Table 1. Study region population, households and building exposure by county

County	Population	Households	Building Exposure (dollars in millions)		
			Residential	Non-Residential	Total
Alameda	1,443,741	523,366	111,030	44,670	155,700
Contra Costa	948,816	344,129	82,392	20,415	102,807
Lake	58,309	23,974	3,872	924	4,796
Marin	247,289	100,650	26,772	9,278	36,050
Mendocino	86,265	33,266	5,561	1,723	7,285
Merced	210,554	63,815	10,450	2,451	12,901
Monterey	401,762	121,236	25,014	8,759	33,773
Napa	124,279	45,402	10,039	4,541	14,579
Sacramento	1,223,499	453,602	84,890	25,672	110,562
San Benito	53,234	15,885	3,424	712	4,136
San Francisco	776,733	329,700	62,296	37,882	100,179
San Joaquin	563,598	181,629	33,228	9,528	42,756
San Mateo	707,161	254,103	63,595	20,706	84,301
Santa Clara	1,682,585	565,863	135,520	47,793	183,312
Santa Cruz	255,602	91,139	21,349	7,034	28,383
Solano	394,542	130,403	28,071	6,749	34,820
Sonoma	458,614	172,403	38,724	12,134	50,858
Stanislaus	446,997	145,146	25,864	7,964	33,828
Yolo	168,660	59,375	10,531	3,948	14,479
All 19 Counties	10,252,240	3,655,086	782,621	272,883	1,055,503

Table 2. Building cost index and study region population, 1900 - 2040, and normalized trends in population and exposure growth

Year	Building Cost Index[1]	Population[2,3]	Growth Trends Normalized to 2006	
			Population	Exposure[4]
1900	95	845,868	7.8%	0.173%
1906	95	1,048,521	9.7%	0.21%
1910	95	1,183,623	11.0%	0.24%
1920	207	1,531,848	14.2%	0.68%
1930	185	2,073,101	19.2%	0.82%
1940	203	2,353,359	22%	1.03%
1950	375	3,660,600	34%	2.9%
1960	559	5,067,984	47%	6.1%
1970	836	6,403,564	59%	11.5%
1980	1,941	7,431,035	69%	31%
1990	2,702	8,988,508	83%	52%
2000	3,539	10,252,240	95%	78%
2006	4,310	10,796,440	100%	100%
2010	4,758	11,127,739	103%	114%
2020	6,090	12,358,781	114%	162%
2030	7,796	13,726,012	127%	230%
2040	9,979	15,135,103	140%	325%

1. Building Cost Index (BCI), 1915 - 2005, ENR (2005). BCI values before 1915 are assumed equal to 1915 BCI; BCI values after 2005 are based on 2.5% annual increase.
2. Population, 1900 - 2000, U.S. Census Bureau (2005)
3. Projected Population, 2010 - 2040, Counting California (2005)
4. Exposure growth based on product of BCI and population.

Table 3. Eleven mapping schemes/combinations of building age and height groups used in this study, and relative use of age and height groups in the study region

Building Age Group (AG)	Building Height Group (HG)			
	HG1	HG2	HG3	Fraction - All Height Groups
AG1		1	2	12%
AG2		3	4	7%
AG3		5	6	10%
AG4		7	8	30%
AG5		9	10	36%
AG6	11			6%
Fraction - All Age Groups	6%	17%	77%	100%

Table 4. Six generic building age groups used in this study to develop mapping schemes

Age Group	Building Age Distribution			Description of Buildings of typical Census Tracts
	Pre-1950	50 - '74	Post-1974	
AG1	0.7	0.25	0.05	Older, mainly pre-WW2, buildings
AG2	0.5	0.45	0.05	Older mix of pre- and post-WW2 buildings
AG3	0.3	0.45	0.25	General mix of buildings
AG4	0.05	0.7	0.25	Newer, primarily post-WW2, buildings
AG5	0.05	0.25	0.7	Newer, primarily post-1974, buildings
AG6	0.33	0.33	0.33	City center/tall buildings of major city

Table 5. Three generic building height groups used in this study to develop mapping schemes

Height Group	Building Height Distribution			Description of Buildings of typical Census Tracts
	Low-Rise	Mid-Rise	High-Rise	
HG1	0.1	0.1	0.8	City center/tall buildings of major city
HG2	0.4	0.4	0.2	Commercial and dense urban residential buildings
HG3	0.95	0.05	0.0	Suburban, primarily residential buildings

Table 6. Comparison of HAZUS default values, target values and the building height and age distributions used in this study

County	Source	Height Distribution			Age Distribution[1]		
		Low-Rise	Mid-Rise	High-Rise	Pre-1950	'50 - '74	Post-1974
Alameda	Default	100%	0%	0%	25%	50%	25%
	Target[3]	79%	10%	11%	26%	40%	33%
	This Study	89%	6%	5%	26%	40%	34%
San Francisco	Default	100%	0%	0%	25%	50%	25%
	Target[2]	72%	12%	16%	52%	30%	17%
	This Study	77%	11%	12%	43%	36%	20%
San Mateo	Default	100%	0%	0%	25%	50%	25%
	Target[3]	84%	12%	4%	26%	47%	27%
	This Study	91%	7%	1%	25%	42%	32%
Santa Clara	Default	100%	0%	0%	25%	50%	25%
	Target[3]	78%	11%	11%	13%	48%	39%
	This Study	90%	6%	4%	18%	43%	39%
All 19 Counties	Default	100%	0%	0%	25%	50%	25%
	Target[3]	81%	11%	8%	20%	42%	38%
	This Study	90%	6%	4%	21%	41%	38%

1. Target age distribution fractions inferred from age of residences (HAZUS demographics file) and comapered to age of residences used in this study

2. Target height distribution fractions based on CAPSS data (ATC, 2005)

3. Target height distribtion fractions inferred from CAPSS data (ATC, 2005) considering reduced fractions of high-rise buildings in counties that have relatively less tall building square footage than San Francisco)

Table 7. Comparison of estimated URM building square footage, CSSC (2005) and this study

County	Number of URM Buildings (CSSC, 2005)			Estimated Square Footage	
	Total	Mitigated	Rate	CSSC[2]	This Study
Alameda	2,597	1,031	39.7%	46,746,000	46,987,658
Contra Costa	431	100	23.2%	7,758,000	6,036,680
Lake	49	10	20.4%	882,000	130,078
Marin	124	52	41.9%	2,232,000	4,243,723
Mendocino	67	2	3.0%	1,206,000	458,026
Merced[1]	NA	NA	NA	NA	779,241
Monterey	209	75	35.9%	3,762,000	4,160,652
Napa	122	36	29.5%	2,196,000	1,568,159
Sacramento[1]	NA	NA	NA	NA	8,943,267
San Benito	28	2	7.1%	504,000	203,706
San Francisco	1,976	1,419	71.8%	35,568,000	60,577,535
San Joaquin	0	0		0	4,059,295
San Mateo	166	123	74.1%	2,988,000	11,165,383
Santa Clara	388	253	65.2%	6,984,000	12,408,111
Santa Cruz	112	21	18.8%	2,016,000	2,719,800
Solano	174	17	9.8%	3,132,000	1,998,840
Sonoma	578	203	35.1%	10,404,000	3,408,494
Stanislaus[1]	NA	NA	NA	NA	2,352,677
Yolo	0	0		0	1,340,970
Total	7,021	3,344	47.6%	126,378,000	156,066,844[3]

1. URM data are not available for Merced, Sacramento, San Joaquin, Stanislaus and Yolo counties (e.g., Seismic Zone 3 counties)

2. Square footage based on average 18,000 sq. ft./building (Rutherford & Chekene, 1990)

3. Total square footage, excluding Merced, Sacramento, San Joaquin, Stanislaus and Yolo counties

Table 8. Rules used in this study to assign the Seismic Design Level to Model Building Type

Model Building Type[1,2]		Building Vintage (Age Group)			
		Pre-1950		1950 - 1974 All Counties	Post-1974 All Counties
		San Francisco and Alameda	Other Counties		
General Rule (for Model Building Types other than those below)		Low-Seismic Code (LC)		Moderate-Seis. Code (MC)	High-Seismic Code (HC)
W1 (Wood under 5,000 sq. ft.)	w/o Retrofit	MC - 40% LC - 25% PC - 25%	MC - 40% LC - 40% PC - 10%	HC - 50% MC - 50%	HC
	w/Retrofit (LS)	MC - 10%	MC - 10%		
W2 (Wood over 5,000 sq. ft.)	w/o Retrofit	MC - 50% LC - 25% PC - 25%	MC - 50% LC - 40% PC - 10%	HC - 50% MC - 40% PC - 10%	HC - 90% PC - 10%
URM (Unreinforced Masonry)	w/o Retrofit	PC - 25%		PC - 25%	NA
	w/Retrofit (LS)	MC - 5%		MC - 5%	
	w/Retrofit (CP)	LC - 75%		LC - 75%	
C1/C3 (Concrete frame w & w/o infill)	w/o Retrofit	LC - 40% PC - 40%		LC - 60% PC -20%	HC
	w/Retrofit (LS)	MC - 20%		MC - 20%	

1. Pre-Code (PC) Seismic Design Level is used in this for study to designate the fraction of vulnerable building types considered to be especially high collapse hazard buildings

2. Retrofitted model building types distinguish crudely between Life Safety (LS) and Collapse Prevention (CP) performance, where CP performance is considered typical of URM mitigation

Table 9. Comparison of HAZUS default building exposures, RMS building exposures and building exposures used in this study (dollars in millions)

County	Residential Building Exposure			Non-Residential Bldg. Exposure			Total Building Exposure used in this Study[1]
	HAZUS Default	RMS	Ratio	HAZUS Default	RMS	Ratio	
Alameda	$100,936	$112,203	1.11	$22,335	$45,735	2.05	$155,700
Contra Costa	$74,902	$74,759	1.00	$10,207	$19,687	1.93	$102,807
Lake	$3,520	$3,232	0.92	$462	$980	2.12	$4,796
Marin	$24,338	$25,961	1.07	$4,639	$8,217	1.77	$36,050
Mendocino	$5,056	$5,308	1.05	$862	$1,867	2.17	$7,285
Merced	$9,500	$9,572	1.01	$1,226	$2,700	2.20	$12,901
Monterey	$22,740	$23,196	1.02	$4,380	$7,324	1.67	$33,773
Napa	$9,126	$10,166	1.11	$2,270	$3,641	1.60	$14,579
Sacramento	$77,172	$79,433	1.03	$12,836	$25,066	1.95	$110,562
San Benito	$3,113	$2,763	0.89	$356	$796	2.24	$4,136
San Francisco	$56,633	$72,001	1.27	$18,941	$40,334	2.13	$100,179
San Joaquin	$30,207	$31,747	1.05	$4,764	$9,709	2.04	$42,756
San Mateo	$57,814	$64,316	1.11	$10,353	$21,410	2.07	$84,301
Santa Clara	$123,200	$153,773	1.25	$23,896	$54,865	2.30	$183,312
Santa Cruz	$19,408	$19,582	1.01	$3,517	$6,002	1.71	$28,383
Solano	$25,519	$23,606	0.93	$3,375	$5,793	1.72	$34,820
Sonoma	$35,203	$31,243	0.89	$6,067	$9,426	1.55	$50,858
Stanislaus	$23,513	$25,237	1.07	$3,982	$7,685	1.93	$33,828
Yolo	$9,573	$9,864	1.03	$1,974	$4,069	2.06	$14,479
All 19 Counties	$711,473	$777,960	1.09	$136,441	$275,305	2.02	$1,055,503

1. Improved building exposures used in this study are based on HAZUS default exposures factored by 1.1 for residential buildings and by 2.0 for non-residential buildings.

Table 10. Comparison of HAZUS default populations and those used in this study

Time of Day	Indoor (IN)			Outdoor (OUT)	Commuting (COMM)	Total - IN, OUT and COMM	Fraction of Total Population
	COM	RES	other				
Populations by Time of Day based on HAZUS Default Demographics Data							
2 AM	61,589	9,735,241	116,503	9,923	51,261	9,974,517	1.0
2 PM	3,545,864	1,668,706	2,389,042	1,229,063	461,351	9,294,025	0.9
5 PM	2,515,082	3,445,197	425,708	2,352,999	6,835,400	15,574,387	1.5
Populations by Time of Day used in this Study							
2 AM	61,589	9,735,241	116,503	9,923	51,261	9,974,517	1.0
2 PM	3,673,004	1,668,706	2,389,042	1,312,109	922,702	9,965,562	1.0
5 PM	1,306,727	2,411,638	425,708	1,627,157	4,511,351	10,282,581	1.0

Table 11. Selected values of median parameters of structural damage functions used in this study for low-rise buildings (after Table 6.3 of the HAZUS AEBM, NIBS, 2002)

Model Building Type		Seismic Design Level	Average inter-story drift ratio of structural damage state			
Label	Description		Slight	Moderate	Extensive	Complete
W1/W2	Wood Frame Structures	HC	0.004	0.012	0.04	0.1
		MC/LC	0.004	0.012	0.031	0.075
W1/W2	Wood Frame w/Soft Story	PC	0.003	0.008	0.016	0.03
W1R	Retrofitted W1 w/Soft Story	Retrofit (LS)	0.004	0.012	0.031	0.075
C1L	Low-rise Concrete Frame Structures	HC	0.005	0.01	0.03	0.08
		MC	0.005	0.009	0.023	0.06
		LC	0.005	0.008	0.02	0.05
		PC	0.004	0.006	0.016	0.04
C1LR	Retrofitted C1L Structures	Retrofit (LS)	0.005	0.009	0.023	0.06
C3L	Low-rise Concrete Frame Structures with Masonry Infill	LC	0.003	0.006	0.015	0.035
		PC	0.002	0.005	0.012	0.028
C3LR	Retrofitted C3L Structures	Retrofit (LS)	0.004	0.007	0.019	0.053
URML	Low-rise Unreinforced Masonry Wall Structures	LC	0.003	0.006	0.015	0.035
		PC	0.002	0.005	0.012	0.028
URMLR	Retrofitted URML Structures	Retrofit (CP)	0.004	0.006	0.016	0.044
		Retrofit (LS)	0.004	0.007	0.019	0.053

Table 12. Assumptions and values of lognormal standard deviation parameters of building damage functions used in this study[1]

Fragility Parameter	Existing Model Building Types			Retrofitted Model Building Types		
Damage-State Variability	Moderate (β_{ds} = 0.4)			Small (β_{ds} = 0.2)		
Capacity-Curve Variability	Moderate (β_C = 0.4)			Small (β_C = 0.2)		
Post-Yield Degradation	Minor	Moderate	Major	Minor	Moderate	Major
Damage States - Building Height	Seismic Design Level			Seismic Design Level		
	HC	MC/LC	PC	HC	MC/LC	PC
All Structural - Low-Rise	0.8	0.9	0.95	0.7	0.75	0.85
All Structural - Mid-Rise	0.75	0.8	0.85	0.65	0.7	0.75
All Structural - High-Rise	0.7	0.75	0.8	0.6	0.65	0.7
All Nonstructural - NSD	Same as structural			Same as structural		
All Nonstructural - NSA	0.65	0.65	0.65	0.65	0.65	0.65

1. Parameters derived from Tables 6.5, 6.6 and 6.7 of the AEBM (NIBS, 2002)

Table 13. Comparison of estimates of damage and loss with "actual" values of damage and loss for the 1989 Loma Prieta earthquake

Damage or Loss Parameter	Estimated Damage or Loss	Actual Damage or Loss	
		2006[1]	1989
Number of Damaged Buildings			
Moderate Structural Damage	100,212	34,000	27,000[2]
Extensive or Complete Structural Damage	11,215		
Social Losses			
Temporary Public Shelter (peak number of people)	6,636	3,100	2,500[3]
Serious Injuries (5 PM) - Severity Levels 2 & 3	347	250	200[4]
Immediate Deaths (5PM) - Severity Level 4	60	20	16[5]
Direct Economic Losses ($ in billions)			
Residential Buildings	$11.2	$15	$7.5[6]
Commercial Buildings	$4.4		
All Buildings w/o Business Interruption	$17.4		
All Buildings w/Business Interruption	$19.1		

1. 2006 building damage and social losses based on 1.25 x 1989 values; 2006 direct economic losses based on 2 x 1989 loss to account of increases in population and building exposure

2. Total number of damaged structures, Fratessa (1994)

3. People in temporary shelter, Tierney (1994)

4. Estimated 200 building-related serious injuries based on approximate 300 total serious injuries, Tierney (1994)

5. Estimated 16 building-related deaths of total 63 deaths, Table 11.2, EERI (1990)

6. Estimated $7.5 billion building-related loss based on $10 billion total loss, Fratessa (1994)

Table 14. Estimates of Extensive or Complete structural damage to single-family dwellings and other residential buildings due to 1906 MMI and M7.9 ground motions by county

County	Single-Family Dwellings					Other Residential Buildings				
	Total	No. of Damaged Bldgs.				Total	No. of Damaged Bldgs.			
	Number	06 MMI	%	M7.9	%	Number	06 MMI	%	M7.9	%
Alameda	367,738	13,497	3.7%	12,237	3.3%	31,824	3,564	11%	3,902	12%
Contra Costa	298,498	1,959	0.7%	949	0.3%	16,352	355	2.2%	367	2.2%
Lake	19,102	21	0.1%	2	0.0%	9,891	12	0.1%	1	0.0%
Marin	84,696	1,521	1.8%	3,874	4.6%	5,701	237	4.1%	791	14%
Mendocino	25,934	465	1.8%	257	1.0%	5,406	197	3.6%	136	2.5%
Merced	49,261	22	0.0%	4	0.0%	6,626	3	0.0%	3	0.1%
Monterey	96,996	376	0.4%	853	0.9%	9,904	119	1.2%	384	3.9%
Napa	38,556	458	1.2%	29	0.1%	5,200	150	2.9%	25	0.5%
Sacramento	340,964	1	0.0%	2	0.0%	28,767	2	0.0%	31	0.1%
San Benito	14,943	168	1.1%	494	3.3%	1,095	28	2.5%	153	14%
San Francisco	125,176	14,864	12%	23,810	19%	36,796	7,074	19%	10,862	30%
San Joaquin	142,587	8	0.0%	8	0.0%	13,510	3	0.0%	12	0.1%
San Mateo	202,877	14,325	7.1%	23,228	11%	10,925	1,522	14%	3,236	30%
Santa Clara	444,273	11,328	2.5%	20,299	4.6%	37,093	2,578	7.0%	4,786	13%
Santa Cruz	78,198	1,646	2.1%	3,016	3.9%	9,932	500	5.0%	1,313	13%
Solano	110,733	366	0.3%	225	0.2%	7,922	72	0.9%	66	0.8%
Sonoma	150,870	4,826	3.2%	1,423	0.9%	14,751	1,209	8.2%	312	2.1%
Stanislaus	116,518	17	0.0%	6	0.0%	11,685	4	0.0%	8	0.1%
Yolo	39,644	1	0.0%	0	0.0%	5,128	1	0.0%	3	0.1%
All 19 Counties	2,747,564	65,869	2.4%	90,717	3.3%	268,508	17,630	6.6%	26,388	9.8%

Table 15. Estimates of Extensive or Complete structural damage to commercial and other non-residential buildings due to 1906 MMI and M7.9 ground motions by county

County	Commercial Buildings					Other Non-Residential Buildings				
	Total	No. of Damaged Bldgs.				Total	No. of Damaged Bldgs.			
	Number	06 MMI	%	M7.9	%	Number	06 MMI	%	M7.9	%
Alameda	10,667	1,197	11%	1,307	12%	3,276	383	12%	491	15%
Contra Costa	5,726	143	2.5%	97	1.7%	705	24	3.4%	18	2.5%
Lake	194	4	2.0%	1	0.4%	69	2	2.5%	0	0.6%
Marin	2,324	137	5.9%	444	19%	474	36	7.6%	107	23%
Mendocino	453	35	7.6%	27	5.9%	47	2	5.1%	1	2.8%
Merced	649	2	0.3%	1	0.1%	142	0	0.2%	0	0.1%
Monterey	2,389	60	2.5%	122	5.1%	549	20	3.6%	43	7.8%
Napa	991	64	6.5%	9	0.9%	306	16	5.2%	3	0.9%
Sacramento	7,252	0	0.0%	5	0.1%	1,808	0	0.0%	4	0.2%
San Benito	198	11	5.7%	35	18%	43	3	5.9%	8	20%
San Francisco	9,527	2,482	26%	3,560	37%	1,432	382	27%	518	36%
San Joaquin	2,522	2	0.1%	5	0.2%	596	1	0.1%	1	0.1%
San Mateo	5,037	1,051	21%	2,054	41%	976	255	26%	454	46%
Santa Clara	10,854	1,170	11%	2,059	19%	3,062	345	11%	543	18%
Santa Cruz	1,657	128	7.7%	328	20%	353	25	7.2%	69	20%
Solano	1,810	30	1.7%	25	1.4%	358	7	1.9%	3	0.9%
Sonoma	2,988	408	14%	169	5.7%	626	86	14%	38	6.1%
Stanislaus	1,980	2	0.1%	2	0.1%	505	1	0.2%	1	0.2%
Yolo	1,023	0	0.0%	1	0.1%	254	0	0.0%	0	0.1%
All 19 Counties	68,241	6,927	10%	10,251	15%	15,581	1,588	10%	2,303	15%

Table 16. Estimates of direct economic losses for buildings due to 1906 MMI ground motions by county (dollars in millions)

County	Capital Stock Losses					Income	Total
	Structural	Non-Struct.	Contents	Total	Ratio	Loss	Loss
Alameda	$2,701	$9,650	$2,401	$14,752	7.9%	$1,419	$16,170
Contra Costa	$578	$2,577	$604	$3,759	3.1%	$272	$4,031
Lake	$15	$65	$17	$98	1.7%	$8	$105
Marin	$388	$1,581	$364	$2,333	5.5%	$198	$2,531
Mendocino	$96	$408	$97	$601	6.9%	$61	$661
Merced	$14	$65	$15	$94	0.6%	$6	$100
Monterey	$198	$775	$194	$1,167	2.9%	$109	$1,276
Napa	$143	$593	$164	$900	5.0%	$90	$990
Sacramento	$8	$19	$3	$30	0.0%	$3	$33
San Benito	$39	$169	$37	$244	5.0%	$19	$263
San Francisco	$3,888	$13,673	$3,060	$20,622	17.5%	$2,582	$23,204
San Joaquin	$22	$81	$18	$121	0.2%	$10	$130
San Mateo	$2,440	$9,474	$2,072	$13,987	14.1%	$1,059	$15,045
Santa Clara	$2,893	$11,729	$2,953	$17,575	8.0%	$1,509	$19,084
Santa Cruz	$398	$1,691	$382	$2,471	7.4%	$190	$2,661
Solano	$124	$572	$144	$840	2.0%	$56	$897
Sonoma	$927	$4,033	$1,012	$5,972	9.8%	$468	$6,440
Stanislaus	$27	$105	$25	$156	0.4%	$12	$168
Yolo	$5	$18	$4	$27	0.2%	$2	$30
All 19 Counties	$14,904	$57,278	$13,566	$85,748	5.2%	$8,071	$93,819

Table 17. Estimates of direct economic losses for buildings due to M7.9 ground motions by county (dollars in millions)

County	Capital Stock Losses					Income	Total	Loss
	Structural	Non-Struct.	Contents	Total	Ratio	Loss		
Alameda	$2,704	$8,742	$2,119	$13,565	7.4%	$1,450	$15,015	
Contra Costa	$347	$1,355	$308	$2,011	1.7%	$184	$2,195	
Lake	$5	$16	$4	$25	0.4%	$2	$27	
Marin	$843	$3,305	$774	$4,923	11.5%	$473	$5,396	
Mendocino	$61	$249	$62	$371	4.2%	$45	$416	
Merced	$8	$27	$6	$40	0.3%	$4	$44	
Monterey	$321	$1,208	$302	$1,832	4.5%	$171	$2,002	
Napa	$33	$130	$35	$198	1.1%	$21	$219	
Sacramento	$30	$50	$8	$89	0.1%	$19	$108	
San Benito	$85	$372	$84	$541	11.0%	$42	$583	
San Francisco	$5,662	$20,285	$4,215	$30,162	25.9%	$3,605	$33,767	
San Joaquin	$24	$78	$18	$119	0.2%	$14	$133	
San Mateo	$4,182	$16,535	$3,726	$24,443	24.6%	$1,914	$26,357	
Santa Clara	$4,437	$17,438	$4,203	$26,078	11.9%	$2,349	$28,427	
Santa Cruz	$691	$2,784	$652	$4,127	12.2%	$355	$4,483	
Solano	$66	$247	$60	$374	0.9%	$37	$410	
Sonoma	$418	$1,651	$411	$2,480	4.1%	$230	$2,710	
Stanislaus	$19	$66	$15	$100	0.3%	$10	$111	
Yolo	$6	$16	$3	$25	0.1%	$3	$28	
All 19 Counties	$19,942	$74,557	$17,007	$111,505	6.4%	$10,926	$122,431	

Table 18. Estimates of the number of displaced households and people seeking temporary, public shelter due to 1906 MMI and M7.9 ground motions by county

County	Households					Number of People Seeking Public Shelter	
	Total	1906 MMI		M7.9			
	Number	Displaced	%	Displaced	%	1906 MMI	M7.9
Alameda	523,366	36,786	7.0%	38,955	7.4%	9,678	10,393
Contra Costa	344,129	4,523	1.3%	4,032	1.2%	1,125	1,067
Lake	23,974	59	0%	18	0%	16	5
Marin	100,650	2,402	2.4%	6,991	6.9%	517	1,497
Mendocino	33,266	732	2.2%	471	1.4%	199	129
Merced	63,815	45	0.1%	57	0.1%	13	18
Monterey	121,236	1,230	1.0%	2,553	2.1%	325	690
Napa	45,402	1,051	2.3%	245	0.5%	262	62
Sacramento	453,602	38	0.0%	499	0.1%	11	142
San Benito	15,885	224	1%	623	4%	58	157
San Francisco	329,700	60,254	18.3%	87,995	26.7%	14,817	21,192
San Joaquin	181,629	73	0.0%	179	0.1%	21	53
San Mateo	254,103	21,348	8.4%	41,356	16.3%	4,535	8,822
Santa Clara	565,863	28,639	5.1%	52,911	9.4%	6,403	11,597
Santa Cruz	91,139	2,434	2.7%	5,216	5.7%	593	1,303
Solano	130,403	757	0.6%	502	0.4%	200	132
Sonoma	172,403	6,791	3.9%	2,855	1.7%	1,610	678
Stanislaus	145,146	87	0.1%	130	0.1%	24	35
Yolo	59,375	28	0.0%	60	0.1%	8	17
All 19 Counties	3,655,086	167,499	4.6%	245,649	6.7%	40,413	57,989

Table 19. Estimates of casualties due to 1906 MMI ground motions by county

County	No. of Casualties - 2 am				No. of Casualties - 2 pm			
	Total Number	Serious Injuries	Requires Rescue	Immediate Deaths	Total Number	Serious Injuries	Requires Rescue	Immediate Deaths
Alameda	4,394	759	93	179	5,560	988	143	276
Contra Costa	739	101	10	20	890	127	15	28
Lake	17	2	0	0	27	4	0	1
Marin	425	73	9	17	543	87	11	22
Mendocino	196	43	7	12	203	37	5	10
Merced	22	1	0	0	25	3	0	0
Monterey	360	60	8	15	377	58	7	14
Napa	173	23	2	4	250	39	5	10
Sacramento	8	0	0	0	9	1	0	0
San Benito	61	7	1	1	93	16	2	4
San Francisco	7,213	1,420	149	287	10,313	2,037	211	404
San Joaquin	27	1	0	0	44	3	0	0
San Mateo	3,273	531	55	105	5,698	1,069	161	312
Santa Clara	4,197	623	66	128	6,914	1,205	171	332
Santa Cruz	494	81	10	18	674	117	17	33
Solano	154	15	1	2	183	24	2	5
Sonoma	1,230	198	22	42	2,023	370	55	107
Stanislaus	33	2	0	0	40	4	0	0
Yolo	7	0	0	0	5	0	0	0
All 19 Counties	23,022	3,942	433	831	33,869	6,187	806	1,558

Table 20. Estimates of casualties due to M7.9 ground motions by county

County	No. of Casualties - 2 am				No. of Casualties - 2 pm			
	Total Number	Serious Injuries	Requires Rescue	Immediate Deaths	Total Number	Serious Injuries	Requires Rescue	Immediate Deaths
Alameda	5,032	1,005	140	269	6,880	1,300	196	378
Contra Costa	660	124	17	32	635	96	11	21
Lake	4	0	0	0	6	1	0	0
Marin	1,340	266	36	69	2,077	404	62	121
Mendocino	220	71	13	24	190	41	7	13
Merced	12	1	0	0	11	1	0	0
Monterey	830	163	23	44	986	182	27	52
Napa	34	3	0	0	46	5	0	1
Sacramento	31	2	0	0	35	3	0	0
San Benito	191	31	4	7	364	74	12	23
San Francisco	13,383	2,873	301	574	18,799	3,977	430	823
San Joaquin	31	2	0	0	52	4	0	0
San Mateo	8,165	1,546	192	370	15,540	3,218	521	1,013
Santa Clara	8,634	1,503	187	361	14,111	2,699	413	802
Santa Cruz	1,237	240	32	62	1,968	391	62	120
Solano	80	8	1	1	105	14	2	3
Sonoma	590	118	17	31	864	149	20	39
Stanislaus	23	1	0	0	27	2	0	0
Yolo	7	0	0	0	6	0	0	0
All 19 Counties	40,506	7,959	962	1,846	62,703	12,562	1,764	3,411

Table 21. Distribution of estimated nighttime (2 am) deaths due to M7.9 ground motions by model building type

Model Building Type (MBT)		Seismic Design Level	Relative MBT Use		Deaths		Relative Risk Factor
Label	Description		Area (SF x 10^3)	Percent of Total	Number	Percent of All	
W1	Wood Frame (< 5,000 SF)	All non-PC	4,376,668	56%	39	2.1%	0.0
W1	W1 w/Soft Story	PC	147,605	1.9%	330	17.9%	9.4
W1R	Retrofitted W1 w/Soft Story	Retrofit	99,702	1.3%	2	0.11%	0.1
W2	Wood Frame (> 5,000 SF)	All non-PC	576,702	7.4%	4	0.22%	0.0
W2	W2 w/Soft Story	PC	34,498	0.45%	160	8.7%	19.5
	All Wood Buildings	All	5,235,174	68%	535	29.0%	0.4
C1/C3	Nonductile Concrete Frame	PC	43,480	0.56%	208	11.3%	20.1
C1/C3R	Retrofitted Nonductile C1/C3	Retrofit	22,576	0.29%	9	0.49%	1.7
	All Concrete Buildings	All	875,221	11.3%	607	32.9%	2.9
URM	Unreinforced Masonry	PC	40,139	0.52%	256	13.9%	26.8
URMR	Retrofitted URM	Retrofit	131,879	1.7%	33	1.8%	1.0
	All Masonry Buildings	All	697,316	9.0%	410	22.2%	2.5
	All Steel Buildings	All	778,835	10.1%	293	15.9%	1.6
MH	All Mobile Homes	All	162,610	2.1%	1	0.05%	0.0
	All Buildings	All	7,749,156	100%	1,846	100%	1.0

Table 22. Distribution of estimated daytime (2 pm) deaths due to M7.9 ground motions by model building type

Model Building Type (MBT)		Seismic Design Level	Relative MBT Use		Deaths		Relative Risk Factor
Label	Description		Area (SF x 10^3)	Percent of Total	Number	Percent of All	
W1	Wood Frame (< 5,000 SF)	All non-PC	4,376,668	56%	9	0.3%	0.0
W1	W1 w/Soft Story	PC	147,605	1.9%	80	2.3%	1.2
W1R	Retrofitted W1 w/Soft Story	Retrofit	99,702	1.3%	0	0.00%	0.0
W2	Wood Frame (> 5,000 SF)	All non-PC	576,702	7.4%	40	1.2%	0.2
W2	W2 w/Soft Story	PC	34,498	0.45%	24	0.70%	1.6
	All Wood Buildings	All	5,235,174	68%	153	4.5%	0.1
C1/C3	Nonductile Concrete Frame	PC	43,480	0.56%	456	13.4%	23.8
C1/C3R	Retrofitted Nonductile C1/C3	Retrofit	22,576	0.29%	23	0.67%	2.3
	All Concrete Buildings	All	875,221	11.3%	1,364	40.0%	3.5
URM	Unreinforced Masonry	PC	40,139	0.52%	637	18.7%	36.1
URMR	Retrofitted URM	Retrofit	131,879	1.7%	117	3.4%	2.0
	All Masonry Buildings	All	697,316	9.0%	1,044	30.6%	3.4
	All Steel Buildings	All	778,835	10.1%	849	24.9%	2.5
MH	All Mobile Homes	All	162,610	2.1%	1	0.03%	0.0
	All Buildings	All	7,749,156	100%	3,411	100%	1.0