
NY & NJ Harbor & Tributaries Focus Area Feasibility Study

Teach In: Hazard & Risk Assessment

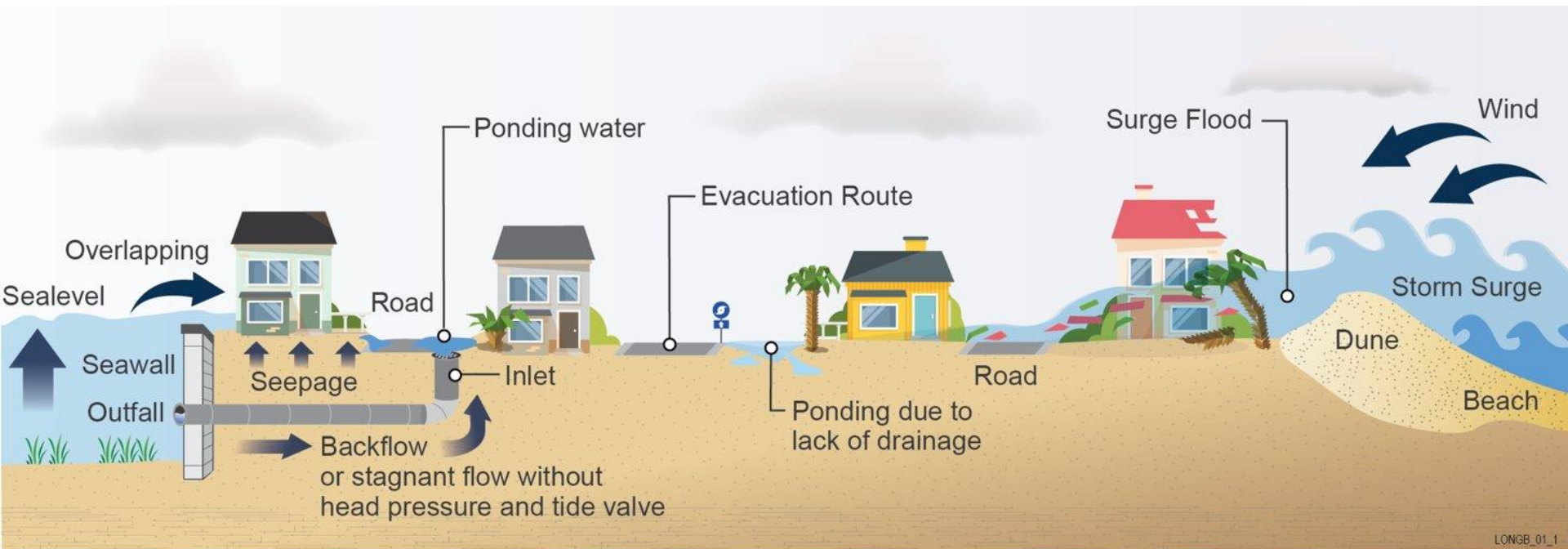
AGENDA

- ▶ Contribution of hazards to risk
- ▶ Sectors at risk
- ▶ How to review a risk assessment
- ▶ Holistic risk reduction
- ▶ Future risk reduction through maintenance and adaptation
- ▶ Iteration during construction



HAZARDS

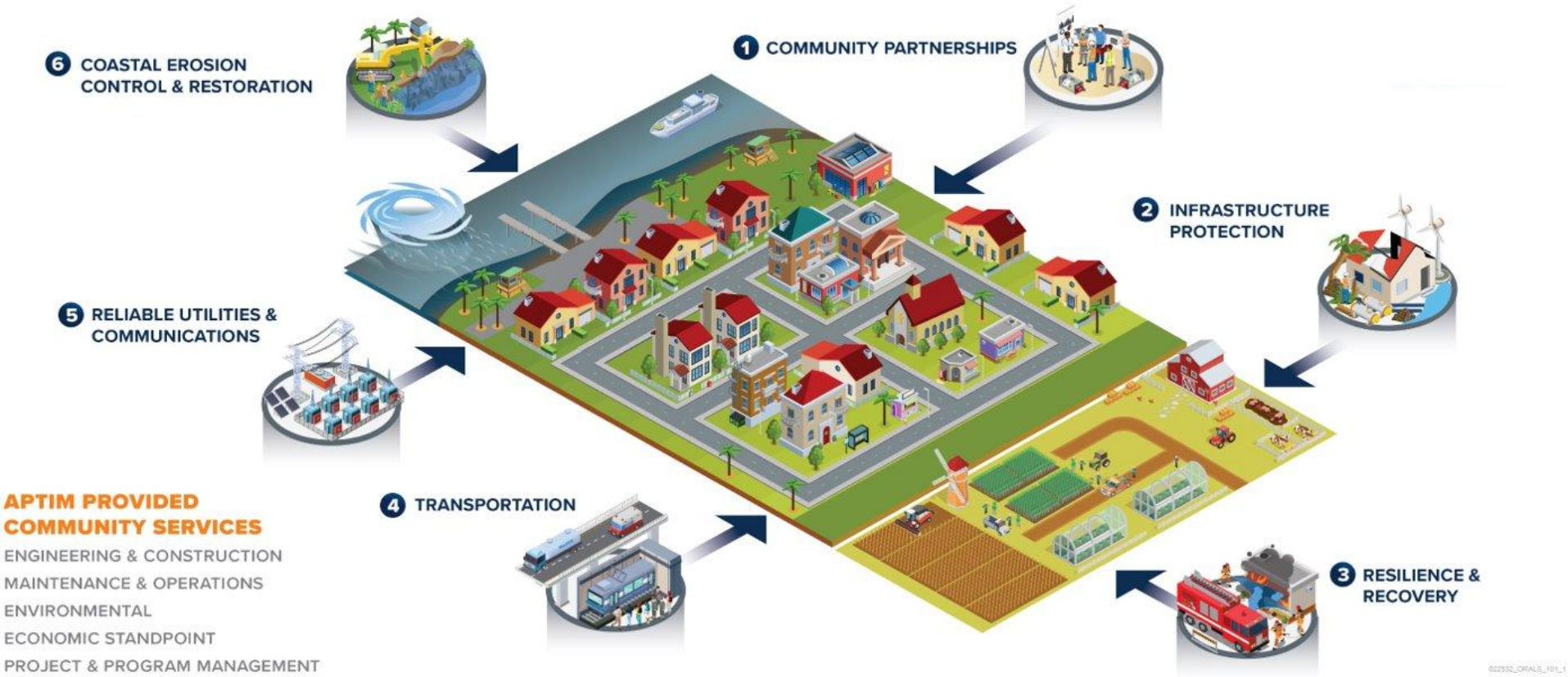
Multiple, simultaneously



LONGB_01_1

CRITICAL ASSETS BY SECTOR

Resilient Communities



DURING THE RISK ASSESSMENT

What to verify?

► Data Collection

- Study area
 - Check perimeter for critical assets
 - Determine unique geography and services
- Scenarios
 - Tide datum and elevation datum
 - Return interval varies with data input
 - Compound scenarios: sea level rise + surge
 - Sea level rise projections- acceleration potential
- Modeling results
 - Extracting data for points, lines and areas
 - Grid size and extrapolation
- Asset Interdependencies
 - Road access to utilities
 - Electrical systems for flood control



DURING THE RISK ASSESSMENT

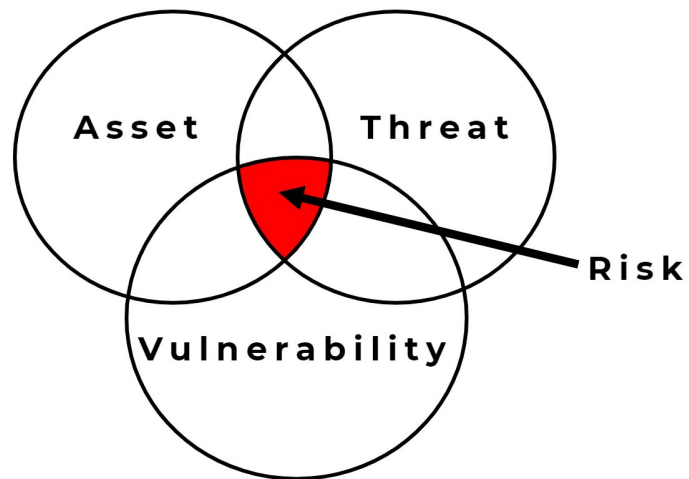
What to verify?

► Vulnerability (impacts and disruptions)

- Exposure (proximity to hazard)
 - Review by sector, multiple hazards at same location, compound impacts requiring multiple adaptation strategies
- Sensitivity (effect of hazard)
 - Sector specific asset data necessary to know sensitivity (underground assets)
 - Quantifying aged infrastructure
- Adaptive Capacity (feasibility to accommodate threat)
 - Thresholds for emergency response, lifeline services

► Risk

- Likelihood of Occurrence (probability of event)
 - Assigning probability to future sea level rise in context of current hazards
- Consequence (effect of impacts)
 - Damages based on recent events to weight impacts
- Risk Ranking and Prioritization (scale, criticality)
 - Varies by stakeholder interest and location



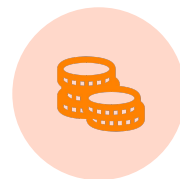
DURING THE RISK ASSESSMENT

What to ask?

- ▶ What is most critical to protect?
- ▶ Where are the impacts most severe?
- ▶ Where are the stakeholder prioritized vulnerabilities?
- ▶ Where are the at risk assets concentrated?
- ▶ What are the common vulnerabilities across locations?
- ▶ What are the regional assets the community is dependent upon (electrical grid, transportation systems, water resources, housing)?



PROPERTY
VALUE
PRESERVATION



AVOIDED
MAINTENANCE
COSTS



BUSINESS
DISRUPTION



LOSS OF LIFE/
EMERGENCY
RESPONSE

APPLICATION OF RISK ASSESSMENT

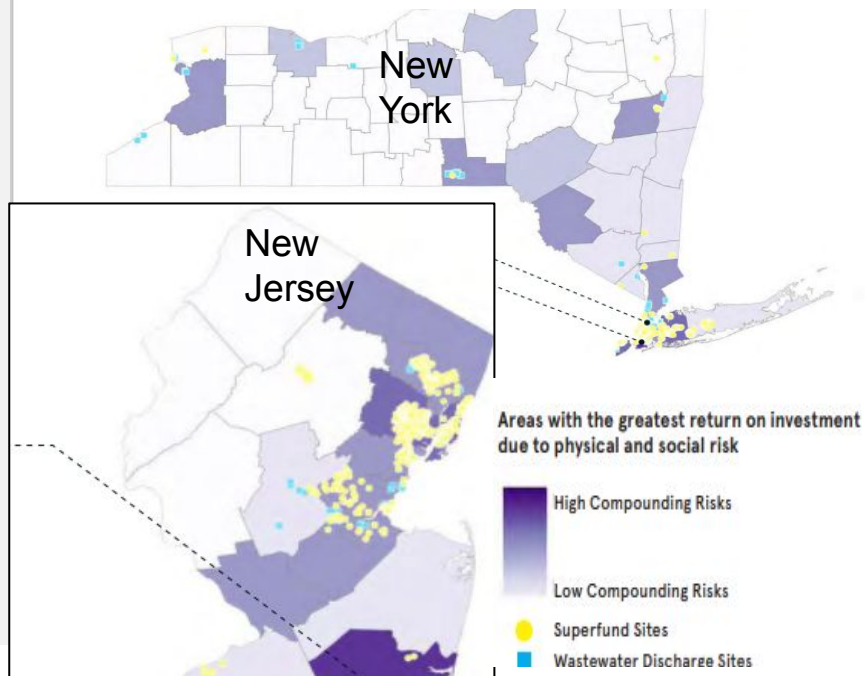
How to think holistically?

- ▶ Using this information for community asset planning/leverage current initiatives for continued success
- ▶ **Affordability of property insurance**
- ▶ Implications of access and supply chain risks
- ▶ Regional population growth, commerce projections and land use changes
- ▶ Sectors (energy and flood control) should coordinate to address cascading failures
- ▶ Public private partnerships

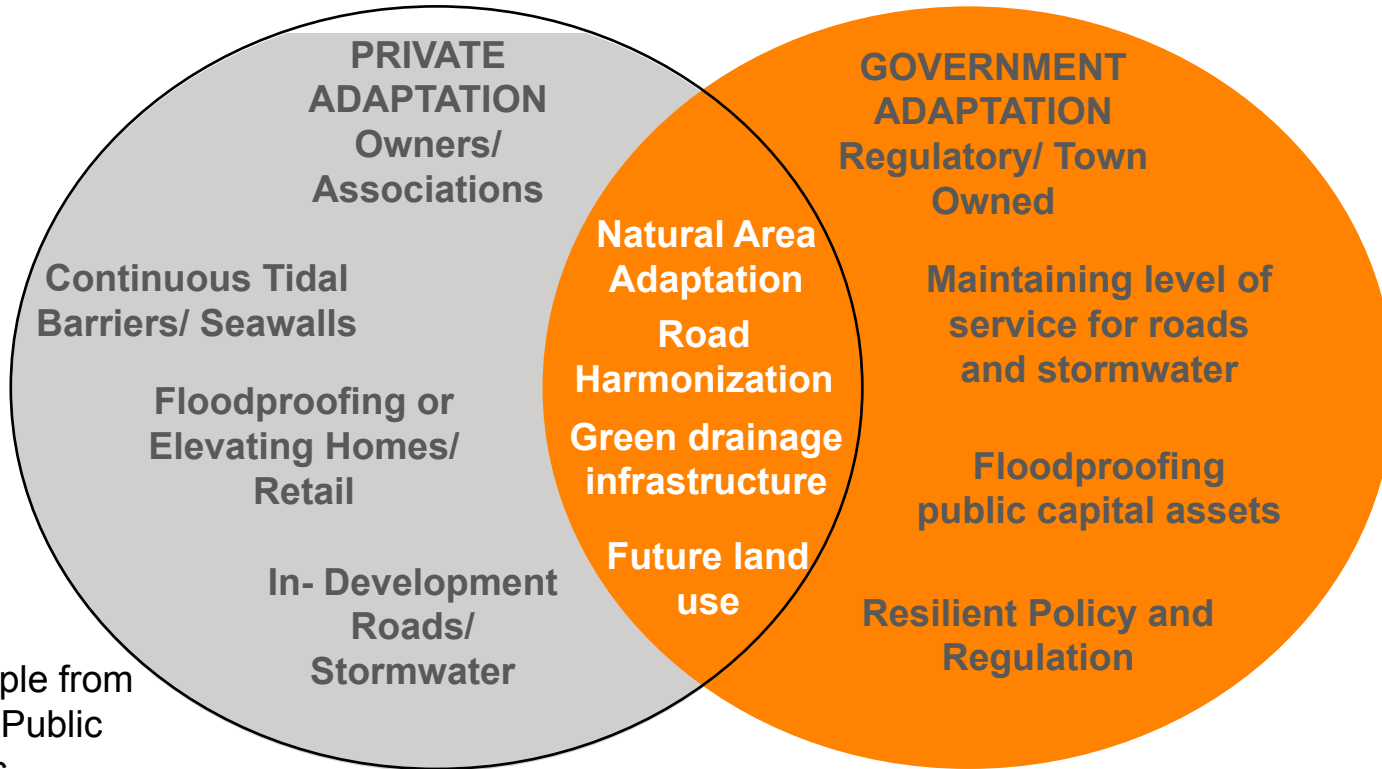
REBUILD BY DESIGN

ATLAS OF DISASTER

COMPOUNDING RISKS: A FRAMEWORK FOR FUTURE INVESTMENT



BUILDING RESILIENCE, SEEING OPPORTUNITIES



Example from
Town Public
Works

ITERATION DURING CONSTRUCTION

INTERIM SOLUTIONS



BAYOU CHENE FLOOD PROTECTION STRUCTURE, Louisiana

- ▶ **Scope:** Downstream flood control in response to new upstream structure and floodwater release
- ▶ **Iterations**
 - St. Mary Levee District constructed temporary structure to prevent 5' of flooding
 - In 2016, installed emergency structure in 15 days to hold 2' flooding
 - In 2019, emergency structure in 11 days
 - Final project of floodwall, gate and levees
 - Iteration of design standard

PRACTICAL METHODS



INNER HARBOR NAVIGATION CANAL SURGE PROTECTION BARRIER, Louisiana

- ▶ **Scope:** 24 feet and 26 feet above water, 100-year storm surge protection for large portion of Orleans and St. Bernard Parishes
- ▶ **Iterations**
 - Closure piles design for effective seal
 - Logistical needs for over water construction

OPERATIONS



HOUMA NAVIGATION LOCK COMPLEX, Louisiana

- ▶ **Scope of Work:** 800 foot long lock chamber, flood gate, 100-250 foot navigation channel, connects to existing levees
- ▶ **Iterations**
 - Phased approach to ensure federal funding is available via Restore Act
 - Coordination with stakeholders and USACE to ensure public and agency concerns are heard
 - Logistical needs for both overwater construction and maintaining flood protection during construction

FUTURE RISKS

Maintenance and Long-term Adaptation

- ▶ Evaluation of performance metrics
- ▶ Recovery planning
- ▶ Timeliness and cost sharing for maintenance
 - Inclusion in cost benefit analysis
- ▶ Federal reauthorization process
- ▶ Adaptability of constructed project for future conditions
 - Expected life cycle and projections for future scenarios
 - Anticipated future points of failure for aged infrastructure



QUESTIONS

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Expect the Extraordinary.