

# Disastrous Policy Making

by  
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Natural disasters, such as earthquakes, create complex situations for policy makers. The difficulty lies in the balance between the costs of mitigation and the actual risk. Failing this, policy makers could find themselves dealing with unintended consequences such as those experienced by the hospital industry in California. Logic would dictate that if seismic retrofitting is worth the expense in any one region it would be California; but looking at recent experiences of the hospital industry in California this approach doesn't seem self-evident. Do you think Memphis could learn to be a bit smarter?

Earthquake risks in California are, to some degree, statistically predictable; being a near certainty that a moderate to strong earthquake will occur somewhere on the west coast during a single generation of the built environment. Another way to look at it is that every building in a California earthquake zone will be shaken at least once before it becomes obsolete and torn down. In a knee-jerk reaction to the 1994 Northridge earthquake California's Legislature attempted to balance public safety with mandated seismic mitigation when it passed Senate Bill 1953 (SB 1953). The bill was an unfunded mandate to seismically retrofit, rebuild, or close hospitals – supposedly a free lunch for California taxpayer or was it. Over the past decade, the consequences of the mandate caused a once sound hospital system to transform into one of the nation's foremost financial basket cases.

As in the New Madrid Seismic Zone policy makers in California were led to believe that earthquake mitigation costs are small and have little or no effect on the cost of the built environment. With this misconception, California's mitigation program requires retrofitting of all acute care hospitals, (or rebuilding them), nearly 70 million square feet. The pace of construction is limited to approximately 1.5 million to 2 million square feet per year due in large part to the ability of regulatory agencies to keep up with inspections. Furthermore it takes upward of 10 years to design and build a new hospital; "The lengthy process for review and approval of hospital construction and retrofitting projects is far too long to increase the pace of construction. Economic growth is being thwarted, jobs are being lost, and patient safety is being compromised."<sup>[i]</sup> The result is that it will take nearly 30 years to complete all the construction required by California's SB 1953. <sup>[ii]</sup> The extended deadline is now 2013; I would expect further extensions. Some private operators are simply not retrofitting their hospitals gambling that California will not close their hospitals.

These projects are very large and expensive, usually in the hundreds of millions of dollars. Compliance could cost California hospitals as much as \$110 billion dollars. The original estimate assumed that the number of patients and the number of beds would generally remain the same. However, modern hospitals are more economical with facilities 35% to 60% larger<sup>[iii]</sup> than existing hospitals. Thus, the scope of each construction project will increase to optimize the bed count resulting in even higher overall costs; perhaps as much as 20%.<sup>[iv]</sup> In California, construction costs are rising at an annual rate of more than 14 percent above the Consumer Price Index resulting in construction costs more than 40 percent higher for comparable facilities in other states.<sup>[v]</sup> In my view this increase is likely to continue due to regulatory oversight, the limited number of qualified contractors, as well as the annual inflation of material costs. In California, a fully furnished and equipped acute care facility has *brick-and-mortar* costs exceeding \$1,000 per square foot compared to hospital costs of less than \$500 per square foot in Memphis. Since the California's SB 1953 mandates affect for-profit, non-profit and publicly owned acute care facilities most will be financed through bonds. Depending on the terms of the loan the cost, in current U.S. dollars, an acute care facility costs can exceed \$2,800 per square foot; comparatively normal office construction in California is roughly a third of this cost per square foot.

Looking at FEMA's annualized earthquake losses<sup>[vi]</sup> we find an inverted relationship of cost vs. benefit. Normally we like to view costs lower than the value of the benefits; but on inspection we find the reverse. FEMA reports that California will experience a statistical loss from earthquakes each year of approximately \$3,200 for each \$1 million worth of infrastructure. Looking at the same 50 year period, California can expect to lose approximately 15.8% of the present value of hospitals. Thus, California's acute care infrastructure, worth approximately \$48 Billion<sup>[vii]</sup> should expect a loss of approximately \$7.6 Billion due to earthquake. California is spending \$110 Billion to insure against a loss of \$7.6 Billion; a cost benefit relationship greater than 14. Californians are paying 14 times the cost of the anticipated earthquake damage. The retrofit of hospitals will only 'reduce' the cost of damage by some unquantifiable amount; consequently the cost vs. benefit ratio becomes even more lopsided.

There are subtle unforeseen consequences having negative impacts, such as forcing acute care facilities to close not being able to afford a seismic retrofit. California is experiencing a critical shortage of hospitals with the closure of over 50 hospitals in the period between 1995 and 2005. More than 3,000 acute care beds have been withdrawn from service between 2001 and 2005. In the five year period prior (1995 to 1999) 23 hospitals have closed. Unfunded mandates for seismic retrofitting are creating a stampede for funding, usually in the form of bonds. The median credit ratio of California hospitals has nosed dived to the junk-bond status. The money needed to retro fit California hospitals is drying up; <sup>[viii]</sup> "Nobody can bear the burden."<sup>[ix]</sup>

"Seismic upgrades are important. But mandating them during the worst economic time in history of California hospitals is like ordering a homeowner to fix a dilapidated porch on a house that's on fire. Right idea. Wrong time."<sup>[x]</sup> So, if the benefits don't outweigh the costs in California, how would they be justified in the New Madrid Seismic Zone? How many doctors and nurses could have been hired in lieu of spending the money on hospital infrastructure? How many lives could be saved by freeing funds for health care instead of concrete bunkers? Who pays? Do we tap the bottomless pocket of the taxpayer? Each of the 35 million people in California will need to pay \$3,143. As a point of reference, the per capita state and local taxes were roughly \$1,600 in 1996. So are the people of California going to agree to pay 3 times their current tax burden? The last time I heard, California is on the brink of insolvency. Surely we can't claim a simple unfunded mandate such as California's SB 1953 can bankrupt an industry; or can we?

The City of Memphis and Shelby County are considering new building codes with strong seismic requirements. In spite of research such as that by the William Dearing recipient, Seth Stein, Ph.D., a geophysicist Northwestern University, indicating that the New Madrid Seismic Zone may have 'shut down' the New Madrid Seismic Zone will be labeled as the most hazardous earthquake region. Nevertheless, the Memphis and Shelby County Office of Building Code Enforcement is currently considering FEMA's latest seismic code for Memphis. This building code designates City of Memphis as one of the most dangerous cities in the continental U.S.

It seems to me the science of predicting earthquakes is not quite ready for the building codes. The problem is that earthquake risks are not well understood: earthquake risk assessment has been described by one of its founders as "*a game of chance of which we still do not know all the rules.*" Nowhere is this more the case than in the Memphis metropolitan area. Large earthquakes are known to have occurred in 1811-12 and probably earlier in New Madrid, Missouri. However, Seismologist Susan Hough with the U.S. Geological Survey (USGS) research found that the hazard may be overrated. The consensus for this

region's hazard maps assumes the New Madrid events being near magnitude 8. Ms. Hough suggests that the four events in the winter of 1811-1812 ranged in magnitude from 6.8 to 7.0 for the largest of the New Madrid events.

To add more uncertainty when designating this region as the most hazardous earthquake region is the underlying physical cause of violent earthquakes is unclear; the magnitudes and recurrence times for the largest earthquakes are difficult to infer, and the likely ground motion caused by such earthquakes is essentially unknown. If these uncertainties were properly factored into predictions the impact on the building codes would have been softened.

Violent earthquakes in the New Madrid Seismic Zone are rare. On average there has been one potentially serious earthquake (magnitude 6) every one hundred-fifty years somewhere in the NMSZ. Since the invention of the seismometer in about 1900, there have been no violent or seriously damaging earthquakes in the Memphis metropolitan area. Therefore, it is not been possible to study such earthquakes or their effects. As a result, the earthquake hazard is difficult to estimate, and a wide range of estimates can be made. Consequently, not being able to predict the earthquake hazard in the region with any degree of certainty the building codes have taken an overly conservative approach.

In my opinion, the proposed building code with strong seismic mitigation designate Memphis a 'Disaster in Waiting' with a level of uncertainty unprecedented in the annals of building codes. How many industries will flee when this happens? Once adopted by the community, how long will it be before FEMA requires all existing facilities to be retrofitted to meet the new standards with the cost to be born by at the expense of the taxpayer? There hasn't been a single building collapse as a result of an earthquake in the Memphis metropolitan area; shouldn't we look to a more moderate approach?

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- [i] California Healthcare Association Statement on the Hospital Construction Plan Review and Area Compliance Process before the California Performance Review Commission, U.C. Riverside, August 13, 2004.
  - [ii] Ibid., 4
  - [iii] Ibid., 41
  - [iv] Ibid., 8
  - [v] Ibid., 30
  - [vi] FEMA 366 Hazus 99 Estimated Annualized Earthquake Losses for the United States, February 2001, 16
  - [vii] My estimate based on C. Duane Dauner's, President and Chief Executive Officer, California Healthcare Association, Statement in "Heath Care Scene in California," of May 10, 2001, who suggested a value of \$24 Billion.
  - [viii] California HealthCare Foundation, The Financial Health of California Hospitals, June 2007, 2-13
  - [ix] Ibid., (interviews with key unnamed health care leaders), B-6
  - [x] The Press Democrat, Another hospital falls, what killed Sutter Medical Center – and what will it mean to families like mine, January 14, 2007

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