Damage Assessment and Disaster Recovery
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Disaster phases

• Planning
• Response
  • Life-sustaining activities
  • *Damage assessments conducted*
• Recovery
  • *Transition to “community-sustaining” phase*
• Mitigation
Response-Recovery Transition

• Based on damage assessments during response, recovery activities may vary
  • Simple restoration of previous infrastructure?
    • Temporary infrastructure needed?
  • Different kind of recovery indicated?
    • Infeasible/inadvisable to repair/replace damaged infrastructure?
    • Too costly? Lack of capacity?
    • Geographic or other permanent community changes?
Organization: Response

- Response: Incident Command System (ICS) - *hierarchical*
  - Federal assistance at request of state
  - Damage assessments produced
    - Results must be coordinated
  - Short-term restoration decisions focus on life-sustaining activities
    - Decisions must be coordinated: public/private priorities, funding available, eligibility for funding
Organization: Recovery

• Long-Term Community Recovery - *coordinating*
  • Federal assistance at request of state
  • Identification of longer-term, “community sustaining” needs
    • There may not be such needs --> simple restoration indicated
    • Needs identified --> simple restoration, or do things differently?
  • Results must be coordinated: level of government, private sector, public involvement/expectations
• New federal recovery framework document being developed
Example: Loma Prieta earthquake, 1989

- Major earthquake in San Francisco Bay Area, California — 17 October 1989
- Many roads and bridges destroyed or out of service
- Focus: restoration and improvement
- Overall: permanent changes to Bay Area transportation system and behavior
Examples: I-880 interchange collapse; I-35W bridge collapse (2007)

- I-880: major highway link in State of Minnesota was destroyed - 29 April 2007
  - Focus on restoration - maximizing speed - expedited building
  - Repairs completed 24 May 2007
  - Disruption less than anticipated

- I-35W: bridge collapse - 1 August 2007
  - Focus on restoration - as well as potential for future transit
  - Replacement bridge - embedded sensing

Figure 6 Aerial Photo of Bridge Area
Example: Red River flooding (1997)

- Extreme flooding in several states including North Dakota: $3.5 billion in damage
- Focus was on recovering *differently*: increasing resilience
- Flood buffer zone created
Example: Greensburg tornado (2007)

- Tornado (Fujita EF5, 205 mph-330 km/h winds) 4 May 2007 virtually destroyed Greensburg, Kansas (population ~1,500)

- Focus: ensuring community survival
- Comprehensive interagency recovery plan
- “Green” rebuilding
- Sister-city EcoPartnership with Mianzhu City, Sichuan Province
Challenges

• Better/faster damage assessments: technology (embedded sensing)
• Methodology for prioritizing and sequencing infrastructure recovery: balancing data inputs and human inputs
• Coordination between levels of government, private sector, and community
• Successful implementation of national disaster recovery framework
• Definition of “successful recovery”