

### Making U.S. Ports Resilient as Part of Extended Intermodal Supply Chains NCFRP Report 30 2024 Marine Board Fall Meeting



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## PROJECT OBJECTIVE: INCREASE PORT RESILIENCE

- Provide a set of high-level guidelines to minimize lost throughput capacity resulting from a major disruption.
- Aid in the ability of a port to withstand and bounce back from a serious threat to its ability to process freight in an efficient, cost-effective manner.



## **PORT OPERATIONS ARE COMPLEX**











Vessel Activities

**Terminal Activities** 

Transaction Activities

Inland Movement Activities

First Place Origin/Destination Activities

## THREE SETS OF ACTIVITIES FOR FREIGHT MOVEMENT

Activities	Definitions and Examples
Physical Flows	<ul> <li>Any physical activity directly needed for freight movement</li> <li>Vessels, terminals, railroads, trucks, pipelines, aircraft, warehouses and distribution centers</li> </ul>
Communication & Information Flows	<ul> <li>Any information and transactional exchange needed for freight movement</li> <li>Bills of lading, financial flows, customer notifications, delivery appointments, warehouse management systems, inter-agency communications, etc.</li> </ul>
Regulatory Considerations	<ul> <li>Any gov't regulations, rules, and agency activities needed for or shaping freight movement</li> <li>USCG, CBP, truck driver credentials, Jones Act</li> </ul>

### PORTS INVOLVE MULTIPLE STAKEHOLDERS



## DEFINING SUPERSTORM SANDY AS A SUPPLY CHAIN DISRUPTION

Characteristics	Superstorm Sandy
Geographical Scope Affected	<ul> <li>Extensive – the entire East Coast</li> <li>At landfall – the New York-New Jersey Region</li> </ul>
Freight Facilities Affected	<ul> <li>All</li> <li>Ports closed along the East Coast in the storm's path</li> <li>Railroads, trucking lines, airports and air cargo, pipelines (power outages, flooding, damage)</li> </ul>
Commodities and Shipments Affected	<ul> <li>Occurred during peak delivery week</li> <li>Multiple commodities and shipments affected</li> </ul>
Recovery Time from Disruption	<ul> <li>Port of New York-New Jersey closed for nearly a week</li> <li>Physical repairs to facilities took years</li> </ul>





Categories from: Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System, NCHRP 732 (2012)

## EAST COAST PREPARATIONS

- Monitoring starts a week before, with agencies and carriers tracking the storm and preparing.
  - USCG issues warnings and sets port conditions as the Sandy progresses.
  - Carriers determine vessel actions.
- As Sandy progresses:
  - Port coordination groups (such as MTSRU) mobilize.
  - Equipment and facilities are secured.
  - Transportation providers start planning for diverted shipments.
  - Railroads reposition equipment and determine train actions.



### **PORT PREPARATION**

 Notification to tenants began Thursday, Oct. 25 (USCG Sector NY Hurricane/Severe Weather Plan + PA's Emergency Op's. Plan)

- PA Emergency Operations Center activated on Oct. 28
- Until Sunday, Oct. 28th, there was a false sense of security
- Oct. 28 National Weather Service briefing indicated surge of 6-11' above normal high tide
- PA decision to close terminals to all but essential personnel by 2359 hours
- Mon -Oct. 29 –1200 hours ---all tenant personnel and PA contract security ordered off port; Port Commerce and PAPD staff vacated at 1915 hours (just prior to surge)
- Mon., Oct 29 2000 hours --- NOAA reported water levels at the Battery and Bergen Point @ 9-10' above MHW; winds @ 80-90 mph; surge 13 -14'.

### **NY-NJ PORT RETURN TO OPERATION TIMELINE**





Source: PANYNJ Presentation at 11/30 NAIOP/CSCMPNJ seminar

# NEWYORK/NEW JERSEY PORT DAMAGE



#### Extensive infrastructure damage

- Flooding (Water level in buildings @ 3-5')
- Utilities ---general commercial power, motors, controllers
- Sewage/fire pump motors and controllers
- Loss of rail relays and switches
- Security fencing and guard booths destroyed
- Damage to cranes and cargo handling equipment
- Debris in roadways, channels and berths
- Road and rail track damage
- Total loss of rail car float and rail transfer bridge at Greenville
- 57 vessels diverted by carriers

#### Cargo impacts

- Toppled container stacks
- Lost containers
- Autos destroyed by flooding and fire

#### **Cruise Passenger Auto Damages**

Source: PANYNJ Presentation at 11/30 NAIOP/CSCMPNJ seminar



### IMPORT CONTAINER DISRUPTION TOPOGRAPHY



# LESSONS LEARNED: PHYSICAL FLOWS

- Identified that electrical power is crucial to expediting recovery.
  - Today's ports and supply chains rely on it.
  - Utilities also must respond to extensive damage and higher priorities.
- Learned from previous events how to prepare for and respond to disruptions but still encounter the unexpected.
- Recognized that keeping the goods flowing is essential for recovery and for business continuity even outside of the affected location.
- Saw that "modal flexing" and "regional flexing" are essential to handling diverted cargo.
- Determined that ports are less prepared for surges in vessels and container movements.
- Considered how to balance resiliency and maintenance costs during rebuilding.

# LESSONS LEARNED: COMMUNICATIONS AND INFORMATION FLOWS

- Build multiple communication channels ahead of time.
- E-alerts, websites, transactional information, warehouse management systems, worker-related systems.
- Cannot operate information systems without power.
- Establish pre-set conference calls and WebEx forums
- Need established groups for preparation, recovery and response.
- Build working relationships and responsibilities before a disruption occurs.
- Use existing contracts can assist in modal flexing and equipment replacement.



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### **REGULATORY LESSONS LEARNED**



- The Merchant Marine Act of 1920, commonly referred to as the Jones Act, requires that goods and passengers transported solely between U.S. ports must be done on U.S. made and staffed vessels.
- CBP inspections and processing of import containers.
  - Security perimeter fencing and radiation detection portals need to be in place to resume operations.
  - Diverted containers need authorization from CBP to move by a permit to transfer within the original port, inbond transfer between ports, or by entry release/clearance by CBP prior to inland movement.
- Credentialing of truck drivers handling diverted cargo.
- Commonsense solutions can expedite recovery.

### **MULTI-PHASE PLANNING & IMPLEMENTATION**



Prepare	Consider how to avoid or limit the impact of disruptions	
Respond	Be ready for immediate response	
Recovery	Work on returning the Port to operation and consider workforce safety	
Resume	Return to operations while implementing the lessons learned	



### **MOVE FORWARD TOGETHER**





# THANKYOU

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Sources: UPS, ShareAmerica, USCIB (Gettty Images), Amazon