

September 22, 2020

**Memorandum #2020-113**

**TO: Coastal Resiliency Committee**

**BY: Ben McFarlane, HRPDC Senior Regional Planner**

**RE: Coastal Resiliency Committee Meeting – September 25, 2020  
RSVP – September 23, 2020**

The next meeting of the **Coastal Resiliency Committee** will be held on **Friday, September 25, 2020** from **10:00 a.m. until 12:00 p.m.** The agenda and related materials are attached.

Pursuant to the declared state of emergency in the Commonwealth of Virginia in response to the COVID-19 pandemic and to protect the public health and safety of the committee members, staff, and the general public, the Coastal Resiliency Committee meeting will be held electronically via Webex. Participants can join using the following information:

**Join by computer:** <https://executive-director.my.webex.com/executive-director.my/j.php?MTID=m1335fb3e26895cd93b9650d6733a248b>

-or-

**Join by phone:** +1-415-655-0001 US Toll

**Meeting Number/Access Code:** 126 796 2380

**Password:** YNuMHmvU233 (96864688 from phones)

**Please RSVP by September 23, 2020** so we may make appropriate logistical arrangements. If you have any questions or need further information, please do not hesitate to contact me.

BJM/cm

Attachments

**Coastal Resiliency Committee Voting Members:**

Bob Baldwin, PO  
Doug Beaver, NO  
Mark Bellamy, YK  
Steve Bond, HA  
Darryl Cook, JC  
Lamont Curtis, NN  
David Kuzma, IW

Beth Lewis, SH  
Al Moor, SU  
Carolyn Murphy, WM  
Brent Payne, GL  
Toni Utterback, VB  
Randy Wheeler, PQ

**HRPDC Staff:**

Bob Crum  
Keith Cannady  
Whitney Katchmark

Ben McFarlane  
Ashley Gordon  
Joe Turner

**AGENDA**  
**MEETING OF THE HRPDC COASTAL RESILIENCY COMMITTEE**  
**September 25, 2020**  
**10:00 A.M.**

Pursuant to the declared state of emergency in the Commonwealth of Virginia in response to the COVID-19 pandemic and to protect the public health and safety of the committee members, staff, and the general public, the Coastal Resiliency Committee meeting will be held electronically.

**1. Summary of the December 13, 2019 Meeting of the Hampton Roads Coastal Resiliency Committee.**

The summary and attendance sheets of the above meeting are attached.

**Attachments:** 1A – June 2020 Coastal Resiliency Committee Meeting Summary  
1B – June 2020 Coastal Resiliency Committee Meeting Attendance

**ACTION:** Accept the Meeting Summary and Attendance

**2. Public Comments**

**3. Roadway Flooding Sensors**

The HRPDC issued a notice of intent to award a contract for the roadway flooding sensor project to YSI Incorporated in August 2020. The RFP and review of proposals were conducted by HRPDC staff with the assistance of locality staff representatives and representatives of other partner organizations. The pilot project (20 sensors) has an estimated cost of \$185,000. The total project scope (200 sensors) has an estimated cost of \$1.25M. Execution of the contract requires your endorsement to spend FY20 and FY21 project funds from the Coastal Resiliency Program. There is \$170,000 available in project funds. HRSD has agreed to contribute \$25,000 to the pilot project. HRPDC has approached DoD's Office of Economic Adjustment and the federal Economic Development Administration about grants for the project.

The HRPDC staff will brief the Committee on the proposal and discuss next steps including the trade-offs of moving forward with regional funds versus pursuing a grant.

**Attachments:** 3 – Roadway Flooding Sensor Network Summary

**ACTION:** Authorize the HRPDC staff to utilize reserve funds to proceed with the roadway flooding sensor project and direct HRPDC staff to seek grant funds to supplement local funds.

#### **4. Regional Coastal Resiliency Design Standards**

The HRPDC staff is developing recommendations for regional recommendations for standards such as design flood elevations, design storms, and tailwater elevations. These build on the regional sea-level rise policy that was adopted in October 2018. The HRPDC staff will brief the Committee on the draft recommendations.

**ACTION:** Recommend HRPDC distribute standards to localities for review.

#### **5. Regional Legislative Proposals**

The HRPDC Coastal Resilience Subcommittee discussed potential resiliency-related proposals to be considered for the regional legislative agenda for the 2021 General Assembly. The subcommittee recommended that the Commission include four proposals in the regional package:

- 1) Creation of a Commonwealth Flooding Board
- 2) Updating precipitation data products
- 3) Requiring flood disclosure on real estate transactions
- 4) Adding resilience to the SMART SCALE project scoring criteria

The HRPDC staff will brief the Committee on the proposals.

**Attachments:** 5A – Commonwealth Flooding Board Draft White Paper  
5B – Future Rainfall Draft White Paper  
5C – Flood Disclosure Draft White Paper  
5D – SMART SCALE Draft White Paper

**ACTION:** None required.

#### **6. Proposed Changes to Virginia Uniform Statewide Building Code**

Virginia established a Resiliency Subworkgroup to recommend changes to the Uniform Statewide Building Code to be considered by the Board of Housing and Community Development. The subworkgroup included representatives from several localities and the HRPDC. Sixteen proposals were submitted to the group for its recommendation. Of these, eleven were recommended for adoption by Board by consensus. The remaining five were submitted to the Board with a “non-consensus” recommendation. The consensus recommendations will be considered by the Board in a block vote, while the non-consensus recommendations will be voted on individually. HRPDC staff will review the non-consensus recommendations with the Committee.

**Attachments:** 6 – 2018 Code Cycle Resiliency Subworkgroup Code Change Proposals

**ACTION:** Recommend HRPDC board submit official comments in favor of the Non-Consensus recommendations to the Board of Housing and Community Development.

**7. FY21 Coastal Resiliency Work Program**

The HRPDC staff will brief the Committee on proposed focus areas for the FY21 work program, including a discussion of outreach and research priorities. This discussion will also cover regional flood insurance outreach efforts for the current fiscal year.

**ACTION:** None required.

**8. FY22 Coastal Resiliency Program Budget**

The Committee will review the FY22 budget for the Coastal Resiliency Program. The guidelines for Committee actions related to budget planning are listed below:

*Recommendations to the Commission on budgetary matters shall require unanimous agreement by the entire committee. Committee members will have opportunities to review and comment on proposed budgets at monthly meetings or via email or written communication. Committee members may express their support of proposed budgets either in-person at Committee meetings or via email or written communication to HRPDC staff.*

*Any Committee decision regarding budget planning is an endorsement by the Committee and amounts to a commitment by the locality to include recommending the agreed-upon budget in the locality departmental budget as input to the locality's budget. If a locality representative did not attend the Committee meeting to vote on budget planning, HRPDC staff will contact the locality and document whether or not the locality supports the proposed budget.*

**Attachments:** 8 – DRAFT FY22 Coastal Resiliency Program Budget

**ACTION:** Endorse the FY22 Coastal Resiliency Program budget. HRPDC staff will email the budget to voting members. Votes need to be submitted no later than October 1.

**9. Update on Federal and State Efforts Related to Sea Level Rise and Recurrent Flooding**

The HRPDC staff will update the Committee on federal and state efforts related to resiliency, sea-level rise, and recurrent flooding.

**ACTION:** None required

**10. Updates on PDC and Local Efforts Related to Sea Level Rise and Recurrent Flooding**

Members will be given an opportunity to brief the Committee on their respective efforts.

**ACTION:** None required

**11. Other Matters**

**THE DRAFT SUMMARY OF THE MEETING OF THE  
HRPDC COASTAL RESILIENCY COMMITTEE  
June 26, 2020**

Pursuant to Governor Northam's Executive Order 53 issued on March 23, 2020 and Executive Order 61 issued on May 8, 2020, the Coastal Resiliency Committee meeting was held electronically via WebEx. The meeting was held on June 26, 2020 at 10:00 AM.

**1. Attendance**

The following members attended electronically:

**Coastal Resiliency Committee Voting Members:**

Doug Beaver, NO

Kent Henkel (Substituting for Mark Bellamy), YK

Brian Lewis (Substituting for Steve Bond), HA

David Bradley, VB

Darryl Cook, JC

Donald E. Goodwin, FR

Beth Lewis, SH

Sam Sawan (Substituting for Eric Martin), CH

**2. Summary of the December 13, 2019 Meeting of the Hampton Roads Coastal Resiliency Committee**

The summary and attendance record for the December 13, 2019 meeting of the Hampton Roads Coastal Resiliency Committee were approved as distributed.

**3. Public Comments**

There were no public comments.

**4. Virginia Beach Public Works Design Standards Manual**

**Mr. C.J. Bodnar, Public Works Stormwater Engineer with the City of Virginia Beach,** provided an overview of the recent update to the Public Works Design Standards Manual. The initial Public Works Specifications and Standards manual was first adopted by City Council in 1994 and amended in 2015. The new Public Works Design Standards Manual was adopted by City Council on June 16, 2020, following public review and comment. Technical changes to the Design Standards manual addressed as-built drawings for all stormwater management facilities and conveyance systems, stormwater conveyance piping material and testing, roadway lighting design, stormwater utility fee adjustment, which provides up to a 50% reduction on the stormwater fee for non-residential properties, and stormwater design requirements.

The City of Virginia Beach has completed extensive stormwater modeling and will require the City models to be used for every project in the City that has a total disturbed area great than

20,000 square feet. All City drainage basins were modeled using PCSWMM Software, with the exception of the Lower Southern Rivers Watershed, which was modeled in the MIKE suite of programs to account for the effects of wind. The models currently include pipes 24 inches in diameter and larger, stormwater management facilities, and natural conveyance systems. The City will be adding 15in and 18in pipes in the model over the next 5 to 6 years. The Design Standards Manual also requires the use of new rainfall depths that represent a 20% increase over NOAA Atlas 14, values last published in 2004. All stormwater designs will also be required to account for sea level rise, with 1.5ft considered for non-critical infrastructure and 3ft considered for critical infrastructure. The models were prepared for the 1-, 2-, 10-, 25-, 50-, 100-, and 500- year storm events; however, no projects will be required to address 500-year storm. The required design storm frequency is based on the project's contributing drainage area. To determine the controlling tailwater elevations, design storm/tide joint probability pairs are specified, and Appendix J of the Design Standards Manual provides detailed tidal elevation reference tables. Stormwater designs must also account for groundwater seasonal high baseflow based on the drainage area of each outfall.

Kimley Horn completed an independent analysis, including a comparison of current versus proposed design standards for the stormwater designs of four previously approved site plans. The analysis concluded impacts are site dependent. While stormwater management design costs will increase, the new standards will prevent increases in upstream and downstream flooding up to the 100-year event. The City of Virginia Beach will have to modify their stormwater ordinance, which codifies the standards. While municipalities are permitted to have more stringent requirements than the state code, the revisions must be submitted to the Virginia Department of Environmental Quality (DEQ) for review and a 30-day public comment period. Beginning July 16, 2020, any new projects submitted will be required to meet the new Public Works design standards.

Mr. Rob Martz, HRSD, asked if the design storms are provided to designers to ensure the correct events are modeled. Mr. Bodnar responded that the models are provided for the required rainfall, boundary, and sea level rise conditions. HRPDC staff will provide the presentation slides and links to the public Virginia Beach documents available online. Mr. Darryl Cook, James City County, asked if the new standards had to be reviewed by City Council and if it was supported. Mr. Bodnar responded that the standards did have to be approved by City Council because they will require a change in the City's stormwater management ordinance and passed on unanimously on June 16, 2020.

Mr. Ben McFarlane, HRPDC, asked which of the new standards received the most push back. Mr. Bodnar responded that the increased precipitation, which would require larger pipes, and tailwater elevations had the most push back from the design community. Mr. McFarlane also asked which standards would most benefit the City's resilience. Mr. Bodnar responded that having scientifically determined tailwater elevations is critical, and increased precipitation will help prevent stormwater projects from being undersized. The City's new stormwater master plan and Capital Improvement Projects will also be applying these standards.

Mr. McFarlane noted that design standards, including tailwater elevations, joint probabilities, and increased rainfall, were discussed at the Coastal Resiliency Working Group meeting last month. Following the Virginia Beach standard methodology, HRPDC staff will develop draft regional stormwater design standard guidance for review by the Committee in September.

## **5. Get Flood Fluent – Flood Risk Calculator**

Mr. McFarlane updated the Committee on the regional flood insurance outreach effort and GetFloodFluent.org. The outreach effort was funded by a grant from the Virginia Department of Conservation and Recreation (DCR) grant and locality contributions. The flood insurance outreach campaign, originally launched in May 2019, consists of paid media, public relations, and the GetFloodFluent.org website, which hosts a campaign toolkit. The 2020 paid media campaign includes three weeks (June 15-28 and July 6-12) of TV, radio, and digital ads. Public relations efforts are being coordinated with the local Public Information Officers. Mr. McFarlane has participated in a Coast Live interview and WNIS radio interview and is also scheduled for the Hampton Roads Show. The Hampton Roads Sanitation District (HRSD) is also including complimentary local floodplain management messages and contact information in the bill messages for the July/August billing cycle. Six localities submitted custom messages that will be eligible for outreach credit in the Community Rating System.

The GetFloodFluent.org website has a new flood insurance calculator feature. HRPDC staff partnered with Old Dominion University and Red Chalk Studios to develop the calculator, with funding from a DCR grant. The calculator asks the user several questions about their property based on the flood insurance manual, including their flood zone, occupancy type, and foundation type, in order to estimate their flood insurance premium. The calculator also features a tool to help estimate the height of the first floor above the base flood elevation where required. The calculator will continue to be revised to address user feedback.

Mr. Donald Goodwin, City of Franklin, asked if the City could post a link to the Get Flood Fluent site on their local floodplain management page. Mr. McFarlane confirmed that local websites can link to this information and that the campaign toolkit includes graphics for social media and print materials that can be downloaded.

## **6. First Floor Elevations Project**

Ms. Ashley Gordon, HRPDC, updated the Committee on the effort to develop a regional dataset of first floor elevations. The multi-year project, funded in part by the Virginia Coastal Zone Management Program, is currently in the third and final phase. The first phase, completed in February 2019, included developing a regional GIS layer of elevation certificate data, available at HRGEO.org, and applying the elevation certificate data to develop predictive models for estimating first floor height (FFH), the difference between a structure's first floor elevation and lowest adjacent grade.

The second phase was completed in February 2020, and the associated report is available on the HRPDC website. In addition to the predictive modeling approach, FFH estimation methods based on Google Street View Imagery were also evaluated in the second phase. First floor elevation datasets for residential structures were developed and applied in flooding vulnerability assessments for three pilot communities, Chesapeake, Hampton, and York County. Multiple flooding vulnerability assessment methods were evaluated, including analysis at the Census Block scale and individual structure scale using estimated FFH values, and a probability-based approach that applies a range of FFH values for each structure. Given that the Census Block analysis appeared to overestimate flooding damage estimates in all three pilot communities, individual structure-level analysis is recommended for residential structures. The damage estimates were also highly sensitive to changes in the FFH input at the individual structure level, emphasizing the importance of accurate FFH data.

The third phase of the regional FFH initiative currently underway will expand the methodologies evaluated in the previous phases to develop a regional FFH layer for residential structures in the Special Flood Hazard Area. The FFH data will be applied in a regional flooding vulnerability analysis for the 100-year flood and a scenario with additional sea level rise. HRPDC staff will continue to coordinate with other entities in the region developing first floor elevation data to develop recommended practices, and the final report and data products are anticipated in late fall 2020.

Ms. Judy Hinch, Chesapeake resident, asked why the flooding damage estimates for the 100-year flood were higher in Hampton than in Chesapeake. Ms. Gordon noted that Hampton has a larger number of residential structures in the Special Flood Hazard Area and also a greater abundance of structures built before adoption of the Flood Insurance Rate Map (Pre-FIRM).

## **7. Update on Federal and State Efforts Related to Sea Level Rise and Recurrent Flooding**

Mr. John Jastram, USGS, noted that USGS is developing a regional coastal resiliency initiative, spanning from Virginia to Maine. USGS will be looking for stakeholder input on science needs.

Mr. McFarlane noted that the Chesapeake Bay Program Urban Stormwater Working Group has a project underway to develop precipitation IDF curves and was asking for stakeholder input. Mr. McFarlane asked if it is standard to use a representative point for the locality, or multiple points, to select rainfall amounts. Speaker Pollard, Williams Mullen, noted that based on a previous study looking at sanitary overflows, the rainfall values can vary within a locality. Mr. Bodnar noted that for Virginia Beach, the centroids of each individual drainage basin were compared, and given little variation (0.25 in) the average was used.

Ms. Gordon shared that the regional resilience project dashboard and inventory was recently updated on HRGEO.org. The resilience program and policies story map was also launched in March 2018 on HRGEO, and includes local summary fact sheets.

Ms. Whitney Katchmark, HRPDC, noted there have been proposals to include more resiliency measures in the state building code, and acknowledged local participants involved in the working group, including Steve Shapiro (Hampton), Mike Redifer (Newport News), and George Homewood (Norfolk).

Ms. Katchmark shared that six responses have been received for the Request for Proposals for the regional flood sensor network. A working group led by Ms. Katchmark is reviewing the proposals and includes Derek Loftis (VIMS), Kyle Spencer (Norfolk,) Russ Lotspeich (USGS), and George McLeod (ODU).

Ms. Katchmark noted that the Coastal Resiliency Subcommittee of elected officials will meet Monday, July 29, to discuss C-PACE, an effort to improve energy efficacy and flooding resiliency,

Mr. McFarlane also responded to Speaker Pollard's previous question regarding the application of FFE data at the time of site plan approval for commercial and residential construction or when issuing a building permit for additions or renovations. Mr. McFarlane noted the data collected varies by community, and HRPDC staff are working to document best practices regarding that in the final first floor elevations report.

#### **8. Updates on PDC and Local Efforts Related to Sea Level Rise and Recurrent Flooding**

Mr. Russ Lotspeich, USGS, noted that USGS has sensors that can be deployed through the storm tide monitoring program. Committee members are encouraged to contact Russ if interested in having a sensor installed.

Mr. Rob Martz, HRSD, stated the HRSD climate change planning study is underway, including a couple pump stations with detailed analysis. Treatment plants will also be included in the analysis. Vulnerability along the James River is also being analyzed, with flooding, storms, and sea level rise impacts included. The study will likely wrap up in the summer of next year.

#### **9. Other Matters**

The next meeting of the Coastal Resiliency Committee will be held September 25, 2020. The meeting will be held virtually via WebEx.

Attachment 1B  
Committee Meeting Sign-In Sheet

Locality/Agency	Representative	Representative	Representative	Representative	Representative	Representative	Representative	Representative
Chesapeake	Sam Sawan	Crystal Bloom	Lucy Stoll					
Franklin/Southampton	Donald Goodwin	Beth Lewis						
Gloucester								
Hampton	Brian Lewis	David Imburgia						
Isle of Wight								
James City	Darryl Cook							
Newport News								
Norfolk	Doug Beaver							
Poquoson								
Portsmouth								
Smithfield								
Suffolk								
Surry								
Virginia Beach	David Bradley	C.J. Bodnar	Sue Kriebel	Whitney McNamara				
Williamsburg								
Windsor								
York	Kent Henkel							
HRPDC	Ben McFarlane	Whitney Katchmark	Ashley Gordon	Keith Cannady				
HRTPO								
HRSD	Robert Martz							
NOAA								
USACE	Michelle Hamor							
USGS	John Jastram	Russ Lotspeich						
VDEM								
VDH								
VDOT								
DEQ								
ODU	Emily Steinhilber	George McLeod						
VIMS								
W&M								
U.S. Navy	Michael King							
DCR								
Guests								
Public	Amelia DaCruz	Amro Helwa	Speaker Pollard	Jessica Rodriguez	Judy Hinch	Liz Scheessele	M. Moore	Camille Liebnitzky
Public	Ross Weaver	William Stiles						
Public								
Public								

# ROADWAY FLOODING SENSOR NETWORK



OVER 200 LOCATIONS IN HAMPTON ROADS WITH FREQUENT FLOODING HAVE BEEN IDENTIFIED AS FUTURE SENSOR LOCATIONS.



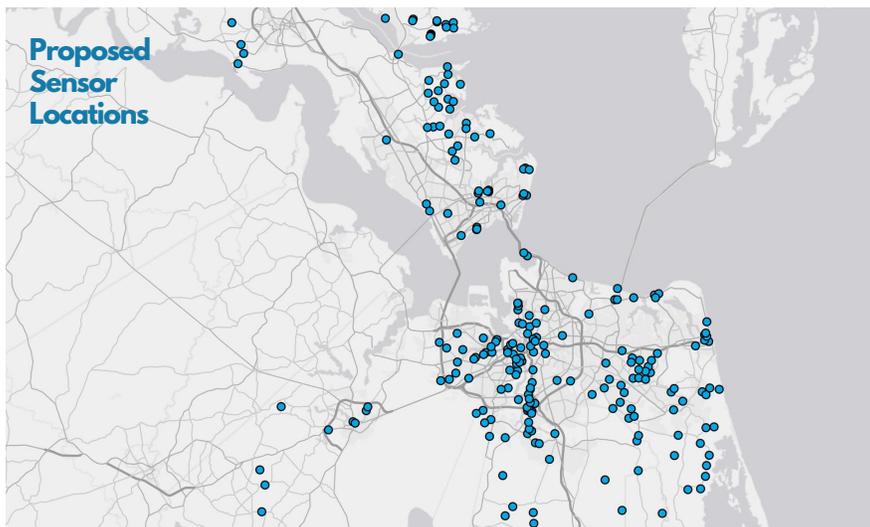
## SHORT-TERM BENEFITS, LONG-TERM VALUE

### Flooding can be unpredictable in Hampton Roads.

It is dependent on the tide, wind, and rainfall. The Hampton Roads Planning District Commission (HRPDC) wants to install a regional network of water level sensors to monitor roadway flooding. The network will be owned by HRPDC and participating localities, providing communities and drivers with real-time data notifications that will reduce the time and money lost by navigating flooded streets. The system will be able to send email, text alerts, and an RSS feed in addition to delivering the data to Waze, a GPS navigation software app owned by Google. The data will be publicly available and exportable to support multiple research efforts with academic institutions.

The sensors redirect drivers to roads that aren't flooded, saving commute time and avoiding potential property damage caused by driving through dangerous high water. The data can also inform emergency response actions such as ambulance routing.

Long-term, the sensor data allows us to analyze trends and understand when tides, wind, and rainfall create the most flooding. This improves our ability to predict the frequency and severity of flooding and evaluate investments in flood mitigation.



## Virginia Commonwealth Flooding Board

Virginia needs a new entity to direct and prioritize state and federal funding for flood mitigation, ensure collaboration and alignment among State agencies, and coordinate planning and adaptation efforts. . In the Commonwealth, flooding is caused by three sources, which sometimes occur simultaneously: precipitation, wind, and tides. Flooding impacts all regions of Virginia including those with upland, riverine, and coastal environments. Each of these drivers appears to be getting worse as a result of changing climatic conditions. Extreme rainfall events repeatedly have caused riverine and inland flooding and have also intensified coastal flooding. Coastal areas are also experiencing the impacts of sea level rise. Increased sea level means regular high tide events result in more flooded roads and properties and storm events impact larger portions of coastal communities. There is a need to define the scope of these problems, design solutions, and invest in mitigation.

The General Assembly should create a Commonwealth Flooding Board (CFB) to be an oversight body to coordinate flood mitigation efforts at the State level. The CFB would be similar to the existing Commonwealth Transportation Board, which meets on a regular basis to address critical transportation needs and issues in Virginia. The CFB would be responsible for performing the same function for statewide flooding issues and should address the following:

- provide a statewide forum for the discussion of flood mitigation and coordination among state agencies and regions in efforts to address this critical challenge.
- approve a prioritized list of projects to be funded by the Community Flood Preparedness Fund,
- approve a prioritized list of proposed investigations to be conducted by the US Army Corps of Engineering Civil Works program
- oversee the implementation and updating of the Coastal Resiliency Master Plan at least every 5 years
- annually evaluate the alignment of the following state programs and associated grants and loans with the Commonwealth’s flood mitigation objectives

VDOT six-year improvement program	VEDP Brownfields
VDOT long-range transportation plan	VDEM Building Resilient Infrastructure in Communities
DCR Dam Safety, Flood Prevention and Protection Assistance Fund	VDEM Hazard Mitigation Plans and Grants
DEQ Water Quality Improvement Fund	VDH Clean Water Revolving Fund
DHCD Community Block Development Grants	VDH Drinking Water Revolving Fund

Virginia currently receives federal funding to multiple state agencies that could be applied to planning and mitigation efforts. The state hasn’t developed priorities to guide the use of federal funding to address flooding. Each agency administers their programs without coordination with other State agencies. Often programs that could be used for flood mitigation and adaptation are used for other



purposes because flooding isn't a particular agency's primary or traditional mission. For example, VDOT isn't focused on rebuilding or replacing roads that flood. VEDP isn't focused on reusing brownfields to mitigate flooding or to address remediation needs in flood-prone areas. DCHD isn't focused on reducing the impacts of flooding on communities. All of these agencies and more have programs with federal funding that could support a coordinated state plan to reduce the impacts of flooding. Virginia needs a plan and a Commonwealth Flooding Board to keep track of all of these opportunities and to make sure the Commonwealth works strategically and comprehensively to mitigate flood risks.

Another significant source of federal funding is the U.S. Army Corps of Engineers (USACE) Civil Works program. The Water Resources Development Act authorizes the USACE to conduct investigations of specific water problems throughout the nation. Some of these authorized projects are implemented each year in accordance with the USACE's annual work program. Virginia needs to develop a prioritized list of investigations to position itself to compete with other states. The Commonwealth will not be eligible for the billions in federal construction funds that are spent under the USACE Civil Works program unless Virginia is first included in the authorizations and appropriations for new investigations and is able to get those projects included in the work program.

In addition to federally funded programs, there will be new state funds dedicated to flood mitigation. In 2020, House Bill 22 created the Community Flood Preparedness Fund. The fund will make loans and grants available to localities for coastal and riverine flood prevention and mitigation projects. Based on HB 981, proceeds from Virginia's participation in the Regional Greenhouse Gas Initiative (RGGI) will be allocated to the Community Flood Preparedness Fund. DEQ estimates that roughly \$50M/year of RGGI revenue would be allocated to the Community Flood Preparedness Fund and over \$3M/year would be available for administration and climate change planning.

The proposed Commonwealth Flooding Board would be comprised of 10 citizens appointed by the Governor and confirmed by the General Assembly and the director of the new Commonwealth Flooding Department. Appointments shall be staggered to provide stability and long-range planning beyond the tenure of any single governor. Ex officio members would include the Secretary of Natural Resources, Secretary of Transportation, Secretary of Public Safety, and Secretary of Commerce.

The Board would be supported by a new Commonwealth Flooding Department (CFD). The Board would direct the CFD's work program to include data collection, planning, research, analysis, modeling, and project management. CFD could also serve as the nonfederal sponsor for USACE Civil Works projects. The CFD would include the Director plus a minimum of eight staff with combined expertise in floodplain management, stormwater modeling, civil engineering, coastal engineering, geology, nature-based green infrastructure, land use planning, economics, benefit-cost modeling, environmental policy development, environmental justice, and financial management (grant management, bond ratings, investment strategies). The CFD would be funded by the estimated \$3M/year in RGGI auction proceeds identified for administration and climate change planning and mitigation activities.



## Building for Future Precipitation

Stormwater infrastructure that collects and directs rainwater away from roads and buildings is sized based on historical rainfall events. For example, the amount of rain that falls within 24 hours is measured in one place over many years to establish how often the location receives different amounts of rain. Then a policy is established for what size stormwater system should be built. The policy should balance the upfront cost of building larger stormwater pipes and pumps and the long-term, community cost of flood damage when a rainfall event occurs that exceeds the capacity of the stormwater system.

Many localities require new developments to build stormwater drainage systems with the capacity to handle a 25-year storm. In Hampton Roads, a 25-year design storm is 6.99 inches of rain in 24 hours based on the current standard for rainfall data – a National Weather Service report called Atlas 14. The Atlas 14 report has not been updated for the Hampton Roads region since 2006. However, Virginia Beach with their consultant, Dewberry, analyzed local rainfall data and determined that in recent years larger storms were happening more frequently. The City adopted a local standard in June 2020 based on Atlas 14 plus a 20% increase. Now, a development that has to build a drainage system to handle a 25-year storm must have the capacity for an 8.39 inch rainfall event instead of 6.99 inch event.

If other localities in Hampton Roads localities continue to design drainage systems based on the Atlas 14 report, the drainage systems will fail more frequently and the community will have increased flooding. If the trend of larger, more frequent rainfall events accelerates, then the frequency and amount of flood damage will significantly increase over time. Updating Atlas 14 by including rainfall events after 2006 in the analysis would only address part of the problem. To size stormwater systems for the future, the design standard must include rainfall projections that reflect emerging climate trends.

Hampton Roads localities should pursue local, state and federal solutions to this challenge. Each solution has a different timeline but pursuing all of them concurrently would be a “no regrets” approach to reduce flood damage.

### **Recommendations:**

#### Local Approach

All Hampton Roads localities should consider adopting the Virginia Beach design criteria of Atlas 14 plus 20%. The rainfall data used to establish this policy covers all of Hampton Roads so it is appropriate to use throughout the region. The new design criteria can be adopted by local ordinance and quickly require new developments to build the drainage capacity needed for the next 30 years instead of being undersized as soon as it is built. The region could develop a memorandum of agreement with state agencies, especially VDOT, requiring them to follow local design standards when constructing projects in the region.

#### State Approach

Virginia should invest in the research to analyze recent rainfall patterns across the entire state to determine future rainfall predictions. If there appears to be a pattern of increased or more intense rainfall in some parts of the state, then a new design standard should be established based on that data. The new standard should be incorporated into all the state agency programs such as DEQ’s stormwater regulation and VDOT’s construction projects. Key elements of this research endeavor and policymaking initiative should include:



1. Analysis of rainfall trends across the entire state
2. Analysis of changing rainfall trends to develop a predictive model
3. Evaluation of the uncertainty of the predictive model
4. Consideration of an iterative policy development including the concept of adding a safety factor to the existing design standard (Atlas 14 + 20%) until additional rainfall data establishes trends with less uncertainty
5. Commitment to reevaluate the data at least every five years

The State Approach could be implemented by tasking the VDOT Research Council or by funding the expansion of Chesapeake Bay Program’s research on rainfall trends to include the whole state, instead of only studying the portion in the Chesapeake Bay watershed.

#### Federal Approach

Hampton Roads localities should encourage their congressional delegation to fund the National Weather Service to update its methodology for analyzing rainfall. Additional funding should be provided to update Atlas 14 every five years and include analysis of rainfall trends and climate projections to provide forecasts for changes expected in the next 10-30 years. Specifically, an appropriation under the Water Resources Development Act could be directed to support this approach.



## Real Estate Disclosures for Flooding

Real estate transactions in Hampton Roads are occurring without disclosing whether a property is vulnerable to flooding or has already experienced damage from a flood. In many cases, prospective or recent buyers do not become aware of these issues until they are required to buy flood insurance policies as part of their mortgage agreements. If this occurs during or prior to closing, it may result in a cancelled sale; if it occurs after a transaction has been made, then the new owner is suddenly subjected to additional costs, which can be quite high in some cases. Virginia's residential property disclosure requirements should be amended to require the seller to disclose information about a property's vulnerability to flooding and any history of flood damage.

Disclosure requirements for sellers of residential property are governed by the Virginia Residential Property Disclosure Act (Code of Virginia §§ 55.1-700 through 55.1-714). The Act currently mandates four disclosures for residential properties:

- 1) If a residential dwelling is in a military air installation noise zone or accident potential zone
- 2) Pending enforcement actions or violations of the Uniform Statewide Building Code or local zoning ordinance
- 3) If a residential dwelling was previously used to manufacture methamphetamine and has not been cleaned up in accordance with state law
- 4) The long-term maintenance and inspection requirements of any privately owned stormwater management facilities

The first required disclosure is based on a community's official zoning map, while the other three are based on the seller's "actual knowledge" of the issues in question. All other potential issues with a residential property fall under the Commonwealth's policy of *caveat emptor* – let the buyer beware. Vulnerability to flooding and past flood damage is one of the issues that falls under *caveat emptor*.

Many nondisclosures can be investigated by a prospective owner, including whether a property is located in a flood zone. However, information on previous flood damage or flood claims is typically not available without the seller giving the information to the prospective buyer. Without the owner's consent, due diligence is not sufficient to determine whether a property has flooded in the past or if flood insurance claims have been filed. The property's flood history can have significant financial impacts on new homeowners. For example, if FEMA has designated a property as Severe Repetitive Loss due to a history of flood insurance claims, that will cause a significant increase in flood insurance premiums.

### Recommendations:

Virginia's residential property disclosure requirements should be amended to require the seller to disclose information about a property's vulnerability to flooding and any history of flood damage or flood insurance claims. Such information would allow prospective homeowners to make informed decisions about property purchases. Amendments to the Virginia Residential Property Disclosure Act should include:



- 1) Removing § 55.1-703(B)(9) and creating a new section requiring disclosure of whether a property is located in a special flood hazard area modeled after the requirement for military air installation zones
- 2) Including a provision requiring the seller to disclose actual knowledge of flood damage to a residential dwelling
- 3) Including a provision requiring the seller to disclose actual knowledge of prior flood insurance claims, to be provided by the flood insurance provider

DRAFT



## Incorporating Resilience into SMART SCALE

### Background:

SMART SCALE is the Commonwealth of Virginia’s method for prioritizing transportation projects for state funding. Created by the General Assembly and administered by the Commonwealth Transportation Board (CTB), SMART SCALE uses a set of objective criteria to score and rank candidate projects. §33.2-214.1 of the Code of Virginia, which covers SMART SCALE, sets the minimum criteria for scoring projects, which include congestion mitigation, economic development, accessibility, safety, and environmental quality. The CTB has also adopted land use as a factor for quantifying project benefits. The sum of the project benefits is compared with the project’s SMART SCALE cost to determine its final score. Specific measures currently included in the SMART SCALE scoring include:

Table 1: SMART SCALE Factors

Factor Area	Measure Name
<b>Safety</b>	Equivalent property damage only (EPDO) of Fatal and Injury Crashes
	EPDO Rate of Fatal and Injury Crashes
<b>Congestion mitigation</b>	Person Throughput
	Person Hours of Delay
<b>Accessibility</b>	Access to jobs
	Access to jobs for disadvantaged persons
	Access to multimodal choices
<b>Environmental quality</b>	Air quality and environmental effect
	Impact to natural and cultural resources
<b>Economic development</b>	Project support for economic development
	Intermodal access and efficiency
	Travel time reliability
<b>Land use</b>	Transportation-efficient land use
	Increase in transportation-efficient land use

Planning, designing, and building for resiliency is a major challenge for communities across Virginia. In coastal areas, sea level rise and changing precipitation patterns are causing more frequent flooding. Similar impacts are also being felt in communities with riverine flooding. It is critical that future climatic conditions be accounted for in the design and construction of new transportation projects.

Addressing these impacts through more resilient project designs increases the costs of transportation projects – they are built higher, have more stormwater capacity, stronger materials, etc. Under the current SMART SCALE system, a project without resilient features would score higher because it has a lower cost. The same project with resilient features would be penalized for the higher cost but would not see any benefit in the scoring for being resilient. Resiliency could be incorporated into SMART SCALE using metrics such as elevation compared to base flood elevations and future sea levels, stormwater management capacity, tolerance for extreme heat or cold, etc.



The CTB has created a system of four weighting frameworks for different areas of the Commonwealth based on their needs and character. The weighting framework categories for FY22 are listed below.

Table 2: FY22 SMART SCALE Weighting Frameworks

Factor	Congestion Mitigation	Economic Development	Accessibility	Safety	Environmental Quality	Land Use
Category A	45%	5%	15%	5%	10%	20%
Category B	15%	20%	25%	20%	10%	10%
Category C	15%	25%	25%	25%	10%	
Category D	15%	35%	15%	30%	10%	

A resiliency factor could be applied in the same way depending on the needs of a given region.

**Recommendations:**

§33.2-214.1 should be amended to include resiliency in SMART SCALE. Specifically:

- 1) §33.2-214.1(A) should be amended to read “The General Assembly declares it to be in the public interest that a prioritization process for projects funded by the Commonwealth Transportation Board be developed and implemented to improve the efficiency and effectiveness of the state's transportation system, transportation safety, transportation accessibility for people and freight, *current and future transportation resiliency*, environmental quality, and economic development in the Commonwealth”
- 2) §33.2-214.1(B)(1) should be amended to read ““The prioritization process shall be based on an objective and quantifiable analysis that considers, at a minimum, the following factors relative to the cost of the project or strategy: congestion mitigation, economic development, accessibility, safety, and environmental quality, *and resiliency.*”

The CTB and the Virginia Department of Transportation should adopt the following definition of resiliency: *“The ability to anticipate, prepare for, or adapt to conditions; or withstand, respond to, or recover rapidly from disruptions; including the impacts of sea level rise, extreme weather events, flooding, or other natural disasters.”*



## 2018 Code Cycle Resiliency Subworkgroup Code Change Proposals

### Proposals Recommended as Consensus for Approval by Workgroups

**RB322.2.1** – Moves elevation requirements for garage and carport floors in flood hazard areas into Section R322 (was in R309.3). **[From 2021 I-Code]**

**RB322.3.3** – Foundation section for coastal high-hazard areas and Coastal A Zones reorganized and clarified regarding pilings and columns. **[From 2021 I-Code]**

**RB301.2(1)** – Coordinates the wind design criteria in the IRC with the currently referenced edition (2016) of ASCE 7. Updates basic wind speed maps for Risk Category II buildings and revises roof component and cladding loads for buildings with mean roof heights less than or equal to 60 feet. **[From 2021 I-Code]**

**RB301.2.1** – Companion to proposal RB301.2(1), submitted by Glenn Overcash. **[From 2021 I-Code]**

**RB609.4** – Requires garage doors have a permanent label that provides a way for the owner to be able to determine their performance characteristics after the building has been occupied. **[From 2021 I-Code]**

**B1709.5.2** - Requires garage doors have a permanent label that provides a way for the owner to be able to determine their performance characteristics after the building has been occupied. **[From 2021 I-Code]**

**RB301.2.1.1** – Corrects errors regarding the applicability of the IRC to areas where wind speeds exceed the prescriptive provisions of the IRC. **[From 2021 I-Code]**

**RB200** – Add the existing VEBC definitions for “substantial damage” and “substantial improvement” to the IRC

**A109.3** – Where dry flood proofing is proposed, requires the engineering details to include details of the walls, floors and flood shields.

**A113.3** – Adds additional minimum inspections to establish lowest floor and elevation in flood hazard areas

**A117.2** – Requires flood hazard documentation for moved buildings (if in flood hazard areas) before the buildings can be occupied.

### Proposals Recommended as Non-consensus by Workgroups

**B1612.2.1** – Increases the minimum building elevation (lowest floor or lowest horizontal structural member of the lowest floor) from base flood elevation plus 1 ft to BFE plus 2 ft.

**B1804.8** – Adds requirements to the IBC and IRC for the top surface of floors of all buildings to be elevated to one foot above the highest adjacent grade to protect from local storm water/drainage flooding. Also incorporates ASCE 24 definition for “Highest Adjacent Grade”, but definition is modified to specify above the “finished ground”.

**RB332** – Requires power inlet to be installed, for an optional (portable) generator, for all new one and two-family homes, and for existing one and two-family homes when the electric service is being upgraded.

**B1612.4** – Adds additional documentation for construction in flood hazard and coastal high hazard areas. This includes a flood emergency plan as specified in Chapter 6 of ASCE 24 and a requirement to meet engineered flood opening requirements of Section 2.7.2.2 of ASCE 24. **[From 2021 I-Code]**

**RB703.11.1** – Improves the wind performance of soffits by clarifying installation requirements for the most common types of soffits. **[From 2021 I-Code]**

**Coastal Resiliency Program Budget**  
**FISCAL YEAR 2021 - 2022 BUDGET**  
**September 21, 2020 - DRAFT**

Jurisdiction	Population	Percent	Tech Staff	USGS Subsidence Monitoring	Sea Grant Fellow	Flood Insurance Outreach	Project Fund	Coastal Resources Total FY22 Budget	Coastal Resiliency Reserves	Coastal Resiliency FY22 Contribution
Chesapeake	245,745	14.21%	\$24,907	\$4,974	\$1,421	\$6,396	\$7,106	\$44,804	(\$2,842)	\$41,962
Franklin	8,261	0.48%	\$837	\$167	\$48	\$215	\$239	\$1,506	(\$96)	\$1,411
Gloucester	37,090	2.15%	\$3,759	\$751	\$215	\$965	\$1,073	\$6,762	(\$429)	\$6,333
Hampton	135,753	7.85%	\$13,759	\$2,748	\$785	\$3,533	\$3,926	\$24,751	(\$1,570)	\$23,180
Isle of Wight	29,174	1.69%	\$2,957	\$591	\$169	\$759	\$844	\$5,319	(\$337)	\$4,982
James City	75,907	4.39%	\$7,693	\$1,536	\$439	\$1,975	\$2,195	\$13,839	(\$878)	\$12,961
Newport News	181,000	10.47%	\$18,345	\$3,664	\$1,047	\$4,711	\$5,234	\$33,000	(\$2,094)	\$30,906
Norfolk	245,054	14.17%	\$24,837	\$4,960	\$1,417	\$6,378	\$7,086	\$44,678	(\$2,834)	\$41,844
Poquoson	12,395	0.72%	\$1,256	\$251	\$72	\$323	\$358	\$2,260	(\$143)	\$2,116
Portsmouth	94,581	5.47%	\$9,586	\$1,914	\$547	\$2,461	\$2,735	\$17,244	(\$1,094)	\$16,150
Smithfield	8,475	0.49%	\$859	\$172	\$49	\$221	\$245	\$1,545	(\$98)	\$1,447
Southampton	17,855	1.03%	\$1,810	\$361	\$103	\$465	\$516	\$3,255	(\$207)	\$3,049
Suffolk	93,825	5.43%	\$9,510	\$1,899	\$543	\$2,442	\$2,713	\$17,106	(\$1,085)	\$16,021
Surry	6,561	0.38%	\$665	\$133	\$38	\$171	\$190	\$1,196	(\$76)	\$1,120
Virginia Beach	452,643	26.18%	\$45,877	\$9,162	\$2,618	\$11,780	\$13,089	\$82,526	(\$5,236)	\$77,291
Williamsburg	15,383	0.89%	\$1,559	\$311	\$89	\$400	\$445	\$2,805	(\$178)	\$2,627
York	69,407	4.01%	\$7,035	\$1,405	\$401	\$1,806	\$2,007	\$12,654	(\$803)	\$11,852
Region	1,729,109	100.00%	\$175,252	\$35,000	\$10,000	\$45,000	\$50,000	\$315,252	(\$20,000)	\$295,252

As of July 2020, the Coastal Resiliency Program has approximately \$130k in reserve funding.  
 \$100k is reserved in the project fund.  
 \$20k is obligated in the FY21 budget. Of this, \$10k is set aside for the Virginia Sea Grant Fellow position, which will be rolled over to FY22.  
 Remaining reserves are \$10k.

Tech Staff: Budget based on fully burdened salary for 1.4 FTE staff positions plus training and hospitality.  
 Technical staff includes 2% increase in salaries from FY20 to FY22. No FY21 salary increase.

SeaGrant Intern: \$10k to host a full-time Virginia SeaGrant intern for one year starting July 2021

Flood Insurance Outreach: \$35k to continue media campaign and develop new material plus \$10k for staff for regional flood insurance outreach campaign.

Project Fund: \$50k to fund projects or match grants identified during FY22.

Reserve Fund: Rollover funds from previous years - includes \$10k that was allocated for VSG intern that was not used in FY21.

Budget is based on the July 1, 2019 population estimates for cities and counties from Weldon Cooper Center. (Published on January 27, 2020)  
 Smithfield's population is based on the United States Census Bureau 2019 Population Estimate (as of July 1, 2019).  
 Smithfield's population was subtracted from Isle of Wight County's population estimate (37,649).