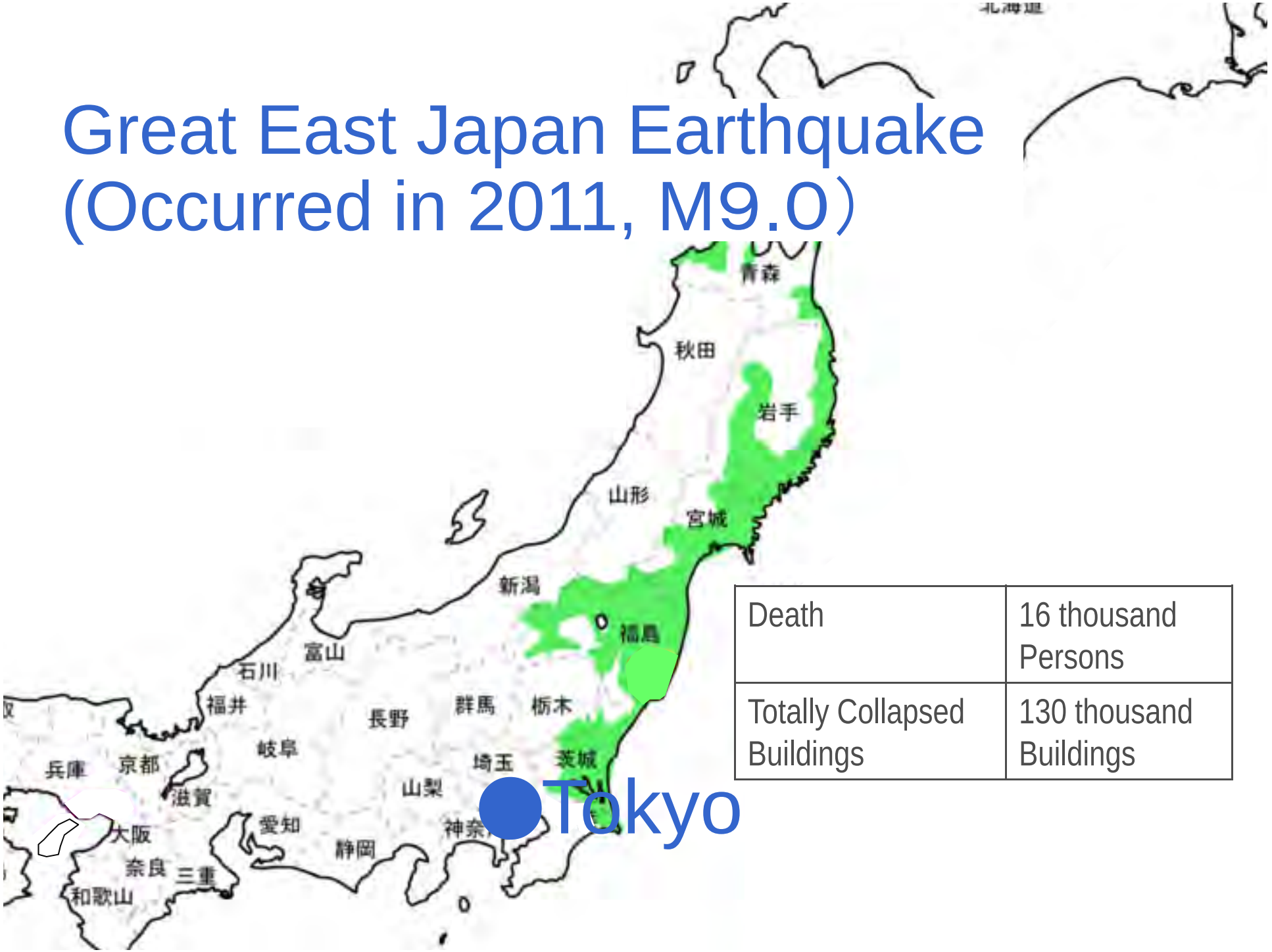
Earthquake Disaster Recovery Plan in TMG

“Pre-disaster Management Measures by District and Recovery from Expected Earthquake Directly Underneath Tokyo”

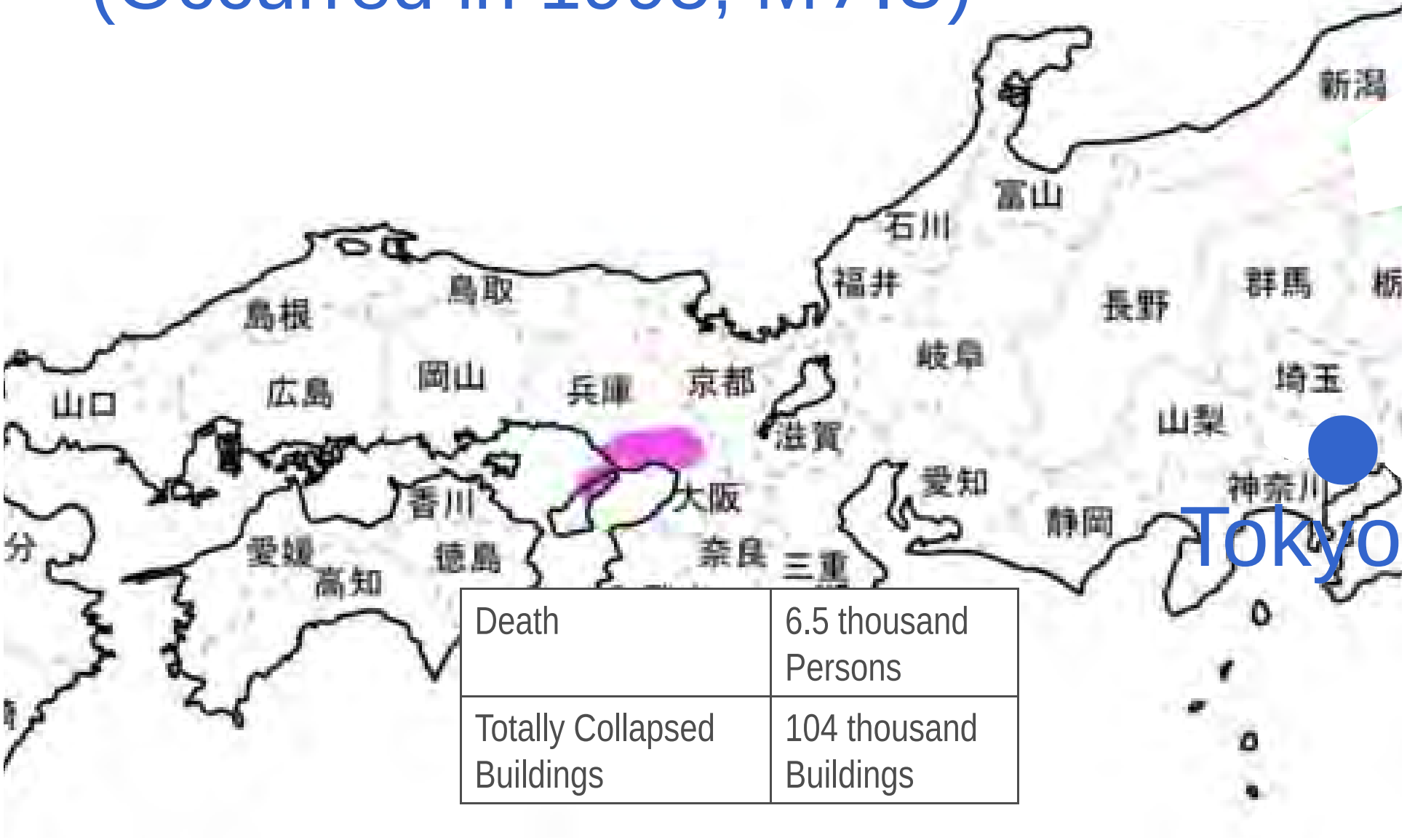
Planning Section
Urban Development Projects Division
Bureau of Urban Development

Great East Japan Earthquake (Occurred in 2011, M9.0)



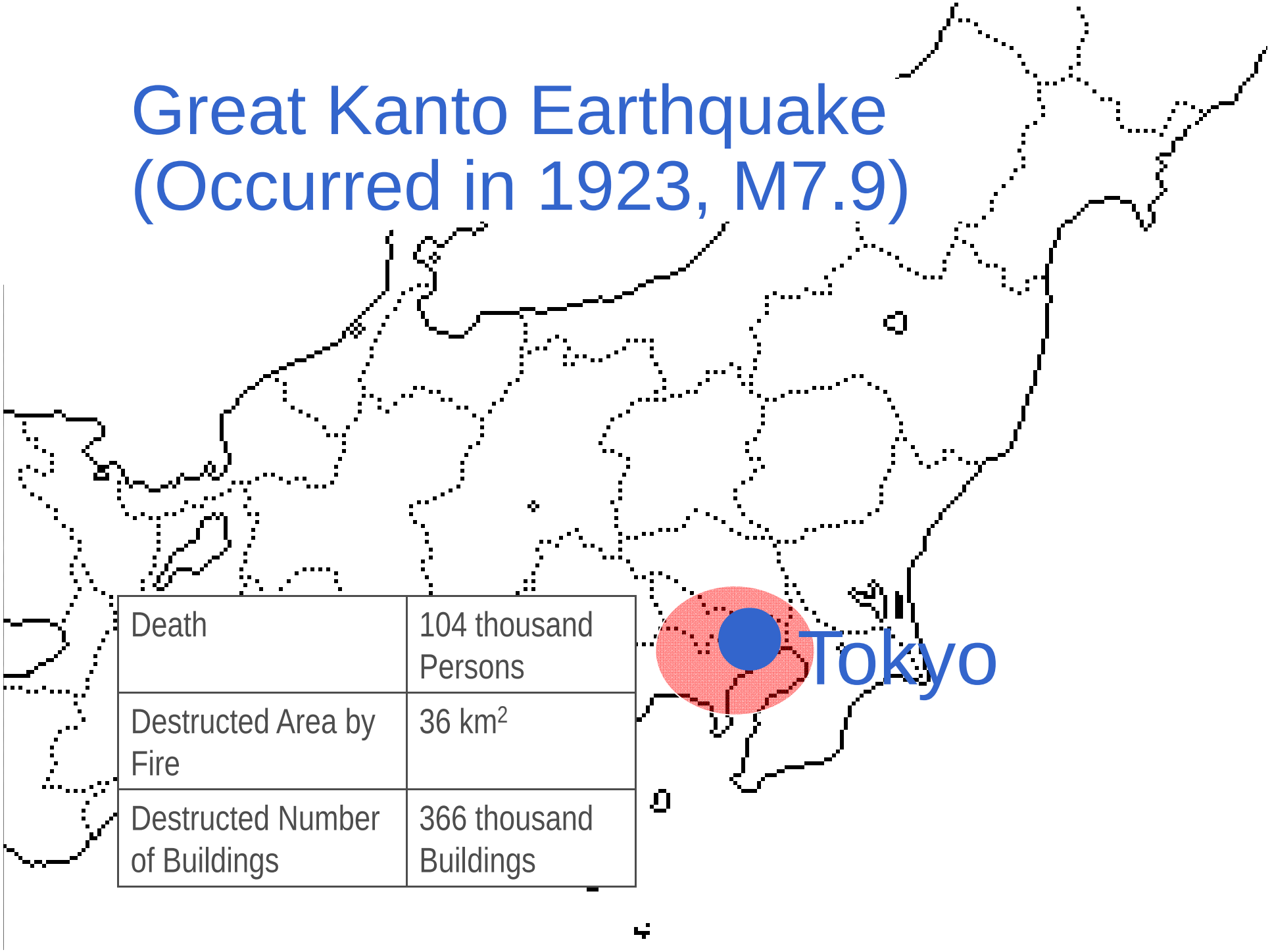
Death	16 thousand Persons
Totally Collapsed Buildings	130 thousand Buildings

Great Hanshin-Awaji Earthquake (Occurred in 1995, M7.3)



Death	6.5 thousand Persons
Totally Collapsed Buildings	104 thousand Buildings

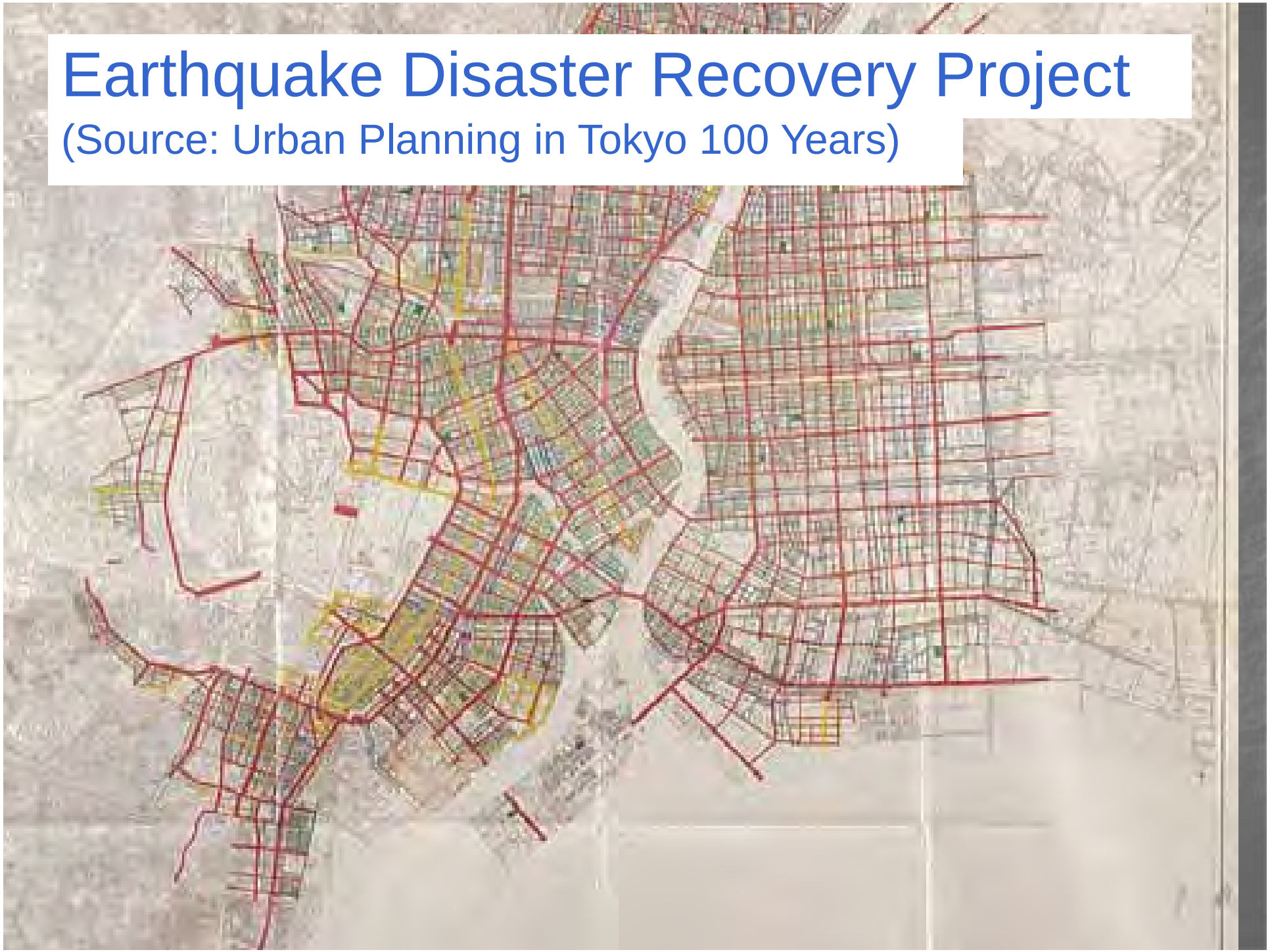
Great Kanto Earthquake (Occurred in 1923, M7.9)



Death	104 thousand Persons
Destructed Area by Fire	36 km^2
Destructed Number of Buildings	366 thousand Buildings

Earthquake Disaster Recovery Project

(Source: Urban Planning in Tokyo 100 Years)



Metropolitan City Recovery Project after Great Kanto Earthquake in 1923

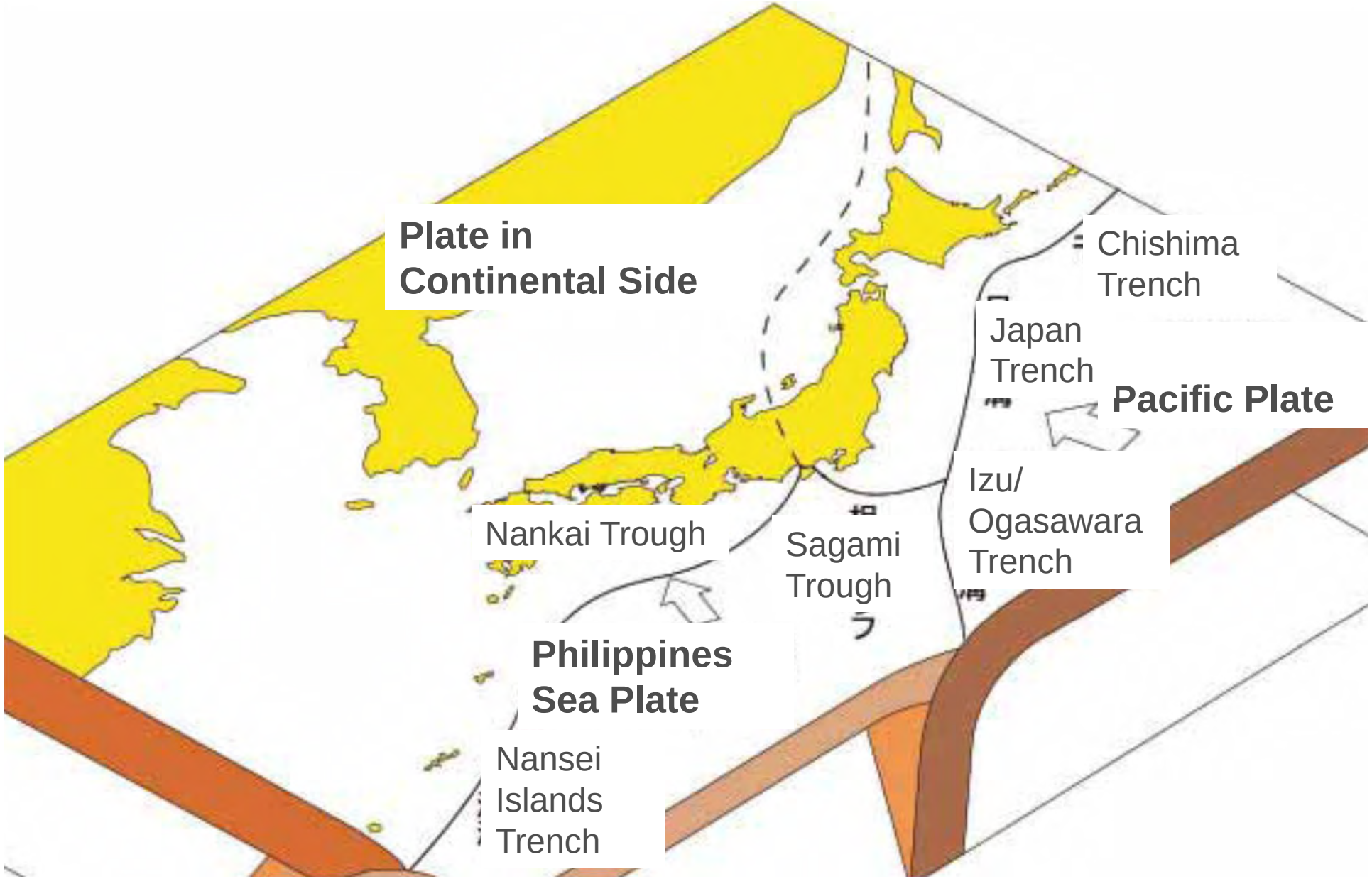
Eitai Bridge just after the Disaster Event

Nearby Sumida Park

Eitai Bridge after Recovery Project

Showa Street, Chuo-Ward

Plates surrounding Japan



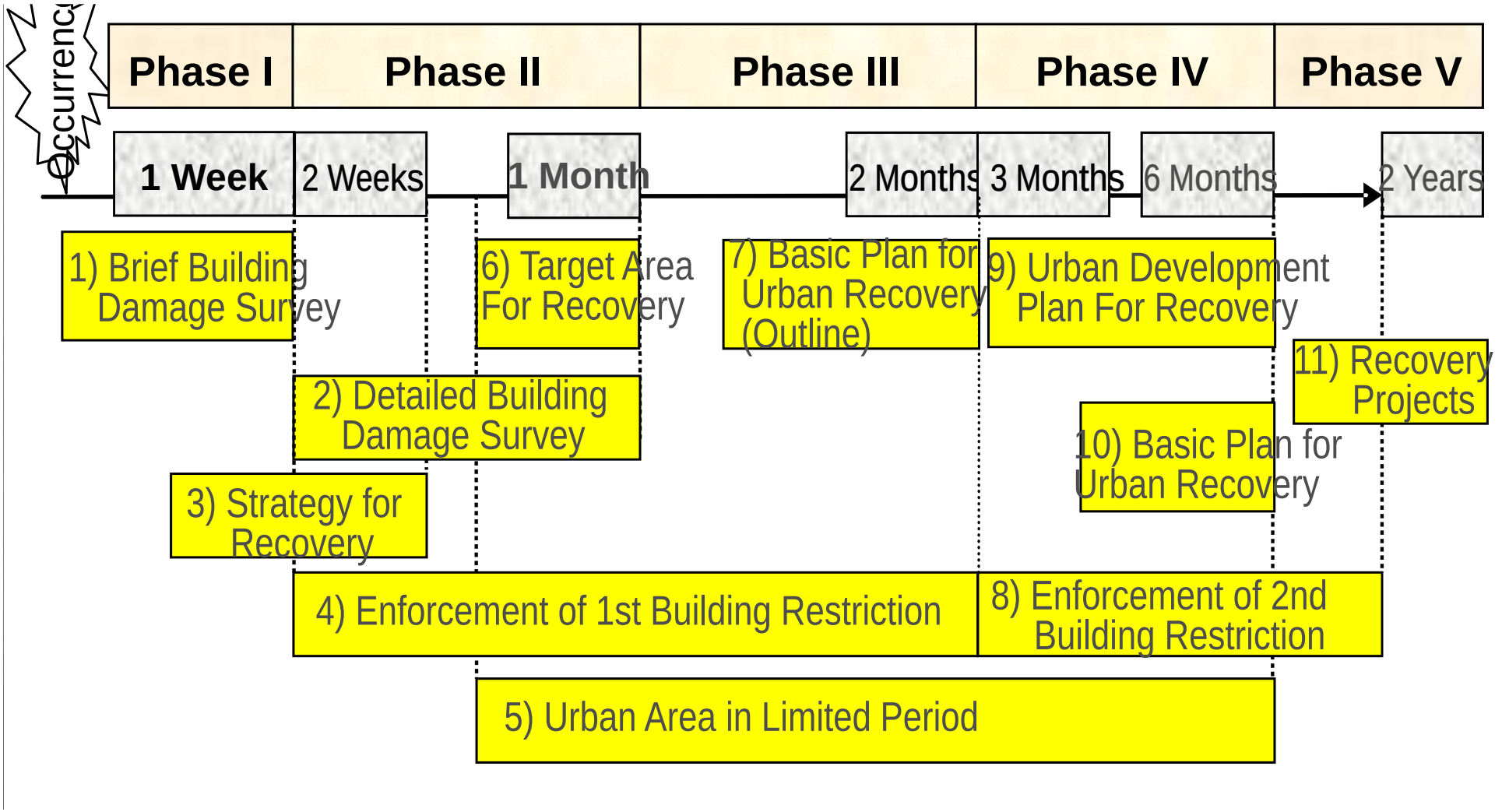
Measures of Pre-disaster Recovery Project in TMG

- Disaster Recovery Manual
- Disaster Recovery Ground Design
- Urban Recovery Simulation Drill

~ Disaster Recovery Manual ~
(Amended in March 2003)

(Government)	(Citizens)
• Recovery Measures • Action Program • Urban Recovery	• Recovery Process

Flow of Recovery Works (Earthquake Disaster Recovery Manual in TMG)



Process for Urban Recovery (5 Phases/11 Steps)

- Occurrence ~ 1 Week

I. Establishment of Initial Recovery Works

1) Brief Building Damage Survey

- 1 Week ~ 1 Month

II. Preparation of Concept for Urban Recovery

2) Detailed Building Damage Survey,

3) Strategy for Urban Recovery

4) 1st Building Restriction

5) Urban Area in Limited Period

6) Target Area for Recovery

- 1 Month ~ 6 Months

III. Preparation of Basic Plan for Urban Recovery

7) Basic Plan for Urban Recovery (Outline)

8) 2nd Building Restriction

9) Urban Development Plan for Recovery

10) Basic Plan for Urban Recovery

- 6 Months ~ 1 Year ~

IV. Decision of Contents of Recovery Project

11) Recovery Project

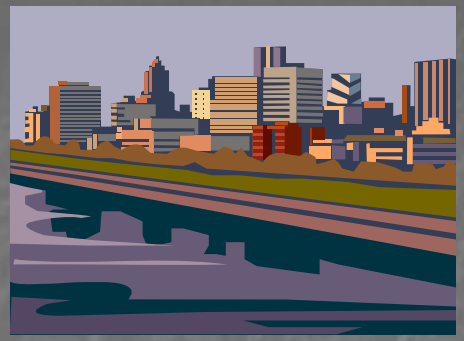
V. Implementation of Recovery Project

- Level of Urban Recovery
  (Never repeat the disaster damages)
- Demarcation of the Role on Urban Development for Recovery
  (Responsible for Ward/City Government
  - Regional Coordination)
- Main Body of Urban Development for Recovery
  (Community-level supporting activities,
  “Cooperation (=Coping Capacity)”

Urban Recovery

Occurrence

Urban Development
Plan for Recovery



Strategy

Plan

Legal
Procedure

Survey on Damage
Condition

Classification of
Recovery Project Area

1) Intensive Recovery
   Area
2) Recovery Promoted
   Area
3) Recovery
   Recommended Area
4) General Area

Project Area
Methodology

Discussion and
Consensus

(Community/
Consultative Group)

~ Disaster Recovery Grand Design ~
(Prepared in May 2001)

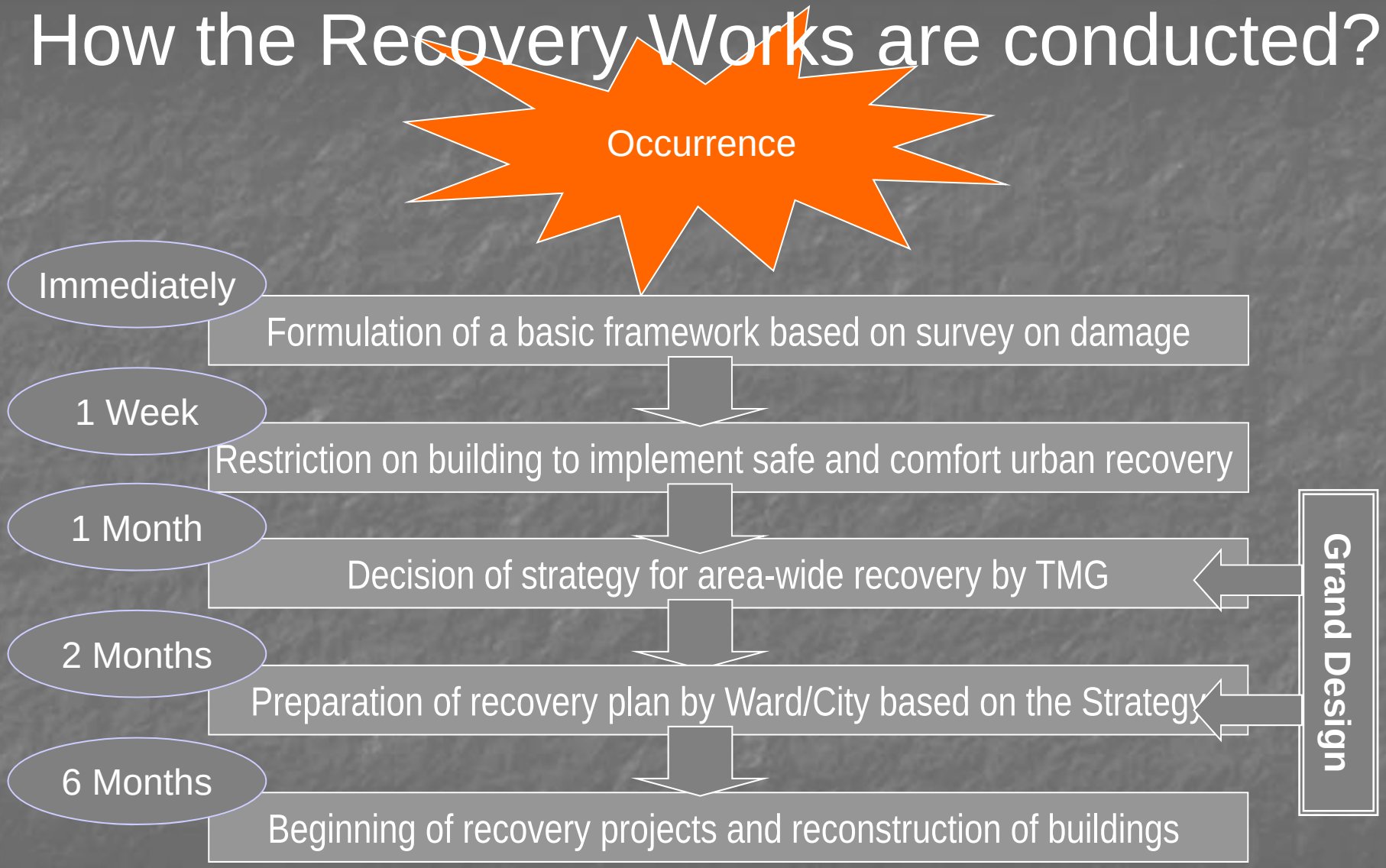
- If a great earthquake hit Tokyo Metropolitan Area…
- After the disaster event, how should we recover the Area?
- Let’s think together about urban development of Tokyo after huge damages by earthquake.

If we suffered by huge damages caused by a great earthquake?

What is the Disaster Recovery Ground Design

1. To share the Concept for Recovery
2. To promote Urban Visions after Recovery Works
3. To propose implementation measures of recovery projects
4. To incorporate into the urban development plans in ordinary times
5. To prepare in consideration of damage estimation

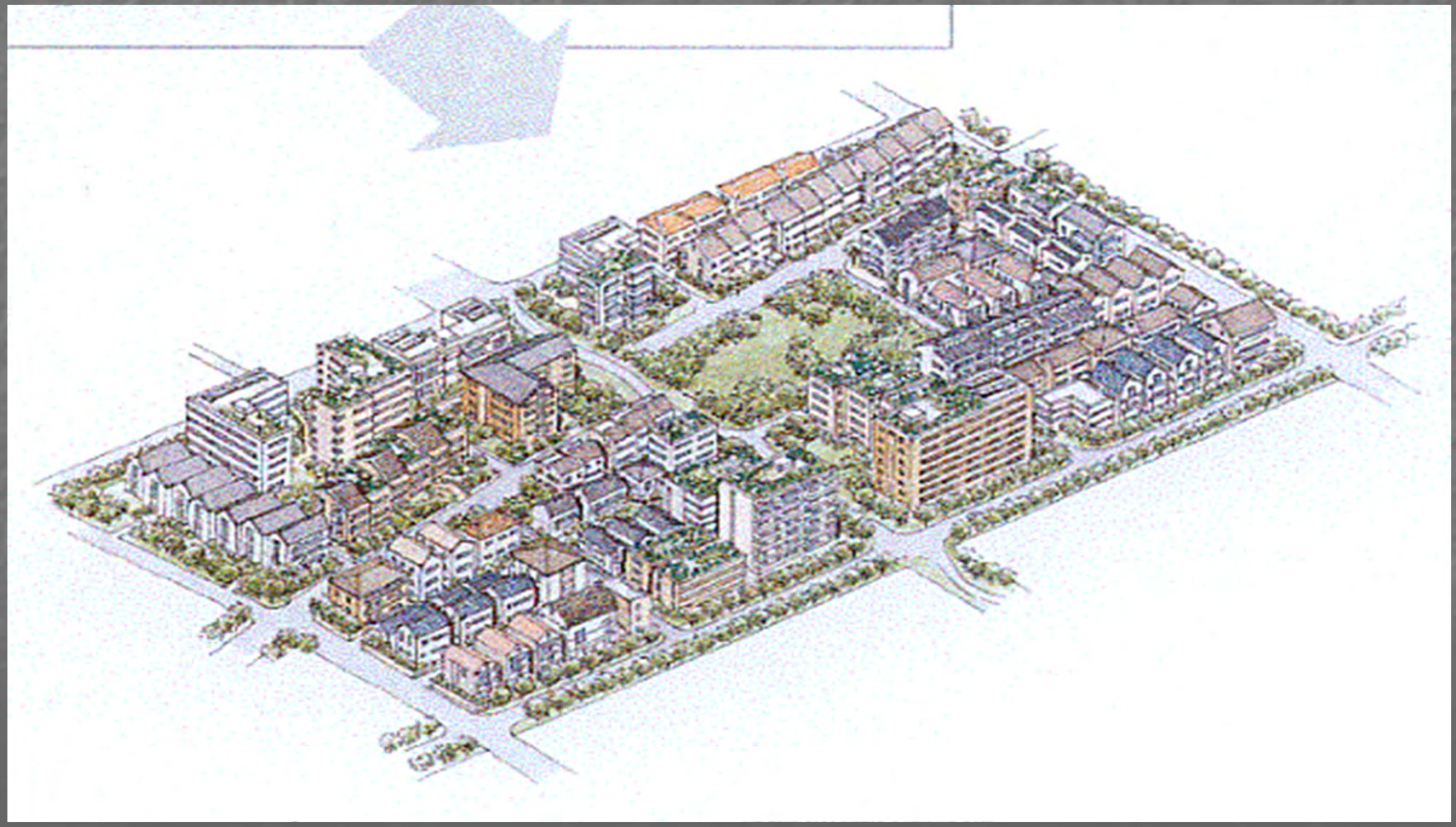
How the Recovery Works are conducted?



Symbol of Recovery called “Green Corridor”

Images of the City after Recovery Works in Suffered Area

The area where is expected to be destructed by fire because of densely built wooden houses and small & medium business buildings



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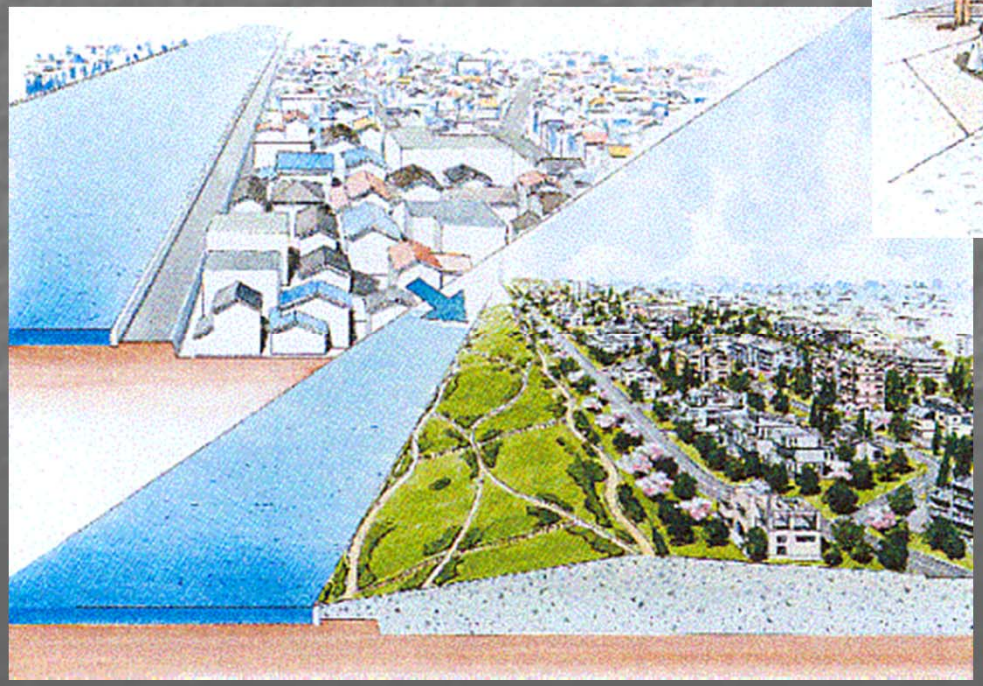
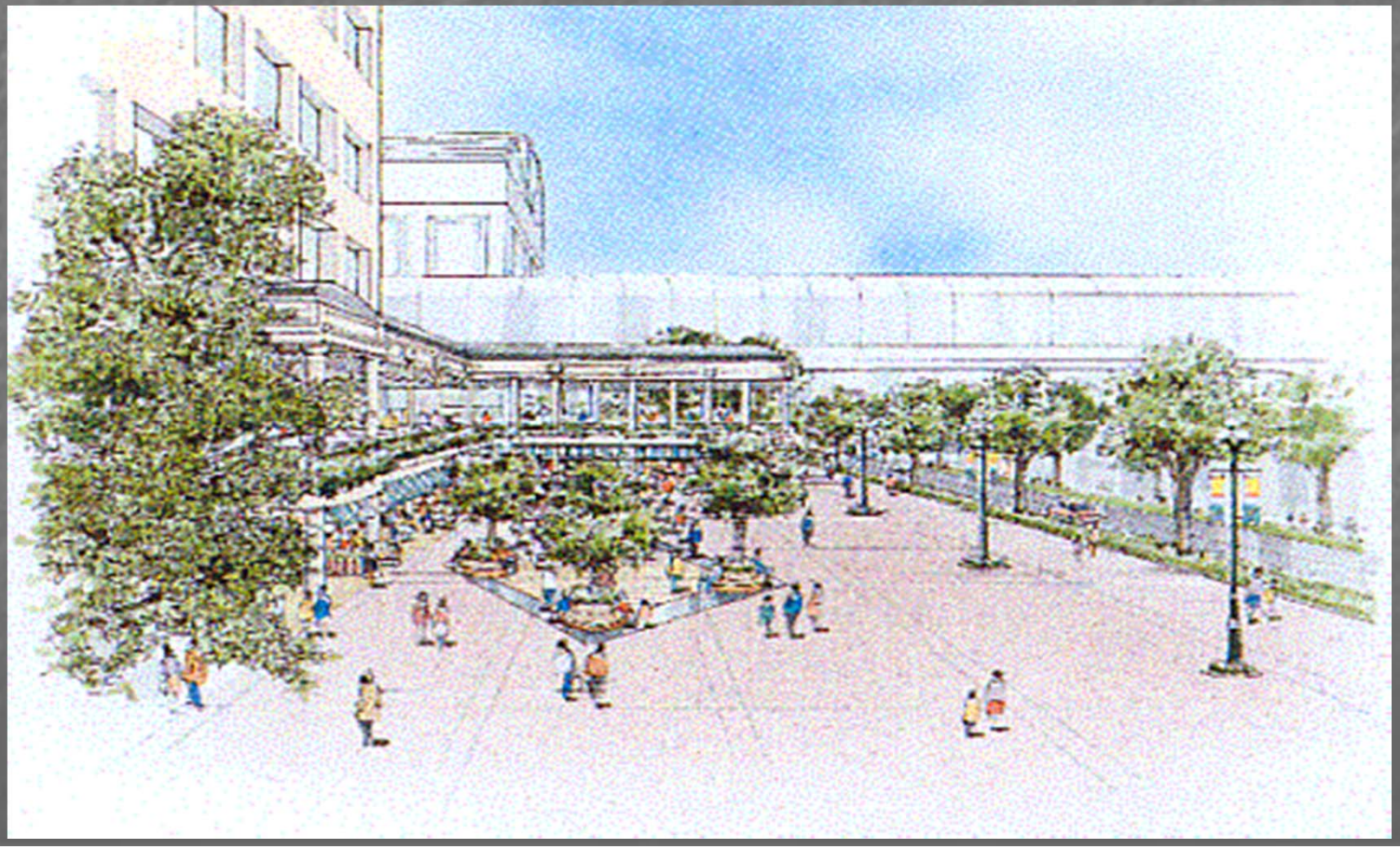


Images of the City after Recovery Works in Suffered Area

District Center near by Railway Station

The area where is expected to be destructed by fire because of densely built wooden houses and small & medium business buildings



～ Urban Recovery Simulation Drill (Map Exercise) ～

(Conducted every year since 1998)

Practice and Investigation of Manual

- Town Inspection
- Preparation of Urban Development Plan for Recovery

"Cooperation"

- Kogakuin University, Tokyo Metropolitan University
- Disaster Recovery Support Organization

Town Inspection
(Damage Estimation Survey)

Discussion on Urban Development Plan for Recovery

Instruction by Experts

Presentation on Prepared Urban Development Plan for Recovery

Map of Urban Development Plan for Recovery (Completed)

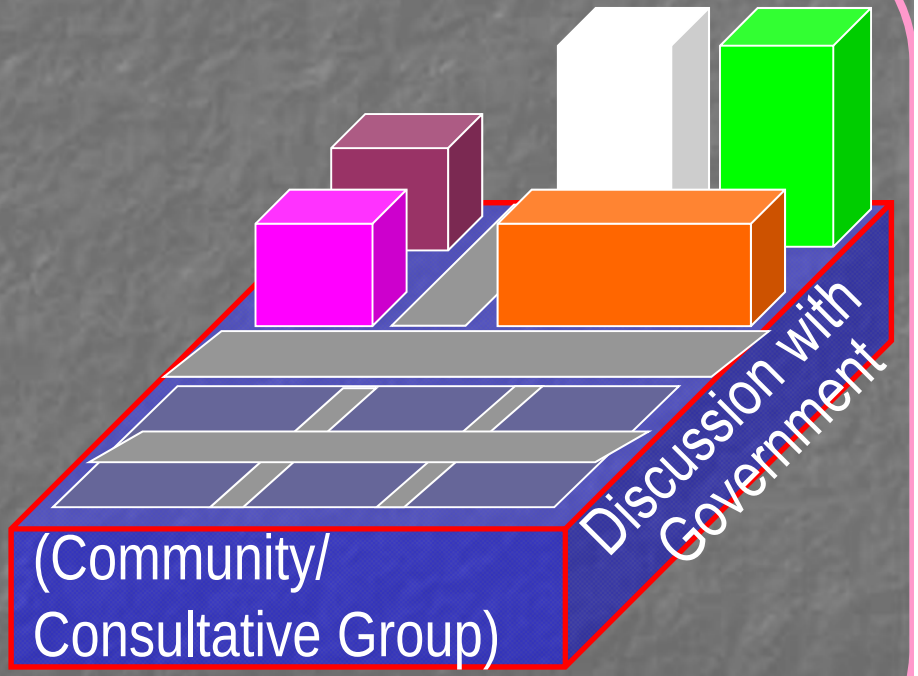
Implementation of Urban Development for Recovery

Government

Proposal of Project Area and Methodology

Discussion/ Agreement

Community (Consultative Group)



Implementation of Urban Development for Recovery [Measures of Consensus Building]

Damage Estimation by Earthquake Directly underneath Tokyo (TMG Disaster Management Board, April 2012)

Northern Tokyo Bay Earthquake – The Most Extensive Damages are Expected

◆ Earthquake Directly underneath Tokyo with M7.3, epicenter is northern Tokyo Bay
- Weekda¥y in Winter, 18:00, Wind Speed is 8m/s
- The depth of epicenter is expected 10km shallower than the former estimation

Seismic Intensity

◆ Intensity 6 upper in Japanese scale covers 444km^2, 70% of Ward Area
- It is increased to 1.5 times larger than the former estimation of 305km^2.

◆ Intensity 7 is applied for the first time to 7 Wards.

Death

◆ 9,700 persons (1.5 times bigger than the former estimation of 6,400 persons)
- 5,600 persons (2,900 persons) by building collapse
- 4,100 persons (3,500 persons) by fire
- The most damages are occurred in Ota-ward (1,073 persons)

Liquefaction

◆ Number of totally/half collapsed buildings: 64,000 buildings
- 2.6 times bigger than the former estimation of 25,000 buildings.
- 1,100 buildings are totally collapsed, 63,000 buildings are half collapsed.

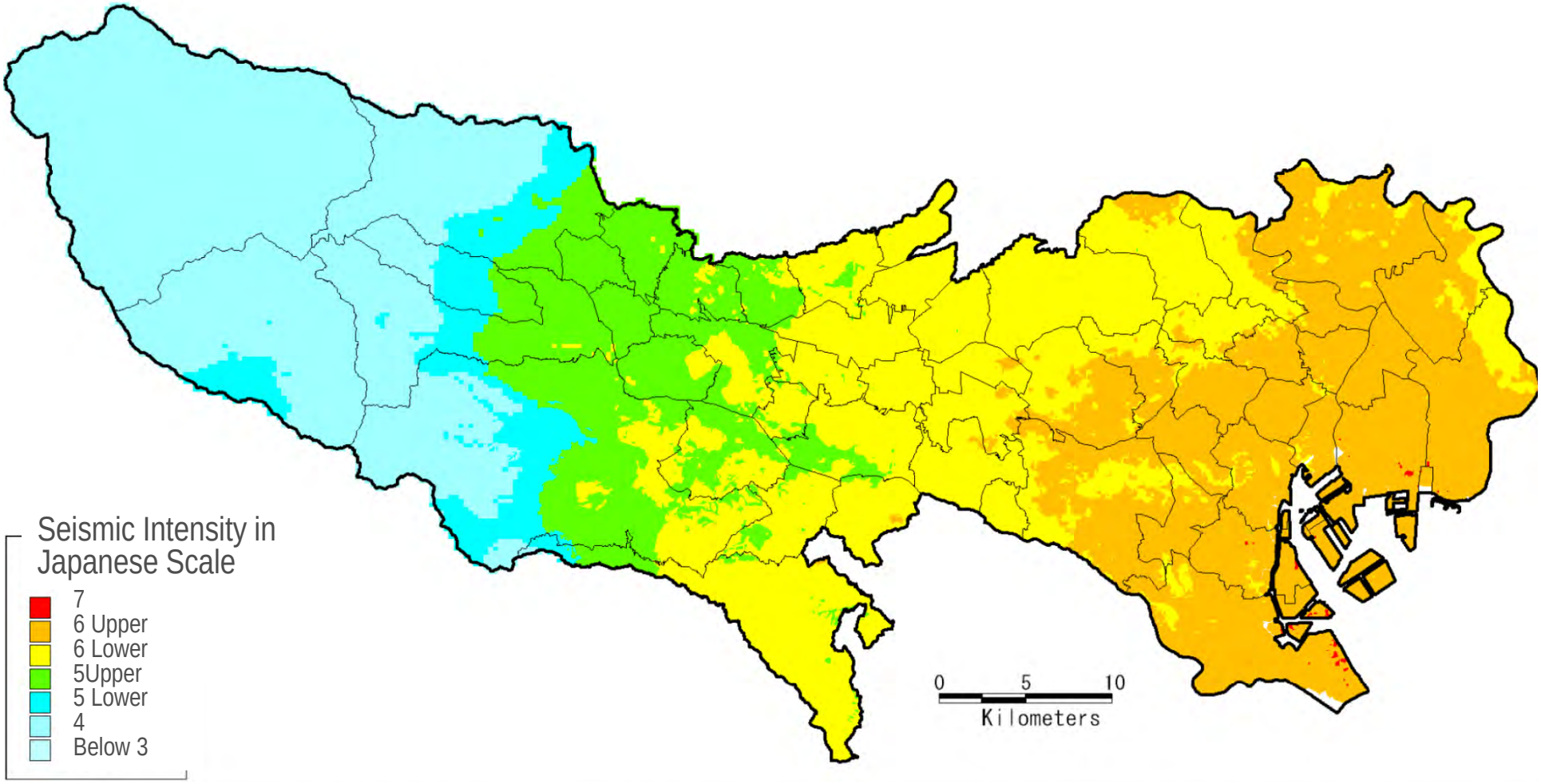
Damaged Buildings

◆ 300,000 buildings by totally collapsed or totally destructed (reduced from 470,000 buildings)
- That amount is 10% of the total number of buildings of 2.82 million buildings in TMG
- 116,000 buildings are totally collapsed (127,000 buildings)
- 188,000 buildings are totally destructed by fire (345 buildings)
- It is reduced from the former estimation because of seismic retrofit/non-frammable/rebuild of buildings

Refugees who are difficult to go back to home

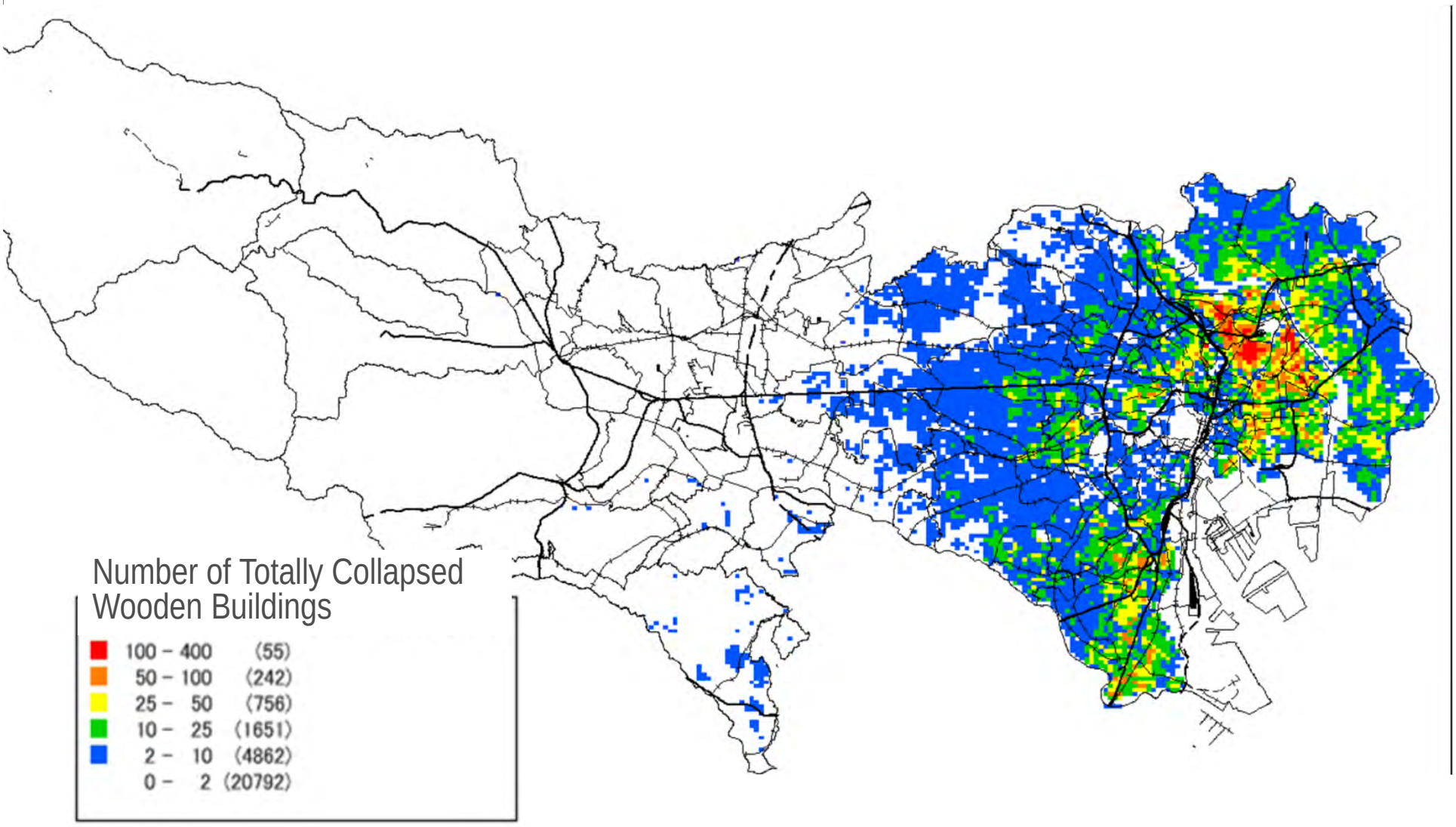
◆ 5.17 million persons (increased from the former estimation of 4.48 million persons)
- Of which 1.63 million persons are stayed in the railway stations and out of building.
- In case of East Japan Earthquake in 2011, these persons amounted to 3.52 millions and the expected number is exceeding that amount.

Distribution of Seismic Intensity By Earthquake Directly underneath Tokyo



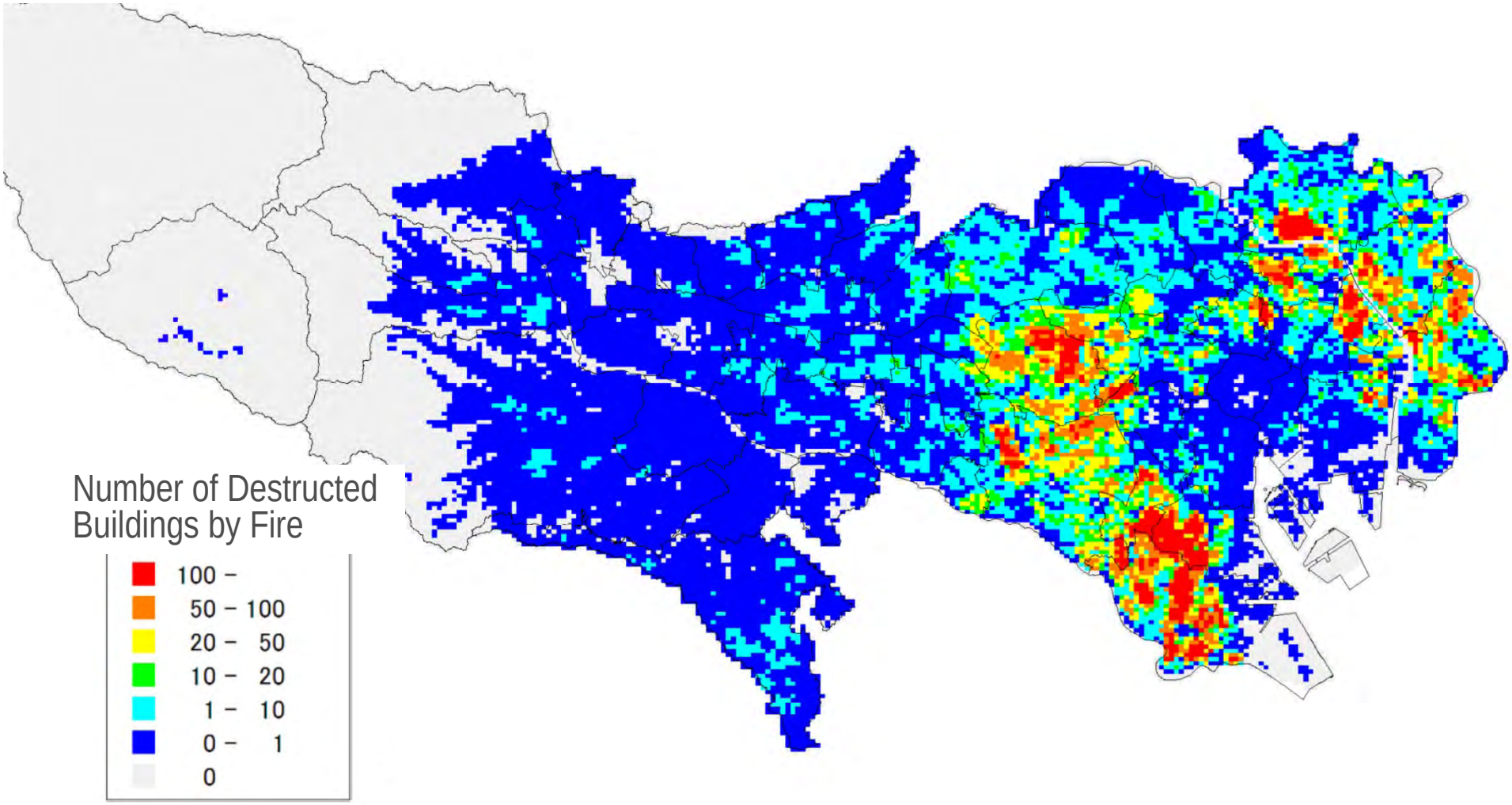
Northern Tokyo Bay Earthquake (M7.3)

Distribution of Totally Collapsed Buildings by Expected Northern Tokyo-bay Earthquake



Distribution of the Number of Destructed Buildings by Fire by Northern Tokyo Bay Earthquake

(Winter Evening, 18:00, Wind Speed: 8m/s)




Thank you very much
多謝各位関注
ขอบคุณครับ