

# Applicant Guidelines



**RISE**

## Urban Coastal Community Resilience Challenge

**Powered by Brinc**

**Application Deadline: Monday, January 10, 2022, 2pm EST**  
All inquiries should be directed to: [info@riseresilience.org](mailto:info@riseresilience.org)



## About RISE

RISE is a U.S.-based nonprofit with a mission to accelerate innovation and business growth by identifying, validating and scaling solutions to coastal community climate resilience challenges such as flooding and sea level rise. RISE achieves this by running Coastal Community Resilience Challenge competitions and offering funding and other support from its Resilience Innovation Fund (RIF), Accelerator, Hub, and Testbed in coastal Virginia.

### Coastal Community Resilience Challenges

RISE Coastal Community Resilience Challenges accelerate innovation by connecting problems in need of better solutions to innovators with new resilience-building technologies, products and services. RISE sources challenges from diverse entities operating in coastal communities. Each challenge occurs in coastal Virginia and is applicable to other coastal areas.

### Resilience Innovation Fund

Since 2018, RISE has deployed over \$5 million in non-equity funding and services from the RIF to more than 30 businesses developing scalable solutions that create substantial new value, can be demonstrated in coastal Virginia and can be built into sustainable ventures. The RIF is seeded with funds from the U.S. Department of Housing and Urban Development and the Commonwealth of Virginia.

### Resilience Innovation Accelerator

RISE accelerates the growth of businesses developing innovative solutions to coastal resilience challenges. The Accelerator works with winners of the RISE Coastal Community Resilience Challenges to help businesses maximize the impact and become sustainable after the RISE funding. The Accelerator offers a two-months program based on the National Science Foundation's I-Corps techniques tailored to the resilience sector.

### Resilience Innovation Hub & Testbed

RISE brokers access to coastal Virginia resources to businesses in need of testing, validating and otherwise demonstrating resilience-building innovations. RISE facilitates access to real-world pilot sites and permits, a co-working office and workshop space in Norfolk, Virginia, data and key stakeholders, a community of resilience entrepreneurs, PR opportunities, and regulatory technical assistance.

### Powered by Brinc

For its 2022 Challenge, RISE teams up with Brinc, a venture capital and accelerator firm that empowers game changers to help solve some of the world's biggest challenges. Brinc provides outreach expertise for the Challenge.



# Table of Contents

<a href="#">Overview</a> .....	p.3
<a href="#">Benefits</a> .....	p.3
<a href="#">Challenge Topics</a> .....	p.3
<a href="#">Eligibility</a> .....	p.4
<a href="#">Timeline</a> .....	p.7
<a href="#">Selection Process</a> .....	p.7
<a href="#">Award</a> .....	p.9
<a href="#">Eligible Uses and Costs</a> .....	p.10
<a href="#">Application Submittal Requirements</a> .....	p.12
<a href="#">Other Requirements</a> .....	p.15
<a href="#">Detailed Challenge Topics Descriptions</a> .....	p.23
<a href="#">Appendix 1 - DUNS and SAM.gov Registration</a> .....	p.29



# Amendments

Please see the list of changes, as of Feb. 1, 2022

Pg. 5	Eligibility: However, applicants must be a small business or a non-profit entity and provide a DUNS number as well as SAM.gov registration prior to execution of an award agreement with RISE (no later than the end of April) if selected as a winner of the Challenge.
Pg. 7	Timeline: 1/28 – Finalists announced. 2/17, 1pm EST – Deadline to submit additional information. 2/28 – Shortlisted finalists announced. 3/14 – 3/25 – Finalists’ pitch presentations to the Selection Committee. April – Winners selected and announced. May – Launch of the Resilience Innovation Accelerator. Launch of projects implementation.
Pg. 7	Selection Committee Review: The finalists will have until February 17, 2022 1pm EST to submit this additional documentation.
Pg. 15	B. Work Plan/Approach and Detailed/Updated Economic Impact
Pg. 17	The Project Work Plan will have 3 components: 1. Project Overview Narrative 2. Project Work Plan Narrative by Stage 3. Work Plan Workbook with Budget, Schedule, and Milestones
Pg. 17	Project Overview Narrative Economic Impact: Describe anticipated and other impacts within the Commonwealth of Virginia during and following the end of your project and the timeframe for these outcomes. Please be specific.

## Overview

The impact of climate change is being experienced at an accelerated rate. In the U.S., almost 40% of the population lives in high-population-density coastal areas vulnerable to sea level rise, leaving these communities at higher risk of flooding, shoreline erosion, and hazards from storms.

To address these issues, the RISE Urban Coastal Community Resilience Challenge offers up to \$1.5 million in non-dilutive funding to businesses solving the many problems that face urban coastal communities as a result of climate change. Selected teams will work closely with government, business, academic and tech leaders in coastal Virginia on pilots to validate their innovative solutions across the Hampton Roads region and scale them to other communities.

With 1.7 million residents, 10 diverse cities and 9 counties experiencing the highest rates of sea level rise along the East Coast, Hampton Roads presents a rare opportunity: An unbeatable living laboratory for the best climate resilience and adaptation technologies, along with the chance to make a positive impact quickly.

## Challenge Topics & Benefits

The Challenge seeks businesses with innovative, scalable solutions that address any of the following topics:



**Flood Management**



**Protection of Buildings**



**Data Analytics**



**Re-Establishing Critical Utilities**

### Winning businesses will get access to:

- Up to \$300,000 USD in non-dilutive grant and revenue-based loan funding
- Real-world pilot sites in the Hampton Roads region of Virginia
- Feedback from government pilot hosts
- Datasets
- Co-working office and workshop space in Hampton Roads, Virginia
- Customized business accelerator curriculum
- Government, technical and business mentors
- PR opportunities and media visibility
- Regulatory assistance with government funding
- Introductions to potential investors and customers
- The only ecosystem of coastal resilience entrepreneurs in the U.S.

## Eligibility

To be eligible for funding from the Resilience Innovation Fund and other resources from the Resilience Innovation Accelerator, Hub, and Testbed, applicants must meet the following criteria:

- Entity must meet the definition of a small business, as defined by the U.S. Small Business Administration and found under [13 CFR Section 121.201](#), or be a nonprofit organization. Funds may not be used to directly assist a privately owned utility for any purpose.
- Business or entity must be registered on SAM.gov, have a DUNS number.
- Must be eligible to receive funds from the United States government and adhere to applicable administrative requirements as outlined in 2 CFR§200 (please note that RISE provides compliance assistance to meet these requirements).
- Must meet goals of the Challenge and be selected as one of the winners of the Challenge (for more details see [Topic Eligibility](#)).
- Must be able to demonstrate the proposed solution in the Hampton Roads region of Southeastern Virginia (for more details see [Geography Eligibility](#)).
- Must have a solution at a prototype stage or later.
- Must be able to complete a proposed project by June 30, 2023.

Please note that applicants are not required to be a business or a non-profit entity and have a DUNS number or SAM.gov registration by the application submission deadline. However, applicants must be a small business or a non-profit entity and provide a DUNS number as well as SAM.gov registration prior to an award agreement with RISE (no later than the end of April, 2022) is selected as a winner of the Challenge.

The DUNS number can be typically received within a week. The SAM.gov registration can take 4-6 weeks to receive, and applicants are strongly encouraged to begin this registration as soon as possible. There are no charges for either DUNS or SAM.gov registrations.

### Challenge Topic Eligibility

Solutions submitted to the Urban Coastal Community Resilience Challenge must fall within one or more of the four topics. Below is a summary of needs identified by stakeholders in Hampton Roads and other coastal communities. Submissions do not need to be limited to these areas. However, to be eligible for funding from RISE, entrants must focus on a Hampton Roads need while demonstrating the ability to scale to other communities. For more details about these pain points, please refer to Detailed Challenge Topics Descriptions.

**Flood Management:** Cost-effective management of ground- storm- and/or tidal water, either as affordable short-term mitigations or low-maintenance long-term options in urban environments with high water tables.

**Data Analytics:** Big data analytics, integration, and accessibility for multiple applications to improve coastal communities' ability to more effectively prepare for, respond to and recover from disruptions.

**Protection of Buildings:** Structural or non-structural alternatives beyond traditional approaches such as costly house elevation that individual homeowners could buy that protects buildings for 15 – 30 years in the flood environment, or that are cost effective protections against the higher frequency, lower magnitude recurrent flooding.

**Re-Establishing Critical Utilities:** Re-establishing and maintaining functionality of critical systems after an acute event to prevent cascading failures and degradation in the resilience of a community.

### Geographic Eligibility

Applicants must demonstrate that the proposed solution may be implemented in or directly benefit the Hampton Roads region of Southeastern Virginia. If an applicant is not located in Hampton Roads, the solution must be deployed, installed, tested or otherwise demonstrated in the region. Teams that are accepted into the RISE program do not have to be located in Hampton Roads as long as COVID-19 restrictions are still in place. However, teams will still need to deploy their solution in Hampton Roads, by either hiring or partnering with local firms/organizations/individuals.

RISE can only select projects that provide a demonstrable benefit to the Hampton Roads region defined as: The City of Chesapeake; The City of Franklin; The City of Hampton; The City of Newport News; The City of Norfolk; The City of Poquoson; The City of Portsmouth; The City of Suffolk; The City of Virginia Beach; The City of Williamsburg; The Town of Smithfield; Gloucester County; Isle of Wight County; James City County; Southampton County; Surry County; and York County.



Date	Event
January 10, 2022, 2:00 pm EST	Application submission deadline.
Every Thursday between November 4, 2021 and January 10, 2022 at 1pm EST	Informational webinars.
January 28, 2022	Finalists announced. Finalists will be required to submit additional documentation, including technical details of your solution, a work plan, and financial projections.
February 17, 2022, 1pm EST	Deadline to submit the additional documentation if selected as a finalist.
February 28, 2022	Shortlisted finalists announced.
March 14 - 25, 2022	Finalists' pitch presentations to the Selection Committee. Finalists will have 20 minutes to present, with an additional 40 minutes for questions from the Committee. The finalists will receive questions from the Selection Committee in advance to aid their preparation.
April, 2022	Winners selected and announced.
May, 2022	Launch of the Resilience Innovation Accelerator. Launch of project implementation.
June 30, 2023	Deadline for project implementation and contract closeout.

*All dates are subject to change.*

## Selection Process

### Selection Committee Review

Applicants must submit applications **no later than Monday, January 10, 2022, 2pm EST**. The Selection Committee will select finalists to submit additional documentation, including technical details of their solution, a work plan (with budget, schedule, milestones and deliverables), and three-year financial projections. The finalists will have until Feb. 17, to submit this additional documentation.



Once all scores and comments are consolidated, and the technical reviews are complete, the highest scoring finalists will be invited to pitch to the Selection Committee for funding and other resources. After the pitches, the Selection Committee will update all scores and comments and select winners.

## Oral Pitch Presentations

Shortlisted finalists will present their proposed project to the Selection Committee. Finalists will have 30 minutes to present, with an additional 1 hour for questions and discussion from the Selection Committee. Presentations will take place in person in Norfolk, Virginia or virtually. The finalists will receive questions from the Selection Committee in advance to aid their preparation.

## Investment Committee Conference

The Investment Committee will assess the presentations and RIF application as a complete package and make award recommendations to the RISE Executive Director.

## RISE Resilience Innovation Accelerator

Winners will receive feedback from the Selection Committee who may recommend making the award (or a portion of the award) contingent upon refinement of a business plan and/or work plan. In such a case, the applicant will be offered to participate in a customized RISE Resilience Innovation Accelerator program (Accelerator) that will assist with addressing the Selection Committee's concerns and recommendations.

Each winner will receive up to **\$10,000 in grant** funding for their participation in the Accelerator and associated deliverables. If the Committee recommends this course and the applicant, for any reason, decides not to participate, the applicant is free to withdraw from the program at that time with no penalty. Winners are not guaranteed any funding for their pilot projects until they successfully complete the Accelerator (if required by the Selection Committee).

Upon the conclusion of the Accelerator, RISE will have the option, but is in no way obligated, to negotiate a contract to proceed with a pilot project in response to the Challenge. The final scope of the project will be subject to negotiation based on the findings and refinements from the Accelerator.

## Evaluation Process

An application will be evaluated on adherence to these guidelines, including the following criteria and how clearly and completely it provides the information requested.

## Strength of the Solution & Intellectual Property (30 points)

- Need addressed & value proposition
- Innovativeness
- Solution stage

## Business Plan (30 points)

- Strength of entrepreneurs & management team
- Size of the market and revenue opportunity
- Strength of competitive environment
- Marketing, sales, and partners

## Project Work Plan/Approach (20 points)

- Relevance to and advancement towards business plan goals
- Clarity and quantification of milestones and metrics
- Feasibility
- Costs and timeline reasonableness

## Economic Impact Potential/Economic Benefit to Hampton Roads and Virginia (20 points)

- Jobs creation and/or retention
- Workforce development
- Benefit to Virginia-based businesses (if an applicant is not a Virginia-based business)

## Award

The total of up to \$1.5 million in funding is available to support solutions in response to this Challenge. RISE is looking to fund innovative approaches that can be built into viable and sustainable businesses. This means businesses that generate revenues through sales of its product and/or attract further investment to grow or develop revenue sources. RISE intends for its funding to be used to get the company to that point.

**Applicants can apply for up to \$300,000<sup>1</sup>.** RIF awards come in two forms: 1) Revenue Based Loan and 2) Grant. Grant awards may be combined with the Revenue Based Loan. The award type and amount is determined by the RISE Executive Director based on the scoring and recommendations of the RIF Selection Committee.

---

<sup>1</sup> RISE reserves the right to increase this threshold.

## Grant Terms and Conditions

Awardees that are awarded funds from RISE may be awarded a grant from RIF. Grants are awarded for the costs of product development, project setup in Hampton Roads, and Hampton Roads-focused use case discovery and development. All grant funds must be fully expended and closed out by **June 30, 2023**. Payments made to the awardee under the grant are made on a reimbursement basis for eligible costs.

Payments made to grantees under the agreement are made on a reimbursement basis for eligible costs. Grantees must incur costs and request reimbursement for eligible expenses. Reimbursements will be issued only for eligible expenses that are supported by the appropriate documentation and are directly linked to project milestones and deliverables. At a maximum, the grantee will be able to request reimbursement twice a month.

All costs charged to the grant shall be supported by properly executed payrolls, time records, invoices, contracts, or vouchers evidencing in proper detail the nature and propriety of the charges. All checks, payrolls, invoices, contracts, vouchers, orders, or other accounting documents pertaining in whole or in part to the grant shall be clearly identified, readily accessible, and separate and distinct from all other such documents.

Payments will be contingent upon successful performance against key milestones and other performance standards outlined in the agreement. The grantee is required to meet the terms of the grant agreement. If the grantee does not meet the agreed upon deliverables, a portion of the entirety of the grant must be repaid. A repayment plan will be determined on a case-by-case basis, with all repayments due by June 30, 2023.

The grantee will be required to repay all or a portion of their grant for any of the following reasons:

- Failure to abide by the terms and conditions set forth in the grant Agreement;
- Failure to achieve successful completion of the activity funded by the grant;
- Failure to follow any federal, state, or local laws, regulations, and requirements.

## Revenue Based Loan Terms and Conditions

Awardees that are awarded funds from RISE may be awarded a Revenue Based Loan from RIF. Revenue Based Loans are awarded to selected applicants who already have a product and seek funding to launch or grow their revenue generation by refining, expanding and/or piloting their resilience-building solution, launching or scaling marketing, sales, fabrication and other capacity.

Companies are awarded an amount based on their capital needs and projected revenue stream. Payments are made monthly to RISE based on the company's monthly gross revenue from sales (as defined by GAAP). Key features of this loan include<sup>2</sup> :

- No equity
- No collateral required
- No board seats or personal guarantees
- Return caps of 1.0x – 2.0x
- Repaid over up to 5 years
- Up to 20% of monthly revenues

Only those revenues associated with the product or service proposed are considered. Terms of this loan (e.g., percentage of monthly gross revenues, term, cap) will all be negotiated individually between RISE and the company based on the financial model. No traditional underwriting will be required to receive this loan. This loan is non-dilutive.

The Revenue Based Loan must be fully expended by **June 30, 2023**. It is structured around milestones and payments are made according to the milestone schedule outlined in the loan agreement. If the deliverables are not met, the loan will enter repayment. At a maximum, applicants with RIF loans will be able to request draws bi-monthly. The remainder of loan terms are negotiated on a case-by-case basis.

The following is a non-exhaustive list of appropriate documentation that may be used to support eligible expenses for grants and loans:

- Receipts
- Invoices that show proof of payment
- Cancelled checks
- Pay stubs that detail date, hours and work completed

## Resilience Innovation Hub & Testbed

In addition to funding the winners will gain access to a suite of resources, including:

- Assistance with securing real-world pilot sites in the Hampton Roads region of Virginia
- Feedback from government pilot hosts
- Co-working office space in Hampton Roads, Virginia
- Fabrication and assembly spaces in a warehouse/workshop space in Hampton Roads, Virginia
- Datasets
- Government, technical, and business mentors
- PR opportunities and media visibility
- Regulatory assistance with government funding
- Introductions to potential investors and customers
- Customized business accelerator curriculum
- The only ecosystem of coastal resilience entrepreneurs in the U.S.

---

<sup>2</sup> Terms may vary according to agreement between teams and RISE.

## Resilience Innovation Accelerator

The Accelerator offers a business assistance program based on the National Science Foundation's I-Corps techniques tailored to the resilience sector and specific feedback from the Selection Committee. The goal is to increase the likelihood of the businesses becoming sustainable and attracting private capital and/or customers after the Challenge award.

## Eligible Uses and Costs

The RISE Resilience Innovation Fund (RIF) is funded with Community Development Block Grant funds and matching funds from the Commonwealth of Virginia, resulting from the National Disaster Competition led by the U.S. Housing and Urban Development (HUD). Projects funded by RIF must meet HUD Community Development Block Grant – National Disaster Resilience (CDBG-NDR) and Commonwealth of Virginia funding regulations and requirements. Based on the requirements of these funds, the following uses are examples of RIF eligible funding uses.

- Purchase of fixed assets, working capital, salaries, and technical assistance to businesses.
- Prototype, planning, drafts, versions, and proof-of-concept development created prior to a final product.
- Installation and testing of prototype, or installation of pilots on publicly owned property
- Recruitment and educational activities.
- Creation of plans, reports, or similar deliverables aimed at providing lessons learned, guidance, and best practices.
- Acquisition or rental of machinery, equipment or services if integral to the proposed project, program or plan.
- Administrative costs related to servicing or ensuring compliance with RIF requirements.
- Payments for salaries and support of staff or the contracting of an outside entity to implement any part of the project, program, or a plan.
- Provisions of technical assistance to businesses such as preparation of financial packages, survey, engineering, legal, architectural or other similar assistance if integral to the proposed project, program, or plan.
- Expenses related to business recruitment, marketing, promotional activities, and related administrative expenses, including, but not limited to, salaries, travel, office expenses, advertising, legal and related costs.

RISE reserves the right to consider the eligibility of items at their discretion, provided those costs are consistent with the RISE mission and support economic development and coastal resilience in the Hampton Roads region. All costs proposed shall be necessary and reasonable to deliver the solution and are subject to the approval of eligibility and cost reasonableness, as determined by RISE. RISE may review any proposed costs and provide an eligibility determination to an applicant.

## Construction costs

For construction projects, applicants will be required to demonstrate to RISE that their project is feasible. This is satisfied if a registered professional engineer (or other design professional) certifies that the design meets the appropriate code or industry design and construction standards.

Construction activities are also subject to an Environmental Review. Depending on the scale and impact of the project, the Environmental Review can range from a determination that the activity is exempt from the Environmental Review requirement to a determination that a full Environmental Impact Statement is required before the project can proceed. Funded applicants should be aware that completing an Environmental Review can be a lengthy and time-consuming process, especially for any construction activities. Applicants should factor this time and effort into their proposal for funding. If the Environmental Review process timeline inhibits the successful completion of the project or project milestones, the RIF award may be rescinded.

Once funding decisions are made, RISE will provide technical assistance to funded applicants, instructing them of their responsibilities and guiding them through the environmental review process. Funded applicants will not be required to pay for their environmental reviews. RISE will complete the environmental review. RISE will provide in-depth technical assistance to all applicants who are implementing construction activities under the RIF.

## Ineligible costs

**The following costs are ineligible. Applicants may include these costs in solution budgets, so long as there is another source of funding which is responsible for covering the costs.**

<b>Pre-award costs</b>	Costs incurred prior to the execution of the contract with RISE including the development of the CCC and RIF applications, prototypes, plans, or other work required to secure RIF funds, are not eligible for RIF funding.
<b>Patents, copyrights and related legal fees</b>	RIF funds cannot be used for the advancement of patents or copyrights of the solution, whether costs are incurred by applicant personnel, partners, vendors or contractors.
<b>Single and multi-family residential projects</b>	RIF funds cannot be used to provide new or rehabilitated housing units. However, solutions that are applied to residential properties or development, such as a prototype for a new mitigation method, may be considered for funding.
<b>Debt payments</b>	The refinancing or payment of existing debt, including secured and unsecured debt capital or interest payments are not an eligible use of RIF funds.
<b>Penalty payments</b>	The payment of governmental fines or penalties arising from late or improper payment of occupational taxes and fees, sales tax, income tax, or other penalties are not an eligible use of RIF funds.

<b>Political or religious activities</b>	All funded activities must be secular and apolitical in nature.
<b>Buybacks</b>	RIF funds may not be used to buy out current stockholders, equity holders, or any family members with vested interest in the applicant business or entity.
<b>Investment instruments</b>	RIF funds may be used to purchase investment instruments if required for the implementation or development of a program or plan. However, purchasing items for the sole purpose of increased return on investment or increased revenue alone is not allowable.
<b>Buildings for the general conduct of government</b>	Except to the extent necessary to fund the rehabilitation or reconstruction of public buildings, or portions thereof, used for the general conduct of government, cannot be assisted with these funds.
<b>General government expenses</b>	Expenses required to carry out the regular responsibilities of local government are not eligible for assistance.
<b>Purchase of equipment</b>	The purchase of construction equipment is ineligible, but compensation for the use of such equipment through leasing or depreciations is allowed. In addition, the purchase of equipment, fixtures, motor vehicles, furnishings, or other personal property not an integral structural fixture is generally ineligible.
<b>Operating and maintenance expenses</b>	Any expense associated with repairing, operating or maintaining public facilities, improvements and services is ineligible.
<b>Improvements to private property</b>	RIF funds may not be used for any improvements and installations on private property.
<b>Income payments</b>	These funds may not be used to pay individuals or families for items such as food, clothing, housing, or utilities, withstanding emergency grant payments.

## Application Submittal Requirements

### Application Submission

Application process is divided into two phases: Phase 1 application shall be submitted online at F6S platform: <https://www.f6s.com/urbanresiliencechallenge>. Proposals may be started at any time and can be edited until the submission deadline of **Monday, January 10, 2022, at 2:00pm EST**. Timely submission of the proposal is solely the responsibility of the applicant. Proposals received after the specified date and time will not be accepted.

## Application Technical Assistance

During the pre-submission application period, RISE staff are available to answer general questions about the application and provide general subject matter technical assistance to all applicants. Technical assistance is limited to the application and process, and staff are unable to provide direct assistance in completing the application.

In order to answer applicants' questions, RISE will hold a series of webinars. These webinars will be open to anyone and attendance or non-attendance does not affect entrants' chances of success. Dates for the webinars will be posted on the RISE website.

Phase 1 application includes the following components:

- |    |  |    |                  |
|----|--|----|------------------|
| A. | Executive Summary & Company Background | D. | Economic Impact  |
| B. | Solution Overview                      | E. | Pilot Site Needs |
| C. | Business Plan                          | F. | References       |

Following a review of Phase 1 applications, the Selection Committee will select finalists to submit additional details using an online Phase 2 application. Finalists will receive a link to upload additional documentation including:

- A. Detailed/Updated Business Plan
- B. Work Plan/Approach and Detailed/Updated Economic Impact
- C. Technical Approach

Specifically, the additional documentation should include following:

### A. Detailed/Updated Business Plan

The Business Plan demonstrates what is going to sustain and grow the business once the project is complete. Applicants must upload the latest version of the Business Plan for their venture that answers all of the questions below:

- 1) A statement of the problem you are solving, and a description of your solution
- 2) A description of the business model(s)
- 3) A three-year financial projections of revenues and expenses, as well as cash flows
- 4) Marketing plan for the solution



- 5) Schedule for the overall Business Plan
- 6) Major milestones for the solution beyond RIF award
- 7) An organizational chart
- 8) A description of partnerships with other organizations and individuals
- 9) Team resumes
- 10) A description of the market for the solution, customers and beneficiaries
- 11) Value proposition of the solution to the buyer and rationale for why a buyer would purchase
- 12) Anticipated market penetration at the end of CY 2022, 2023 and 2024
- 13) Alternatives to the solution that are currently available in the market
- 14) Description of active competitors delivering a similar solution
- 15) A description of obstacles that may be encountered when trying to enter the market with this product/service
- 16) A description of intellectual property (IP) protection
- 17) Other key information that is key to understanding the market for the solution and how the team will capitalize on the solution

The Business Plan should be a maximum of 15 pages.

## B. Work Plan/Approach

The Project Work Plan will have three components:

- 1) Project Overview Narrative
- 2) Project Work Plan Narrative by Stage
- 3) Work Plan Workbook with Budget, Schedule, and Milestones

Applicants should break down the proposed project into a series of stages, each with measurable objectives and deliverables to create the project Work Plan narrative. Each stage must advance the effort toward the overall goals in a measurable and meaningful way, clearly demonstrating an advancement of the project. Deliverables can be in the form of physical objects, experiment/test results, analyses, reports, evidence of job creation, etc.

### 1) Project Overview Narrative

The Project Overview should include the following in narrative form:

- Overall technical goal(s) and strategies for the project, including an explanation of how the entity is achieving the project goal(s) and will advance the goal(s) outlined in the Business Plan.
- The critical accomplishments, deliverables, or achievement points over the duration of the award.
- Anticipated permit requirements of the locality and other authorizing jurisdictions that will be required for the project.
- Economic Impact: Describe anticipated and other impacts within the Commonwealth of Virginia during and following the end of your project and the timeframe for these outcomes. Please be specific.

- Period of performance for the project, as well as a description of current related efforts and work that may extend beyond the expenditure timeline.
- For Construction Projects only: Attach existing feasibility studies or reports. If no existing studies are available, please include a feasibility study in the timeline.

## **2) Project Work Plan Narrative by Stage**

- Name of stage.
- Description of tasks to be performed.
- Key personnel working on the tasks and description of qualifications of the team (principal, key personnel, subcontractors and consultants) to execute the stage of the Work Plan.
- Milestones of each stage.
- Deliverables/objectives and measurable criteria to determine that the deliverables/objectives have been met/achieved.
- Schedule of each stage.

## **3) Project Work Plan Workbook**

The Project Work Plan Workbook will have the following components (required template will be made available prior to inviting Phase 2 applications):

- Total budget with line items.
- Milestones by quarter through the expenditure period (expenditure deadline is June 30, 2023).

## **C. Technical Approach**

Technical report(s), and/or presentation describing your solution in further detail from a technical perspective.

## **Proprietary Information/Non-Disclosure & IP Ownership**

All application materials are considered confidential. Applicants will retain ownership of intellectual property.

## **Cost Incurred in Responding**

This Challenge does not commit RISE to pay any costs incurred in the preparation and submission of proposals or in making necessary studies or designs for the preparation thereof, nor to procure or contract for services.

## **No Requirement of Award; Non-commitment**

Notwithstanding any other provision of this document to the contrary, the Coastal Community Resilience Challenges do not commit RISE to award any funding to any applicant. RISE reserves the right to reject any and all applications or any portions thereof, at any time, and to cancel the Challenges and to request new applications under a new Challenge or other vehicle.

## **Monitoring and Oversight**

RISE monitors each funded applicant throughout the lifetime of their award. Monitoring serves to identify risks and deficiencies early in the process, so that any issues may be remedied at the outset. In general, the levels of monitoring range from desk auditing, to on-site monitoring, to integrity monitoring. Any risks and deficiencies identified result in a request for timely corrective action from the entity being monitored. RISE provides Technical Assistance (TA) to all entities being monitored in order to facilitate compliance with all applicable federal, State, and local regulations.

## **Reporting**

As a condition of the award, awardees are required to submit a monthly progress report(s) and final report discussing project and financial performance. Awardees are required to briefly report on commercialization and/or other outcomes and impact annually for three years after the period of performance.

## **Award Appeals Process**

Applicants are notified by email regarding the results of their application. Applicants who are not selected for funding can appeal their determination. Applicants must make appeals within 15 calendar days after receipt of the notification. Appeals must be received in writing and include supporting documentation to justify a change in status. RISE will notify the appealing applicant when an appeal is received.

All appeals are reviewed in the order in which they are received by the Chief Strategy Officer of RISE. The Chief Strategy Officer makes an appeal determination and forwards it to the Executive Director for confirmation and approval. The results of the appeal are provided to the applicant by email within 30 days of appeal acceptance.

### **Award amount appeals**

Applicants selected for funding can appeal the awarded amount of funding. Appeals for awarded amounts must include sufficient documentation to revise an award offer, such as:

- Updated financial statements;
- Newly identified private funds, loans, or equity;
- Updated cost estimates; and/or,
- Revised scopes and deliverables.

The award appeal process does not allow for substantial revisions of applications and appeals that substantially alter the original proposal are not accepted.

Appeals of the amount of loan funds awarded may require a revised underwriting analysis. The underwriting analysis may adjust the review time frame for appeal determinations beyond the standard 30-day window. Before a revised underwriting review occurs, the Chief Strategy Officer makes an initial determination on the merit of the appeal to prevent duplicative efforts from the underwriting team.

Following approval from the Chief Strategy Officer, the Executive Director, and a satisfactory underwriting review, if applicable, the applicant is offered a revised award amount.

### **Board appeals**

Applicants who have had their appeal denied for award amount or participation in RIF may direct their appeal to the RISE Board of Directors. Appeals to the Board must contain a detailed rationale justifying the reversal of the Chief Strategy Officer's decision.

Appeals to the Board must be made in writing within 10 calendar days of receipt of the appeal determination from RISE. The Board reviews appeals during their regularly scheduled quarterly board meetings and documents appeal decisions made in meeting minutes. Appeal determinations are made when most of the Board reaches a decision regarding the appeal. The results of the appeal are provided to the applicant by standard mail and email. Decisions reached by the Board are final.

## Key Regulations

RISE and its funded applicants must adhere to all applicable State and federal laws, rules, and regulations. This section provides a summary of the significant and applicable federal regulations for the RIF awards. RISE provides extensive regulatory and compliance technical assistance to its awardees during the entire period of their projects.

### **Procurement requirements**

Funded applicants will be required to follow 2 CFR 200.318-326. RIF awards must be expended in compliance with 2 CFR 200, which outlines cost principles, and procurement standards. All costs are subject to the approval of eligibility and cost reasonableness, as outlined in [2 CFR 200.404](#).

Where applicable, the requirements set forth at 2 CFR Part 200 will apply to the procurement, selection, and contract requirements of any participating consultant, vendor, or contractor that engages with the applicant in the course of expended grant and/or loan funds.

### **Cross-cutting requirements**

#### ***Americans with Disabilities Act (ADA)***

RISE takes affirmative steps to ensure that qualified persons with disabilities are informed of the availability of program services and activities, and RISE's programs or services are readily accessible to, and usable by, individuals with disabilities. RISE will also ensure that handicapped persons are provided with benefits and services as those provided to non-handicapped individuals. And will ensure that all programs and activities are accessible, both structurally and administratively, to handicapped and disabled persons. The types of reasonable accommodations that can be provided include accommodations or adjustments to a rule, policy, practice or service.

#### ***Davis-Bacon Act and Related Acts (DBRA)***

Construction projects over \$2,000 must comply with Davis Bacon Act and Related Acts (DBRA). DBRA requires all contractors and subcontractors funded whole or in part with CDBG-DR financial assistance through the RISE in excess of \$2,000 to pay their laborers and mechanics employed under the contract no less than the locally prevailing wages and fringe benefits for corresponding work on similar projects in the area. In some cases, the Commonwealth of Virginia Prevailing Wage Law is in effect. In these cases, the higher prevailing wage rate between the federal and State must be adhered to and made applicable. For prime contracts in excess of \$100,000, contractors and subcontractors must also, under the provisions of the Contract Work Hours and Safety Standards Act, as amended, pay laborers and mechanics, including guards and watchmen, at least one and one-half times their regular pay for all hours worked over 40 in a work week.

Additionally, RISE must follow the reporting requirements per the HUD and Department of Labor (DOL) regulations. This requirement also extends to RISE’s funded applicants and contractors.

The Monitoring and Compliance Department (MCD) ensures that RISE’s applicable programs and services are in compliance with DBRA through the submission of weekly payrolls as well as interviews with laborers. RISE utilizes its Davis-Bacon FTP Submission website and electronic tracking system to both track and monitor weekly payroll submissions by contractors.

### ***Equal Employment Opportunity***

**Executive Order 11246**, Equal Employment Opportunity, as Amended, prohibits federal contractors and federally-assisted construction contractors and subcontractors, who do over \$10,000 in Government business in one year from discriminating in employment decisions on the basis of race, color, religion, sex, sexual orientation, gender identity or national origin. The Executive Order also requires Government contractors to take affirmative action to ensure that equal opportunity is provided in all aspects of their employment. This regulation is adhered to within RISE programs.

### ***Fair Housing***

The **Fair Housing Act** requires all grantees, sub-recipients, and/or developers funded in whole or in part with HUD financial assistance to certify that no person was excluded from participation in, denied the benefit of, or subjected to discrimination in any housing program or activity because of their age, race, color, creed, religion, familial status, national origin, sexual orientation, military status, sex, disability or marital status. RISE enforces the Fair Housing Act by ensuring that all grantees, sub-recipients, and/or developers meet the applicable Fair Housing and Affirmative Marketing requirements and provide a marketing plan and report on compliance in accordance with the Fair Housing Act and the associated forms on HCR’s website, where applicable. The Affirmative Marketing Plan must be in compliance with applicable Fair Housing Laws and demonstrate how the Applicant will affirmatively further fair housing throughout applicable RISE disaster recovery programs.

### ***Fair Labor Standards Act of 1938, as Amended (FLSA)***

The **Fair Labor Standards Act of 1938**<sup>4</sup> (FLSA) establishes the basic minimum wage levels for all work and requires the payment of overtime at the rate of at least one and one-half times the basic hourly rate of pay for hours worked in excess of 40 per week.<sup>5</sup> These labor standards are applicable to the entire construction contract whether or not CDBG-DR funds finance only a portion of the project. Excluding the exceptions listed below, all workers employed by contractors or subcontractors in the performance of construction work financed in whole or in part with assistance received under RISE CDBG-DR program must be paid wages at rates not less than those prevailing on similar construction in the Locality as determined by the Secretary of Labor in accordance with the Davis-Bacon Act, as amended. In some cases, Commonwealth of Virginia Prevailing Wages and Davis-Bacon Prevailing Wages both apply. In such instances, the higher of the two prevails.

Exceptions to Fair Labor Standards Act of 1938, as Amended (FLSA) include:

- Construction contracts of \$2,000 or less;
- Real property acquisition;
- Architectural and engineering fees;
- Other services (such as legal, accounting, construction management);
- Other non-construction items (such as furniture, business licenses, real estate taxes);
- Rehabilitation of residential property designed for fewer than eight families; and,
- Demolition and/or clearance activities, unless related to construction (demolition and clearance as independent functions are not considered construction). Contact a RISE CDBG-DR Labor Specialist for assistance.

### ***Limited English Proficiency (LEP)***

Federal Executive Order 131661 and State Executive Order #26 require RISE and all satellite offices, programs, subrecipient, contractors, subcontractors, and/or developers funded whole or in part with CDBG-DR financial assistance to ensure fair and meaningful access to programs and services for families and individuals with LEP and/or Deaf/Hard of Hearing. RISE ensures fair access through the implementation of a Language Assistance Plan (LAP) which includes non-English based outreach, translation services of vital documents, free language assistance services, and staff training. RISE's LEP Coordinator is responsible for coordinating all activities associated with the LAP, and the (MCD) monitors its implementation. Refer to the "Language Assistance Plan" Provision of Language Assistance Services for additional guidance and protocols. Refer to the "Language Assistance Plan" Provision of Language Assistance Services for additional guidance and protocols.

### ***Minority/Women-Owned Business Enterprises (MWBE)***

The federal **Executive Order 12432** guidelines requires selected federal agencies to promote and increase the utilization of Minority Business Enterprises. 24 CFR 85.36 requires grantees to ensure that all sub-recipients, contractors, sub-contractors, and/or developers funded in whole or in part with HUD CDBG-DR financial assistance to make a commitment or demonstrate an acceptable "good faith effort" toward ensuring that contracts and other economic opportunities are directed to small and minority firms, women's business enterprise, and labor surplus area firms. In addition, RISE ensures compliance by requiring sub-recipients, contractors, and/or developers to achieve an overall MWBE participation goal of 30 percent of the entire contract value, consisting of 15 percent for Minority-Owned Business Enterprises (MBE) and 15 percent for Women-Owned Business Enterprises (WBE). RISE verifies MWBE certification and monitors to ensure compliance with all reporting requirements.

### **Section 3**

Construction projects over \$100,000 must comply with Section 3 hiring regulations. Section 3 of the Housing and Urban Development Act of 1968 requires grantees, sub-recipients, contractors, sub-contractors, and/or developers funded in whole or in part by the CDBG-DR funding, to the greatest extent feasible, extend hiring opportunities and contracts to Section 3 eligible residents and businesses. Section 3 eligible residents are low- and very low-income persons, particularly those who live or reside in public or government assisted housing. For those entities that receive more than \$200,000 in HUD CDBG-DR assistance and contractors that are awarded covered contracts that exceed \$100,000, RISE requires that an approved Section 3 plan be in place before the project is awarded and approved. RISE's Monitoring and Compliance Team monitors contracts with sub-recipients, contractors, subcontractors and/or developers. RISE manages the education and outreach efforts, reviews the proposed Section 3 Plans, and provides Technical Assistance (TA) when needed.

## **Detailed Challenge Topic Descriptions**

The Challenge topics areas described below are developed around technical areas of interest to the community. Submissions are not required to meet the needs of only one topic or topic area. In many cases it may be that the solutions proposed meet the needs of two or more of the Challenge topic areas. Although not specifically required, RISE encourages submissions that have this multi-use capability and companies are encouraged to emphasize this in their submission (including the business plan).

Specific topic areas are described for each topic where needs have been identified, however if applicants have solutions outside of these areas, it is recommended that they contact RISE to inquire about their suitability.





## Flood Management

### Problem

Flooding is becoming more frequent and more severe throughout the Hampton Roads area and other coastal communities, resulting in asset damage and financial losses. Flooding affects residents (e.g., homes, vehicles, disruption to daily lives), businesses (e.g., loss in economic productivity), utilities, and governments alike (e.g., critical infrastructure).

The watershed management problem combines many of the following:

- Tidal flooding overtopping seawalls
- Tidal flooding tailwater in stormwater pipes producing flooding inland
- Aging and undersized stormwater infrastructure limiting effective drainage
- High water table/groundwater limiting ability to store water underground
- Large, paved areas (e.g., parking lots) increasing runoff and localized flooding
- Urban environment limiting access to existing infrastructure or new infrastructure installation

### What We've Heard

Coastal communities seek innovative solutions for management of ground-storm-and/or tidal water, either as affordable short-term mitigations, or low-maintenance, longer-term options in a variety of environments with high water tables.

Below are priority areas identified by stakeholders in Hampton Roads and other coastal communities. Submissions do not need to be limited to these areas. However, to be eligible for funding from RISE, entrants **must focus on a Hampton Roads need**, while demonstrating the scalability to other communities.

- Tidal backflow prevention (see more details below).
- Rainbomb flooding reduction (see more details below).
- City hardscape adaptation (see more details below).
- Innovative solutions for wetland and floodplain restoration, living shorelines and vegetated buffers, stream bank restoration or stabilization, or any other nature-based approaches.
- Replacement of existing residential bulkheads with nature-based solutions.
- Improved stormwater management in dense urban environments with low operations and maintenance costs.
- Active watershed management and control for existing infrastructure optimization.
- "Rainbomb" detection, warning and applications.

Specific pain points associated with tidal backflow prevention, rainbomb flooding reduction, and city hardscape adaptation are detailed below.

## 1) Tidal Backflow Prevention

### The Problem(s)

During high tide events, tidal water can flow into the stormwater system and out of drains, leading to significant “blue sky” flooding on roadways and intersections. Tidal valves (check valves) are placed in the stormwater system to prevent this backflow.

Coastal communities typically have many tidal outfalls requiring multiple valve installations. Installation, operation and maintenance costs can be significant to the city.

Many cities are looking for an affordable, effective, turn-key installation and operation at these outfalls that will prevent backflow into the stormwater system.

For instance, the City of Norfolk alone has hundreds of tidal outfalls. The City is very interested in sourcing a more effective and efficient solution to its backflow prevention problem and is willing to provide teams access to outfalls to demonstrate their solutions. This problem is expanded further in the seven other municipalities in the Hampton Roads region and beyond.

### The Pain Points in Current Solutions

There are a variety of backflow prevention systems available. Typically, cities have installed different check valves and tested them for:

- Ease of installation
- Functionality of flood reduction
- Ease of maintenance

Of course, one of the biggest discriminators are the associated costs, which fall into three components:

Installation:	Procurement:	O&M:
<ul style="list-style-type: none"> <li>• Difficulty and errors in installation lead to loss of function or blockage</li> <li>• Pipe infrastructure around the valve is in poor condition, requiring repairs and making it harder and more expensive to install</li> <li>• Valves sometimes do not fit well in the pipes</li> <li>• High labor costs</li> </ul>	<ul style="list-style-type: none"> <li>• Procurement of the check valve and associated materials</li> </ul>	<ul style="list-style-type: none"> <li>• Keeping the valve clear of debris, biological growth, and ensuring proper operation</li> <li>• In general, cities want to keep labor costs as low as possible, so automation or contractor labor (if more economical) is preferable to in-house Operations and Maintenance</li> </ul>

For the purposes of our Challenge, we will use the following costs as a baseline relative to which improvements will be gauged. The costs include costs of purchasing an existing technology, installing it, and maintaining it. In effect, the total cost to install a tidal valve costing around \$5,000 (e.g., Tideflex) can be over \$50,000 per outfall. Breakdown of the costs is available from RISE upon request.

### **Solutions Being Sought**

Due to cities' desire to reduce labor costs, RISE seeks solutions with end-to-end installation (check valves, liners, plus any other materials required for a working installation). The vendor providing the solution will take care of complete installation and maintenance (as opposed to procuring the valve and other materials from a vendor, then using another contractor to install it and using in-house city staff to maintain it).

RISE can only fund small businesses (including small business-led teams) to perform these pilot programs. Larger companies may be involved but can only be used as contractors to the small business prime. RISE is seeking an installed and maintained project(s) to assess the affordability and functionality of the installation over a period of several months. RISE would provide pilot sites for the installation in Norfolk, Virginia. Performance assessment is based on (relative to the baseline):

- Cost of install
- Functionality of flood reduction
- Ease and cost of maintenance

The evaluation period will last until June 2023.

### ***Dates subject to change at RISE discretion.***

Datasets Available Upon Request

- Tidal outfall maps for Norfolk
- Cost estimates for tidal valve installation, and O&M.

Please email all questions to [info@riseresilience.org](mailto:info@riseresilience.org)

## **2) Rainbomb Flooding Reduction**

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

Many cities experience heavy localized rainfall-induced (“rainbomb”) flooding with increased intensity. These events generate large amounts of water in a short amount of time, overwhelming stormwater systems and leading to major flooding. When this occurs in urban environments it can significantly affect transportation, flood buildings and businesses, and lead to loss of vehicles or life. The flooding is often localized, making one intersection impassable while other nearby roadways remain unaffected.

## The Pain Points in Current Solutions

Major infrastructure projects to mitigate or alleviate this situation, such as floodwalls, cisterns, ponds and large pump stations, take a long time and large amounts of funding to design and install, and are often not possible in an urban environment. These types of solutions are not considered in this Challenge. The very flat topology of Hampton Roads does not provide the pressure head to generate flows in the stormwater system, leading to pipes having standing water and reducing their capacity to hold stormwater. Green infrastructure solutions such as roadside rain gardens and bioswales are quickly overwhelmed during rain-bombs.

## Solutions Being Sought

RISE is seeking solutions that take advantage of existing infrastructure to reduce the flooding effect that rainbombs have on major roadway intersections to a maximum of 3" of water roadway centerline depth on the street during a rain event.

Since this work must be installed and demonstrated by **June 2023**, solutions that require significant prior development or installation permitting and review may not be suitable. RISE is looking for implementable submissions, **not just designs**.

Some examples of preferred approaches include:

- Installation of sensors and/or other equipment in/on existing infrastructure if it does not impede the operation of the infrastructure. If costs will be associated with installing and/or maintaining these sensors and/or equipment, they should be included in the proposal.

Also, it may be that the intersection(s) of interest are affected by infrastructure elements that are:

- Poorly installed
- Incorrectly sized
- Degraded
- Some other attribute(s) causing poor stormwater management

In these cases, RISE would accept equipment installation to mitigate these shortfalls. For example, if a segment of a pipe is seen to be undersized, it may make sense to add a pump to increase the mass flow through the undersized pipe.

It is likely that a series of mitigations may be needed, and they should work together in an integrated manner. Mitigations implemented to improve stormwater management should not result in another area being adversely affected.

## The Location(s):

RISE will provide entrants with datasets on stormwater infrastructure, topography, and other model data upon request by the entrant. Entrants should use these data to develop their solutions and their estimated performance. If selected, RISE will work with the entrant and the City of Norfolk to get access to the intersection and surrounding infrastructure as needed.

## The Level of Threat:

Instead of designing solutions to a particular rainfall event, RISE wants entrants to define, as part of their submission, the rainfall events that they believe their solution can maintain less than 3" depth of water in the intersection during an event. The rainfall events are defined by NOAA in the table below, which is also [linked here](#).

## POINT PRECIPITATION FREQUENCY (PF) ESTIMATES WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION - NOAA Atlas 14, Volume 8, Version 2

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches) <sup>1</sup>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.415 (0.326-0.522)	0.481 (0.378-0.606)	0.589 (0.462-0.743)	0.679 (0.529-0.858)	0.801 (0.605-1.03)	0.895 (0.663-1.17)	0.989 (0.710-1.31)	1.08 (0.751-1.46)	1.21 (0.809-1.66)	1.30 (0.853-1.81)
10-min	0.608 (0.478-0.765)	0.705 (0.554-0.887)	0.863 (0.676-1.09)	0.994 (0.774-1.26)	1.17 (0.886-1.51)	1.31 (0.970-1.71)	1.45 (1.04-1.92)	1.59 (1.10-2.14)	1.77 (1.18-2.43)	1.91 (1.25-2.65)
15-min	0.741 (0.583-0.933)	0.859 (0.675-1.08)	1.05 (0.824-1.33)	1.21 (0.944-1.53)	1.43 (1.08-1.85)	1.60 (1.18-2.08)	1.77 (1.27-2.34)	1.94 (1.34-2.61)	2.16 (1.44-2.96)	2.33 (1.52-3.23)
30-min	1.08 (0.846-1.35)	1.25 (0.983-1.58)	1.54 (1.20-1.94)	1.77 (1.38-2.24)	2.10 (1.58-2.71)	2.35 (1.74-3.06)	2.60 (1.87-3.44)	2.85 (1.97-3.84)	3.19 (2.13-4.38)	3.44 (2.25-4.78)
60-min	1.42 (1.12-1.79)	1.66 (1.31-2.09)	2.05 (1.61-2.59)	2.38 (1.85-3.01)	2.83 (2.14-3.66)	3.19 (2.36-4.16)	3.54 (2.55-4.70)	3.91 (2.71-5.27)	4.39 (2.94-6.04)	4.76 (3.12-6.62)
2-hr	1.77 (1.41-2.20)	2.07 (1.65-2.58)	2.57 (2.04-3.20)	2.99 (2.36-3.73)	3.57 (2.73-4.57)	4.03 (3.02-5.20)	4.49 (3.27-5.89)	4.96 (3.48-6.64)	5.60 (3.79-7.63)	6.09 (4.03-8.39)
3-hr	1.99 (1.59-2.45)	2.33 (1.87-2.88)	2.90 (2.32-3.59)	3.38 (2.69-4.20)	4.07 (3.14-5.18)	4.61 (3.48-5.92)	5.16 (3.78-6.74)	5.73 (4.04-7.62)	6.49 (4.43-8.82)	7.09 (4.72-9.72)
6-hr	2.36 (1.92-2.88)	2.77 (2.25-3.38)	3.47 (2.80-4.24)	4.07 (3.27-4.99)	4.93 (3.87-6.23)	5.63 (4.31-7.17)	6.35 (4.72-8.23)	7.10 (5.08-9.38)	8.14 (5.62-11.0)	8.95 (6.03-12.2)
12-hr	2.75 (2.26-3.31)	3.22 (2.64-3.88)	4.03 (3.30-4.87)	4.75 (3.87-5.76)	5.80 (4.61-7.27)	6.66 (5.18-8.41)	7.57 (5.70-9.73)	8.53 (6.19-11.2)	9.87 (6.91-13.2)	10.9 (7.46-14.7)
24-hr	3.19 (2.65-3.79)	3.70 (3.08-4.41)	4.61 (3.82-5.50)	5.43 (4.48-6.50)	6.65 (5.37-8.27)	7.67 (6.04-9.60)	8.75 (6.68-11.2)	9.91 (7.29-12.9)	11.6 (8.20-15.3)	12.9 (8.88-17.2)
2-day	3.70 (3.12-4.35)	4.27 (3.60-5.03)	5.29 (4.45-6.24)	6.21 (5.19-7.35)	7.60 (6.23-9.35)	8.77 (7.01-10.9)	10.0 (7.75-12.6)	11.4 (8.47-14.7)	13.3 (9.54-17.5)	14.8 (10.3-19.6)
3-day	4.03 (3.42-4.70)	4.68 (3.97-5.46)	5.83 (4.93-6.82)	6.86 (5.78-8.06)	8.40 (6.92-10.3)	9.68 (7.79-11.9)	11.0 (8.61-13.9)	12.5 (9.39-16.0)	14.6 (10.5-19.1)	16.2 (11.4-21.4)
4-day	4.31 (3.68-5.00)	5.02 (4.28-5.83)	6.26 (5.33-7.29)	7.37 (6.25-8.62)	9.02 (7.47-10.9)	10.4 (8.39-12.7)	11.8 (9.25-14.7)	13.4 (10.1-17.0)	15.5 (11.3-20.2)	17.3 (12.2-22.6)
7-day	5.08 (4.39-5.84)	5.88 (5.07-6.76)	7.25 (6.24-8.36)	8.47 (7.25-9.79)	10.3 (8.56-12.3)	11.7 (9.55-14.2)	13.2 (10.5-16.3)	14.9 (11.3-18.8)	17.2 (12.6-22.2)	19.0 (13.5-24.7)
10-day	5.81 (5.05-6.63)	6.66 (5.79-7.61)	8.12 (7.04-9.30)	9.40 (8.10-10.8)	11.3 (9.45-13.4)	12.8 (10.5-15.3)	14.3 (11.4-17.6)	16.0 (12.2-20.0)	18.3 (13.5-23.5)	20.1 (14.4-26.0)
20-day	7.91 (6.98-8.91)	8.98 (7.91-10.1)	10.7 (9.44-12.1)	12.2 (10.7-13.9)	14.3 (12.1-16.7)	15.9 (13.2-18.8)	17.6 (14.1-21.2)	19.2 (14.9-23.8)	21.5 (16.0-27.2)	23.2 (16.9-29.8)
30-day	9.63 (8.56-10.8)	10.9 (9.69-12.2)	13.0 (11.5-14.5)	14.7 (12.9-16.5)	17.0 (14.5-19.6)	18.7 (15.6-21.9)	20.4 (16.5-24.4)	22.2 (17.2-27.1)	24.4 (18.3-30.6)	26.1 (19.1-33.3)
45-day	11.7 (10.5-13.0)	13.3 (11.9-14.8)	15.8 (14.1-17.6)	17.8 (15.8-19.9)	20.4 (17.5-23.3)	22.4 (18.8-25.9)	24.3 (19.8-28.7)	26.1 (20.4-31.7)	28.4 (21.5-35.4)	30.1 (22.2-38.2)
60-day	13.5 (12.2-14.9)	15.3 (13.8-16.9)	18.2 (16.3-20.1)	20.5 (18.3-22.8)	23.5 (20.2-26.6)	25.6 (21.6-29.5)	27.7 (22.6-32.5)	29.6 (23.3-35.8)	32.1 (24.3-39.7)	33.8 (25.1-42.7)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

Entrants should define the range of events for which their solutions will meet the criteria.

### **Datasets Available Upon Request**

- Stormwater infrastructure maps
- Elevation maps
- SWMM models for the location

Please email all questions to [info@riseresilience.org](mailto:info@riseresilience.org)

[https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html)

## **3) City Hardscape Adaptation**

### **The Problems**

Impervious surfaces (roads, parking lots, sidewalks, etc.) constitute the majority of surfaces in many cities. Because of the prevalence of these impervious surfaces, stormwater systems can be overloaded quickly during heavy rainfalls (e.g., “rainbombs”) and will back up onto the streets leading to significant flooding, impassable roads, traffic congestion, and loss of property and lives in extreme cases.

Many mitigations of this problem have been developed, proposed, and implemented in cities around the world including rain gardens, daylighting creeks, etc. However, these mitigations can take a long time and large amounts of funding to design, permit, and implement. They may be the preferred solution long-term but with climate change resulting in more intense storms, many cities need shorter-term solutions quickly.

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

1. Stormwater departments in cities are very attuned to the vulnerable areas that have deficient stormwater infrastructure or contribute most to localized flooding in rainfall events. Some departments do not have the resources and would benefit from an analysis of the infrastructure, its weak points, as well as identification and quantification of “high-payoff” areas suited for adaptation.
2. Once the “high-payoff” areas have been identified and quantified, the solution itself (e.g., excavation, demolition, etc.), may be expensive, time-consuming, disruptive, and require lengthy permitting and review processes.
3. The question always arises as to who will pay for this work. Municipalities often rely on government grants and other financing sources to pay for the implementation and upkeep of the solutions. This is time-consuming and expensive to apply for, receive, and manage, and is also unsustainable in the long-term.

## Solutions Being Sought

RISE seeks solutions to this problem that address all three “pain-points,” for example:

1. Stormwater problem area analysis, identification, and quantification
2. Solutions to mitigate the area that will be installed and working within **one year of city go-ahead** from 1 above
3. Financing of the implementation (including recurring O&M costs), without using government grants or bonds

RISE is seeking solutions that will provide **measurable benefits** to a region of a city. Given the short time and limited funding of the program, the demonstration area under consideration will be very localized and is not expected to fix the needs of an entire city.

RISE seeks total solutions comprising all three elements above. Companies may apply already in teams or may form (and amend) teams during the pilot process if selected. Each of the three elements above will be viewed by RISE as a separate Challenge from the funding perspective. For example, if one analysis company is selected, they may receive up to \$300,000, and if they are teamed with a finance company they may, together, receive up to \$600,000.

RISE can only fund small businesses (including small business-led teams) to perform these pilot programs. Larger companies may be involved but can only be used as contractors to the small business prime. Selection and funding of companies, and groups of companies is at RISE’s sole discretion.

The evaluation period will last until June 2023.

Dates subject to change at RISE discretion.

## Datasets Available Upon Request

- Elevation and flooding maps for City of Norfolk

Please email all questions to [info@riseresilience.org](mailto:info@riseresilience.org)



## Data Analytics

### Problem

To reduce the risk of living on the coast and adapt to more frequent disruptions, coastal communities seek to utilize data and new/existing sensor networks to improve their ability to:

- Prepare for, respond to, and recover from disruptions.
- Increase knowledge and awareness of interactions between ground-, storm-, and tidal waters and their effects, and understand the economic impact of the use of this information.
- Interface real-time and forecast of flooding information and other environmental hazards with new technologies in a near- to mid- term time horizon (e.g., smart city data, self-driving/autonomous vehicles and traffic control, augmented/virtual reality technologies, etc.).

### What We've Heard

Coastal communities seek innovative data analytics solutions to improve their ability to more effectively prepare for, respond to, and recover from disruptions.

Although not meant to be comprehensive, below are suggested areas in need of innovative solutions identified by stakeholders in Hampton Roads and other coastal communities. Submissions do not need to be limited to these areas. However, to be eligible for funding from RISE, entrants **must focus on a Hampton Roads need** while demonstrating the ability to scale to other communities.

- Increased knowledge and awareness of interactions between ground-, storm-, and tidal waters and their effects, and understanding the economic impact of the use of this information.
- Augmented/virtual reality applications for enhanced resilience infrastructure installation, operation, and maintenance.
- "Rainbomb" detection, warning and applications.
- Innovative smartphone apps to enhance residents' quality of life during acute and chronic (nuisance) stresses.
- Integration of climate risk data analysis into transportation infrastructure planning to characterize system-wide effects of disruptions from flooding and help prioritize projects more efficiently and effectively.





## Protection of Buildings

### Problem

Buildings in flood plains experience different levels of flooding. Some buildings may experience several feet of flooding and require substantial modification to remain viable (e.g., building elevation). Others may only experience a few inches (6-8 inches) and minor modifications to avoid the costs of damage.

Many buildings experience up to 8 of flooding several times per year. To avoid recurring flood damage and insurance claims, effective, affordable and readily deployable remedies are needed.

Also of concern is how these modifications are financed. Are costs shared among home/building owners, the City, and insurance companies (or others)? What are viable and sustainable options for funding these efforts? Homes in Norfolk Vision 2100's "Yellow Areas" are representative of many of these issues ([see Vision 2100](#)).<sup>3</sup> These areas are established neighborhoods that experience more frequent flooding.

### What We've Heard

Coastal communities seek innovative solutions to maintain the viability of existing buildings facing different levels of flooding.

Although not meant to be comprehensive, below are suggested areas in need of innovative solutions identified by stakeholders in Hampton Roads and other coastal communities. Submissions do not need to be limited to these areas. However, to be eligible for funding from RISE, entrants **must focus on a Hampton Roads need**, while demonstrating the ability to scale to other communities.

- Structural or non-structural alternatives beyond traditional approaches such as costly house elevation that individual homeowners could buy.
- Cost effective protections against the higher frequency, lower magnitude recurrent flooding.
- Alternatives to raising existing homes up above the Base Flood Elevation. For instance:
  - A modular building system that can be adapted to increasing flood levels (e.g., floor levels installed as planes that can one day be mechanically lifted).
  - Retrofit solutions for existing buildings beyond FEMA approved solutions.
- "Rainbomb" detection, warning and applications to protect buildings quickly.
- Quick-reacting, affordable building protection for "rainbomb" (rapid, short-lived) flooding events.
- Innovative financial models to make building modifications and/or protections more affordable to building owners.
- Augmented/virtual reality applications for enhanced resilience infrastructure installation, operation and maintenance as related to buildings.

Note that the RISE funding cannot be used to make modifications or improvements to privately owned properties, but could be used in other areas (e.g., to develop and validate various approaches and business models).

<sup>3</sup> <https://www.norfolk.gov/DocumentCenter/View/27768/Vision-2100---FINAL?bidId=>



## Re-Establishing Critical Utilities

### Problem

After a hurricane, flood, or other catastrophic event, the greatest threats to people and businesses come from the inability to resume normal operations. Prompt resumption of communications, emergency services, and basic needs are essential to the region's resilience. Economic hardships are endured if people cannot get to work, and businesses of all sizes face significant costs due to disruptions to operations. There are even threats to public safety if emergency services cannot be contacted to help those in distress. Important institutions such as hospitals, airports and ports are affected. Small businesses such as gas stations, hardware stores and food service providers supply essential services and disruptions to them could result in their going out of business.

After an acute event, vital installations need to be made functional as soon as possible to prevent further degradation in the resilience of a community. Electricity, communications (including data) and water are some of the most important elements that need to be restored after an acute event. Capabilities currently exist that can be installed (permanently) at installations to provide that backup but are expensive to implement and maintain at every installation, particularly when they may not be required. Needed is an integrated unit that may be pre-deployed just prior to the event and readily implemented after an event.

The types and sizes of facilities to be considered in this topic are:

- A 250 bed Level I trauma center hospital
- Stand-alone outpatient facilities
- A major company's data and operations center
- A city block

Critical functionalities include:

- Electricity
- Potable water and wastewater management
- Cell phone communications
- 911 access
- Internet access

Also, interdependencies among networked infrastructure that supports communities – e.g., interconnected water, stormwater, electricity, telecommunications, transportation systems – create a known risk of cascading failure: A disruption in one system may lead to a significant disruption in one or more other systems. For example, during a coastal flooding event the vulnerability of the power grid to flooding can cause cascading failures to telecommunications, transportation, sanitation and other interconnected networks, exponentially raising the consequence of flooding.

## What We've Heard

Coastal communities seek innovative solutions to re-establish and maintain functionality of critical systems after an acute event to prevent cascading failures and degradation in the resilience of a community.

Although not meant to be comprehensive, below are suggested areas in need of innovative solutions identified by stakeholders in Hampton Roads and other coastal communities. Submissions do not need to be limited to these areas. However, to be eligible for funding from RISE, entrants must focus on a Hampton Roads need while demonstrating the ability to scale to other communities.

- Portable systems deployable within 2 hours of a disruptive event and able to provide 72 hours of continuous functionality to critical services.
- Approaches to allow re-establishing the power supply to residences and businesses city-wide within 72 hours of a storm event.
- "Rainbomb" detection, warning and applications to protecting and/or re-establishing critical utilities.
- Mitigating the risk of cascading failure in interdependencies among networked infrastructure that supports communities.
- Means of protecting the existing grid infrastructure against wind and water damage leading to outages.
- Energy storage, microgrids and other approaches to enhance power supply resilience hyper locally.
- Alternate fuels for back-up power applications. Solutions must be for applications other than single private residences.

## Appendix 1

### General Instructions for Registering in DUNS/SAM.GOV

If you have not previously registered in DUNS or SAM, read all instructions below before you register in these systems.

#### Important Facts

1. All organization/entity information MUST BE IDENTICAL IN BOTH DUNS and SAM.
  - You cannot enter one address for DUNS and then a different address for SAM. This will cause a system error and result in significant delays.
  - You cannot have unequal spacing between words in the primary contact information fields. Be very precise when entering all data.
2. Certain internet browsers work better than others for navigating the SAM system. If you have technical difficulties read "Browser Settings for Optimal Use of SAM": <https://inside.fws.gov/media/FinancialAssistance/Documents/Browser%20Use%20of%20SAM.pdf>
3. Obtaining a CAGE or NCAGE code is an important first step in this process.
4. For SAM Customer Service, contact:
  - Federal Service Desk: [www.fsd.gov](http://www.fsd.gov)
  - US Calls: 1-866-606-8220
  - International Calls: 334-206-7828
  - You may also contact your DIC point of contact
5. There is no registration fee for DUNS or SAM for any organization that is a financial assistance recipient of the US government, including contracts, grants and cooperative agreements.
6. There are businesses that will assist in registration for a fee, but you are not required to make payment to any DUNS representatives for purposes of contracts, grants or cooperative agreements.

### SAM.GOV Instructions: Read prior to application

1. Go to [www.sam.gov](http://www.sam.gov)
2. Click on the "Help" Tab.
3. Click on the "FAQs" Tab, read the "SAM User Help" information.
4. Click on the "User Guides" tab, then the "Quick User Guides" tab below.

5. Read the “Quick Start Guide for Entities Interested in Being Eligible for Grants.” [https://www.sam.gov/sam/transcript/Quick\\_Guide\\_for\\_Grants\\_Registrations.pdf](https://www.sam.gov/sam/transcript/Quick_Guide_for_Grants_Registrations.pdf)
6. Click on “Full User Guide” and download full instructions for completing SAM registration. This guide contains step-by-step screenshots to assist in the registration process.
7. Also under the “User Guides” tab are “Demonstration Videos”:
  - SAM Overview Video
  - Register a New Entity in SAM to be Eligible for Grants and Other Federal Assistance
  - Migrating Your Legacy System Roles
8. For SAM frequently asked questions (FAQs), go to: <https://www.sam.gov/portal/public/SAM/>
9. Once you have read through the formal instructions on the SAM website, you can use the instructions below for basic reference when entering SAM organizational information.
10. If you are awaiting an assistance award from DIC, please email your Grant Specialist once you have completed SAM registration.

## Basic Instructions for completing SAM entry registration

1. Complete DUNS registration for your organization. See below for DUNS information.
2. Click "Register New Entity" under "Manage Entity" on your "My SAM" page
3. Select your Entity type
4. Select "NO" to "Do you wish to bid on contracts?"
5. Select "YES" to "Do you want to be eligible for grants and other federal assistance?"
6. Complete "Core Data"
  - Validate your DUNS
  - Enter Business Information
  - Enter CAGE code if you have one. If not, one will be assigned to you after you have completed your registration. Non-domestic registrants must enter a NCAGE code.
  - Enter General Information (business type, etc.)
  - Financial Info (EFT)
  - Proceedings detail
7. Complete "Point of Contact"

8. The entity's registration should be active in 3-5 business days (10 business days for manual validations).
9. Click on "Full User Guide" and download full instructions for completing SAM registration. This guide contains step-by-step screenshots to assist in the registration process.
10. Also under the "User Guides" tab are "Demonstration Videos":
  - SAM Overview Video
  - Register a New Entity in SAM to be Eligible for Grants and Other Federal Assistance
  - Migrating Your Legacy System Roles
11. For SAM frequently asked questions (FAQs), go to: <https://www.sam.gov/portal/public/SAM/>
12. Once you have read through the formal instructions on the SAM website, you can use the instructions below for basic reference when entering SAM organizational information.
13. If you are awaiting an assistance award from DIC, please email your Grant Specialist once you have completed SAM registration.