Adapting to Climate Change: Practical Strategies at the Port Authority

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Port Authority of New York and New Jersey
Climate Change Adaptation at PANYNJ

Introduction

- Port Authority of New York and New Jersey
  - 1921 Bi-State Compact:
    “To enhance the region's competitiveness and prosperity by providing transportation services that efficiently move people and goods within the region and facilitate access to the nation and the world “
  - 6 operating arms; 31 major facilities
  - Financially self-sufficient
    - $3.1 Billion in capital funding 2010
  - We’re BIG
PANYNJ Sustainability Policy

Policy Overview

• PANYNJ Sustainability Policy, March 2008

• Policy Goals
  • Reduce GHG emissions by 80% by 2050 (2006 baseline)
  • For GHG emissions that cannot be reduced, purchase offsets (goal of net-zero emissions by 2010)
  • Promote sustainability among tenants and customers
  • Adapt facilities to reduce climate change risks
PANYNJ Sustainability Policy

Why have a Sustainability Policy?

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**Offshore Oil Rig in the Gulf of Mexico Explodes**
By CAMPBELL SCHAEFFER and JACK HALEY

NEW ORLEANS — An offshore oil rig exploded in the Gulf of Mexico on Thursday morning, injuring one worker, the United States Coast Guard said.

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**Intensifying Hurricane Heads North**
By MICHELLE KANTROW

CAROLINA, N.C. — Hurricane Earl passed through the northern Caribbean early on Tuesday after strengthening to Category Four status and veered onto a path toward the East Coast of the United States.

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**Heat Wave Report: 102 Degrees in Central Park**
By PATRICK McGEORSE

Updated. 3:30 p.m. At 3:30 p.m., it was 102 degrees in Central Park, with a heat index — that’s how it feels — of 107 degrees.
PANYNJ Sustainability Policy

Climate Change Predictions

Source: ClimAID

### Region 4

<table>
<thead>
<tr>
<th></th>
<th>Baseline 1 (1971-2000)</th>
<th>2020s</th>
<th>2050s</th>
<th>2080s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air temperature</strong> Central Range</td>
<td>53° F</td>
<td>+1.5 to 3.0° F</td>
<td>+3.0 to 5.0° F</td>
<td>+4.0 to 7.5° F</td>
</tr>
<tr>
<td><strong>Precipitation</strong> Central Range</td>
<td>47 in</td>
<td>0 to +5%</td>
<td>0 to +10%</td>
<td>+5 to 10%</td>
</tr>
</tbody>
</table>

Stations used for Region 4 are New York City (Central Park and LaGuardia Airport), Riverhead, and Bridgehampton.

Source: USEPA
PANYNJ
Vulnerable Facilities

- PANYNJ infrastructure is coastal
- Over Half of PANYNJ facilities are potentially vulnerable
  - Sea level rise
  - Storm surges
  - Increased precipitation
  - Wind
PANYNJ Adaptation Program
Projects and Collaboration

• Internal Projects
  • Inventory and assess
    – Multi-hazard Risk Assessment
  • Mitigate
    – Sustainable Design Guidelines
    – Physical and operational projects

• External Collaboration
  • NY City Panel on Climate Change (NPCC)
  • ClimAID (NY State)
  • NY State Climate Action Council
  • NY State Sea Level Rise Task Force
PANYNJ Adaptation Program
Security and Climate Change

- **Federal Grant**: Climate Change as Security Risk
- **SMRT**
  - System-wide
  - Multi-Hazard
  - Risk
  - Tool

- **Measuring Risk**
  - Across different scenarios
  - Weigh risks against each other
  - Prioritize funding

- **Applied Center of Excellence**
PANYNJ Adaptation Program

Operational Adaptation Projects

• Property Insurance
  • Green Coverage Endorsement Program
  • $5 million towards rebuilding to green

• Sustainable Design Manual
  • July 2006 Board adopted Policy
  • Sustainable Design Guidelines (complete)
  • Sustainable Infrastructure Guidelines (in progress)
  • Includes adaptive design measures
  • Issued memo on interim design criteria
    – LGA Airport Terminal Modernization
PANYNJ Adaptation Program
Physical Adaptation Projects

- **PATH**
  - Address flooding
  - 1992 Nor'easter, Hoboken station
    - flooding
    - commuter service interrupted for 10 days
  - Flood gates at Hoboken
  - Sealing all openings below 100 year flood

- **LGA**
  - Addressing power outages due to heat waves
  - Redundancy built into substations
PANYNJ Adaptation Program
Physical Adaptation Projects

- Protecting Natural Systems

- Hudson-Raritan Estuary Resources Program
  - $60M to preserve open space in Hudson-Raritan Estuary
    - $30 million New Jersey
    - $30 million New York
PANYNJ Adaptation Program
Operational and Physical Adaptation Projects

• WTC Design and Construction
  • Elevated structures
    – Bulkhead wall raised to 305’
    – Plaza at 313’
    – West Street at 308’
  • Flood gates at WTC PATH station
  • Structural and operational redundancy
  • Sustainable design
    – 20% Energy reduction
    – Fuel cells at WTC Tower 1
      » 1.2MW fuel cell plant installed
PANYNJ Adaptation Program

Energy Adaptation

- Port Jersey Wind Farm
  - $3.6M grant

- PSE&G Direct Install Program
  - Approx 5M KW-hours
  - $1M in annual savings
  - $6M in avoided capital costs

- Demand Response Program Participation
  - 11 facilities over $45,000 in direct revenue
  - Adaptive strategy for climate change
PANYNJ Adaptation Program
Challenges Towards Adaptive Management

• Funding and Budgeting
  • Capital Planning
  • Economic Realities

• Politics and Regulatory
  • State and Federal Regulatory Guidance

• Immediate Problems
  • Aging Infrastructure
  • Congestion and Growth
  • Economy

• Geographical and Operational Boundaries
  • Infrastructure Location
  • Transportation System–wide Planning

• Technology and Research
  • Hard Infrastructure Limitations
  • Costs and Benefits
Adaptive Management Challenges

Financial Concerns

- **10 year Capital Capacity**
  - Shrunk by $5 billion
  - $29.5B, to $24.5B

- **Net income from operations:**
  - Negative $39 million in 2010
  - A decline of $197 million from the 2009 Budget

- **Committing $21 million**
  - Port Clean Air Program
  - Reducing GHG emissions
  - Promoting environmental protection
  - Conserving energy
Adaptive Management Challenges

Immediate Problems

• Growth

Forecasted Increase in Demand for Port Authority Transportation Services 2005-2020³

<table>
<thead>
<tr>
<th>Service</th>
<th>Increase</th>
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<tbody>
<tr>
<td>Air Passenger</td>
<td>40%</td>
</tr>
<tr>
<td>Air Cargo (by volume)</td>
<td>70%</td>
</tr>
<tr>
<td>Port Cargo (by volume)</td>
<td>100%</td>
</tr>
<tr>
<td>PATH Passenger</td>
<td>60%</td>
</tr>
<tr>
<td>Truck and Bus Traffic, Tunnels and Bridges</td>
<td>20%</td>
</tr>
<tr>
<td>Auto Traffic, Tunnels and Bridges</td>
<td>16%</td>
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Adaptive Management Challenges

**Immediate Problems**

- **Infrastructure** designed for a different time
Adaptive Management Challenges

Immediate Problems

- Issues are not new
PANYNJ Adaptation Program

PANYNJ Recommendations

• Promote Research

• Adopt Climate Change Projections
  • State adopted projections
    • Sea level rise and storm surge
    • Precipitation rates
    • Temperature: extremes and averages
    • Wind direction
    • Regional contour maps and projections

• Provide State and Federal System Level Guidance
  • Adaptation strategies
  • Cost-benefit analyses

• Provide State and Federal Funding