Policy and Planning Issues
GEER Workshop
May 18, 2009
Policy and Planning Issues in Post-event Reconnaissance

- Emergency and Societal Response
  - Hazard/risk assessment
  - Warnings and evacuations

- Early Recovery
  - Prioritizing repairs, temporary/permanent measures
  - Siting temporary facilities

- Long-term Recovery and Rebuilding
  - Recovery planning
  - Rebuilding policies
2007 Wenchuan Earthquake Reconnaissance

(Source: Stake Key Laboratory for Geohazard Prevention, Chengdu University of Technology, 2008)
State Key Laboratory for Geohazard Prevention: Types of Earthquake-induced Geological Disasters

- Up to July 20, 9,671 additional geological disaster spots in 44 severe disaster counties
- IMainly includes 4 kinds of hazards:
  - Landslide: 3627 spots, 41%
  - Avalanche: 2383 spots, 28%
  - Debris flow: 837 spots, 10%
  - Unstable slopes and shattered hill body: 1694 spots, 20%
  - Others: 86 spots
- These directly threaten the lives of 804,945 persons
Wenchuan Earthquake 3-month Reconstruction Planning Effort

- Special reconstruction planning team: National agencies, disaster-affected provinces, 100s of planners and academic institutions
- For all 3 disaster-impacted provinces, prepared a general reconstruction plan, as well as 10 specific plans:
  - urban systems
  - rural development
  - urban-rural housing
  - infrastructure
  - public service facilities
  - productivity distribution
  - industrial restructuring
  - ecological rehabilitation
  - land utilization
  - disaster prevention and mitigation
- Incorporated into comprehensive reconstruction plan released for public review on August 12
# State Key Laboratory for Geohazard Prevention: Post-earthquake Land Suitability Evaluation

<table>
<thead>
<tr>
<th>Gradient</th>
<th>Suitable area</th>
<th>Basically suitable area</th>
<th>Unsuitable area</th>
</tr>
</thead>
<tbody>
<tr>
<td>地形坡度（度）</td>
<td>&lt;15°</td>
<td>15° - 25°</td>
<td>&gt;25°</td>
</tr>
<tr>
<td>海拔高程（m）</td>
<td>&lt;1500</td>
<td>1500-2000</td>
<td>&gt;2000</td>
</tr>
<tr>
<td>距发震断裂带距离（m）</td>
<td>&gt;1500（县级城镇）</td>
<td>1000-1500（县级城镇）</td>
<td>&lt;1000（县级城镇）</td>
</tr>
<tr>
<td></td>
<td>&gt;800（乡镇驻地）</td>
<td>500-800（乡镇驻地）</td>
<td>&lt;500（乡镇驻地）</td>
</tr>
<tr>
<td></td>
<td>&gt;500（其它区域）</td>
<td>200-500（其它区域）</td>
<td>&lt;200（其它区域）</td>
</tr>
<tr>
<td>地质灾害点距离（m）</td>
<td>&gt;80</td>
<td>50-80，灾害能有效控制情形，适宜性上调一级</td>
<td>&lt;50，灾害能有效控制情形，适宜性上调一级</td>
</tr>
</tbody>
</table>

Laurie Johnson PhD AICP
State Overall Planning for Post-Wenchuan Earthquake Restoration and Reconstruction

- Disaster-affected counties grouped into 3 categories:
  - Areas suitable for reconstruction
  - Areas suitable for appropriate reconstruction
  - Ecological reconstruction areas (with future growth limitations)

- Sets the rebuilding and funding guidelines for each

<table>
<thead>
<tr>
<th>Area</th>
<th>Population</th>
<th>Proportion of Land in Planning Area</th>
<th>Proportion of Population in Planning Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area suitable for reconstruction</td>
<td>10,077</td>
<td>7.6%</td>
<td>38.9%</td>
</tr>
<tr>
<td>Area suitable for appropriate reconstruction</td>
<td>38,320</td>
<td>28.9%</td>
<td>59.4%</td>
</tr>
<tr>
<td>Ecological reconstruction area</td>
<td>84,199</td>
<td>63.5%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>
Land Suitability Map Developed for Reconstruction Planning Process

(Source: Stake Key Laboratory for Geohazard Prevention, Chengdu University of Technology, 2008)
2 Towns – Beichuan and Qingchuan – Recommended for Relocation

- Both impacted by fault rupture and major landslides
- Nearly all buildings seriously damaged or destroyed
- Sichuan provincial government approved and relocation sites have been recommended

(Source: Stake Key Laboratory for Geohazard Prevention, Chengdu University of Technology, 2008)
2005 Hurricane Katrina
Early Investigations of Levee Failures

BARRIERS OF EARTH AND CONCRETE
Levees and floodwalls that protect against flooding from both the Mississippi River and hurricanes are built by the Army Corps of Engineers and are maintained by local levee districts. The corps and the local districts share the construction cost of hurricane levees, while the Mississippi River levees are a federal project. Local levee districts also build and maintain nonfederal, lower-elevation levees with construction money from each district’s share of property taxes and state financing.

LEVEES AND FLOODWALLS
- Mississippi River
- Hurricane protection
- Interior parish

HEIGHT ISN’T EVERYTHING
Different factors permit Lake Pontchartrain levees of varying elevations to withstand an 11½-foot storm surge plus several feet of waves.

Levees on higher ground and separated from the water by 5 miles of marshland need be only 12½ feet tall.

Levees without any breakers need to be about 17 feet tall or taller.

Levees fronted by boulders and concrete rubble breakers can be about 14 feet high.

Seawalls on the water must be 12 feet high.

THE LEVEE SYSTEM:

Source: www.lib.utexas/mapa/ locations of crevasses added from various sources

Laurie Johnson PhD AICP
Phase 1: Recovery Assessment

- Population
- Flood Protection
- Funding
- Housing
- Education
- Infrastructure
- Public Safety
- Healthcare
- Transportation
- Economic Development
- Public Facilities
- Historic Preservation
- Culture

Citywide Recovery Assessment

District-level Assessments

Laurie Johnson PhD AICP
Public’s Priorities for Recovery and Rebuilding

- Safety from Future Flooding
  - Effective Cat 5 levees and wetlands protection,
  - Shared responsibility with standards and programs, as well as incentives, to reduce individual flood risk
- Empowerment to Rebuild Safe, Stable Neighborhoods
- Opportunity for All to Return
  - Funding for a range of housing solutions
- Equitable Access to Public Services
  - Strong Educational System
Natural Land Elevations
Increasing Rate of Population Return

Increasing Risk of Future Flooding

<table>
<thead>
<tr>
<th>Above sea level</th>
<th>Between 0 and 3 feet below sea level</th>
<th>3 feet or more below sea level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>Moderate Risk</td>
<td>High Risk</td>
</tr>
<tr>
<td>Moderate Return</td>
<td>Low Risk</td>
<td>Moderate Risk</td>
</tr>
<tr>
<td>Slow Return</td>
<td>Slow Return</td>
<td>Slow Return</td>
</tr>
</tbody>
</table>

Laurie Johnson PhD AICP
Policy Area A – Less flood risk and/or higher repopulation rates
Policy Area B – Moderate flood risk and/or moderate repopulation rates
Policy Area C – Highest flood risk and slowest repopulation rates
# Citywide Recovery Framework

<table>
<thead>
<tr>
<th>Policy Area C</th>
<th>Policy Area B</th>
<th>Policy Area A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0 - 2 yrs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stabilize neighborhoods and help rebuild together safely</td>
<td>Help returning residents and businesses with elevation</td>
<td>Ensure residents can fund individual flood protection</td>
</tr>
<tr>
<td>Use modular or temporary facilities to provide full coverage</td>
<td>Repair major infrastructure</td>
<td>Accommodate additional residents and businesses</td>
</tr>
<tr>
<td></td>
<td>Use modular or temporary facilities to provide full coverage</td>
<td>Repair major infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restore permanent facilities</td>
</tr>
<tr>
<td><strong>2 - 5 yrs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continue neighborhood stabilization</td>
<td>Help slow-recovery neighborhoods rebuild together</td>
<td>Improve infrastructure to spur revitalization and accommodate additional population</td>
</tr>
<tr>
<td>Invest in permanent infrastructure</td>
<td>Improve infrastructure scalable to population and resettlement</td>
<td>Initiate re-visioning of public services and amenities</td>
</tr>
<tr>
<td>Re-vision public services and amenities</td>
<td>Re-vision public services and amenities</td>
<td></td>
</tr>
</tbody>
</table>
| **> 5 yrs**  | Complete reconstruction and revision of services and amenities | Complete reconstruction and re-vision of public services and amenities | Laurie Johnson PhD AICP
Strategic Framework for Recovery

- Risk-based recovery strategies that balance pace and scale of recovery with pace of repopulation across neighborhoods and future risks of flooding

- Core Programs:
  - “Elevate New Orleans” Program
  - “Slab-on-Grade” Remediation Program
  - Neighborhood Cluster Program
  - Premier, Regional and Neighborhood-serving Health Care Network
  - Re-vision the K-12 Public Education System
  - Restore and Upgrade the Physical and Social Infrastructure

- Implementation and Financing
  - $4.1 bn (short-term), $6.8 bn (mid-term), $3.4 bn (long-term)