Site-Level Structural Solutions

Sea Level Wise
A vibrant future for Virginia Beach

Site-level mitigation strategies for residential and non-residential structures can be implemented alone or in combination with other measures to provide comprehensive flood protection.

Strategy Toolkit

Based on a detailed review of protection benefits, construction costs, and other technical data, the following cost-effective site-level flood mitigation strategies were identified for residential and non-residential buildings in Virginia Beach.

Residential Elevation

Elevation projects involve raising an existing flood-prone home so the first floor is higher and therefore less vulnerable to flooding.

Residential Demolition/Rebuild

Demolition/rebuild projects involve tearing a home completely down and then replacing it with a new structure that is more resilient to flooding.

Residential Property Voluntary Acquisition

Voluntary property acquisition and buyout programs are intended to reduce a community's exposure and vulnerability to flood risk and sea level rise by removing properties and residents from high risk areas.

Non-Residential Dry Floodproofing

Dry floodproofing involves reinforcing walls, adding flood shields, and installing drainage systems with pumps to keep the building impermeable to the passage of flood waters.

Non-Residential Wet Floodproofing

Wet floodproofing involves installing flood vents, using flood-resistant materials, and elevating key equipment and contents to reduce damages and losses during flood events.

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Objective

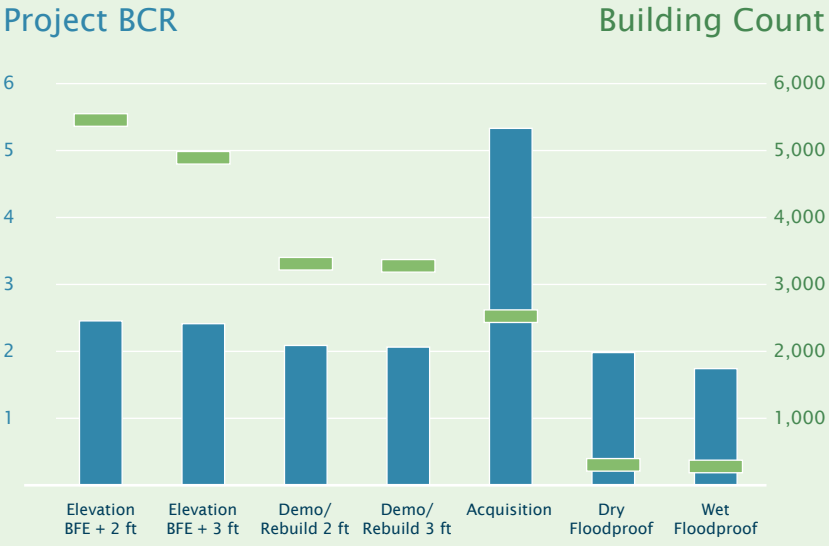
Evaluate site-level flood mitigation strategies for residential and non-residential structures across the City. Site-level mitigation can help address risk, lessen large structural strategy costs, introduce green/open space, and allow for phased implementation.

Approach

- Estimate project benefits, including economic losses avoided as well as social benefits and environmental benefits, for every-flood prone structure in City at the 3 ft SLR scenario.
  - Social benefits are the mental stress and anxiety suffered by residents and the loss of productivity to wage earners caused by flood events.
  - Environmental benefits can be added to voluntary acquisition projects that add or restore open space to the community.
- Identify cost-beneficial projects across the City, where the benefit to cost ratio (BCR) is greater than or equal to one.
  - BCR = Benefits/Costs
- Evaluate groups/neighborhoods of cost-beneficial projects as it may be more effective to perform projects at this scale rather than one property at a time.

Benefit Summary

City-wide BCR results for individual residential and non-residential mitigation measures.



Residential structural elevation and demo-rebuild projects were analyzed for both 2-foot freeboard in accordance with the City's floodplain management ordinance and 3-foot freeboard based proposed recommendations in the Virginia Beach Sea Level Rise Policy Response report.

What are other things a homeowner can do?

- Relocate flood-prone contents to a higher level
- Install flood vents on crawlspace foundation walls or the walls of enclosures below the BFE that allow for the free entry and exit of floodwaters
- Elevate building utility equipment to a higher level
- Use flood damage-resistant building materials (ex: replace wood cabinets with metal)

The City also evaluated cost-beneficial building-level flood mitigation projects that could be implemented outside of areas protected by the city-wide structural solutions. To learn more about these combined protection measures, please visit the website, *www.vbgov.com/pwSLR*.