



2021 COASTAL COMMUNITY RESILIENCE CHALLENGE FLOOD MANAGEMENT

FM 1: Tidal Backflow Prevention

The Tidal Backflow Prevention 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 many 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 is a variety of backflow prevention systems available. Typically, cities have installed different check valves and tested them for:

- ease of installation
- functionality of reducing flooding
- ease of maintenance

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

Installation:

- Difficulty and errors in installation lead to loss of function or blockage.
- Pipe infrastructure around the valve is in poor condition, requiring repairs and making it harder and more expensive to install.
- Valves sometimes do not fit well in the pipes.
- Labor costs.

Procurement:

- Procurement of the check valve and associated materials.

O&M:

- Keeping the valve clear of debris, biological growth, and ensuring proper operation.
- 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.

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 that constitute the end-to-end installation (check valve, liners, plus any other materials required for a working installation), with a vendor providing the solution and taking care of the complete installation and maintenance (as opposed to procuring the valve and other materials from a vendor, then using another contractor to install it, and then 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 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 reducing flooding
- ease and cost of maintenance

The evaluation period will last until May 2022.¹

Datasets Available Upon Request

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

Please email all questions to KaterinaOskarsson@riseresilience.org

¹ Dates subject to change at RISE discretion.