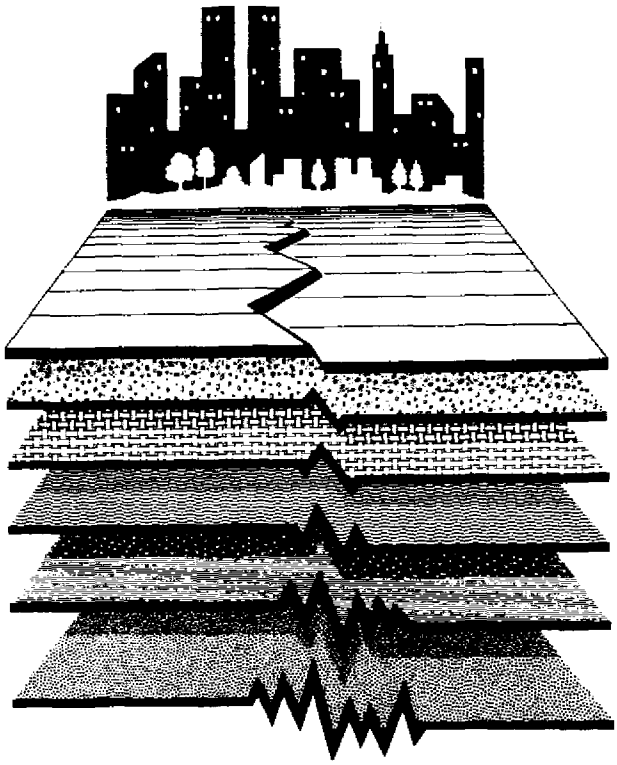
Part I
User's Guide



SMALL-TO-MEDIUM-SIZED CITY

COMPREHENSIVE EARTHQUAKE PREPAREDNESS PLANNING GUIDELINES

PART I - THE USER'S GUIDE

A. INTRODUCTION

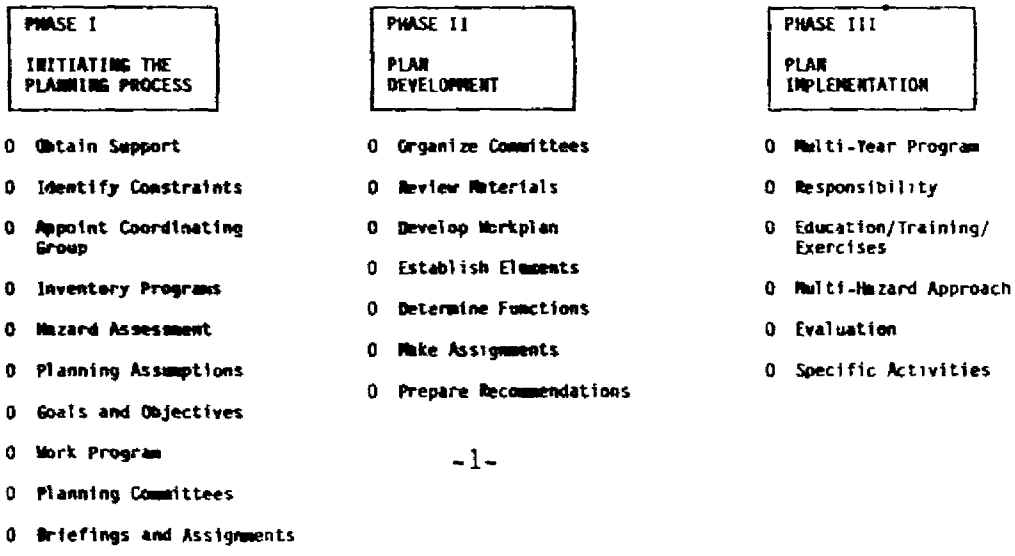
1. Purpose of the Guide

The User's Guide provides a step-by-step approach to a comprehensive earthquake preparedness planning effort. The User's Guide is divided into three major phases.

- 0 PHASE I -- Initiating the Planning Process
- 0 PHASE II -- Plan Development
- 0 PHASE III -- Plan Implementation

Each phase has several steps as shown in Figure 1.

Figure 1



The User's Guide provides a beginning point for a city either to initiate a comprehensive preparedness planning effort or to augment an existing planning effort. The User's Guide proposes greater integration and coordination of long-term seismic safety preparedness and mitigation programs, emergency response and post-earthquake recovery planning.

2. Importance of Intergovernmental Planning

Major damaging earthquakes can cause numerous deaths and injuries as well as seriously disrupt normal operating conditions over a wide regional area. The impact on a city must be measured both from an assessment of the problems within the city as well as those resulting from damage to the regional lifeline networks which serve the city. Disruption of electricity, gas, water, and sewer systems, as well as transportation and communication networks, can significantly reduce or halt day-to-day operations even in an area which has not directly experienced physical damage.

Mutual aid procedures which function well in smaller day-to-day emergencies are likely to be less effective at the time of a major damaging earthquake due to the impact of the event over a large urban area. Adjacent counties, cities, regional, State and Federal aid will all be required in support of the response and recovery activity. Because of the above, plans developed by the city must be coordinated for compatability with neighboring jurisdictions as well as with other levels of government.

3. Essential Elements to Planning Success

a. Awareness of Need

The potential for loss of life, injury and monetary cost of a major damaging earthquake in or near a metropolitan area is staggering. No one knows what exactly that cost will be, but all agree it can be in the billions. The total impact that such an event will have on the State and national economy has not been measured, but there is no doubt that physical damage and loss of productivity will have an immediate and costly impact on the tax base which provides a major source of State and local revenues. There is, of course, no dollar amount that can be put on the loss of life.

Preparedness and mitigation measures, accomplished in the long- and short-term preparedness phases, coupled with effective response and recovery planning, are all essential elements and, if implemented, will significantly reduce the time and cost associated with managing and recovering from the event.

b. Commitment

A personal commitment is required from the city executive management to fully support the earthquake planning effort. Associated with this commitment is the need to actively explore cooperative arrangements with the county, other cities, school and special districts,

and private organizations in the development and implementation of the plan. The same kind of commitment is also required to coordinate planning with the State and Federal governments.

c. Education and Training

The completion and implementation of the planning effort provides the city with the mechanism by which earthquake-related activities can be accomplished. An essential component of the effort is a training and education program focused on both public and private sector participants. Planning is not the same as preparedness. There is little value associated with a planning effort unless that effort includes education and training elements which are sufficient to ensure that the plan will work as intended.

4. Earthquake Predictions and Warnings

Earthquakes have been successfully predicted, although a reliable system for predictions has not yet been developed. In addition, efforts are moving ahead to develop impact warning systems which can provide seconds of warning prior to the arrival of ground motion.

Any scientifically credible prediction will require difficult and consequential decisions on the part of elected officials at all levels of government. Decisions may include such possibilities as the mobilization of State and Federal resources prior to the event, the imposition

of special procedures or drills at potentially hazardous facilities, the condemnation or evacuation of particularly unsafe buildings with the subsequent need for evacuation and temporary housing, and the provisions of special protection of fragile inventories.

A comprehensive major earthquake plan should consider actions to deal with predictions and warnings, as eventually they may form a significant part of the planning activity.

B. PHASE I -- INITIATING THE PLANNING PROCESS

A recommended ten-step procedure for initiating the comprehensive earthquake preparedness planning process is listed below and discussed in further detail in this section.

The steps are presented in a logical planning sequence. Although it is not necessary to complete the steps in this exact order, the omission of any one of these steps could result in costly delays later.

The ten planning process steps are as follows:

(1) Obtain support from locally elected officials

(2) Identify political and economic constraints

(3) Appoint a City Coordinating Group

(4) Inventory existing programs and support activities

(5) Conduct city-wide earthquake hazard assessment and vulnerability analysis

(6) Establish key planning assumptions

(7) Adopt goals and objectives

(8) Develop overall work program

(9) Form planning committee structure

(10) Prepare briefings and make planning committee assignments

1. Obtain Support from Locally Elected Officials

Because of the scope of a comprehensive earthquake planning program, it is essential that it receive the support and cooperation of all city departments and agencies. The best way to obtain that support is by obtaining an enabling resolution or ordinance through the City Council with support from the Mayor's Office.

To aid in obtaining this support, a briefing should be arranged for the city's executive management. This briefing should include a general introduction to the threat and the potential impact on the metropolitan portion -- of an area threatened by a major damaging earthquake. This information currently exists and can serve as the base for more detailed analysis later in the planning effort.

It is also important to obtain the support of the other local governmental, professional and industrial organizations, so that all elements of city operations, volunteer organizations and the private sector are incorporated into the planning process.

2. Identify Political and Economic Constraints

This step is intended to identify those existing conditions which may impede or influence the earthquake preparedness planning effort. This foreknowledge of constraints will assist in developing a realistic scope of work and an acceptable plan for implementation.

The City Administrative (or City Manager's) Office should be responsible for examining these issues, and preparing a guidance document to be used in Step 8.

3. Appoint City Coordinating Group

The City Administrative Officer (or City Manager) should designate a Comprehensive Earthquake Preparedness Planning Coordination Group and, if possible, serve as its chairperson. This group should be made up of key city department managers and agency heads, and will have the responsibility for carrying out Steps 4 through 10 below. In addition, this group will set the objectives for the various planning committees to be formed; assist in the coordination of planning committee work efforts; review and approve planning committee recommendations; recommend approval of the completed plan to the City Council; participate in exercises; and subsequently implement the plan within their own departments. Existing disaster councils could form the nucleus of this group if they have adequate representation. It is important to the success of the

planning effort that this group be institutionalized within the city structure.

In addition, it will be useful to have representation from school districts, volunteer organizations and the private sector.

4. **Inventory Existing Programs and Support Activities**

This step involves identifying those organizations or programs within the city that would support the earthquake preparedness planning effort. For example, the city may have an ongoing public safety program through the fire department to provide public information. In addition, it will be useful to locate and coordinate with programs having similar goals.

5. **Conduct City-Wide Earthquake Hazard Assessment and Vulnerability Analysis**

Extremely important to the planning effort will be the development of a realistic earthquake scenario(s), and a damage vulnerability assessment for city-wide resources (structures, equipment and personnel). This hazard and vulnerability assessment will be used by all planning committees as a basis for their discussions of the planning functions, and can serve as a test bed against which planning recommendations may be examined for adequacy. The assessment must consider both governmental and private sector vulnerability. This complex hazard and vulnerability

assessment may require contracting with professional consultants and/or engineers to ensure adequate attention to all concerns.

To the extent possible, the vulnerability assessment of structures, equipment and personnel should be expressed in estimated numbers rather than percentages or vague terms (such as "many," "a large number" or "most"). The discussions of all the planning committees must be modeled around a realistic scenario and a quantified vulnerability analysis. Dealing with the vulnerability problem in generalities will result in a less effective planning effort, and create potential imbalances as a result of individual planning committees viewing the problem in different ways.

6. Establish Key Planning Assumptions

Establishing a set of planning assumptions which will serve as a background and a guide to the planning committees is an important step.

Listed below are examples of planning assumptions. (Note: These assumptions will be further quantified as a result of the hazard vulnerability analyses described in Step 5 above).

a) A catastrophic earthquake is an event or series of events that will result in large numbers of deaths and injuries, destruction of a large percentage of facilities that provide and sustain human needs,

overwhelming demand on State and local response resources and systems, severe long-term effects on general economic activity, and severe effects on State, local, and private sector initiatives to begin and sustain initial recovery activities.

b) Earthquakes may occur without warning and at a time of day that will produce a maximum number of casualties. Access to and from the damaged areas may be severely restricted for hours and perhaps days. Communications and life support systems will be severely disrupted or destroyed. The maximum possible non-resident work force and tourist population may be present in the affected area. Planners must examine both day and night scenarios.

c) Earthquakes and resulting aftershocks may trigger secondary events such as fires, tsunamis, liquefaction, landslides, flooding and release/spread of hazardous materials. Dam failures are also likely to occur following catastrophic earthquakes.

d) A catastrophic earthquake will result in an immediate declaration of a state of emergency by the Governor, followed later by a Presidential disaster declaration. This will allow State and Federal life support and emergency response operations to begin. These resources may not be available, however, in any large quantities for several days, and even then may be insufficient to meet the need.

e) Local resources will most likely be inadequate to respond to the effects of major damaging earthquake, and local jurisdictions will have to be self-sufficient for the first hours or perhaps several days after the event occurs. Local governments must establish and maintain updated resource inventories and determine priorities and procedures for the use of available resources.

f) Damage resulting from a catastrophic earthquake will be widespread. The intensity of seismically caused ground motions will vary within a city area, and so will resulting damage. There will be high concentrations of damage in some areas with only slight damage in others. Local jurisdictions with only slight damage should be prepared to respond with mutual aid for neighboring jurisdictions requiring such assistance.

7. Adopt Goals and Objectives

The goals and objectives are best put together by the Coordinating Group. Objectives should provide measurable benchmarks in achieving the overall goals. Listed below are several objectives which may be used or serve as examples for the group's consideration.

GOALS AND OBJECTIVES

To Develop a City-Wide Comprehensive Earthquake Preparedness and Response Plan.

...which covers all phases of earthquake hazard reduction, preparedness, response and short-term recovery.

...that brings together the planning efforts of the various city departments and agencies, non-governmental agencies, and the private sector.

...that is compatible and consistent with planning efforts of adjacent cities, the county, and the State and Federal governments.

...that is realistic to accomplish with the resources available

...that is user-oriented and acceptable.

8. **Develop Overall Work Program**

The Coordinating Group will establish the way in which the comprehensive planning is to be accomplished. This will include developing an overall work program and time schedule for completion. The overall work program can be based on the scope of work outlined under each of the four planning elements but should also take into account ongoing related city activities.

Phase II - Plan Development, which follows, outlines a seven-step process which will be useful to the Coordinating Group in developing the work program.

9. Form Planning Committee Structure

The Coordinating Group will be responsible for determining how best to accomplish the planning process, using the Planning Guide and considering any known political or economic constraints. Plan development (Phase II) will be carried out by planning committees established by the Coordinating Group.

Within the Planning Guide, a number of functions have been identified for each of the four elements. Determination of personnel to serve on planning committees may vary according to both the planning element and the function. A number of functions "carry over" from element to element, and the same personnel could continue to serve. In many cases, however, the elements and functional considerations may require special expertise which would not be applicable for other elements or functions.

10. Prepare Briefings and Make Planning Committee Assignments

The final step in initiating the planning process will be to prepare the necessary materials for planning committee use, make the planning committee assignments and brief members on their planning responsibilities. If possible, it is recommended that a joint first session of all planning committees be held. At that time, the planning committees

should be given a detailed briefing and handout materials regarding:

a) The scenario

b) Results of hazard assessment and vulnerability analyses

c) Role of the City Coordinating Group

d) Coordinating Group overall Work Program

e) Operating instructions for planning committees sessions

f) Schedule for completion

C. PHASE II -- PLAN DEVELOPMENT (Adapting the Planning Guide)

This section of the User's Guide outlines the steps that should be taken to adapt the Planning Guide (Part II of the Comprehensive Earthquake Preparedness Planning Guidelines) to the city's individual needs.

The Coordinating Group will have the overall responsibility for organizing and guiding the planning effort. The plan development will be accomplished by the planning committees established in Phase I. The planning committees may call upon the Coordinating Group for advice or review of recommendations at critical points in the plan development.

A recommended approach to accomplishing the plan development phase is listed below and discussed in further detail in this section.

(1) Organize the planning committees

(2) Review pertinent materials

(3) Develop the workplan and timeline

(4) Establish elements and time frames

(5) Determine functions to be included in plan

(6) Review actions and assign responsibility

(7) Prepare plan content and format recommendations

1. Organize the Planning Committees

Activities to be performed include: appointing a chairperson, determining if membership is adequate to accomplish the activity, designating or requesting additional membership if required, and scheduling meetings. Note that planning committee membership should be tied to the particular phase and functions being considered. For this reason, it may be necessary and desireable to modify the planning committee structure from time to time. Planning committee members should be aware of this.

2. Review Pertinent Materials

Before beginning the task of preparing plans, it is essential that all committee members have a common knowledge and understanding of the various briefing materials developed by the Coordinating Group. It is suggested that the following be reviewed and discussed by each of the planning committees.

a) **Hazard Vulnerability Analysis**

It is essential that all planning committee members be briefed on the scenario and resulting vulnerability analyses. It will not be possible for the planning committees to work together effectively in using the Planning Guide if they do not have a common understanding of the scope of the hazard and its implications.

b) **The Planning Guide**

The Planning Guide describes functions applicable to four elements of earthquake planning activity. (It may be helpful at this point to turn to the Planning Guide to review its format and content.) For each function, there are several planning actions noted. The planning committees should consider these as a minimum list, and will undoubtedly come up with other considerations which should be included.

c) **Existing City Plans and Programs**

Step 4 Phase I recommends that the Coordinating Group compile an inventory of existing city plans and programs related to earthquake preparedness. The list should also include activities being undertaken by schools, volunteer organizations and the private sector, and any other programs with similar goals.

The planning committees should become familiar with existing plans and ongoing efforts. This step will help avoid duplication of effort and ensure compatability between existing efforts and new plan developments.

In addition, the planning committees should review existing county, state and federal plans relating to earthquake preparedness and response for compatability with this planning guidance.

3. **Develop the Workplan and Timeline**

An overall Work Program for the comprehensive earthquake planning effort was developed by the Coordinating Group in Phase I. Each planning committee should develop a workplan based on its assessment of current plans and activities versus the desired level of preparedness planning as outlined in the goals and objectives of the overall planning effort.

Current plans can be rated against those activities outlined in the Planning Guide and should be measured in light of the scenario and hazard vulnerability analysis.

4. **Establish Elements and Time Frames**

The Planning Guide is organized into four elements as follows:

Long-Term Preparedness

Preparedness and mitigation actions taken a few years to a few decades before the earthquake occurs in response to a long-lead-time prediction.

Short-Term Preparedness

Immediate preparedness actions to be taken a few days to a few weeks before the earthquake occurs, where there has been a prediction.

Emergency Response

Actions taken during the first seventy-two hours to a few weeks after the earthquake.

Short-Term Recovery

Actions taken during the first one-two months after the earthquake.

Within each element, the Planning Guide identifies a number of discrete functions, provides recommended primary and support assignments to city departments and agencies, and lists a number of specific activities under each function. The City Coordinating Group should attempt to follow the sequence established in the Planning Guide.

5. **Determine Functions to be Included in Plan**

Each of the elements is divided into functional areas of activity. The functions address the anticipated requirements and efforts posed by the

occurrence of a catastrophic earthquake. (A chart listing the functions included in each element is shown on page 5 of the Planning Guide.)

Each function should be reviewed for appropriateness to the city's activities. Functions can be added or deleted as necessary.

Certain functions essential to city operations are often done under contract arrangements with the county. In these cases, it is important that the function be planned for and discussed. A good method for doing this is to invite the appropriate county agency representative to participate in those functional areas. Schools and utilities should also be represented.

6. **Review Actions and Assign Responsibility**

Within each function are listed associated actions. These actions should be reviewed and new actions formulated as necessary. The actions listed in the Planning Guide tend to be general in order to accommodate a wide range of users. These assignments should be reviewed and adapted to reflect the city's organizational structure and areas of responsibility. In adapting the guide to your city be as specific as possible about:

1) What is to be done?
2) When should the activity be completed?

3) Who should be responsible for doing it?

4) What follow-up actions are required?

Following the list of activities within each function is a Task/Mission Assignment section. This section assigns responsibility for activities to specific city departments or offices. Lead and support roles should be designated for each function by department.

In addition to the interdepartmental plans produced by following the functional approach as recommended in the planning guide, the city will need to develop specific departmental checklists. These checklists would assist department personnel in carrying out the actions assigned within each function by establishing procedures and outlining the steps to be followed.

7. Prepare Plan Content and Format Recommendations

The final step in the planning committees' work effort should be to prepare the specific recommendations that will be submitted to the Co-ordinating Group.

The output for the Long-Term Preparedness Element should be in the form of a multi-year planning program. This document will then be the principal long-term guidance for all city preparedness, mitigation and response planning activities.

It is recognized that some cities may already have a Response Plan for Earthquakes. The format of that plan may be adequate for continued use, or a new plan format may be necessary to incorporate the elements required for catastrophic event planning. Recommendations for format changes should be submitted to the Coordinating Group for review and final format determination.

The recommended changes to the existing plan, or to be included in the new plan, should be made in the proper format as established by the Coordinating Group, consistent with State/Federal IEMS and multi-year development planning concepts.

D. PHASE III -- PLAN IMPLEMENTATION

The third phase of the city comprehensive earthquake preparedness process is concerned with implementation. Implementation of the plan should be viewed as a long-term and continuing process, with the city executive management responsible for implementing the developed plans.

1. Implementation Strategy

There are several essential considerations applicable to the implementation phase.

a. **Adoption of a Multi-year Program**

The necessity to take a longer range view of plan implementation is important. Certain long-term preparedness functions will require a sequenced approach which may involve multiple-year funding. Many of these measures entail an enforcement of ordinances and regulations which will require a continuous program. A number of the steps will require extensive inter-departmental implementation planning.

b. **Establishment of Implementation Responsibility**

Responsibility for implementation of the comprehensive earthquake plan is something that must be shared by the several city departments and agencies (along with the county for certain support functions). The overall responsibility for ensuring that the implementation is being accomplished according to the recommended time line is that of city executive management.

c) **Emphasize Education, Training and Exercising**

As pointed out in the introduction to this Guide, it is essential that the city include education, training and exercising within the multi-year implementation program. This is particularly applicable to certain long-term preparedness and to the emergency response functions. This activity is often supported in concept, but overlooked for what seem to be higher priorities. City emergency management staff and line department exercises in functional area responsibilities are critical to effective performance at the time of the disaster.

d) **Adopt a Multi-hazard Implementation Approach**

The major earthquake planning has resulted in the identification of a large number of primary and secondary effects which generally encompass the full range of peacetime natural or technological hazards found within larger municipalities. The activities assigned to various departments and agencies for major earthquake response would also be those assigned (in most cases) for preparedness/response for other kinds of naturally/technologically induced hazards. The work that has been done in the planning process and plan development phases for the major earthquake provides the framework for the development of an all-hazards, multi-functional plan for the jurisdiction.

e) **Establish an Evaluation Component**

An Evaluation Component should be included as part of the Plan Implementation Process. This component simply identifies the responsibilities and schedules for implementation and provides city executive management a built-in capability for monitoring the success of the implementation process. The evaluation Component should be closely tied to the exercises identified in Step 3.

2. Specific Implementation Activities

The implementation activities outlined below relate primarily to accomplishing those activities identified under the Long-Term Preparedness Element. Activities identified under the Emergency Response and Recovery Elements are more procedural or operational in nature. Implementation of preparedness and mitigation programs will reduce the demands on response and recovery at the time of the event and will ensure a more effective response to the event.

a) Enforcing zoning, land-use, building-code, and hazardous buildings and materials ordinances recommended and enacted under the Plan Development Phase.

b) Sponsoring, supporting and enacting additional ordinances associated with the above.

c) Developing and maintaining a database of resources and support services (public and private) which can be used in response and short-term recovery.

d) Establishing an information management system for use by city emergency management staff and line departments which allows for the effective use of the database.

e) Implementing a communications system for the city which allows a full range of inter-departmental communications under emergency conditions. This system must be adequate to meet the operating requirements dictated by the scenario and be survivable to be operable in the immediate response phase of the disaster.

f) Establishing a bi-level emergency management system within the city. This system should be capable of providing simultaneous multiple-incident inter-departmental direction and control in the field, as well as city-wide (EOC) emergency management of all response activities. This system should include a standard mapping and geo-referencing capability applicable and suitable for all city departments.

g) Implementation of city employee education and training programs, and providing materials related to these kinds of programs to city-wide business and industry.

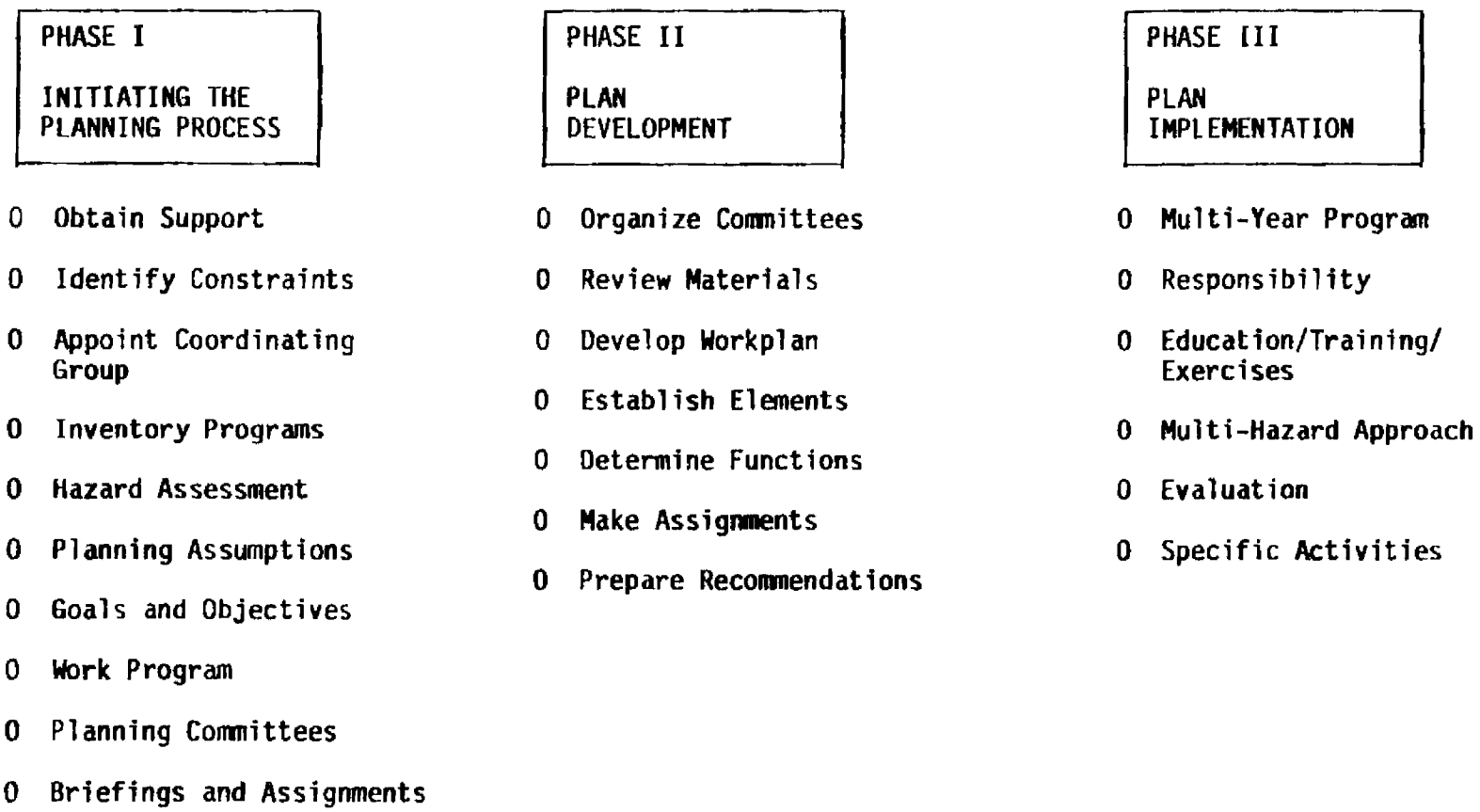
h) Conduct of regularly scheduled exercises which will test all elements of the city response plan. These exercises should include a range of workshop problem-solving sessions for senior information executives of line departments as well as full operational simulation exercises to test adequacy of facilities, communications and operational procedures and checklists.

i) Implementation of a public information and awareness program applicable to the jurisdiction. The implementation of this program will require cross-jurisdictional procedural and content compatability.

j) Conduct a continued liaison with adjacent municipalities and with the county to ensure interjurisdictional plan compatability and procedures development for those functional areas which involve mass movements and/or care of the public.

k) Installation and support of a comprehensive earthquake education and awareness curriculum within city schools. This should include encouraging private schools to undertake the same programs.

Figure 1


PHASE I
INITIATING THE PLANNING PROCESS
0 Obtain Support
0 Identify Constraints
0 Appoint Coordinating Group
0 Inventory Programs
0 Hazard Assessment
0 Planning Assumptions
0 Goals and Objectives
0 Work Program
0 Planning Committees
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PHASE II
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PHASE III
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