

GeoHazards International / OYO Pacific

123 Townsend Street #655
San Francisco, CA 94107
phone (415) 543-9030
fax (415) 543-9032

From Christina Hwang for Brian Tucker

Date: January 14, 1994

To: Claude de Ville de Goyet

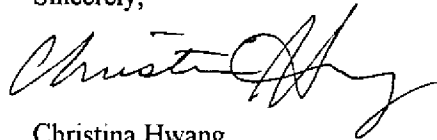
Pages: 8 + 1

Dear Mr. de Ville de Goyet:

Please find enclosed the final version of our joint proposal with Metropolis. As you will see, we found your suggestion for a more balanced Executive Committee a very good one, and we have invited Mr. Harsh Gupta of India's National Geophysical Research Institute to participate.

If you have further comments or suggestions on the project, please let us know. We look forward to working further with you.

Sincerely,



Christina Hwang

Urban Seismic Safety Project

I. Project Title

Urban Seismic Safety Project

II. Project Goal

Our goal is to reduce urban earthquake hazard, particularly in developing countries. We will start with a four-step project: (1) constitute a Working Group on urban seismic safety made up of responsible officials from earthquake-threatened cities in both industrialized and developing countries; (2) convene this Working Group to develop ways in which threatened cities can share knowledge about earthquake hazard mitigation; (3) present the findings of the Working Group at a Workshop of the 1996 Metropolis Congress in Tokyo; and (4) maintain the network of responsible officials through the Metropolis newsletter, conferences, United Nations International Decade for Natural Disaster Reduction (IDNDR) meetings, and publications.

III. Products

The Urban Seismic Safety Project will yield the following products:

- *Recommendations on how to promote urban seismic safety worldwide, particularly in developing countries.*
- *A network of government, business and academic leaders concerned with earthquake hazard reduction from the world's earthquake-threatened cities.*
- *A catalogue of seismic safety fact sheets from earthquake-threatened cities.*

IV. Problem Statement

By the year 2000, approximately 3 billion people—nearly one-half of the world's population—will live in cities. Of the fifty largest cities, half will have populations over 10 million, four-fifths will be located in developing countries, and half will lie within 200 kilometers of faults known to produce earthquakes of magnitude 7 or greater. Death tolls from recent urban earthquakes have been large: the 1976 Tangshan earthquake in China killed at least 250,000 people; the 1990 earthquake in Tabas, Iran killed 40,000; the 1991 earthquake in Yerevan, Armenia, killed 20,000. The rapid growth of the world's cities, both in number and in population, will make such events increasingly disastrous.

Figure 1 shows that in 1950, about 1 in 4 of the people living in the world's fifty largest cities was earthquake threatened, while in the year 2000, 250 million, or about 1 in 2, will be. Furthermore, of those people living in earthquake-threatened cities in 1950, about 2 in 3 were located in developing countries, while in the year 2000, about 9 in 10 will be. Urban earthquake hazard is growing and is becoming increasingly a problem of developing countries.

Trends in Urban Earthquake Hazard

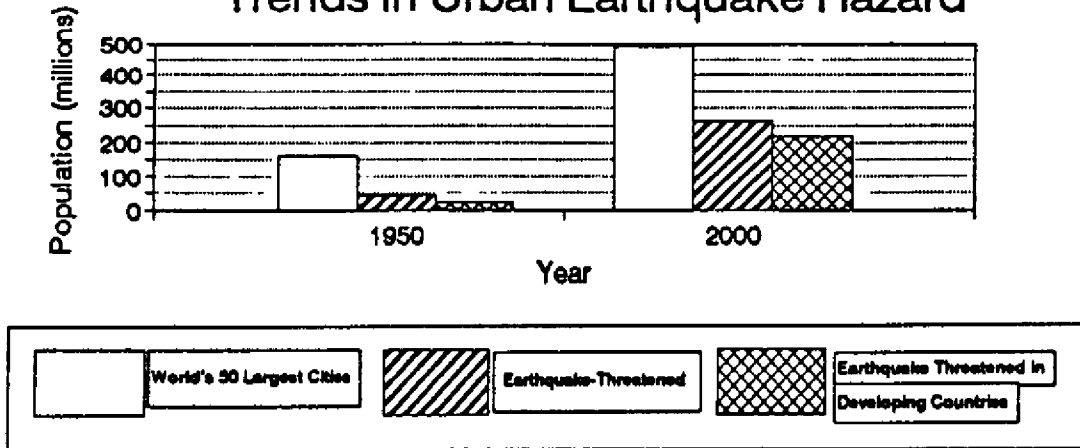


Figure 1

Source: Jones and Bilham

Records of earthquake-caused deaths during this century indicate that, over time, earthquakes have affected populations of developing countries more than those of industrialized nations. Figure 2 shows that in the period 1900-1949, of the total number of earthquake-caused deaths, 70% occurred in developing countries, while in the period 1950-1988, this percentage increased to 99%.

Earthquake-Caused Fatalities

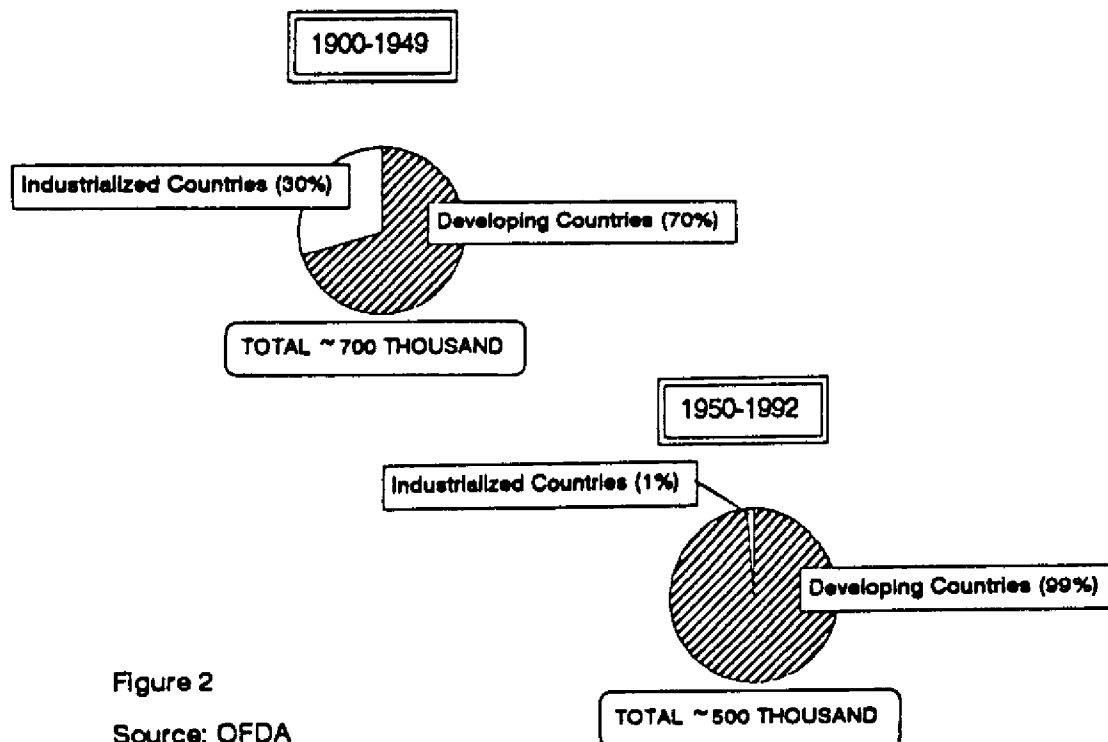


Figure 2

Source: OFDA

Although the greater proportion of earthquake-threatened cities—and thus the greater potential for earthquake-related fatalities—will increasingly be found in developing countries, most mitigation research and research application has taken place in industrialized nations. It has been estimated by various authors that only 2% of the world's resources devoted to earthquake hazard mitigation are focused on the problems of developing countries. Furthermore, consideration of the traditional sources of support for mitigation efforts in developing countries leads to the conclusion that current levels of international aid cannot meet the increasing threat. As a result, the disparity between where earthquake hazards occur and where mitigation efforts are focused will not be reduced in the near future and may, in fact, increase. Given the unlikelihood that international funding will increase correspondingly, how can the earthquake hazard mitigation needs of cities in developing countries best be met?

If worldwide, earthquake-related human and economic loss is not to grow, new means must be devised to promote urban seismic safety in developing countries.

V. Our Approach

Through the Urban Seismic Safety Project, we hope to promote urban seismic safety in the countries of greatest need by developing and facilitating communication among experienced municipal officials. Via this new communication network, the years of emergency response and disaster mitigation expertise found in industrialized nations can be shared with developing countries, and officials from cities worldwide can hear firsthand accounts of how other cities dealt with disastrous earthquakes and what lessons they learned from their experiences.

GeoHazards International (GHI) is a nonprofit consultancy dedicated to reducing the social and economic consequences of earthquakes in urban areas. Most recently GHI initiated, organized and oversaw an earthquake hazard mitigation pilot project in Quito, Ecuador. In addition to the Quito Project, GHI organized and co-directed the 10th World Conference on Earthquake Engineering Special Theme Session, *Uses of Earthquake Damage Scenarios for Cities of the 21st Century*, July 23, 1992 in Madrid; and the NATO Advanced Research Workshop entitled *An Evaluation of Guidelines for Developing Earthquake Damage Scenarios for Urban Areas*, held October 8-11, 1993 in Istanbul. GHI has offices in San Francisco and the Blume Center of Earthquake Engineering at Stanford University, where GHI's director Dr. Brian Tucker serves as a Consulting Professor.

VI. Project Description

The Urban Seismic Safety Project will involve four stages

1) *Project Definition* An Executive Committee of nine members will meet prior to an Urban Seismic Safety Seminar to develop the Agenda and participant list. An Urban Seismic Safety Evaluation Survey, that covers topics ranging from the nature of the city's earthquake hazard to demographics to existent emergency planning, will also be developed for participant cities to complete. The Executive Committee members' backgrounds will represent, as much as possible, the diversity of earthquake-threatened cities (a list of which is found in the Appendix). GHI will compile from the completed surveys a catalogue of seismic safety fact sheets as a reference source. GHI will also locate the appropriate city representatives, based on the Executive Committee's suggested participant list. In the time leading up to the Seminar, GHI will familiarize participant

cities with each other through newsletter articles, urban earthquake case histories, and participant profiles, and publicize the Project at a booth at the IDNDR U.N. Conference on Natural Disaster Reduction, to be held May 23-27, 1994 in Yokohama, Japan.

2) *Urban Seismic Safety Seminar*. This will last five days and be held in Quito, Ecuador. It will involve 20-30 participants from earthquake-threatened cities around the world. We expect that this Seminar will lay the foundation for an international network of city officials concerned with earthquake hazard mitigation. The Agenda might be as follows:

Day One	Day Two	Day Three
<ul style="list-style-type: none"> • Invited paper addressing issues related to urban earthquake hazard worldwide, including social and economic factors and public-policy formulation 	<ul style="list-style-type: none"> • Case study of one or more successful urban seismic safety programs • Review Participant Survey 	<ul style="list-style-type: none"> • Field trip to selected critical facilities in Quito, Ecuador, at risk from earthquakes or related to earthquake preparedness
<ul style="list-style-type: none"> • Testimonies given by one or more administrators whose cities or urban areas recently experienced a disastrous earthquake. Candidates include Erzincan (Turkey), Cairo, or areas in Japan or India. 	<ul style="list-style-type: none"> • Formation of Working Groups to discuss the individual situations of the cities and their seismic safety problems; Determine research, education and training needs; Review the survey results 	<ul style="list-style-type: none"> • Discussion by government and business leaders of recent steps to improve Quito's seismic safety • Informal social time during which participants can meet to discuss common concerns

Day Four	Day Five
<ul style="list-style-type: none"> • Plenary session to review and discuss the findings of the Working Groups 	<ul style="list-style-type: none"> • Second plenary session to summarize findings and recommendations of the Working Groups, Finalize information to be presented at the Metropolis Congress
<ul style="list-style-type: none"> • Second meeting of Working Groups to determine specific needs of earthquake-threatened cities in developing countries and possible roles for counterpart cities in industrialized nations 	

The host city for the Seminar, Quito, was chosen according to the following criteria: (1) The city (and Ecuador in general) faces a significant earthquake threat and has experienced many damaging events in its history. According to a recent US Geological Survey study, Ecuador has the greatest probability of experiencing an earthquake of magnitude >7 of all the countries in South America; (2) Because Quito is growing at an extremely rapid pace, the pressures of expansion have led to many poorly-constructed dwellings and strains on city lifelines; therefore Quito is more vulnerable

to earthquakes now than in the past, (3) The Pan-American Health Organization has offered meeting facilities and organizational assistance for the Seminar; (4) And finally, the Municipality of Quito has recently participated in an innovative earthquake hazard reduction project that could serve as a model for other cities.

3) *A Workshop at the 1996 Metropolis Congress.* This Workshop will expand on the results of the Seminar. It will describe the global problem of rising urban earthquake threat and current earthquake hazard mitigation priorities, summarize mitigation efforts and developments in various fields, and look at examples from our participant cities. Findings of the Seminar Working Groups will be described, including the identification of greatest seismic safety needs and methods for sharing information between cities in industrialized nations and developing countries. Holding the Workshop will increase the number of cities involved in the information network and allow delegates of the Metropolis Congress to participate in this project

4) *Network Maintenance.* After the 1996 Metropolis Congress, city participants involved or interested in the Urban Seismic Safety Project will be kept up-to-date on developments in the field of urban seismic safety through Metropolis newsletters, conferences, IDNDR meetings, and publications. Especial attention will be focused on advances made in seismic safety that grew out of work done in the Project and on interaction or cooperation among cities to share information.

VII. Schedule

<i>Date</i>	<i>Description of Work</i>
Early 1994	Sign final contract
May 23-27, 1994	Publicize project at a booth at IDNDR U.N. Conference in Yokohama
July 1994-November 1994	Prepare for Executive Committee meeting; Draft participant survey; Determine possible Seminar invitees
November 1994	Executive Committee meets (Paris); Review participant survey, Review participant list; Determine Seminar Agenda
December 1994-March 1995	Contact possible invitees; Test survey questions
April 1995	Send Seminar invitations to speakers and other participants; Develop information network
May 1995	Send surveys to city participants
June 1995-February 1996	Collect and compile survey data; Prepare for Seminar
February 1996	Urban Seismic Safety Seminar (Quito); Prepare Proceedings and Congress presentations
May 1996	Hold workshop at Tokyo Metropolis Congress
Ongoing	Maintain information network

VIII. Breakdown of Costs

<u>Expense</u>	<u>Amount</u>
Airfare	\$ 49,500 00
Executive Committee to Paris 8 @ \$1,500 each = \$12,000	

Representative to Yokohama 1 @ \$1,500	
Committee Members and 12 Sponsored Participants to Quito: 21 @ \$1,500 each = \$31,500	
Seminar representatives to Tokyo: 3 @ \$1,500 each = \$4,500	
Living expenses (same groups as above)	22,450.00
Paris: 8 for 4 nts @ \$175/night= \$5,600	
Yokohama: 1 for 5 nts @ \$250/night=\$1,250	
Quito: 21 for 6 nts @ \$100/night = \$12,600	
Tokyo: 3 for 4 nts @ \$250/night = \$3,000	
Simultaneous translation at Seminar	2,000.00
Management & Research (GeoHazards International)	40,252.00
One project manager at the following rate:	
1) 13 months 25% time	
9 months 50% time	
3 months 75% time	
1 month 100% time	
Management involves: (1) Organization and communications for Executive Committee meeting; (2) Develop survey and compile results, (3) Develop participant list and information network; (4) Organization and communications for Quito Seminar; (5) Edit proceedings; (6) Organization and communications for Metropolis Congress; (7) Follow-up to Project and network maintenance.	
Phone/Fax (@\$300/month for 24 months)	7,200.00
Postage	3,000.00
Printing/Publication and Materials	5,000.00
TOTAL	\$129,402.00

IX. Organization and Management

The project will be administered and supervised by an Executive Committee consisting of the following members.

- Alain LeSaux, Metropolis; Scientific Director, Metropolis International Committee—Major Hazards
- Claude de Ville de Goyet, Pan American Health Organization, member, Metropolis International Committee—Major Hazards
- Shirley Mattingly, Director, Emergency Management, City of Los Angeles
- Teodoro Abdo, Technical Advisor to the Mayor, Illustrious Municipality of Quito
- Brian E. Tucker, Executive Director, GeoHazards International

- **Mustafa Erdik, Kandilli Observatory and Earthquake Research Institute, Bogaziçi University, Istanbul**
- **Raymundo S. Punongbayan, Director, Philippine Institute of Volcanology and Seismology, Quezon City**
- **T. Jeggle, Director, Asian Disaster Preparedness Centre, Asian Institute of Technology, Bangkok**
- **Harsh Gupta, Director, National Geophysical Research Institute, Hyderabad, India**

X. Appendix

The following table lists the twenty-five largest earthquake-threatened cities in the year 2000.

City	Projected Population (in millions)
Mexico City, MEXICO	24.4
Tokyo/Yokohama, JAPAN	21.3
Shanghai, CHINA	14.7
Teheran, IRAN	13.7
Jakarta, INDONESIA	13.2
Delhi, INDIA	12.8
Istanbul, TURKEY	12.2
Karachi, PAKISTAN	11.6
Manila/Quezon, PHILIPPINES	11.5
Beijing, CHINA	11.5
Dacca, BANGLADESH	11.3
Osaka/Kobe, JAPAN	11.2
Los Angeles, USA	10.9
Bangkok, THAILAND	10.3
Tianjin, CHINA	10.0
Lima/Callo, PERU	8.8
Baghdad, IRAQ	7.7
Bogota, COLOMBIA	6.9
Lahore, PAKISTAN	5.9
Santiago, CHILE	5.6
Shenyang, CHINA	5.5
Medan, INDONESIA	5.4
Ankara, TURKEY	5.2
Alger, ALGERIA	5.2
Caracas, VENEZUELA	4.8