



## Nonstructural Workshop

December 15<sup>th</sup> –16<sup>th</sup>, 2021

### ~Official Minutes~

#### Goals:

- Gather individuals from private and public sector with varying backgrounds in Nonstructural measures to discuss aspects of planning, design and construction in the New Jersey and New York areas.
- Collect information presented and discussed for the purposes of optimizing the Nonstructural plans for the feasibility design phase of the respective studies.
- Discuss agency program strategies and challenges of executing Nonstructural solutions to aid Philadelphia District in the development of their implementation approach for the Nonstructural plans.

#### Deliverable Goals:

- Develop flowchart/decision making process for New Jersey Back Bays (NJBB) & Nassau County Back Bays (NCBB) studies to optimize Nonstructural measures after Agency Decision Milestone (ADM) meeting

### DAY 1

#### *Introduce the NJBB/NCBB Studies*

JB Smith & Scott Sanderson, NAP

- A general overview of the NCBB study was provided by Scott Sanderson, NAP-PM.
- Brief highlights of the Nonstructural plan provided below:
  - 14,183 Residential Structures to be raised
  - 2,667 Industrial/Commercial Structures to be floodproofed
  - Estimated \$3.9 billion in construction costs

#### Helpful Links:



## New Jersey & Nassau County Back Bays Coastal Storm Risk Management Feasibility Studies



<https://www.nap.usace.army.mil/Missions/Civil-Works/Nassau-County-Back-Bays-Study/>

- A general overview of the NJBB study was provided by JB Smith, NAP-PM.
- Brief highlights of the Nonstructural plan provided below.
  - 42,800 Structures Retrofitted (Elevation/Floodproofing)
  - Estimated \$13.9 billion in construction costs

Helpful Links:

<https://www.nap.usace.army.mil/Missions/Civil-Works/New-Jersey-Back-Bays-Study/>

*Nonstructural Plan & Vision for Post-TSP Work/Goal of Workshop*

E.Majusiak/P. Oakley/J.Benigno, NAP

- Purpose of Workshop
  - Learn from past experiences (both good and bad) from folks working on projects and programs of similar scope.
  - Help determine best path forward for NAP studies.
- NS Risk Management Matrix (Flooding)
  - Characteristics - Site, Building, Community Project Area
  - Responses – Elevate, Dry FP, Wet FP, Buyout, Relocate
    - All these factors produce several location specific decisions
- Future work
  - Additional field investigation needed (field & virtual)
    - Determine: Foundation/Structure – Condition and Type.
    - Evaluate: Elevation height, Geotech conditions, water level assumptions.
    - Plan: Develop flowchart, refine economics, additional mapping, etc. during the Feasibility-level design phase.
- Key Takeaways
  - Brief synopsis of the nonstructural plan status
  - Large inventory of structures with need to identify more characteristics with each structure
  - Desire to refine/optimize work completed prior to TSP

*USACE Nonstructural Committee*

*What is NNC and what do they do? /FIMP Project Status*

Danielle Tommaso, NAN

- National Nonstructural Committee (NNC)
  - 6 people – Engineers, Economists & Planners
- Fire Island Inlet to Montauk Point Project (FIMP)
  - 100% federally funded



## New Jersey & Nassau County Back Bays Coastal Storm Risk Management Feasibility Studies



- Federal led nonstructural effort. USACE will manage contracts and oversee construction.
- Purpose – Reduce storm damage while maintaining or enhancing natural systems.
- 83 miles of ocean shoreline & 220 miles back bay shoreline
  - 3 federal navigation inlets
  - 4,432 structures to be raised

### Helpful Links

<https://www.usace.army.mil/Missions/Civil-Works/Project-Planning/nnc/>

<https://www.nan.usace.army.mil/Missions/Civil-Works/Projects-in-New-York/Fire-Island-to-Montauk-Point/>

<https://www.nan.usace.army.mil/Missions/Civil-Works/Projects-in-New-York/Fire-Island-to-Montauk-Point/FIMP-FAQ/>

- Question/Comment (VonBriel): What is the largest NS implemented in USACE History?
  - Response 1: FIMP is currently the largest one in design and fully funded for construction.
  - Response 2: NCBB/NJBB will dwarf it.
- Question/Comment (Griggs): How were contracts awarded?
  - Response 1: Not awarded yet, currently working through mechanism. Considering a MATOC of pre-approved contractors.
  - Response 2: Trying to group whole blocks/communities together for efficiency.
- Question/Comment (VonBriel): Can there be different contractors for each task order?
  - Response: Very possible. Will depend on the individual homeowners desire to select their GC.
- Question/Comment (Davi): What kind of agreements with property owners will you use?
  - Response 1: Not sure about legal information yet. Still to be vetted.
  - Response 2: Homeowners will sign flood proofing agreement.
- Question/Comment (Pakan): Who will handle local government/municipalities construction permitting?
  - Response 1: USACE or General Contractor.
- Question/Comment (Tesla): How will you address the seasonal nature of the Coastal areas, Memorial to Labor Day?
  - Response 1: Don't have an exact answer right now, year-round work along LI by USACE.
- Question/Comment (Tesla): What about EHP restrictions? Plover or other birds?
  - Response 1: Not sure, it will be a site-by-site specific analysis.
- Question/Comment (Testa): Are you requiring (Deed) maintenance of the insurance policy?



- Response 1: I would suggest establishing an arbitration process (Third Party) for disagreements between the homeowners and the GC.
- Response 2: Should coordinate on rules of thumb.
  
- Key Takeaways:
  - NNC can be used as a consultation tool during plan development
  - FIMP study provides an outline for the NAP studies
  - Need to determine if FIMP implementation strategies are options or are required by national guidance.

### *Wet & Dry Floodproofing Methods*

Latest in Wet & Dry Flood Proofing methods with regional case studies  
Brian Shaw, Floodproofing.com

- Wet Flood Proofing
  - Nonliving or unfinished space
  - Relieves rather than restricts
    - Prevents structural damages to building/house
  - SmartVent is popular wet flood proofing solution
  - Flood Insurance benefits
- Dry Flood Proofing
  - Latest in dry flood proofing methods
  - Flood proof windows
  - Glass flood walls
    - Resist 8 feet of water (1,000 lbs impact tested)
- Current Business Structure
  - Mostly new construction, but retrofitting business is growing rapidly due to increased frequency of flooding
- Question/Comment (Sanderson): NCBB plan has over 2,600 industrial buildings that need protection located 3' above existing grade, how to determine if dry flood proofing or wet flood proofing is more effective?
  - Response 1: Multiple factors: Can it be flooded and dried out, what is existing wall/foundation design (structural, material)
- Key Takeaways
  - Several dry and wet flood proofing solutions on the market
  - Retrofitting existing homes and businesses is increasing
  - Most projects Floodproofing.com sees includes a combination of wet and dry flood proofing methods.

### *Active vs Passive Barrier Solutions & Examples*

Difference between Active and Passive Barriers. Types of Passive Barriers with regional case studies

Victor Althoff, FloodBreak

- Passive Flood Barriers
  - Deploys automatically
  - Disperses load, no point load
  - Increased \$ compared to active barriers
  - O&M still required, however less work needed before, during, and after an event
  - USACE Louisville District example presented, 600LF longest example
  - NY Hospital example presented
  
- Active Flood Barriers
  - Manually deploy
  - Less \$ than passive barriers
  - O&M required
  - Disperses load, no point load
  
- Question/Comment (Geissele): Can FloodBreak barriers be designed for wave load?
  - Response 1: Can be designed for ocean and bay, only installed on bay side, to date.
  
- Question/Comment (Sanderson): How do gates prevent sand from clogging the drains?
  - Response 1: Pans are at angles so when it rains, it self-rinses, or put multiple for failsafe.
  
- Question/Comment (Source): Are extended warranties available, or would we need to put money aside for post life?
  - Response 1: Any length warranty is available, only part that would need to be replaced periodically are the gaskets.
  
- Question/Comment (N/A): Is there a potential to adversely impact adjacent properties with transfer of water due to use of barriers?
  - Response 1: It is possible, but is something that can be modeled during design/prior to implementation.
  
- Top 3 Key Points
  - Active and Passive barriers are potential solutions for critical infrastructure and commercial facilities.
  - May be too costly for protection of longer stretches. Better suited for vehicular or pedestrian openings.
  - An emergency action plan and succinct O&M guidelines will be required to implement.



### *Wet & Dry Floodproofing and other Approaches for Critical Infrastructure*

Open discussion how such approaches apply to the studies & what criteria shape the decision between these solutions & elevation

Leader – Majusiak/Renaud

- Open discussion was held on topics related to dry and wet flood proofing and active and passive barriers.
  - Will be a very challenging effort to design solutions for thousands of structures selected for flood proofing
  - Additional investigation will be required during feasibility-level design

### *Home Elevation in NJ & NY*

Observations of Design & Construction, Case Study Examples, and navigating Local Grant Programs

Steve Hauck, SJ Hauck Construction

- Factors that impact cost
  - Year built, frame type (balloon or platform), existing foundation, soil conditions and setbacks
  - Intrinsic knowledge example: not one house they have done in Margate, NJ is on timber piles
  - As SF of facility increases, unit cost tends to decrease
  - Poor soil conditions will increase costs. Need for deep foundation (helical piles most common).
- Elevation Process
  - Determine economic feasibility, design phase, permit phase, production, post-production
    - Production: pre-lift demo, pre-lift landscaping, elevation, foundation install, set house on foundation, deck (if applicable)
    - Post-production: exterior, mechanical, interior, landscaping
  - Aesthetics are extremely important to many of the shore communities
    - Not allowing homeowners to do betterments during elevation will be met with resistance

Helpful Links

<https://www.sjhauckconstruction.com/>

- Question/Comment (Sanderson): What was the approximate total cost of this type of elevation?
  - Response 1: Dependent on when the house was built and the condition of the home.
- Question/Comment (Sanderson): When implementing home elevations or modifications, does the proximity to the bay shoreline (or in many cases the existing bulkhead) significantly impact construction methods (staging areas, etc.) as well as foundation (maybe pilings) issues related to subsurface geotechnical considerations?
  - Response 1: Homes are usually in the D or A zone
  - Response 2: The main issues are the enlarged cost for mobilization and soil the foundation is being placed on
- Question/Comment (Tommaso): What's the average duration for construction? For soup to nuts from design to completion?
  - Response 1: 7 to 9 months on average, most time spent on design and permitting. 90-day construction period for most lifts.
- Question/Comment (Pakan): Could you repeat the info for the standard helical pile? What rough spacing would that be?
  - Response 1: Standard spacing for piles is 6-9 feet, determined by load calculation in the design phase.
  - Response 2: Typical helical piles used are 1.5" dia or 2 7/8" dia piles.
- Question/Comment (Pakan): Have you had any issues with height restrictions or with ADA that came up during any of your raisings?
  - Response 1: Not Usually
- Question/Comment (Pakan): Have you ever raised a shore home that is along one of the finger canals (i.e., adjacent to a bulkhead)?
  - Unanswered. However, noted that along the back bay poorer soils exist which will require helical piles. This could potentially impact any existing bulkhead tie-back systems. Construction could also destabilize existing bulkheads if not adequately designed.  
Comment: Strapping requirements on Long Island appear to be much more robust than what appears to be the case in New Jersey. NY requires that we strip and strap the ridge of the roof, strap roof rafters to the exterior walls, strap between floors and ultimately strap to the foundation. The cost of stripping most of the siding and replacing need to be considered on NY Lifts.
- Key Takeaways
  - Several key factors to consider that impact elevation cost.
  - Aesthetics are extremely important to the community.
  - Structure Type and Age are most important.

### *Executing Buyouts*

Property evaluation & buyout/demolition/restoration processes in NJ.



Kim Rennick, NJDEP Blue Acres Program

- Program Started in 1961
  - Look to buyout homes in flood plains for recreation and conservation purposes.
  - Doesn't matter if homeowner owes money on mortgage.
  - Blue Acres has closed on 780 homes to date (712 Demolished).
- Process for getting bought out
  - Submit home through Blue Acres website, GA does a site visit and sends a quote, HO makes decision (GA does not negotiate)
  - Green Acres looks for, but not exclusively, clusters of homes, homes at the end of a cul-de-sac, or homes that borders state land

Helpful Link

[https://www.nj.gov/dep/greenacres/blue\\_flood\\_ac.html](https://www.nj.gov/dep/greenacres/blue_flood_ac.html)

- Question/Comment (Source): Average time frame from inquiry to close?
  - Response 1: Varies, but typically 6-9 months.
- Question/Comment (Source): In the programs history what types of structures have been acquired?
  - Response 1: The program focuses on residential home but would consider industrial if available.
- Question/Comment (Benigno): Has Blue Acres executed Buyouts in an urban area? Was that residential?
  - Yes. Blue Acres has done residential buyouts in Woodbridge and Linden, NJ as an example.
- Top 3 Key Points
  - Program buys properties to expand state land
  - Program helps relieve people underwater with their mortgage
  - Acquire residential structures but would be open to industrial

*Executing Elevation Program - NJ*

The challenges of administering a home elevation program in NJ

Larry Johnson, NJDCA

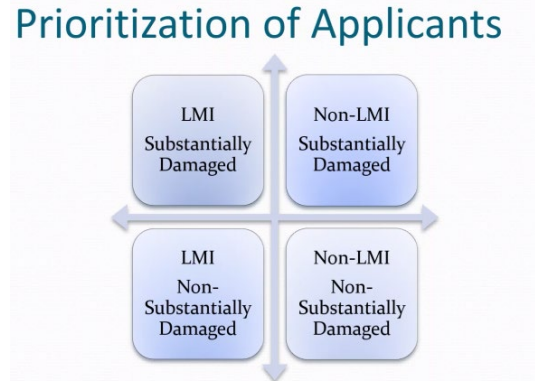
Helpful Links

<https://www.nj.gov/dca/divisions/sandyrecovery/pdf/reconstructionrehabilitationelevationmitigationfinal.pdf>

<https://www.nj.gov/dca/news/news/2018/approved/20181029.html>



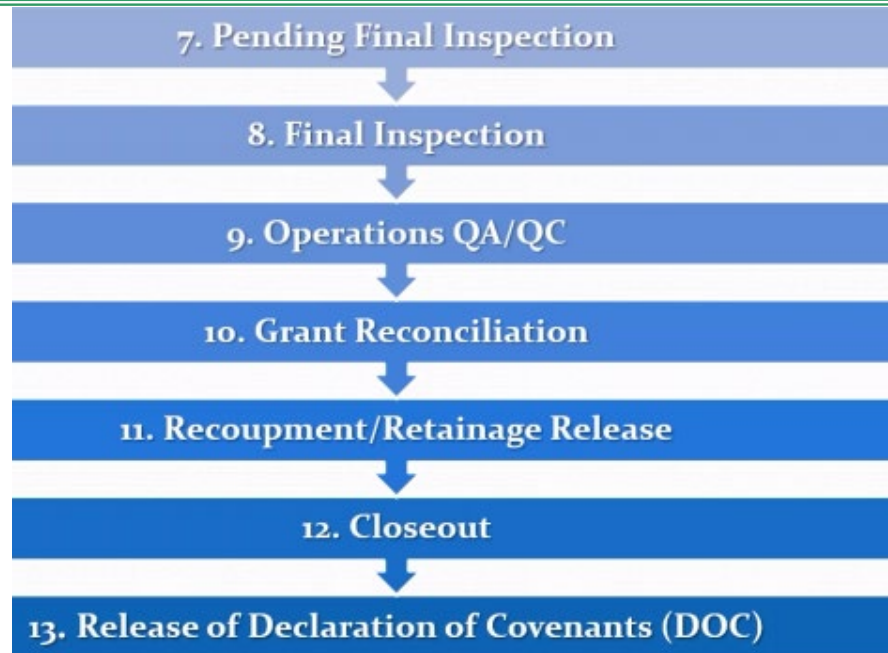
- RREM and LMI Overview
  - RREM funds of last resort
    - Cover gap in financing to complete the necessary repairs to a project (see figure below):



Left to right (top then bottom)

- The RREM and LMI steps are shown in the two figures below:





- Pathway B&C
  - Pathway B was developed for homeowners who have the means and methods to GC their own project and add additional improvements to their home, past the scope of the program's requirements.
  - Pathway C was developed for homeowners who are not capable of being the GC on their own project and don't want any additional out of scope additions.
  - \$150k maximum benefit for both pathways.
- Best Practices/Lessons Learned
  - The program best runs when the home renovation/recovery is the same as a commercial job:
    - Schedule of values for materials and labor, predetermined construction schedule
  - Required home improvements and additional home improvements should be kept separate
- Question/Comment (Source): Structures built under RREM Program?
  - Response 1: 6,000 structures
- Question/Comment (Source): How did the program handle situations where homeowners did not pay contractors?
  - Response 1: Revert back to the base construction contract
- Question/Comment (Source): Where were the employees pulled from?
  - Response 1: In some cases, pulled from other groups within the State, but otherwise many were hired as temporary employees



- Key Takeaways
  - Program designed to help people recover from Superstorm Sandy
  - Pathways B and C were main contracting methods for elevation
  - Much to be learned from both the positive and negatives of the program

### *Brainstorm Sessions*

- Discussion was had involving several parties on variety of topics. Refer to video recordings for full dialogue. Included is a brief synopsis of some the major questions and key takeaways.

Group activity with the following topics to be discussed:

A) Community Outreach/Plan Implementation – How to message NS plan to homeowners and community. What program delivery approach works best for NY/NJ (Leaders – Sanderson/Smith)

- This time was allotted for discussion on planning strategies and community messaging.
- Major questions and key takeaways:
  - Has USACE ever completed a project to the scale of the NJBB/NCBB studies?
  - Cannot exclude the impact on insurance rates and property taxes in local communities. Could also lead to a type of gentrification of socio-economically vulnerable communities if properties are elevated and value increased substantially. How do we address this?
  - Suggested to bring HUD into the discussion prior to rolling out implementation strategy.
  - Need clarification on what USACE policy allows prior to development of implementation plan.
  - Going to need much more staff to implement project once it is authorized (i.e. lessons from NJDCA).
  - Locals could keep building permits open for use by more than one contractor.
  - Beware of jamming up contractors from getting to other structures.
  - Aesthetics very important to homeowners. Buy-in from the public could depend on the ability to due betterments parallel with eligible costs.
  - Renderings will be very important moving forward as a communication tool with the public.
  - Is 80% Buy-in required? If so, this may be difficult due to current cost share allocation and other implementation strategies currently proposed.
  - Overall costs for USACE to raise a home will be much greater than if the homeowner does it on their own. This may cause them to shop for other options (i.e., a Hazard Mitigation grant). This can hurt buy-in.
  - Can a homeowner be eligible for relocation costs or only a renter? Does USACE Uniform Code apply?



- Just because we can raise a structure, doesn't necessarily mean we should.

B) Industry Outreach – Involving designers, contractors, suppliers, and other agencies in the project planning & how to share design/construction data useful for plan optimization. (Leaders – Renaud/Rochette)

- This time was allotted for discussion on how to collaborate and share information with the private sector that may be beneficial to USACE during feasibility-level design
- Major questions and key takeaways:
  - Possible to set up a share drive that can be continuously accessible for sources outside of USACE to drop and pick up files. DoD Safe Transfer has limited time windows. Looking to create something permanent.
  - Potentially look to create a group of interested members of the private sector to collaborate periodically in a workshop format to gather industry information and get feedback on planning strategy.
    - Note that intrinsic study details cannot be continuously brought up to outside agents as it may appear as favoritism

C) Feasibility Design – Ways to break down the existing structure inventory to optimize evaluation of the inventory. (Leaders – Benigno/Majusiak)

- This time was allotted for discussion on how to optimize the feasibility-level design (i.e. how to refine structure inventory)
- Major questions and key takeaways:
  - FIMP developed flowchart/decision tree. Used AE services to develop this tool. Algorithm to select recommended mitigation for features.
  - FIMP spent significant time on desktop data collection efforts (see Day 2 presentation). Is it worth NAP to do this? Does our structure inventory have enough information for Feasibility?
  - How can we analyze if in-person assessments are useful from a study budgeting/prioritizing standpoint? (i.e. if time and labor is spent on gathering data, will it pay off in optimization)?
  - Targeting 30% design, so cannot try to push beyond what is reasonable for 30%.
  - Suggest looking at low hanging fruit (i.e. what reliable information do we have in our inventory currently that we could take another look at)? What is worth looking at during feasibility that may affect cost and economics?
  - Major factors that impact cost currently at our disposal:
    - Soil Conditions
    - Structure Age
    - Structure Size (Square Footage)
  - Engineering PDT can evaluate the parameters and try to adjust design for ranges/types in each category.



## New Jersey & Nassau County Back Bays Coastal Storm Risk Management Feasibility Studies



- Optimization will require input and file sharing from the industry and/or development of pilot designs.
- A decision tree/flowchart is possible to begin development during feasibility but would be completed during PED phase like the FIMP project.
- Pre-1930's structures are very costly to raise. Issues with shared-masonry walls (party walls).

### D) Cost Refinement – How to utilize regional industry information to refine parametric costs. (Leaders – Sanderson)

- This portion of time was meant to discuss ongoing work NNC is doing to refine parametric costs for nonstructural solutions.
- NCBB Cost Estimator was unable to attend but Scott discussed/asked the question how do we go about buying down risk of our cost estimate?
  - What items can we look at within our inventory/add to our inventory data set to enhance analyses?
  - What will be impactful for the purposes of cost estimating?
  - When we do optimize, there is a risk new costs will increase the current overall plan costs. How do we handle that with economics? Could it impact or help inform the plan implementation strategy?



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## DAY 2

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### *Recap of Day 1*

J.Smith/S.Sanderson, NAP

- This time was allotted to revisit topics of discussion from Day 1 and prepare attendees for Day 2.
- Topics revisited:
  - Importance of structure parameters such as foundation type that have significant impact on cost.
  - 3 metrics to evaluate in optimization:
    - Soil condition, Square Footage, Year Built
  - Flowchart used to determine raising procedure produced in SAS (info gathered) and converted to Python (analyzed).
  - Types of Flood Proofing methods and other nonstructural solutions that will be necessary for structures that cannot be elevated.
  - How buyouts/property acquisition is handled in NJ and how it may be applied to NAP studies.
  - Lessons learned from FIMP, RREM and LMI
  - Great thought-provoking discussion at the end of the day.

### *GIS Mapping Capabilities & Ongoing Study Efforts*

Rourke/Long, NAP

- How we use GIS
  - Not just a map! Also does data analysis, data visualization, helps teams collaborate.
- Coastal Texas Story Map
  - Created during COVID to assist in townhall style meetings
  - Story map is a tool to illustrate the future with project conditions
    - Uses fact sheets, renderings, videos, polls, mapping tools, etc. to tell the project story
    - Mapping tools can be very useful in conveying information to the user

### Helpful Links

<https://coastal-texas-hub-usace-swg.hub.arcgis.com/>



## New Jersey & Nassau County Back Bays Coastal Storm Risk Management Feasibility Studies



- Question/Comment (Source): Any example where folks in and out of government can get different types of maps tied together?
  - Response 1: AGOL and ArcGIS are online sources that provide this.
  - Response 2: NJDEP mentioned that they are currently working on a decision support tool that is essentially a story map. NJDEP would be interested in sharing that with NAP GIS for collaboration purposes.
- Question/Comment (Source): Information added to this is limitless. FEMA zones, soil classifications, etc. can be added. Is it possible to zoom in on towns and see stats based on what is available in the database?
  - Response 1: Yes, but depends what you want to be generated and what we want the user to see.
- Key Takeaways
  - GIS is a powerful tool.
  - The Story Map is a great way to communicate the plan to interested parties.
  - NAP has started a story map for NJBB study but needs guidance from PDT on what content to add and may need appropriate data for mapping displays.
  - The team would definitely like to develop this tool during feasibility-level design.

*GIS Mapping Completed for FIMP study*  
Matt Davis, NAN

- FIMP Data Collection & Mapping Efforts
  - Phased process: data collection, refinement & display
  - Data collection (field): 2 cars at a time, survey lasted 1-2 days at a time
    - 5 people per car
    - Anything that looked out of place take pictures of
  - Desktop Analyses occurred over a long period. At one point about 12 employees were utilized to collect data.
  - FFEs were collected through Google Earth. Counted steps to evaluate FFE. Average step about 7".
- Improvements for next time
  - Don't rely on tax parcels, data is different everywhere
  - Collect more data on basement types
- Question/Comment (Source): What was your thought process on what was targeted during field data collection?
  - Response 1: It was entirely up to the field staff on what they photographed.
- Question/Comment (Source): Did you provide advanced notice?
  - Response 1: Yes, we sent out letters giving notice that data collectors would be in their neighborhood.
  - Response 2: if homeowner got aggressive leave for own safety.



- Key Takeaways
  - Lengthy and time-consuming process to collect data for structures. Great for use in evaluation, but data collected still does not encompass entire picture.
  - Requires a lot of manpower that NAP will not have.
  - Created very nice dashboard of information on the structure inventory that has been very helpful to the planning team in determining implementation strategy.

*Developing First Floor Elevation Data for Coastal Resilience Planning*

A.Gordon/B.McFarlane – Hampton Roads Planning District Commission

- 1<sup>st</sup> floor elevation data collection
  - Inform flooding vulnerability assessment, support, evaluating flood mitigation options, add necessary data gap in Hampton Roads, VA
  - Project Goals: Data products, methodology, analysis and coordination
    - See Figure below for hierarchy of important parameters:



- Phases of the project
  - Phase 1 – Elevation certificates -> HRGEO.org
    - Roughly 6,000 elevation certs digitized as of December
  - Phase 2 – FFE elevations applied in flood vulnerable areas
  - Phase 3 – Expanded across Hampton Roads, VA
  - Phase 1-3 occurred between Feb 2019 and Nov 2020
- Study undertaken for coastal resiliency planning
- Also utilized for flood insurance rate determinations

Helpful Links

[https://www.hrpdcva.gov/uploads/docs/07A\\_Attachment\\_Developing\\_First\\_Floor\\_Elevation\\_Data\\_for\\_Coastal\\_Resilience\\_Planning\\_in\\_Hampton\\_Roads\\_HRPDC.pdf](https://www.hrpdcva.gov/uploads/docs/07A_Attachment_Developing_First_Floor_Elevation_Data_for_Coastal_Resilience_Planning_in_Hampton_Roads_HRPDC.pdf)

<https://www.hrgeo.org/apps/fc5b5ff1b9564f6a82dd2c7a2c5a0b94/explore>

- Question/Comment (Source): Assume uniform height for stairs?
  - Response 1: Yes, assumed uniform height for stairs (7 inches).
- Question/Comment (Source): How much manpower did it take to manually scan homeowner certs into computer system?
  - Response 1: 2-3 minutes per cert.





- Response 2: Frontrunner has a system that will do the scanning but not always accurate. Found that it was more economical to manually input data.
- Question/Comment (Source): Did the elevation certs include BFE?
  - Response 1: They did not.
- Key Takeaways
  - Elevation certificates for most communities are not digitized.
  - Takes significant effort to make this data digital. In this case several years of work and approximately \$100k of funding each year.
  - This may be the type of initiative local interagency groups may need to push.

### *Rutgers/NJ OEM Lidar Collection Efforts*

Presentation on Rutgers efforts to develop Lidar coverage for NJ & How USACE can use this data

Jie Gong, Rutgers

- Geospatial mapping & disaster reconnaissance
  - Collect survey grade mobile (LIDAR) via digital images along 500-year flood plain
  - Provides digital modeling for floods, hurricanes, and projections
  - Roughly 9k miles traversed
  - Generate DEMs of collected areas
  - Will provide significant database of existing structure information for NJOEM and other partnering agencies once completed
- Question/Comment (Source): Is data open for public use?
  - Response 1: No, database is not available or accurate enough yet. At some point though a user will be able to extract information such as FFE data.
- Question/Comment (Source): Have the areas in the NAP studies been captured in this data collection effort?
  - Response 1: Yes, and in some cases, they have been mapped out twice.
- Question/Comment (Source): How long to map neighborhoods?
  - Response 1: About to 80-120 miles per day can be done. So approximately 2-3 hours per community.
- Key Takeaways
  - Very robust data collection program.
  - Several key structure parameters being collected in this dataset.
  - Data may not be available for use during feasibility-level design. Will have to coordinate with NJOEM & Rutgers in the future for use of data.



## *First Floor Elevation Data & AI Property Analytics*

Shelly Klose, True Flood Risk

- Patented AI driven climate & property risk management platform
  - Covers 250 M properties globally
  - Properties globally include:
    - 1<sup>st</sup> floor height/lowest floor elevation, 3-day weather tracking, property values at risk, flash and river flooding simulations
  - Generates instant flood risk report for each property and visualization tools including optimal strategies for flood risk mitigation (e.g. parametric, indemnity insurance, house raising, fill in basements, raise HVAC)
  - Default platform setting combines proprietary first floor height (FFH) estimate with USGS ground elevation to estimate first floor elevation (FFE)

### Helpful Links

<https://www.youtube.com/embed/DMknnR8bz4M>

<https://truefloodrisk.com/#/>

- Question/Comment (Source): Can flood reports be generated for the NY/NJ area?
  - Response 1: Yes. We have roughly 85% coverage in the communities there, and in some cases higher to full coverage
- Question/Comment (Source): Cost per property?
  - Response 1: \$1.00 per property, about \$10,000 per community
- Question/Comment (Source): Report elevations in NAVD88?
  - Response 1: Yes. Can tailor data in the report generated to the customer needs and preferred data sources.
- Question/Comment (Source): How is data collected for any large-scale project?
  - Response 1: Using licensed imagery through partners, Google streetview, independent sources or images uploaded by users
- Question/Comment (Source): Earn credit through NFIP?
  - Response 1: No, not yet
- Question/Comment (Source): How long to create the algorithm?
  - Response 1: 5-6 years of R&D and validation testing

### Key Takeaways

- Very interesting potential data collection source.
- Could be something the studies entertain for the PED phase. Would need to consult with contracting on how to procure services.



### *Data Acquisition Approach*

Open Discussion on Best Time/Resource Approaches for  
Gathering USACE-Accessible Data  
Leader - Renaud

### *Refining Structure Inventory*

Open discussion on potential for categorization of sample structure  
investigations during feasibility study and how to utilize collected/available information  
and GIS methods discussed  
Leader(s) – Workshop Team

- This time was allotted to openly discuss the two previously mentioned topics. The goal was to have open discussion with these areas of focus after hearing the presentations in the morning session on what type of data collection methodologies and datasets are available to the team.
- Major questions and takeaways:
  - Does NAP have the manpower to do any significant data collection efforts at this point in the study? Not likely.
  - Is their potential to use existing available data for the purposes of the Back Bay studies? Yes, but it is largely dependent on what the team needs and if the existing data set is up to date and comprehensive.
  - Potentially work together with NJ to extract data from Rutgers dataset.
  - Could use third party data source like True Flood Risk if necessary. However, all data sets have their limitations.
  - A risk evaluation should be done to see if it is worth to complete any additional data collection efforts during feasibility other than potentially sampling for the purposes of refining the structure inventory.
  - Comprehensive data set may not come until PED phase when all assessments have been completed. It is likely that structure assessments during PED will have to be completed by an AE firm.

### *Relocation from a NFS Perspective*

Presentation/Open Discussion on relocating structures, challenges associated with  
identifying structures for relocation and public messaging of relocation  
Robert VonBriel, NJDEP

- This time was allotted to openly discuss the nonstructural solution of relocation. Relocation is a small subset of the plan, but the team wanted to provide time to discuss this topic.
- Presentation is lead by the NFS to give their perspective on the concerns with relocations.
- Relocation concerns
  - Extremely difficult to discern if relocation is the best option.



- Will need major consultation with State Historic Preservation Office (SHPO) and potentially federal resource agencies if the structure is historic.
- Real Estate availability will be a concern (i.e. need to have a place to put the relocated structure).
- More to be discussed/fleshed out during PED. For feasibility any property associated with relocation will remain at low level of design.
- Difficulty in actually performing the relocation (i.e. roadway navigation, clearances, utility relocations, etc.).
- Surprisingly, NJ does have ongoing relocation projects. SJ Hauck stated they perform about 20 relocations a year between NY & NJ. Most of that is moving properties from the Back Bays further inland.
- Key Takeaways
  - Most likely will only be considered for historic properties.
  - Will require immense coordination and consideration prior to choosing relocation as solution.
  - Such a small portion of the selected structures that would potentially be eligible for relocation. Not worth further exploring till PED phase.
  - NAP could talk to an archaeologist during feasibility to at least start to put together a relocation determination action plan (i.e., if the structure is historic, who needs to be coordinated with).

### *Elevation Phasing & Insurance Penetration*

Presentation/Open Discussion on Nonstructural solution impacts on flood insurance, suggested elevation phasing per SHMP requirements

Chris Testa, NJOEM

- Program to help people who have been affected by natural disaster
  - Target to help people with insurance, will help uninsured
  - Rewards having insurance
- Repetitive Loss vs. Sever Repetitive Loss
  - RL (90%) vs. SRL (100%)
  - ICC comes in to play with elevated structures
- Question/Comment (Source): Elaborate on parameters of ICC?
  - Response 1: Increased cost of compliance additional \$30,000 rider to get into compliance improvements or restoration
- Key Takeaways
  - SHMP Rules should be considered during plan formulation
  - NAP Studies could have significant impact on insurance rates
  - Continue conversation with NJOEM as study progresses to ensure that these items are being considered

### *Executing Elevation Program - NY*

The Challenges of administering a home elevation program in NY



Paul Lozito, GOSR

- Program that allows money to quickly flow to homeowners who are elevating
  - Steps - setup, operations, damage assessment, contracting, change orders
  - Challenges – poor structure conditions, confined lot size, limited contractors, contractor fraud, verifying costs
  - Approximately 3k structures elevated by the program
  - Common environmental hazards encountered were lead and asbestos. Homeowner would have to hire hazardous waste specialist or LSRP for remediation. Not retained by GOSR.

#### Helpful Links

<https://stormrecovery.ny.gov/>

<https://stormrecovery.ny.gov/nyrcr/final-plans>

- Question/Comment (Source): Is putting onus on homeowner's best way to go?
  - Response 1: Properties belong to owners not the government, along with the reducing liability greatly for government
- Question/Comment (Source): Timeline for elevation process?
  - Response 1: roughly 12 months

#### *Path Forward & Responsibilities*

Open discussion to brainstorm ideas that NAP can use to optimize the Nonstructural plan and help develop a flowchart to path from ADM to PED phase using all information presented and discussed.

- This time was allotted for discussion on planning strategies and community messaging.
- Major questions and key takeaways:
  - NAP PM: What is driving our uncertainty at this point and how can we buy down the risk associated with it?
  - Is there 80% participation required for the nonstructural plan to be implemented? NAP stated that there is no minimum required at this time but needs to be fleshed out going forward.
  - USACE risk is mitigated by overinclusion of participation (i.e. using the 80% rate).
    - Include costs with higher participation, then if more homeowners don't wish to participate, the actual costs are lower than estimated. Higher risk for USACE would be using a lower participation rate.
    - If estimate is blown then would need to go back to Congress for more \$.
  - Will homeowners be able to get reimbursed for relocation costs?
  - Buyout is written that it's a mandatory nonvoluntary program



- Is that required? Wouldn't USACE rather have voluntary rather than involuntary?
- Preston – the crux of this is that USACE won't make decisions in a vacuum to a point of were saying acquisition...rather than elevation...there is some threshold that leads to that...so if not viable.... point would be to go to no action rather than elevation for some reason....
- FEMA and SBA loans area going to cover a large area
- Under the states upcoming regulation reform package attempting to increase the required freeboard above BFE for new FFEs. NJ stated 5 feet for conversation's sake.
  - Can this be constructed too?
  - Anything above USACE design criteria would be LPP.
  - USACE target elevation will be optimized during PED.
- Fed policy to align diff methods and econ methods to also include cost per
- 12 ft feasibility #...sensitivity how important to look at that elevation...
- Are 2<sup>nd</sup> homes eligible? TSP Report states that they may not be.
  - If so, this could greatly change the number of eligible structures

- END OF NOTES -

## Sponsor Questions

Below is a concise list of sponsor questions that must be answered in the timeframe between post-Nonstructural Workshop and ADM Meeting:

- 1) Does the Construction Contract for nonstructural solution need to be between USACE and Contractor or can it be between Owner and Contractor?
- 2) Can USACE fund temporary relocation for tenants and homeowners or must USACE follow the Uniform Relocation Act (URA)?
- 3) Would USACE only be able to fund elevation up to the Base Flood Elevation (BFE) and the NFS would be fully responsible for the additional cost associated with the state/local freeboard requirements?
- 4) Can betterments be completed parallel by the homeowner with the contractor during construction?
- 5) Are detached garages eligible for elevation?
- 6) Are secondary residences eligible for elevation?

Note: DEP referenced example of Franklin, TN elevation project being conducted by USACE Nashville District.

## Due Out Tasks

- A) NAP Planning to investigate clear answers on NFS questions listed above and any others discussed during the workshop.



New Jersey & Nassau County Back Bays  
Coastal Storm Risk Management Feasibility Studies



- B) NAP Planning to develop flowchart mapping tasks needed to be completed to ADM
- C) PDTs for each study to develop strategy to design decision making flowchart and layout tasks for feasibility phase
- D) NAP Planning to present synopsis of workshop and key findings from during the ADM milestone meeting. PDT can support with review of material to be presented.

**USACE NAP - Minutes Approval**

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Jay B. Smith, PM – NJBB

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Scott Sanderson, PM - NCBB

THANK YOU ALL FOR YOUR PARTICIPATION AND SUPPORT!

NAP BACK BAY STUDIES  
NONSTRUCTURAL WORKSHOP TEAM

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