What Is Resilience?

The ability to withstand and/or recover quickly from difficult conditions.
What Makes a Hazard a Disaster?

Unprepared = Disaster

http://pubs.usgs.gov/fs/2011/3008/
Pacific Northwest

- Inherited community infrastructure at-risk
Overwhelming Problem

one bite at a time...
Resilience Planning - Overall Goal

Mitigate Hazards and Reduce Risks to Decrease Response and Recovery Times
Oregon Resilience Plan

- 50 Year Plan for State
- Assessment of Current State
  - Coastal Communities
  - Business
  - Critical Buildings
  - Transportation
  - Energy
  - Communications
  - Water/Wastewater
- Months to Years of Recovery
- 1/5 of Oregon GDP Lost
- 10,000’s Displaced
## Oregon Resilience Plan

<table>
<thead>
<tr>
<th>Critical Service</th>
<th>Zone</th>
<th>Estimated Time to Restore Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>Valley</td>
<td>1 to 3 months</td>
</tr>
<tr>
<td>Electricity</td>
<td>Coast</td>
<td>3 to 6 months</td>
</tr>
<tr>
<td>Police and fire stations</td>
<td>Valley</td>
<td>2 to 4 months</td>
</tr>
<tr>
<td>Drinking water and sewer</td>
<td>Valley</td>
<td>1 month to 1 year</td>
</tr>
<tr>
<td>Drinking water and sewer</td>
<td>Coast</td>
<td>1 to 3 years</td>
</tr>
<tr>
<td>Top-priority highways (partial restoration)</td>
<td>Valley</td>
<td>6 to 12 months</td>
</tr>
<tr>
<td>Healthcare facilities</td>
<td>Valley</td>
<td>18 months</td>
</tr>
<tr>
<td>Healthcare facilities</td>
<td>Coast</td>
<td>3 years</td>
</tr>
</tbody>
</table>
Resilience Planning

- Define Hazard
- Define Timelines
- Assess Risks
- Develop Cost/Benefit Analysis
- Prioritize
- Develop a Plan
- Incorporate Plan into Long Term Plans and Budgets
Define Goals

Define the Hazard(s) of Concern
  • Return Interval and Likelihood

Develop Ideal Timeline for Recovery
  • Define Specific Goals
  • Response vs. Recovery
Specific Resilience Goals

The Triple 3 Resilience Target

- **3 DAYS**
  - to restore emergency services
- **3 WEEKS**
  - to restore pre-disaster service levels
- **3 YEARS**
  - to improve infrastructure to a new normal

Level of Service

- Normal
- Disaster Hits
- High Resilience (Chile, Japan)
- Low Resilience (Oregon, Washington)

Time

- 3 Days
- 3 Weeks
- 3 Years
Prioritize

• Critical Facilities
• Personnel Resources
• Service Loads
Plan and Prioritize

– Tier 1: Backbone system
  Restored within Hours to 3 Days

– Tier 2: Secondary system
  Restored with Days to Weeks

– Tier 3: Tertiary systems
  Restored with Weeks to Months
Prioritize
Prioritize
Incorporation into Existing Efforts

- Sustainability
- Transportation Planning
- Land Use Planning
- Master Planning
- Capital Improvement Plans
- Long-term budgeting
- Localized and Overall Emergency Plans
- Operations and Maintenance Plans
Better New Structures

- US Resiliency Building Rating System
  - Safety
  - Cost of Repairs
  - Time to regain functionality

- Similar criteria can be adopted for infrastructure
Foster Resilient Culture