The Infrastructure Challenge: Separating Myth from Reality

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The Future: Key Forces of Change

• Social and technological trends
  – Information access and use of information
  – Changing demographics
  – Smart buildings, systems, and infrastructure

• Globalization
  – Increasingly interlinked global supply chains

• Budgets

• Critical infrastructure and issues
  – Age
  – Recapitalization
  – Divestiture

• Evolving terrorist threat
Infrastructure

- Productive – beneficial and used routinely
- Protective – available for use as needed against natural disasters or man-made incidents
- Aesthetic – monuments and other infrastructure which provide society intangible but real value which cannot be measured economically
Incidents

- Preventable
- Inevitable
- What are the measures of effectiveness for preparing for, mitigating, and/or responding to:
  - Preventable incidents
  - Inevitable incidents
Differentiating Risks

• Natural disasters
  – Inevitable
  – Predictable spatially (with limitations)
    • Seismic zones, fault lines, hurricane prone areas, flood zones, tornado alleys, etc.
  – Predictable temporally (with limitations)
    • Hurricane season, flood season, fire season, etc.

• Man-made disasters (industrial accidents / terrorist incidents)
  – Preventable
  – Predictable and actionable to a significant degree, or are they?
The Basic Premise

- Avoid, minimize, and/or mitigate risk for those incidents which are preventable
  - As an individual
  - As a society
- Prepare for, respond to, and recover from incidents and risks which are not preventable
  - As an individual
  - As a society
- Provide appropriate productive infrastructure to flourish as a society
- Provide appropriate protective infrastructure to mitigate risks as a society
Million Dollar Questions

- What constitutes acceptable risk?
- Who decides?
- How do we measure effectiveness when dealing with risk?
- Who pays the bill for protective infrastructure?
Dealing With Risk

• Ignore and do nothing
• Avoid
• Minimize
• Mitigate
  – Disaster resistance
• Prepare in anticipation of an event
• Respond immediately post event – save lives and protect property
• Recover – restore infrastructure, public services, and basic societal functions
  – Disaster resilience
• Long-term recovery
Typical Response Mechanism
Personal Investment: Risk-Reward Decisions
New Condo Construction in South Miami Beach: 2007-2009

- Number of new developments: 15
- Number of individual units: 2,111
- Avg. price of least expensive unit: $940,333
- Avg. price of most expensive unit: $6,460,000
- Range: $395,000 - $16,000,000
- Overall average price per unit: $3,700,167*
- Aggregate property value: at least $6 billion
- Market value today?

*Based on average of high/low value for each of the 15 developments

Total Value of Insured Coastal Exposure (2004, $ Billions)

- Florida: $1,937.3
- New York: $1,901.6
- Texas: $740.0
- Massachusetts: $662.4
- New Jersey: $505.8
- Connecticut: $404.9
- Louisiana: $209.3
- S. Carolina: $148.8
- Virginia: $129.7
- Maine: $117.2
- North Carolina: $105.3
- Alabama: $75.9
- Georgia: $73.0
- Delaware: $46.4
- New: $45.6
- Mississippi: $44.7
- Rhode Island: $43.8
- Maryland: $12.1

Source: AIR Worldwide

Florida & New York lead the way for insured coastal property at more than $1.9 trillion each.
Northeast state-insured coastal exposure totals $3.73 trillion.
2012 Air Hurricane Model Study

Source: AIR Worldwide
Nightmare Scenario: Insured Property Losses for NJ/NY Category 3/4 Storm

Insured Losses: $110B
Economic Losses: $200B+

Distribution of Insured Property Losses, by State, ($ Billions)

Source: AIR Worldwide
The Homeland Security Dimension

• A 40-tank car chlorine train derails in West Virginia. The community in which it occurs is evacuated but not before 50 people are killed and 100 injured.
  – Cause “A” – A broken rail
  – Cause “B” – Terrorist sabotage
  – Cause “C” – Operator error

• Post 9/11 response (consequence management) essentially identical to Pre 9/11 response

• What is the basis of investment decisions in prevention and preparedness?
How Do You Measure Effectiveness?

- Fort Moultrie, South Carolina
- Border Fence
- Coastal Battery
- Border Fort, Iraq
The Myths

- Infrastructure can be made “unbreakable”
- Security systems are impenetrable
- Preparedness activities are appropriately resourced
- Response activities are conducted with absolute precision and total integration between local, state, and federal partners
- Borders can be totally secured
- Recovery activities will be flawless with activities occurring within hours and days as opposed to weeks, months, and years
The Myths

• The “bad-guys” will become so frustrated with the impenetrable shield surrounding the U.S. that they will “give up”
• Individuals and local governments will voluntarily agree to rethink vulnerable zoning and construction (such as coastal zone planning)
• Expectations will be well-managed
The Reality

• Lessons learned will be largely ignored
• Systems and technology will be touted as the “answer” to mitigating risk – whether man-made or natural – adding complexity to an already complex system
• Estimating cost to achieve effectiveness levels is not simple
• Politics affects everything
• Limited resources; unlimited resource demands

*Investing a significant portion of the GNP to prevent an unrealistic or unsubstantiated “threat” is as irresponsible as a lack of preparedness for a substantiated threat*
Rethinking Our Critical Infrastructure Strategy

• A New Paradigm:
  – Discuss and align risk, accountability (economic responsibility), and expected outcomes for infrastructure investment
  – Establish and communicate expectations in advance
  – Establish basic measures of effectiveness
  – Avoid subsidized programs which promote irresponsible infrastructure investment decisions
  – Fully consider alternative tactics and strategies when looking at security and protective measure investments
Questions / Discussion

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