

Istanbul Seismic Risk Mitigation and Emergency Preparedness Project



**İstanbul Project Coordination Unit
(IPCU)**

**Kazım Gökhan ELGİN
Director**

August 16, 2006

DEVELOPMENT AND DISASTER

THROUGHOUT THE WORLD;

- ✓ The natural disasters caused loss of 1.5 million lives in the last 20 years.
- ✓ While 15% of the population exposed to risk is in the developed countries, 1.8% loss of life occur in these countries.
- ✓ 94% of natural disasters take place in developing countries.
- ✓ 98% of the population affected from natural disasters live in these countries.

DEVELOPMENT AND DISASTER

continue

THROUGHOUT THE WORLD;

- ✓ Annual GDP loss in developing countries is between 2-15%.
- ✓ The economic loss in developing countries is 20 times as much as developed countries.
- ✓ The average annual loss resulting from disasters in 1990s USD 63 billion.
- ✓ The annual loss resulting from disasters in 2050 is estimated as USD 300 billion.

Earthquake Toll in Turkey

- ✓ The estimated average annual direct economic loss in the last decade is over USD 1 billion.
- ✓ Frequency of earthquakes over 5.5 M per annum: 0.76
(6th in the world)
- ✓ Annual loss of life due to disasters: 950
(3rd in the world)
- ✓ Loss of life per capita (million): 15,58
(4th in the world)
- ✓ Average population exposed to disasters per annum: 2.745.757
(8th in the world)
- ✓ Loss of life per capita exposed to disasters (million): 346
(4th in the world)

Lessons from 1999 Marmara Earthquake

COMMUNICATION

- ✓ Interruption in communication
- ✓ Phone lines being out of service in initial hours

RESPONSE

- ✓ Insufficiency in organization and coordination
- ✓ Chaotic environment
- ✓ Bureaucracy; problems faced in official procedures and permission
- ✓ Inefficiency in search and rescue activities at night due to poor illumination
- ✓ Insufficiency in logistic support
- ✓ Complexity caused by amateur rescue groups and volunteers lacking the
- ✓ necessary health and building structure information

DAMAGE

- ✓ More than 77,000 heavily damaged buildings
- ✓ Damage in public buildings
- ✓ Damaged and unutilized infrastructure
- ✓ Complexity in building damage assessments

ECONOMIC LOSSES

- ✓ USD 10-15 billion primary economic loss
- ✓ 5-7% of Turkey's GNP

EARTHQUAKE RISK ESTIMATION OF ISTANBUL

- ✓ Comparable seismic risk degree with San Francisco, Los Angeles and Tokyo cities
 - Probability of occurrence of a large earthquake in next 30 years is greater than 50%,
 - Probability of occurrence of a large earthquake in the next decade is greater than 20%.

- ✓ Social and economic impacts of a possible 7.5 M earthquake in Istanbul
 - Approximately loss of 70.000 lives, 120.000 injured/heavily injured, 400.000 minor injured
 - Direct economic loss ~USD 30 billion

Disaster Preparedness of Istanbul Under the Principles of Comprehensive Disaster Management

Emergency Management

Communication Systems

Emergency Mng. Info. Sys.

Emergency Response Capacity

Infrastructure/ Lifelines

- Airports, harbors
- Highways, bridges
- Natural gas
- Electricity
- Water
- Sewage
- Others

Superstructure / Buildings

Public Buildings

Residential/ Commercial Buildings

Industrial Estates / Factories

Cultural Heritage/ Historical Monum.

- Ministry of Culture and Tourism
- Gen. Dir. of Foundations
- Metropolitan Mun.
- Turkish Grand National Assembly
- Private Property

- Inventory
- Prioritization
- Multi-hazard risk assesment
- Cooperation (historians, architects, international practices, int. Agreements..)
- Pilot Studies

Legal Issues

Development Law

Disaster Insurance

Regulation on Soil Improvement

Retrofitting Regulation

Condominium Law

Transfer of Development Rights

Building Inspection Law

- Research
- Socio-economic
 - Willingness of participation
 - Environmental impact

Training

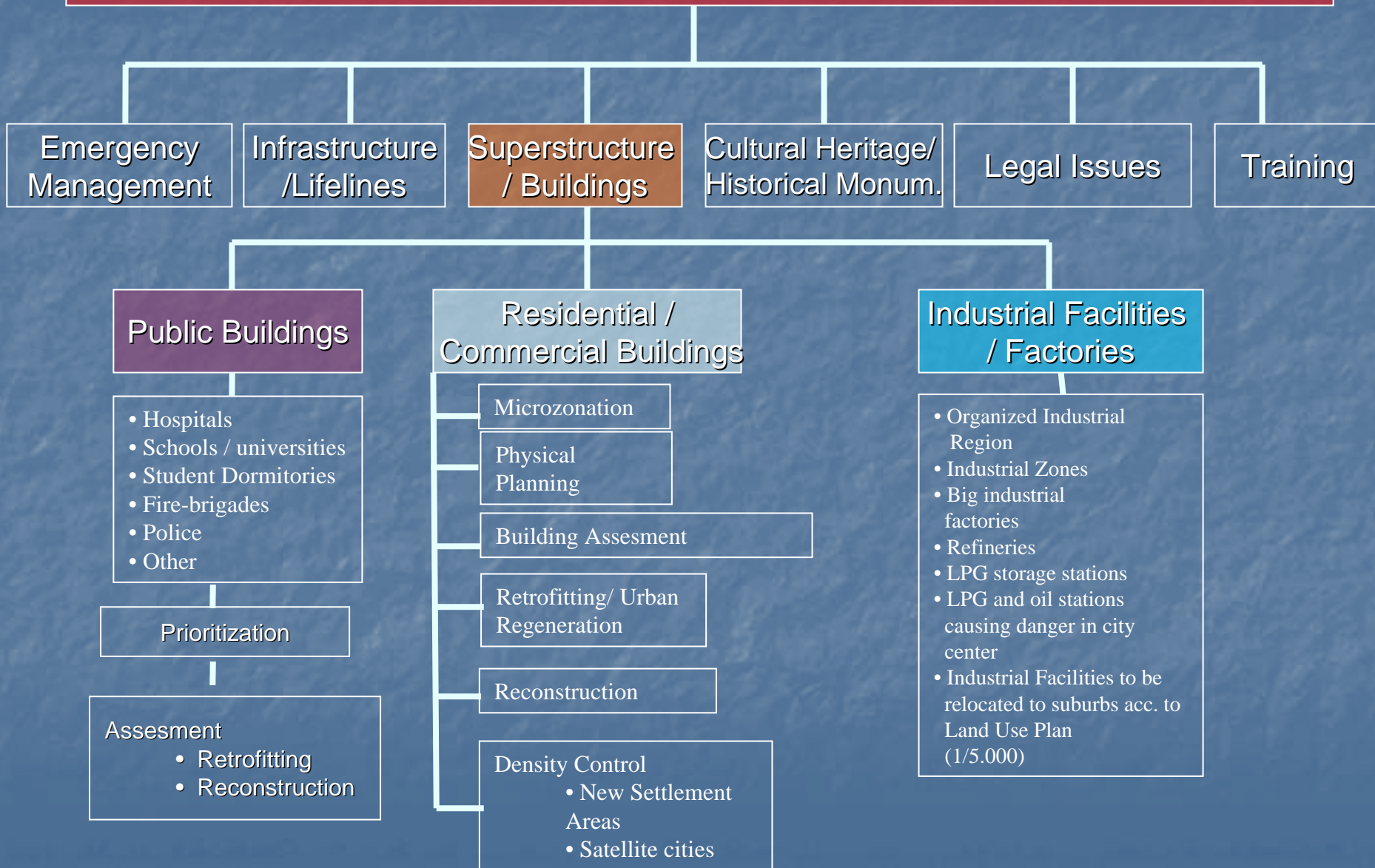
Public Awareness

Decision makers

Public Officials

Private Sector

Disaster Preparedness of Istanbul Under the Principles of Comprehensive Disaster Management



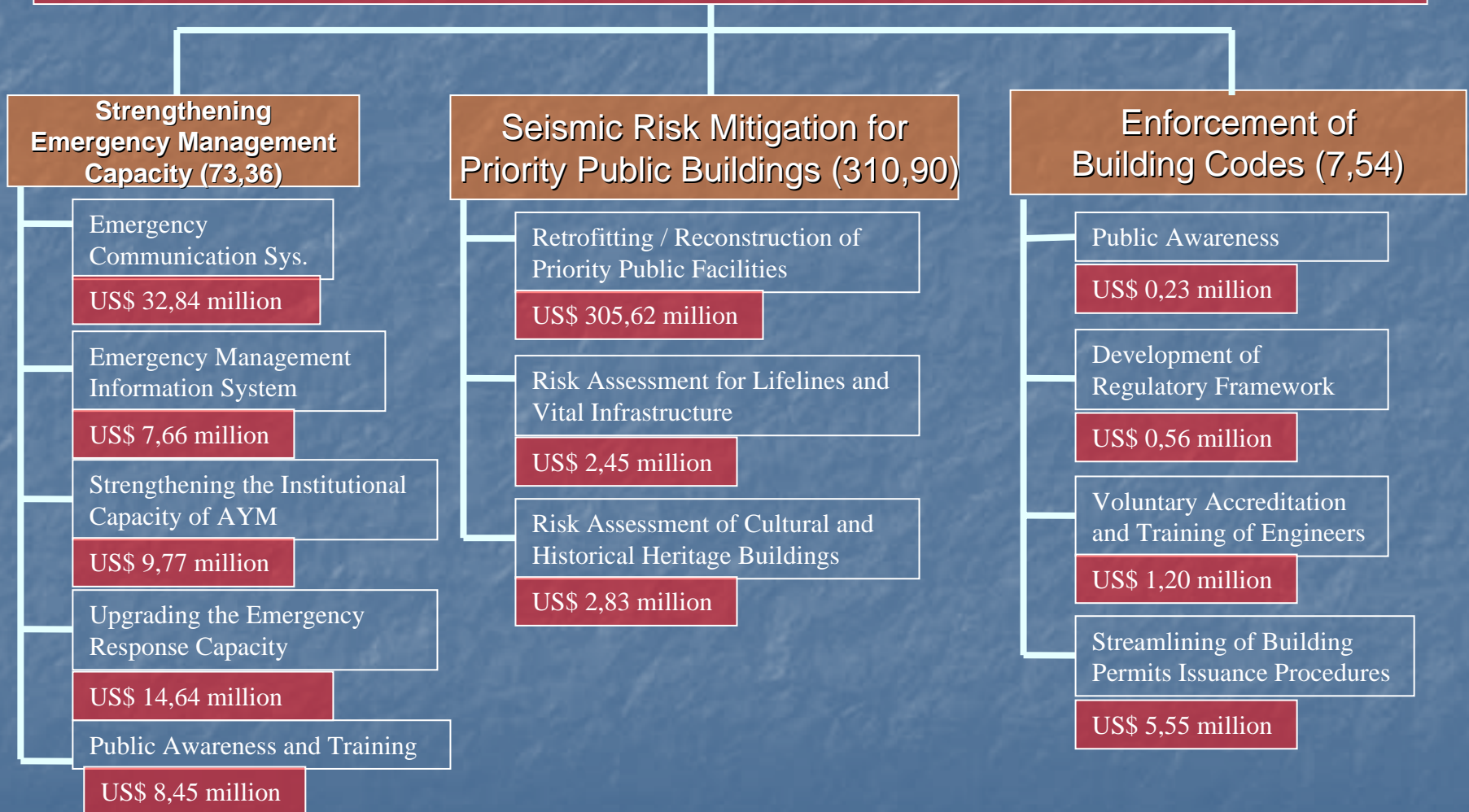
Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP)

- **Country / Region** : Turkey / Istanbul
- **Project Duration** : 5 Years
- **Implementation** : Istanbul Special Provincial Administration / Istanbul Project Coordination Unit (IPCU)
- **Finance** : World Bank
- **Loan Amount** : USD 400 million (310 million Euro)

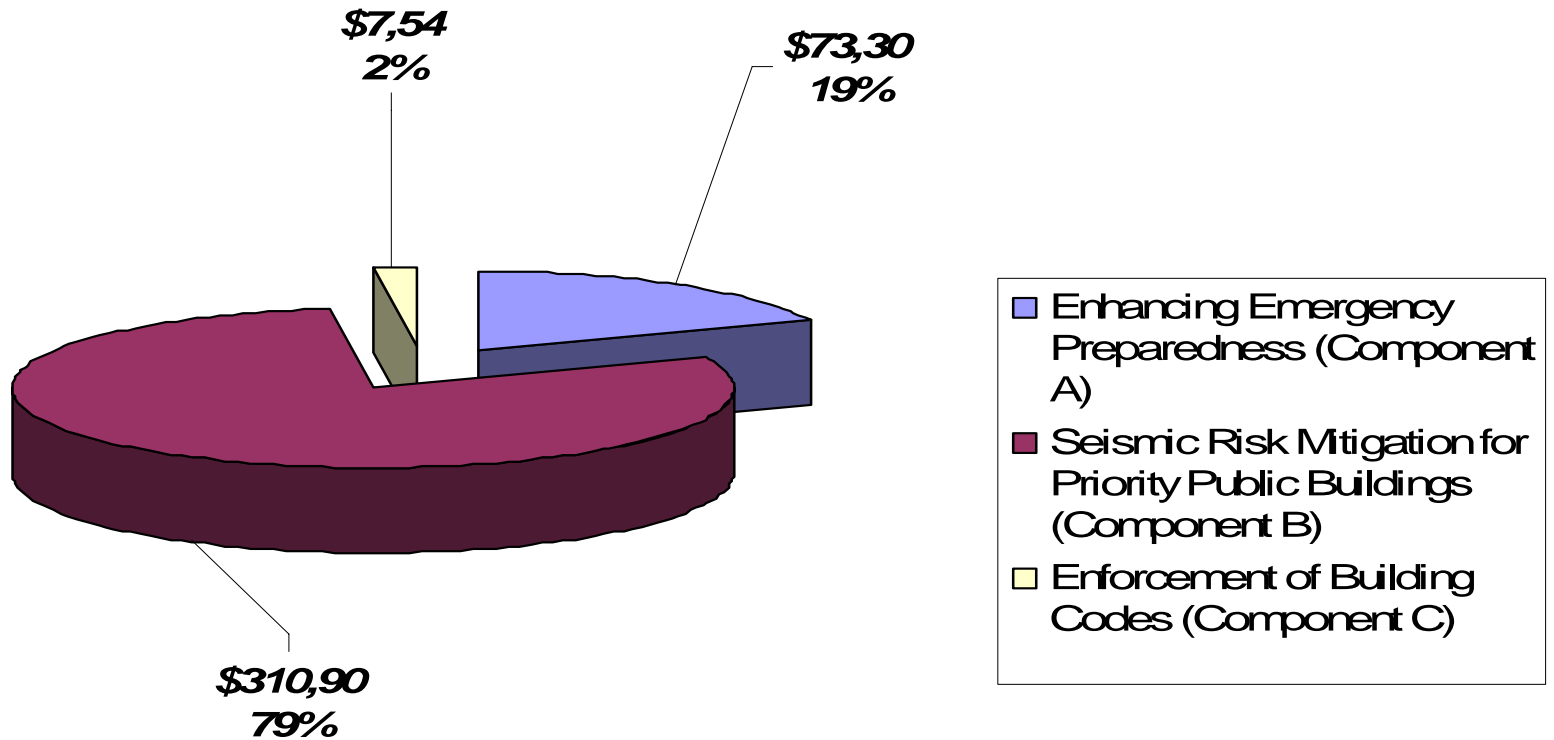
GOALS

- Strengthening institutional and technical capacity of emergency management.
- Increasing emergency preparedness and response awareness.
- Retrofitting/Reconstruction of priority public buildings.
- Vulnerability inventory and sample retrofitting design for cultural and historical heritage assets.
- Taking supportive measures for the efficient implementation of development law and building codes.

ISMEP PROJECT



ALLOCATION OF LOAN AMOUNT BY COMPONENTS



PROJECT COMPONENTS

COMPONENT A

Enhancing Emergency Preparedness

- ✓ Improving Emergency Communication Systems.
- ✓ Installation of Emergency Management Information System.
- ✓ Strengthening Institutional Capacity of AYM.
- ✓ Upgrading the Emergency Response Capacity.
- ✓ Creating Public Awareness and Supporting Neighborhood Community Volunteers.

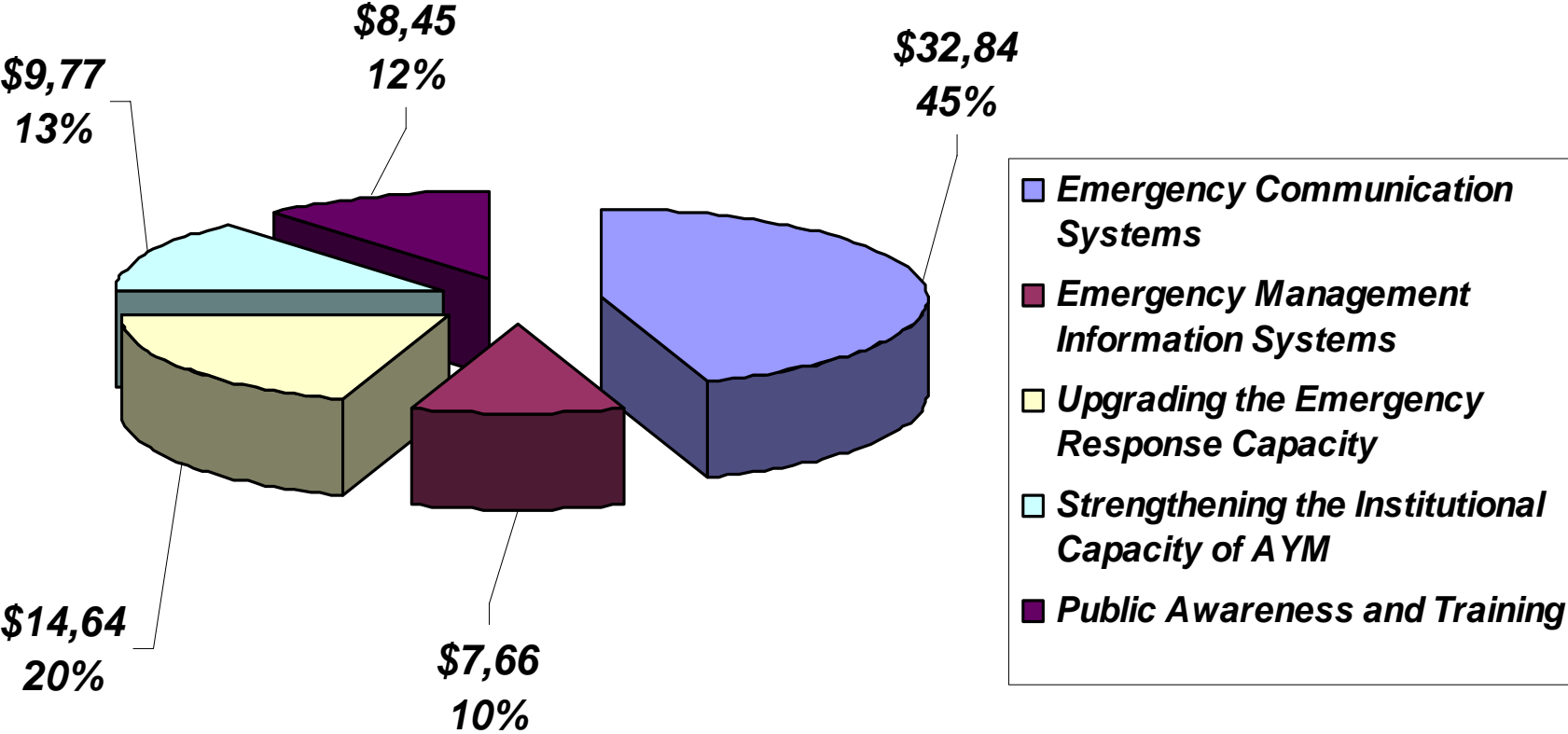
COMPONENT A

Enhancing Emergency Preparedness

The objective is to set up a comprehensive public information and communication system with the following features:

- ✓ The highest number and variety of user group (app. 70.000).
- ✓ Mobile coordination at site.
- ✓ The first and the largest digital trunk communication network
- ✓ Intensive and high capacity database for geographical information.
- ✓ Efficient back-up system.

BUDGET OF COMPONENT A (USD MILLION)



COMPONENT B

Seismic Risk Mitigation for Priority Public Buildings

- ✓ Retrofitting or reconstruction of 840 priority public buildings consisting of schools, hospitals, dormitories, administrative and social services.
- ✓ Seismic risk assesment for natural gas, water, electricity, telecommunication, transportation and other vital lifelines.
- ✓ The inventORIZATION of buildings under the auspices of Ministry of Culture and Tourism within the scope of cultural and historical heritage and making seismic risk analysis of selected buildings and preparing retrofiting designs.
- ✓ Analyzing land management policy and tools for assesing public lands in different models and options with regard to reconstruction and relocation decisions.

PRIORITIZATION OF PUBLIC BUILDINGS IN ISTANBUL

- ✓ Approximately 2500 public buildings prioritized,
- ✓ Criteria set for each sector,
 - ✓ Hospitals
 - ✓ Schools
 - ✓ Administrative Buildings
 - ✓ Social Service Buildings
 - ✓ Dormitories

Prioritization Criteria for Public Buildings

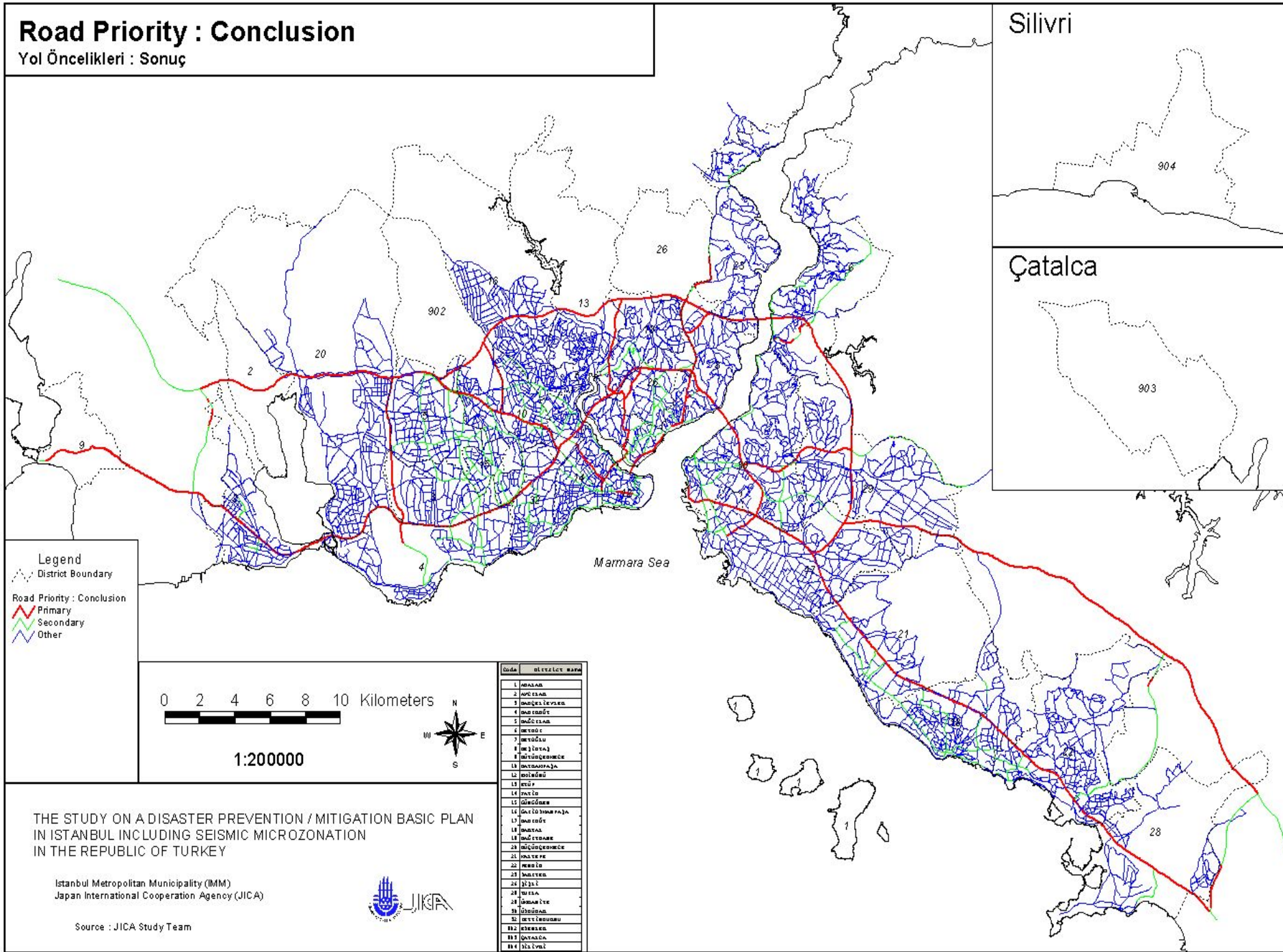
- ✓ Accessibility
- ✓ Technical features of building
 - ✓ Construction year
 - ✓ Number of storeys
- ✓ Number of personnel and users
- ✓ Distance to faultline
- ✓ Importance in disaster management plan

Road Priority : Conclusion

Yol Öncelikleri : Sonuç

Silivri

Çatalca



THE STUDY ON A DISASTER PREVENTION / MITIGATION BASIC PLAN
IN ISTANBUL INCLUDING SEISMIC MICROZONATION
IN THE REPUBLIC OF TURKEY

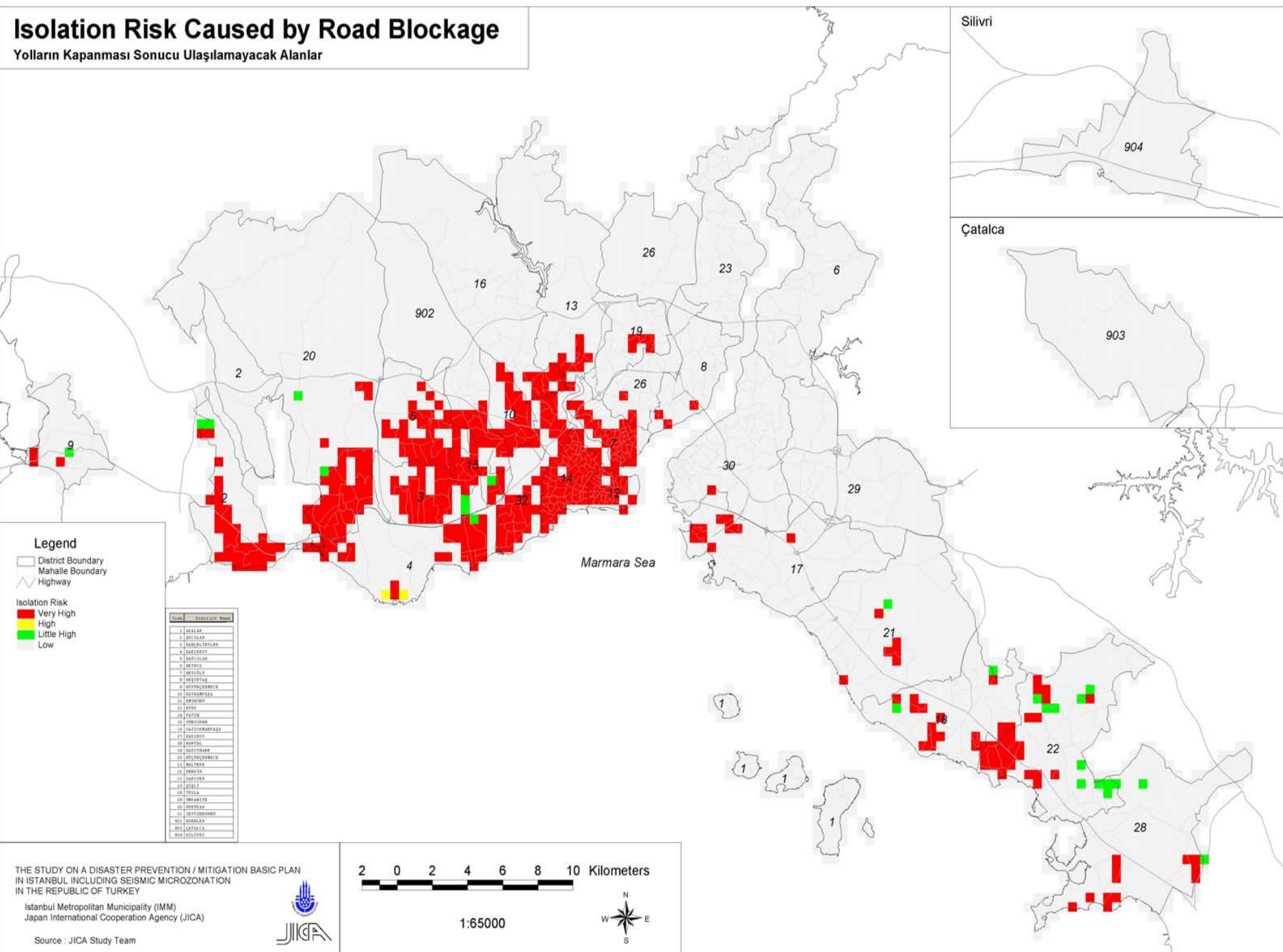
Istanbul Metropolitan Municipality (İMM)
Japan International Cooperation Agency (JICA)



Source : JICA Study Team

Isolation Risk Caused by Road Blockage

Yolların Kapanması Sonucu Ulaşılamayacak Alanlar



Legend

- District Boundary
- Mahalle Boundary
- Highway

Isolation Risk

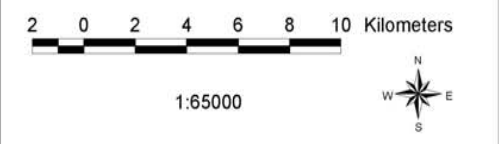
- Very High (Red)
- High (Yellow)
- Little High (Green)
- Low (Light Green)

District	Isolation Risk
1 ADALAR	Very High
2 BECİTLER	Very High
3 FENİKLİSÖĞÜK	Very High
4 BAĞCISQY	Very High
5 BABUQLAN	Very High
6 BEYOGLU	Very High
7 BEYOGLU	Very High
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30 BEYOGLU	Very High

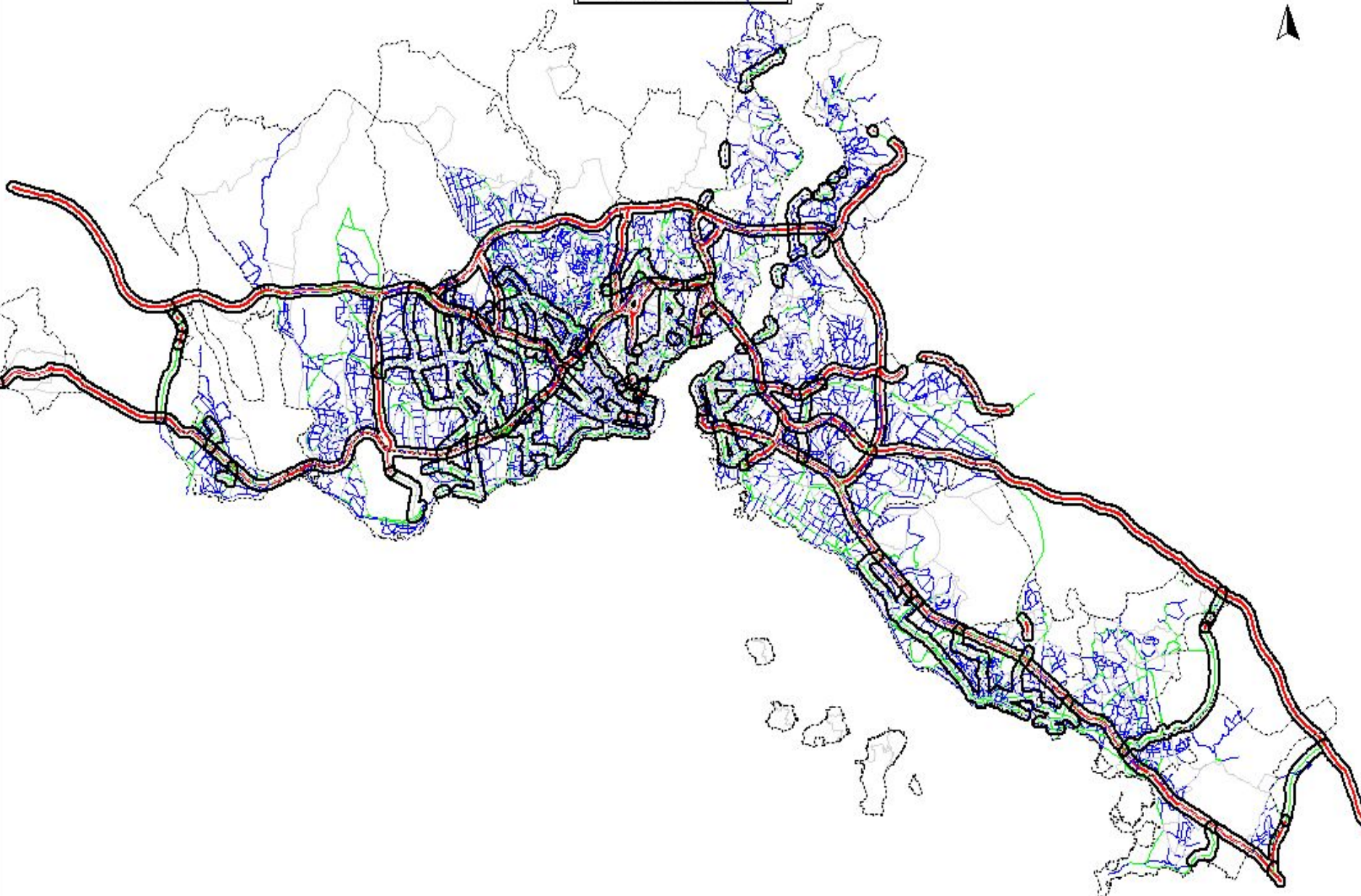
THE STUDY ON A DISASTER PREVENTION / MITIGATION BASIC PLAN IN ISTANBUL INCLUDING SEISMIC MICROZONATION IN THE REPUBLIC OF TURKEY

Istanbul Metropolitan Municipality (IMM)
Japan International Cooperation Agency (JICA)

Source : JICA Study Team

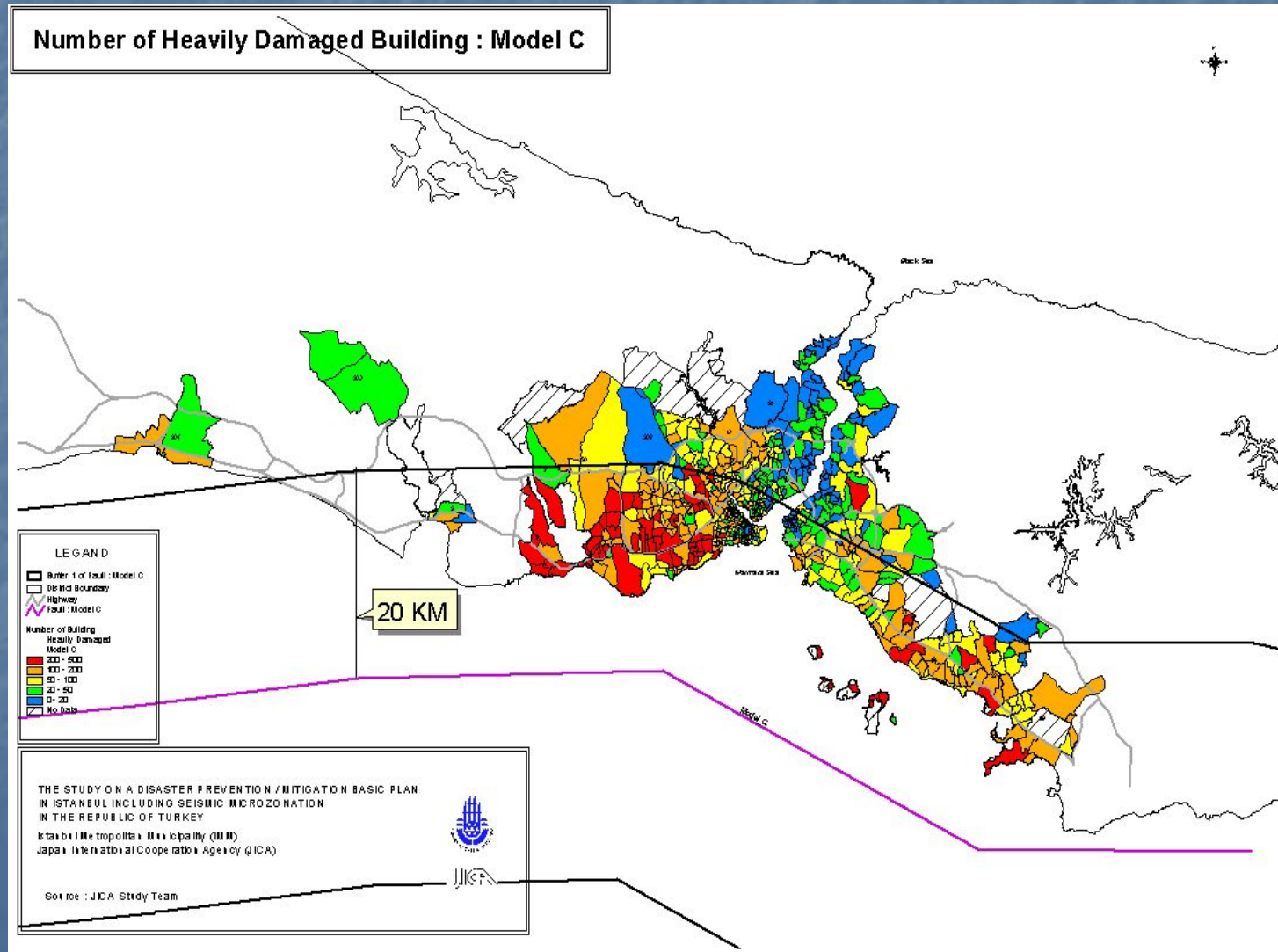


BUFFER ZONE



Prioritization Criteria

Distance from fault line





**Dr. Lütfi Kırdar Kartal
Eğitim ve Araştırma Hastanesi**



□ Bakırköy Ruh ve Sinir Hastalıkları Hastanesi

Seismic Risk Mitigation for Priority Public Buildings

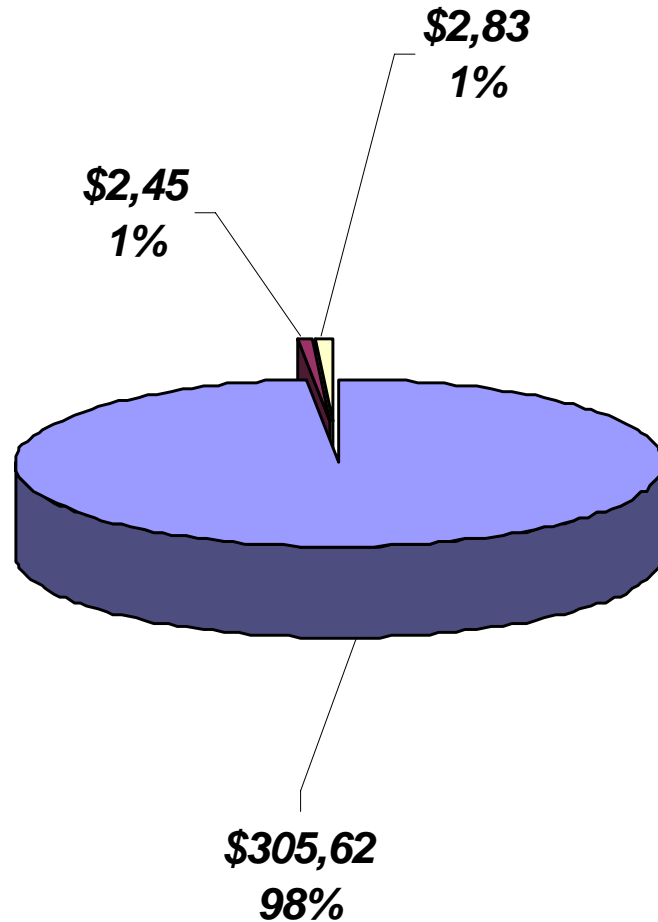
Vulnerability Assessment




Retrofitting

- ✓ Socially acceptable
- ✓ Technically applicable
- ✓ Economically feasible

Reconstruction

BUDGET OF COMPONENT B (USD MILLION)



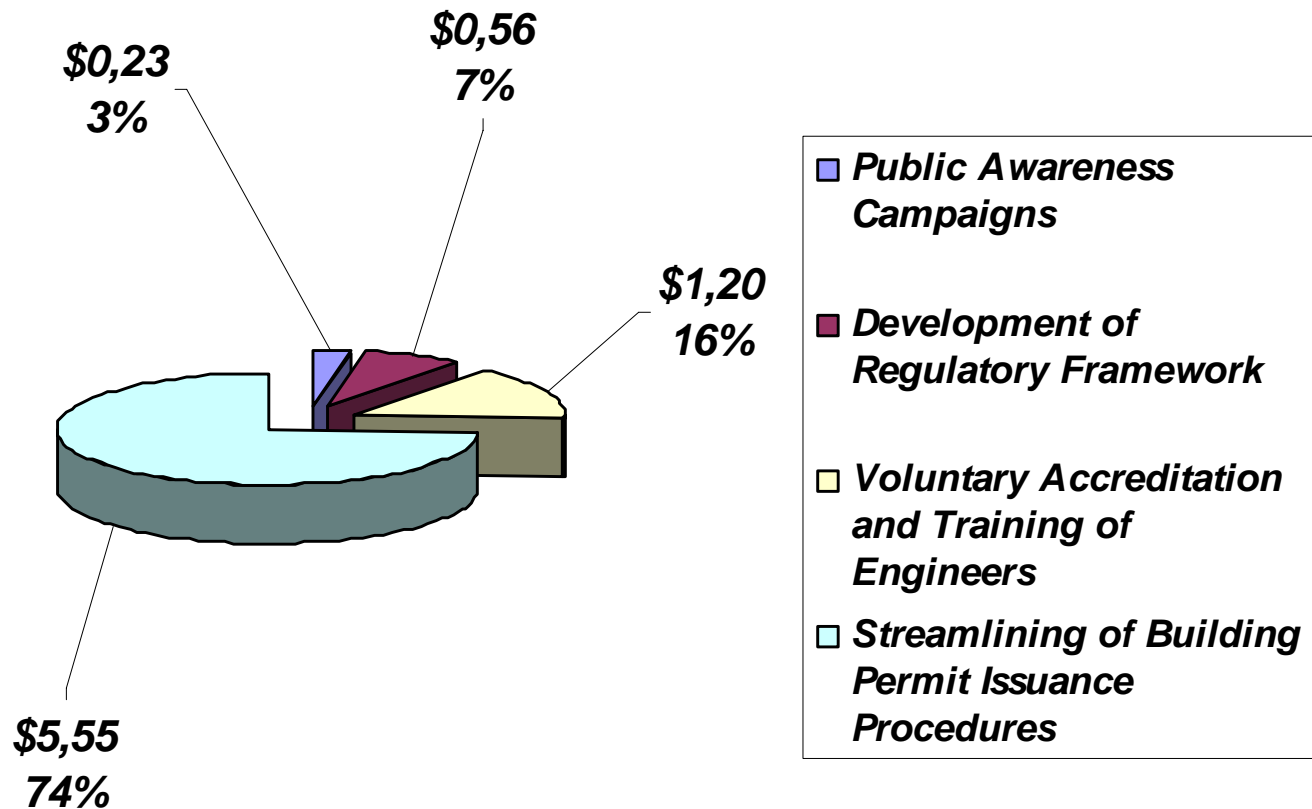
-  *Retrofitting of Priority Public Buildings*
-  *Risk Assessment of Vital Infrastructure and Lifelines*
-  *Risk Assessment for Cultural Heritage Assets*

COMPONENT C

Enforcement of Building Codes

- ✓ Creating public awareness in regard to the importance for public safety of compliance with building codes and land use plans.
- ✓ Analysis of building codes and regulations to identify problems during the implementation process at municipal level and suggesting solutions.
- ✓ Supporting the activities for the volunteer accreditation and training of engineers.
- ✓ Strengthening institutional and technical capacities of Istanbul Metropolitan Municipality and 2 pilot municipalities to better enforce building codes and comply with land use plans.

BUDGET OF COMPONENT C (USD MILLION)



CURRENT SITUATION

COMPONENT A

ENHANCING EMERGENCY PREPAREDNESS CAPACITY

New Disaster Management Center Building:

- ✓ Construction started

Equipments to be Purchased for upgrading emergency response capacity:

- ✓ Provincial Directorate of Health 112
 - 8 off-road ambulances
- ✓ Istanbul Metropolitan Municipality Fire Brigades
 - Various Fire-fighting instruments
- ✓ Provincial Directorate of Civil Defense Search and Rescue Unit
 - Studies on specifications

COMPONENT A

ENHANCING EMERGENCY PREPAREDNESS CAPACITY

- ✓ Assessment of Neighborhood Volunteer System.
- ✓ Procurement of Consultancy Services for Designing of Public Awareness Campaign and Materials for Disaster Preparedness

COMPONENT B

SEISMIC RISK MITIGATION FOR PRIORITY PUBLIC BUILDINGS

INITIATED TENDERS:

CB1.1: Revision of projects and construction supervision of 3 hospitals, 25 schools, 1 administrative building with available retrofitting projects (March 17, 2006)

CB1.2: Revision of projects and construction supervision of app. 113 schools, 8 hospitals and 1 administrative building with available retrofitting projects (May 18, 2006)

CB1.3: Preparation of project designs and feasibility studies for app. 115 schools and 12 hospitals (May 18, 2006).

CB1.4: Reconstruction of 4 schools with available construction design projects. (May 18, 2006).

CB1.5: Project design and construction supervision of Governorate's Disaster Management Center (AYM) and 2 hospital buildings (May 18, 2006)

COMPONENT B

SEISMIC RISK MITIGATION FOR PRIORITY PUBLIC BUILDINGS

- ✓ Tender process has been initiated for the hardware and software requirements of Istanbul Directorate of Survey and Monuments.
- ✓ The procurement of Consultancy Services for Inventorization and Multi-Hazard and Earthquake Retrofit Evaluation of the Cultural Heritage Buildings in Istanbul under the Responsibility of the Ministry of Culture and Tourism has been initiated.



Archeology Museum

ISMED PROJECT

Contributions of ISMED Project:

- ✓ Prevention of potential loss of life.
- ✓ Mitigation of social, economic and financial effects of a possible earthquake.
- ✓ Formation of a model for the design and implementation of other projects and activities within the field of disaster management.
- ✓ Creation of a model to improve emergency management capacities of local governments.

Thank you...

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