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Lucy A. Arendt,[1] Daniel J. Alesch[2] and William J. Petak[3]

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1 Assistant Professor, Business Administration, University of Wisconsin-Green Bay
2 Professor Emeritus, Department of Public and Environmental Affairs, University of Wisconsin-Green Bay
3 Professor Emeritus, School of Public Policy, Planning and Development, University of Southern California

MCEER
University at Buffalo, The State University of New York
Red Jacket Quadrangle, Buffalo, NY 14261
Phone: (716) 645-3391; Fax (716) 645-3399
E-mail: *mceer@buffalo.edu*; WWW Site: *http://mceer.buffalo.edu*

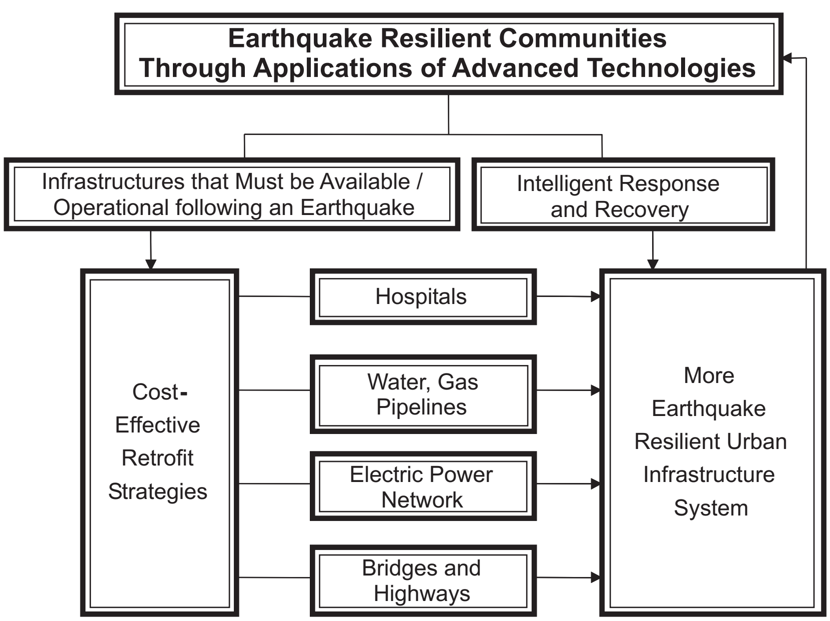
Preface

The Multidisciplinary Center for Earthquake Engineering Research (MCEER) is a national center of excellence in advanced technology applications that is dedicated to the reduction of earthquake losses nationwide. Headquartered at the University at Buffalo, State University of New York, the Center was originally established by the National Science Foundation in 1986, as the National Center for Earthquake Engineering Research (NCEER).

Comprising a consortium of researchers from numerous disciplines and institutions throughout the United States, the Center's mission is to reduce earthquake losses through research and the application of advanced technologies that improve engineering, pre-earthquake planning and post-earthquake recovery strategies. Toward this end, the Center coordinates a nationwide program of multidisciplinary team research, education and outreach activities.

MCEER's research is conducted under the sponsorship of two major federal agencies: the National Science Foundation (NSF) and the Federal Highway Administration (FHWA), and the State of New York. Significant support is derived from the Federal Emergency Management Agency (FEMA), other state governments, academic institutions, foreign governments and private industry.

MCEER's NSF-sponsored research objectives are twofold: to increase resilience by developing seismic evaluation and rehabilitation strategies for the post-disaster facilities and systems (hospitals, electrical and water lifelines, and bridges and highways) that society expects to be operational following an earthquake; and to further enhance resilience by developing improved emergency management capabilities to ensure an effective response and recovery following the earthquake (see the figure below).



A cross-program activity focuses on the establishment of an effective experimental and analytical network to facilitate the exchange of information between researchers located in various institutions across the country. These are complemented by, and integrated with, other MCEER activities in education, outreach, technology transfer, and industry partnerships.

This is the third in a series of three reports resulting from a project on overcoming obstacles to implementing hazard mitigation policies against extreme events. It focuses on developing an organizational decision-making model that may be used to predict the conditions under which organizations will spend a great deal of money on their buildings to reduce the likelihood of substantial damage from natural hazard events. The report describes a theoretical framework of organizational decision making around hazard mitigation investments, primarily developed from theoretical literature and structured interviews with hospital executives and other stakeholders over a three-year period. Public, not-for-profit, and investor-owned acute care hospital facilities in California and their response to State legislation known colloquially as SB 1953 are examined. The model is derived from consideration of both macro and micro factors, including general environmental factors (e.g., the economic sector), task environmental factors (e.g., the industry sector), organizational factors (e.g., financial capacity), and decision-maker factors (e.g., decision-makers' functional backgrounds). Earlier reports in this series are "Seismic Safety in California Hospitals: Assessing an Attempt to Accelerate the Replacement or Seismic Retrofit of Older Hospital Facilities," by D.J. Alesch, L.A. Arendt and W.J. Petak, MCEER-05-0006 and "Overcoming Obstacles to Implementing Earthquake Hazard Mitigation Policies: Stage 1 Report," by D.J. Alesch and W.J. Petak, MCEER-01-0004.

ABSTRACT

This is the third in a series of three reports resulting from a project on overcoming obstacles to implementing hazard mitigation policies against extreme events. It proposes an organizational decision-making model that predicts the conditions under which organizations will spend significant money to reduce the likelihood of substantial damage from extreme events such as earthquakes. The model is informed by relevant theoretical literature and by interviews with hospital executives representing public, not-for-profit, and investor-owned acute care hospital facilities in California. In developing the general predictive model, the authors use the specific case of how California hospitals have responded to the State legislation known as SB 1953. SB 1953 requires that acute care hospital buildings built before 1973 meet or exceed specified seismic safety standards by 2008 and higher standards by 2030, or be withdrawn from service as acute care facilities.

The purpose for developing the predictive decision-making model is three-fold. First, neither the policy implementation nor the organizational literature fully addresses what happens within organizations charged with implementing legislative (and often, “unfunded”) mandates. The proposed model attempts to identify the conditions under which organizations will choose to act. Second, since solutions to problems are seldom considered in the context of systemic relations, public policy may be enacted that yields unintended and adverse consequences. The proposed model is intended to improve both the policy process and its likely outcomes. Third, by better understanding how organizations make choices, the proposed model is intended to help organizational actors make complex, uncertain, and difficult hazard mitigation investment decisions.

The model draws on five streams of organizational decision-making literature to predict the conditions under which organizations choose to make hazard mitigation investment decisions: transaction cost economic theory, institutional theory, regulatory theory, upper-echelons theory, and organizational strategy theory. Drawing first on *transaction cost economic theory*, the authors suggest that whether and how an organization decides to invest in hazard mitigation around extreme events depends partly on whether the organization believes that such investments will yield a profitable return. Then, consistent with *institutional theory*, the authors argue that there are external and internal forces that compel organizations to behave like other organizations and that yield similar organizational outcomes. These forces are expected to influence how and whether organizations choose to mitigate against extreme events.

Using *regulatory theory*, the authors suggest that several characteristics of the regulatory relationship will influence hazard mitigation investment decision making, including the degree or intensity of the regulation, competence of the regulators, and collaboration in developing regulations. Next, the authors rely on both *upper-echelons* and *organizational strategy* theory to argue that the characteristics of an organization’s top management team and its generic strategy will influence the hazard mitigation investment decision-making process and outcomes.

Having described the model, the authors present a series of descriptive cases drawn from interviews with hospital executives conducted after the theoretical model was developed. The report concludes with a discussion of the implications of the model and initial findings, and by outlining next steps.

ACKNOWLEDGEMENTS

This is the third of a series of three reports addressing issues associated with designing policy and implementing programs aimed at reducing the consequences of extreme events on individuals, organizations, and communities. The first focused on overcoming the obstacles to implementing earthquake hazard mitigation policies. The second focused on the development and implementation of a California law requiring enhanced seismic safety in acute care hospitals built before 1973, known as SB 1953. This one focuses on decision processes made by organizations expected to implement and pay for actions to enhance seismic safety.

As always, we extend our sincere thanks to the many people who helped us with our research and who reviewed our work. Carl Scheuerman, Sutter Health Facility Planning & Development, and Robert Olson, Robert Olson Associates, Inc. reviewed drafts and provided many insightful comments. Their comments were especially useful in our effort to construct an authentic model of the hazard mitigation investment decision-making process. Likewise, two anonymous reviewers provided extensive comments on a version of this report that was accepted for presentation at the National Academy of Management Meeting in Atlanta, Georgia, in August 2006. Their comments were especially useful in our effort to construct a theory-based decision-making model infused with the most rigorous scholarly thinking.

Many others contributed their valuable time, talking candidly with us with the guarantee that they would remain anonymous and their affiliations confidential. Most of the individuals interviewed were based in California. They include healthcare administrators associated with the upper echelons of their organizations, staff from various associations, representatives of labor organizations, legislators and legislative staff, local government officials, and design professionals. We want to thank the many people who spent significant time meeting with us to discuss their issues, consequences, decision processes, and so on. We are grateful to several key individuals who helped us to make valuable interview connections, and who went above and beyond in their efforts to assist us. Without their aid, we would have had considerably less insight into the issues faced by healthcare organizations faced with making hazard mitigation investment decisions.

We want also to acknowledge the help and support of our colleagues in the Multidisciplinary Center for Earthquake Engineering research at the University at Buffalo and in other participating institutions across the country. Finally, we are grateful to the National Science Foundation for its support in our work.

Lucy A. Arendt, Green Bay
Daniel J. Alesch, Green Bay
William J. Petak, Los Angeles

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INTRODUCTION

The research reported here is part of a larger study aimed at gaining greater understanding of the circumstances under which organizations invest resources to reduce the likely consequences of rare, but potentially devastating, extreme events. The larger study is also concerned with identifying obstacles to enhancing safety in the United States against extreme events and with various strategies for overcoming those obstacles and enhancing resilience. This part of the larger study focuses on developing an organizational decision-making model that may be used to predict the conditions under which organizations will spend a great deal of money on their buildings to reduce the likelihood of substantial damage from natural hazard events.

Specifically, in order to develop the organizational decision-making model for this larger study, the research reported here examines the case of public, not-for-profit, and investor-owned acute care hospital facilities in California and their response to State legislation known colloquially as SB 1953. This legislation, which became law in 1994, requires that acute care hospital facilities built before 1973 (at which time new construction standards for new hospitals came into effect) are upgraded to meet or exceed specified seismic safety standards by 2008 and higher standards by 2030, or be withdrawn from service as acute care facilities. Failure to comply with these requirements would result in the hospital losing its license.

The model proposed herein is derived from consideration of both macro and micro factors, including general environmental factors (e.g., the economic sector), task environmental factors (e.g., the industry sector), organizational factors (e.g., financial capacity), and decision-maker factors (e.g., decision-makers' functional backgrounds).

1.1 SB 1953: Background

1.1.1 Description of the Legislation

The Alquist Hospital Seismic Safety Act requiring **new** hospitals to meet high standards of seismic resistance was enacted in California in 1973 following the 1971 San Fernando earthquake (magnitude 6.7). The unreinforced masonry Veterans Administration Hospital, built in 1925, collapsed in that earthquake, killing 47 people (figure 1-1). Olive View Hospital, newly constructed in 1971 at a cost of $25 million, also failed, killing three (figure 1-2).

At the time of its passage in 1973, the Alquist Act focused only on new buildings because seismic safety advocates expected that old hospitals would be replaced gradually with new, safer structures. However, twenty years later, when the Northridge Earthquake occurred in 1994, most of those old acute care hospitals were still in use. They were being withdrawn from the state's hospital building inventory much more slowly than seismic safety advocates had hoped.

Figure 1-1. The 1971 San Fernando earthquake collapsed four buildings at the San Fernando Veterans Administration Hospital complex, killing 47 people.
Source: U.S. Geological Survey Fact Sheet 2005-3052 http://pubs.usgs.gov/fs/2005/3052/

Figure 1-2. The 1971 San Fernando, California, earthquake severely damaged the "soft story" of the then-recently built Olive View Hospital in Sylmar.
Source: U.S. Geological Survey Fact Sheet 068-03 (http://pubs.usgs.gov/fs/2003/fs068-03/).

SB 1953, essentially an amendment to the Alquist Act, became law in September 1994, nine months after the Northridge Earthquake. The program rules and regulations designed to implement the amended Act were published three and one-half years later, on March 18, 1998 (OSHPD, 2005). The regulations created a staged implementation scheme in which hospital buildings classified by the State as most susceptible to seismic damage would be strengthened or taken out of service ten years later, by January 1, 2008. All acute care hospitals would have to meet Alquist Act standards by 2030. Hospitals that failed to meet the published deadlines would lose their acute care facility license.

1.1.2 Intended Effects

Seismic safety advocates worked for enactment of SB 1953 because they wanted to ensure that hospitals would not collapse from an earthquake, and because they wanted to ensure that acute care facilities would be available to care for existing patients and the newly injured after an earthquake. Based on our review of archival materials and interviews with various stakeholders, it appears that at least some people assumed that SB 1953 would eliminate the inventory of pre-1973 hospitals by 2030. The date seemed reasonable to advocates and lawmakers, many of whom believed that hospital structures had an economic life of about 50 years.

In the meantime, they apparently reasoned, acute care hospitals should take steps to address both their structural and nonstructural shortcomings, at least to intermediate levels. Such retrofitting was to be accomplished by the end of 2007, leaving 23 years (2030 – 2007) for healthcare organizations to essentially replace the inventory of acute care facilities built before 1973.

The primary assumption underlying the Act appears to have been that hospitals would respond to the regulations by first retrofitting (to meet the intermediate deadline) and then rebuilding (to meet the long-term deadline). Seemingly no one imagined that hospitals would respond otherwise, since the regulations explicitly identified licensure loss as the consequence of non-compliance, and licensure loss meant hospital closure.

1.1.3 Time Line

Within the framework of SB 1953, the California Office of Statewide Health Planning and Development (OSHPD) developed program regulations and implementation timetables. OSHPD's regulations specified dates by which each acute care hospital building built before 1973 had to comply with standards. The intent was to deal with the most critical threats to life-safety and continued operations first and, by 2030, to bring all the hospital campuses and facilities up to contemporary standards.

> **January 1, 2001**. January 1, 2001 was the first critical date in the implementation schedule. By then, each hospital owner was to have completed and submitted a seismic assessment of each building in which acute inpatient care was provided as of that date. If the buildings did not meet current standards (i.e., did not comply with the Hospital Seismic Safety Act of 1973 as amended), the owner was to prepare and submit a plan for achieving compliance. This could be accomplished by removing the building from acute care inpatient service, performing seismic retrofit, or demolishing and rebuilding the structure.

> **January 1, 2002**. By January 1, 2002, all acute care inpatient hospitals were to have met minimum standards for anchoring equipment for specified nonstructural systems.
>
> **January 1, 2008**. By January 1, 2008, all acute inpatient hospital buildings still in the most dangerous classification were to be taken out of service as acute care facilities.
>
> **January 1, 2030**. All acute inpatient hospital buildings were to meet the standards of the Hospital Seismic Safety Act of 1973 as amended. Failure to do so would result in loss of license.

Compliance with the Act has not proceeded without controversy and conflict. For the most part, hospitals have complied with the first two items on the time line: the January 2001 certification and the January 2002 compliance with limited nonstructural standards. Retrofitting or replacing acute care facilities has proceeded much less consistently. Some organizations are complying quickly, others slowly, and some, so far, not at all.

1.2 A Broader Set of Issues

Petak and Atkisson (1982: 61) describe ten types of public policies that might be used to reduce the consequences of extreme events1. One of these is regulatory policy. Public regulatory policy is a mandate in which someone or some organization other than the legislative body or its administrative agents must assume responsibility and culpability for action. In the larger context, the research reported here is intended to contribute to an understanding of the conditions under which regulation, especially as it applies to reducing the probability of individual and societal losses to extreme events, can be an appropriate and effective policy option.

Regulations: (1) prescribe one or more specific outcomes with which individuals or private organizations must comply, and (2) threaten to impose sanctions on those that fail to comply as directed. The implicit assumption on the part of those who devise the regulations, and those public officials charged with ensuring compliance, is that organizations will comply rather than bear the costs of the sanctions. However, regulatory policy does not always result in the desired behavior on the part of those being regulated. Individuals and organizations do not always comply and sanctions are routinely imposed. Sometimes, individuals and organizations intentionally flout regulations. Other times, they do so inadvertently or because they see themselves as having no reasonable alternative.

We expect that we will be able to contribute, through analysis of hospitals' responses to SB 1953, to a better understanding of the characteristics of effective regulatory policy aimed at mitigating the effects of extreme events. That understanding will provide a basis for designing better policy.

[1] The ten types of policy are action-forcing policies aimed at lower levels of government; attention-focusing policies; disaster recovery policies, technology development policies; technology transfer policies; regulatory policies; investment and cost allocation policies; system management policies; system optimization policies, and direct action policies.

1.3 Our Goal

Broadly, our goal is to understand how organizations respond to regulatory mandates so that we can learn how to devise policy that is more effective. Specifically, our goal is to develop a descriptive model of organizational decision making that may be generalized to organizations other than hospitals facing legislative mandates similar to SB 1953 in the following respects:

1. The mandate applies to all organizations within the relevant legislative body's borders that share certain characteristics. For example, SB 1953 applies to all acute care hospital buildings in the State of California built before 1973.

2. While the legislative body assumes responsibility for crafting the relevant legislation, and for designating the administrative body charged with enforcing the legislation, the legislature does not assume responsibility for identifying the capital and other resources needed to implement the legislation. Instead, someone or some organization other than the legislative body (or its administrative arm) must assume responsibility and culpability for implementation. For example, while the California legislature has identified OSHPD as the body charged with enforcing SB 1953, the legislature has not taken steps to identify the capital or other resources needed by the hospital organizations to implement SB 1953. Hence, the legislation is viewed by at least some stakeholders as an "unfunded mandate."

3. The focus of the legislation is an extreme event. While the likelihood of the event in question is understood to be rare, the consequences of the event are understood to be negative and far-reaching. In all possible ways – material, physical, emotional, and intellectual – the potential consequences associated with the extreme event are expected to affect individuals, organizations, their immediate communities, and beyond. For example, SB 1953 focuses on seismic safety in California's acute care hospital buildings.

4. Responding to the legislative mandate will compel the affected organizations to divert resources away from other decision opportunities. In the case of SB 1953, retrofitting or rebuilding acute care hospital buildings will cost each hospital organization many millions of dollars. Those dollars will be unavailable for other facilities, medical equipment, and staff – all of which might be associated more directly with patient care.

5. Responding to the legislative mandate will be expensive for the affected organizations. For California hospitals, the costs of compliance will be both direct and indirect, as organizations are forced to incur construction or reconstruction costs and to deal with lost revenue while their physical plant is in flux (Meade, Kulick, & Hillestad, 2002).

6. The legislatively mandated consequence for non-compliance with the mandate has material consequences for the organization's ability to perform its primary function. Hospitals that do not comply with SB 1953 risk loss of licensure, that is, the prerequisite operational credential for hospitals.

1.4 Why Create this Model?

1.4.1 Because It Hasn't Been Done Before

The policy implementation literature stops short of discussing what happens within organizations charged with implementing legislative mandates. Instead, the literature tends to focus on governmental actions and does not talk about what happens when the mandate crosses over into the realm of the individual nongovernmental organization. Likewise, the organizational decision making literature does not discuss how organizations do or should respond to legislative mandates. Presumably, the decision of how to respond to a legislative mandate occurs in the same way that any other organizational decision does. Importantly, however, we believe that responding to legislative mandates differs from other organizational decision making in two critical ways: (1) the expected outcomes are not determined by the focal organization but instead are specified by an external body, i.e., the legislature and the associated administrative body, and (2) the processes to be used in complying with the legislative mandate are delineated or constrained by the legislature and the associated administrative body. Thus, affected organizations find themselves in an unenviable position: they are expected to comply with an expensive mandate, according to an externally designated time frame, and in line with an externally chosen set of outcomes, by virtue of their own resources and the resources that they can secure with their own means.

1.4.2 To Help Legislative Bodies Craft Public Policy That Results in Desired Outcomes Without Adverse Consequences

Legislation typically stems from the efforts of advocates of one or another causes to address a phenomenon they perceive as a serious problem. Because of how advocates organize and advocate and how legislative bodies are organized, the solutions proposed to deal with the problem are seldom considered in the broad context of systems and systemic relations. It isn't the case that people don't *want* to engage in an optimal decision-making process. Rather, it is the case that the contextual reality interferes with and makes such optimization impossible. Time is limited, information is imperfect, information costs money, power and personal preferences affect decisions, and decision makers face cognitive limitations, i.e., they are boundedly rational and are prone to rely on intuition. Such realities tend to yield satisficing (Cyert & March, 1963), where decision makers choose an option that is "good enough." Individuals conduct simple and local searches for problems and solutions. Thus, whichever group first identifies the problem (e.g., seismic safety advocates) tends to look for a solution that aligns with its area of expertise or preference The first alternative that meets some minimum level of acceptability tends to be adopted. Immediate problems and short-term solutions tend to absorb attention. Once a solution is identified, its advocates become attached, and may not want to consider other alternatives, especially those that do not fit with their area of expertise or preference. Such advocates tend to believe strongly in the efficacy of their solutions: if we do x, then y will most certainly follow.

Unfortunately, very few public policy regulations are promulgated without some unexpected side effects. Sometimes, the side effects outweigh the intended consequences. In the case of SB 1953, we suggest that advocates failed to comprehend the number of acute care hospital facilities that would be affected, both the average and aggregate cost of compliance for acute care hospitals, the inability of most hospital facilities to finance the needed improvements, and the comparative desirability of replacing facilities rather than retrofitting them. Even more basically, we believe that the advocates failed to appreciate the likelihood that regulations would contribute to the closure of acute care hospitals in the areas that need them most. We cannot imagine that the advocates wanted hospitals to close. Their motives were to ensure that hospitals would stay open after a major earthquake, not close before one ever occurred. Such unexpected side effects are a common consequence of bounded rationality and the satisficing that results.

One can design legislation to require private organizations to take steps that contribute to addressing public problems effectively with minimal adverse side effects. In the case of SB 1953, acute care hospitals are critical facilities; it is important that they be able to perform their designated function during normal times as well as in the aftermath of an extreme event. The regulatory policy did not take into account the inability of a large portion of the targeted organizations to do what was necessary to meet the legislative intent. Nor did the legislation contain provisions to facilitate compliance by the targeted organizations or to trade off enhanced seismic safety against access to acute care. Instead, proponents of the "seismic safety agenda" prescribed and acted as if hospital organizations had not yet upgraded their facilities because they hadn't been pressured enough to do so, because they didn't want to acknowledge the importance of seismic safety, or because they preferred to spend all of their profits on other causes. Some proponents argued that, left to their own devices, hospital organizations hadn't willingly upgraded their facilities despite 30 years of opportunity (the time period between 1973 and 1994), and might never undertake the task willingly. We believe that such thinking is counterproductive, and is disadvantageous to all affected stakeholders. We argue also that it is time to improve the both the policy process and the likely outcomes of substantive policies.

1.4.3 To Help Organizations Effectively Engage in Similar Decision Making

We have come to believe that most organizations are not experienced at making decisions about investing resources to reduce the likely adverse consequences of extreme events. Traditional normative approaches typically involve applying a univariate economic or financial analysis founded in the rational model of decision making. A normative benefit-cost analysis is typically favored for public sector organizations while investor-owned organizations are more likely to opt for return on investment analyses. Our research to date suggests, however, that both private and public decision makers employ multiple criteria when making complex decisions, trading off among competing goals and, sometimes, among mutually exclusive objectives.

The research reported here aims at contributing to an understanding of how organizations actually make decisions about complying with a regulatory mandate. The regulatory mandate has a nominal date certain for compliance, but few of the regulated organizations are convinced that compliance will be forced by that date. They believe the adverse consequences for the public of enforcing the mandate would be too great. So, to some extent, this is research on organizational decision making about the consequences of an uncertain event, but one that, should it occur, would have very significant consequences. By better understanding how organizations make choices, our behavioral research can contribute toward normative models for making complex, difficult decisions about investing to prevent devastating consequences of an uncertain and extreme event.

1.5 Overview of this Report

We begin by describing a theoretical framework of organizational decision making around hazard mitigation investments. In addition to drawing on previous theoretical literature, our framework is informed by a series of interviews with hospital executives and other stakeholders (e.g., professional engineers) involved in developing and addressing SB 1953. These semi-structured interviews were conducted over a three-year period, and involved more than 40 individuals. The purpose of these preliminary interviews was to increase the authors' fundamental understanding of how those affected directly by SB 1953 (e.g., hospital executives) perceived the Act, their possible responses, and the decision making environment. Thus, our theoretical framework relies on both established theory and preliminary, descriptive field research.

Having articulated our theoretical framework, we turn next to a series of descriptive cases, each based on a different California hospital. Drawn from interviews with hospital executives that we conducted after we developed our theoretical framework, these cases serve as a first-round check of the propositions included in our theoretical framework. In other words, we use these cases to assess the extent to which the experiences of the more recently interviewed hospital executives and their hospitals align with our theoretical framework. We conclude by discussing the implications of our findings, and by outlining next steps in our research study.

SECTION 2
THEORETICAL FRAMEWORK

By any standard, the process of hazard mitigation investment decision making is complicated, and its outcomes are difficult to predict. First, hazard mitigation investments typically consume substantial resources, especially when the mitigation involves building construction or alteration. Money spent on hazard mitigation is money not spent on other projects or activities. Thus, the greater the amount of money spent on hazard mitigation, the greater the amount not available for other projects, and the larger the potential opportunity cost associated with the hazard mitigation expenditure. Second, the individuals involved in making final hazard mitigation investment decisions are often not experts in hazard mitigation, but are experts instead in managing their particular enterprise. To that end, key decision makers find themselves having to rely on the professional judgment of individuals whom they may not fully trust or understand to give them options with respect to hazard mitigation investments. Third, like so many other things, hazard mitigation is an evolving discipline, such that today's "state-of-the-art" may be outdated in short order, perhaps before a given hazard mitigation is completed (e.g., before a building is fully retrofitted). New, more effective, and sometimes less expensive options for hazard mitigation are routinely developed.

Faced with understanding a less complicated decision making process, a typical research approach would start with our specifying a dependent variable and hypothesized explanatory variables. Then, using appropriate statistical techniques, we would test the hypothesized relationships. To that end, and assuming a less complicated decision-making process, we began our research by selecting "compliance with the statutory requirements" as our dependent variable. The "statutory requirement" of interest was SB 1953. A series of preliminary interviews with healthcare executives demonstrated that our dependent variable was essentially a **moving target** among the organizations to be studied.

Briefly, the choice of whether to comply with SB 1953 and, if so, how, was rarely made by the authorized organizational decision makers once and for all or even early in the period allowed for compliance. The decision of whether and how to comply was made in most healthcare organizations we interviewed over a period extending over several years. Several of the organizations we interviewed within the past year have still not made those decisions.

What appears to have happened and to be happening is that most of the organizations we interviewed, after a quick analysis of the likely costs of retrofitting their buildings against the earthquake threat, found the costs to be exceptionally and prohibitively high. The high costs stem from three sources: (1) the *actual costs* of strengthening the building, (2) the *logistics* costs associated with interrupting acute care operations (and sequentially shifting the location of operations to accommodate reconstruction), and (3) the *supplemental* and often high costs that arise from complying with other costly building regulations that are triggered when major changes are made to buildings. The problem of high costs was exacerbated for most healthcare organizations because about 85 percent of California acute care hospitals were losing money – hemorrhaging – in the late 1990s. About half are still losing money, primarily because of having to shift from a cost-plus financial basis to a highly competitive business in which HMO and Medicare reimbursements do not always cover the costs of treatment. Thus, the SB 1953 compliance requirement was integrated by most hospitals as simply one more consideration in corporate strategic business planning focused on getting and remaining solvent.

As their financial circumstances have changed in the decade since the law was enacted and the eight years since the administrative regulations were produced, California's healthcare organizations have explored various means for adapting their businesses to an increasingly hostile task environment while, at the same time, complying with SB 1953's seismic safety rules. For most of the organizations studied, the process has been nonlinear and episodic. Decision making criteria have changed as circumstances have changed for both the industry and its individual healthcare organizations. Options that may have been considered outlandish or cost-prohibitive in one last year may find favor in another year because circumstances have changed and, with them, what is possible or impossible.

Thus, measuring "whether organizations comply" has become "the extent to which organizations comply" and "how they choose to comply." In some cases, the answer for each organization has been known to change over a period of months.

Our challenge is further complicated because there is uncertainty, even disbelief, among the regulated as to whether the prospective sanction, i.e., loss of license, is really a threat. Some hospital executives have argued that the State would not close hospitals in underserved areas that could not or would not comply with SB 1953. After all, doing so would simply ensure that those acute care hospitals would be closed both before **and** after an earthquake disaster. Such a counterproductive move strikes some as untenable. Thus, the threat may not serve its intended purpose of compelling compliance, because key decision makers do not perceive that the threat will be enforced. As they say, "If the idea behind SB 1953 is to ensure uninterrupted access to acute care throughout the State, why would anyone choose to close acute care hospitals?" Threatened punishment must be believable to be effective (Skinner, 1974).

We have discovered that key decision makers' perceptions of the problem, potential solutions, and likely consequences are central to understanding their decisions and the process used to reach those decisions. Thus, we have learned that looking at SB 1953 as an objectively-defined regulation with an objectively-defined consequence for failure to comply is counterproductive to our accurately understanding hospital decision makers' decision making processes and chosen outcomes. Consistent with cognitive appraisal theory (Lazarus & Folkman, 1984), we believe it is their **perceptions** that matter, perceptions that depending on their individual and their hospital's circumstances and context.

Consequently, we have developed our theoretical framework in line with Weick's (1995, 2001) description of sensemaking in organizations. Our goal is to describe the process and outcomes associated with hazard mitigation investment decisions from the perspective of those involved in making these decisions. In brief, we want to understand hazard mitigation investment decision making as it is understood by those who do it. What we have learned thus far about hazard mitigation investment decisions suggests that any search for and attempt to describe accurately a linear and rational formal decision making process will prove futile. Indeed, we think that the actual non-linear and quasi-rational decision making process may be far more interesting to ponder, and is certainly more useful to document. To that end, our theoretical framework draws from relevant literature in management and public policy, as well as from interviews conducted by the authors over the past few years of more than 40 hospital executives and other relevant stakeholders.

Several key elements characterize sensemaking (Weick, 1995). First, sensemaking involves seeing through the eye of the beholder. To understand how and why a particular decision was made, one needs access to the thinking and perceptions of key decision makers. Second, sensemaking is a social process based on retrospective consideration of historical thinking and action. Third, sensemaking is ongoing, a never-ending process in which past actions are considered, reconsidered, and considered anew. Fourth, sensemaking derives from a relatively small set of cues extracted from myriad cues in the environment. We are not able to evaluate all relevant points of data. Instead, we ponder that which is immediate, that which reminds us of something we already know, that which supports our existing perceptions. Finally, sensemaking is driven by plausibility, not accuracy. Once people find what they construe to be an answer to a question, they stop looking for additional, possibly more correct, answers. As described by Weick (2001: 96),

> "Sensemaking generates understanding that is provisional, plausible, subject to revision, swift, directed toward continuation of interrupted activity, ready-to-hand, tentative, infused with ignorance, and sufficient for current purposes. … Sensemaking starts out as momentary, expedient understanding. But the sense thus created often lingers and gets stored as if it were the product of a far more deliberate, intentional analysis."

In general, we have used the sensemaking "lens" to help us understand the hazard mitigation investment decision making process as it occurs in organizations, or at least as it is believed to occur in organizations from the perspective of key organizational decision makers. In particular, we have used the sensemaking lens to help us understand the decision making process used in California hospital organizations facing SB 1953, legislation that compels significant investment in hazard mitigation.

Our theoretical framework has two major sections. In the first section, we review Petak and Alesch's (2004) five organizational prerequisites for adoption and implementation of hazard mitigation measures. Building on the influential work of March and Olsen (1973), the five prerequisites include: awareness of the issue, belief that action is possible, belief that now is the right time to act, existence of an acceptable solution, and capacity to act. The five prerequisites set the stage for organizational action, and are fundamental to our understanding the process and outcomes associated with hazard mitigation investment decisions in organizations.

While the prerequisites to action serve as the foundation of our model, their purpose is more descriptive with respect to generalized organizational process than predictive with respect to specific organizations and their actual process and outcomes. As stated by Petak and Alesch (2004: 128-129),

> "… While all the organizations we studied engaged in the same general process, individual processes varied in detail and emphasis. Moreover, virtually none of the organizations engaged in a strictly linear approach to solving the problem. Most organizations addressed it iteratively, circling back to earlier assumptions, building in

> new information and new perceptions, and rethinking options, discarding some, fleshing others out, and searching for new ones."

If the prerequisites to action are general in nature, and if actual decision-making process and outcomes vary by organization, then what accounts for these differences? We attempt to address this critical question in the second half of our theoretical narrative.

Consistent with the work of Sharfman, Meo, and Ellington (2000), the second half of our theoretical framework draws from transaction cost economic (TCE) theory (e.g., Williamson, 1975), institutional isomorphism theory (e.g., DiMaggio & Powell, 1983), and information from the regulatory relationship literature (e.g., Rothwell, 1992). Besides these three approaches, we use two additional approaches to create our theoretical framework: upper-echelons theory, as described by Hambrick & Mason (1984) and others, and Porter's (1980) work on organizational strategy.

First, whether and how an organization decides to invest in hazard mitigation around extreme events would seem to depend in part on the economic feasibility of doing so. Drawing on Williamson's (1975) work, we suggest that whether and how an organization decides to invest in hazard mitigation around extreme events depends in part on whether the organization believes that such investments will yield a profitable return. Faced with an array of possibilities for using available capital, which investments are likely to produce the greatest return? Such is one of the themes associated with transaction cost economic theory.

Second, institutional theory provides insight into the external and internal forces that might be expected to both facilitate and hinder hazard mitigation investment decision making. Looking at DiMaggio and Powell's (1983) work, for example, we can see that there are forces external to the organization that compel it to behave like other, similar organizations and that yield similar organizational outcomes. Specifically, DiMaggio and Powell (1983) assert that there are coercive, normative, and mimetic forces. In turn, these forces emanate from the legal or regulatory context, shared professional values, and competition. Internally, there are forces that compel organizations to behave in certain ways, such as the organization's established structure and culture and formally sanctioned decision-making process.

Third, the nature of the regulatory relationship is expected to influence the process and outcome of organizational decision making around hazard mitigation. In looking at the particular case of innovation, for example, Rothwell (1992) identified several characteristics of the regulatory relationship expected to influence decision making. Those characteristics included degree or intensity of the regulation, competence of the regulators, and collaboration in developing regulations.

Fourth, Hambrick and Mason (1984) make a strong case that the characteristics of those occupying an organization's upper-echelons condition the organization's decision-making process and outcomes. Thus, the functional background, experience, perceptions, and so on of the individual members of the organization's top management team are expected to affect how the organization proceeds when faced with making hazard mitigation investment decisions.

Fifth, organizational strategy is expected to influence hazard mitigation investment decision making. As described by Porter (1980), the particular generic strategy adopted by an organization consequently affects or is expected to affect decisions around resource allocation. Specifically, organizations tend to align with one of three generic strategies: differentiation, low cost leadership, or focus. Each of these strategies makes different assumptions about the market to be served and the approach to serving the chosen market. Whether and to what extent an organization decides to invest in hazard mitigation would seem to depend in part on whether the organization's decision makers believe that the investment would align with the organization's chosen strategy.

We turn now to a review of the prerequisites to action, as described by Petak and Alesch (2004).

2.1 Prerequisites to Action

Much of the public policy literature on implementation of hazard mitigation or risk reduction measures focuses on why implementation is ineffective or inadequate in one or another settings. Clearly, it is important to understand the obstacles to implementation of hazard mitigation measures in order to better understand how to increase the probability of implementation. Likewise, it is important to focus on the other side of the equation; that is, under what conditions will organizations choose to invest in hazard mitigation measures? In other words, what facilitates implementation of or investment in hazard mitigation measures?

Petak and Alesch's (2004) work on the prerequisites to organizational action was inspired by March and Olsen's (1973) garbage can model of organizational decision making. That model suggests that decisions are not made, nor are actions taken, unless four independent streams come together simultaneously. The four streams consist of a problem (about which there is general agreement within the organization), a solution to the problem (which is credible for a critical mass of actors within the organization), space on the organizational agenda, and one or more persistent advocates for matching the available solution with the existing problem.

While it is our hope that the model we describe in this paper will be generalizable to more than one type of decision and to more than one type of organization, it is critical for our present purposes that our model apply to hazard mitigation investment decisions as they are made by hospital organizations. Specifically, we are interested in describing a decision making model for California acute care hospitals faced with responding to SB 1953, a legislative mandate for implementation of seismic hazard mitigation measures. Analysis by Petak and Alesch (2004) suggests five fundamental organizational prerequisites for adoption and implementation of seismic hazard mitigation measures, as shown in figure 2-1. We discuss each in turn.

2.1.1 Organization Is Aware of the Issue

The first prerequisite for implementation of seismic hazard mitigation measures is that the organization's key decision makers must **perceive that the organization is at risk from earthquakes**. This is similar to March and Olsen's (1973) problem prerequisite.

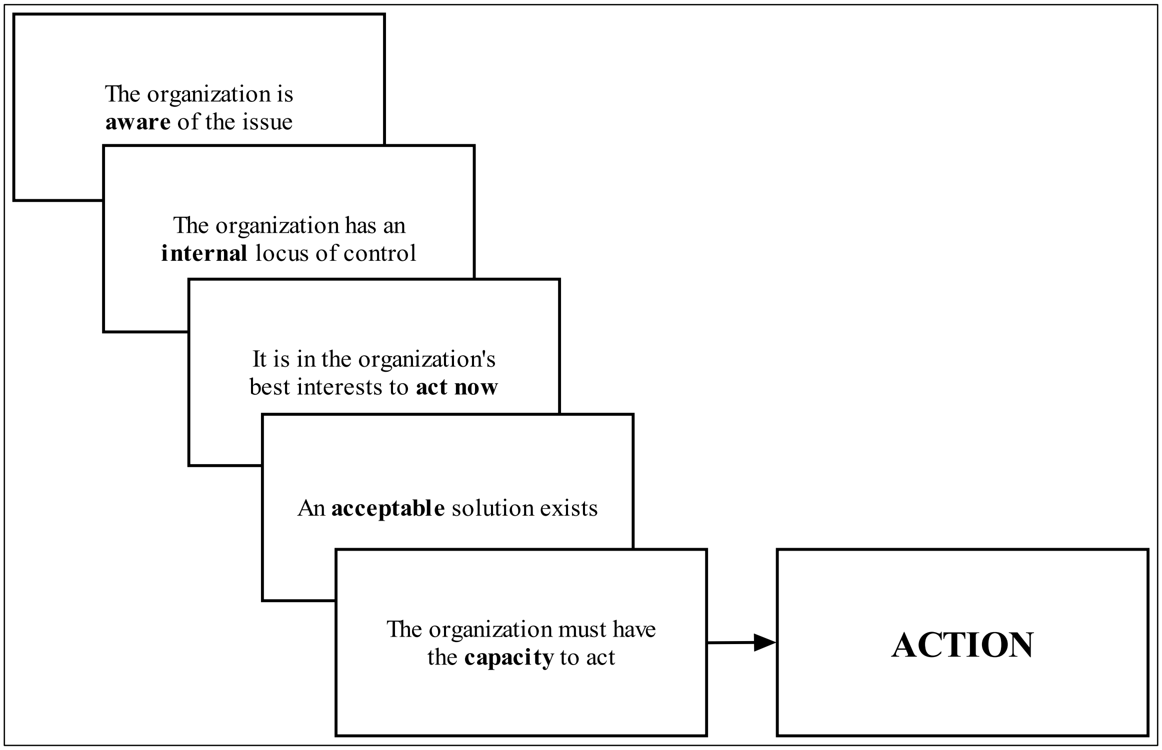

Figure 2-1. Prerequisites to Action

Problems exist for organizations only when there is a difference between what the organization's key decision makers (i.e., top-level managers or Board of Directors, representing owners) desire and expect for the organization and their perception of the state of affairs in which they find or expect to find the organization. In brief, there needs to be a disparity between the decision makers' desired and perceived reality. Consequently, we would not expect an organization to invest in hazard mitigation unless key organizational decision makers are dissatisfied with their perceptions of the current or projected situation and decide that a problem exists.

Traditional models of risk assessment look at the hazard, exposure, vulnerability, and probable losses from events of various magnitudes. For organizations to perceive themselves as having an "earthquake problem," a critical mass of key decision makers must believe that a credible earthquake hazard exists, that it is likely to occur within a relevant time frame, and that, should it occur, the organization would suffer more than trivial losses.

While it may be difficult for seismic scientists to accept that there are individuals and organizations in California who do not believe in the inevitability of damaging earthquakes and the subsequent negative consequences for life and property, proof that such individuals exist is presented every time someone is quoted in the news media saying something like, "I never thought that my house (business, school, church, etc.) would be affected." While those in the scientific community may tend to believe that these individuals and organizations underestimate the risks to which they are exposed, many of these individuals and organizations believe that the scientific community overestimates the risks. Every week, month, and year that goes by without a damaging earthquake seems to bolster the case of the non-scientific community, at least from its perspective.

A key element in risk perception and problem definition has to do with timing. No one knows enough to predict earthquakes in anything but a geologic time frame. In general, individuals who are not members of the seismic scientific community, including top managers of hospital organizations, have a hard time understanding return periods and understanding that no one knows the location of all potential earthquake faults. Even if one accepts the inevitability of a damaging earthquake, if the threat is not perceived as likely within one's relevant time frame, the salience of the risk is minimal because the individual or organization does not perceive a risk that justifies action.

Finally, it is not enough for individuals and organizations to believe in the likelihood of a damaging earthquake. If we expect organizations to take action to protect themselves, they have to understand their exposure, vulnerability, and the likelihood of adverse consequences when the event occurs. In brief, they must expect to incur meaningful losses. Knowing that there will be damage from an earthquake is not the same as expecting significant and adverse consequences from it.

2.1.2 Organization Has an Internal Locus of Control

The second prerequisite for implementation of seismic hazard mitigation measures is that the organization must **believe that actions taken to mitigate seismic risks will be effective**. Key decision makers must trust that their hazard mitigation investments will yield desired outcomes: Hospitals that remain standing after earthquakes, such that the safety of patients and staff members is protected and such that key assets (e.g., medical equipment, HVAC units) remain operational. This second prerequisite represents an addition to March and Olsen's (1973) model.

Locus of control is a well-known personality trait associated with individuals' generalized belief in internal versus external control of reinforcement (Rotter, 1966). An organization's top management team may be understood to possess "team" locus of control (Boone, Van Olffen, & Van Witteloostuijn, 2005), such that a team comprising predominantly individuals with an internal locus of control is likely to develop a collective sense of potency (Shea & Guzzo, 1987). In contrast, a team comprising predominantly individuals with an external locus of control is not likely do so. Top management teams with a collective sense of potency will believe that they can influence positively their own processes and outcomes, such as the quality of their decision-making process and its outcomes. As described by Shea and Guzzo (1987: 26), a collective sense of potency is a key group-level factor that determines "real-world, real-time group effectiveness." A self-reinforcing loop is created as high potency teams seek information to enhance the effectiveness of their decision making, which in turn enhances their decision making, which in turn enhances their collective potency, and so on.

In general, organizations with an internal locus of control (i.e., organizations led by top management teams with a team internal locus of control) are likely to believe that they can exert some measure of control over seismic hazards by means of implementing seismic risk reduction measures. Key decision makers in these organizations believe that practical steps exist to reduce the risks associated with seismic events. They also believe that these steps are congruent with the nature and extent of the problem and with the organization's best interests. In contrast, organizations with an external locus of control may believe that no amount of seismic risk reduction will prove sufficient in the face of a damaging earthquake. Key decision makers in these organizations may adopt an almost fatalistic posture, "No matter what we do, we cannot protect our facility, equipment, and stakeholders from the harm associated with a damaging earthquake." Whether a hospital organization has an internal vs. external locus of control with respect to seismic hazard mitigation likely depends on its relationship with reputable structural engineering firms, and the trust placed in its own facilities management personnel.

2.1.3 It Is in the Organization's Best Interests to Act Now

March and Simon (1958) created a simple, yet robust model of organizational decision making to explain a set of choices. The model suggests that key decision makers in organizations seek alternatives to what they are doing when they are dissatisfied with the way things are going. They keep searching as long as they believe there is a reasonable solution that can be found for less than the cost of the search, or when they find an acceptable alternative, or when they come to believe they cannot do better than they are doing now. Organizations take action when a critical mass of key decision makers believes either they or **the organization will be better off taking the action now rather than either deferring the action or not taking it at all**.

Alesch and Petak (1986) relate the story of an 85-year-old woman who testified before a Committee of the Los Angeles City Council that was deliberating what was to become of the city's unreinforced masonry building retrofit ordinance. "Let me understand this," she said. "You want to increase my rent by $50 a month for sure, forcing me to choose between medicine and food, because there might be an earthquake that might damage my building and I might be injured. Are you gentlemen playing with all your marbles?"

This story illustrates a critical issue. Individuals and organizations have more ways to use resources than they have resources. When given a choice of how to use those resources, most individuals and organizations aspire to make rational choices. Most organizations, for example, will consider carefully the marginal utility of a dollar spent to reduce earthquake risk compared with the marginal utility of a dollar spent elsewhere. Then, given their preferences and their perception of the probable payoffs from alternative courses of action to realize those preferences, they will spend appropriately, for the most part. Of course, some people and organizations are better than others are at making good choices.

Implementation problems for public policy occur when governments enact policies dictating that some specific hazard mitigation measures be taken by a class of organizations regardless of the calculus of those individual organizations concerning risk and potential payoff. As suggested by the story of the 85-year-old woman, organizations will resist implementing those policies if their subjective estimates of the risks and payoffs and of relative priorities do not coincide with those of the governmental policy makers.

The individual organization's economic analysis of the financial benefits of reducing risks by employing one or another hazard mitigation technology is important, but only part of the story. In general, organizations do not implement policies unless those policies pass several tests. Not only must a proposed hazard mitigation policy make financial sense today, it must also be congruent with the organization's current goals, and align with the organization's priorities. Thus, organizations will evaluate the costs associated with a given hazard mitigation measure, and assess the likelihood that the costs will increase or decrease in a given time frame. Likewise, organizations will consider the potential contribution or benefit of a given hazard mitigation measure to the organization's current vs. future goals. Such **cost-benefit ratio analysis** will be critical to choosing a particular hazard mitigation measure. Of course, the specific array of goals and priorities will be unique to a given organization. Consequently, a hazard mitigation practice that makes sense this year for one organization may not make sense for another until next year, even later, or never.

Finally, one could argue that, consistent with expectancy theory (Porter & Lawler, 1968; Vroom, 1964), organizations and their key decision makers are motivated to act when they expect adequate rewards for doing so. In general, the greater the potential rewards, and the stronger the link between performance and rewards, the greater the motivation (Vroom, 1964), unless the means for following the path are beyond the ability of the organization. Likewise, the stronger the perceived link between effort (e.g., implementing a specific hazard mitigation measure) and performance (e.g., increasing a hospital building's resistance to seismic forces), the greater the motivation.

2.1.4 An Acceptable Solution Exists

Assuming that the three preceding prerequisites have been met, organizational decision makers must **perceive that there is an acceptable means to mitigate against seismic hazards, or nothing will be done**. A solution is not a solution unless decision makers know it exists and believe that it will be effective within their organizational context. There are at least three reasons why an organization might not be aware of workable solutions.

First, a workable solution may not yet exist. New problems, like broken steel welds in buildings, continue to surface, often as side effects of employing new technologies. It took quite a while, for example, to come up with the means to strengthen unreinforced masonry buildings that were cost-effective for owners.

Second, the inventory of workable solutions may be thin. Those old enough to have done business before xerographic copying machines will remember choosing between carbon paper and wet process copiers. Innovative ways to create multiple copies were developed, but at first, they were too expensive for all but the most affluent organizations. As costs dropped, more organizations were able to afford xerographic copiers. Now, many individuals have sophisticated copying machines in their homes for personal use.

Third, even with continuing enhancements to communication systems such as the Internet, disseminating innovations takes time. Dissemination especially takes time when the innovation has been developed as proprietary property by an organization in the business of selling its mitigation techniques. Even when solutions are not secret, innovation dissemination and technology transfer can take a long time, as organizations may not routinely interact with relevant sources of hazard mitigation information (in this case, structural engineering firms).

The ability to perceive an acceptable solution requires a belief that a problem is solvable. If an organization decides that a problem is intractable, the organization is likely to stop trying to understand the problem, and to cease efforts focused on finding a workable solution. Faced with the requirement to retrofit or rebuild their acute care hospital buildings at a cost of many millions of dollars, an organization bleeding red might well decide that there is simply no way to afford either a retrofit or a rebuild. The problem is unsolvable, and therefore unworthy of continued contemplation.

Intractability, of course, varies from time to time and place to place. Intractability often has less to do with complexity than it has to do with being locked into a perceptual paradigm that keeps one from seeing familiar things in new ways – ways that make obvious a solution to a situation that was otherwise impenetrable. So, what is intractable to some may not be intractable to others. Moreover, intractability can change to tractability with changes in the social, legal, or organizational environment. Sometimes, intractability can change when new technologies become available. Sometimes, intractability can change when the problem is viewed by someone with a novel perspective. In any event, as long as an organization perceives a problem as intractable, little will likely be done toward implementing a solution.

2.1.5 Organization Must Have the Capacity to Act

Even if all of the preceding four prerequisites are met, the organization may still not implement hazard mitigation measures. In the competition of issues and ideas for attention, mitigating natural hazard risks may not reach the top of the organizational agenda. It may be because other issues continue to crowd it out, because the organization lacks the capacity to do what it perceives necessary, or because the environment within which the organization would attempt implementation is itself dysfunctional.

The organizational agenda. "It's important, but we just have too much on our plate right now." How often is something like this said in the context of a formal organization faced with an array of important, urgent, and complex initiatives? Like individuals, organizations must set priorities and address issues based on criteria concerning what comes first. Often, unfortunately, operational concerns take time better spent on strategic assessment, so risks from natural hazards perceived as having relatively low likelihood this week are pressed onto the back burner so today's "fire" may be put out.

Organizational capacity: Financial considerations. Any new activity requires an influx of additional resources or a reallocation of existing resources. In terms of hazard mitigation, organizations must have (or must have access to) the financial means to invest in hazard mitigation. No additional or reallocated money means no hazard mitigation, no matter what. A common phrase heard in the healthcare industry is, "No margin, no mission." In other words, like all other organizations, hospitals need to generate revenue in order to perform their primary functions. Lack of revenue means lack of ability to attract inputs (e.g., staff members, equipment), which necessarily yields organizational entropy. To the extent that "no margin, no mission" accurately characterizes the hospital business (and we believe it does), we suggest that "no margin, no mitigation" accurately characterizes it as well. The remaining narrative on financial considerations is drawn directly from Alesch, Arendt, and Petak, 2005 (pp. 44-48).

Perhaps the single greatest obstacle to implementing SB 1953 has been the unprecedented financial and structural upheaval in healthcare economics experienced in the decade following passage of SB 1953. This upheaval made it financially impossible for most California hospitals to comply with the legislation in the years immediately following issuance of the rules, regardless of their designation as investor owned, not-profit, or public.

Since 1994, the healthcare industry has undergone extraordinary structural and financial changes. Rapid changes in healthcare economics and an increasingly bewildering industry structure have created incredible instability and uncertainty for most healthcare organizations as they have attempted to make reasonable business decisions across a wide spectrum of problems and issues.

When SB 1953 was enacted, most of California's healthcare organizations were generating profits or, in the case of not-for-profit and public hospitals, surpluses. By the late 1990's, however, more than 80 percent of California's healthcare organizations were losing money. More specifically, they were experiencing net operating losses (Shattuck Hammond, 2001).

Fundamentally, two things happened to change the industry's financial situation and structure. First, the number of individuals participating in managed medical care increased dramatically during the second half of the 1990s, primarily as a response to rapidly escalating health insurance premiums. Between 1995 and 2005, a single decade, participation in managed care programs was projected to increase from 12.2 million Californians to 20.1 million (Shattuck Hammond, 2001; Harrison & Montalvo, 2002). For many decades, hospitals had charged patients for services received on a cost-plus basis. In the managed care environment, they were usually paid a fixed price for a service, regardless of their costs. Competition among HMOs for customers led them to cut payments to hospitals for treatment, often to less than the hospital's cost of providing the service.

Second, at the same time California HMOs were experiencing explosive growth, Medicare was experiencing its problems associated with rising costs. The problem was not new, but it reached a point where something had to be done. Medical hospital costs per patient more than doubled from 1970 to 1975. They doubled again by 1980 (Shattuck Hammond, 2001). The Federal government took action on the high cost of Medicare as part of the 1997 Federal Balanced Budget Act. It called for reducing Medicare expenditures by $215 billion over five years. Alas, the number of Medicare patients and the costs of treating them continued to increase. To meet the goal of cutting federal expenditures, Congress cut Medicare reimbursements to hospitals and healthcare professionals, often to levels below the cost of providing the services. To help achieve the balanced budget goal, hospitals were paid a fixed amount per discharge based on the patient's general diagnostic group, regardless of the actual cost of treating the patient.

All of this took place in an ongoing context of rapidly escalating costs for healthcare organizations. Dating to the early 1970s, the federal and state governments had been involved in trying to contain the rising costs of health care. Prior to 1986, for example, Congress had strongly encouraged states to enact "Certificate of Need" laws that required state health planning agencies to issue a permit before a health care facility could construct or expand, offer a new service, or purchase equipment exceeding a certain cost. The intent behind such "CON" laws was threefold: "to restrain escalating health care costs, prevent duplication of health resources, and yield equal access to quality health care at a reasonable cost." Such laws ultimately proved ineffectual in the fight to reduce health care costs. At the same time, both the cost of and the demand for contemporary diagnostic and treatment equipment were skyrocketing, particularly with the introduction of sophisticated new medications and advanced technologies. Moreover, the cost of supplies was increasing much faster than the Consumer Price Index.

Labor costs, which are a major component of hospital operating costs, were also increasing dramatically. Several forces drove the costs up. The number of Catholic nuns, devoted women who had provided nursing care for more than a century in hospitals with Catholic religious affiliations, declined precipitously. Since the nuns had worked for low pay, the rapid decline in their numbers had to be made up by hiring secular nurses at much higher cost. Simultaneously, California's population was swelling. More nurses were needed, but by the 1990's, both women and men had many professional occupational choices beyond nursing and teaching. Hospital work was demanding and did not pay competitively. The availability of licensed registered nurses declined in the face of increasing demand, even as pay increased.

Some hospitals, unable to staff themselves with the required number of nurses, found that they had to reduce the number of beds available for acute care. Administrators found themselves with declining revenues per patient, higher direct costs per patient, and the need to allocate large, fixed overhead costs across fewer patients.

The response by hospitals to this complex, dynamic, and troublesome combination of challenges was generally rational and rapid. Hospitals and physicians began to reorganize themselves to gain efficiencies. Hospitals sought to develop integrated delivery systems by aligning themselves with groups of physicians. This way, they thought, they could reduce costs and cope with "capitation," a form of payment to healthcare organizations from third-party payers that provides for a set amount of money per enrolled member per year, regardless of the number or types of treatment required.

At the same time, individual hospitals merged or affiliated with one another in hopes of realizing economies of scale (Spetz, Mitchell, & Seago, 2000). Bigger, stronger corporations with more assets could presumably benefit from integrated management and operations. Hospital mergers swept the nation during the 1990s. They peaked from 1995 to1997, during which more than 680 hospital mergers were completed nationally.

Despite their efforts, California hospitals, on average, could not reduce costs quickly enough or deeply enough to make up for the reduction in revenue and the increases in the costs of equipment, labor, and materials. In 1999, California hospital median operating margins became negative. That is, by 1999, more than half of California's hospitals had negative cash flows. They were losing money.

In 1995, the median operating margins for California hospitals were 1.65 percent compared with 2.8 percent nationally. Operating margin, defined as "total operating revenue minus total operating expense," is considered "… a primary and 'early warning' indicator of the financial health of California's hospitals" (Shattuck Hammond, 2001: 2). In part, operating margin is considered an important indicator because "operating margin directly and indirectly provides access to the capital required to sustain and/or grow a business in the future. Particularly in the capital-intensive hospital industry, access to capital (or lack thereof) determines future viability"

(Shattuck Hammond, 2001: 2). By 1999, California hospital median operating margins had become negative (- 0.33 percent) while national median operating margins had declined, but remained positive (0.4 percent). In 1999, the top quartile of California's hospitals was outperforming the top 25 percent nationally, with operating margins of 5.7 percent compared to 5.0 percent, but the lowest quartile of California's hospitals was experiencing operating margins of - 7.8 percent vs. –5.1 percent nationally (Shattuck Hammond, 2001: 3).

The financial distress that developed in the second half of the 1990's was not shared equally by the all healthcare organizations. Hospitals most likely to have operating losses were small, owned by a local government (municipality, county, or special district), rural, not part of a healthcare system, and/or serving mostly poor patients. Those healthcare organizations most likely to still have positive operating margins were medium-large or large, investor-owned, urban, part of a system, and not receiving a disproportionately large proportion of poor patients as was the case with the public or Catholic hospitals (Shattuck Hammond, 2001).

In the midst of the financial crisis facing more than half of California's healthcare organizations, the California legislature decided that requiring one nurse for every six patients in acute care units was not sufficient. In 2001, therefore, the legislature enacted a revised requirement for one nurse for every four patients in acute care facilities. It was, of course, unlikely that sufficient numbers of nurses existed in California to meet those new requirements. Consequently, healthcare organizations have been faced with further increasing pay for nurses to attract them from other states and from foreign countries. Alternatively, hospital organizations could reduce their available beds to meet the standards. Whatever the medical merits of the new nursing ratio requirement, the financial burden for a very significant number of hospitals could be expected to further depress net operating revenues.

In this milieu, healthcare organizations with many facilities had more flexibility and options. Such organizations could presumably afford short-term losses in one or a few facilities, as long as other facilities generated sufficient revenues to cover any losses incurred by the organization overall. Likewise, healthcare organizations that were investor-owned typically had more flexibility and options than did not-for-profit and publicly owned hospitals. Some readers will leap to the assumption that investor-owned hospitals are more efficient than not-for-profit or public hospitals. That is not necessarily the case. What is more likely is that investor-owned healthcare organizations can generally choose where, how, and to whom to provide service. They are in a better position to locate in upscale markets and are able to focus on providing services that have favorable reimbursements from insurance and Medicare payers. Further, they are in a better position to lure and retain medical specialists whose expertise is associated with higher revenues (e.g., orthopedics, plastic surgery).

Public hospitals and many not-for-profit hospitals rarely have the option to "cherry pick" their markets and customers. Indeed, they are often serving the customers who are least able to pay. Not-for-profit hospitals typically have missions to serve particular neighborhoods or communities, whether they are secular or religiously based. As such, while not-for-profit and public hospitals might benefit by adopting more of the efficiency-oriented practices associated with investor-owned hospitals, they could not implement all of them and still be true to their missions. Moreover, neither the not-for-profits nor the public hospitals could segment the market as aggressively as the investor-owned hospitals could. Finally, in considering especially the case of the not-for-profit and the public hospitals, local governments have suffered with their own fiscal problems and have been limited in their ability to provide sufficient funds for either contemporary capital infrastructure or preventive maintenance.

These financial and structural changes in the healthcare industry have a great deal to do with the responses of healthcare organizations to SB 1953. Hospitals experiencing financial hemorrhaging or barely surviving were not likely able to justify spending money on seismic retrofitting, at least in the short run. At the same time, healthcare organizations able to remain profitable may have been in a position to benefit from the mandated seismic improvements. The costs of retrofits provide legitimate reasons to eliminate "loser" hospital facilities and complexes, by either selling or closing them. Since so many healthcare organizations were in difficult financial straits, this also presented profitable healthcare organizations with the opportunity to strengthen their market positions by acquiring desirable facilities and market locations from financially strapped organizations. One might expect, in this environment, that the largest and most profitable organizations might greatly expand their market share. Unfortunately, one could also expect those organizations to expand their market share by building on the profitable areas of healthcare, leaving those procedures and services with low or below cost reimbursements to public and not-for-profit hospitals.

The upshot of all this was that, depending on their fiscal position and their primary organizational objectives, it made sense for some healthcare organizations to support SB 1953 and to move forward with compliance on schedule. Compliance would be easier for them because they would have had a variety of options for dealing with inadequate buildings, and because they could benefit organizationally from the difficulties stressing other healthcare organizations. It was to their clear advantage to address their buildings' seismic issues, and then declare to potential customers and coveted medical providers that they were "ahead of the curve" – both in terms of seismic issues, and in terms of updated facilities overall. Other organizations might have been barely able to comply. Still others may have been unable to at all.

Could healthcare organizations have borrowed or otherwise generated sufficient funds to finance the mandated retrofits or replacement? It appears that they could not. Standard and Poors noted that "cash flow generation for a high percentage of California hospitals is insufficient to finance any significant increase in capital expenditures" (Harrison, Montalvo, & Fiorella, 2001, cited in Shattuck Hammond). Shattuck Hammond analysts compared credit ratio data for the sum of California hospitals and for the overall median with Moody's national median ratios. The ratios compared with Baa credits, the lowest investment grade bond rating offered by Moody's. The lower the bond rating, the higher the interest that must be paid to sell the bonds.

Importantly, the State of California has an office to help healthcare organizations borrow money. It works to find the best rates, using the State's bond rating, but few hospitals sought help from the agency to borrow money for retrofits, in large part because their precarious financial positions made it difficult for them to demonstrate credit-worthiness. Given the negative cash flow situation that more than half of California's hospitals were experiencing during the late 1990s, it appears as though they would have considerable difficulty servicing the debt, even if they could float a bond issue. Paradoxically, those investor-owned and not-for-profit healthcare facilities with strong cash positions and positive cash flows typically would not need the State's services to obtain favorable bond rates or to meet the costs of meeting SB 1953.

The organizational environment. The environment within which an organization attempts to reduce its natural hazard risk is critically important to successful implementation. Organizational environments can range from placid and predictable to convoluted and chaotic (Emery & Trist, 1965). Environmental factors that may affect an organization include the industry, suppliers, consumers, socio-cultural aspects, technology, political-legal aspects, human resources, and physical resources. The greater the number of environmental factors expected to directly an organization, the more complex its task environment. This complexity, along with the rate of change in these factors (dynamism), and the lack or abundance of needed resources (munificence), determine the relative amount of environmental uncertainty faced by the organization (Dess & Beard, 1984).

When organizational environments are highly unpredictable and extremely complex, the chances of successful policy implementation diminish appreciably. Scholars of implementation concluded this long ago. In 1973, Pressman and Wildavsky concluded that "the multiplicity of participants and perspectives combined to produce a formidable obstacle course … When a program depends on so many actors, there are numerous possibilities for disagreement and delay … (G)iven a large number of clearance points manned by diverse and independent participants, the probability of a program achieving its goals is low" (102-110). We agree. The probability of successful, timely implementation of natural hazard mitigation policies is inversely related to the complexity of the policy and implementation process, the number of actors participating in the process, the number of sign-offs required, and the diversity of interests and priorities among the actors.

Having described the prerequisites to action, we now shift to the second section of our theoretical framework.

2.2 What Accounts for Differences?

In this, the second section of our theoretical framework, we use five theoretical approaches to develop several propositions around the issue of hazard mitigation investment decisions. The propositions are intended to be illustrative, rather than exhaustive. The unit of analysis for these propositions is the individual organization and its key decision makers, usually the members of the top management team (i.e., the CEO, CFO, COO and other members of the C-suite).

2.2.1 Economic Predictors of Hazard Mitigation Investment Decision Making

As described by Sharfman and his colleagues (2000: 280), organizations cannot "operate in the long term at a price point lower or a cost point higher than the intersection of marginal costs and marginal revenues (P)." This assertion will remain accurate whether the organization is investor or equity-owned, not-for-profit, or public. Organizations must cover their costs. Without an adequate revenue stream, organizations cannot acquire sufficient resources or inputs to sustain their core transformation processes. Without adequate inputs or well functioning transformation processes, organizations cannot produce or deliver quality outputs. Failure to do so over a sustained period will cause the organization to enter a state of entropy, or organizational death (Katz & Kahn, 1978).

In order to change this price or cost point, organizations must change something about their core production process such that their marginal production or transaction costs are lowered, or they are able to charge prices above "P." Accomplishing such a change is done through alterations to design, introduction of new or more efficient technology, or creative efforts of people (Evans, 1997). In essence, organizations must either simplify or make lean their production or service operation in order to reduce their costs, or they must augment their product or service such that consumers are willing to pay a premium for something they believe is unique.

Unless hazard mitigation investments allow the organization to lower its costs or raise its prices, then, the organization is unlikely to make such investments. Importantly, hazard mitigation investments represent only one of a large array of potential expenditures that might yield lowered costs or increased prices. In the specific case of acute care hospitals, the possibilities for capital expenditures are many, and most represent additions to the acute care setting that are far more visible than hazard mitigation to both internal users (e.g., physicians, nurses, administrators) and external users (e.g., patients, patient family members). Illustratively, physicians are more likely to see the value in procuring a new MRI machine that can be used to facilitate caring for more people better than they are likely to see the value in retrofitting a building with base isolation to enhance structural resistance to seismic forces. Likewise, potential patients are more likely to be impressed with private rooms and space for family members to sleep than by seemingly invisible strengthening of a hospital's lateral resistance to seismic forces. In the end, the opportunity to invest in hazard mitigation will compete with several other investment possibilities, most likely unfavorably, since hazard mitigation investments on existing buildings are generally not visible to most hospital users. Accordingly, organizations may want to link hazard mitigation activities to more visible enhancements (e.g., remodeled bed towers that boast larger private rooms) that either lower the cost or enable price increases. Thus,

> *Proposition 1*. The more that hazard mitigation investments (or the investments to which they are linked) decrease operating or transaction costs or allow the organization to increase its prices, the more likely that hazard mitigation investments will occur.

The regulatory environment can be expected to affect the extent to which an organization's key decision makers consider economics in their hazard mitigation investment decision-making process. For example, regulations with a focus other than hazard mitigation that potentially affect an organization's operating or transaction costs are likely to divert attention and resources away from hazard mitigation investments. In the case of hospitals in California, regulations around increasingly smaller staffing ratios for nurses have directed attention toward the costs associated with compensation and benefits, a major component of a hospital's operating budget, and away from the costs associated with hazard mitigation. The negative impact of such regulation on hazard mitigation investment decision making is made all the more potent by three factors: the regulation's immediacy – the staffing ratios must be achieved in short order; by its visibility – both internal and external users can ascertain for themselves whether the regulation seems to be met; and by its support from a large group of vocal advocates (e.g., nurses) embedded in the affected communities. Thus,

> *Proposition 2a*. The more that regulations unrelated to hazard mitigation impose costs on focal organizations, the less likely that hazard mitigation investments will occur.

While regulation such as that described in the preceding paragraph might be expected to divert attention away from hazard mitigation investments, other regulations can serve to direct attention toward hazard mitigation investments. Most directly, regulation can compel investment in hazard mitigation. Whether such regulation will cause or help top managers to think in terms of economic benefits and costs is our concern here. Regulations may be written so that they permit a full range of possible hazard mitigation investments, any of which might be expected to yield the desired outcomes of such mitigation (e.g., patient safety in the aftermath of an earthquake). In addition to supporting a wide array of mitigation investments, such regulations may be written with flexible deadlines and approval procedures that recognize the idiosyncratic context facing individual hospital organizations. Under these flexible circumstances, we would expect organizations to consider possible hazard mitigation investments in view of their ability to reduce operating or transaction costs, or to permit the charging of higher prices.

> *Proposition 2b*. The greater the implementation flexibility associated with hazard mitigation regulations, the more likely that organizations will perceive economic incentives for making hazard mitigation investments.

Likewise, regulations may be written so that the cost of not meeting specified hazard mitigation requirements is sufficiently high, perhaps even escalating as time goes by, to attract top management attention. Faced with increasingly high costs for non-compliance, organizations will look for ways to comply as soon as possible, and as cheaply as possible. Since all organizations facing the regulation must comply with it, organizations must rely on both established connections with those who can supply hazard mitigation services (e.g., structural engineering firms) and subsequent speed of compliance to provide any measure of competitive advantage. Specifically, organizations that are able to make their hazard mitigation investments quickly while relying on established networks are likely to be rewarded with lower transaction costs (e.g., of construction) than are those organizations that follow. To that end, albeit perhaps only in the short run, such "first-mover" organizations are likely to comply quickly in order to minimize their transaction costs and make the case for higher prices. Thus,

> *Proposition 2c*. The higher the costs associated with non-compliance with hazard mitigation regulations, the more likely that organizations will perceive economic incentives for making hazard mitigation investments.

2.2.2 Institutional Predictors of Hazard Mitigation Investment Decision Making

External institutional pressures. DiMaggio and Powell (1983) describe three sets of forces that compel firms to behave similarly and appear isomorphic: normative, mimetic, and coercive. We believe that all three forces may play a significant role in influencing hazard mitigation investment decision making.

As described by Sharfman et al. (2000: 282), **normative isomorphic forces** "occur when some actor can influence the collective values of a focal firm." Professional associations, especially those to which a focal organization might belong, are most likely to engender such normative forces. Professional associations often craft statements and standards of expected professional conduct on the part of their member organizations and decision makers. Enforcement of such standards often takes an organic form, relying on promises of compliance, publicized expectations for member behavior, and "peer pressure." This contrasts with more bureaucratic forms of enforcement that often include the administration of punitive measures for non-compliance. Thus, for hospital organizations in particular, statements about the value of hazard mitigation investments by state hospital associations (e.g., the California Hospital Association) or national hospital associations (e.g., the American Hospital Association) might reasonably be expected to influence positively such hazard mitigation investment decisions.

In addition to professional associations of which they may be members, organizations may also find themselves influenced by apparently tangential professional associations. In the case of hospitals facing hazard mitigation investment decisions, for example, another professional association seems likely to have some measure of influence on hospital decision making, the association representing the views of structural engineers. As a group, structural engineers are generally believed to advocate strongly the positive benefits associated with hazard mitigation investments. To the extent that they are able to make themselves heard by hospital decision makers, and to be found credible in their assertions, we expect that they might influence positively the hazard mitigation investment decisions made by hospitals.

Similarly, organizations may also find themselves influenced by the values and demands of the non-management staff members who comprise the organization. These staff members may communicate their values and demands individually or through unions or other groups that represent them collectively. Again, in the case of hospitals facing hazard mitigation investment decisions, staff members may perceive that their personal welfare may or may not be improved when the hospital chooses whether to invest in hazard mitigation. Some may believe that the hospital should invest in hazard mitigation, in order to protect them and those around them from negative physical consequences in the event of a disaster. Others may believe that the hospital should not invest in hazard mitigation, but instead should offer improved compensation and benefits to staff members.

In general, then, we believe that organizations will respond positively to external normative forces. Still, organizations will not behave in ways that they believe will harm them economically, or in ways that are not expected to yield improvements in cost or pricing structures. With this caveat in mind, therefore:

> *Proposition 3a*. The more that relevant external forces (e.g., professional associations) support hazard mitigation investments, the more likely that hazard mitigation investments will be made.

Mimetic forces are also expected to influence whether and to what extent organizations elect to make hazard mitigation investments. As described by DiMaggio and Powell (1983), **mimetic isomorphic forces** compel organizations in an industry to copy or imitate the behavior of market-leading (first-mover) organizations. The more competitive the industry, the more likely that mimetic forces will induce an observable level of mimicry in behavior and desired outcomes, as organization pursuing a K-strategy (late entrants) seek to maximize their profits and standing (Brittain & Freeman, 1980).

According to the hospital administrators interviewed by the authors, the hospital industry is considered a highly competitive industry, in part because the competition extends beyond that for patients or end-users. Hospitals compete for administrators, physicians, nurses, and other staff members. Hospitals compete for insurance providers. Hospitals compete for land. Hospitals compete for financial capital. Hospitals compete for philanthropic donations. In many ways, the munificence (Dess & Beard, 1984) afforded by hospitals' task environment is low, such that hospitals are constantly competing for hotly contested resources. Without question, the competitive landscape facing hospitals is a hostile one (Covin & Slevin, 1989), fraught with the ubiquitous advertising (e.g., billboards, radio, fliers), expensive compensation packages, and donor events that typify competitive industries. To the extent that the leading hospitals in an area choose or do not choose to make and promote hazard mitigation investments, we would expect other hospitals to follow their lead. Thus,

> *Proposition 3b*. The more that perceived market leaders invest in hazard mitigation, the more likely that hazard mitigation investments will be made by other organizations in the focal industry.

DiMaggio and Powell (1983) assert that **coercive isomorphic forces** are strongest in industries and organizations that face high levels of government regulation or ownership. Thus, pressure from government is added to the pressure exerted by normative and mimetic forces to compel conformance with desired behaviors and outcomes. In the case of California hospitals, for example, SB 1953 represents a direct attempt to coerce hospital investment in hazard mitigation through the imposition of negative consequences (i.e., loss of licensure) on hospital organizations that fail to retrofit, rebuild, or alter the use of their acute care hospital buildings by specified deadlines. In brief, because California hospitals are required to be licensed by the State, legislators and seismic advocates seemed to believe that threatening to non-renew hospitals' licenses would force hospitals to accelerate the replacement or retrofit of their acute care facilities. As it was, hospitals were not replacing their facilities quickly enough for seismic advocates who thought that the threat to patients from earthquakes should have been sufficient to increase hospitals' interest in hazard mitigation investments. With the exception of these advocates, however, apparently few people believed that patients were actually at risk from earthquakes. As numerous hospital executives told us, "No one has died in a hospital from an earthquake since … I can't remember when, if ever." Certainly, no patients had been killed by an earthquake in any of their facilities, or in anybody else's facilities that had the same characteristics as theirs. The 1971 San Fernando earthquake deaths at the two hospitals are considered anomalous by most present-day hospital executives.

As suggested by this narrative, the actual effect of attempted coercion depends on the perceptions of the individuals or organizations being coerced. In talking with various California hospital executives, for example, it became clear that some did not believe that the proposed sanction of licensure non-renewal would ever come to pass, any more than they believed that their hospital would suffer significant damage from an earthquake, or any more than they believed that their patients would be injured in the event of an earthquake. For these individuals, then, we would expect the impact of attempted coercion on their behavior or decisions to be negligible. Again, potential punishment must be credible in order to serve as an effective deterrent or motivator of behavior, if in fact it ever serves these purposes well (Skinner, 1974).

Still, organizations that receive a significant share of their operating budget from government sources may be especially prone to such coercive forces. After all, they rely on government to provide a substantial portion of the inputs (resources) required to perform their primary function. Without government support, these hospitals cannot imagine continuing their existence. In the case of SB 1953, then, one would expect government owned and operated hospitals to believe that their compliance with SB 1953 was an absolute necessity.

Two propositions are suggested by this narrative, as follows:

> *Proposition 3c-1.* In the face of government-mandated hazard mitigation, the greater the believability of negative sanctions for non-compliance with hazard mitigation legislation, the more likely that hazard mitigation investments will be made.
>
> *Proposition 3c-2*. In the face of government-mandated hazard mitigation, the greater the level of government ownership of a given organization, the more likely that that organization will make hazard mitigation investments.

In looking at the effects of regulations on behavior, it is important to consider not only their coercive nature, but also the direct impact of their deadlines. Importantly, regulations such as SB 1953 often contain a **deadline** after which some negative sanction is imposed for non-compliance. Of course, organizations may delay their response to a given regulation or mandate for any number of reasons, not the least of which is lack of available capital or access to needed capital. Some organizations may perceive that waiting to invest in hazard mitigation will be to their advantage, as new technologies may be developed that cost less than today's technologies. Such a "wait-and-see" approach (essentially, a K-strategy) is not unusual for individuals, groups, and organizations – all of which may believe that committing to a given course of action too early will cause them to bear too many of the initial costs of developing innovative technologies (Brittain & Freeman, 1980).

In considering the direct effects of deadlines on behavior, we are drawn to research on individual, group, and organizational behavior that suggests that temporal pacing has as much to do with behavior and decisions as do specific events. As described by Gersick (1994: 12),

> "Sometimes consciously, sometimes not, groups select the midpoint (or occasionally another time) as a heuristic milestone and use it like an alarm clock, to help ensure they will move fast enough to finish by their deadlines. In effect, groups allow themselves to persist with opening work patterns until the midpoint. The event of reaching the midpoint – not the completion of a given amount of work – stimulates feelings of urgency and an awareness of the deadline and breaks groups' momentum. Groups feel it is time to move ahead."

In looking at organizations subject to a regulation with a deadline, then, we might expect to see more "action" as the midpoint between the regulation's passage and final deadline is reached. In the case of SB 1953, the initial date that would seem to matter to hospital organizations would be the date that the implementation rules and regulations were published – March 1998. The final deadline for ensuring that all acute care hospital buildings meet current seismic safety standards is 2030. Also relevant to this discussion is the deadline of 2008 by which hospital organizations were to have retrofitted their existing non-compliant acute care hospital buildings. Many hospital organizations have successfully pursued an extension of the 2008 deadline to 2013, making 2013 the *de facto* retrofit deadline.

If Gersick's (1994) findings are applicable to the case of California hospitals facing SB 1953, then we should not be surprised to see limited retrofitting action on the part of hospitals before 2003, the midpoint between the publication of the regulations (1998) and the retrofit deadline (2008). With the *de facto* retrofit deadline shifted to 2013, we should not be surprised to see limited retrofitting action before 2006. Likewise, we should not be surprised to see limited rebuilding action on the part of hospitals before 2014, the midpoint between the publication of the regulations and the final deadline. In general, as deadlines approach, we expect to see more action on the part of hospitals responding to coercive pressure. Thus,

> *Proposition 3d*. The closer the deadlines associated with government-mandated hazard mitigation, the more likely that that organization will make hazard mitigation investments.

Internal institutional pressures. Pressure to make hazard mitigation investment decisions emanates from the inside of organizations at least as much as it emanates from the outside. In particular, aspects of the organization's authority and political structure are likely to influence whether and to what extent the organization invests in hazard mitigation. In general, we suggest that organizations having a more mechanistic structure (Burns & Stalker, 1961) will be less likely to invest heavily and proactively in hazard mitigation. Of the elements comprising a mechanistic structure, three are especially likely to hinder proactive and positive hazard mitigation investment decisions: high degrees of centralization, high degrees of formalization, and high complexity in the form of vertical and horizontal differentiation.

By definition, in organizations with a high degree of **centralization**, strategic decisions tend to be introduced by one or a few members of the top management team, i.e., the dominant coalition (Burns & Stalker, 1961; Cyert & March, 1963; Pugh, Hickson, Hinings, & Turner, 1968). Likewise, in organizations with a high degree of centralization, the decision-making platter of the top management team will, be relatively full, with many decisions competing to be made. Decisions brought for top-level management consideration tend to result from what Fredrickson (1986: 284) calls, "proactive, opportunity-seeking behavior." Since top-level management is the origin of virtually all strategic decisions in a highly centralized organization, it stands to reason that the content of most strategic decisions will reflect the particular interests, functional expertise, and knowledge of an organization's top-level managers. If none of the top-level managers has an interest, background, or other connection to hazard mitigation, then it seems likely that none of them will bring the issue of hazard mitigation investment to the strategic decision table for proactive consideration.

In looking at the particular case of hospitals, it seems likely that few members of top-level management will have achieved their positions through the route of facilities management, the functional home for most hazard mitigation investment decisions. Instead, the hospital executives with whom we have spoken tend to have backgrounds and credentials in health administration, business administration (finance), public administration, and medicine. In fact, except in organizations with a mission related directly to facilities management, it seems likely that few top-level managers will have backgrounds and credentials in facilities management. To this end,

> *Proposition 4a*. The more centralized the strategic decision process in an organization, the less likely that hazard mitigation investment decisions will be proactively introduced by top-level managers.

A slightly different picture emerges in organizations having a high degree of **formalization**. By definition, these organizations rely on many written rules, regulations, and policies to guide their decision making and activities (Burns & Stalker, 1961; Pugh et al., 1968). As described by Fredrickson (1986: 284), "the strategic decision process will be initiated only in response to problems or crises that appear in variables that are monitored by the formal system." Thus, unless an organization has a department or similar mechanism charged with monitoring hazard mitigation investments, the organization will not consider them a topic requiring strategic decision making. In the event that an organization does have such a department or similar monitoring mechanism, then we would expect strategic action around hazard mitigation to "be the result of standardized organizational processes" (Fredrickson, 1986: 284). For example, we would expect hazard mitigation investment decision making to be made in the context of the organization's standard budgeting cycle and process, such that hazard mitigation investment decisions would be subject to the same criteria applied to all potential capital or operating investments. Given the competition for resources within most organizations, it seems likely that most hazard mitigation investment decisions would produce only incremental results (Fredrickson, 1986).

Similarly, Sharfman and his colleagues (2000: 284) suggest that high degrees of formalization "as characterized by high corporate 'hurdle rates' or inflexible approaches to discounted cash flows" might prove restrictive. While Sharfman et al. (2000) are interested in the particular case of "green innovation," we see their topic as sufficiently analogous to hazard mitigation investments in that both green innovation and hazard mitigation are characterized by less visible and less immediate payoffs. Thus, decision makers considering either green innovation or hazard mitigation often must make their decisions while trusting that they will yield long-term and perhaps socially responsible benefits, benefits that may not be visible until some time after the current management has moved on.

As described by Sharfman et al. (2000), managers are known to assert that their strategic decision making relies on a rational decision making model that includes financial analysis as its cornerstone. Two financial tools are seen as particularly relevant to innovation decision making, "hurdle rates" and discounted cash flows. Based on our interviews with hospital executives, we believe that these same tools are seen as relevant for hazard mitigation decision making in organizations. In brief, hurdle rates may be defined as the internal return on investment (ROI) targets that capital and other internal investments must meet or exceed in order to be approved by upper-level management. Likewise, discounted cash flows may be defined as the future value of present-day investments. Whether an organization uses either hurdle rates or discounted cash flows, or both, the objective of such financial analysis is to assess the potential capital investment's contribution to "the bottom line." The more formalized the organization and its capital decision making process, the less flexibility we would expect to find in the use of these financial tools. Consequently, it may be difficult for hazard mitigation investments to be approved as part of the usual capital budgeting process, since the timeline for observing effects on profits or costs from hazard mitigation investments may exceed that used in standard discounted cash flow analysis.

Additionally, it may be difficult to demonstrate that investing in hazard mitigation will ever have a positive impact on the bottom line, since the costs associated with failing to invest in hazard mitigation may become apparent only if the organization is confronted with a serious hazard. It is no easy task to preemptively calculate the costs associated with a low probability, high consequence hazard. The cost of closing a hospital, completely or partially, depends on the length of the closure, and the ability to conduct operations off-site. The costs associated with staff or patient injury or death depend on the proximal causes and the ability to minimize such injury and death. The cost of a damaged reputation may be incalculable. Who knows which future staff members and patients might avoid a hospital that did not care for its own when needed? Who knows which philanthropists might choose to donate their money and time to other causes? In brief, the less probable the particular hazard, the more difficult it may be to show negative cost consequences for lack of hazard mitigation, because the costs are so difficult to quantity in the face of such uncertain parameters.

Two propositions are suggested by this narrative, as follows:

> *Proposition 4b-1*. Organizations with a high level of formalization will engage in hazard mitigation investment decision making to the extent that they have a formal mechanism for monitoring hazard mitigation issues (e.g., a facilities management department).

> *Proposition 4b-2*. The more formalized the strategic decision process in an organization, the less likely that hazard mitigation investment decisions will be approved by top-level managers as part of the usual capital budgeting cycle and process.

Organizational complexity is a function of both horizontal and vertical differentiation, as well as spatial dispersion (Hage, 1965; Fredrickson, 1986; Pugh et al., 1968). First, the more departments or functions at a given level in the organization, the more horizontally differentiated is the structure. Next, the more levels in the organization, the more vertically differentiated is the structure. Finally, the more locations that comprise the organization, the more spatially dispersed the structure. Organizational complexity may or may not be related to organizational size, in terms of number of employees or other assets. For our purposes, we focus on horizontal and vertical differentiation alone, since they are primarily responsible for "impos(ing) boundaries of rationality on (organizational) members" (Fredrickson, 1986: 288). In brief, the more horizontally differentiated the organization, and the more vertically differentiated the organization, the more narrowly will each person's sphere of influence be construed, as delineated by each person's position description, reporting relationship, and departmental affiliation.

In looking at the issue of hazard mitigation investment decision making, it seems likely that in highly complex organizations, hazard mitigation decisions may struggle to rise to the top of the strategic decision making pile. Whose issue is it? According to the Carnegie model of decision making (Cyert & March, 1963), bounded rationality contributes to most individuals engaging in a localized search for problems and solutions. Put simply, we tend to look in "our own neighborhood" (function, department, division, etc.) for problems, opportunities and solutions. Thus, while facilities management personnel are likely to see the importance of hazard mitigation investment decisions, are individuals in other areas of the organization likely to agree with the facilities perspective? In the specific case of hospitals, for example, it seems plausible that physicians might not value hazard mitigation investments in the same way and to the same extent that facilities managers might. After all, and depending on how narrowly a given physician's position is construed, a physician might well argue that money spent on hazard mitigation is money not spent on critical diagnostic or surgical equipment, both of which might be expected to directly affect achievement of the hospital's mission (e.g., providing state-of-the-art healthcare) and its bottom line.

> *Proposition 4c*. The more complex the organization's structure, the less likely that hazard mitigation investment decisions will occur.

In addition to their authority structures, the **political structures** of organizations are expected to influence also whether and to what extent they invest in hazard mitigation. As described by Pfeffer (1981), lack of goal consensus is a key factor that increases organizational reliance on political rather than rational decision making. Since goal consensus is unlikely to be achieved fully in any organization, it seems reasonable to assert that all organizations are characterized by some level of political activity and decision making. The nexus of power in organizations often depends on the historical pattern of resource allocation (Pfeffer & Salancik, 1978), such that those with the greatest proportion of resources tend to possess and will continue to possess the greatest amount of *de facto* power, regardless of what the formal organizational chart might suggest in terms of rational-legal authority (Blau & Scott, 1962). In matters of planning and budget, then, the divisions of the organization are likely to play a win-lose game of "us vs. them," such that whatever accrues to "us" is denied to "them."

Consistent with arguments made by Sharfman et al. (2000), we suggest that decisions to invest in hazard mitigation require substantial resources, so substantial in many organizations that the existing structure of resource allocations may need to be significantly altered. This will not be the case necessarily, however, if hazard mitigation advocates are already key players in the organization's political structure. In the more likely former case, resources will need to be redirected away from some previously identified array of activities and toward hazard mitigation. The sheer magnitude of the expense associated with hazard mitigation investments implies that any redirection of resources will be away from an equally significant investment or set of investments. In the end, redirection of resources toward hazard mitigation will likely require and yield a shift in the political structure of affected organizations. Importantly, those occupying powerful positions are unlikely to willingly cede their resources, unless they perceive advantages accruing to their divisions in the organization. Thus,

> *Proposition 5*. The more that extant intra-organizational political structures direct resources away from hazard mitigation investments, the less likely that hazard mitigation investments will be made.

Without high levels of regulation or other form of external governmental pressure requiring a particular organizational response, the win-lose game of "us vs. them" tends to be an internal one. Within the organization, divisions "battle" each other for resources, "wage campaigns" to acquire positions, and so on. The game changes when the organization perceives a significant threat from outside, one that must be addressed, such as a legislative mandate that hospitals invest substantial capital in hazard mitigation. Then, the organization as a whole becomes the "us," while those responsible for the external threat (e.g., the government agency charged with administering the legislative mandate) become "them." As described by Sharfman and his colleagues (2000: 285), such external pressure:

> "… May cause members of the firm to either pull together and forget petty political concerns or try to find innovative ways to respond to the threat. Conditions of an external threat may cause managers to become more interested in the existence of the 'pie' rather than about the size of their particular 'piece'."

Organizational members understand that the organization as a whole must survive in order for them to battle internally for resources. To that end, we expect that they will find the means to redistribute resources such that the external threat may be effectively addressed, i.e., the "foe vanquished." In the case of SB 1953, for example, we expect that all hospital employees would see the value in retaining their licensure. Thus, if a critical mass of hospital members believe that "they" (in this case, State government) will take away or non-renew "our" hospital's license for non-compliance with SB 1953, then the hospital members will likely bond together, as "us," in opposition to "them," and will do whatever is needed to retain the license.

Whether the redistribution of resources will be sufficient to compel long-term political behavior change is uncertain, as other factors are more likely to reassert themselves. In the specific case of hospitals, for example, while resources may be redirected to hazard mitigation investments in the relative short-term, the demands of key physicians (for equipment and staffing) are likely to regain political dominance in the long-term. The primary reason for this readjustment lies in the overarching mission of hospital organizations, which is to provide healthcare, and the primary basis for power in hospital organizations, which is the ability to provide healthcare. In other words, no matter the external impetus for hazard mitigation investments, hazard mitigation is not the primary function of hospitals; healthcare is. In the end, the primary mission and its representatives will hold sway with respect to long-term resource allocation. Still, in the near-term,

> *Proposition 6*. The greater the degree of perceived external threat around hazard mitigation, the more likely that a coalition of internal organizational participants will band together in support of hazard mitigation investments, at least temporarily.

2.2.3 Regulatory Relationship Predictors of Hazard Mitigation Investment Decision Making

The degree to which the regulatory process is **participative** is expected to influence significantly the likelihood of hazard mitigation investment decisions. Consistent with the participative management literature (e.g., Coglianese & Nash, 2002; Conroy & Berke, 2004; Wagner, 1994), involvement in the design of legislation and concomitant regulations may be critical to successful implementation of legislative mandates. Depending on the extent of the participation, we expect that both sides would have the opportunity to describe fully their goals and intentions, along with any perceived obstacles to and facilitators of change. "Advance warning" of likely obstacles should permit the inclusion of appropriate palliative measures. For example, involving hospital organizations in the development of hazard mitigation legislation such as SB 1953 should give those organizations insight into the rationale behind the legislation, while also providing a realistic view of the organizations and their capabilities to those responsible for crafting the legislation. In the case of California hospitals facing SB 1953, their lack of financial capacity has been a major obstacle in need of attention.

Ideally, the parties involved will display high levels of both cooperativeness and assertiveness, the two ingredients necessary for collaborative problem solving and conflict management (Ruble & Thomas, 1976). Cooperativeness focuses on the other party's concerns, and assertiveness focuses on one's own concerns. Whereas the level of cooperativeness indicates the importance of the relationship between the two parties, the level of assertiveness conveys the importance of the issue. High levels of both cooperativeness and assertiveness advance the relevant issues without sacrificing or downplaying the significance of the relationship. The ultimate outcome of collaborative conflict management is problem resolution. In other words, the problem and its root cause(s) are likely to be fully addressed. Likewise, both parties are more likely to be committed to the chosen solution, and more likely to be satisfied that they have been treated fairly.

> *Proposition 7a*. The more participative the regulatory process, the more likely that hazard mitigation investments will be made.

> *Proposition 7b*. The greater the extent to which concerns of implementing organizations are acknowledged explicitly in the regulatory process and provisions are made to alleviate the burdens associated with implementation (e.g., lack of financial capacity), the more likely that hazard mitigation investments will be made.

2.2.4 Organizational Leadership Predictors of Hazard Mitigation Investment Decision Making

Management scholars (e.g., Hambrick & Mason, 1984; Wiersema & Bantel, 1992) have argued that the characteristics of those occupying an organization's upper-echelons condition the organization's decision-making process and outcomes. For our purposes, an organization's upper-echelons include the top manager (e.g., CEO, President) and those managers who report directly to the top manager (e.g., the COO, CFO, CIO). Other than an organization's Board of Directors, the individuals who comprise an organization's upper-echelons, or top management team, are expected to exert the greatest amount of influence with respect to strategic decisions, including all major capital expenditure decisions.

We view two individual characteristics as particularly relevant to the consideration of hazard mitigation investment decisions: functional backgrounds and previous disaster experiences. First, we expect that top managers' **functional backgrounds** likely affect the way they perceive the hazard mitigation problem and potential solutions. Functional background is understood to include the knowledge and expertise that one acquires because of experience in a particular functional domain (e.g., finance, operations). Such knowledge and expertise accrue to individuals through both their formal education and their actual work experience. While some individuals' functional backgrounds may include several disciplines, we expect that most individuals' functional backgrounds consist of three or fewer complementary disciplines (e.g., finance and accounting).

Previous research suggests that functional background affects managerial perceptions, at least with respect to perceptions of organizational effectiveness (e.g., Waller, Huber, & Glick, 1995). Thus, top managers with a functional background in finance might be expected to view potential decision opportunities through an economic lens, and to rely primarily on economic criteria, such as return on investment, when choosing among potential action alternatives. In the case of hospitals, top managers with a functional background in patient care might be expected to view potential decision opportunities through a relational lens, and to rely primarily on relational criteria, such as patient satisfaction, when choosing among potential action alternatives.

Similarly, previous research suggests that functional background affects resource allocation decisions (Barker & Mueller, 2002). Thus, top managers with a functional background in marketing might be expected to allocate more resources for organizational R&D. In the case of hospitals, top managers with a functional background in finance might be expected to allocate more resources to projects associated with positive cash flow.

In fact, the number of hospital executives having functional backgrounds in business, especially finance, appears to have increased over the past decade (Molpus, 2004). In other words, more hospital CEOs have an MBA or its equivalent in addition to or in lieu of an MD. As such, we expect that strategic decisions made in hospitals are at least as likely to be made in light of economic criteria, specifically return on investment, as they are to be made in light of relational criteria, such as patient satisfaction. Specifically,

> *Proposition 8a.* The greater the proportion of top management team members having a functional background in accounting or finance, the greater the emphasis on economic criteria (e.g., ROI) in making hazard mitigation investment decisions.

Second, we expect that top managers' **previous experience with disasters** likely affects the way they perceive the hazard mitigation problem and potential solutions. The first of Petak and Alesch's (2004: 127) prerequisites to organizational action is that the organization (i.e., the organization's top managers) "must be *aware* of a threat, opportunity, or challenge from its relevant environment and *believe* it to be salient to the organization" (*emphasis added*). Experience is widely regarded as a fundamental source of knowledge and subsequent action. Whether top managers believe that a particular hazard is likely to befall their organization is expected to depend in part on whether those managers have previous experience with the particular hazard, and on whether those managers believe that the circumstances of their current hospital (e.g., building type, location near a known earthquake fault) align with the circumstances of the hospitals or other organizations to which they belonged during a previous disaster. In brief, previous experience with a hazard is expected to increase top managers' subject probabilities that such a hazard could affect their current organization in the near future.

> *Proposition 8b*. The greater the amount of top management team members' experiences with disasters, the more likely that hazard mitigation investments will occur.

2.2.5 Organizational Strategy Predictors of Hazard Mitigation Investment Decision Making

The particular generic strategy adopted by an organization consequently affects or should affect decisions around resource allocation (Porter, 1980). Each of Porter's (1980) generic strategies – differentiation, cost leadership, and focus – makes different assumptions about the market to be served, and the approach to serving the chosen market. An organization adopting a differentiation strategy seeks to distinguish itself in the industry and secure profits by means of producing or delivering a unique, premium product or service to a broad-based market. If successful, the organization should be able to charge a premium price for its product or service. An organization adopting a cost leadership strategy seeks to achieve market dominance through relentless cost cutting and subsequent production or delivery of the lowest-price products or services, also to a broad-based market. An organization adopting a focus strategy chooses either a differentiation or a cost-leadership strategy and applies it to a niche market.

Whether and to what extent an organization decides to invest in hazard mitigation would seem to depend in part on whether the organization's decision makers believed that the investment would align with the organization's chosen strategy. In the case of hospitals, for example, those with a **differentiation strategy** might be expected to invest in hazard mitigation only if such mitigation would help the organization position itself as offering something "special" to end-users. Offering something "special" is prerequisite to charging a premium for one's products or services. Since hazard mitigation, especially seismic hazard mitigation, tends to be invisible to the typical hospital user, we would expect to see it occur in the context of visible changes. As suggested earlier, we would expect to see hazard mitigation linked to capital projects that provide end-users (e.g., doctors, patients) with tangible premium benefits, such as newly constructed bed towers boasting all private rooms.

Hospitals with a **cost-leadership strategy** might be expected to invest in hazard mitigation only if such mitigation would help the organization position itself as "spending money now to save money later." Considering expenses in terms of their ability to reduce costs is prerequisite to being a low-cost leader. Since hazard mitigation, especially seismic mitigation, tends to be expensive in terms of capital and ongoing operating expenses, we would expect to see it occur in the context of enhancing efficiency. Specifically, we would expect to see hazard mitigation linked to capital projects that enhance hospital efficiency, such as newly constructed or remodeled bed towers that minimize use of energy.

In general, then, we expect that hospital executives would be most likely to invest in hazard mitigation that serves a broader purpose, that of helping the organization pursue its overall strategy. Similarly, we expect that hospital executives would be most likely to invest in hazard mitigation that aligns with a pre-existing facilities plan or strategy. If a hospital was planning already to rebuild its bed towers, for example, it seems likely that investing in hazard mitigation at the same time would be relatively straightforward. More than one hospital executive with whom we spoke described SB 1953 as something that "just happened" to align with plans the hospital already had for its physical plant. "We were planning to build a new acute care bed tower anyway." Likewise, if a hospital was planning already to alter its facilities to conform to ADA or other regulations, again, it seems likely that investing in hazard mitigation at the same time would be relatively straightforward. In general, then, to the extent that hazard mitigation investments support or "piggyback" the organization's overall business strategy or facility plans, we expect greater acceptance of and willingness to make hazard mitigation investments. Thus,

> *Proposition 9.* The greater the association between hazard mitigation and the organization's strategy (i.e., differentiation, cost leadership, focus) or existing facility plans, the more likely that hazard mitigation investments will occur.

Whether and to what extent hospitals will invest in hazard mitigation measures depends on various factors. As suggested earlier, the process of hazard mitigation investment decision making is complicated, and its outcomes are difficult to predict. Our goal in developing the preceding theoretical framework has been to suggest plausible explanations for why hospital organizations, like those in California, might behave and respond differently to a government mandate (e.g., SB 1953) that seems to require investments in hazard mitigation of all hospitals meeting certain criteria. That hospitals respond differently lends support to our broadest assertion, which is that hospital organizations do not **perceive** their circumstances, including the imposition of SB 1953, similarly.

In the next section, we briefly describe the cases of seven different California hospitals, each of which has approached SB 1953 somewhat differently. We then discuss the extent to which the cases appear to support the propositions outlined previously.

SECTION 3
CASE STUDIES

3.1 Seven Brief Case Studies of Healthcare Organizations

As shown in table 3-1, throughout the State of California there are approximately 397 acute care hospitals with a total of 86,364 beds in 2,465 buildings. Of these, 947 buildings (37 percent) are rated as SPC 1, meaning they are classified the most dangerous in terms of seismic risk. Non-profit organizations own 213 hospitals and private investors own 106. Acute care hospitals owned and operated by government fall into three categories: district hospitals, city/county hospitals and state (academic) hospitals. The government group includes 49 district hospitals, 24 city/county hospitals, and five teaching-academic hospitals for a total of 78. The non-profit group, being the largest with 213 hospital facilities, controls 51,676 licensed general acute care beds located in 1,562 buildings of which 583 or 37 percent are rated SPC-1.

Table 3-1. California Hospitals, Buildings, and Beds by Ownership

Type	Number of Hospitals	Buildings	Beds	% of Total Hospitals	% of Total Buildings	% of Total Beds
District	49	259	5,789	12%	11%	7%
Non-Profit	213	1,562	51,676	54%	63%	60%
City/County	24	157	9,318	6%	6%	11%
Investor	106	444	16,654	27%	18%	19%
State	5	43	2,927	1%	2%	3%
Total	397	2,465	86,364			

Source: California Hospital Data Project, Center for Health Financial Policy and Management, University of Southern California http://www.usc.edu/schools/sppd/research/healthresearch/HospitalData.html and the California Office of Statewide Health Planning and Development, Summary of Hospital Seismic Performance Ratings, April 2001.

3.2 Three Investor-Owned Acute Care Hospital Facilities

Investor-owned healthcare organizations include all health facilities that are partnerships, sole proprietorships, and corporations, or divisions of corporations that issue stock. Investor-owned hospitals comprise about 27 percent of all hospitals in California and about 18 percent of all licensed hospital beds in the state. They are characterized by diverse ownership, ranging from facilities owned by one or a few physicians to those owned by large national corporations operating hospitals in many states.

3.2.1 Case 1

For our first privately owned hospital, we selected a facility in a relatively small system of acute care facilities located in one of California's many metropolitan areas. It is located in an area with somewhat higher than average incomes and somewhat higher than average proportion of households with health insurance. The acute care building on the campus does not comply with the structural requirements of SB 1953. Consequently, according to the statute and program regulations, the acute care building will have to be retrofitted, taken out of service as an acute care facility, or replaced. Even if the building is retrofitted by 2008, it will have to be replaced or taken out of service in 2030.

Organizational characteristics. Although the hospital is investor-owned and its primary mission is to generate a return for investors by providing medical services within the metropolitan area, the administrators of the facilities in this small system see their facilities as having the characteristics of a typical community hospital. The organization is committed to doing business in and providing service to specific geographically defined communities. In this way, the group is different from many large investor-owned healthcare organizations in that they have a tendency to buy or build hospitals in areas that appear to be good markets with relatively little commitment to serving specific neighborhoods or communities.

Top management at the facility is relatively new to the organization, but there has been stable leadership in corporate offices. The managers of facilities in the healthcare group think of themselves as managing different campuses comprising a single healthcare organization. The entire organization sees itself as aggressive competitors in the region for providing healthcare, but as cooperating with one another within the corporation. The individual facilities specialize in treating various kinds of healthcare needs so cooperation makes sense in terms of achieving corporate objectives. Top level executives at the facility include a CEO, CFO, and COO, all of whom have extensive professional training and experience with this and other healthcare organizations, as well as experienced and well-trained medical and nursing directors and a director of business development.

The organization's competitive strategy, one of differentiation, appears to focus on competition for quality physicians and a reputation for quality patient care. The head of this facility explained to us that a hospital must be at the "head of the pack" if it wishes to survive financially and to continue to serve its clientele.

Like 85 percent of California hospitals, this facility suffered net operating losses throughout the second half of the 1990s. It now has a modest operating surplus – three or four points above break-even. About half California's equity-owned and not-for-profit hospitals now have income in excess of their operating costs as the result of cutting costs, increasing efficiency, managerial innovation, and learning how to do business in a highly competitive and frugal environment. The hospital is still struggling to help ensure its continuing financial viability in the face of continuing changes in the industry and in state regulations.

The SB 1953 compliance decision. Although there is some commonality among their characterizations of SB 1953, administrators in various hospitals and healthcare systems frame the SB 1953 compliance decision differently from one another depending, at least in part, on the circumstances in which they find their respective organizations.

The administrators at this hospital facility think that SB 1953 is bad policy. They described it as a knee-jerk reaction to the Northridge Earthquake of 1994. To paraphrase them, "It's overkill. If the state is really concerned about providing acute care after an earthquake, why don't they consider other alternatives, like field hospitals? This just isn't a cost-effective approach. There is no value added by SB 1953." Further, they are of the mind that, "without economic and legislative relief, there will be a serious loss of needed capacity" as hospitals close or are converted from acute care to other uses. "Hospitals have closed," they told us, "because owners went through the analysis and said 'there is no way to get from here to there.'" The administrators added that California hospitals were closing because of a whole bundle of events: Staffing problems and state staffing mandates, inadequate reimbursements by government and insurers, the extremely high costs of seismic upgrading, and the "big hospital financial bust" of the late 1990s.

Compliance with SB 1953's structural requirements is "just one more thing in a constant stream of challenges, problems, and change." Administrators said that they have been able to cope with regulations like ADA (improved access for the physically handicapped) and required upgrades for fire protection, despite the high costs of compliance, because of the way the requirements were imposed (e.g., comply when undertaking any major reconstruction), but that the cost of seismic upgrading "is the elephant that is loose in the back room."

The administrators told us that the basic problem is financial. "You can't retrofit or rebuild if you are losing money or just breaking even." Relatively few California hospitals have the capacity to service large capital debt, even if they had the ability to borrow the funds required to replace their noncompliant facilities.

Decision makers in this system determined that it did not make sense to retrofit the acute care facility to meet SB 1953's structural requirements. Retrofit is expensive, takes a long time, and, then, would only extend the life of the building for about 20 years. Replacement is much more sensible. Unfortunately, hospital construction costs are skyrocketing upward.

Administrators at this and other hospitals cite reviews at OSHPD that take two years or more. The cost of structural steel has escalated rapidly to extraordinary levels. Concrete costs are rising at nearly similar rates. "What used to be a cost of about a million dollars a bed is starting to look more like two million dollars a bed," the administrator sighed.

Corporate and facility decision makers are still devising and evaluating alternative means for complying with SB 1953. "We're on alternative 59," they told us, "And we still don't have one that works." The decision process involves the CEO, CFO, Business Development officer, and COO, along with land planners, architects, and the owners – "on particular issues." The corporation's basic intent is to stay in business and to serve the community. As the decision makers continue their search for a viable alternative, they hope for legislative relief.

3.2.2 Case 2

Our second case study is a relatively small urban hospital housed, essentially, in a single building. The building was built before 1973 and does not meet OSHPD standards.

Organizational characteristics. This hospital serves a large lower income neighborhood in a metropolitan area. Most of its patients receive MediCal benefits – California's state assistance for the medically indigent. Fewer than 10 percent of its patients have medical insurance. Patients who come here have few other options for medical treatment without having to travel a considerable distance. When asked about the hospital mission, the administrator said, "The best description is that this is a bread and butter community hospital."

The hospital is investor-owned, part of a larger corporation that owns hospitals in California and elsewhere. Although part of a larger organization, linkages with that organization are minimal; based on the interviews, the healthcare corporation is loosely coupled and provides relatively little support or guidance to the local facility.

This hospital was experiencing major net operating losses for the past decade, but is now starting to break even. The larger corporation is not doing well financially; in fact, it is trying to sell this hospital to raise cash to support other facilities in other places. The corporation has absolutely no capital that it can provide to this hospital to meet either regular, recurring capital needs or the needs associated with SB 1953. Several potential buyers have expressed interest, but none has yet made a firm offer for the facility.

The CEO is a professional administrator with almost a decade of experience as a head hospital administrator, more than two decades of experience in healthcare management experience, and a specialty in corporate finance. The balance of the relatively small management staff gained most of its training through extensive on the job experience.

The SB 1953 compliance decision. The hospital has complied thus far with OSHPD's SB 1953 mandates. Unlike many other hospitals, it has not applied for an extension for complying with structural upgrades, hoping instead that legislation would make irrelevant the need to apply for such an extension. In brief, it seems that this hospital is hoping that SB 1953 will go away.

As part of its initial evaluation for SB 1953, the hospital concluded that retrofitting the facility would cost in excess of $10 million, would create major logistical problems (since everything is located in one building and the building's lot is surrounded by other businesses), and would offer no potential for increased income to offset the costs. While it may be possible to raise that money under some scenarios (presumably from a new investor-owner), the entire facility would still have to be replaced to meet the 2030 standards. That would cost at least $100 million and achieving the reconstruction is viewed as completely impossible to administrators, given the hospital's assets and income stream.

With hospital ownership in limbo and with income barely matching expenses, hospital administrators have deferred making any decisions about whether and how to comply with the structural requirements of SB 1953. "We have no idea what we could do to meet those requirements. I can't imagine, though, that the State will close hospitals like this. These people have nowhere else to go."

3.2.3 Case 3

The third case is an investor-owned hospital operating under a different set of circumstances and a different strategy.

Organizational characteristics. This hospital is part of a larger corporation that owns hospitals in several states. The corporation is in the business of making money by providing health care services. The corporation chose this location to purchase a hospital because of the market there:

It has a growing population, other acute care hospital facilities are not adequate to serve the area, and the area is above income with an above average rate of insured customers. The decision was made to acquire facilities in this location even though profit margins for hospitals in California are lower than elsewhere, partly because reimbursements are comparatively low and the costs of operation, including nursing staff, are particularly high.

The corporation makes the critical, strategic decisions, including the location of new hospital facilities, acquisitions, and facility sales, but the administrators of local facilities are important participants in capital decisions. The individual hospitals in the corporation develop operating and capital budgets that are submitted to the corporate level. There is extensive interaction between the corporate offices and individual hospitals. Large capital investment decisions are made at the corporate level; the corporation then provides funds for the improvements. Criteria for investment in individual facilities include meeting the needs for patient safety, meeting regulations, and generating revenue, in that order. Other criteria are secondary. Individual hospitals are charged with complying with their annual budgets. Budget status is tracked monthly and variances must be explained and addressed.

The management staff is professional and may move, within the corporation, among individual facilities. At this facility, most members of the senior management team have graduate degrees in their area of specialization (e.g., finance, development, nursing).

The SB 1953 compliance decision. The single-building hospital facility acquired by the corporation does not meet the SB 1953 structural standards and the corporation has no plans to upgrade the facility. "This is being replaced by a new facility. That was our plan all along." The existing facility is inadequate in terms of size, operating characteristics, and infrastructure, so the hospital administration has advised the corporate office to avoid making any capital improvements to it. It also suffered from deferred maintenance by the previous owner. Plans are well underway to create a new facility in a nearby location. "The SB 1953 regulations have nothing to do with it. We need a better facility than the one occupied by the hospital we bought, a facility that will allow us to differentiate ourselves and provide higher-end services." Capital for the new hospital will be made available through the national corporation.

3.3 Hospitals Owned by Local Government

Hospitals owned by local governments are those owned by a city, county, or single purpose government (district) governments. We selected one hospital for a case study that is owned by a hospital district – a single purpose local unit of government created for the sole purpose of providing healthcare services to those within the boundaries of the district who need medical care. Our second case is of hospitals owned by general-purpose local governments.

3.3.1 Case 4

California special hospital districts own approximately 50 facilities comprising about 260 buildings and 5,800 beds. About 43 percent of the facilities contain fewer than 100 licensed beds. Approximately 36 per cent of all the district-owned buildings are classified as SPC 1, meaning they fall within SB 1953 requirements for seismic strengthening. Most of those are district hospitals with fewer than 100 beds.

This hospital is small and located in a rural area. The population of the area is growing steadily and fairly quickly: Retirees have found the community and are moving there in significant numbers. The hospital is the only acute healthcare facility in the area. It serves a large geographic area with relatively low population density.

Organizational characteristics. This acute care hospital is owned and operated by a single purpose local government. The hospital is governed by a small board elected from the population of the district. Elections to board positions are phased so that board members serve staggered terms. This provides some continuity from year to year, but, at the same time, sometimes inhibits rapid change to meet new circumstances. Competition for board positions varies in intensity, depending on the interest generated by current hospital and healthcare issues in the community. Board members tend not to be healthcare professionals.

The hospital is administered by a CEO who is professionally trained in healthcare administration and who has multi-state experience. Positions reporting to the administrator are also held by professionals, but, since the hospital is small (under 100 beds), it has a small budget, and the balance of the managerial staff does not have advanced academic training. Most of their experience has come on the job.

Even though the hospital is in a relatively small, rural area, it is not a stranger to competition. The chief administrator told us he believes that "people go to the closest hospital they trust." When residents are not confident in the care they might receive locally, they drive long distances to go to larger facilities. He sees it as his job to ensure that the district hospital is one that people can trust for a wide range of acute care services. The hospital has to maintain a competitive position so that it can survive financially and continue to carry out its mission. Hospital operating costs are covered by a combination of user fees and reimbursements from private insurances and Medicare and Medical, so it is important to ensure that patient volume is sufficient to cover direct and indirect costs. The hospital has the authority to levy a tax on real property within the district, but relies on operating revenue to cover operations. It levies a small annual tax to help with capital expenses associated with maintenance and repair of the facility.

Like most other hospitals, the district suffered hard times in the 1990s as it struggled to maintain financial viability in the face of declining reimbursements and rapidly increasing costs. The district used a combination of managerial innovation, legislative provisions that put them in a more favorable financial position, and cost cutting to remain viable.

The SB 1953 compliance decision. When SB 1953 was enacted, the district owned an old hospital facility. It did not comply with either SB 1953's structural or nonstructural requirements. Moreover, the facility was too small for the growing population and was inadequate for current medical practice. It had been clear for some time that a new facility was needed to help ensure that residents had confidence in the facility and to meet the needs of a growing and aging population.

The primary obstacle to building a new facility in a better location was financial. The facility generated sufficient revenue for routine operations, with its reimbursements and the small property tax it levied, but the income from operations was clearly inadequate to either replace or retrofit the facility to a point where it would be adequate.

Administrators and the board framed the challenge of complying with SB 1953 as a chance to replace the dated and inadequate hospital facility. They reasoned that they could use the "unfunded SB 1953 mandate" as a means for replacing the facility. "We can use SB 1953 to pass a referendum to replace the facility. The message to voters could be simple. One might say to voters, 'Look what the State has done to us! Now we have to replace our hospital or we won't have any at all.'" The impetus for the new facility would not be perceived, therefore, as coming from overzealous local hospital personnel trying to improve their situation, but, instead, from regulators in Sacramento.

The challenge was to get a referendum to build a new hospital on the ballot and, then, to put together a campaign that would result in a positive vote for the new facility. With the help of a community advisory board, the district organization did just that. The referendum passed. As the time of this report, a new hospital is being built in a new location. Most of the capital costs for construction will be paid by taxes levied on property owners within the district. The district has to find a way to generate approximately 14 percent of the costs for the facility and equipment. The staff is working on finding sources for these funds. Some may have to come from the hospital's operating budget. Some may come from charitable contributions. The key, according to the chief administrator, is to come up with the money in such a way as to minimize any adverse effects on the hospital's financial balance sheet.

Unlike some hospitals that viewed SB 1953 as "overkill" (Case 1), this hospital viewed SB 1953 as a valuable mechanism for accomplishing a pre-existing goal. The hospital district was able to use the requirements of SB 1953 as a catalyst to motivate voters to levy a tax on themselves to replace their old, inadequate hospital with a new structure that should meet community needs for some decades to come.

3.3.2 Case 5

It would be extremely difficult to create an anonymous case study of a county hospital in California. Therefore, this case is not really a case. It is a summary of the situation in which local government hospitals in large California metropolitan areas find themselves. County hospitals in California are administered through the local County Departments of Health. In the case of Los Angeles County and the City-County of San Francisco, the county hospitals are affiliated with university medical schools and serve as teaching hospitals. They both provide trauma centers and, because they are public, serve a disproportionately large share of medically indigent and uninsured patients. The hospital administrators report to the heads of the respective Health Departments and, through them, to elected executives and the county board of supervisors.

California's large local government hospitals charge fees for service where practical, but they operate at a loss. Their operations are subsidized through their respective county budgets. Many local government hospital facilities do not meet SB 1953 standards.

Hospitals owned by general purpose local governments are at the mercy of the voters and elected local officials who have to make difficult decisions about allocating scarce resources. Finding the capital resources to retrofit or rebuild those large local public acute care hospital facilities is exceptionally difficult. California's state and local governments are experiencing serious financial problems. The State's financial problems over the last decade are the stuff of legends.

Local governments face taxing and spending restrictions imposed by voters and state government. The need for tax funds to support local activities at reasonable levels of performance far exceeds the supply. Hospitals must compete with all the other public needs for capital investment resources. Los Angeles County has received money from the Federal Emergency Management Agency (FEMA) to rebuild its main acute care facility because it was damaged in the 1994 Northridge Earthquake, but, even so, political conflict has delayed the construction. San Francisco General Hospital has decided to rebuild its acute care facility, but does not have the money to do so at this time. Whether local government hospitals in large urban centers serving the poor will be able to comply with the requirements of SB 1953 without significant outside funding, such as that provided to Los Angeles County by FEMA, remains an open question.

3.4 Not-for-Profit Community Hospitals

Not-for-profit hospitals are an ownership group that includes all church-related and other facilities that are corporations organized and operated under a policy by which no trustee or other person shares in the profits or losses of the enterprise. In California, not-for-profit hospitals account for 60 percent of all licensed beds and account for 213 of the 397 hospitals in the state. About 80 percent of not-for-profit hospitals have more than 100 licensed beds. About 37 percent of not-for-profit hospital buildings are classified as SPC-1, in danger of collapse.

Many not-for profit community hospitals are part of a larger corporation that often operates hospitals in several states. Others are affiliated with other hospitals in confederation. Affiliated hospitals generally retain their own local ownership but work together to achieve economies of scale. Affiliations vary in the degree to which the members work with or depend on others.

A few not-for-profit hospitals are stand-alone community hospitals. That means they are not part of a large, multi-facility corporation. They may be loosely affiliated with other hospitals, but they are, in virtually all respects, an organization unto themselves. Stand-alone, not-for-profit community hospitals are usually dedicated to serving a particular community. They are typically nonsectarian. Not-for-profit hospital corporations with community hospitals in several or many locations are often, though not necessarily, connected with religious organizations.

3.4.1 Case 6

This hospital is not associated with any religious organization, but is dedicated to serving what it sees as its community and its market. The hospital has been strained lately because several larger hospitals in adjoining areas have closed. Each of them was in financial trouble before, but "SB 1953 tipped the scale and they had to close." This puts an additional burden on our case hospital, forcing administrators to think seriously about adding capacity.

Organizational characteristics. The dozen or so top administrators at this hospital have uncharacteristically long tenures in their positions. Administrators in California hospitals, especially those in corporations owning numerous facilities, tend to change jobs and locations frequently. Moving from one corporation to another is commonplace and most administrators have met many of the others in their field as they have relocated from place to place and been promoted from job to job, up the corporate ladder. The administrators at the case hospital are professionally trained in areas such as finance and nursing, and have extensive experience in their areas of expertise.

Like most other California hospitals, this hospital experienced financial difficulties during the 1990s. Good management enabled the hospital to survive that period. The hospital now enjoys a modest operating surplus and has established excellent bond ratings from both Moody's and Standard and Poor. Nonetheless, the hospital has considerable long term capital debt for new buildings it has constructed over the past two decades to remain competitive and to meet community demand for its services. There is little room for additional debt load.

Remaining competitive is a central concern. Administrators see trends that are making it increasingly difficult for full service hospitals to compete. Physicians and others are opening facilities designed to provide one or another single service that generates relatively high reimbursements from insurance companies, Medicare, and MediCal. These specialty organizations generate substantial profits for their owners and are essentially unregulated by the State. Full service hospitals are then left to provide the services that pay disproportionately low reimbursements and to comply with high standards imposed by State government. Competition, then, is not just against other full service hospitals, but also against investor-owned organizations seeking to draw off profitable procedures outside the hospital. Under those circumstances, devising effective strategies by which to compete becomes extremely difficult.

The SB 1953 compliance decision. The main acute care building does not comply with SB 1953 structural standards and must be retrofitted, replaced, or withdrawn from service. The hospital needs to have an acute care facility, so it must somehow find a way to comply with the legislation.

The initial estimated cost of retrofitting the acute care building using a standard approach was far in excess of $100 million. Hospital administrators told us, "We don't want to put that much money into a building we will have to vacate in less than 20 years." Thus, the administrators and its governing board have continued to search for a workable, affordable alternative. The design group, which meets every two weeks, has sharpened its cost estimates. Even the revised cost estimates have been too high, leading the organization to explore and evaluate alternative approaches, including employing a much less expensive retrofit using new technology. "Economics is driving this. At this point, it is all about survival. Unfortunately, we see no value added by SB 1953. It's just costs we have to absorb without improving our capacity to provide medical care." Hospital administrators feel that their current acute care facility is not at risk from collapse due to an earthquake. Nor are they particularly concerned about the effect of an earthquake on their ability to provide services to victims. "The problem will not be whether hospitals are operable; it will be whether the injured can get to the hospitals."

As of this report, the preference of this hospital's administrators is to replace the existing acute care facility with a new building, and to convert the existing acute care building to another use, as allowed in the legislation. This preference is driven by the increased demand brought about because neighboring hospitals closed their doors, but also because of administrators' belief that putting money into structural retrofit is a waste. The facility will not be large enough to meet the growing need and is simply money taken away from a new facility. Still, there are some problems associated with building a new facility. "If we have to buy additional land, we have to keep in mind that land here costs more than $50 a square foot." Beyond that, the administrators expressed concern with construction costs that they see as escalating daily, along with long delays waiting for plan approval from the State of California. "We've looked at a lot of alternatives, but we still don't know exactly what to do. We keep looking at the economics of the situation and trying to decide on the best use of the money we have, given all the things that are needed at the hospital."

3.4.2 Case 7

Years ago, most not-for-profit hospitals were independent. Today, only a few not-for-profit hospitals are stand-alones; i.e., almost all not-for-profit hospitals are affiliated either with other hospitals or with part of a larger corporation. The hospital in this case is a stand-alone. It is an old hospital, located in an old, higher income suburb.

Organizational characteristics. The subject hospital is governed by a board of directors, which is self-perpetuating; i.e., the board itself names replacement board members as seats become vacant. The board, drawn primarily from the community, plays a key role in the organization. It meets monthly, engages in discussions with staff about both policy and operating issues, and works successfully to find philanthropic support for the hospital.

The staff is highly professional. The top management team has graduate training in finance and healthcare administration and extensive relevant experience. The tenure of corporate level executives varies considerably, but all have held high-level positions for some time.

The hospital's business-level strategy is to differentiate itself from other healthcare organizations. It has developed a reputation as a prestigious community hospital and strives to maintain that reputation. It works hard to identify itself with the community.

The hospital has a strong balance sheet and bond rating. It was able to withstand the financial turmoil of the 1990's and to begin generating an operating surplus a few years ago. The operating surplus is small and will not support major capital investments or service a substantial debt load by itself.

The SB 1953 compliance decision. The buildings that comprise this hospital campus were built over many decades. Many of them have been upgraded over the years, but the older, primary acute care building is not compliant with SB 1953's structural standards. Years before SB 1953 was enacted, the hospital initiated a planning and development program that would, coincidentally, make the acute care facility compliant. SB 1953 has not driven the replacement of the acute care facility; replacement is being driven by the desire for a larger, more efficient, and more "user-friendly" facility – one that will allow the hospital to continue to differentiate itself from other hospitals in terms of services offered and quality. The hospital sees the SB 1953 mandate as accelerating some construction, but complying with SB 1953 "is an afterthought." The principal problem with the hospital's construction program is financial. The operating margin alone will not support the investment. Consequently, the hospital has been seeking philanthropic gifts as a mainstay of the capital investment program.

SECTION 4
DISCUSSION AND NEXT STEPS

In this section, we examine the propositions in light of the cases. Rather than discuss each proposition, we look at each of the five major categories of propositions, and describe whether any of the cases suggests support for the categories.

As stated earlier, the process of hazard mitigation investment decision making is complicated, and its outcomes are difficult to predict. Our goal in this research has been to develop a theoretical framework that might be used to predict the decision-making process and outcomes of organizations required to comply with an unfunded seismic safety mandate. To that end, we have examined the case of California hospitals and their response to SB 1953, legislation requiring that all acute care hospital facilities meet current seismic safety standards or be removed from service as acute care facilities. Our approach to building our theoretical framework has been iterative, consistent with a grounded theory approach (Strauss & Corbin, 1998). Figure 4-1 illustrates our process.

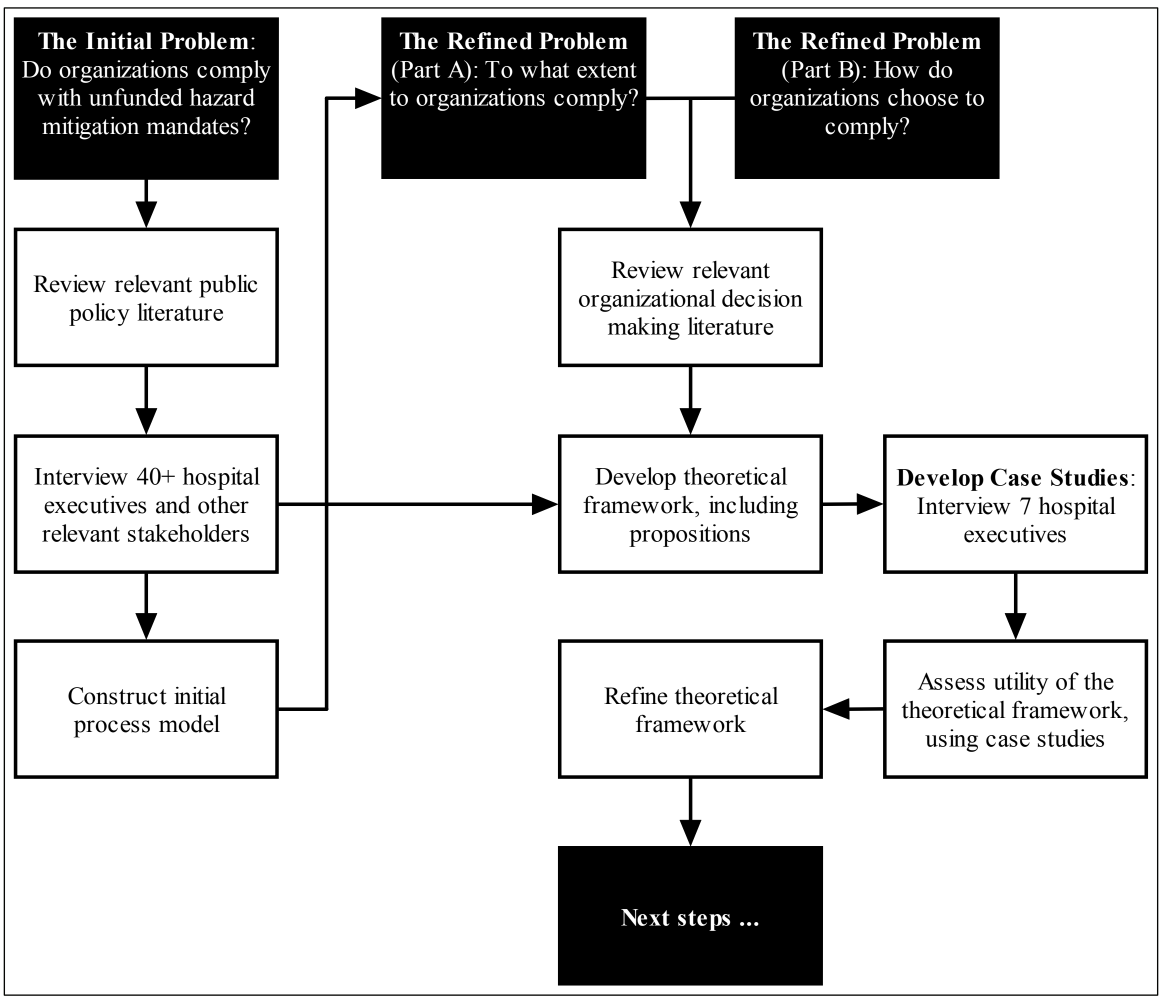

Figure 4-1. Our Research Process

As shown in figure 4-1, we began with a review of the relevant public policy literature (Alesch & Petak, 2001), followed by an extensive series of preliminary interviews with more than 40 hospital executives and other relevant stakeholders. This initial work resulted in a process model that depicted a set of decisions about whether and how to comply with the regulations that took place over an extended period. The process was iterative and complex, with old, discarded options sometimes gaining favor a year later, new options evolving, and new actors in individual organizations bringing different perspectives. Across this lengthy process, the environment within which each organization operated continued to change, presenting new possibilities and new constraints.

Ongoing reflection on the interviews and process model caused us to change our understanding of the problem. Our newfound understanding compelled us to review the organizational decision making literature, while simultaneously reconsidering what we had learned in our preliminary interviews. In general, our interviews seemed to suggest that our process model – "The Prerequisites to Action" – was a fair descriptor of how things happened, but it failed to differentiate adequately which organizations selected which strategy for complying or not complying with SB 1953. Thus, we were unable to predict the compliance outcomes that would emanate from individual healthcare organizations from our process model.

From there, we developed the propositions described earlier in this paper, propositions about factors that would influence organizational decision makers to move in one or another direction in terms of compliance, and arranged to interview a new set of hospital executives. These interviews, conducted in Fall 2005, were used to construct this paper's case studies. The discussion that follows represents an initial assessment of our theoretical framework, based upon the case studies presented in the last section.

4.1 Review of Propositions

4.1.1 Economic Predictors of Hazard Mitigation Investment Decision Making

Four propositions (1, 2a, 2b, and 2c) addressed economic predictors of hazard mitigation investment decision making. Without question, economics was a major driver of decision making in all seven case studies. Executives spoke at length about their hospitals' financial difficulties: historical, current, and anticipated. Access to capital, or the lack thereof, was frequently mentioned as a major obstacle to investing in hazard mitigation, as was the expectation that hospitals could not pay simultaneously for increased staffing and hazard mitigation while receiving smaller reimbursements for services provided. The few hospitals that indicated a strong willingness and intent to invest in hazard mitigation were those that (1) believed that such investments would enhance their ability to compete, either through lowering their costs or by increasing their prices (Proposition 1); and (2) had access to needed capital or the means to raise needed capital. For example, the executives associated with Case 3, representing an investor-owned hospital, spoke directly of the need to rebuild their acute care facility so that they could manage their costs and better serve the needs of patients wanting more contemporary services. Likewise, the executives associated with Case 4, representing a local government owned hospital, spoke of the need to have an acute care hospital "that people can trust for a wide range of acute care services." If any theme dominated the round of interviews used to construct our case studies, it was an economic one. In brief: "**No money, no mitigation.**"

4.1.2 Institutional Predictors of Hazard Mitigation Investment Decision Making

The extent to which institutional factors likely influence hazard mitigation investment decision making is difficult to ascertain in an interview lasting one hour or less. Thus, while the executives interviewed for our case studies were generous with their time and candid in their responses, in most situations we did not have adequate time to ask detailed questions about the hospitals' internal workings. Still, we were able to assess the utility of at least some of our internally focused propositions.

For example, many hospital executives expressed doubt that the State of California would revoke their acute care license if they failed to comply with SB 1953. Instead, most said that such an action would be counterproductive, and that hospital advocates would argue strenuously on hospitals' and communities' behalf (Proposition 3c-1). The threat of not having adequate acute care, they stated, was far more salient than the threat of an improbable earthquake. Still, the extent to which hospitals asserted such a belief seemed to depend in part on their ownership. Government-owned hospitals, for example, seemed to believe that they needed to comply with SB 1953, no matter whether they believed that the State would non-renew licenses of non-compliant hospitals (Proposition 3c-2).

The impact of the organization's structure on hazard mitigation investment decision making was not discernible from our interviews, brief as they were. Thus, we were unable to assess accurately the relative importance of such factors as centralization, formalization, complexity, and internal politics on the decision-making process and outcomes. Instead, we confirmed that the individuals involved in final decision making around hazard mitigation investments tended to be C-suite members (e.g., CEO, COO, CFO), none of whom had backgrounds in facilities management or structural engineering (Proposition 4a). Instead, most had backgrounds in business (finance) or health administration. Further research into these topics will likely require interviews that are more extensive with the same executives, along with other individuals from the same hospitals. Importantly, without such internally focused research, we will be hard pressed to describe accurately the actual **process** of hazard mitigation investment decision making.

4.1.3 Regulatory Relationship Predictors of Hazard Mitigation Investment Decision Making

Nothing in the case studies described in Section 3 suggests involvement on the part of these hospitals in the development of SB 1953. When asked whether they had exerted any influence over the legislative process, most referred to efforts on their behalf by the California Hospital Association and similar entities. None believed that their concerns had been heard, or were being heard, by OSHPD, the state agency charged with administering SB 1953's regulations (Proposition 7a). Instead, we heard numerous complaints about OSHPD's apparent lack of responsiveness and speed, and about how it was costing them increasing amounts to comply with SB 1953 as a result. (Note: This is what these hospital executives said. Since we are interested in their sensemaking, their perceptions are most critical. Whether OSHPD has been less than optimally responsive was not our concern. Nor did we ascertain the actual costs associated with compliance. Since the executives' perceptions are what condition their decision, those perceptions take precedence over any "objective reality" in our theorizing and description. In brief, the executives make decisions based on what they perceive, not what is.)

When told that the interview's focus was SB 1953, nearly the first phrase uttered by every hospital executive we interviewed was "**unfunded mandate,**" followed by expressions and gestures of disgust and dissatisfaction. Hospital executives were clear in their belief that those responsible for crafting and implementing SB 1953 did not understand and did not care about the economic situation faced by most California hospitals. Instead, hospital executives shared their belief that legislators had been misled in their quest to enhance access to acute care hospitals by seismic safety advocates who pushed for implementation of the same seismic mitigation measures in all California hospitals, regardless of their actual risk profile and no matter the health of their balance sheet (Proposition 7b). Since they were not consulted in advance of the legislation's passage, they recognized that current complaints and laments sounded more like "sour grapes" than useful feedback.

4.1.4 Organizational Leadership Predictors of Hazard Mitigation Investment Decision Making

Just as the case studies revealed a strong emphasis on economics, they also revealed that a significant number of C-level decision makers had backgrounds in business (finance) and health administration. Relatively few C-level administrators had risen to top-level management as patient care staff members (i.e., physicians, nurses). Instead, most were career administrators who had been promoted within their own hospitals or across hospitals following predictable career paths. For example, most of the CEOs we interviewed had served previously as COOs or CFOs (Proposition 8a). All had advanced degrees in administration of some form. Consequently, all discussed the importance of **financial ratios** when making capital decisions, and all discussed the need for hazard mitigation investments to have a meaningful impact on the "bottom line." At the same time, all were quick to note that their interests were with patient care and safety as much as with the bottom line.

When asked about their experience with disasters, all seemed knowledgeable with respect to seismic safety in California. Many had lived in California for many years, and had experienced their fair share of earthquakes. In fact, we think that their experiences with disasters in general, and earthquakes in particular, may be a major contributor to their general **non-interest** in making hazard mitigation investments (Proposition 8b). Though it may seem counterintuitive at first, this non-interest makes sense when one understands that: (1) none of these executives' earthquake experiences had been associated with patient deaths or even injuries resulting from a failed hospital building, and (2) many of these hospital executives' perceived their hospital buildings to be secure from major structural damage from earthquakes. More than one hospital executive pointed at us and asked, "Do you know how many patients have died in a California hospital due to an earthquake in the last 30 years? None!"

4.1.5 Organizational Strategy Predictors of Hazard Mitigation Investment Decision Making

Throughout our interviews, and often without necessarily realizing it, hospital executives discussed their business-level strategies, and the relationship of those strategies to hazard mitigation investments. The hospitals most likely to have plans drawn up for rebuilding or retrofitting their acute care hospital buildings were those that had started thinking about doing so in advance of SB 1953. In other words, the need to invest in hazard mitigation in response to SB 1953 just happened to coincide with existing plans to alter a hospital's physical plant, as we saw in Case 3. Or, as we saw in Case 4, SB 1953 was the catalyst that helped a community commit to providing the financial support needed to execute an existing rebuilding plan.

More than one hospital executive wanted to know why hazard mitigation was not being treated like other regulations that affected buildings. For example, everyone understood that major changes to existing facilities would be accompanied by the need to alter those facilities in line with ADA and similar building regulations. Rather than require hospitals to rebuild or retrofit facilities outside the normal replacement cycle, when the cost of doing so would be excessive (e.g., since the building may not have been fully depreciated), why not require hospitals to incorporate seismic hazard mitigation into any major changes? That way, the decision to upgrade or replace a building would be integrated with the rest of the hospital's strategic and capital decision-making process, and would therefore be driven by the hospital's strategic priorities (e.g., differentiation vs. cost-leadership) (Proposition 9). After all, these executives reasoned, shouldn't strategic priorities drive capital decision making, rather than building regulations?

In general, the case studies described in this paper appear to offer tentative support for many of our propositions. Other propositions await preliminary testing. Together, all of the propositions that comprise our theoretical framework require evaluation that is more extensive and validation.

4.2 Next Steps

4.2.1 What We Have Learned

As reported in this document, we have concluded that there are prerequisites to organizational compliance with regulations or, indeed, with taking steps to reduce the likely consequences of an extreme event. We have learned, too, that the organizational context within which executives must make choices about what to do, when to do it, and how to do it is critical. So, too, is the nature of the industry's overarching environment. The context for each organization is unique, given that it comprises a set of perceptions of what may or may not be an objective reality. Nonetheless, when almost all of an entire industry is in flux, it is reasonable to expect that a significant number of the organizational players will have difficulty being able to predict, with confidence, the consequences of alternative actions.

We have learned that decision making about complex issues is not a linear process, nor is it the outcome of cranking through some quantitative algorithm generating benefit-cost ratios, return on investment, or other ratio. The calculus is far more complex, depending on the weighting of many variables, only some of which can be measured or even communicated with any precision. Nor is it the case that every problem is tractable for those faced with making a choice about how to address it.

We have learned that some specific variables seem to make a difference in how different hospital organizations approach making hazard mitigation investments: the economics and financial implications of a decision, differences in organizational strategy, isomorphism in terms of organizational structure and staffing, how the regulatory process plays out, and the characteristics of top managers in individual organizations. Preliminary work examining these variables is promising, though not complete.

4.2.2 Where to From Here?

While this work has been useful to us and sheds light on the process and outcomes associated with hazard mitigation investments, our research objectives are not fully met. We have two primary goals. The first is to better understand how organizations make decisions about mitigating the consequences of extreme events. The second is to better understand how to design public policies to increase the likelihood of organizations taking precautions to mitigate against the likely consequences of extreme events without generating adverse side effects.

Achieving these goals will require additional research. We believe it is necessary to look at how hazard mitigation decisions are made in other contexts, including contexts without specific regulatory mandates and contexts focused on other perils, such as hurricanes and terrorism. It is also important to continue our research on SB 1953, and to build on our qualitative work. Doing so will involve conducting quantitative analyses based on survey research employing a larger sample, using the propositions and hypotheses developed from the work reported here.

SECTION 5
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University at Buffalo, The State University of New York
Red Jacket Quadrangle ▪ Buffalo, New York 14261
Phone: (716) 645-3391 ▪ Fax: (716) 645-3399
E-mail: *mceer@buffalo.edu* ▪ WWW Site *http://mceer.buffalo.edu*

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