



## Protection of Buildings and Property

RISE is looking for innovative technologies, products and services that introduce new materials, methods, and integrated designs to allow buildings to survive in the coastal environment. Emphasis is placed on protecting and prolonging the lives of existing structures, as well as holistic approaches to the design of new properties.

**Below are four areas of interest related to Protection of Buildings and Property, and specific problems in need of solutions:**

### 1. Use and Application of Dredge Materials

#### The Problem(s)

There are currently multiple dredging projects underway in the Middle Peninsula waterways to maintain and improve the navigability of the Chesapeake Bay. The Middle Peninsula Planning District Commission and the Eastern Shore has close to \$20 million in “shovel-ready” dredging projects in the queue for execution. Currently there are smaller deposits in the region, however in the future these projects will yield an enormous amount of material that must be accommodated on land close to the dredging projects.

This Challenge will re-imagine how the dredging materials may be used in economically sustainable ways to address the resilience needs of the community and region.

#### The Pain Points in Current Solutions

The dredging material is generally permitted for onshore storage, which can be unsightly and a poor use of municipal and private land. Transportation of the material can be expensive. To date, no economically viable uses or applications in Virginia have been found for the material to reduce the stockpiles.

Rural dredge material is of known composition and is not considered to be toxic. However, the composition may include nitrogen and phosphorus, which qualify for the nutrient credit program.

#### Solutions Being Sought

RISE is seeking solutions to use the dredging materials in ways to mitigate local flooding threats in the special flood hazard area and/or enhance the region’s resilience in other beneficial ways.

#### Some examples may be:

- Building materials
- Roadway materials (for paving, elevation, etc.)



- Uses of stockpiles of dredge materials in resilience-building or resilience-related applications and are financially sustainable
- Use of the material to expand/enhance living shoreline or other nature-based and hybrid solutions

Other uses (e.g., non-flooding related construction outside of the special flood hazard area) may be considered as part of the business model or plan, but those applications cannot be piloted using this Challenge funding.

Dredging materials can be made available for companies (upon request) wanting to use it for their projects.

### **Additional Information Available Upon Request**

Reports on composition of local dredge materials available upon request.

## **2. Integrated Coastal Property Design**

### **The Problem(s)**

Most coastal properties designed with resilience solutions from the water to the buildings are developed in a piecemeal fashion using a series of accepted practices. The solutions are designed and implemented to work individually but not together. Greater integration of home and building design could enhance resilience and sustainability, leading to novel waterfront properties - from the bay to the building - that can withstand sea level rise.

This Challenge seeks new approaches to the design, integration, and implementation of resilience solutions integrating shoreline, landscape, and building designs. Demonstrations may use an available network of publicly owned waterfront properties (residential structures and/or vacant parcels of land) as R&D test sites.

### **The Pain Points in Current Solutions**

Designing new structures for future flooding conditions has been a focus of many efforts, but the results have not always been applied to rural communities. Affordability and permitting issues often preclude new approaches.

It is often difficult to measure and assess the effectiveness of a new design, which, in turn can make optimization challenging. There may be a need to employ sensors and data analytics to measure and demonstrate design performance. These data sources and analysis may also inform when a building must be moved from its existing location. Getting adequate warning of this will help the homeowner and community plan ahead.

## Solutions Being Sought

RISE is seeking affordable and permittable solutions for demonstration that:

1. Designs that integrate living shoreline, landscape, and buildings, incorporating green and blue infrastructure with novel building materials.
2. Designs that more effectively live with water and drive toward net zero energy and carbon encumbrance.
3. Measure and monitor the effectiveness of the design, smart system technology.

## Additional funding available

Also, the Middle Peninsula Planning District Commission (MPPDC) has an additional \$800,000 [Virginia Housing and Development Authority \(VHDA\) grant](#) to be used to purchase completed residential homes that can be moved into by June 2024. These residential units must:

- be built on Public Access Authority property
- have an installed and functioning well access for potable water
- have an installed and functioning septic system
- consist of a residential building with a Certificate of Occupancy

At this time, it is estimated that each unit would be bought for up to \$80,000 (subject to revision). Each qualifying company may qualify to sell one or more units. Land for these units will be provided at no cost. This funding and its award will be administered by the MPPDC at its sole discretion. This will be discussed further in upcoming webinars.

## Additional Information Available Upon Request

- [Living Shoreline definitions, Virginia Marine Resources Commission](#)
- <https://vhdagrants.com/insideLinkOpps.jsp?documentPk=1617118530127>

## 3. Existing Building Rehabilitation

### The Problem(s)

Many existing coastal homes and properties are vulnerable to inundation from flooding and sea level rise impacts, including access to the property. To extend their useful lifecycle, beyond 15 years, many buildings require rehabilitation to make them habitable and more resilient to flooding.

This Challenge seeks new cost effective, innovative, solutions to make current residential and commercial structures resilient (viable and habitable) to flooding and sea level rise for 15 years or more.

## **The Pain Points in Current Solutions**

Best practices on preparing existing buildings before flooding or adapting existing buildings after flood damage for rural properties are not widely applied or known.

Designing new structures for future flooding conditions has been a focus of many efforts, but the results have not always been applied to rural communities.

## **Solutions Being Sought**

RISE is looking for the following solutions for existing buildings:

- Building enhancements that will prepare a structure for flooding events and/or to minimize the amount of time it will be out of service after an event
- Building mitigations (or mitigation practices) to repair structures after flooding events to allow it to return to use and minimize the effects of future flooding events.

## **4. Property Accessibility**

### **The Problem(s)**

In the Middle Peninsula region, private roads connecting buildings to public roadways are affected by flooding conditions limiting property access and effectively isolating the home. When these roads are impassable, private property owners are unable to access their properties and public services (e.g., fire, ambulance, school buses, etc.) are blocked from residents.

Building new or elevating existing roads are time consuming and costly propositions. Altered roads (material, structure, elevation) or alternatives to roads are required to provide consistent access to properties during flooding events for a defined duration.

### **The Pain Points in Current Solutions**

Building new or elevating existing roads are time consuming and costly propositions. Altered roads (material, structure, elevation) or alternatives to roads are required that provide consistent access to properties during flooding events for a defined duration.

### **RISE is seeking cost-effective, innovative solutions that:**

Provide reliable and consistent, but short-term (~10 - 15 years) accessibility to properties currently impacted by flooding and sea level rise.



**RISE is seeking cost-effective, innovative solutions that:**

Provide reliable and consistent, but short-term (~10-15 years) accessibility to properties currently impacted by flooding and sea level rise.

Solutions for this topic may take advantage of solutions to **Use and Application of Dredge Materials above.**

---

<sup>3</sup> <https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/Virginia-Coastal-Resilience-Master-Planning-Framework-October-2020.pdf>

<sup>4</sup> <https://law.lis.virginia.gov/vacode/28.2-104.1/>

<sup>5</sup> <https://law.lis.virginia.gov/vacode/title58.1/chapter36/section58.1-3666/>