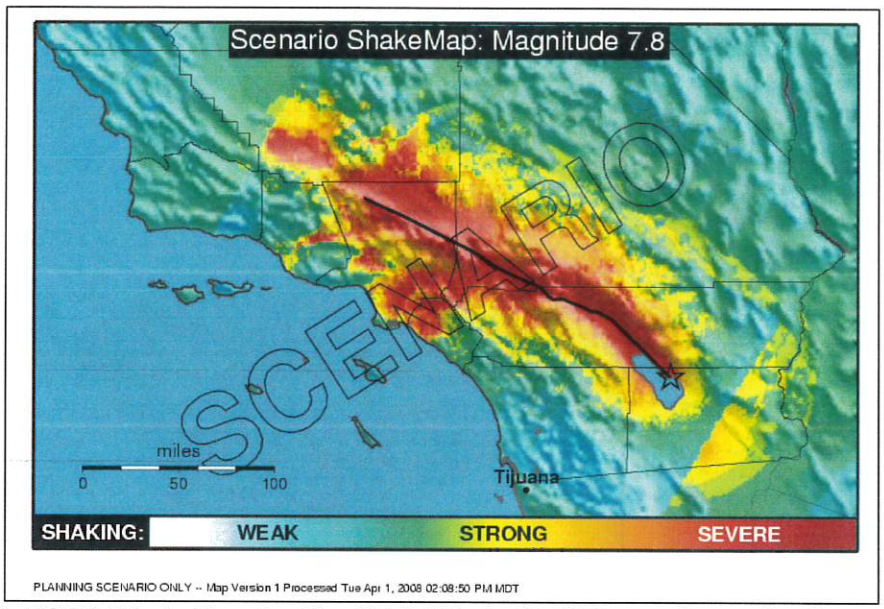

Figure 3: USGS ShakeMap for the M7.8 "ShakeOut" Scenario on the Southern San Andreas Fault

Hazards – Liquefaction Susceptibility

In addition to earthquake ground shaking, the current assessment also considers additional damage due to liquefaction. Liquefaction, the loss of strength of saturated sandy, cohesionless soils, can cause ground failure in the form of lateral spreading and differential settlement. Both of these types of failures can cause damage to building foundations.

Regional liquefaction susceptibility data for southern California were assembled by the USGS as part of the "ShakeOut" Scenario modeling effort (Ponti, et al., 2008). Liquefaction susceptibility data for Orange County are shown in **Figure 4** (top), along with a close-up view in the vicinity of the City of Westminster (bottom). For the current assessment, only the regional data were available. For the City's critical facilities, site-specific data and reports would reflect local conditions in more detail, and could produce a different liquefaction susceptibility assignment, affecting the resultant damage and loss estimated. In particular, no data were available on whether building design and construction incorporated specific features intended to mitigate potential liquefaction impacts. The presence of such features could also change the assigned liquefaction susceptibility and affect damage estimates.

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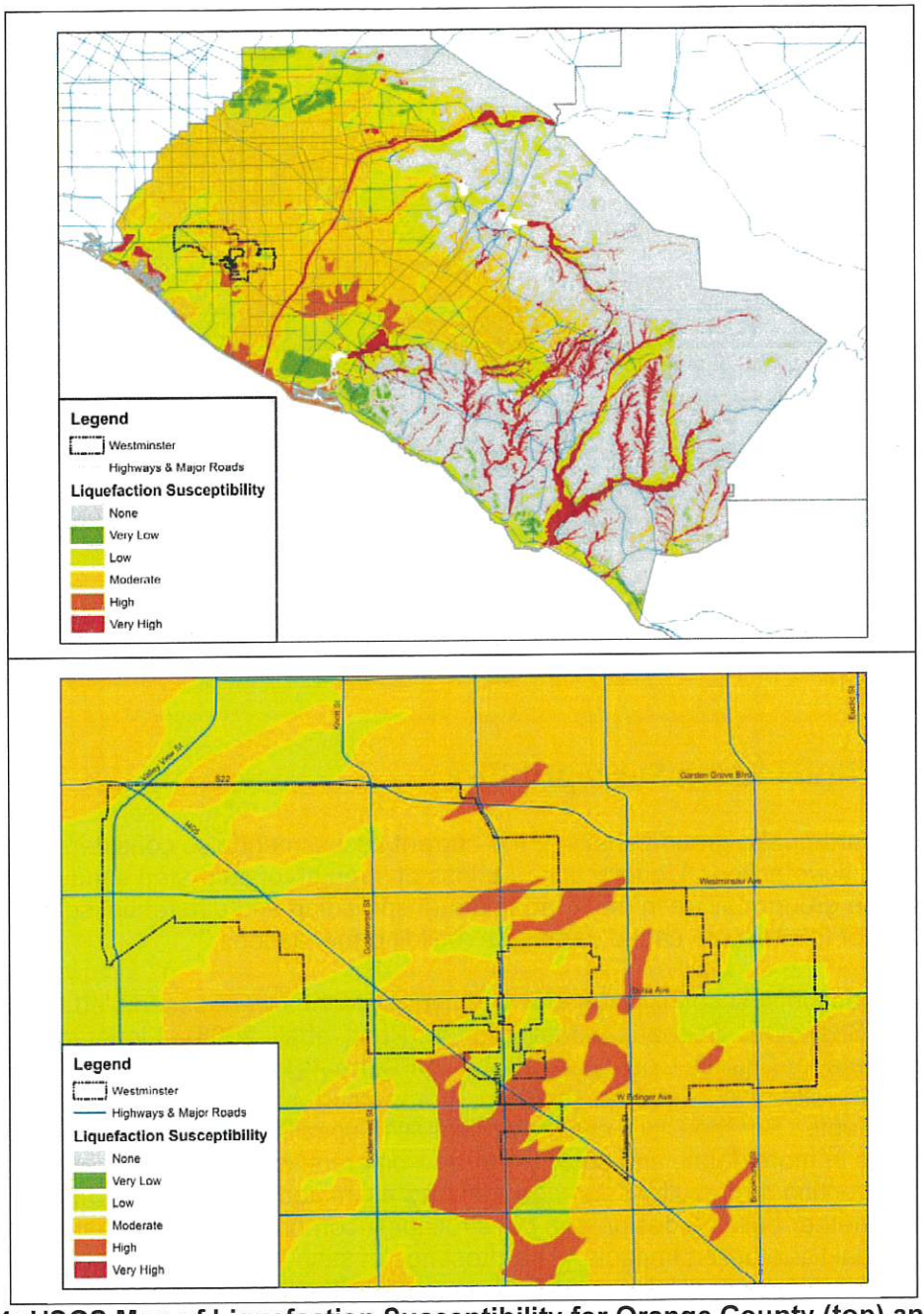

Figure 4: USGS Map of Liquefaction Susceptibility for Orange County (top) and in the Vicinity of the City of Westminster (bottom) [After Ponti et al., 2008]

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Hazards – Flooding

Hazus' built-in (default) flood modelling capabilities have been utilized to develop maps of potential flood depths for the one-percent chance annual flood (the 100-year flood), and the 0.2 percent chance annual flood (the 500-year flood), shown in **Figures 5 and 6**, respectively, for Orange County (top) and in the vicinity of the City of Westminster (bottom).

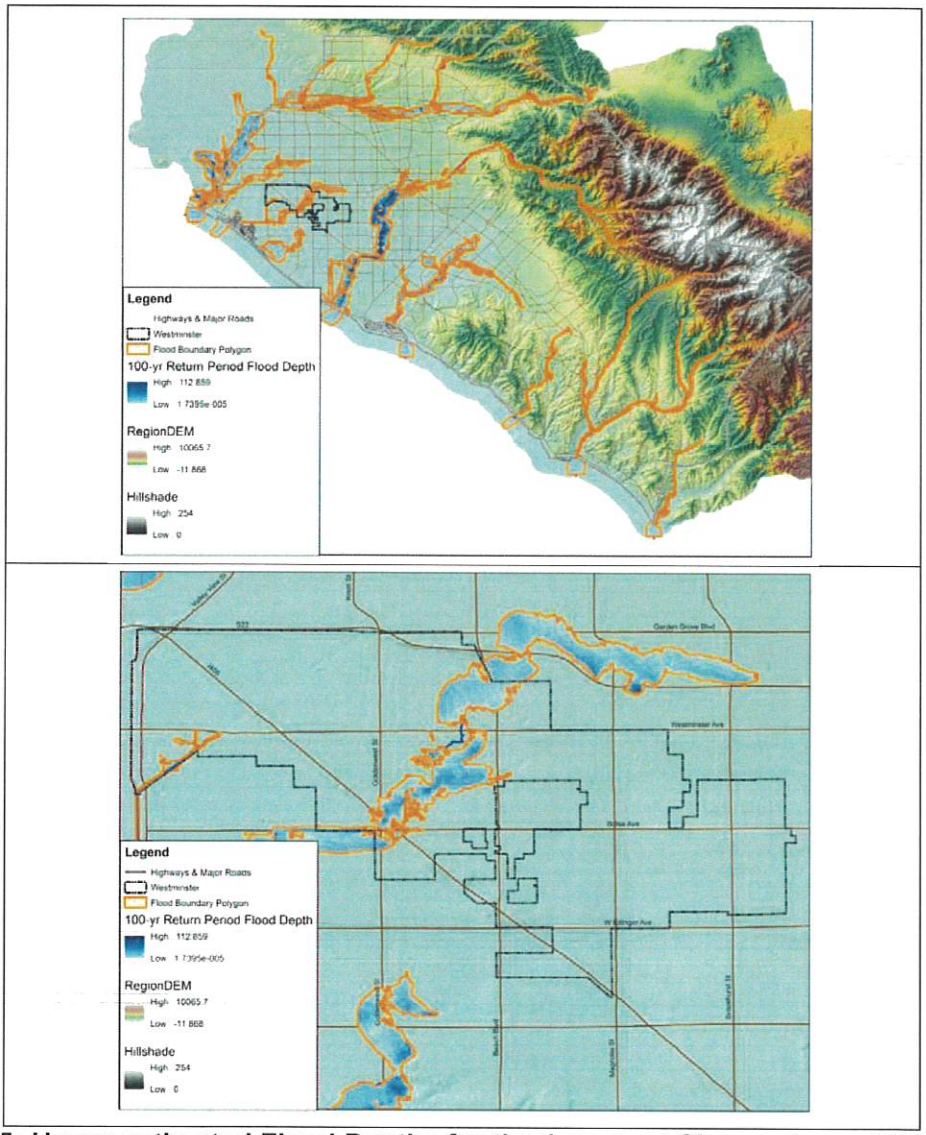

Figure 5: Hazus-estimated Flood Depths for the 1-percent Chance Annual (100-year) Flood for Orange County (top) and in the Vicinity of the City of Westminster (bottom)

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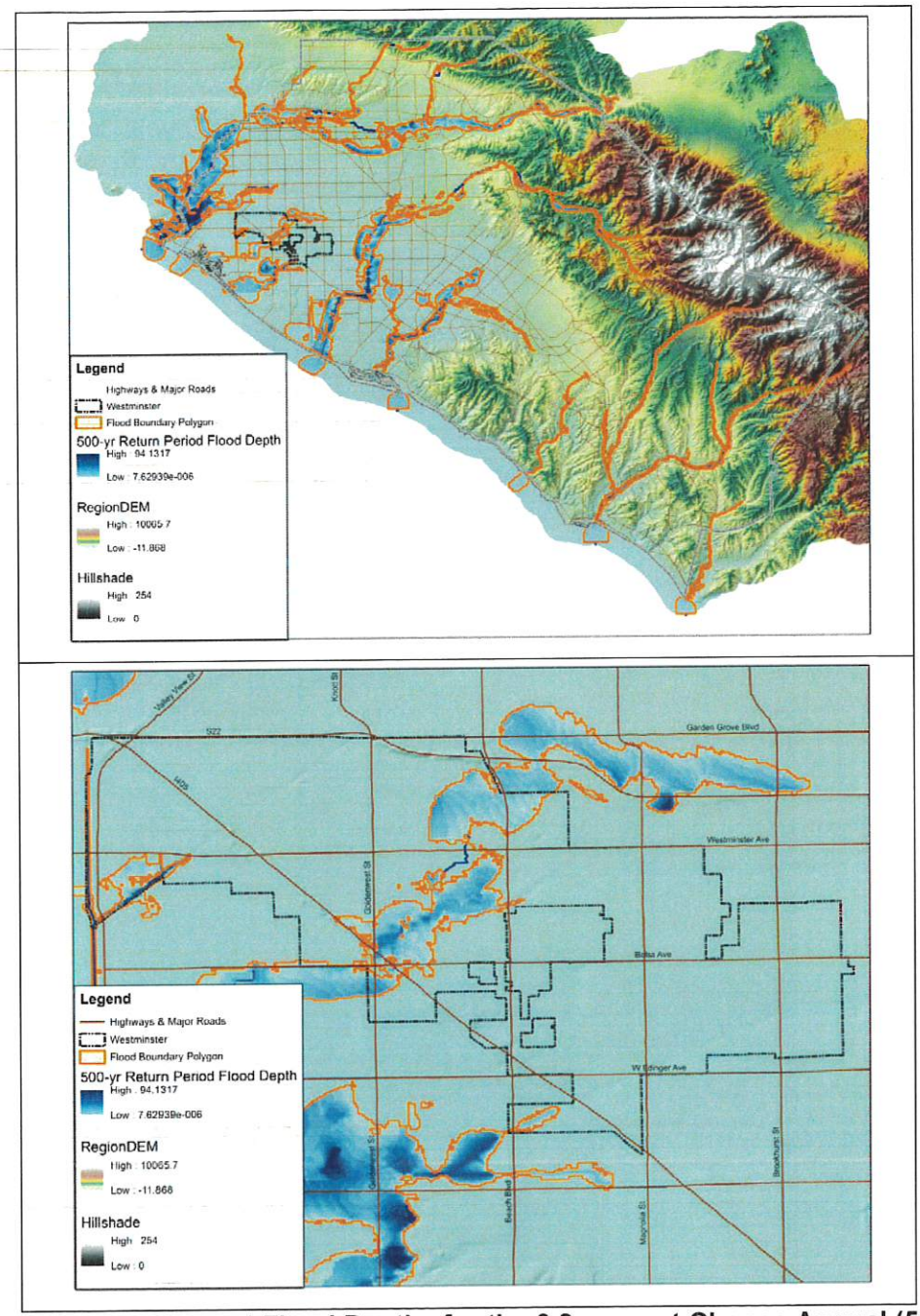

Figure 6: Hazus-estimated Flood Depths for the 0.2-percent Chance Annual (500-year) Flood for Orange County (top) and in the Vicinity of the City of Westminster (bottom)

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Data – City-Owned Critical Facilities Data

A list of eleven City-owned critical facilities, along with structural information, was assembled by PMC, and is summarized in **Table 1**. These data were used to execute the Hazus earthquake and flood risk assessments. The eleven city-owned buildings represent more than $94 million in building replacement values, along with close to $10 million in building contents value.

Using the data provided by PMC, each facility was assigned Hazus-specific classifications required for analysis. These parameters are described below, and are provided for each building in **Table 2**.

- There are just two government-related *Occupancy Classes* in Hazus; GOV1 for general services facilities (e.g., offices) and GOV2 for emergency response facilities (e.g., police stations, fire stations and EOCs).
- Buildings are classified into Hazus *Model Building Types* according to their lateral force resisting systems and number of stories. Relevant examples include low-rise reinforced masonry bearing wall buildings with wood or metal deck diaphragms (RM1L), low-rise steel moment frame construction (S1L), low-rise steel braced frame construction (S2L), low-rise concrete shear wall buildings (C2L) and light wood frame (W1). The critical facility building type categorizations for the masonry, concrete and wood buildings were straightforward. Based on available information[1], the "non-combustible steel frame" Police Department Building was assumed to be steel braced frame. Similar information for the "non-combustible steel frame" Miriam Warne Community Building was not found; the building was assumed to be steel moment frame in accordance with Hazus default structural data for similar facilities.
- For the Hazus earthquake model, seismic *Design Level* is based on the building code in place at the time of construction, generally determined from the year built. For most buildings, pre-1941 construction would be considered "Low Code" design level, buildings build between 1941 and 1975 would be considered "Moderate Code", and post 1975 construction would be considered "High Code". The Superior sub-classes (e.g., "High Superior") are generally reserved for buildings built as essential facilities, with an increased factor of safety reflected in the design.
- For communities participating in the National Flood Insurance Program, the Hazus Flood *Design Level* is determined by comparing a facility's construction date to the date that the initial Flood Insurance Rate Map (FIRM) was issued for the community. For the City of Westminster, the initial FIRM date is 1977 (FEMA, 2015); for the County of Orange (i.e., for Midway City), the initial FIRM date is 1979.

[1] http://www.mccarthy.com/news/2010/01/27/westminster-police-department-headquarters/

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Table 1: City-Owned Critical Facility Data, as Provided by PMC

#	Name	Address	City	Zip	Building Area (Sq. Ft.)	Building Value ($M)	Contents Value ($M)	Latitude	Longitude	Year Built	Structure Type	Foundation	# Stories
1	Westminster City Hall	8200 Westminster Blvd.	Westminster	92683	19,478	7.2	2.1	33.757823	-117.985891	1968	Masonry Const/Wood Roof	slab on grade	1
2	City Senior Center	8200 Westminster Blvd.	Westminster	92683	34,350	5.1	0.6	33.758972	-117.98706	1968	Masonry Const/Wood Roof	slab on grade	1
3	Police Department	8200 Westminster Blvd.	Westminster	92683	88,000	56.2	4.2	33.756506	-117.985987	2011	Non Comb Steel Frame	slab on grade	3
4	Municipal Corp. Yard	14381 Olive Street	Westminster	92683	25,442	2.6	1.7	33.753412	-118.000549	1974	Masonry Const/Wood Roof	slab on grade	1
5	Family Resource Center	7200 Plaza Street	Westminster	92683	3,835	1.0	0.2	33.757834	-118.003512	1972	Masonry Const/Wood Roof	slab on grade	1
6	Westminster Rose Center	14140 All American Way	Westminster	92683	33,839	13.4	1.1	33.756538	-117.984966	2006	Masonry Const/Wood Roof	slab on grade	2
7	Miriam Warne Community Building	14491 Beach Boulevard	Westminster	92683	4,800	2.2	0.1	33.752129	-117.98968	2010	Non Comb Steel Frame	slab on grade	1
8	Fire Station 64	7351 Westminster Blvd.	Westminster	92683	15,400	3.9	0.012	33.75952	-118.000734	1982	Reinforced masonry	slab on grade	1
9	Fire Station 65	6061 Hefley Street	Westminster	92683	6,000	1.0	0.006	33.761071	-118.023235	1978	Reinforced masonry	slab on grade	1
10	Fire Station 66	15061 Moran Street	Westminster	92683	4,480	0.8	0.006	33.743798	-117.967787	1963	Concrete shear wall	slab on grade	1
11	Fire Station 25	8171 Bolsa Avenue	Midway City	92655	3,156	0.5	0	33.744983	-117.986632	1952	Wood Frame	slab on grade	1
	TOTAL				238,780	94.09	9.98						

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Table 2: Hazus Classifications for City-Owned Facilities

No.	Name	Occupancy	Model Building Type	EQ Design Level	Flood Design Level
1	Westminster City Hall	GOV1	RM1L	MC	Pre-FIRM
2	City Senior Center	GOV1	RM1L	MC	Pre-FIRM
3	Police Department	GOV2	S2L	HS	Post-FIRM
4	Municipal Corporation Yard	GOV1	RM1L	MC	Pre-FIRM
5	Family Resource Center	GOV1	RM1L	MC	Pre-FIRM
6	Westminster Rose Center	GOV1	RM1L	HC	Post-FIRM
7	Miriam Warne Community Building	GOV1	S1L	HC	Post-FIRM
8	Fire Station 64	GOV2	RM1L	HC	Post-FIRM
9	Fire Station 65	GOV2	RM1L	HC	Post-FIRM
10	Fire Station 66	GOV2	C2L	MC	Pre-FIRM
11	Fire Station 25	GOV2	W1	MC	Pre-FIRM

Occupancy Classes:

GOV1 = Government, General Services
GOV2 = Government, Emergency Response

Model Building Types:

RM1L = Reinforced Masonry Bearing Walls with Wood or Metal Deck Diaphragms, low-rise
S1L = Steel Moment Frame, low-rise
S2L = Steel Braced Frame, low-rise
C2L = Concrete Shear Walls, low-rise
W1 = Wood, Light Frame (≤ 5,000 sq. ft.)

Earthquake Design Levels:

MC = Moderate Code
HC = High Code
HS = High Superior

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Data - Community Level Building Inventory Data

Buildings within the City of Westminster include those used for Residential, Commercial, Industrial and other occupancies. Data on the total square footage and the number of buildings, tabulated at the census block and census tract levels, are stored within the Hazus default "General Building Stock" databases. For the City of Westminster Hazard Mitigation Plan, improved Hazus "General Building Stock" inventory databases, developed for the FEMA-funded Orange County Essential Facilities Risk Assessment (OCEFRA) Project (FEMA, 2009) were utilized. These improved databases were developed from available 2008 Assessor's parcel data for residential parcels, aggregated to the census block level.

Nineteen census tracts (2000 census) covering the City of Westminster have been identified, and are shown in **Figure 7**. It should be noted that the census tract south of Westminster Ave. at Bolsa Chica Rd. is quite large and was not included in order to avoid overestimating exposure for the City.

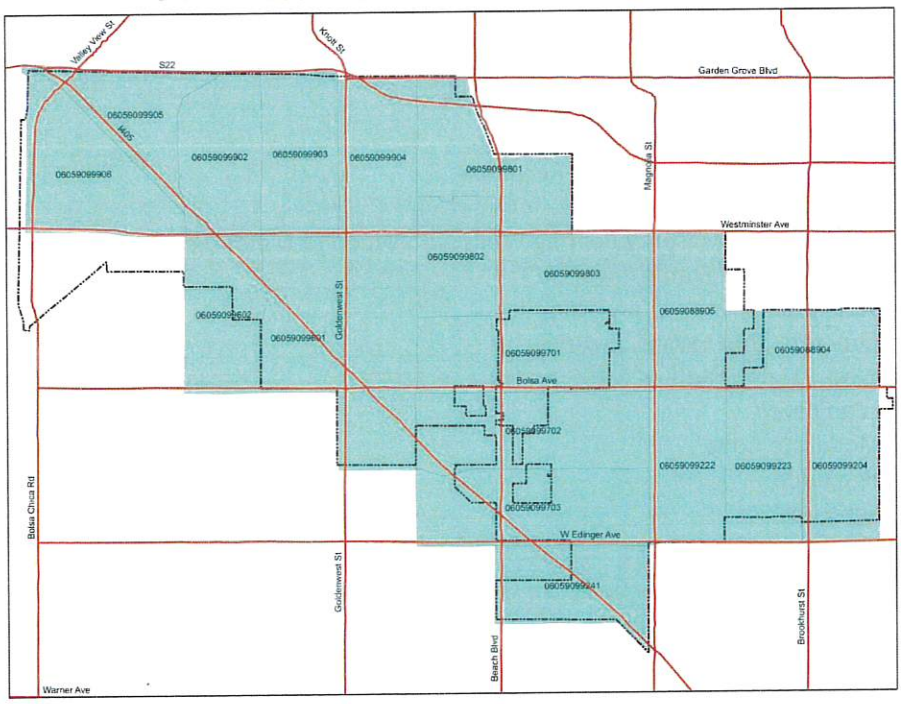

Figure 7: Census Tracts Approximately Covering the City of Westminster

Building inventory data for the identified census tracts have been extracted from the improved OCEFRA Hazus databases, and are summarized in **Tables 3 and 4**. **Table 3** provides a breakdown of building and content replacement value, square footage and building count by general occupancy (residential, commercial, industrial and other uses). The total estimated replacement cost of buildings in the City of Westminster exceeds $5.7 billion (in 2006 dollars). As shown, residential buildings account for the majority of the buildings (92%) and building value (81%). However, the average building replacement

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value for commercial buildings (approximately $627,000) exceeds that for residential buildings (approximately $203,000).

Table 3: Summary of Improved Hazus Building Inventory Data for the City of Westminster, by General Occupancy

General Occupancy	Building Replacement Value ($M)	Contents Replacement Value ($M)	Building Square Footage (1,000 Sq. Ft.)	Building Count
Residential	$4,639	$2,320	41,716	22,824
Commercial	$866	$921	7,222	1,381
Industrial	$107	$144	1,226	355
Other	$139	$142	1,085	181
TOTAL	$5,751	$3,527	51,249	24,741

Table 4 provides a different breakdown of the same database, this time summarizing the building replacement value and estimated building count by general construction type. It should be noted that the Hazus databases tabulate the inventory data by occupancy category, so that building counts by occupancy, if derived from Assessor's data, are "true" counts. Similar data reported by construction type are derived by multiplying the occupancy data by an assumed construction distribution or "mapping scheme" (e.g., office buildings may be 40% steel moment-frame, 30% concrete shear wall, etc.). Accordingly, construction type estimates have more uncertainty, and should be assumed to represent an ***order-of-magnitude*** estimate, rather than a precise figure. For example, the improved construction type distribution utilized in this study produces an estimate of 47 unreinforced masonry (URM) buildings in Westminster, whereas the California Seismic Safety Commission (CSSC, 2006) reports no URM buildings within the City (CSSC, 2006). As shown in the table, the majority of the construction is assumed to be wood frame, which is generally assumed to be fairly resistant to earthquake damage (except for the case of soft-story and buildings with "tuck-under" parking). More vulnerable construction types include URM, pre-cast concrete (including tilt-up construction), manufactured housing, and non-ductile concrete construction (a subset of the general concrete category). These construction types represent a small percentage of the building inventory within the City of Westminster.

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Table 4: Summary of Improved Hazus Building Inventory Data for the City of Westminster, by Building Type

General Building Type	Building Replacement Value ($M)	Building Replacement Value (%)	Estimated Building Count	% of Building Count
Concrete	$272	4.7%	368	1.5%
Manufactured Housing	$152	2.6%	3,376	13.6%
Pre-cast Concrete	$57	1.0%	93	0.4%
Reinforced Masonry	$336	5.9%	546	2.2%
Steel	$169	2.9%	230	0.9%
Unreinforced Masonry	$29	0.5%	47	0.2%
Wood Frame (Other)	$962	16.7%	1,658	6.7%
Wood Frame (Single-family)	$3,774	65.6%	18,423	74.5%
TOTAL	$5,751	100%	24,741	100%

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Results – Critical Facilities

Critical facility earthquake and flood losses have been estimated using Hazus (Hazus-MH Version 2.1).

Earthquake

The locations of critical facilities relative to ground shaking in each of the three earthquake scenarios are shown in **Figures 8 through 10**. As shown in the figures, ground shaking at the critical facilities reaches Modified Mercalli Intensity (MMI) VIII (Severe) in the Newport Inglewood Scenario, MMI VII and VIII (Very Strong – Severe) in the San Joaquin Hills Scenario and MMI VI-VII (Strong – Very Strong) in the ShakeOut Scenario. Exposure of critical facilities to mapped regional liquefaction susceptibility is shown in **Figure 11**, and summarized in **Table 5**. Earthquake damage estimates for the City's critical facilities, generated using Hazus' Advanced Engineering Building Module (AEBM), are provided in **Table 6,** and are discussed in more detail below.

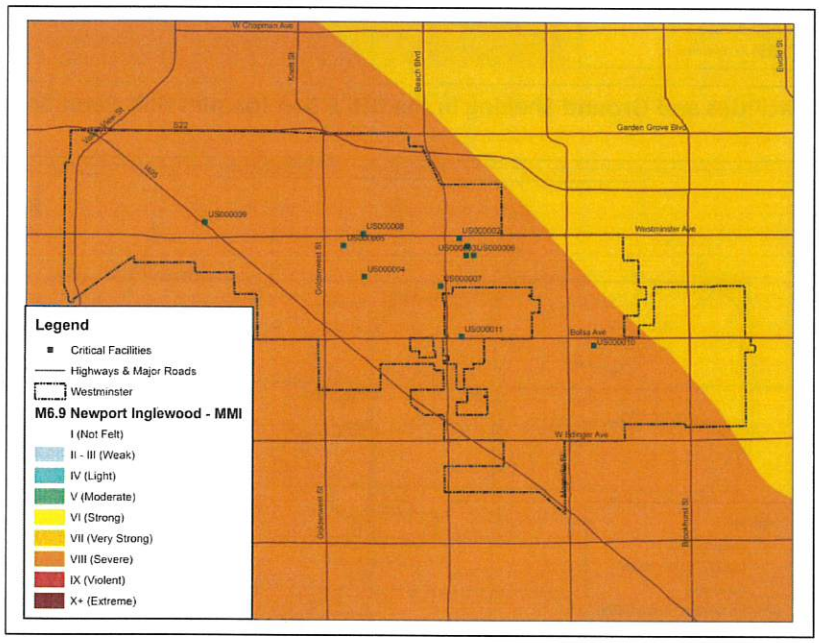

Figure 8: Critical Facilities and Ground Shaking in the M6.9 Newport-Inglewood Fault Scenario Earthquake

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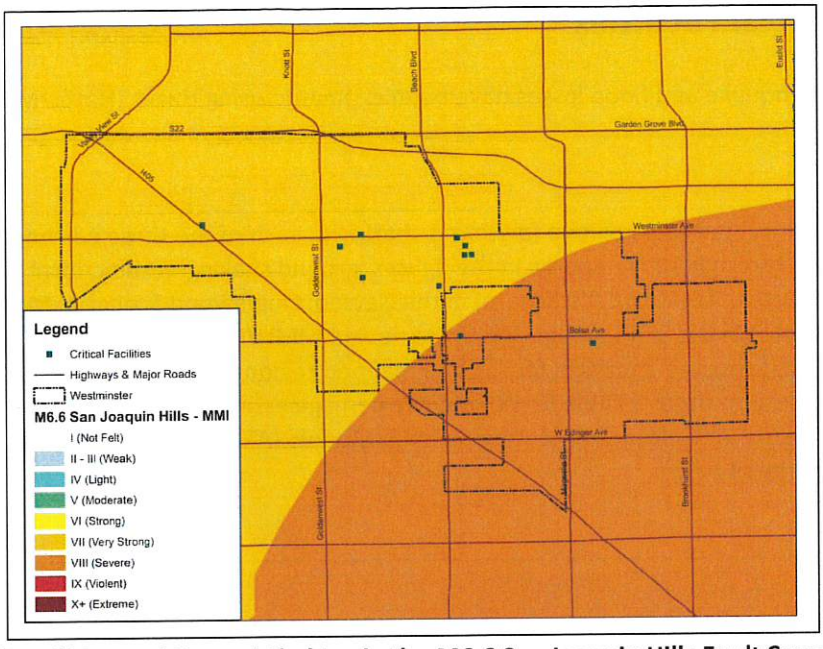

Figure 9: Critical Facilities and Ground Shaking in the M6.6 San Joaquin Hills Fault Scenario Earthquake

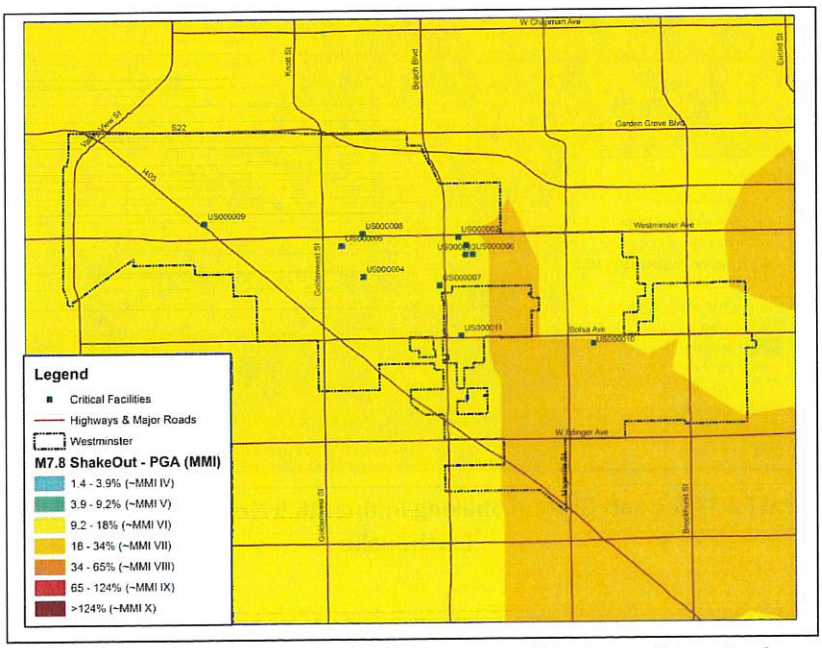

Figure 10: Critical Facilities and Ground Shaking in the M7.8 "ShakeOut" San Andreas Fault Scenario Earthquake

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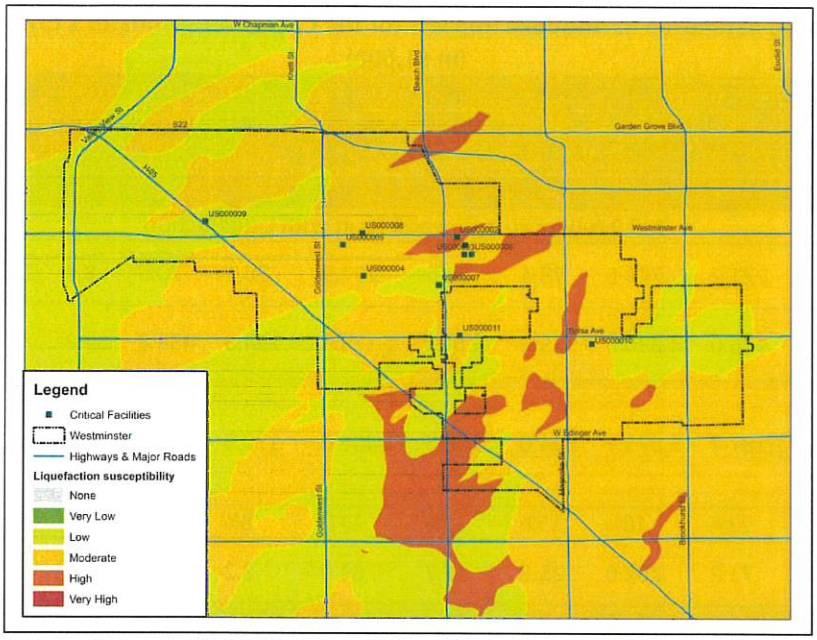

Figure 11: Critical Facilities and USGS Regional Liquefaction Susceptibility [After Ponti et al., 2008]

Table 5: Liquefaction Susceptibility Assignments for the City of Westminster's Critical Facilities

No.	Name	Liquefaction Susceptibility
1	Westminster City Hall	Moderate
2	City Senior Center	High
3	Police Department	Moderate
4	Municipal Corporation Yard	Moderate
5	Family Resource Center	Moderate
6	Westminster Rose Center	Moderate
7	Miriam Warne Community Building	Low
8	Fire Station 64	Moderate
9	Fire Station 65	Low
10	Fire Station 66	Moderate
11	Fire Station 25	Moderate

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Table 6: Hazus-estimated Earthquake Impacts for the City of Westminster's Critical Facilities (in $1,000)

	Critical Facilities											
Name	City Hall	Sr. Ctr.	PD	Corp Yard	Family Ctr.	Rose Ctr.	Warne Bldg	FS #64	FS #65	FS #66	FS #25	
Number	1	2	3	4	5	6	7	8	9	10	11	Total
M6.9 Newport-Inglewood Fault with Liquefaction												
Structural Damage	166.9	221.7	744.8	78.4	28.5	227.9	26.1	70.9	8.9	11.1	10.6	1,595.8
Non-Str. Damage	681.6	966.0	4,830.9	315.6	114.8	1,178.7	144.5	438.8	62.3	72.0	66.9	8,872.1
Building Damage (Str + Non-Str.)	848.5	1,187.7	5,575.7	394.0	143.3	1,406.6	170.6	509.7	71.2	83.2	77.5	10,467.9
Loss Ratio	12%	23%	10%	15%	15%	11%	8%	13%	7%	10%	14%	11%
Contents Damage	127.2	71.2	202.0	125.8	16.7	64.0	3.2	0.9	0.3	0.3	N/A	611.6
Total Loss	**975.7**	**1,258.9**	**5,777.7**	**519.8**	**159.9**	**1,470.6**	**173.9**	**510.6**	**71.4**	**83.5**	**77.5**	**11,079.5**
M6.6 San Joaquin Hills Fault with Liquefaction												
Structural Damage	152.5	201.7	702.9	52.3	15.7	212.9	17.0	40.0	5.9	13.3	7.8	1,421.9
Non-Str. Damage	641.3	903.8	4,591.8	227.2	64.9	1,107.4	103.4	250.5	42.7	85.5	50.5	8,068.8
Building Damage	793.7	1,105.5	5,294.6	279.5	80.6	1,320.4	120.4	290.5	48.5	98.8	58.3	9,490.8
Loss Ratio	11%	22%	9%	11%	8%	10%	5%	7%	5%	12%	11%	10%
Contents Damage	121.8	67.5	192.9	94.6	9.7	60.1	2.3	0.5	0.2	0.4	N/A	550.0
Total Loss	**915.5**	**1,173.0**	**5,487.5**	**374.1**	**90.3**	**1,380.5**	**122.7**	**291.0**	**48.7**	**99.2**	**58.3**	**10,040.8**
M7.8 ShakeOut Scenario with Liquefaction												
Structural Damage	16.1	57.0	43.9	7.3	2.6	17.0	2.6	5.2	0.4	3.9	0.6	156.7
Non-Str. Damage	85.6	269.5	392.8	36.9	13.4	112.1	27.6	39.6	4.8	25.3	4.9	1,012.5
Building Damage	101.8	326.5	436.7	44.1	16.1	129.1	30.2	44.8	5.3	29.3	5.4	1,169.2
Loss Ratio	1%	6%	1%	2%	2%	1%	1%	1%	1%	4%	1%	1%
Contents Damage	18.5	20.3	15.4	17.1	2.3	6.4	0.6	0.1	0.0	0.1	N/A	80.8
Total Loss	**120.2**	**346.8**	**452.1**	**61.3**	**18.3**	**135.6**	**30.8**	**44.9**	**5.3**	**29.4**	**5.4**	**1,250.0**

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As shown in **Table 6**, the event causing the greatest damage overall to the critical facilities in the Newport-Inglewood Scenario, followed closely by the San Joaquin Hills. Despite being a distant event, the ShakeOut scenario (expected to cause significant damage and disruption throughout Southern California) could still cause minor damage to the City's critical facilities.

The table also shows that older buildings and buildings potentially subject to liquefaction show higher levels of damage. The facility expected to suffer the largest loss ratio (the ratio of the expected structural and non-structural repair cost, relative to building replacement cost) in all three events is the City Senior Center (23%, 22%, and 6%, in the Newport-Inglewood, San Joaquin Hills and ShakeOut scenarios, respectively), which has been assumed to be subject to high liquefaction susceptibility. It is recommended that the City review any available site-specific studies or reports to confirm the applicability of this hazard assumption, if possible. The table also shows that despite its "High-Superior" Design Level, minor damage to the new Police Department building (most of which is non-structural) is possible in all three events, and because of its large replacement value ($56.2 million), this minor damage would result in the largest economic loss among the 11 critical facilities.

Flood

Critical facility exposure to expected flood depths are shown in **Figures 12 and 13** for the 1% annual chance flood (the 100-year flood) and the 0.2% chance annual flood (500-year flood), respectively. As shown, just one critical facility (Facility #7 – Westminster Rose Center) is located within the mapped flood boundary for both maps. In both cases, the facility is located close to the edge of the mapped flood zone, with very shallow water depths (<1 foot). Flood damage estimates were generated using the Hazus Flood "User-Defined Facility" module, with the results predicting no appreciable damage to the facility at either flood level.

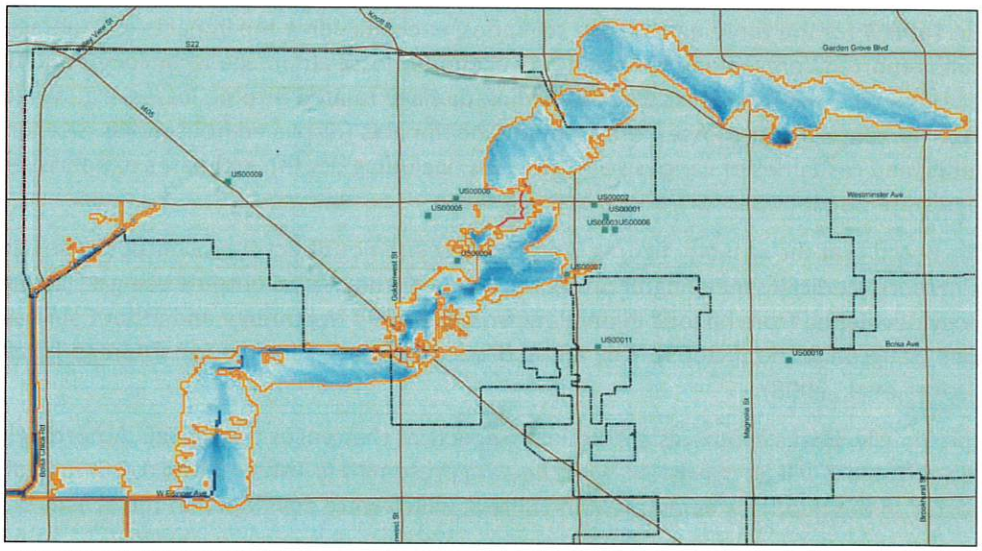

Figure 12: Critical Facilities and Hazus-estimated 1% Annual Chance Flood Depths

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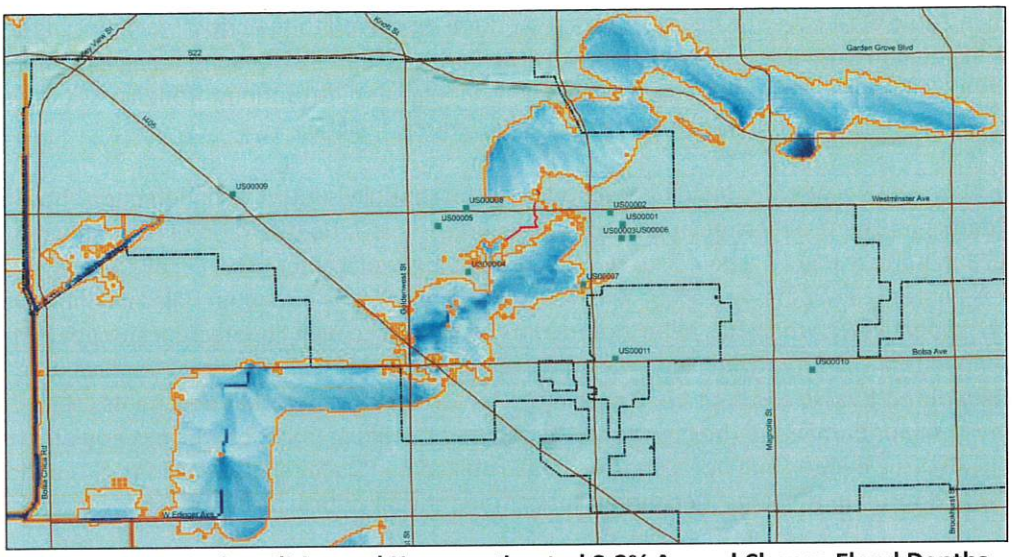

Figure 13: Critical Facilities and Hazus-estimated 0.2% Annual Chance Flood Depths

Results - Community Level Earthquake and Flood Losses

Regional (i.e., community-wide) earthquake and flood losses and population impacts have been estimated using Hazus (Hazus-MH Version 2.1), incorporating the improved regional building inventory databases developed under FEMA funding for the OCEFRA Project (FEMA, 2009).

Earthquake

A summary of the Hazus regional earthquake risk assessment results for the City of Westminster are provided in **Table 7** for the three earthquake scenarios, each including the impacts of liquefaction. Hazus results reported here include various direct economic losses (damage to buildings and their contents, commercial inventories, as well as building-damage related income losses, e.g., wage losses, relocation costs, rental income losses, etc.), population impacts (displaced households, shelter requirements, and casualties of various severity levels, including death), estimates of debris generated, and damage state distributions for various building types.

It should be noted that the casualty figures reported here are not direct Hazus outputs; they are estimates in more medically-meaningful categories derived from Hazus outputs using a "calibration" methodology developed from historic injury data from the 1994 Northridge and other California earthquakes (Seligson & Shoaf, 2003). The method was also applied for the San Andreas "ShakeOut" Scenario (Jones et al., 2008).

As noted previously, Hazus estimates earthquake impacts at the census tract level. Accordingly, building count totals in **Table 7** will be consistent with the data presented in **Tables 3 and 4**, but may differ from totals reported in the flood risk assessment in **Table 8**, which were developed at the census block level.

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Table 7: Hazus-estimated Earthquake Impacts for the City of Westminster

		Earthquake Scenario		
		M6.9 Newport-Inglewood Fault with Liquefaction	M6.6 San Joaquin Hills Fault with Liquefaction	M7.8 ShakeOut Scenario with Liquefaction
Direct Economic Losses for Buildings ($Million)				
	Total Building Exposure Value	5,750.9		
Capital Stock Losses	Cost of Structural Damage	65.3	40.2	17.7
	Cost of Non-Structural Damage	259.8	177.2	59.4
	Total Building Damage (Str. + Non-Str.)	325.1	217.4	77.1
	Building Loss Ratio %	5.7%	3.8%	1.3%
	Cost of Contents Damage	86.4	64.0	18.7
	Inventory Loss	1.8	0.9	0.6
Income Losses	Relocation Loss	40.9	25.6	12.2
	Capital-Related Loss	12.8	7.6	2.1
	Rental Income Loss	20.7	12.2	3.7
	Wage Losses	17.2	10.1	3.2
	Total Direct Economic Loss	504.9	337.8	117.6
	Percent (%) of Countywide Loss	5.5%	2.3%	3.5%
Casualties				
Day Casualties	**Casualties - 2 pm**			
	Fatalities	3	0	0
	Trauma injuries	1	0	0
	Other (non-trauma) hospitalized injuries	7	0	0
	Total hospitalized injuries	8	0	0
	Injuries requiring Emergency Department Visits	250	100	70
	Injuries treated on an Outpatient basis	470	210	140
	Total injuries	731	310	210
	Hospital visits requiring EMS transport	13	4	4
Night Casualties	**Casualties - 2 am**			
	Fatalities	2	1	1
	Trauma injuries	1	0	0
	Other (non-trauma) hospitalized injuries	7	0	0
	Total hospitalized injuries	8	0	0
	Injuries requiring Emergency Department Visits	380	180	200
	Injuries treated on an Outpatient basis	710	360	370
	Total injuries	1,100	541	571
	Hospital visits requiring EMS transport	19	7	11

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		Earthquake Scenario		
		M6.9 Newport-Inglewood Fault with Liquefaction	M6.6 San Joaquin Hills Fault with Liquefaction	M7.8 ShakeOut Scenario with Liquefaction
Shelter				
Shelter	Number of Displaced Households	1,450	900	100
	Number of People Requiring Short-term Shelter	550	350	50
Debris (thousands of tons)				
Debris	Brick, Wood & Other (Light) Debris	82.4	45.8	39.0
	Concrete & Steel (Heavy) Debris	77.7	34.8	30.4
	Total Debris	**160.1**	**80.6**	**69.4**
Building Damage Count by General Building Type*				
Concrete	None	49	104	267
	Slight	113	140	57
	Moderate	151	107	34
	Extensive	48	16	9
	Complete	7	1	1
	TOTAL	**368**	**368**	**368**
Manuf. Housing	None	2	29	124
	Slight	29	219	88
	Moderate	514	1,427	826
	Extensive	1,962	1,500	1,866
	Complete	869	201	472
	TOTAL	**3,376**	**3,376**	**3,376**
Precast Concrete	None	21	28	83
	Slight	40	40	9
	Moderate	30	24	1
	Extensive	2	1	0
	Complete	0	0	0
	TOTAL	**93**	**93**	**93**
Reinforced Masonry	None	159	219	501
	Slight	183	186	35
	Moderate	161	124	9
	Extensive	40	16	1
	Complete	3	1	0
	TOTAL	**546**	**546**	**546**

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		Earthquake Scenario		
		M6.9 Newport-Inglewood Fault with Liquefaction	M6.6 San Joaquin Hills Fault with Liquefaction	M7.8 ShakeOut Scenario with Liquefaction
Building Damage Count by General Building Type (Continued)				
Steel	None	23	63	97
	Slight	66	88	69
	Moderate	113	72	56
	Extensive	26	7	8
	Complete	2	0	0
	TOTAL	**230**	**230**	**230**
Unreinforced Masonry**	None	9	13	40
	Slight	17	18	6
	Moderate	15	13	1
	Extensive	5	3	0
	Complete	1	0	0
	TOTAL	**47**	**47**	**47**
Wood Frame (Other)	None	358	549	1,373
	Slight	707	786	235
	Moderate	507	304	48
	Extensive	79	17	2
	Complete	7	2	0
	TOTAL	**1,658**	**1,658**	**1,658**
Wood Frame (Single-family)	None	7,019	8,330	17,385
	Slight	9,287	8,550	1,000
	Moderate	1,929	1,434	25
	Extensive	161	94	11
	Complete	27	15	2
	TOTAL	**18,423**	**18,423**	**18,423**
ALL BUILDING TYPES	None	7,640	9,335	19,870
	Slight	10,442	10,027	1,499
	Moderate	3,420	3,505	1,000
	Extensive	2,323	1,654	1,897
	Complete	916	220	475
	TOTAL	**24,741**	**24,741**	**24,741**

* These data have been developed from a county-wide distribution of building occupancies across common construction types and do not represent building-specific data.

** According to published reports, there are no URM buildings in the City of Westminster (California Seismic Safety Commission, 2006).

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Flood

A summary of the Hazus regional flood risk assessment results for the City of Westminster are provided in **Table 8** for the 1-percent chance annual flood (the 100-year flood) and the 0.2-percent chance annual flood (500-year flood). The Hazus results reported here include the same direct economic losses and shelter estimates reported for earthquake, but no casualties are reported because the Hazus flood model does not include a flood casualty module. Debris estimates are broken down into flood-relevant sub-classes; finishes, structures and foundations. Finally, building damage counts are reported by occupancy and range of percent damage, reflecting the underlying structure of the Hazus flood damage model.

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Table 8: Hazus-estimated Flood Impacts for the City of Westminster

		Flood Scenario	
		1-percent chance annual flood (100-year flood)	0.2-percent chance annual flood (500-year flood)
Direct Economic Losses for Buildings ($Million)			
	Total Building Exposure Value	**5,750.9**	
Capital Stock Losses	Total Building Damage	22.1	34.6
	Building Loss Ratio %	0.4%	0.6%
	Cost of Contents Damage	34.1	50.2
	Inventory Loss	1.0	1.5
Income Losses	Relocation Loss	0.1	0.1
	Capital-Related Loss	0.1	0.2
	Rental Income Loss	0.0	0.1
	Wage Losses	0.3	0.3
	Total Direct Economic Loss	**57.7**	**87.0**
	Percent (%) of Countywide Loss	1.1%	1.0%
Shelter			
Shelter	Number of Displaced Households	5,300	7,300
	Number of People Requiring Short-term Shelter	4,900	6,800
Debris (thousands of tons)			
Debris	Finishes	2.4	3.5
	Structures	0.2	0.3
	Foundations	0.5	0.6
	Total Debris	**3.1**	**4.4**
Building Damage Count in Flooded Census Blocks by Occupancy			
Single Family Homes	None	291	440
	1 - 10%	0	0
	11 - 20%	21	46
	21 - 30%	89	163
	31 - 40%	1	2
	41 - 50%	0	0
	Substantial Damage	0	0
	TOTAL	**402**	**651**

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		Flood Scenario	
		1-percent chance annual flood (100-year flood)	0.2-percent chance annual flood (500-year flood)
Building Damage Count in Flooded Census Blocks by Occupancy (Continued)			
Manufactured Housing	None	58	63
	1 - 10%	0	0
	11 - 20%	0	0
	21 - 30%	0	0
	31 - 40%	0	0
	41 - 50%	1	2
	Substantial Damage	17	20
	TOTAL	**76**	**85**
Other Residential	None	50	61
	1 - 10%	4	4
	11 - 20%	5	9
	21 - 30%	18	27
	31 - 40%	0	0
	41 - 50%	0	0
	Substantial Damage	0	0
	TOTAL	**77**	**101**
Commercial	None	2	4
	1 - 10%	0	2
	11 - 20%	0	0
	21 - 30%	0	0
	31 - 40%	0	0
	41 - 50%	0	0
	Substantial Damage	0	0
	TOTAL	**2**	**6**
Industrial	None	3	2
	1 - 10%	0	0
	11 - 20%	0	1
	21 - 30%	0	0
	31 - 40%	0	0
	41 - 50%	0	0
	Substantial Damage	0	0
	TOTAL	**3**	**3**

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		Flood Scenario	
		1-percent chance annual flood (100-year flood)	0.2-percent chance annual flood (500-year flood)
Building Damage Count in Flooded Census Blocks by Occupancy (Continued)			
Other Occupancies	None	0	0
	1 - 10%	0	0
	11 - 20%	0	0
	21 - 30%	0	0
	31 - 40%	0	0
	41 - 50%	0	0
	Substantial Damage	0	0
	TOTAL	**0**	**0**
ALL OCCUPANCIES	None	404	570
	1 - 10%	4	6
	11 - 20%	26	56
	21 - 30%	107	190
	31 - 40%	1	2
	41 - 50%	1	2
	Substantial Damage	17	20
	TOTAL	**560**	**846**

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Conclusions and Recommendations

While the City's critical facilities do not appear to be vulnerable to flood damage, the facilities could suffer as much as $11 million in damage to the buildings and their contents in the Newport-Inglewood Fault scenario earthquake. Much of this damage is expected to be non-structural in nature. To minimize this type of damage and its effects on functionality, the City could conduct detailed non-structural evaluations of their facilities, in order to identify and mitigate potentially vulnerable non-structural components and systems. As noted above, the facility with the largest expected loss ratio (the City Senior Center) has been located within a mapped area of high liquefaction susceptibility; site specific conditions should be determined, if possible.

In the community at large, impacts from a large Newport-Inglewood Fault scenario could be significant, including more than $500 million in building-related losses and more than 700 injuries during a daytime event and 1,100 injuries in a night time event. Estimated flood losses are an order of magnitude smaller than the largest earthquake losses, with 500-year flood losses of less than $90 million. While the databases used to predict damage to specific building types have some uncertainty associated with them, a significant percent of mobile homes (26%) have been identified as potentially suffering "Complete" damage in the Newport-Inglewood Fault scenario, representing 95% of all buildings in this category. Further, a number of mobile homes are also located in potentially flooded areas and may suffer substantial flood damage. These buildings would be good candidates for a more detailed review. For example, a more detailed inventory could be developed, including information on the first floor elevation and whether the mobile homes are mounted with an earthquake restraint bracing system, which could be used to refine the damage estimates for these buildings.

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