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II  Disaster Management Environment of Seoul

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Disasters in the Past
Recent Disasters in Asia

- Indian Ocean earthquake and tsunami
  (Dec. 26, 2004.)

- Sumatra, Indonesia
  - Magnitude of 9.0
  - Tsunami

- Death toll of 290,000
- 5 mil people displaced
Great Sichuan Earthquake (May 12, 2008)

- 90km NW of Chengdu
  - Magnitude of 8.0

- 70,000 Dead
- 18,000 Missing
- 370,000 Injured
Typhoon Ketsana, Philippines (Sep. 27, 2009)

- Worst Typhoon in 40 yrs
  - Torrential Rainfall & Landslide

- 144 Dead
Great East Japan Earthquake (Mar. 11, 2011)

- Magnitude of 9.0
- Tsunami over 8m
- 1,600 Roads/Bridges & 140,000 Buildings Damaged
- Nuclear Reactor Suffered Explosion, Radioactive Leakage
Past Disasters in Korea

**Typhoon Rusa**  
(Oct. 2002)

- Central Pressure: 850hPa,  
- Highest Precipitation/day: 871mm  
- 209 Dead, 37 Missing  
- Property damage of 5.1 tril KRW

**Typhoon Maemi**  
(Sep. 2003)

- Biggest Typhoon in 99 yrs  
- Highest Winds: 60m/s  
- 119 Dead, 13 Missing, 366 Injured  
- 10,975 Displaced  
- Property Damage: 4.8 Tril KRW
Daegu Subway Fire
(Feb. 2003)

- Act of Aggression Toward the Society, Committed by an Arsonist Suffering from Depression
- 192 Dead, 148 Injured
- Property Damage of 61.4 bil KRW

Oil Spill in Taean
(Dec. 2007)

- Clash between Crane Barge and Crude Carrier
  - Crude Oil Spill of 12,547kℓ
- Polluted 5,159ha
- 573,000 People for Control Efforts
- Property Damage of 61.4 bil KRW
**Heavy Snow**  
(Jan 2010)

- Heaviest Snowfall Recorded  
  - 17cm in 4 hrs
- Urban Transportation Paralyzed
- Subways Stopped Operating
- 2,381 tons of Calcium Chloride Used

**Umyeonsan Landslide**  
(July, 2011)

- Heavy Rainfall of up to 100mm/hr
- Soil, Stone & Driftwood Clogged Water Drainage
- 16 Dead
Ⅱ Disaster Management Environment of Seoul
Increasing Threat to Safety

Higher Risk of Natural Disaster

Heavy Rain or Snow caused by changes in climate

Sudden Snowfall (Jan, 2010)
- 25.8cm (Highest in Record)

Localized Heavy Rain (July, 2011)
- Up to 100mm/hr
Increasing Threat to Safety

- Higher Risk of Large Scale Damage

132 Skyscrapers
- World’s 5th Highest Density
- Increase 6% Every Year

Increasing City Facilities
- 34,387 in 2010
- Multi Complex Buildings increase by 4% since 2003.

Highly Concentrated City Structure
Higher Disaster Risk

City Infrastructure Performance Decline

Ageing Basic City Infrastructures e.g. Bridges, Overpasses
Disaster Statistics for Recent 5 yrs

Natural Disasters (Storm & Flood)

# of Incidents

Property Damage

(#{})

(Mil KRW)

2006 2007 2008 2009 2010

49,143

54,685

5,804 0 0 0 0
Manmade Disasters - Traffic

Accidents

- # of Accidents

Casualties

- (People)

<table>
<thead>
<tr>
<th>Year</th>
<th># of Accidents</th>
<th>Casualties</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>38,336</td>
<td>56,894</td>
</tr>
<tr>
<td>2007</td>
<td>39,482</td>
<td>57,962</td>
</tr>
<tr>
<td>2008</td>
<td>41,740</td>
<td>60,372</td>
</tr>
<tr>
<td>2009</td>
<td>44,362</td>
<td>64,037</td>
</tr>
<tr>
<td>2010</td>
<td>41,644</td>
<td>60,058</td>
</tr>
</tbody>
</table>
Manmade Disasters - Fire

<table>
<thead>
<tr>
<th>Year</th>
<th># of Incidents</th>
<th>Casualties</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>4,907</td>
<td>331</td>
</tr>
<tr>
<td>2007</td>
<td>6,698</td>
<td>463</td>
</tr>
<tr>
<td>2008</td>
<td>6,731</td>
<td>340</td>
</tr>
<tr>
<td>2009</td>
<td>6,318</td>
<td>257</td>
</tr>
<tr>
<td>2010</td>
<td>5,321</td>
<td>230</td>
</tr>
</tbody>
</table>
Disaster Management Policies of Seoul
**New Disaster Mgmt Headquarters** (Sep. 27, 2010)

**Purpose**
- Concentrate Disaster Related Divisions to Enable Effective & Prompt Disaster Prevention and Response

**Mission**
- Develop Measures for Disaster Prevention, Recovery & Management
- Operate Urban Safety Headquarters

**System**
- Disaster Mgmt Headquarters
  - Overall Control

**Division in Charge**
- Control Command
- Disaster Mgmt
Changes in the Environment

- Climate Change (Natural Disasters)
- City Facilities
  - Highly Dense & Aged
- Socioeconomic Structure Change

Policy Demand

- Large Scale & Compound Disaster Response Tailored for Seoul
- Facilities Mgmt. in Disaster Vulnerable Areas

Major Policy Direction

- Disaster Mgmt for Skyscrapers & Underground Space
- Information & Science Based Disaster Management
- Improve Living Environment in Disaster Vulnerable Areas
- Protect People Vulnerable to Disasters
Disaster Mgmt Related Budget of Seoul

Recent 5-year Budget

(100 mil KRW)

<table>
<thead>
<tr>
<th>Year</th>
<th>Budget (100 mil KRW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1,995</td>
</tr>
<tr>
<td>2008</td>
<td>3,408</td>
</tr>
<tr>
<td>2009</td>
<td>2,732</td>
</tr>
<tr>
<td>2010</td>
<td>3,419</td>
</tr>
<tr>
<td>2011</td>
<td>4,380</td>
</tr>
</tbody>
</table>
Policy Goal

SEOUl IS SAFE 24/7

ENHANCED DISASTER MANAGEMENT

Establish Disaster Prevention System

Develop Management Measures, Improve & Manage Facilities

Prompt Response & Recovery
Establish Disaster Prevention System

Basic Guideline and Index

Disaster/Safety Guideline

- Common Standard for Urban Safety
- Specialized Guideline for Different Disaster Types

Develop Safety Index

- Index to Measure Local Disaster Vulnerability & Risk
- Index to Measure Potential Risk & the Level of Safety
Risk Management Manual

- Standard Manual
  - Standard Manual for Each Type of Emergency
- Work Manual
  - Process & Actual Work Manual for Department in Charge
- Field Manual
  - Mission and Process Manual for Field Agencies
- Command Card
  - Mayor’s or Bureau Head’s Command Card for Each Emergency Level
- Citizen Manual
  - Responding to Disasters, Disaster Prevention Tips
- Citizen Manual in Multi-Complex Facilities
  - Fire, Building, Gas, Electricity
**Better Storm/Flood Preparation & Response**

<table>
<thead>
<tr>
<th>All Time Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 6 People on 24-Hour Watch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Establish Real Time Flood Control System</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide Flood Prevention Information</td>
</tr>
<tr>
<td>• Establish System to Send Video Feed of Disaster Area, Wireless &amp; Real Time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improve Drainage System</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increase Underground Road Water Pump Capacity</td>
</tr>
<tr>
<td>• Optimal Management System for Rain Water Pump</td>
</tr>
</tbody>
</table>
Smart Snow Removal

- Snow Removal Using Vehicles Equipped with Smart System e.g. GPS ⇒ Multi-faceted, Comprehensive Command & Control of Fields
Responding to Cold Wave/Heat Wave

- Expand Care Service for the Vulnerable (e.g. the elderly living alone, the disabled, etc.)
- Prevent Water Meter Freezing and Free Safety Check on Welfare Facilities
Better Earthquake Resistance in Infrastructure

• Secure Earthquake Resistance in Major Public Facilities
• Strengthen Screening for Earthquake Resistance for New Construction
<table>
<thead>
<tr>
<th>Facilities Requiring Earthquake Resistance</th>
<th>Total</th>
<th># of Resistant Buildings</th>
<th>% of Resistant Buildings</th>
<th>Goal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Building (#)</td>
<td>719</td>
<td>227</td>
<td>31.6</td>
<td>50</td>
</tr>
<tr>
<td>Urban Railway (km)</td>
<td>335.9</td>
<td>234</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>Road (above-ground) (#)</td>
<td>349</td>
<td>238</td>
<td>68.2</td>
<td>88</td>
</tr>
<tr>
<td>Hospitals (#)</td>
<td>441</td>
<td>280</td>
<td>63.5</td>
<td>70</td>
</tr>
</tbody>
</table>
Facilities Safety Management

- Conduct Safety Checks & Inspection

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Safety Checks &amp; Management</td>
<td>• Bridges, Large Buildings, Public Residence etc.</td>
</tr>
<tr>
<td>• Prevention &amp; Emergency Response to Disasters</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety Grade</th>
<th>Condition of the Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade A (Excellent)</td>
<td>Best Condition without Any Problems</td>
</tr>
<tr>
<td>Grade B (Good)</td>
<td>In Good Condition with Minor Damage</td>
</tr>
<tr>
<td>Grade C (Average)</td>
<td>Average Level with No Safety Issues</td>
</tr>
<tr>
<td>Grade D (Below-Average)</td>
<td>Fault(s) Exists in Major Parts</td>
</tr>
<tr>
<td>Grade E (Poor)</td>
<td>Threat to Safety</td>
</tr>
</tbody>
</table>
※ Facilities (as of Sept. of 2011)

• Current Status

<table>
<thead>
<tr>
<th>Total</th>
<th>Facilities</th>
<th>Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sub-total</td>
<td>Bridges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tunnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>River</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>works</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Retaining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Walls</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pedestrian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overpass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Others</td>
</tr>
<tr>
<td>34,877</td>
<td>3,177</td>
<td>515</td>
</tr>
<tr>
<td></td>
<td>375</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>867</td>
</tr>
<tr>
<td></td>
<td>152</td>
<td>981</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31,700</td>
</tr>
</tbody>
</table>

• Status by Grades

<table>
<thead>
<tr>
<th>Total</th>
<th>Facilities (Grade A-C)</th>
<th>Facilities Vulnerable to Disasters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sub-total</td>
<td>Grade D</td>
</tr>
<tr>
<td>34,877</td>
<td>34,434</td>
<td>443</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Prompt Response & Recovery

Monitoring & Response

< Non-Emergency>

Collect Info & Monitoring
- Disaster Headquarters of Central & Local Governments
- Gas/Electricity/Communication Control Team
- National Disaster Management System
- Internet, TV, Citizen Call Center (☎120)

Real-time Report via Calls or Texts

Review Establishing Disaster Mgmt Headquarters

< Emergency>

Report System
- Mayor, Vice Mayors
- Head of Urban Safety Headquarters

Safety Mgmt Team
- When the Disaster Level is Determined
- When Disaster Mgmt Headquarters is formed
Disaster Mgmt Headquarters

Commander (Mayor)

Deputy Commander (Vice Mayors)

Support Official

Control Official
- Heads of bureaus related to Disaster Mgmt

Director (Head of related division)

Overall Mgmt Team

Rescue Team

Recovery Team

Transportation Team

Support Control Team

PR Team

Aid Team
Thank you