



Updating the Costs of Compliance for California's Hospital Seismic Safety Standards

Appendix D. Regional Cost Analysis

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Appendix D. Regional Cost Analysis

Because population density and hospital density and size vary substantially around California, this appendix presents hospital upgrade costs for separate regions throughout the state.

Defining Regions for Analysis

Our choice for defining the regions we used in our analysis was guided by balancing competing factors. On the one hand, we wanted to provide information at a small geographic scale. On the other hand, we wanted to retain a large number of hospitals in any single region. The reason for including many hospitals per region was twofold. First, we are using the same statewide cost data for this regional analysis that we used for our statewide estimates presented in Chapter 5. This means that the cost estimates do not take into account hospital-specific factors that will influence costs. By including many hospitals, we hope that inaccuracies in the cost estimates for individual hospitals will average out (e.g., estimates that are higher than actual costs will be balanced by estimates that are lower than actual costs). Second, we wanted to ensure that readers could not infer the cost estimate for an individual hospital.

Based on these criteria, we defined analysis regions as individual counties with at least ten hospitals and groups of counties containing fewer than ten hospitals each. For county groupings, we used the California economic markets defined by the California Employment Development Department.¹

The state's 418 general acute care hospitals are located in 56 of California's 58 counties. Twelve of these counties have ten or more hospitals and 44 have fewer than ten. Our set of analysis regions therefore consists of a mix of individual counties and partial or complete multicounty economic markets. Analysis regions are listed in Table D.1.

¹ California Employment Development Department, "Regional Economic Analysis Profiles," webpage, undated (as of June 12, 2019: <https://www.labormarketinfo.edd.ca.gov/geography/regional-economic-profiles.html>).

Table D.1. Analysis Regions

Economic Market	Counties		Analysis Region
Northern	Butte Colusa Del Norte Glenn Humboldt Lassen Mendocino	Modoc Plumas Shasta Sierra Siskiyou Tehama Trinity	Northern market
San Francisco Bay Area	Alameda Contra Costa Lake Marin Napa	San Francisco San Mateo Santa Clara Solano Sonoma	Alameda County San Francisco Bay Area market (remainder) San Francisco County Santa Clara County
Sacramento	Alpine El Dorado Nevada Placer	Sacramento Sutter Yolo Yuba	Sacramento County Sacramento market (remainder) + Eastern Sierra market
Eastern Sierra	Amador Calaveras Inyo	Mariposa Mono Tuolumne	
San Joaquin Valley	Fresno Kern Kings Madera	Merced San Joaquin Stanislaus Tulare	Fresno County Kern County San Joaquin Valley market (remainder)
Coastal	Monterey San Benito San Luis Obispo	Santa Barbara Santa Cruz	Coastal market
Southern	Los Angeles Orange Riverside San Bernardino Ventura		Los Angeles County Orange County Riverside County San Bernardino County Ventura County
Southern border	Imperial	San Diego	Southern border market

Approach to Estimating Costs

Retrofit and replacement costs were estimated for building and bed numbers in each analysis region with the data and approach used for the statewide estimate. Retrofit costs were estimated using cost data shown in Tables 5.2 and 5.3 and the cost element categories in Table 5.5. Replacement costs were estimated using cost data shown in Table 5.4 and the cost element categories in Table 5.6. For both retrofit and replacement, we present unescalated costs, costs escalated at 4 percent per year through 2030, and a demand surge escalation estimate that increases the escalation rate to 8 percent per year for the second half of the period.

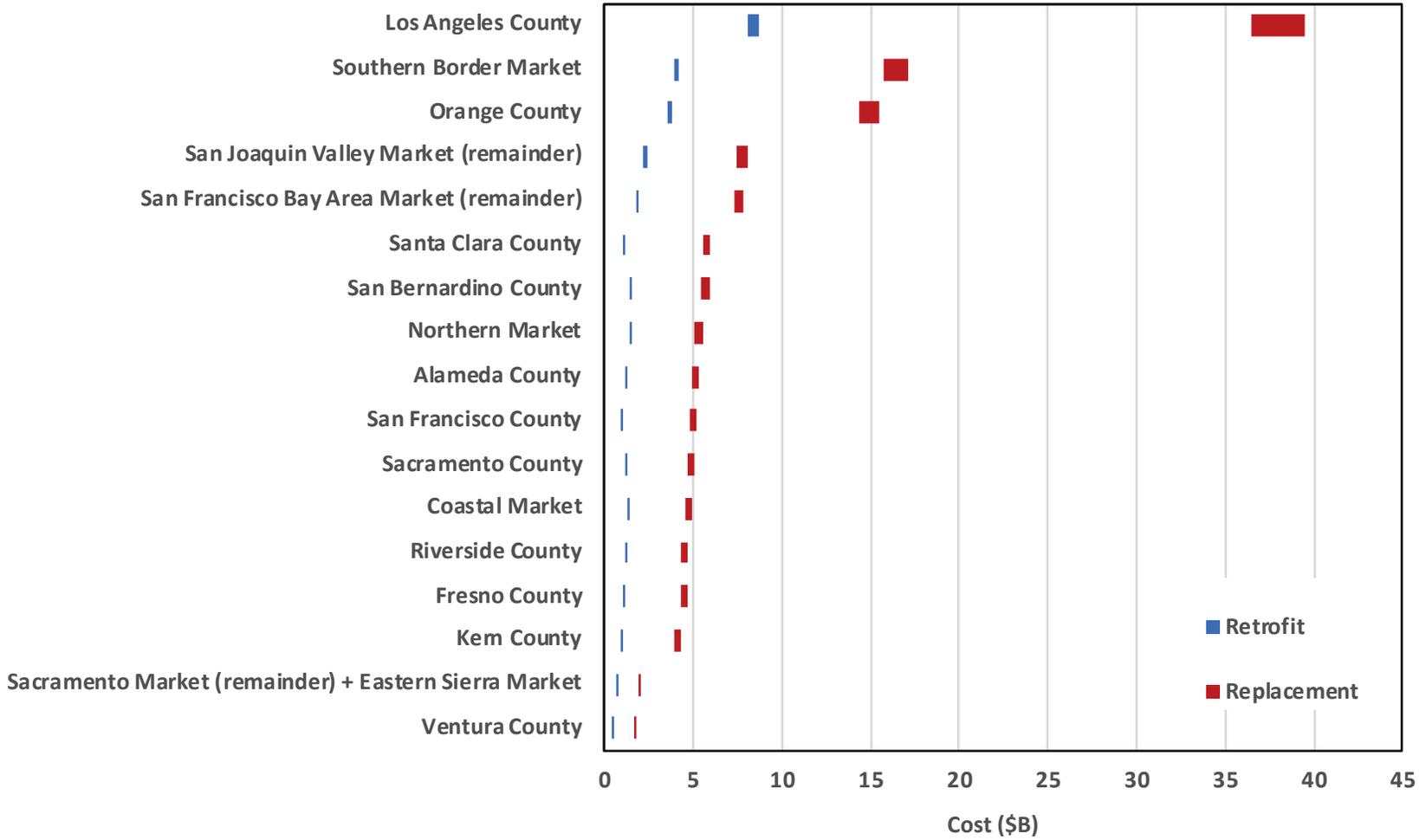
Results

Results of our analysis are shown in Table D.2 and Figures D.1–D.2. Costs per hospital vary because of differing numbers of buildings per hospital requiring structural performance category (SPC) and nonstructural performance category (NPC) upgrades.

Table D.2. Regional Seismic Upgrade Costs

Analysis Region	Hospitals	Retrofit Cost (\$B)	Escalated Cost 4%/year	Demand Surge Escalated Cost		Replacement Cost (\$B)	Escalated Cost 4%/year	Demand Surge Escalated Cost	
				2019–2024 = 4%/year	2025–2030 = 8%/year			2019–2024 = 4%/year	2025–2030 = 8%/year
Northern market	32	\$1.09	\$1.36	\$1.48		\$4.05	\$5.07	\$5.50	
Alameda County	17	\$0.876	\$1.10	\$1.19		\$3.92	\$4.91	\$5.31	
Santa Clara County	13	\$0.807	\$1.01	\$1.09		\$4.39	\$5.49	\$5.95	
San Francisco County	15	\$0.741	\$0.928	\$1.01		\$3.78	\$4.74	\$5.13	
San Francisco Bay Area market (remainder)	37	\$1.40	\$1.75	\$1.89		\$5.79	\$7.25	\$7.85	
Sacramento County	10	\$0.907	\$1.14	\$1.23		\$3.70	\$4.63	\$5.01	
Sacramento market (remainder) + Eastern Sierra market	19	\$0.504	\$0.631	\$0.684		\$1.50	\$1.88	\$2.04	
Fresno County	10	\$0.780	\$0.976	\$1.06		\$3.43	\$4.29	\$4.65	
Kern County	13	\$0.729	\$0.912	\$0.988		\$3.14	\$3.94	\$4.26	
San Joaquin Valley market (remainder)	24	\$1.75	\$2.19	\$2.37		\$5.92	\$7.41	\$8.03	
Coastal market	18	\$0.987	\$1.24	\$1.34		\$3.59	\$4.50	\$4.87	
Los Angeles County	96	\$6.41	\$8.02	\$8.69		\$29.1	\$36.5	\$39.5	
Orange County	34	\$2.82	\$3.53	\$3.83		\$11.4	\$14.3	\$15.5	
Riverside County	20	\$0.964	\$1.21	\$1.31		\$3.47	\$4.35	\$4.71	
San Bernardino County	24	\$1.10	\$1.37	\$1.48		\$4.34	\$5.43	\$5.89	
Ventura County	10	\$0.356	\$0.446	\$0.483		\$1.28	\$1.60	\$1.74	
Southern border market	26	\$3.08	\$3.85	\$4.17		\$12.6	\$15.8	\$17.1	
Total	418	\$25.3	\$31.7	\$34.3		\$105	\$132	\$143	

Figure D.1. Regional Seismic Upgrade Costs



NOTES: Bars represent the range of compliance cost estimates (as in Table D.2) for retrofit (blue) or replacement (red) for each analysis region. The minimum value for each bar assumes an escalation rate of 4% per year, while the maximum value assumes demand surge escalation of 4% per year followed by 8% per year.

Figure D.2. Geographic Distribution of Compliance Costs (as in Table D.2)

