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Creating a Seismic Safety Advisory Board

A GUIDE TO EARTHQUAKE RISK MANAGEMENT

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Disclaimer

Creating a Seismic Safety Advisory Board: A Guide to Earthquake Risk Management was prepared by the Seismic Safety Commission of California under an agreement with the Federal Emergency Management Agency (FEMA). Its purpose is to assist states, groups of states, local governments, or private-sector entities in developing seismic safety advisory boards. It also contains guidelines for strategic planning and developing a model seismic risk management program to enhance seismic safety once the board is established. However, neither the Seismic Safety Commission nor FEMA can ensure that by using the concepts in this publication, either public- or private-sector entities can avoid bodily injury or property damage when an earthquake occurs. Therefore, neither the Seismic Safety Commission nor FEMA, nor any of their employees makes any warranty, express or implied, nor assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process described herein.

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Acknowledgments

The Seismic Safety Commission of California developed this manual under an agreement with the Federal Emergency Management Agency to assist states in creating seismic safety advisory boards.

States in this country present a myriad varieties of geologic conditions, types of construction, populations, and awareness of and interest in seismic safety. This manual incorporates points of view from several states, the Central United States Earthquake Consortium, and the New England States Earthquake Consortium to reflect the concerns and needs of every region of the United States as much as possible. The project manager consulted with representatives of agencies from several states and organized a workshop of key personnel from across the country to assess and suggest amendments to the manual.

The Seismic Safety Commission acknowledges and thanks all who assisted in this work. In addition to Commissioner Stanley Scott, who devoted hours of review and advice, the following individuals participated in developing or contributed to the manual:

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Introduction

The purpose of this manual is to assist interested states, coalitions of states, or confederations of local governments to develop and nurture seismic safety advisory boards. The first part contains "how-to" tips and advice to assist states that already have such panels in upgrading their advisory boards.

The second part of the manual contains advice on strategic planning for improving seismic safety. Specifically, it includes guidelines for developing a model seismic risk management program by which to gauge progress.

A seismic safety advisory board is a multi-disciplinary panel composed of volunteers with expertise in fields related to earthquakes and preparation for and response to earthquakes, such as earth sciences, engineering, emergency services, local government, social services, and public policy. They are drawn from the private sector, academia, and government. The board's functions are to:

- Advise the legislature and administrative agencies
- Advocate earthquake programs
- Promote improvements to seismic safety and procedures
- Identify seismic hazards
- Coordinate plans and actions of responsible agencies, programs, and government levels
- Gather, integrate, and transfer information from a wide range of sources
- Plan for the long-term implementation, review, and maintenance of seismic safety programs

EARTHQUAKES ARE POSSIBLE IN VIRTUALLY ALL PARTS OF THE UNITED STATES. EVERY STATE SHOULD BE PREPARED.

The need for seismic safety advisory boards and for model seismic risk management programs is based on the following assumptions:

- A damaging earthquake can occur with little or no warning. With each passing year, the potential for one increases.
- Positive, goal-oriented leadership is a prerequisite to starting an effective advisory board.
- Organizations at many levels of government and in the private sector have responsibilities in seismic safety. The board can help develop comprehensive and consistent programs for seismic safety and risk management.
- Earthquakes can cause extensive property damage and endanger lives, but this risk can be reduced and managed by prudent policies for locating and designing structures.
- Managing earthquake risks has collateral benefits, bringing about improved buildings, dams, transportation facilities, building stock, communications, fire safety, toxic materials management, and emergency response.
- Concerted efforts bring long-term progress toward seismic safety.

For most states seismic safety is a new need crammed onto an already full agenda. As a result, it is not being addressed by a statewide governmental program in a majority of states. Earthquakes occur less frequently than other disasters, such as floods, hurricanes, and tornadoes. Consequently, the time, expense, and effort of contending with seismic safety concerns must often be weighed against the probability—the "odds"—that a major earthquake will not occur in a decade or even within a generation.

Making progress in reducing and managing earthquakes risk requires a long-term commitment. Many of the planning issues addressed in this manual are also involved in preparing for, responding to, and recovering from other types of disasters. Therefore, the creation and maintenance of the board will also help enhance general emergency preparation, response, and recovery plans. The cost of reducing risk and strengthening emergency response capabilities is more than justified in view of the cost of damage, repair, and rehabilitation—that is, the cost of not preparing. In this case, a "stitch" in time saves money and lives.

This manual is meant to help in the creation of a seismic safety advisory board—either as an autonomous agency or as part of an existing entity. It provides advice gained from dealing with existing hazards and offers options to consider when establishing a new board or revitalizing an existing board to meet the unique needs of a region.

The board will provide access to expertise, giving government as well as the private sector help in focusing attention on earthquake-related issues. Although this manual attempts to create "perfect" boards, it allows room to select from options and do what is necessary to establish a board and get it underway. Without the seismic safety advisory board, state and local governments are ill-equipped to develop consistent and comprehensive programs for improving safety and reducing risks.

Why Create a Board?

Earthquakes pose unique public policy challenges. Awareness is limited outside a few areas. Major earthquakes are infrequent events with potentially great consequences. Few jurisdictions regard them as clear and present dangers, so daily problems tend to crowd out earthquake issues. There is little understanding about what can be done to lessen earthquake risk. Moreover, because earthquakes occur in most areas less frequently than other major disasters—such as floods, hurricanes, and tornadoes—the resources required to deal with seismic issues are often weighed against the probability that no major event will occur in the near future. As a result, a majority of states are not addressing earthquake risk in an on-going statewide program. A seismic safety advisory board can help keep efforts to address this risk viable.

Responsibility for seismic safety is typically spread among many local, state, and federal agencies as well as individuals and businesses. Emergency response and recovery may be a multi-state effort. It is also crowded onto disparate agendas and mingled with more immediate demands that get a higher priority. Seismic safety stands a better chance of increased priority in both the public and the private sectors if one entity has responsibility for bringing it into focus and to the attention of the public and the policy makers.

CREATING A SEISMIC SAFETY ADVISORY BOARD IS JUSTIFIED ORGANIZATIONALLY AND FISCALLY.

State and local governments are short of resources and have crowded agendas. But despite crowded agendas and desperate budgets, those entrusted with public safety should not gamble on the future. It must be remembered that a "moderate" chance of earthquake refers only to occurrence interval, not to the level of damage that such an event may cause. A seismic safety advisory can provide a low-cost, common-sense means to ensure that legitimate, long-term seismic safety problems receive the attention they deserve and the mitigation efforts they demand.

EARTHQUAKES ARE POSSIBLE IN VIRTUALLY ALL PARTS OF THE UNITED STATES.

The U. S.—Earthquake Country

The Plymouth pilgrims felt their first earthquake in 1638, thus discovering that the northeastern states are seismically active. In 1727, a temblor shook the eastern seaboard from Maine to Delaware, and in 1755, an even stronger quake rocked Massachusetts and rendered the streets of Boston impassable. The 1925 La Malbaie, Quebec, earthquake was felt over an area of 1 million square miles, from New England as far south as Virginia. A pair of damaging earthquakes occurred near Ossipee, New Hampshire, in 1940, and were felt to distances of 350 miles and over an area of 400,000 square miles. More recently, New England has been subjected to ground shaking from two moderate quakes occurring in New Brunswick during 1982, a moderate earthquake in central New Hampshire in 1982, and another moderate temblor in New York State in 1983.

Even the southeastern states were reminded of their seismicity in 1886, when a major earthquake struck Charleston, South Carolina, causing

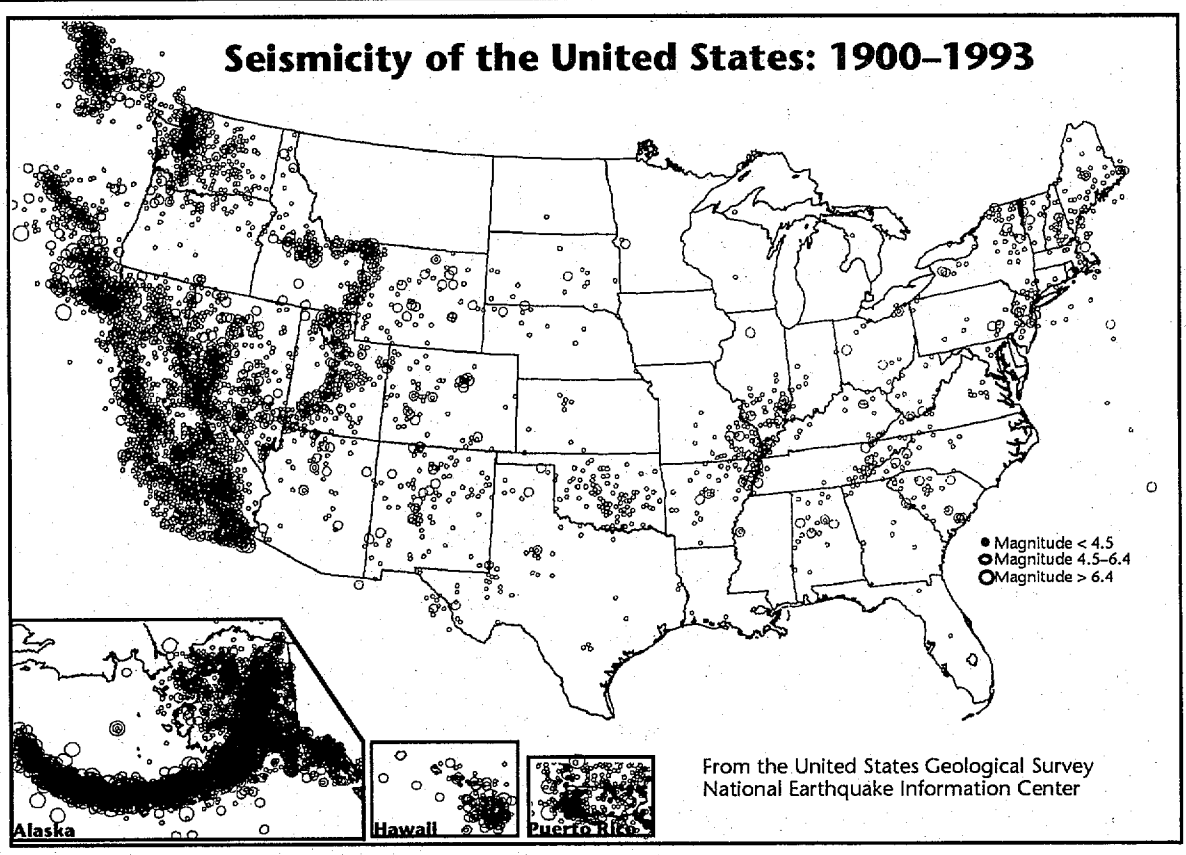
severe damage. In what is now the central United States, a series of great earthquakes exceeding Richter magnitude 8 occurred on the New Madrid (Missouri) fault during the winter of 1811-12, rocking what are now the states of Arkansas, Illinois, Indiana, Mississippi, Missouri, Kentucky, and Tennessee. These events were of such enormous magnitude that the flow of the Mississippi River was temporarily reversed. Ground shaking was so strong and far reaching that buildings were severely damaged in Chicago and Cincinnati. Pavement was cracked and church bells rung in the mid-Atlantic and New England states, a thousand miles from the New Madrid epicenters. These earthquakes were felt over an area of 5 million square miles.

The Pacific Coast states—Alaska, Washington, Oregon, California, and Hawaii—are among the nation's most seismically active, having experienced damaging earthquakes and volcanic activity within the lifetimes of residents. Utah, Montana, Nevada, Idaho, and portions of Wyoming and Arizona also experience earthquakes.

EARTHQUAKES CAN BE AMONG THE MOST MANAGEABLE DISASTERS.

Although earthquakes occur more frequently in the western states than elsewhere in the United States, earthquakes in the central and eastern states are potentially more damaging. This discrepancy is caused by two things: the large percentage of unreinforced masonry buildings and a more consistent underlying rock that transmits shock waves farther. The western states' geologic structure tends to break up earthquake vibrations,

Figure 2-1—Seismicity of the U.S. in the 20th century



whereas that of the central and eastern states transmits vibrations relatively undiminished.

Eastern and central earthquake shocks travel two to four times the distance of those in California, covering areas four to forty times greater. The East also includes denser populations, most of whom are not trained to respond to an earthquake. The heavy industrial development means that central and eastern states face a greater probability of damage resulting from toxic wastes, chemicals, and collapses.

Managing the Risk

The risk to life and property from earthquakes is especially significant in areas of rapidly growing urban areas near earthquake faults. In such areas, each year that passes without earthquake planning increases the potential for catastrophe. Earthquakes can, however, be among the most manageable of disasters. Eliminating vulnerabilities will reduce risks, and developing the plans and resources will help manage those that remain.

A properly composed and structured board can provide the long-term commitment, responsibility, and oversight necessary to develop and pursue meaningful seismic safety goals and effective risk-reduction programs. It can accomplish this by reviewing, evaluating, and helping the work of governmental agencies and the private sector. It can monitor seismic safety programs to ensure their adequacy and effectiveness. It can focus attention on seismic safety and provide a consistent policy framework for integrating and implementing needed programs.

Seismic safety must be incorporated into design and construction practices, emergency response, and recovery planning for the long-term. Without a long-term commitment, effective oversight and remedial efforts may be short-lived, piecemeal, and ineffective.

Why Limit It to Earthquakes?

Earthquakes differ from other natural disasters in a number of ways that make the threat unique and deserving of a single-focus advisory board. Unlike floods and most windstorms that create relatively localized damage, a large earthquake can create an enormous, multi-state area of damage that may leave its victims dependent on their own resources for days before relief can reach them. Moreover, with the exception of Alaska, California, and Hawaii, earthquake response planning is not a part of the public consciousness in most of the United States, as is preparation for floods, tornadoes, and hurricanes in the central and eastern United States.

Many earthquake risk reduction efforts are also unique. Seismic safety must not only be integrated into construction practices, but emergency response, recovery, and long-term risk reduction efforts as well. Earthquake risk management includes improvements in buildings, dams, transportation, and communications facilities. A seismic safety advisory board, by focusing its efforts on earthquake-related issues, will have plenty to do.

EARTHQUAKES CAN CREATE ENORMOUS, MULTI-STATE DAMAGE, A UNIQUE THREAT THAT DESERVES A SINGLE-FOCUS ADVISORY BOARD.

The question of overspecialization is certain to arise, particularly in areas where floods, hurricanes, or tornadoes are common. Earthquake response planning has much in common with fire safety, toxic materials handling, and other emergency response preparations, and the general level of response planning for these and other natural disasters. Broadening the focus of the advisory board to include these

and other natural disasters may allow it to address many of the interrelated issues relevant to preparation for, response to, and recovery from other types of natural disasters as well as earthquakes. Broadening the focus of the advisory board to make it multi-hazard is an option that can be exercised, particularly if it is the only approach available to concentrate attention on earthquake-related issues, but to do so may dilute its effectiveness in dealing with earthquake-specific mitigation matters.

The Bottom Line

A principal obstacle to effective earthquake risk management is lack of commitment by both the public and private sectors to make seismic safety a priority in allocating financial and other resources. Yet reasonable, long-term, incremental investment of resources to avoid future earthquake damage and economic and social disruption is enormously more effective than paying for building repairs and victim assistance after an earthquake. Some seismic risk reduction measures may be costly and complex; others may be inexpensive and relatively simple. An advisory body with a broad perspective can help weigh the cost-benefit of such measures, set priorities, and provide oversight for prudent long-term progress.

THE BOARD IS THE OUNCE OF PREVENTION THAT WILL PROVE ITS WORTH IN REDUCED RESPONSE AND RECOVERY COSTS.

Moreover, earthquake risk-reduction measures often result in other benefits, such as long-term improvements in buildings, dams, transportation facilities, communications, fire safety, toxic materials handling, and emergency response capabilities. The board can be the catalyst that promotes an efficient, cost-effective ounce of preventive investment in seismic safety that will prove its worth in a general state of preparedness for other natural hazards as well as earthquake risk reduction.

STATES WITH SEISMIC SAFETY ADVISORY BOARDS WILL BE MORE SUCCESSFUL IN REDUCING EARTHQUAKE RISK.

A seismic safety advisory board can enable both government and the private sector to respond to multiple needs with expertise that would not otherwise be available and make timely decisions on what should be done and when. Moreover, as a credible advocate of seismic safety that can help integrate the competing interests of multiple agencies and organizations, the board can promote needed seismic safety programs by building a supportive, nonpartisan constituency.

Future earthquakes will occur, and scientists and engineers know a great deal about how to minimize earthquake losses. A board can apply this knowledge to ensure that in the next century all states and communities will be seismically safer places to live. Unless earthquake risks are reduced and emergency response is strengthened, many of this nation's cities and millions of its citizens will remain at great—and unnecessary—risk.

Putting It Together: Creating a Board

This section discusses the creation of a seismic safety advisory board. A board can be constituted to advise a state, a coalition of states, or even a confederation of local governments. It can also be a private-sector entity. This section will emphasize formulation of state-level boards and give a number of options. Because creating an ideal board may be impossible, the strategy should be to get started and then improve the organization as necessary.

Creating a State-Level Board

As the principal governing entity of a major population, state government is responsible for the safety of its residents. Accordingly, state government is obligated to take measures adequate to meet the need. These measures typically include working with the local governments (the entity responsible for building safety and land-use planning, as well as the principal governmental resource at the site of any disaster) to help and encourage their seismic safety efforts and to improve their performance.

> BECAUSE CREATING AN IDEAL BOARD MAY BE IMPOSSIBLE, THE STRATEGY SHOULD BE TO GET STARTED AND THEN IMPROVE THE ORGANIZATION AS NECESSARY.

Therefore, a state-level board can provide a focal point for developing statewide policies and implementing needed improvements. Moreover, a state-level board can recommend seismic safety components for statewide comprehensive plans or policies—for example, industrial development, hazardous material control, or environmental quality. This might include the identification of hazard zones and the development of criteria and standards that should be applied in such zones. Finally, a state-level seismic safety advisory board can provide analysis of a state's seismic safety statutes and regulations and evaluate their application in all cities, counties, and special districts.

A state-level board can become a legally authorized entity of state government through an executive order issued by the governor or by legislative enactment. Each method of creating the board has benefits and drawbacks. It is important to involve someone with knowledge of state government and the legislative process. Even good, well-meaning ideas must "fit in."

An expeditious way to create and empower a state-level board is for the governor to create it by executive order. A board created by executive order can ensure participation by all state agencies in the executive branch. On the other hand, there are several drawbacks to using an executive order. Earthquake risk management is a long-term endeavor. An effective board must be an agency with staying power. Governors change, and a new governor can unilaterally rescind the order. Thus, creation by executive order may not provide the necessary continuity. Moreover, except during emergencies, a governor cannot mandate the participation of local governments or elements of the private sector. If the board is created by an

executive order, the ability to promote earthquake-related programs at the local level and in the private sector may be hampered.

A state-level board can also be created by legislative enactment that defines its powers and gives it a statutory mandate to promote a consistent seismic safety policy and the coordination of earthquake-related programs of agencies at all governmental levels and with the private sector. Inasmuch as such a board's mandate grows out of the legislative process of debate, compromise, and consensus, including ratification by the governor, a legislative enactment probably assures the board of a degree of bipartisan support that may be lacking if established by executive order.

An executive order may be the quickest way to establish a board. Some of the disadvantages of using an executive order may be mitigated if the order directs the board to draft and sponsor legislation creating a state-level board mirroring the one created by the governor. In essence, this course seeks legislative ratification of the governor's action.

> A BOARD IS LESS LIKELY TO BE AT THE MERCY OF SHIFTING POLITICAL PRESSURES IF CREATED BY LEGISLATIVE ENACTMENT.

Whichever method is used, the following components should be considered for inclusion in either a gubernatorial or legislative board:

1. A declaration of the seismic safety advisory board's purpose and scope of responsibility.

   Typically a board is created when there is interest in doing something about earthquake risk. Because progress will involve activities of many different agencies at various levels of government and the private sector and expertise from diverse disciplines, the purpose statement must be broad. The board should be directed to develop a consistent policy and promote earthquake-related programs at all governmental levels and in the private sector. Any legislative declaration must recognize the comprehensiveness of the task. It should not be just a matter of retrofitting buildings, improving emergency response, or recovering from an earthquake. The board should be responsible for keeping the earthquake issue on the public agenda and advocate an acceptable rate of progress.

   The executive order or enabling legislation creating a board should acknowledge that:

   - Earthquakes can cause extensive property damage and endanger the lives of people.
   - Earthquakes can overwhelm local and state emergency response resources.
   - The knowledge and technology exists to make significant improvements in seismic safety; for example, retrofitting potentially hazardous buildings.
   - Earthquake-related problems require the knowledge and expertise of the earth sciences, earthquake engineering, the social and the behavioral sciences, emergency management, finance, insurance, business, public policy, and public administration.
   - Many different agencies at various levels of government as well as elements of the private sector have substantial responsibilities in seismic safety, and these need to be discharged in a consistent and mutually supportive manner.
   - Earthquake risk management can bring about improvements in buildings, dams, transportation facilities, communications, fire safety, toxic materials handling, emergency response preparations, and the general level of response planning for earthquakes and other natural disasters.
   - Long-term progress in seismic safety requires broadly based and comprehensive efforts, planned for,

coordinated, and promoted by the board.

2. Specific language creating the board as an autonomous entity.

The legislation or executive order creating the advisory board should determine where the board will be placed within the organizational hierarchy of state government. There are advantages to creating it as an autonomous entity rather than as part of an existing agency. If its functions are incorporated into an existing agency, rather than as a stand-alone organization, it will probably have to respect the host agency's agenda and the political agenda of the current governor. Moreover, the fiscal and political limitations imposed on the host agency will limit the board too. Incorporating an advisory board into an existing agency may also limit its ability to develop independent perspectives and could discourage the participation of the private sector and local governments. The result may be institutionalized biases and bureaucratic processes that can insulate even the best organization.

To ensure accountability as well as autonomy, the board can be required to report periodically to the governor and to the legislature, presenting findings, reviewing progress, and making recommendations on seismic safety and earthquake risk management. Such a requirement will signify legislative or gubernatorial recognition of the need for a continuing policy-making progress for seismic safety. It will also ensure that the board's agenda is reported regularly to the legislature or governor. Through this kind of merchandising, the executive and legislative branches may rely on the board for guidance in formulating state seismic safety policy.

3. Procedures for appointing the board's members and for selecting its chair and vice-chair.

Procedures should be established for selecting the board's chair and vice-chair, as well as for replacing them in the event of vacancies. Selection of the chair and vice-chair could follow either of two options: appointment by the governor or election by the members.

Procedures for the nomination and appointment of board members should be specified. The most advisable option is to solicit the names of prospective members from professional organizations and agencies in appropriate fields of expertise. The appointing authority should retain the power to make the final selection. This would allow the flexibility needed to hand-pick board members after conducting interviews and evaluating the nominees' expertise and other qualifications, including commitment to active participation in the advisory board's activities. Such a procedure makes it less likely that a board will include members who fail to attend and participate consistently.

Another option is for the appointing authority to shop around, making inquiries regarding individuals who are recognized for their expertise in their fields and professions. Good candidates could then be "drafted," allowing professional organizations to choose members to represent their area of expertise. This has the advantage of creating strong relationships with the organizations making such selections, but has the disadvantage of giving the final say to those groups.

It may be advisable to have members appointed by the chief elected executive and confirmed by the legislative branch of government. For a state-level board, it will be helpful to include a member from each house of the legislature.

4. Definition of the board's general powers and duties.

The executive order or legislative enactment creating the board should clearly define its powers and duties. Powers that may be conferred on the advisory board may include the following:

- Authority to appoint committees from its own membership which may also include nonmembers at the board's discretion. Power to appoint advisory committees from interested public and private groups and appoint ex officio members who shall not be entitled to vote but are allowed to participate in discussions and provide advice.

- Authority to contract for professional services and research required by the board or required for the performance of necessary work and services which, in the board's opinion, cannot satisfactorily be performed by its own officers and employees or by other federal, state, or local governmental agencies.
- Authority to accept grants, contributions, and appropriations from public agencies, private foundations, or individuals to ensure its continued function in times of budgetary ebbs.
- Authority to enter into agreements to act cooperatively with private nonprofit scientific, educational, or professional associations or foundations engaged in promoting seismic safety, including activities under the National Earthquake Hazard Reduction Program.
- Authority to administer oaths and issue subpoenas for the attendance of witnesses, the production of documents, and testimony in the conduct of any hearing, investigation, or study.

5. Establishment of and statement of objectives for the state's earthquake risk management program.

   The executive order or legislative enactment creating a board should clearly state its principal purpose: developing and promoting a comprehensive and consistent earthquake risk management program. The program should set priorities and schedules, recommend funding sources and amounts, as well as other resources needed to reduce earthquake vulnerabilities statewide significantly by one or more long-term target dates. The board should be authorized to explore and report what needs to be done, who needs to do it, what the probable costs will be, and what degree of priority should be accorded the principal remedial measures. (See Section 8 for a discussion of strategic planning.)

6. Definition of the board's risk-management responsibilities.

   The executive order or legislation creating a board should define the board's responsibility for any or all of the following:

- Setting goals and priorities for the public and private sectors.
- Requesting appropriate state agencies to devise criteria to promote earthquake safety.
- Analyzing post-earthquake recovery issues in cooperation with the state agency providing recovery services.
- Recommending program changes for state and local agencies and the private sector to improve earthquake risk management.
- Reviewing recovery and reconstruction after damaging earthquakes and making appropriate recommendations.
- Gathering, analyzing, and disseminating information.
- Recommending and sponsoring training to improve the competence of personnel.
- Helping coordinate earthquake safety activities of government at all levels.
- Establishing and maintaining working relationships with other federal, state, or local boards, departments, and agencies, as well as private, nonprofit, and volunteer organizations.
- Providing information to other agencies from the National Earthquake Hazard Reduction Program and principal state agencies involved in earthquake risk management.
- Encouraging research that will contribute to improved seismic safety and risk management.
- Encouraging the translation, dissemination, and use of research findings and other knowledge.

7. Promotion of an earthquake risk management program.

   The executive order or legislation creating a board should empower it to promote an earthquake risk management program prepared in consultation with the appropriate state and local agencies, the private sector, and the legislature. This will require authorization for the board to:

- Review proposed legislation related to earthquake safety, advise the governor and legislature concerning

the proposals, and recommend needed legislation.

- Recommend the addition, deletion, or modification of state agency standards to help reduce risk and promote mitigation.
- Conduct hearings, investigations, inquiries, or studies to investigate seismic safety problems and issues as well as the effects of seismic events.
- Review the state's budget and review grant proposals for earthquake-related activities and advise the governor and legislature on them.

8. Authorization to consult with other agencies and organizations.

   The executive order or legislation creating the advisory board should authorize it to consult with appropriate federal, state, and local agencies, the private sector, volunteer groups, and the legislature. It may be advisable to authorize the board to hold joint hearings with other groups and conduct other activities as necessary for the development and maintenance of such a program.

9. Authorization to employ an executive director and employees.

   The board will need the authority to appoint an executive director or program manager, who will be responsible for managing day-to-day affairs, subject to the direction of the board and in compliance with its policies. Depending on the scope of the board's activities and financial resources, it may also be advisable to empower the executive director to recruit and employ other staff members to carry out the board's functions.

   Experience with existing statewide and local boards has demonstrated that the most effective boards are typically established and operating before they select an executive director or hire staff. In those instances where an executive director was named and a staff was established before the board is formed, it was not uncommon for staff to set the policy and goals. Not only does this compromise the concept underlying creation of the board, in some instances it also leads to a lack of involvement with staff, a failure of staff to use the expertise available from board members, and a staff agenda that is inconsistent with that of the board.

10. Authorization for per diem and compensation for expenses.

    Fiscal stress may very well make it necessary for the members of the advisory board to serve without compensation. On the other hand, members will typically devote large amounts of otherwise uncompensated time to the advisory board's pursuit of seismic safety and hazard mitigation. Equity may thus dictate that, at the very least, they be paid the state's standard per diem for each day's attendance at a meeting of the board, plus necessary travel expenses as determined by the state's fiscal control agency. Paying a small stipend for attending meetings is a useful gesture that recognizes a member's contribution to the board.

11. Authorization to establish a program for responding to earthquake predictions and other forecasts.

    The advisory board also may wish to initiate a comprehensive program to prepare the state for responding to earthquake predictions or forecasts. The program could be implemented with the assistance and participation of other state, federal, and local agencies.

The foregoing components suggested for an executive order or legislative enactment creating a board may not necessarily be appropriate for all states and can be tailored to meet a state's needs. A model executive order and a model legislative act for creation of a state-level board are contained in appendixes A and B, respectively.

Creating a Single-State Board

1. Evaluate the state's earthquake risk and risk management needs.
2. Identify representatives of appropriate state and local government and professions to plan the creation of a seismic safety advisory board.
3. Identify funding sources.
4. Decide the following:
   a. Executive order vs. legislation to create a board.
   b. Which professions and areas of expertise should be represented on the board.
   c. How should members be nominated and selected?
   d. How many members should the board have?
   e. Which members, if any, should be authorized to designate alternates.
   f. Which of the suggested components should be incorporated into the vehicle creating the board.
5. Draft the executive order or legislation creating the board.
6. Issue executive order/enact legislation creating the board.
7. Select board members.
8. Convene first meeting and commence formulation of the state's earthquake risk management agenda.

Multi-State Board

Areas of the United States encompassing millions of square miles and several states may be subject to earthquake damage from a single major seismic event. The historic record demonstrates this vulnerability. A single seismic safety advisory board set up as a coalition or partnership of the states in such an area can offer more resources than several single-state boards. A coalition may also provide a coordinating body for a group of single-state boards. A multi-state entity would be able to develop plans and advise on risk reduction programs, emergency response measures (including facilitating mutual aid among states), and earthquake recovery plans of its member states. It can be a central repository of information and equipment in the multi-state area.

A board set up as a coalition of states may be preferable to a number of state-level boards, particularly in multi-state areas subject to widespread damage from a single earthquake or where individual states lack the resources to establish an advisory board. A multi-state coalition can also work with existing state or local advisory boards to integrate earthquake risk management programs at the regional level. A multi-state board can provide a credible voice on earthquake-related issues, improve communication among member states, and promote consistent polices and programs. The board could formulate earthquake risk management programs and emergency response measures, review earthquake recovery plans of the member states, and facilitate mutual aid between member states. A multi-state board should not become embroiled in state-level politics or issues.

State Legislation and Congressional Authorization

Creating a seismic safety advisory board as a multi-state coalition is more

complicated than establishing a single-state advisory board. Each participating state must pass legislation authorizing its government to join the coalition and participate in its activities. The legislation must be reasonably consistent state-to-state, and each state should be able to participate in the endeavor as an equal partner.

Moreover, if the coalition is viewed as an agreement or "compact" between the participating states, each state must petition the United States Congress for permission to create the coalition, as required by Article I, §10, clause 3, of the Constitution. Once Congress approves the interstate compact that creates the board, the legislatures in the participating states must ratify it. (See Appendix C for an example of an interstate compact.)

Articles of Incorporation

A multi-state board can be a loosely structured association or partnership or can be organized as a corporation. Examples of corporations are the Central United States Earthquake Consortium and the New England States Earthquake Consortium. A corporation is a distinct legal entity that limits the participating states' liability for the board's debts and actions. Another important factor favoring incorporation is the continuity of corporate status. Risk management is a long-term endeavor, and the need for emergency planning and public information never ends. An incorporated board provides such continuity because it exists perpetually, until dissolved in conformance with the statutes under which it is incorporated.

Another significant factor favoring incorporation of an interstate board is the degree of autonomy incorporation affords. Control of an incorporated board is centralized in its board of directors. The directors' autonomy in managing the board can provide a uniform policy structure and a means for developing and promoting the earthquake-related programs of all participating states. There would be, of course, statutory procedures for selecting and removing directors. (See Appendix D for an example of articles of incorporation; *note, however, that laws controlling incorporation vary greatly from state to state.*)

If a coalition of states sets up a board, the articles of incorporation will set forth the purposes for which it is formed and the powers granted. In most instances the articles of incorporation will also specify the number of directors authorized to serve on the corporation's board. Some states, however, allow the articles to establish a flexible board, the number of directors being set by the corporation's bylaws. Bylaws set forth the ground rules for the day-to-day management of the entity, typically including the duties and authority of corporate officers, formalities for directors' meetings, and the mechanics of voting. Although a coalition is free to tailor its board to meet its own needs, the following components—along with those mentioned already for state-level board—should be considered for inclusion into the bylaws of multi-state advisory boards. (See Appendix E for an example of bylaws.)

Creating a Multi-State Board

1. Draft a preamble with a declaration of the coalition's purpose and scope of responsibility.
2. Decide on the qualifications for membership on the board.
3. Decide on the place of business and, where appropriate, state of incorporation.
4. Decide on voting eligibility and procedures.
5. Decide on the composition of, powers of, and selection procedures for the board's directors and executive leadership.
6. Decide the powers to confer on the advisory board, such as the following:
   a. Authority to contract for or employ professional services and research.
   b. Authority to enter into agreements with private nonprofit scientific, educational, or professional associations or foundations.
   c. Authority to accept grants, contributions, and appropriations from public agencies, private foundations, or individuals.
   d. Authority to appoint committees from its membership and from outside.
   e. Authority to appoint ex officio members.
   f. Procedures for convening and conducting meetings.

Creating an Interstate Board

1. Evaluate the regional earthquake risk as well as the risk management, recovery, and emergency planning needs.
2. Identify representatives of appropriate state and local government and professions to plan the creation of the board.
3. Identify funding sources.
4. Decide the following:
   a. Whether to incorporate the coalition of member states or to set it up as a loosely structured association or partnership.
   b. Which professions and areas of expertise should be on the board?
   c. Which components will be incorporated into the vehicle creating a board.
5. Each state must pass legislation authorizing its government to join the coalition and participate in its activities.
6. Each state must submit a petition to the United States Congress asking permission to create the coalition by interstate compact.
7. Each state's legislature must ratify the compact.
8. Select board members.
9. Convene first meeting and formulate an earthquake risk management agenda.

Confederation of Local Governments

A seismic safety advisory board can be set up as a confederation of local governments. As previously noted, local governments have significant earthquake responsibilities. Moreover, the earthquake-related issues for local government may require a more hands-on approach differing from those of other levels of government. Local agencies must be heavily involved in preventive actions related to buildings and land-use planning as well as immediate on-the-scene response to earthquakes. This fact, coupled with America's strong local home-rule tradition, suggests that multi-jurisdictional, intrastate advisory boards can provide important direction in the planning of local governments and local business organizations.

Single- or limited-purpose regional organizations are increasingly important in many metropolitan areas. Such multi-jurisdictional, intrastate boards can provide important direction for the planning and development for local and regional organizations and help advance the cause of seismic safety. A board may be well suited for outreach to local private-sector organizations, schools, and local governments, including special purpose districts. Moreover, such a board can be a useful adjunct to either a state or multi-state coalition board.

Typically, an advisory board set up as a confederation of local governments will become a legally authorized entity by state legislation. Like a state board, enabling legislation provides it with a legislative mandate that defines its powers and duties. Although an ad hoc committee or association of local governmental officials is the quickest way to establish a board that represents a confederation of local governments or functions as an advisory board to a state-level agency, creation by legislation may have the same overriding advantages noted earlier

with regard to state boards. In meeting common seismic safety needs, local governments may find it advisable to include at least some of the following components in the legislation or the bylaws:

- Prepare model plans, draft legislation, and model policies on land use, zoning, building codes, redevelopment, and new community development.
- Develop local outreach programs for private-sector organizations, schools, other local governments, and special purpose districts, including public information and cooperative programs with the print and broadcast news media.
- Establish an information resource center with appropriate earthquake-related educational materials.
- Establish of an overview body to assess the impact of damaging earthquakes, recommend appropriate actions, and monitor progress.
- Develop local mutual assistance agreements.
- Develop plans and procedures to reestablish governmental services and business services after earthquakes.
- Coordinate activities with risk management, emergency service providers, and local governments.

Creating a Local Government Board

1. Evaluate local earthquake risk and risk management needs.
2. Identify representatives of local government, the professions, higher education, the business and legal communities, and volunteer organizations to formulate a plan for initiating the board.
3. Identify funding sources.
4. Decide the following:
   a. Should the board be incorporated?
   b. Which professions and areas of expertise should be on the board?
   c. What scope and powers should the board be given?
5. Each participating local government must draft and enact an ordinance authorizing membership in the consortium.
6. If appropriate, draft and enact state-level legislation authorizing the local governments to join and participate in the board's activities.
7. Provide for the selection of board members.
8. Provide for the board's first meeting and initiate work on a earthquake risk management agenda.

Creating a Private-Sector Board

Private-sector organizations can also create a broad-based board to address common concerns. The private sector has many of the resources needed for a viable board: in-house property and asset managers, risk managers and safety departments, structural and civil engineers, geologists, and individuals familiar with land-use and environmental regulation.

Telecommunications, transportation, financial, and insurance businesses typically have state-of-the-art expertise in communications and data transmission that are relevant to mitigating earthquake-related damage to lifeline services. A private-sector advisory board can use the pool of multi-disciplinary expertise to address common concerns or risks just as easily as a public-sector board. In areas where the private sector lacks expertise, a private-sector board can invite

academicians, earth scientists, or civil servants to volunteer their services.

Even if governments do not establish a board, there are valid reasons for private-sector institutions to take the initiative in creating one. In a technologically complex and regionally interdependent economy like that of the United States, a damaging earthquake can cause a widespread disruption of commerce and crucial business support systems, including public utilities and transportation. Businesses in an earthquake-damaged area may be unable to manufacture vital components for goods assembled and sold in other regions of the country. Trading relationships may be severed and the financial markets affected. The insurance industry may need to liquidate assets to pay claims.

A private-sector board would be able to recommend seismic safety goals, practices, and policies—not only within the business community, but for governmental consideration as well. Moreover, a properly constituted private-sector board would be able to monitor program implementation and evaluate effectiveness, while avoiding anti-trust-related allegations of collusion, price fixing, or anti-competitiveness.

Creating a private-sector board need not be complicated. Although the board could be a loosely structured association or ad hoc committee of concerned business people, it is usually preferable to organize it as a nonprofit corporation. (See the discussion of the incorporation of interstate coalitions for details.) Earthquake risk management is a long-term endeavor; the need for emergency planning and public information never ends. An incorporated board may provide the requisite continuity. Incorporation also confers a degree of autonomy, helping the board prepare a credible earthquake-related program for all or most participating businesses.

Creating a Private-Sector Board

1. Evaluate the private sector's regional earthquake risk and risk management needs.
2. Identify representatives of businesses to formulate a plan for creation of a board.
3. Decide the following:
   a. Should the board be incorporated?
   b. Which business and professions should be on the board?
   c. What should be the scope and powers of the board?
4. Provide for selecting board members.
5. Find a sponsor willing to provide physical facilities for the board.
6. Provide for the board's first meeting and initiate work on an earthquake risk management agenda.

Selecting Advisory Board Members

The methods and care used in selecting members are critical in shaping the nature and ensuring the success of the board. Every member should have a "can-do" attitude. The first step is deciding which professions and fields of expertise need to be included. Earthquake concerns cut across traditional disciplinary boundaries. A broad perspective on seismic safety is essential to help a seismic safety advisory board achieve a well-balanced program. The board might include representatives of earthquake-related governmental agencies and private-sector organizations, as well as experts in such fields as architecture, planning, fire protection, medicine, law, public utilities, insurance, finance, electrical engineering, mechanical engineering, structural engineering, geotechnical engineering, geology, seismology, education, emergency services, public policy, the media, contracting, and land development.

Although an advisory board will not necessarily need representatives from each of these areas, the membership should be multi-disciplinary and well balanced (perhaps including a member representing the public at large) so that no one group or discipline dominates. Seismic safety policies should be formulated in consultation with the private sector. Including private representatives of the commercial and manufacturing sectors along with nonprofit scientific, educational, professional associations or foundations engaged in promoting seismic safety—and even the public at large—will prevent the development of organizational biases and procedures that may tend to insulate even the best organization from perceptive and innovative practices. Integration of the public and private sectors promotes the consistency in policy that is a must if a seismic safety advisory board is to benefit its constituency and ensure accountability.

Selecting the Members

Methods of selecting individuals to serve on the board can be critical in the board's success. Prospective members should be leaders in their fields, whose intellectual integrity is recognized by their peers and the organizations representing their professions. Equally important, nominees should be knowledgeable about earthquake risks and willing to devote substantial amounts of uncompensated time to the board's pursuit of seismic safety and hazard mitigation. Each member should be a "spark plug" who can create a sense of excitement and an abiding desire in his or her contemporaries to be a part of an organization that is accomplishing something.

Nominees must want to be on the board. At the very outset, they should be advised that board membership is a job, not an honor. Nominees should accept appointment to a seismic safety advisory board with the understanding that the position carries significant public service responsibilities. Members not only serve on the board itself but as ambassadors to their constituencies and other audiences, interpreting the mission of the board, defending it when it is under pressure, and representing it within their professional organizations and communities. They also must be sponsors of the board, assigning a high priority of their personal time and effort to the advisory board. In recruiting members, it is not unrealistic to ask them to accord as high a priority to the work of the board as they do to their efforts in their own professions. In addition to a commitment to the work of managing earthquake risks, they must also be able to work effectively in

achieving a consensus with colleagues from other backgrounds.

The relationship between the legislature and the board may be enhanced by requiring that the board's members be confirmed by the legislature and providing that the board's membership include one member from each house of the legislature. The legislators or their staffers (sitting as alternates) can provide the board access to the legislature's leadership and may facilitate the successful translation of seismic safety advice into public policy.

It may be advisable to have members appointed by the chief elected executive and confirmed by the legislative branch of government. If the board is established as a state-level body, it will be helpful to include a member from each house of the legislature.

How Many?

Although Arkansas' 47-member seismic safety advisory board has proven to be quite effective, experience by other existing boards suggests that the number of board members is best kept to a manageable level—between nine and 19 members—if it is to be effective. The board should be just large enough to ensure participation by all elements of the private and public sectors with an interest in earthquake risk management, yet it should it not be so small as to be viewed as elitist or a special-interest clique. A semblance of parity should be maintained between the socioeconomic interests and the geotechnical and engineering interests represented on the advisory board. Inviting representatives of organizations and disciplines not represented on the board to serve on committees is a good way to involve these persons.

The use of alternate members (except for legislators) should be limited, if not prohibited. The use of alternates creates an impediment to the development of the working relationships necessary for the board to develop a true consensus on issues and policies. Moreover, using alternates will deprive the board of preeminent expertise, the continuity and commitment its concept is based on and its effectiveness depends on. Effective advisory boards typically prohibit the designation of alternates by members. It should be clear that board members are personally responsible to the board for their performance.

Term of Office

The viability of a board and a seismic hazard mitigation program requires a broad consensus. The term of office for members of the board should be long enough to provide for continuity in the board's policies. Four years is probably a good starting point, with reappointment possible. Initially, it may be advisable to appoint one-half of the members to terms that expire two years after appointment and the remaining members, including the chair, to terms that expire four years after appointment. Such overlapping terms of office tend to promote continuity since the entire board would never change at one time. Any unexpected vacancies could be immediately filled by the appointing power for the unexpired part of the term.

To prevent stagnation and forestall the growth of institutionalized views and procedures that can isolate even the best organization, the board may find it advisable to limit the terms of board members. An alternative to term limits may be for the appointing authority to evaluate a board member's performance when his or her term is completed. If a board member has performed effectively in terms of attendance, professional expertise, participation, and stewardship, then that member could be invited to serve further. In any event, the board's leaders must deal with poor performance.

Operations: Getting to Work

Once the seismic safety advisory board is established, it will hold meetings and hearings to act on seismic safety issues and problems. It will also set up committees and subcommittees to address topics that cannot or should not be handled by the full group. This section contains advice on holding meetings and hearings as well as creating and managing committees and subcommittees.

Planning Meetings

Meetings are important events that need to be properly planned and staged. Regular meetings will be the board's primary means for members to communicate with each other, gather information, and work with others in the public and private sectors. Such meetings will be the principal way of integrating both lay and expert perspectives on seismic safety issues. Meetings can also be a device for promoting communication between state and local governments, professional design and geotechnical organizations, and the private sector. These meetings also will be a primary means for exchanging information with the news media by providing a platform for individuals who are interested in and knowledgeable about seismic safety to promote, discuss, and analyze seismic safety programs and policies. The board can publicize meritorious seismic safety activities as well as inadequate ones.

The board should meet a minimum number of times each year. Nine meetings is the recommended minimum. Otherwise, it will be difficult to foster communication among earthquake-related disciplines, establish priorities, and ensure reasonable progress in board activities. The board should conduct business in a public forum with a meeting structure that fosters a variety of viewpoints and allows public comment. Agendas should be arranged so that presentations do not squeeze out discussion. Good meetings do not just happen. A concentrated effort is needed to plan and run meaningful and successful meetings. Good meetings will attract and motivate good board members.

Conducting Meetings

Public participation allows members of the public to listen to the deliberations of the board and provides an opportunity for public comment. Periodic meetings can provide a public forum to reward deserving individuals and seismic safety activities, expose earthquake-related problems, and pressure responsible agencies and entities to take necessary action. Meetings also allow board members to interact with their constituency—the public.

To ensure the right of all interested parties to be heard, however, the board should be able to limit the time allowed for testimony on an issue or by an individual speaker. Despite the merits of public participation, the board should retain the right to exclude nonmembers who disrupt the normal progress of the meeting. Persons attending public meetings of a seismic safety advisory board should be permitted to record the proceedings on a video or audio recorder if done unobtrusively. The board also should be able to stop or prohibit such a recording if it disrupts proceedings.

Advertising forthcoming meetings and encouraging interested parties to attend is a good way to reach the media and expand the board's constituency. In addition, legislation in many states and local jurisdictions re-

quires that the balance between public access and the protection of sensitive information be struck in favor of public access. It is recommended that all aspects of the decision-making process—all discussion, debate, and information gathering—be conducted in public, open to scrutiny. Unscheduled or "informal" meetings in which a quorum of members "drop-in" should be avoided. Such meetings restrict the public's ability to observe the deliberative process and contribute to, or monitor, the board's decision-making process.

A "meeting" should be considered to be any gathering of a quorum of the board, no matter how informal, if the board's business is discussed. However, this should not be construed to mean that board members should refrain from attending general conferences on issues directly or collaterally related to seismic safety. Such conferences, even if attended by a quorum of members, would not constitute a meeting so long as the members do not convene and discuss matters that are or may be before the board. When establishing meeting policies, consult the applicable open-meeting laws.

The minutes of a board's meetings are valuable for informing interested parties as well as keeping a record of the proceedings. Widespread dissemination of minutes can serve to inform a broad constituency and encourage coordination. The minutes should be reviewed by the board and approved at the next meeting. The minutes should be kept on file and remain accessible as public record, as should any recordings.

Publishing the Agenda

To encourage public access and participation, the public must be given adequate notice of the time and place of the meetings as well as the topics to be discussed. This requires timely dissemination of an agenda containing a description of each item to be discussed and the time each item is scheduled to be heard. Every agenda for a regular meeting should include adequate time for the public to address the advisory board. Even if the state's open meeting laws do not specify a minimum number of days' notice for meetings, set a minimum of ten days' notice for any board meeting or hearing.

Planning a meeting agenda is an important exercise. Include the entire board when discussing possible topics, witnesses, and meeting formats. Above all, the agenda must call for action to be taken at each meeting. Taking reasoned, informed action—doing something—at every meeting is the key to an advisory board's effectiveness and board members' participation. Board decisions should never become mere "rubber stamping" of its staff's work or the work of a committee.

Closed Sessions

Although the public should be able to observe the board's entire deliberative process, the need for candor, discussion, and information gathering will occasionally justify closed sessions. Closed sessions are typically justified for the following reasons:

- Personnel matters that may cause undue publicity or embarrassment to public employees. Candid discussion of personnel matters may require closed meetings.
- Pending litigation and matters that are within the attorney-client privilege.
- Labor negotiations.
- National and public security matters.

The meeting agenda should indicate a closed session and give the reason for it. An accurate record of the proceedings at a closed session is a must, including confidential discussions and debates. The record should be kept confidential and made accessible only to the board itself or a court in connection with litigation. It should not be considered a public record. However, decisions (even roll-call votes) should be made public.

Hearings and Investigations

It is critical that seismic safety advisory boards conduct hearings to identify, investigate, study, or evaluate earthquake-related issues or problems and showcase noteworthy actions or events furthering seismic safety. Such hearings can provide for communicating among state and local governments, professional design and earth sciences organizations, and the private sector. That knowledge and increased public awareness can lead to expedited seismic risk management. Public hearings also afford an opportunity for both public- and private-sector organizations to present testimony on seismic safety issues, providing the focus necessary to pull things together and arrive at consensus.

When a public agency is the subject of board hearings, the focus should be to assist it in addressing its seismic safety concerns, not embarrassing it. The hearing process should include the submission of concise reports, public comments at the hearing, board discussion, and preparation of a report on the findings. Such a report should not only evaluate the agency's seismic safety performance but also include the board's recommendations for improvement or compliance.

It is also important that a board be empowered to investigate any earthquake or any issue affecting seismic safety. As an example, a state-level board might be directed to determine what policy changes should be implemented by governmental agencies, how seismic safety programs have worked or not worked, and recommend legislation to ameliorate weaknesses and expedite remedial action. The evaluation process would typically include submission of reports by those involved, public hearings, and preparation of a report by the board for submission to the governor, the legislature, or both. Such a report would typically include a number of recommendations for certain agencies the legislature and governor to follow to achieve an adequate degree of seismic safety.

Committees

The board should be empowered to appoint committees from its membership and from interested public and private groups. Such advisory committees can provide it with a broad base of representation and fresh ideas. State and local representatives of disciplines such as science and engineering, emergency response, and governmental administration, drawn from both the public and the private sectors can integrate their fields of expertise into a comprehensive seismic risk management program.

> COMMITTEES SHOULD NOT FRAGMENT THE MULTI-DISCIPLINARY NATURE OF THE BOARD BY ISOLATING ANY ONE SUBJECT OR ISSUE.

A chair who is willing and able to give strong leadership is essential to a committee's effectiveness and punctuality in meeting deadlines. Choice of the chair is thus an important decision, along with selection of other members who can be counted on to contribute to deliberations.

Initially, much of a board's work may be performed by committee members with interests in specific topics or concerns. Because of their expertise, members will almost certainly be busy with other professional commitments; therefore, it is imperative to use their time and expertise efficiently. However, if a board's responsibilities expand, it may become apparent that committee

members cannot be asked to give specific issues or programs the time and effort that may be required. In such a case, adequate staff may have to be added to the board. (See Section 6 for information on staffing.)

At the outset, the board may find it advisable to form ad hoc committees to address issues that the board determines must be accorded the highest priority. These committees can write publications on key seismic risk reduction topics. By focusing on narrow topics or issues, committee members can efficiently translate their knowledge and expertise into usable information and effective government policy. This advice can be capsulated into policy reports and, if appropriate, draft legislation. Committees' activities should not fragment the board by isolating any one subject or issue; the integration of earthquake-related disciplines and issues must be preserved. Committees' products can be subjected to public hearings to gather perspectives and to give them greater visibility and media coverage.

An alternative is for the board to establish standing committees to coordinate the technical expertise available to the advisory board and translate their advice into policy recommendations. These are some of the more obvious standing committees, their makeup, and their responsibilities:

Executive Committee—Board operations require that decisions be made in between board meetings. They also raise a host of administrative matters which, although they do not merit the time of the full board, should be considered by more that the chair or staff director. Creating an executive committee to assist the board's chair, executive director, or program manager in formulating policy and procedures for the day-to-day management of the advisory board and its staff is recommended.

- *Seismic Hazards Committee*—This committee can review available scientific and engineering knowledge on the earthquakes and related geological hazards.
- *Structural Vulnerability Committee*—The committee can review the existing building and infrastructure codes and enforcement and recommend improvements.
- *Emergency Planning Committee*—This committee would recommend and review plans to marshal human, physical, and economic resources to minimize losses after an earthquake and facilitate restoration of the normal life of the board's region. The committee would recommend pre-earthquake measures to help minimize human and material losses attending an earthquake.
- *Post-Earthquake Recovery Committee*—This committee would be responsible for recommending contingency measures to guide the long-term work of recovery, reconstruction, relocation, and redevelopment. Such plans should include variable courses of action based on the earthquake's location, duration, intensity, the soil conditions, and resulting damage.
- *Land-Use Planning Committee*—This committee would describe the limits that should be placed on the use of land subject to seismic hazards so that it is designated appropriately in state and local land-use plans.
- *Local Government Committee*—This committee would study the needs of local government to determine how the plans formulated by other committees to reduce risk may be best put into effect. It would recommend changes to policies and practices to help local government exercise the authority to manage earthquake risks effectively. It would also recommend new governmental institutions as necessary.
- *Earthquake Awareness Committee*—This committee would devise and promote programs that will keep the issue of earthquake safety and hazard reduction in the public eye.
- *Earthquake Prediction Committee*—This committee would devise and promote programs that will focus on the issue of earthquake warnings, advisories, and alert levels.

Staffing the Board

Typically, much of the seismic safety advisory board's initial work will be performed by board and committee members, drawing on their experience and expertise and providing their own support. As the board's responsibilities expand, however, members will probably no longer be able to provide the time and effort that may be required. The efficiency of a board made up of high-level, successful people requires support. Adequate staff support may have to be added.

The board will require both administrative and technical support. Beyond the obvious need to make meeting arrangements, do correspondence, reports, keep financial records, and so on, the board's planning effort should determine which avenues of expertise are needed and which staff positions are required. This section will provide suggestions about staffing a seismic safety advisory board and using personnel effectively. Appendix F contains model duty statements for the positions described.

Staff and Director

Staff work can be done by employees from supportive state or federal agencies, by college-level interns, or volunteers. If funds are available, contractors may be a good way to provide staff and retain flexibility.

A board will probably need to hire a director to plan, direct, and organize administrative matters related to the board's functions and responsibilities. These responsibilities would include hiring and supervising other staff and managing the board's office. The director would prepare grant proposals, and administer the budget.

The director can also assist the board in searching for qualified personnel to serve on committees and for ex officio members. The director would be a primary contact with the public, media, governmental officials, and other entities. The director also will need to maintain contact with decision makers in the public and private sectors. The director will oversee the preparation and publication of reports and dissemination of information pertaining to the board's work.

Probably most important, the director must be able to coordinate the day-to-day activities with those of other agencies with the intent of providing the leadership and coordination of public and private efforts necessary to attain higher levels of seismic risk management. These responsibilities will include meeting with and advising directors and officials of other state agencies as well as maintaining working relationships with other public or private organizations to further an effective seismic safety program.

Technical and Professional Staff

The mix of personnel needed on staff will depend on a board's strategic and risk management plans, the issues and tasks given highest priority, and the groups and entities that will be involved. The board does not need a large bureaucracy to function effectively. Some professional staff will, however, probably be essential. The need for staff positions must be documented and justified in terms of the work to be performed to maintain financial support.

The board's staff will gather information, support the work of committees, help draft reports, and assist in disseminating ideas. This may mean taking technical data from scientists and engineers and translating

it into easily understood and usable policy information. Therefore, staff members not only need to be conversant with specialized disciplines, but must also be generalists who can bridge between the technical community and policy makers. They will need strong writing and speaking skills and credibility among their peers. Preferably, staff members will have developed networks within their professions.

Because of the multi-disciplinary nature of a board's work, it will require the assistance of skilled professionals in a number of areas. If the board's fiscal and organizational means are limited, it may be necessary to rely on the technical and professional resources of other public-sector agencies or those donated by the private sector. This may require full-time staffers to perform more than one of these functions or outside professionals to perform such work.

Particularly at the outset, staff members may need to be generalists who can deal with the myriad issues associated with the board's start-up. However, the board may require assistance of the following professional and technical personnel:

- Legal counsel
- Engineering geologist
- Structural engineer
- Architect
- Legislative specialist
- Emergency response specialist
- Recovery specialist
- Public information officer
- Research writer and editor
- Land-use planner
- Budget/financial analyst
- Grant writer

Support Staff

The board will need support staff to provide secretarial support for the board and the staff. Tasks include arranging meetings, responding to routine inquiries, handling correspondence, completing travel claims, making travel arrangements, and dealing with other fiscal and administrative matters.

The support staff would also be responsible for screening calls and visitors, keeping appointment schedules, and referring calls to appropriate staff members or advisory panel members. The support staff may include, if the staff is large enough, an office manager responsible for supervising the support staff.

Another support staff duty is taking and transcribing the minutes of meetings and hearings as well as assisting with arrangements for locations, organizing and assembling meeting materials including agendas, minutes, reports, and background information for mailing. The support staff would typically make quorum checks and report advisory board members' attendance at meetings.

Footing the Bill: Funding a Board

Who should foot the bill, and how should it be paid? Should the public in general assume major responsibility through federal, state, and local governments. Should the owners of properties benefiting from seismic safety programs contribute? Should the costs be met in other ways? These are legitimate questions that need to be dealt with.

Initially, the seismic safety advisory board should secure funding for its establishment and operating expenses and thereafter acquire funding for its earthquake risk management activities. Because public funds always seem to be in short supply, seismic safety should be recognized as a public priority so that sufficient funds can be allocated and standby devices employed to help raise additional money as needed. Equity would suggest that costs generally be prorated among those benefiting. Sometimes the public as a whole should pay the bill, sometimes the user or owner of the property should bear the main financial burden for seismic safety, and sometimes the costs should be shared.

Earthquake dangers are seldom immediately threatening—until an earthquake strikes. As long as things remain quiet seismically, public and private motivations focus on more immediate problems. Nevertheless, progress can be made, given a strong commitment, sustained effort, and a realistic plan for financing what needs to be done.

Federal Funds

One avenue of financing is grants or federal matching funds from agencies such as the Federal Emergency Management Agency. Although state and local governments often have to provide a certain amount of match money to secure federal funding, matching funds can substantially defray the cost of establishing and operating a board.

Typically there are cost-sharing requirements as a condition of receiving such funds. The most current regulations will always be found in the Code of Federal Regulations (44 CFR 361).

State General Funds

If a seismic safety advisory board is a governmental entity, fairness may dictate paying the costs of its operations and risk management activities benefiting the general public out of government's general fund. In this age of great mobility, virtually everyone is at some time in earthquake-prone territory or economically dependent on the survival and normal functioning of communities that are either located in earthquake areas or vulnerable to damage to transportation, power, and other lifeline systems that traverse earthquake-prone areas.

Inasmuch as the public will benefit directly and demonstrably from the board's operations, financial support from general fund sources is justified and should be pursued. Moreover, if state government requires local governments to establish seismic risk management programs, economic necessity may dictate that at least a portion of their costs be met from the state's general fund.

Special Assessments

An alternative way to finance a board's activities is to assess a fee or surcharge on regulated activities that will benefit from the board's operations. This would shift a portion of the cost of the

board to property owners and facility users. Devices to generate funding can use an existing collection mechanism, and should not be so burdensome as to provoke a public outcry. For example, a surcharge of less than a dollar on an existing collection mechanism, such as building permits could finance the portion of the board's staffing and operations costs focusing on potentially hazardous buildings.

Surcharges, seismic safety assessments, or fees might be set on a sliding scale. Projects involving greater seismic risks would contribute more. It should be noted, however, that special assessments, surcharges, and fees could, if necessary, be partially offset by general tax funds, inasmuch as the public benefits from measures that will reduce the loss of life, the number of injuries, and economic disruption. Some of the earthquake-related regulatory activities that could be subjected to a seismic safety assessment, fee, or surcharge might include the following:

- *Occupancy and Use Permits*—Depending on the size and composition of an area's building stock, a very small surcharge levied on all properties considered potentially hazardous at the time of transfer, change in occupancy or permitted use, or renewal of licensed use can generate enough revenue to staff and operate an effective board. A fee could be charged on admission prices to places of public assembly to support the board's activities related to reducing seismic hazards in places that have a high potential for deaths or injuries in an earthquake.
- *Building Permits*—A very small assessment, surcharge, or fee could be absorbed as a part of costs for each building permit (commercial or residential).
- *Special Fees in Earthquake Hazard Zones*—A board's hazard-reduction activities will have broad benefits to the public as a whole, justifying special fees or surcharges on all new subdivisions or buildings planned for property within designated earthquake hazard zones.
- *Utilities*—A seismic safety fee of only pennies on utility bills (telephone, energy, water, or sewer service) to pay for hazard-reduction activities for these lifelines seems justifiable.

Bond Issues

State and local governments typically use general obligation bonds and revenue bonds to make long-term capital improvements in buildings, highways, and other elements of their infrastructure. Although bond measures are not generally used to fund the day-to-day operations of governmental agencies, a board should attempt to acquire an allocation of a very small percentage (typically less than 2 percent) of any bond fund proposal to ensure that the projects funded with bond money incorporate seismic safety concerns. The suggested allocation would enable the board to evaluate and monitor the seismic safety of bond-financed programs.

Other Sources

A seismic safety advisory board should have the authority to accept grants, contributions, and appropriations from other public agencies, private foundations, or individuals to finance its staff and operations. Corporate grants have been made to existing boards and should not be overlooked as a source of funding. To facilitate use of these funds, the board should be empowered to enter into interagency agreements and contracts to act cooperatively with other governmental agencies, private scientific, educational, or professional associations, or foundations engaged in promoting seismic safety.

An alternative to cash funding might be contribution of in-kind services, such as legal, engineering, or other professional services. Needed equipment may be available from surplus equipment stores. Airlines may

be willing to contribute tickets for some activities.

An advisory board's work is valuable. Publications can be sold at a reasonable price to recoup costs and possibly generate a modest surplus to pay for reprinting, for example. Training courses and conferences can be financed by registration fees.

What the board lacks in funding can be made up for with creativity and innovation. One goal might be to leverage a variety of funding sources. One existing board strives to match every dollar of government money with private-sector money.

Footing the Bill: Funding a Board

Who should foot the bill, and how should it be paid? Should the public in general assume major responsibility through federal, state, and local governments. Should the owners of properties benefiting from seismic safety programs contribute? Should the costs be met in other ways? These are legitimate questions that need to be dealt with.

Initially, the seismic safety advisory board should secure funding for its establishment and operating expenses and thereafter acquire funding for its earthquake risk management activities. Because public funds always seem to be in short supply, seismic safety should be recognized as a public priority so that sufficient funds can be allocated and standby devices employed to help raise additional money as needed. Equity would suggest that costs generally be prorated among those benefiting. Sometimes the public as a whole should pay the bill, sometimes the user or owner of the property should bear the main financial burden for seismic safety, and sometimes the costs should be shared.

Earthquake dangers are seldom immediately threatening—until an earthquake strikes. As long as things remain quiet seismically, public and private motivations focus on more immediate problems. Nevertheless, progress can be made, given a strong commitment, sustained effort, and a realistic plan for financing what needs to be done.

Federal Funds

One avenue of financing is grants or federal matching funds from agencies such as the Federal Emergency Management Agency. Although state and local governments often have to provide a certain amount of match money to secure federal funding, matching funds can substantially defray the cost of establishing and operating a board.

Typically there are cost-sharing requirements as a condition of receiving such funds. The most current regulations will always be found in the Code of Federal Regulations (44 CFR 361).

State General Funds

If a seismic safety advisory board is a governmental entity, fairness may dictate paying the costs of its operations and risk management activities benefiting the general public out of government's general fund. In this age of great mobility, virtually everyone is at some time in earthquake-prone territory or economically dependent on the survival and normal functioning of communities that are either located in earthquake areas or vulnerable to damage to transportation, power, and other lifeline systems that traverse earthquake-prone areas.

Inasmuch as the public will benefit directly and demonstrably from the board's operations, financial support from general fund sources is justified and should be pursued. Moreover, if state government requires local governments to establish seismic risk management programs, economic necessity may dictate that at least a portion of their costs be met from the state's general fund.

Special Assessments

An alternative way to finance a board's activities is to assess a fee or surcharge on regulated activities that will benefit from the board's operations. This would shift a portion of the cost of the

board to property owners and facility users. Devices to generate funding can use an existing collection mechanism, and should not be so burdensome as to provoke a public outcry. For example, a surcharge of less than a dollar on an existing collection mechanism, such as building permits could finance the portion of the board's staffing and operations costs focusing on potentially hazardous buildings.

Surcharges, seismic safety assessments, or fees might be set on a sliding scale. Projects involving greater seismic risks would contribute more. It should be noted, however, that special assessments, surcharges, and fees could, if necessary, be partially offset by general tax funds, inasmuch as the public benefits from measures that will reduce the loss of life, the number of injuries, and economic disruption. Some of the earthquake-related regulatory activities that could be subjected to a seismic safety assessment, fee, or surcharge might include the following:

- *Occupancy and Use Permits*—Depending on the size and composition of an area's building stock, a very small surcharge levied on all properties considered potentially hazardous at the time of transfer, change in occupancy or permitted use, or renewal of licensed use can generate enough revenue to staff and operate an effective board. A fee could be charged on admission prices to places of public assembly to support the board's activities related to reducing seismic hazards in places that have a high potential for deaths or injuries in an earthquake.
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Strategic Planning: The Long View

Strategic planning is the process of defining the direction for an organization so it can reach its goal. Strategic planning is planning for the long haul. More specifically, strategic planning means identifying the board's mission, goals, and objectives and then devising policies and strategies to achieve those ends. Strategic planning will allow the board to anticipate the probable impact of its decisions on its constituency and to prepare a more detailed plan that specifies tasks, responsibilities, schedules, and costs for the endeavors to be pursued. Even though the mission and goals will not change much over time, strategic planning should include a formal evaluation and revision process to keep the objectives and activities current.

> THE STRATEGIC PLANNING PROCESS IS AS IMPORTANT AS THE PLAN ITSELF.

The strategic plan will serve as a "road map" for setting priorities, guiding decisions, and assessing progress in lowering seismic risk. This section describes a three-phase strategic planning process in the context of a statewide constituency; however, it is also fully applicable to a multi-state, local, or private-sector constituency.

The Process

The strategic planning process is as important as the plan itself. The process will result in the identification of "stakeholders" (persons who will be responsible for—or affected by—the resulting activities) and potential leaders for the cause of seismic safety. It can create open, collaborative channels of communication and lasting commitments.

The first phase is information collection—the collection of information and opinions from board members and others who are essential to earthquake risk reduction and management efforts. Because perceptions will affect the program, they are as important as facts. The assessment must provide a current and comprehensive perspective of the state's strengths, weaknesses, opportunities, and obstacles. The information obtained in this phase will be the foundation of the strategic plan.

The second phase is the evaluation and integration of the information collected. The information is presented and discussed in an open forum. A workshop or series of workshops involving the stakeholders and decision makers should be held to consider the information gathered and chart a course of action. This collaborative exercise is a key element of strategic planning.

Formulating the strategic policies is the third phase, in which the results of the workshop are melded to develop the long-range policy guidance needed for preparing a detailed, action-specific, shorter-term earthquake risk reduction and management plan. Not only should the strategic plan be adopted by the board, but a commitment is needed to refine, improve, and update the strategic plan periodically.

Phase I: Collecting Information

The objective of the information collection phase is to obtain a current and comprehensive assessment on the state's earthquake risk reduction and

management needs and to identify stakeholders and leaders.

Crucial to the strategic planning process is identifying and interviewing stakeholders—individuals and entities with earthquake-related responsibilities who have significant influence on seismic risk management efforts. Stakeholders may represent external sources (the private sector, the legislature, local government) and internal sources (board members and staff). The selection of stakeholders must be balanced to ensure that no one group or discipline dominates.

Stakeholders should include persons with varied experience in academia, government, and the private sector, and other professionals, including earth scientists, engineers, emergency managers, mitigation specialists, and representatives of human services agencies.

> THE INFORMATION FROM INTERVIEWS WILL PROVIDE THE ISSUES DISCUSSED AT THE WORKSHOP.

The interview is used to obtain perspectives on the board's earthquake-related needs and, if appropriate, on the board's past performance. Questions should relate to strengths, weaknesses, obstacles, and opportunities for organizing existing conditions and programs within the field as well as required legal mandates.

In depth, face-to-face interviews by a strategic planner or other qualified personnel are better than telephone interviews and written solicitations. The interviewer must elicit information and perceptions about vulnerable facilities and seismic hazards, the potential for managing the risk and reducing vulnerability, and planning for emergency response and recovery. The interviewer should seek to identify clients and interest groups, potential leaders, personnel and monetary resources, and other sources of support or opposition to the board's programs and objectives.

The information should be collected on "issue statement" forms. Each completed form should include a brief description of the issue or idea, supporting information, and recommended action. (Appendix G is an example of an issue statement.)

The information collected should be separated into four categories:

- *The state's strengths* (to capitalize on), such as academic and professional resources offering expertise in earth sciences and engineering, knowledgeable local government building officials, and the resources of emergency response and recovery organizations.
- *The state's weaknesses* (to strengthen), such as untrained building officials, out-of-date emergency response plans, and inventories of vulnerable buildings and lifelines.
- *Opportunities* (to exploit), such as private-sector interest in building codes, recent seismic events, and pending redevelopment programs.
- *Obstacles* (to overcome), such as shrinking sources of funding, loss of leadership, competing interests or needs, public apathy, and lack of awareness.

The information generated by this exercise will identify numerous issues and provide an overall profile of the topics to be considered during Phase II at the workshop. Issues can be grouped into themes. Together they will provide an initial assessment of the current situation. It should be stressed that the collection of information and the needs assessment do not require an excessive expenditure of time or money for detailed studies; indeed, detailed studies may be an element of the earthquake risk reduction and

management plan discussed in the next chapter.

Phase II: Evaluating and Integrating

The purpose of the second phase is to assess the factual and perceived information and to agree on (and refine) a mission statement, goals and objectives, and prioritized action items.

One two- or three-day off-site workshop or two or three one-day workshops are recommended as a way to deliberate, evaluate, and integrate information using a variety of participants.

The workshop should explore basic assumptions, discuss desired outcomes, and consider potential timetables. Promising implementation strategies can be identified, along with processes for evaluating and measuring progress and making mid-course corrections. It is critical that proposed activities be realistic, given the current political climate and fiscal realities. In the end, a consensus should be reached regarding the board's overall mission and its fundamental goals and objectives.

Workshop participants must to be selected carefully to include advisory board members, staff, and representative stakeholders who will influence or be responsible for the implementation of the strategic plan. If successful, the workshop will assist the board in solidifying its constituency, improving visibility, enhancing credibility and improving access to the expertise it will need to make its strategies effective. Since the number of persons attending the workshop must be kept to a manageable number, the selection process is important, and potential participants must be carefully screened.

Each attendee should receive in advance a clear statement of the workshop's purpose and expectations to encourage participants to come well prepared. Highlights of the information collection phase should be summarized and distributed in brief issue statements prepared in a uniform format (see Appendix G).

The first order of business at the workshop is to review objectives and expectations. Sufficient time should be allowed for participants to review all issue statements and to become comfortable with the process and each other. After the opening plenary session, participants should break into smaller working groups to discuss the results of the data collection phase.

> PHASE II SHOULD CONSIST OF EVALUATING BOTH INFORMATION AND PERCEPTIONS. IMPLEMENTING AND EVALUATING STRATEGIES CAN THEN BE IDENTIFIED.

The issue statements prepared in Phase I identify what must be addressed. Those statements also facilitate the formulation of action items by the working groups. It may be helpful if the issue statements are kept to a manageable number and if redundant statements are consolidated without losing the intent behind them. Related statements should be grouped. For example, a dozen statements concerning schools could be consolidated into three school-related topics such as strengthening school buildings, mitigating nonstructural hazards, and educating teachers and students on appropriate earthquake response.

Working groups can be assigned categories based on themes or issue statements. For example:

- Vulnerable buildings
- Societal vulnerability
- Seismic hazard identification
- Schools
- Public awareness and constituency
- Professional training
- Emergency response planning and mutual aid

Effective working groups typically have at least three to five persons. The group selects a chair, a recorder, and spokesperson to present the group's reports to the plenary session.

Working groups should consolidate the principal issues raised by the issue statements into proposed action items. Brainstorming (without criticizing or judging ideas) should be encouraged initially, followed by critical discussions. Action items are written up to summarize terms the following points:

- *Assumptions*—The premise for proposing the action item. Assumptions set the parameters and limiting conditions, including legislative, contractual, policy mandate, or other special considerations.
- *Objectives*—The proposed outcome or result of the action item. The components of the objective are:
  1. An assignment of responsibility
  2. A statement of the results expected or the desired level of performance
  3. A schedule for performance
- *Implementation*—The resources and research required, the foundation to be laid to perform the task, obstacles to be overcome and the basic implementation strategy.
- *Rationale*—The reasons underlying the working group's recommendations.
- *Consensus*—The desired areas of agreement needed among organizations and constituents on policy issues.
- *Evaluation*—Feedback mechanisms to assure that the work is on the right track.

Typical action items may include:

- Drafting proposed legislation to address building standards
- Creating voluntary programs to retrofit existing buildings and lifelines
- Training design professionals in seismic principles
- Improving quality control of new construction
- Abating nonstructural hazards in schools
- Supporting efforts to improve emergency response capability
- Encouraging earthquake response exercises
- Preparing recommendations (not regulations or mandates) for agencies with earthquake-related functions

After the working groups have had time to complete most of their work, the workshop should reconvene in plenary session. The products of the working groups are presented and reviewed. All workshop participants should have an opportunity to evaluate and discuss the recommendations. The entire group needs to clarify assumptions, integrate the variety of activities proposed, and decide on priorities. After discussion, the entire group should have a complete list of items.

Setting priorities is a critical step. The "nominal group technique" is one way to make decisions (see Figure 8-1 for an overview of the technique). The nominal group technique is a form of brainstorming that allows all participants an equal voice in establishing the whole group's priorities and rank-ordered selection of ideas. It is well suited to collecting different types of information, converting that information into reasonably consistent measures, identifying where breakdowns occur, and designing an improved process.

After workshop attendees discuss and rank the action items, they will have an opportunity to write (or review) a mission statement. A mission statement is a succinct statement of the fundamental objectives of the organization. It should be brief enough to be easily understood and remembered, general enough to cover the scope of the organization's work, yet provide specific direction. A mission statement may include elements addressing who the board is, what it is intended to do, and how it does it. This additional information, however, should not detract from the aim of being succinct and easily

understood. A possible mission statement is as follows:

> The [state] Seismic Safety Advisory Board's mission is to improve the well-being of the people of [state] through cost-effective measures that lower earthquake risks to life and property.

Participants will also discuss and agree on long-term, fundamental goals. A goal is a statement of results to be achieved by the end of a period of time. Specific objectives or implementation strategies are identified and a process for evaluation (measuring progress and making mid-course corrections) can be discussed.

A sample workshop design, including a model agenda, is included in this manual as Appendix H. The design and agenda were adapted from an existing board's strategic planning session. The workshop will not result in a finished product. Follow-up work, including an opportunity for workshop participants to review their written products, will be necessary.

PHASE III PULLS TOGETHER THE PRIORITIES AND STRATEGIES FOR IMPLEMENTING THE BOARD'S MISSION.

Phase III: Deciding on Strategic Policies

After the workshop the board can refine the priorities and establish strategies for managing actions and for developing a shorter-term earthquake risk reduction and management plan. In this phase the board's contractors, staff, or volunteers first will need to compile and edit the workshop's results. A draft should be circulated to participants for comments before the board decides on the steps to take. After the review the board should formalize its mission statement, goals, objectives, and action items. The board will be faced with tough decisions when balancing its own resources with the "wish list" that came from the workshop.

THE BOARD MUST ESTABLISH A MECHANISM FOR FEEDBACK AND A WAY TO EVALUATE PROGRESS.

The next step will be to work out the details for action items. These details include tasks, schedules, responsibilities, needed resources, and references. At this point the board can either prepare a work plan and begin work or develop a comprehensive earthquake risk reduction and management plan described in the next section.

Conclusion

A collaborative strategic planning process can prepare the conceptual framework of a risk reduction and management plan. This process gives participants an opportunity to exchange views on an interdisciplinary basis, build understanding and commitment among those who will play a key role in carrying it out, and take ownership of the issues and programs. The process can prevent one agency, discipline, or point of view from pursuing a narrow, isolated interest when other action items are given higher priority or otherwise must go first. By involving persons who can promote the needs of "users"—who often are policy makers, school administrators, building users, design professionals, etc.—the mission and action items can focus on reducing and managing earthquake risk in more informed and effective ways.

Although the results of a board's efforts will not be perfect the first time, it is a critical step toward focusing the resources of the organization. The board may find it best to follow the plan and then repeat the strategic planning process in six months or a year to refine and improve the results.

Figure 8-1—Overview of a technique for conducting a workshop

The Nominal Group Technique

The nominal group process can be conducted by using the action items as topics of discussion. The process consists of five steps.[1]

1. *Problem statement*—The matter to be decided is stated, discussed, and agreed on.
2. *Quiet period*—Five minutes of silence is provided to allow participants to consider ideas and solutions.
3. *Round robin*—Each participant responds, one at a time, by identifying each action item he or she feels is critical. If an action item merely restates another in slightly different terms, the two versions can be merged. This continues until all items are on flip charts for all to see.
4. *Bull session*—Participants discuss issues to clarify, consolidate, edit, or eliminate them. Once the list is complete, participants should be encouraged to argue why they believe certain items are important.
5. *Prioritization*—The ranking process recommended recognizes the difficulty in comparing and ranking disparate items.
   - Participant should pick the most important item and assign it the number that represents the total number of items being ranked.
   - The least important is given a "1."
   - Each person then selects the most important of those remaining and assigns it a score one less than before.
   - Then the least important of the remaining items is given a "2."
   - This process is repeated until arriving at the center.
   - Then the participants' rankings are collected, and the collective ranking for each action item is computed by adding. The action item with the highest total score is the one considered most important to the workshop participants.

As an example, a group of five participants might consider the following five hypothetical action items, ranking them accordingly:

Issues	Ranking by Participants					Total
A. Seek funds to strengthen older hospitals	4	4	4	5	4	21
B. Evaluate the seismic safety of school bldgs.	2	3	2	2	2	22
C. Map all active faults	3	2	3	3	3	14
D. Enforce special standards for new schools	5	5	5	4	5	24
E. Do research on liquefaction	1	1	1	1	1	5

In this example the safety of school buildings was awarded the highest overall score from the five participants, making it the issue accorded the highest priority by the participants. On the other hand, the liquefaction research, with a total score of 5, is accorded the lowest priority.

[1] R. C. Whiteley, *The Customer-Driven Company: Moving from Talk to Action,* Addison Wesley, 1991, pp. 266-67.