Reality Check Workshop
Adaptation on the ground in Istanbul

Istanbul-Turkey

April 2018

Resilient Cities 2018
CURRENT STATE

Istanbul

- **Population**: 15 Million
- **Buildings**: 1,180,861
- **Total Area**: 5,345 Km²
- **Agricultural Area**: 26.25%
- **Forests**: 45.15%
- **Lakes**: 2.4%
- **Urban Area**: 26.12%

**General Information**

- **15 Million Population**
- **1,180,861 Buildings**
- **Total Area**: 5,345 Km²
European Seismic Hazard Map

Source: SHARE PROJECT
Historical Process

ISTANBUL & EARTHQUAKE
Historical Process

17/08/1999
Kocaeli Earthquakes

2002
The Study on A Disaster Prevention / Mitigation Basic Plan in Istanbul

2003
Earthquake Master Plan for Istanbul (IMM)

2003 - 2008
Urban Transformation Studies based on Earthquake (Fatih - Zeytinburnu - Küçükçekmece)

2006 - 2009
Microzonation Projects (IMM)

2007 - 2008
HAZTURK (Loss - Damage Estimation Programme)

2009
Updating of Probable Earthquake Losses for Istanbul

2008 - 2014
Megacity Indicator System for Disaster Risk Management (MegaIST)

2015
Istanbul Urban Transformation Strategic Plan

2016 - 2018
Istanbul Urban Transformation Master Plan

ISTANBUL & EARTHQUAKE
ISTANBUL EARTHQUAKE MASTER PLAN (2003)

The scope of Earthquake Master Plan for Istanbul comprised of works to be done in the following areas:

a) Assessment of current situation
b) Seismic assessment and retrofitting of existing buildings
c) Urban planning issues
d) Legal issues
e) Financial issues
f) Educational issues
g) Social issues
h) Risk and disaster management issues

and aimed at planning of the activities in these fields, preparation of implementation programs, and identification of the responsibilities and responsible authorities for earthquake disaster mitigation works to be carried out in Istanbul.
Disaster Based Studies

HAZARD MAPS

250m x 250m cell size
European Side = 182 km²
4364 mechanical drilling with 125.578.90 m

250m x 250m cell size
Anatolian Side = 458.25 km²
5029 mechanical drilling with 118.047m
3,500 to 5,000 buildings will have heavy damages
20,000 to 30,000 buildings will have heavy damage
90,000 to 110,000 buildings will have moderate damage
Earthquake base economical loss due to building damage is around 26 billion TL
Total economical loss is around 80-100 billion TL.
Casualty estimation varies between 15,000 to 35,000.
The number of units which may need urgent accommodation need is around 500,000.
Urban seismic risk index

Coping capacity index

Physical Risks
- Building Damage
- Casualties
- Lifeline Damage
- Road Blockage
- Fire Outbreak Possibility

Social Vulnerability
- Demographic Structure
- Disability and Special Treatment Needs
- Access to Health Service
- Education Status
- Economic Status
- Mobility
- Community Preparedness

Coping Capacity
- Rescue and Recovery Capacity
- Sheltering Area Support Capacity
- Infrastructure Improvement Capacity
- Debris Removal Capacity

Performance-based administrative monitoring process
ISTANBUL & EARTHQUAKE

MEGACITY Indicator System For Integrated Disaster Risk Management

Ranking for Physical Risk Indicators Goal

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Utility</th>
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</table>

Physical Risk Indicators:

- High Risk
  - Death Number
  - Slightly Damaged Building Number
  - Natural Gas Line Damage Number
  - Water Supply Damage Number

- Low Risk
  - Slightly Damaged Number
  - Building Collapse Number
  - Fire Outbreak Possibility – Explosive Building

ISTANBUL & EARTHQUAKE
Earthquake Based Urban Transformation Studies

Gökhan YILMAZ / Didem ÇALIŞKAN
Some Risky Districts due to the engineering studies

EARTHQUAKE BASED STUDIES
EARTHQUAKE BASED STUDIES

1.9 m

3.1 m

2.1 m

1.5 m
Some Risky Districts due to the engineering studies
Fatih 10 Project Areas

EARTHQUAKE BASED STUDIES
Some Risky Districts due to the engineering studies
Zeytinburnu Urban Transformation Studies

Completed Projects

600
Residential Units

484
Residential Units

Earthquake Based Studies
Istanbul Urban Transformation Master Plan Study (IKDMP)

Seniye Selcen ONUR / Semih ADİL
ISTANBUL URBAN TRANSFORMATION MASTER PLAN (IKDMP)

1. Economic Plan
2. City Scale Transformation Masterplan
3. Detailed Masterplans for Priority Areas
Istanbul Metropolitan Municipality will ensure urban transformation is delivered that is **sustainable, resilient** and contributes to **long term economic and population growth requirements** while maximising **the quality of life** for all residents.
The IKDMP will take a holistic approach to urban transformation ensuring that Istanbul in the future is...

1. SAFE
   Citizens and businesses are safe and protected from natural hazards and future risks

2. SUCCESSFUL
   The quality of life and prosperity of all citizens is raised as the city grows

3. ACCESSIBLE
   Citizens are well connected to neighbourhoods, centres, city systems, services and infrastructure

VISION

THEMES

• Urban Resilience
• Natural + Historic Environment
• Green Infrastructure
• Built Environment
• Social Structure
• Economy + Employment
• Centres + Community Facilities
• Transport
• Utilities
• Holistic Delivery
Multicriteria Analysis

Risk
- Earthquake
- Landslide
- Flood
- Fire

Life Quality
- Socio-Economics Composite Score
- Transportatio

Urban Form
- Urban Fabric (Pattern)

Environmental Conditions

Social Infrastructure and Centres Accessibilit y Composite Score
- Socio-Economics Composite Score
- Transportatio

Environmental Conditions
- Water Quality
- Water Supply
- Watercourses
- Biodiversity
- Slope

Resilience
- Liquefaction Potential following Ed
- Tsunami due to offshore
- Earthquake
- Building Damage due to
- Landslide
- Road Blockage due to
- Landslide
- Road Blockage due to
- Flood
- Fire Prone Buildings

- Tsunami following

Earthquake
- Fire Following Earthquake
- Building Damage Earthquake
- Road Blockage due to
- Earthquake

Informal Housing
- Incompatible Residential Use
  (Surrounded by Industrial
  Zone)
- Average Household Income
  (monthly)
- Percentage Employed of Total
  Population
- Percentage of Population
  Received Higher Education

Proximity
- to Open Space
- to Religion
  Facilities
- to Educational
  Facilities
- to Health
  Facilities
- to Local Centre Facility
  Bus stops, Tram, Metro, Pier
- Facility Catchment

- Proximity

To

Floor Area Ratio
- Population Density
- Typology
- Solid and Void (figure -Ground)
Multicriteria Analysis

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<th>Criteria</th>
<th>Sub-Criteria</th>
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<tr>
<td>Road blockage/biasure due to Earthquake</td>
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Risk:
- Safe
- Low precaution
- High precaution
- Restricted

RESILIENCE
Determination of Problem Areas for Urban Transformation

RISK

URBAN FORM

ENVIRONMENTAL CONDITION

LIFE QUALITY

RESILIENCE - MULTI CRITERIA ANALYSIS
Determination of Problem Areas for Urban Transformation
**Population & Employment**

2016: 14,943,319
2036: 19,800,000

2016: 5,408,802
2036: 7,880,000

Net Developed Land (2016) Land required by 2036

Legend:
- Grey: Urban Area
- Red: Commercial
- Orange: Hotel
- Green: Office
- Pink: Industry & Storage
- Brown: Residential
- Teal: Social Infrastructure

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Developed Land (Ha)</th>
<th>Land Required by 2036 (Ha)</th>
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<tr>
<td>2016</td>
<td>99,600</td>
<td>28,355</td>
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<tr>
<td>2036</td>
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</table>
Projection for 2036:
- 19.8 million people
- 150 people/ha GROSS DENSITY
- 7.8 million jobs
- 132,310 hectares URBAN AREA

1- 1/100,000 Scaled Urban Transformation Structure Plan

2- 1/25,000 Scaled Urban Transformation Town Plans
IKDMP
Methodology

3- 1/10,000
1/5,000 Scaled Opportunity Area Schemes

4- 1/1000 - 1/500 Scaled Priority Area Urban Transformation Plans

ISTANBUL URBAN TRANSFORMATION MASTER PLAN
Implementaiton Studies by using the “Built & Transfer&Evecuate” model on state-owned areas

Ayşe GÖKBAYRAK / Mehmet Akif LEVENT

BAYRAMPASA
URBAN TRANSFORMATION PROJECT
Urban Transformation Model

- Project Area: 25 Hectares
- Ownership: İBB
- Construction Start Date: 2016
- Project End Date: 2019
- Independent Units: 2,500
- Transformation Model: Build/Transfer/Evacuate
- Residential + Commercial: %40
- Reinforcement area: %60

Bayrampaşa Former Prison Area Urban Transformation Project
Bayrampaşa Former Prison Area Urban Transformation Project

Social Studies

Mosque Square
Commercial Street
Green Corridor
Hospital
Metro Station
School
Social Infrastructure
Architectural & Sustainable Design

Bayrampaşa Former Prison Area Urban Transformation Project