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Alison Wrynn

Sarah Simonetti

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Planning for the “New Normal”: Using *Build One Portsmouth* to Address Flood Resilience



Alison Wrynn, J.D. 2019
Virginia Coastal Policy Center
William & Mary Law School

Sarah Simonetti, J.D. 2019
Virginia Coastal Policy Center
William & Mary Law School



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About the Authors



Alison Wrynn is a recent graduate of William & Mary Law School. While in law school, Alison served as Editor-in-Chief of the William & Mary Environmental Law and Policy Review. She also interned for the EPA in Washington, D.C. and the Environmental Section of the Virginia Attorney General's Office. She graduated from Skidmore College in 2012 with a B.A. in Government. In fall 2019, Alison will clerk for the Honorable Stuart A. Minkowitz, Assignment Judge for the New Jersey Superior Court.

Sarah Simonetti is from Great Falls, Virginia. She went to Penn State University, where she studied Comparative Literature and International Politics. In 2019, she graduated from William & Mary Law School and is now working in the Intellectual Property Litigation group at Morris Nichols Arsht & Tunnell. Sarah participated in the Virginia Coastal Policy Center's Practicum I and II as a means of aiding localities in the Commonwealth and exploring her lifelong interest in environmental issues.



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About the Virginia Coastal Policy Center

The Virginia Coastal Policy Center (VCPC) at the College of William & Mary Law School provides science-based legal and policy analysis of ecological issues affecting the state's coastal resources, by offering education and advice to a host of Virginia's decision-makers, from government officials and legal scholars to non-profit and business leaders.

With two nationally prominent science partners – the Virginia Institute of Marine Science and Virginia Sea Grant – VCPC works with scientists, local and state political figures, community leaders, the military, and others to integrate the latest science with legal and policy analysis to solve coastal resource management issues. VCPC activities are inherently interdisciplinary, drawing on scientific, economic, public policy, sociological, and other expertise from within the University and across the country. With access to internationally recognized scientists at VIMS, to Sea Grant's national network of legal and science scholars, and to elected and appointed officials across the nation, VCPC engages in a host of information exchanges and collaborative partnerships.

CONTACT US

Please contact
Elizabeth Andrews
(eaandrews@wm.edu)
if you have comments,
questions, or suggestions.

VCPC grounds its pedagogical goals in the law school's philosophy of the citizen lawyer. VCPC students' highly diverse interactions beyond the borders of the legal community provide the framework for their efforts in solving the complex coastal resource management issues that currently face Virginia and the nation.

VCPC is especially grateful to the Virginia Environmental Endowment for providing generous funding to support our work as well as to establish the clinic in fall 2012.

I. INTRODUCTION

Sea level rise, recurrent flooding, and increasingly severe storms are ever-present threats to coastal Virginia. As climate change becomes the “new normal”, creative solutions are needed to adapt to these stark realities.

In response to these climate-related challenges, Governor Ralph Northam issued Executive Order 24, “Increasing Virginia’s Resilience to Sea Level Rise and Natural Hazards,” on November 2, 2018. The Executive Order designated the Secretary of Natural Resources as the Chief Resilience Officer of the Commonwealth,¹ and set forth various actions intended to increase statewide resilience to natural hazards and extreme weather. Later that same month, Portsmouth released its 2018 comprehensive plan, *Build One Portsmouth*,² which also takes resiliency issues into account and attempts to increase the City’s preparedness moving forward.

Considering these recent developments, it is important for Portsmouth to establish the boundaries of its authority as the City plans for the future. This memorandum attempts to answer some of the City’s most pressing questions in its efforts to become more resilient.

II. EXECUTIVE ORDER 24 SUMMARY AND RECOMMENDATIONS

Governor Ralph Northam issued Executive Order 24, “Increasing Virginia’s Resilience to Sea Level Rise and Natural Hazards” (the “EO 24”) on November 2, 2018.³ EO 24 outlines the importance of addressing the risks associated with climate change, recurrent flooding, and severe weather events, especially given that water levels in the Hampton Roads region could increase by as much as five feet by 2100.⁴ The Chief Resilience Officer, with the assistance of the Special Assistant to the Governor for Coastal Adaptation and Protection,⁵ is instructed to create and implement a Coastal Resilience Master Plan. In developing the Coastal Resilience Master Plan the Chief Resilience Officer and Special Assistant are instructed to consult with local governments.

EO 24 Section 1 focuses on “Making Commonwealth Holdings More Resilient.”⁶ In response to Section 1, Portsmouth should identify any parcels of land that would serve as adequate relocation sites, particularly if the City has vulnerable or low-lying state-owned buildings that may need to be relocated.⁷ Portsmouth should also consider what information or independent research

¹ The Secretary of Public Safety and Homeland Security had previously been designated as the Chief Resilience Officer of the Commonwealth. *Homeland Security Division, SEC’Y OF PUB. SAFETY AND HOMELAND SEC.*, <https://www.pshs.virginia.gov/homeland-security/> (last visited July 22, 2019).

² See generally CITY OF PORTSMOUTH, VA., BUILD ONE PORTSMOUTH: PORTSMOUTH 2018 COMPREHENSIVE PLAN (2018), <https://www.portsmouthva.gov/396/Comprehensive-Plan> [hereinafter BUILD ONE PORTSMOUTH].

³ Va. Exec. Order No. 24 (2018), <https://www.governor.virginia.gov/media/governorvirginiagov/executive-actions/ED-24-Increasing-Virginias-Resilience-To-Sea-Level-Rise-And-Natural-Hazards.pdf>.

⁴ *Id.* at 1.

⁵ This position was created in 2018. VA. CODE ANN. § 2.2-435.11 (2018).

⁶ Va. Exec. Order No. 24, *supra* note 3 at 2.

⁷ See *id.* at 2. For instance, Portsmouth could refer to *Build One Portsmouth*’s section on “Vacant and Underutilized Land” for this effort. BUILD ONE PORTSMOUTH, *supra* note 2, at 186.

the City has collected on sea level rise projections and vulnerability in case the Commonwealth wants to implement a uniform standard for new state-owned buildings.⁸

EO 24 Section 2 focuses on “Reviews, Reports, and Recommendations.”⁹ In response to Section 2, Portsmouth should consider what “ongoing planned and proposed” infrastructure projects it has in place that are aimed at “reduc[ing] tidal and storm surge flooding and flood risk.”¹⁰ Projects that alter existing stormwater infrastructure, raise or modify houses, or implement green streets¹¹ projects may be important. The City may also want to identify areas of the community that would benefit from nature-based solutions, land conservation, and coastal retreat efforts.¹² However, since Portsmouth does not have much undeveloped land left within its boundaries, especially near tidal wetlands,¹³ this action may be limited to green infrastructure efforts and identifying specific areas where current development may need to consider relocation.

EO 24 Section 3 focuses on “Coordination and Objectives” to achieve the EO’s goals, including improved communication, hazard mitigation, and military and community resilience.¹⁴ In response to Section 3, Portsmouth should consider how it communicates risks and information about disaster events to citizens.¹⁵ Means of communication with military installations and personnel to ensure disaster preparedness and response coordination may also be relevant.¹⁶ Portsmouth may also want to consider its “efforts to test and implement resilience technologies.”¹⁷ For instance, Portsmouth could mention its coordination with the Virginia Institute of Marine Science (“VIMS”), as well as other partners and technical consultants it has employed to further its resilience efforts.

III. COMPREHENSIVE PLAN

A. Overview and Roadmap

Portsmouth’s comprehensive plan is divided into three main sections – the Strategic Plan, the Geographic Plan, and the Implementation Plan – with each section listing its own short-term, mid-term, and long-term goals.¹⁸ Within the Strategic Plan, the R.1 (“Work with regional, state, and federal agencies to mitigate the impacts of climate change”),¹⁹ R.5 (“Increase green spaces in

⁸ Va. Exec. Order No. 24, *supra* note 3, at 2. Executive Order 24 requires that the Commonwealth implement a uniform standard for predicting the impact sea level rise will have on new state-owned buildings beginning on or after January 1, 2020.

⁹ *Id.* at 3–4.

¹⁰ *Id.* at 3.

¹¹ A green street is defined as a “stormwater management approach that incorporates vegetation to slow, filter, and cleanse stormwater runoff from impervious surfaces.” *Learn About Green Streets*, U.S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/G3/learn-about-green-streets> (last visited July 22, 2019).

¹² Va. Exec. Order No. 24, *supra* note 3, at 3.

¹³ BUILD ONE PORTSMOUTH, *supra* note 2, at 306.

¹⁴ Va. Exec. Order No. 24, *supra* note 3, at 6–7.

¹⁵ *Id.* at 6.

¹⁶ *Id.*

¹⁷ *Id.* at 7.

¹⁸ *See generally* BUILD ONE PORTSMOUTH, *supra* note 2.

¹⁹ Some of the R.1 goals include “Integrate resilience planning efforts into city and regional plans, codes, and regulations,” “Encourage green building technologies and design approaches that improve sustainability and

our city”),²⁰ E.3 (“Be a technically advanced city and modernize our infrastructure”),²¹ E.4 (“Provide stewardship of our environment and ecology”),²² and EQ.3 (“Seek social and environmental justice in policies and practices”)²³ sections are particularly relevant to a discussion of the City’s resiliency efforts.

Build One Portsmouth contains a number of specific goals that the City of Portsmouth wishes to undertake to become more resilient and prepared for the long-term effects of recurrent flooding, severe storms, and sea level rise. Portsmouth’s primary goals are largely influenced by the City’s defining characteristics as a city with a rich 250-year heritage that recognizes and values the need for future planning efforts. To accomplish these goals, Portsmouth wants to “adopt[] standards or guidelines that are either formally enforced through police power as a law, or may provide guidance for practices and actions that are not as enforceable as law but still represent official positions of the city.”²⁴

However, some of the actions Portsmouth wishes to take may be hindered in part by Dillon Rule restrictions on City authority. The Dillon Rule provides for state control and supremacy over local government actions. Local governments in Dillon Rule states only have power to the extent that power is: (1) expressly granted by the legislature; (2) necessarily or fairly implied in or incident to the powers expressly granted; or (3) essential, and not merely convenient, to the purposes of the municipal corporation.²⁵ Since Virginia is a Dillon Rule state, its localities are more limited in the actions they can independently take as compared to home rule jurisdictions.

In the face of potential constraints on authority—whether due to Virginia’s Dillon Rule or federal restrictions—this memo will also offer suggestions for Portsmouth to consider to achieve its goals in alternative ways.

B. Evaluating Actions and Tools

Portsmouth hopes to undertake a number of changes that will improve the way the City uses and manages its land in the face of increasing flooding events. This section will outline the primary improvements and goals the City has, and whether or not they are ultimately achievable given constraints on legal authority. Specifically, these proposed actions will be addressed in four main parts: 1. Green Infrastructure and Sustainable Land Use Practices; 2. Overlay Districts and

resiliency of the built environment,” and “Intensify development in areas that are not prone to flooding where compatible with surrounding land uses.” *Id.* at 62–64.

²⁰ Some of the R.5 goals include “Promote ‘green’ design, infrastructure, and development practices” and “Connect open spaces to create networks of greenways and blueways.” *Id.* at 91, 93.

²¹ Some of the E.3 goals include “Encourage renewable energy production and use on city and private properties” and “[u]pdate and improve Portsmouth’s water, sanitary sewer, and stormwater drainage systems.” *Id.* at 112, 114.

²² Some of the E.4 goals include “Promote energy efficient design” and “Promote the use of green infrastructure in public and private development.” *Id.* at 122, 126.

²³ A relevant EQ.3 goal is “Promote resilient and sustainable development and land use patterns.” *Id.* at 142.

²⁴ These standards and guidelines are included in the City’s Zoning Ordinance, Engineering Standards, Stormwater Management Ordinance, and Historic District Guidelines, to name a few examples. BUILD ONE PORTSMOUTH, *supra* note 2, at 239.

²⁵ *The Dillon Rule*, CITY OF WILLIAMSBURG, <https://www.williamsburgva.gov/government/departments-a-h/city-manager-s-office/newsroom/the-dillon-rule> (last visited July 22, 2019).

Addressing Flood-Prone Areas; 3. Transportation, Infrastructure, Roads, and Resiliency; and 4. Other Considerations.

1. Green Infrastructure and Sustainable Land Use Practices

Portsmouth would like to revise its zoning ordinance to incorporate more sustainable practices, including green infrastructure.²⁶ Portsmouth also wants to incorporate green infrastructure in its subdivisions by revising its subdivision ordinance. It hopes to implement sustainable infrastructure upgrades that will comply with state laws²⁷ and also incorporate more green infrastructure provisions.²⁸ In this section, green infrastructure will refer to how land can be developed to incorporate natural features (or not developed at all) in ways that will reduce the threat posed by flooding. The following discussion outlines how Portsmouth’s zoning and subdivision ordinances can be improved, and identifies other flexible approaches to make the City more sustainable. Green infrastructure related to transportation and roads will be discussed in a later section of this memo.

a. Zoning Ordinance

In general, the Virginia General Assembly has granted localities wide flexibility when it comes to drafting their zoning ordinances.²⁹ Zoning traditionally falls within the purview of localities, who are most familiar with the needs and character of their communities. For instance, Virginia Code § 15.2-2280 explicitly states that localities can “regulate, restrict, permit, prohibit, and determine,” *inter alia*, the use, size, height, and location of buildings, as well as areas that will remain unoccupied.³⁰ Additionally, localities have authority to implement “more flexible and adaptable zoning methods.”³¹ Thus, Portsmouth has a good foundation of authority when it comes to potentially implementing any changes that would promote green infrastructure as it relates to zoning. However, there are also some specific challenges and issues that the City should take into account.

The City wants to look to what other localities have done in their zoning ordinances and what resources are available to encourage additional green infrastructure. As a city at the forefront of resiliency planning, Norfolk’s 2018 zoning ordinance revision created a Flood Plain/Coastal Hazard Overlay district, or FPCH-O district, which encompasses FEMA-designated areas as well as “other areas identified as likely to benefit from floodplain management.”³² This language

²⁶ BUILD ONE PORTSMOUTH, *supra* note 2, at 126, 356 & 389.

²⁷ *Id.* at 63.

²⁸ *Id.* at 126. Connected to this green infrastructure goal is the recommendation that the City use “site sensitive design through subdivision and redevelopment requirements to create usable open spaces that connect with the wider network of waterway and green spaces.” *Id.* at 181. This would be similar to the green corridors mentioned in Section (A)(i)(1) of this memo.

²⁹ A specific grant of authority is important because Virginia is a Dillon Rule state.

³⁰ VA. CODE ANN. § 15.2-2280 (1997).

³¹ *Id.* § 15.2-2296.

³² NORFOLK, VA., ZONING ORDINANCE § 3.9.7(A)(1) (2019). Portsmouth’s City Code contains similar language. *See* CITY OF PORTSMOUTH, VA., FLOOD PROTECTION ORDINANCE, §§ 14.1-2 (“otherwise deemed special flood hazard areas”) and 14.1-6 (“The City of Portsmouth may identify and regulate local flood hazard or pending areas that are not delineated on the FIRM. These areas may be delineated on a ‘Local Flood Hazard Map’ using best available

therefore addresses at-risk areas that are outside the FIRM, representing a major step forward. In addition, Norfolk established a Coastal Resilience Overlay District, or CRO district.³³ The goal of the CRO district is to improve the resilience of new development located in areas that are vulnerable to flooding by requiring all FPCH-O areas to meet certain requirements.³⁴ These requirements include: elevating homes and utilities;³⁵ using only salt-tolerant and native species for landscaping; forbidding a diminution in set-asides; requiring the incorporation of pervious surfaces that can receive stormwater; and restricting the number, type, and composition of materials that can be used for parking spots.³⁶ Norfolk’s updated zoning ordinance also includes a “resilience quotient”³⁷ for all proposed development. There are standards specific to single-family homes, multiple-family homes, and non-residential buildings. Single-family green building requirements include risk reduction (by elevating the lowest habitable floor), stormwater management (with rooftop drainage systems), and energy resilience (with pre-installed wiring and/or connecting to a locally-generated or renewable source such as wind or solar).³⁸ Although the zoning ordinance exempts some buildings and improvements from the listed resilience quotient standards, it is very difficult to meet these exceptions.³⁹

With its recent zoning ordinance revisions, Norfolk is on the cutting edge of resilient localities in the Hampton Roads area, if not the nation. However, in addition to citing authority from the Virginia Code and other laws, Norfolk points to its city charter for authority to enact these stringent zoning provisions.⁴⁰ Since Norfolk’s city charter grants uniquely expansive powers as compared to other Virginia localities, Portsmouth should carefully consider whether it has the same level of authority.

Additional resources for the City to consider include a recent report the Green Infrastructure Center prepared for the City of Norfolk, detailing how the City could incorporate more green infrastructure into its existing plans.⁴¹ This report contains inexpensive suggestions such as encouraging community engagement, partnerships, and volunteerism, as well as

topographic data and locally derived information such as flood of record, historic high water marks or approximate study methodologies.”)

³³ *Building a Better Norfolk: A Zoning Ordinance of the 21st Century*, ADAPTATION CLEARINGHOUSE (Jan. 23, 2018) <https://www.adaptationclearinghouse.org/resources/building-a-better-norfolk-a-zoning-ordinance-of-the-21st-century.html>.

³⁴ See NORFOLK, VA., ZONING ORDINANCE § 3.9.18 (2019).

³⁵ The minimum ground flood height for single-family and multiple-family homes must be no less than three feet, all major electrical and mechanical systems must be elevated at least one foot, and basements are prohibited. *Id.* § 3.9.18(C)(1).

³⁶ *Id.* § 3.9.18(C)(1)-(4).

³⁷ *Id.* § 5.12.1. Under the resilience quotient, developers earn “points for adopting different resilient measures that promote flood risk reduction, stormwater management, and energy resilience, among other practices. New developments are required to meet different resilience point values based on the development type (e.g., residential, non-residential, mixed-use) and development size, unless the developer opts to meet specified standards for elevation and drainage.” *Building a Better Norfolk: A Zoning Ordinance of the 21st Century*, *supra* note 33.

³⁸ NORFOLK, VA., ZONING ORDINANCE § 5.12.5 (2019).

³⁹ Some examples of exempted development are LEED-certified buildings at the gold level or above or particularly historic or architecturally significant buildings. *Id.* § 5.12.2(A).

⁴⁰ *Id.* § 1.2.1.

⁴¹ GREEN INFRASTRUCTURE PLAN FOR NORFOLK: BUILDING RESILIENT COMMUNITIES, GREEN INFRASTRUCTURE CTR. INC., (July 2018), <http://www.gicinc.org/PDFs/GreenPlan-CityofNorfolk-FinalReport%202018.pdf>.

encouraging the use of and providing incentives for native tree plantings.⁴² Another resource that may be helpful for the City is a 2013 U.S. Environmental Protection Agency (“EPA”) report that provides a checklist for local governments seeking to implement additional green infrastructure projects.⁴³ The EPA checklist contains several categories that are further divided by color (green, yellow, and red) based on the authority that a local government expressly has, typically has, or never has for these initiatives.⁴⁴ It may be useful for Portsmouth to use this checklist and adopt a similar approach as it proceeds with specific green infrastructure plans and zoning ordinance revisions.

b. Subdivision Ordinance

The purpose of a locality’s subdivision ordinance is “to assure the orderly subdivision of land and its development.”⁴⁵ Virginia Code lists both mandatory and optional provisions for local ordinances that relate to resilience. For example, a local subdivision ordinance must include “adequate provisions for drainage and flood control”⁴⁶ and may include “provisions for clustering of single-family dwellings and preservation of open space[,]”⁴⁷ as well as “provisions for establishing and maintaining access to solar energy to encourage the use of solar heating and cooling devices in new subdivisions.”⁴⁸

Given this authority within the Virginia Code, Portsmouth could require that subdivision proposals consider future sea level rise and precipitation changes in order to meet requirements associated with drainage and flood control and that sea level rise projections be identified on plan submissions. The Virginia Beach Sea Level Rise Policy Adaptation Report proposes a similar approach.⁴⁹ As a basis for the city’s adaptation plan, Virginia Beach conducted a Comprehensive Sea Level Rise and Recurrent Flooding Study (CSLRRF). This study, which began in 2014 and is expected to be completed in 2019, was a three-phase effort, which seeks to “understand current and future flood hazard risks”, tailor the solutions to the issues facing Virginia Beach specifically, and create an effective implementation plan.⁵⁰ Thus far, the City is considering adaptation strategies that combine both policy and engineering approaches.⁵¹ As noted above, because Virginia is a Dillon Rule state, and there is no specific, express Virginia Code provision regarding

⁴² *Id.* at 4.

⁴³ See generally U.S. Env’tl. Protection Agency, *Sustainable Design and Green Building Toolkit* (July 2013), https://www.epa.gov/sites/production/files/2014-09/documents/sustainable-design-permitting-toolkit-06_27_13_formatted.pdf.

⁴⁴ *Id.*

⁴⁵ VA. CODE ANN. § 15.2-2240 (1997).

⁴⁶ *Id.* § 15.2-2241 (2012).

⁴⁷ *Id.* § 15.2-2242(8) (2018).

⁴⁸ *Id.* § 15.2-2242(6) (2018) (stating that “[t]he provisions shall be applicable to a new subdivision only when so requested by the subdivider[.]”).

⁴⁹ VIRGINIA BEACH SEA LEVEL RISE POLICY ADAPTATION REPORT, CITY OF VA. BEACH 41 (Jan. 14, 2019), <https://www.vbgov.com/government/departments/public-works/comp-sea-level-rise/Documents/slr-policy-adapt-draft-rpt-1-14-19.pdf>.

⁵⁰ *Id.* at 11.

⁵¹ *Id.*

the use of future predictive data in subdivision ordinances, it is possible that such action could be challenged in court.⁵²

Additionally, Portsmouth could strengthen existing references to natural features within its subdivision ordinance. For example, the language within § 33.1-41 of Portsmouth’s subdivision ordinance could be strengthened to require preservation of listed features.⁵³ Additionally, the language detailing “noteworthy features” could be expanded to provide additional detail regarding specific size of trees, examples of “other desirable natural growths”, and a list of other types of natural and nature-based features that may assist with flood protection and stormwater retention.⁵⁴

However, because the City is already so built out, such changes would likely have a limited impact. Notably, “[t]he city has not processed a major subdivision request in over five years, and while some smaller subdivisions may be completed in the future, the lack of significant parcels of undeveloped land will limit the impacts of the subdivision ordinance on a citywide basis.”⁵⁵

2. Overlay Districts and Addressing Flood-Prone Areas

One of Portsmouth officials’ main concerns is that existing laws and ordinances are insufficient to address the City’s growing resiliency needs, particularly for single-family homes. This concern is a primary motivation for possibly creating a flooding overlay district and for encouraging new design standards and construction requirements.⁵⁶

Build One Portsmouth mentions that the City, in its main residential areas, wants to “[e]ncourage new housing to incorporate design features that are energy efficient, sustainable, and protect against flooding.”⁵⁷ Connected to this, the City wants to “[i]dentify durable, low-maintenance, and sustainable materials for development and repairs to existing homes and buildings, and include them in design guidelines where appropriate.”⁵⁸

Portsmouth’s current zoning ordinance already contains some design standards. For instance, there are standards for single-family and multi-family residential buildings, landscaping, open space set-asides, and exterior lighting, as well as some design standards for signs.⁵⁹ Incorporating additional development and design standards into its zoning ordinance, particularly

⁵² See generally, VA. CODE ANN. § 15.2-2240 (1997). The text of the code lacks language relating to “future”, “predictive”, and “projected”, and other forward-looking terms.

⁵³ PORTSMOUTH, VA., SUBDIVISION ORDINANCE. § 33.1-41 (2010).

⁵⁴ *Id.*

⁵⁵ BUILD ONE PORTSMOUTH, *supra* note 2, at 303.

⁵⁶ These requirements would arguably apply to substantial improvements as well, since substantial improvements (i.e., worth 50 percent or more of the value of the building) are generally treated like new construction for purposes of the National Flood Insurance Program and associated floodplain management regulations. *Substantial Improvement and Substantial Damage*, FED. EMERGENCY MGMT. AUTH. 8-3, https://www.fema.gov/pdf/floodplain/nfip_sg_unit_8.pdf (last visited July 22, 2019).

⁵⁷ These areas include Portsmouth’s Early Traditional Neighborhood (Type 1), Late Traditional Neighborhood (Type 1), Early Suburban Neighborhood (Type 2), and Late Suburban Neighborhood (Type 2). BUILD ONE PORTSMOUTH, *supra* note 2, at 165, 167, 169, & 171.

⁵⁸ *Id.* at 142.

⁵⁹ PORTSMOUTH, VA., ZONING ORDINANCE, §§ 40.1-4.3(A)(1)(a), -5.5, -5.2(C), -5.4(C)(4), -5.9(D) & -5.11(E) (2014).

ones that go beyond their current standards and can address threats in flood-prone areas, can make these neighborhoods more resilient.

Portsmouth also wants to implement more cutting-edge requirements for new construction.⁶⁰ For instance, the City wants to “identify sustainable infrastructure upgrades that could be required in the Subdivision Ordinance,” and “insure city ordinances require new buildings to be designed for adaptive capacity and minimize environmental impacts.”⁶¹

There are several legal hurdles the City must consider before it can encourage the use of more durable building materials, technologies, and standards. Portsmouth may face substantial roadblocks that may ultimately necessitate pursuing legislative solutions.

a. City’s Floodplain Management Regulations

i. Flooding Overlay District

Portsmouth’s current floodplain management regulations are structured as an overlay district to the City’s zoning map.⁶² A flooding overlay district can improve Portsmouth’s resiliency with additional, stricter requirements in areas that are likely to flood. The Federal Emergency Management Agency (“FEMA”) defines these areas as ones that “can be developed in accordance with the underlying zone, provided the flood protection requirements are met.”⁶³

Federal standards provide a baseline for floodplain regulation. Localities are authorized to impose stricter regulations in their FEMA flood zones and are, in fact, encouraged to do so.⁶⁴ These stricter regulations can take several forms. For example, “local flood plain regulations adopted as a condition of participation in the National Flood Insurance Program” supersede the provisions of Virginia’s Uniform Statewide Building Code (USBC).⁶⁵ Under this authority, Portsmouth has adopted higher freeboard requirements for new development or redevelopment and also requires V Zone standards within the Coastal A Zone.⁶⁶

⁶⁰ Substantial improvements are also presumably considered as “new construction.” See *Substantial Improvement and Substantial Damage*, *supra* note 56, at 8-4.

⁶¹ BUILD ONE PORTSMOUTH, *supra* note 2, at 63.

⁶² PORTSMOUTH, VA., FLOOD PROTECTION ORDINANCE § 14.1-6(b) (2016).

⁶³ FED. EMERGENCY MGMT. AGENCY., NATIONAL FLOOD INSURANCE PROGRAM (NFIP) FLOODPLAIN MANAGEMENT REQUIREMENTS 7-6 (Feb. 2005), https://www.fema.gov/media-library-data/1481032638839-48ec3cc10cf62a791ab44ecc0d49006e/FEMA_480_Complete_reduced_v7.pdf [hereinafter NFIP REQUIREMENTS].

⁶⁴ “The criteria [for FEMA flood zones] . . . are minimum standards for the adoption of flood plain management regulations by flood-prone . . . communities. Any community may exceed the minimum criteria . . . by adopting more comprehensive flood plain management regulations . . . [A]ny flood plain management regulations adopted by a State or a community which are more restrictive than the criteria . . . are encouraged and shall take precedence.” 44 C.F.R. § 60.1(d) (2018).

⁶⁵ VA. CODE ANN. § 36-98 (2006).

⁶⁶ Currently, Portsmouth imposes “V” Zone requirements in Coastal “A” Zones and also has a 3-foot freeboard standard. CITY OF PORTSMOUTH, VA., FLOODPLAIN ORDINANCE § 14.1-11(b)(5). See also CITY OF HAMPTON ET AL., 2017 HAMPTON ROADS HAZARD MITIGATION PLAN 6:8 (Jan. 2017), <https://www.hrpdcva.gov/uploads/docs/2017%20Hampton%20Roads%20Hazard%20Mitigation%20Plan%20Update%20FINAL.pdf> [hereinafter HAMPTON ROADS HAZARD MITIGATION PLAN]. Zone V refers to “Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves” where “... [m]andatory flood insurance purchase requirements and floodplain management

ii. Cumulative Valuation

Portsmouth could consider changes to utilize cumulative valuation when calculating what counts as a “substantial improvement.”⁶⁷ Under this concept, all construction projects are totaled, usually over the course of 5 or 10 years; and if the improvements during this time total 50 percent or more of the value, the building must comply with regulations as if new construction occurred.⁶⁸ Portsmouth’s Flood Protection Ordinance currently includes cumulative language with respect to the definition of “substantial damage” due to flooding⁶⁹ and conditions for use of existing structures.⁷⁰ Despite potential community pushback, using cumulative valuation to determine substantial improvement thresholds can serve as a means to implement stricter requirements on structures that have undergone several major recent modifications. Another potential modification to the existing Flood Protection Ordinance could be to expand the regulatory floodplain by incorporating the 500-year flood, or Shaded X, zone as the City of Hampton has done.⁷¹

iii. Increasing the Regulatory Floodplain

Although, as noted above, some language from Virginia Code § 36-98 provides localities with authority to implement more stringent building code regulations, the provision does not account for areas that are not regulated by the NFIP. Thus, this Virginia Code section limits Portsmouth’s ability to implement more resilient design and construction measures outside of its existing floodplain management regulations. Other states have been similarly constrained by their building codes but successfully lobbied for change. For instance, in 2010, Florida amended FL. STAT. ANN. § 553.73(5) to specifically allow communities to adopt local technical and administrative amendments to implement more stringent standards than what had been provided in the Florida Building Code.⁷² The revised statute also ensured that, for the most part, local amendments will remain in place even when Florida adopts a revised version of the building

standards apply.” *Zone V*, FED. EMERGENCY MGMT. AGENCY, <https://www.fema.gov/zone-v> (last visited July 22, 2019). Coastal A Zones refer to the “area landward of a V zone, or landward of an open coast without mapped V zones.” *Design and Construction in Coastal A Zones*, FED. EMERGENCY MGMT. AGENCY (2009), https://www.fema.gov/media-library-data/20130726-1645-20490-7671/757_apd_2_coastalazones.pdf.

⁶⁷ Portsmouth utilized cumulative valuation to determine substantial improvement and substantial damage in previous iterations of its Flood Protection Ordinance. PORTSMOUTH, VA., FLOOD PROTECTION ORDINANCE §14-5 (2009). During the process of updating its flood regulations in 2015, a speaker at the City Council meeting objected to this cumulative approach and the general cumulative requirements for substantial damage and substantial improvement were removed; however, the ordinance language does still contain cumulative language for substantial damage if that damage is due to flooding. PORTSMOUTH, VA., City Council Meeting Minutes (May 15, 2015); PORTSMOUTH, VA., FLOOD PROTECTION ORDINANCE §14.1-5 (2015).

⁶⁸ *Substantial Improvement and Substantial Damage*, *supra* note 56.

⁶⁹ PORTSMOUTH, VA., FLOOD PROTECTION ORDINANCE §14.1-5.

⁷⁰ *See id.* §14.1-14(a)(2).

⁷¹ HAMPTON, VA., ZONING ORDINANCE § 9-33(1)(h) (2016).

⁷² FLOOD RESISTANT CONSTRUCTION AND THE 6TH EDITION FLORIDA BUILDING CODE, BUILDING A SAFER FLORIDA, INC. 1 (June 2017), http://www.floridabuilding.org/fbc/thecode/2017-6edition/basf_2017_flood_061217.pdf.

code.⁷³ The state also provides instructions and model ordinances for localities to adopt that go beyond the building code requirements.⁷⁴

Portsmouth seems to recognize the inherent limitations of the USBC, since *Build One Portsmouth* mentions actions such as lobbying the state legislature to modernize the statewide building code. Adopting innovative techniques, such as the use of plyscrapers,⁷⁵ and “consider[ing] combining efforts with the other coastal communities of Virginia to lobby for changes to the USBC”⁷⁶ may help Portsmouth and other vulnerable localities achieve their resiliency goals. Legislative intervention seems to be the best course of action on this front due to Dillon Rule restrictions, as well as inherent shortcomings of incorporating all USBC regulations affecting resiliency into the Virginia Code.

Localities cannot vary from the FIRM maps or data without prior approval from the FEMA regional office or administrator.⁷⁷ Yet, localities may be able to work around an initial FIRM designation. They are still free to submit their own data to FEMA to address possible shortcomings of FEMA data, and can also request map revisions.⁷⁸ Localities can and often do map additional stream tributaries and small waterways that are missing from the federal Flood Insurance Rate Map (“FIRM”).⁷⁹ For instance, Norfolk “found discrepancies in the FIRM during the initial review and provided additional information to assure the maps’ correctness.”⁸⁰ In addition, localities can submit information regarding a historic flood that may have been higher than the Base Flood Elevation (“BFE”) provided on the FIRM as another way to demonstrate how FEMA data may not accurately reflect local flooding issues.⁸¹ If Portsmouth experienced a historic flood that is higher than the current FIRM BFE, such as from Hurricane Isabel, the City could submit a request to revise the existing FIRM map. This would allow the City to impose stricter requirements in vulnerable areas that might be covered by a possible overlay district but are currently difficult to regulate because they are not included in the existing FIRM.

Another option is for the City to identify, map, and incorporate its own local flood hazard areas into its floodplain management regulations. General language supporting this approach is

⁷³ *Id.*

⁷⁴ *Id.* The Virginia Department of Conservation and Recreation (“DCR”) also provides a model floodplain ordinance at the bottom of its Floodplain Management Regulations and Ordinances page. See *Floodplain management regulations and ordinances*, VA DEP’T OF CONSERVATION & RECREATION, <http://www.dcr.virginia.gov/dam-safety-and-floodplains/fpordnce> (last visited July 22, 2019).

⁷⁵ Plyscrapers are wooden skyscrapers that may be quicker to build and can be more environmentally friendly. Zaria Gorvett, ‘Plyscrapers’: The rise of the wooden skyscraper, BBC (Oct. 31, 2017), <http://www.bbc.com/future/story/20171026-the-rise-of-skyscrapers-made-of-wood>.

⁷⁶ BUILD ONE PORTSMOUTH, *supra* note 2, at 63.

⁷⁷ One example of this is using modified data to implement different regulations based on physical changes to the land, whether natural or unnatural. NFIP REQUIREMENTS, *supra* note 63, at 5-8. There are only a few other times when a locality can depart from the FIRM data that FEMA provides, such as when FEMA data is incorrect, insufficient, merely advisory, or in draft form. *Id.* at 5-9.

⁷⁸ See *id.* at 5-8.

⁷⁹ NFIP REQUIREMENTS, *supra* note 63, at 5-8.

⁸⁰ Letter from George M. Homewood, FAICP, CFM, Planning Director, to the Honorable Council, City of Norfolk, Virginia (Dec. 20, 2016), <https://www.norfolk.gov/AgendaCenter/ViewFile/Item/2938?fileID=6468>. These discrepancies included variations in the data that identified flood zone boundaries on the FIRM.

⁸¹ NFIP REQUIREMENTS, *supra* note 63, at 5-8.

provided in DCR’s model floodplain ordinance⁸² and has been incorporated into several local ordinances;⁸³ however, few localities – including Portsmouth – have taken that next step to identify, map, and incorporate such local areas into local floodplain management regulations. Two localities that have designated and regulate local flood hazard areas, beyond those identified by FEMA, are Augusta County and Fairfax County. Section 25-473(A) of Augusta County’s zoning ordinance states that “[t]he basis for the delineation of [floodplain overlay] districts shall be the Augusta County Floodpool Maps and the Flood Insurance Study and associated FIRM for the County of Augusta prepared by the Federal Emergency Management Agency, Federal Insurance Administration[.]”⁸⁴ The floodpool overlay districts are “area[s] upstream of publicly owned or maintained flood control or water supply structures that are at or below the elevation of the top of the dam[.]”⁸⁵ These locally identified areas are regulated in the same manner as the FEMA designated SFHAs. Similarly, § 20-300 of Fairfax County’s Zoning Ordinance states that “[f]loodplains shall include all areas of the County which are designated as a floodplain by . . . FEMA, by the United States Geological Survey, or by Fairfax County.”⁸⁶ The City could take similar steps to identify and map locally identified flood zones, which potentially could cover additional areas outside of the FEMA, and incorporate these areas into the regulatory floodplain via local floodplain management regulations. The City plans to “[a]dopt an official Flood Threat Zones Map based on best available data, and monitor and update it accordingly based on state or federally mandated boundaries to account for the recognized impact of sea level rise, severe storms, and land subsidence”⁸⁷ and it is possible that these maps could serve as an initial step for the City to increase its regulatory floodplain.

b. Voluntary Incentives, Mapping, and Data Collection

Whether or not Portsmouth decides to create a floodplain overlay district that includes areas outside the FIRM or seeks to modify the FIRM by providing information to FEMA, the City could still pursue alternative strategies. Voluntary incentives and mapping and data collection are valuable, no matter what course of action the City ultimately decides to take.

i. Shifting Behavior With Tax Breaks and Other Incentives

Build One Portsmouth highlights the need to pursue resilient practices outside FIRM areas that are not necessarily reliant on strict laws and regulations. It notes the importance of recommendations, incentives, and focusing on what the City can clearly do on its own. Incentives may be the most useful tool in this regard.

⁸² *Floodplain management regulations and ordinances*, VA. DEP’T OF CONSERVATION & RECREATION, *supra* note 74, at 12.

⁸³ *See, e.g.*, PORTSMOUTH, VA., FLOOD PROTECTION ORDINANCE §14.1-6(a) (2015); SMITHFIELD, VA., FP-O, FLOODPLAIN OVERLAY DISTRICT art. 3.0, § 1.2 (1998).

⁸⁴ AUGUSTA CTY., VA., ZONING ORDINANCE § 25-473(A) (2015), <https://www.co.augusta.va.us/home/showdocument?id=164>.

⁸⁵ *Id.* § 25-473(A)(4).

⁸⁶ FAIRFAX CTY., ZONING ORDINANCE, § 20-300, <https://www.fairfaxcounty.gov/planning-zoning/sites/planning-zoning/files/assets/documents/zoning/zoning%20ordinance/art20.pdf> (last visited July 22, 2019).

⁸⁷ BUILD ONE PORTSMOUTH, *supra* note 2, at 61.

Incentives such as tax exemptions may assist Portsmouth particularly in achieving its resiliency goals. One recent grant of authority may be especially relevant. In 2018, Virginia voters approved ballot question 1, which allows the General Assembly “to authorize local governments to provide a partial local property tax exemption for real estate subject to recurrent flooding that undertook improvements to prevent flooding or long-term damage from flooding.”⁸⁸ As a result, in 2019, the General Assembly adopted Senate Bill 1588, which authorizes the governing body of any county, city, or town to provide a partial tax exemption for improved real estate that is subject to recurrent flooding and upon which qualifying flood improvements have been made on or after July 1, 2018.⁸⁹ Should Portsmouth choose to adopt an ordinance providing for such a partial tax exemption, citizens may be incentivized to improve their properties to make them more flood-resistant.

In addition, the Virginia Code currently provides some incentives and tax breaks for individuals who voluntarily embrace green building practices. Virginia Code § 58.1-3852 allows any locality to incentivize the use of green roofs in construction and remodeling, which can include lower permit fees, a more streamlined process, or lower taxes.⁹⁰ Similarly, Virginia Code § 58.1-3666 allows localities to exempt living shoreline projects approved by the Virginia Marine Resources Commission from local taxation.⁹¹ Adopting such a tax exemption could encourage homeowners and businesses to embrace more resilient landscaping options that can help defend against storm surges and provide other ecosystem services. Additionally, recent amendments to Virginia Code § 15.2-958.3 added resiliency and stormwater management to the list of types of improvements for which “any locality may, by ordinance, authorize contracts to provide loans for the initial acquisition and installation of clean energy, *resiliency*, or *stormwater management* improvements with free and willing property owners of both existing properties and new construction.”⁹²

Rewarding sustainable behavior at special community events may be another way to encourage more resilient practices. Localities like Portsmouth are free to create and host recognition programs and competitions for residents and businesses that undertake resilience efforts; however, Portsmouth should take care to identify exactly what efforts qualify for recognition, the information that would be needed to make these determinations, and a method to ensure that participants comply with any promised future actions.⁹³

Thus, encouraging behavioral shifts by incentivizing green practices—both inside and outside the FIRM—may be one way to make communities, such as Portsmouth, more resilient.

⁸⁸ *Virginia Question 1, Property Tax Exemption for Flood Abatement Amendment (2018)*, BALLOTPEDIA, [https://ballotpedia.org/Virginia_Question_1_Property_Tax_Exemption_for_Flood_Abatement_Amendment_\(2018\)](https://ballotpedia.org/Virginia_Question_1_Property_Tax_Exemption_for_Flood_Abatement_Amendment_(2018)) (last visited July 22, 2019).

⁸⁹ S. Bill 1588, 2019 Gen. Assemb., Reg. Sess. (Va. 2019).

⁹⁰ VA. CODE ANN. § 58.1-3852 (2009).

⁹¹ *Id.* § 58.1-3666.

⁹² *Id.* § 15.2-958.3 (emphasis added).

⁹³ SEE ELIZABETH ANDREWS ET AL., THE RAFT, METHODS OF INCENTIVIZING PRIVATE ACTION FOR RESILIENCE (Summer 2018), <https://raft.iem.virginia.edu/system/files/Incentivizing%20Private%20Actions.pdf>.

ii. Collecting and Organizing Information

Build One Portsmouth is focused on both information distribution and information collection. The City wants to increase awareness of severe weather events and tidal and storm surge flooding by engaging the community with public awareness campaigns and by making information widely available to the public.⁹⁴ Portsmouth also wants data collection to be a priority. Statistics, maps, and models could help make the City more resilient and prepared for the future. One of the primary data collection initiatives is completing an inventory of first floor elevations of residential structures, particularly in low- to moderate income areas, in order to gauge how vulnerable these areas are to flooding.⁹⁵

Focusing on maps and data allows the City to bolster its argument that it needs to go beyond existing standards at the state level. As noted previously, the City plans to “[a]dopt an official Flood Threat Zones Map”.⁹⁶ Collecting information could potentially be the impetus for lobbying the General Assembly for local authority to embrace more sustainable construction materials that are not currently provided for in the USBC.

The City can also lobby national agencies for necessary changes. As mentioned earlier, data can also be used from areas outside the FIRM to either provide proof that the FIRM should be revised to account for certain vulnerable areas currently outside the FIRM, or as proof of a more general need to regulate additional areas.

3. Transportation, Infrastructure, Roads, and Resilience

Portsmouth plans to update its roads by creating more multimodal roadways that encourage various uses and incorporating water management techniques along the right-of-way (or “ROW”), which will address problems posed by stormwater and recurrent flooding. This section will begin by identifying portions of *Build One Portsmouth* that will likely interact with Virginia Department of Transportation (VDOT) requirements, particularly those related to stormwater management techniques, including green infrastructure, in the right-of-way. It will then discuss how VDOT right-of-way requirements interact with a locality implementing green infrastructure in the right-of-way. It will conclude by addressing VDOT’s support of the multimodal roadways often featured in “Complete Streets” projects.

a. Summary of Relevant Goals in *Build One Portsmouth*

To modernize the City’s roadways, Portsmouth aims to prepare its Citywide Bike and Pedestrian Plan, as well as develop and adopt its own “Complete Streets” manual.⁹⁷ Complete Streets is a design approach that seeks to have streets operate as “community-oriented streets that safely and conveniently accommodate multiple travel modes and provide safe options for all

⁹⁴ BUILD ONE PORTSMOUTH, *supra* note 2, at 142.

⁹⁵ *Id.* An added benefit of this inventory may be an improved CRS score, since Portsmouth only has 30 percent of the possible credits it could receive for keeping elevation certificates. *The Community Rating System*, VA. DEP’T OF CONSERVATION & RECREATION, <https://www.dcr.virginia.gov/dam-safety-and-floodplains/fp-crs> (last visited July 22, 2019).

⁹⁶ BUILD ONE PORTSMOUTH, *supra* note 2, at 61.

⁹⁷ *Id.* at 221.

users.”⁹⁸ To carry out this broad effort, Portsmouth has highlighted several specific projects. First, Portsmouth wants to design and build its Court Street Complete Streets pilot project, which has been identified as a short-term effort.⁹⁹ Portsmouth has also identified an eligible portion of High Street for conversion to the Complete Streets approach.¹⁰⁰ In connection with this project, the City aims to develop wider sidewalks and shared lanes, which will accommodate different types of travel.¹⁰¹ The City hopes that Complete Streets conversion will be done in phases along the City’s roads.¹⁰²

Beyond encouraging different types of travel, Complete Streets also offer localities the opportunity to approach stormwater management in a more holistic manner.¹⁰³ Indeed, Portsmouth, a city that experiences frequent flooding, is seeking to install green infrastructure along the rights-of-way to help handle excess water.¹⁰⁴ These types of projects can include rain gardens and bioswales.¹⁰⁵ Specifically, Portsmouth plans to install green infrastructure as part of the Court Street project.¹⁰⁶ In designing and constructing these projects, however, the City must consider certain VDOT requirements, particularly those related to the right-of-way.

b. Green Infrastructure in the Right-of-Way

In the midst of the Great Depression, the Byrd Road Act of 1932¹⁰⁷ sought to relieve counties of costly road construction and maintenance responsibilities by establishing Virginia’s current system of secondary roads.¹⁰⁸ While Virginia oversees the 58,000 miles of different categories of roads throughout Virginia, including the secondary roads formerly under counties’ jurisdiction, a separate system of about 11,000 miles is urban streets, which are maintained by cities and towns with the help of funding from VDOT.¹⁰⁹ Independent cities were not included in the Byrd Act, so Virginia cities have greater leeway in constructing and maintaining roads than counties. However, cities are constrained by several requirements and limitations VDOT has set forth for cities to receive funding.¹¹⁰ Cities hoping to install green infrastructure will have to contend with these limitations, particularly given the expense of such projects.

First, the Commonwealth does not give credit to green infrastructure when utilizing its SMART SCALE transportation funding formula. The purpose of SMART SCALE is to allocate

⁹⁸ *Id.* at 217.

⁹⁹ *Id.* at 220.

¹⁰⁰ *Id.* at 208.

¹⁰¹ BUILD ONE PORTSMOUTH, *supra* note 2, at 208.

¹⁰² *Id.*

¹⁰³ See *Complete Streets Design Guidelines*, CITY OF ALEXANDRIA, VA, <https://www.alexandriava.gov/localmotion/info/default.aspx?id=91090> (last updated Apr. 21, 2016).

¹⁰⁴ BUILD ONE PORTSMOUTH, *supra* note 2, at 62 & 70.

¹⁰⁵ *Id.* at 91.

¹⁰⁶ *Id.* at 18.

¹⁰⁷ AMY O’LEARY, FINAL REPORT: BEYOND THE BYRD ROAD ACT: VDOT’S RELATIONSHIP WITH VIRGINIA’S URBAN COUNTIES (1998), http://www.virginiadot.org/vtrc/main/online_reports/pdf/98-r29.pdf.

¹⁰⁸ VA. DEP’T OF TRANSP., A HISTORY OF ROADS IN VIRGINIA 33 (2006), <http://www.virginiadot.org/about/resources/historyofrds.pdf>.

¹⁰⁹ *Virginia’s Highway System*, VA. DEP’T OF TRANSP., http://www.virginiadot.org/about/vdot_hgwy_sys.asp (last updated Feb. 13, 2018). Arlington and Henrico counties opted to maintain their own roads and still do today.

¹¹⁰ AMY O’LEARY, *supra* note 107, at 1.

project funding by analyzing the merits of each project and prioritizing projects accordingly.¹¹¹ SMART SCALE considers six different criteria when ranking projects, including (1) safety, (2) congestion mitigation, (3) accessibility, (4) environmental quality, (5) economic development, and (6) land use coordination (for areas with over 200,000 population).¹¹² Environmental quality can be further broken down into two subcategories: the extent to which a project (a) addresses “the reduction of pollutant emissions and energy consumption,” and (b) minimizes “the impact on natural and cultural resources.”¹¹³ The fourth category does not, however, specifically contemplate projects, like green infrastructure, that minimize stormwater pollution and flooding from runoff. Similarly, in calculating a project’s economic development value, SMART SCALE considers the extent to which a project improves travel time reliability, which includes examining the frequency of weather events using *historical* flood and weather data.¹¹⁴ By relying solely on historical weather data to determine travel time reliability, SMART SCALE fails to consider the effects of increased flooding and weather events, which green infrastructure can help mitigate. Ultimately, SMART SCALE does not incentivize localities to implement green infrastructure because the benefits stemming from such projects are not incorporated into funding decisions.

Second, VDOT has attached a minimum right-of-way width requirement to road maintenance funding, which could conflict with a locality’s ability to implement green infrastructure in the right-of-way. According to VDOT’s Road Design Manual, minimum widths for roadways and the rights-of-way within cities to qualify for maintenance funding are set forth in Virginia Code § 33.2-319.¹¹⁵ This section states that the “Commissioner of Highways, subject to the approval of the [Commonwealth Transportation] Board, shall make payments for maintenance, construction, or reconstruction of highways to all cities and towns eligible for funds.”¹¹⁶ VDOT will not provide funding under this section unless the portion of the highway for which payment has been requested meets certain standards.¹¹⁷ First, the road can qualify for funding if it has (a) “an unrestricted right-of-way at least 50 feet wide and (b) a hard-surface width of at least 30 feet.”¹¹⁸ Second, the road can qualify for funding if it has (a) an unrestricted right-of-way at least 80 feet wide, (b) a hard-surface width of at least 24 feet, and (c) approved engineering plans for the ultimate construction of an additional hard-surface width of at least 24 feet within the same right-of-way.”¹¹⁹ Finally, the road can qualify if it “is a street established prior to July 1, 1950, that has an unrestricted right-of-way width of not less than 30 feet and a hard-

¹¹¹ VA. DEP’T OF TRANSP., SMART SCALE TECHNICAL GUIDE 1 (2018) http://vasmartscale.org/documents/2018documents/ss_technical_guide_nov13_2017_revised_feb2018_for_posting.pdf.

¹¹² *Id.* at 27.

¹¹³ *Id.* at 29.

¹¹⁴ *Id.* at 83.

¹¹⁵ VA. DEP’T OF TRANSP., ROAD DESIGN MANUAL app. A, A-17-A-20 (2019), <http://www.virginiadot.org/business/resources/LocDes/RDM/appenda.pdf>. For median requirements, see VA. DEP’T OF TRANSP., ROAD DESIGN MANUAL ch. 2E, 2E-9-2E-10 (2015), <http://www.virginiadot.org/business/resources/LocDes/RDM/chap2e.pdf>.

¹¹⁶ VA. CODE ANN. § 33.2-319(A) (2017).

¹¹⁷ For a simplistic breakdown of these requirements, see VA. DEP’T OF TRANSP. URBAN STREET ACCEPTANCE CRITERIA (Oct. 1, 2014), http://www.virginiadot.org/VDOT/Business/asset_upload_file549_47098.pdf. See also *Local Assistance Division*, VA. DEP’T OF TRANSP., <http://www.virginiadot.org/business/local-assistance-programs.asp> (last updated June 24, 2019).

¹¹⁸ VA. CODE ANN. § 33.2-319(B) (2019).

¹¹⁹ *Id.*

surface width of not less than 16 feet.”¹²⁰ While the Commissioner of Highways may waive the right-of-way and hard-surface pavement width requirements (1) when the locality requests the modification to protect the quality of drinking water, or (2) for highways constructed on or after July 1, 1994, to “accommodate some other special circumstance where such action would not compromise the health, safety, or welfare of the public,”¹²¹ there seems to be minimal flexibility for cities to operate outside of the above requirements if they also want funding from VDOT. This might hamper a city’s desire to implement green infrastructure in the right-of-way, particularly for cities that heavily rely on VDOT funding.¹²²

Finally, the administrative code imposes additional restrictions that might unintentionally discourage a city from implementing green infrastructure. For example, in calculating lane mileage eligibility, which is used to determine the amount of money VDOT will provide a city for maintenance costs, “nonhard surfaced streets do not qualify for street payments,”¹²³ and “pavement widths of less than 14 feet qualify for only one moving lane even if it carries traffic in two directions.”¹²⁴ These provisions may discourage the use of pervious streets and the reduction of pavement respectively by connecting maintenance funds to measures counter to the purpose of green infrastructure. Additionally, Virginia limits the amount of money that can be allocated for “landscape improvements” to 3 percent of the construction budget for urban construction projects.¹²⁵ However, it is currently unclear where exactly green infrastructure falls because neither “nonhard surfaced streets” nor “landscape improvement” are defined.

Despite these limitations, other cities in Virginia have forged ahead with planning and completing green infrastructure projects in the right-of-way or requiring such projects as part of MS4 permit compliance. For example, the City of Alexandria has proposed a green infrastructure project in Second Street’s right-of-way.¹²⁶ The purpose of the project is to reduce and treat stormwater runoff, and it plans to utilize street trees and bioretention features to accomplish this goal.¹²⁷ While there is little information regarding the precise source of funding for this project, Alexandria has raised money for stormwater management through an impervious area-based

¹²⁰ *Id.* There are several other situations in which roads can qualify for funding, according to this section of the Code. However, this paper has honed in on those explicitly relating to minimum width of right-of-way pursuant to direction from Portsmouth.

¹²¹ *Id.*

¹²² However, it seems that VDOT maintenance funds are not precluded from applying to maintaining green infrastructure projects that have already been installed. After receiving and spending maintenance funds, cities must certify that funding was not used for something other than “maintenance, construction, or reconstruction of the streets.” *Id.* § 33.2-319(F). According to VDOT, maintenance can include vegetation control, such as brush cutting, and reseeding, mulching, sodding, and replacing soil. VA. DEP’T OF TRANSP., URBAN CONSTRUCTION AND MAINTENANCE PROGRAM (URBAN MANUAL) 85 (2017), http://www.virginiadot.org/business/resources/local_assistance/Urban_Construction_and_Maintenance_Program_Urban_Manual.pdf.

¹²³ 24 VA. ADMIN. CODE § 30-325-10(B)(5) (2014).

¹²⁴ *Id.* § 30-325-10(B)(4).

¹²⁵ *Id.* § 30-325-10(G).

¹²⁶ *Green Infrastructure*, CITY OF ALEXANDRIA, VA., <https://www.alexandriava.gov/tes/stormwater/info/default.aspx?id=103950> (last updated Mar. 29, 2019).

¹²⁷ Brian Meli, *Green Infrastructure Demonstration Project: Second Street*, CITY OF ALEXANDRIA, VA. Slide 13, <https://www.alexandriava.gov/uploadedFiles/ProjectImplementation/info/10.28.2016%20Draft%20Second%20Street%20Presentation.pdf> (last visited July 22, 2019).

stormwater utility fee.¹²⁸ Alexandria has also highlighted green infrastructure in the right-of-way for the specific purpose of complying with its MS4 permit. In Alexandria, permittees “shall study, implement and promote green infrastructure projects within the CSS sewershed during this permit term.”¹²⁹ This includes green infrastructure in the right-of-way. In fact, the City states that “facilities which can reduce non-point source pollution . . . in storm water run-off are required the maximum extent practicable within the City’s Public rights-of-way.”¹³⁰

Similarly, Lynchburg has been commended for the revitalization of its Riverfront Park, part of which incorporates rain gardens along Jefferson Street, among other elements of green infrastructure.¹³¹ Richmond has also completed several different green infrastructure projects. The city successfully implemented low impact development technologies, including permeable pavement, along the 12th Street alley.¹³² Notably, the city completed this project despite the problems posed by the road’s incline and amount of existing underground utilities.¹³³ A grant from the National Fish and Wildlife Foundation provided \$211,000, which was ultimately matched by the Department of Public Utilities’ partnership with the Virginia Department of Conservation and Recreation (“DCR”).¹³⁴ Richmond also installed bioretention tree planters along 14th Street.¹³⁵ Finally, though not focused on a specific project, Roanoke implemented its own Street Design Guidelines in 2007.¹³⁶ These guidelines encourage low impact design improvements in the ROW and medians that allow for natural filtration of stormwater.¹³⁷ The Guidelines also offer detailed parameters regarding the selection and placement of trees in the right-of-way.¹³⁸

Finally, while the VDOT funding framework may not incentivize the installation of green infrastructure, it is noteworthy that VDOT is, in fact, responsible for the Virginia Pollinator Habitat Program, which seeks to promote the health of local pollinators by funding projects like planting

¹²⁸ NAT. RES. DEF. COUNCIL, MAKING IT RAIN 4 (2018), <https://www.nrdc.org/sites/default/files/stormwater-fees-ib.pdf>. The Virginia Code gives localities the authority to adopt such a fee. VA. CODE ANN. § 15.2-2114 (2017).

¹²⁹ CITY OF ALEXANDRIA, VA., REGULATORY REQUIREMENTS pt. I, 6 (2014), <https://www.alexandriava.gov/uploadedFiles/tes/oeq/info/Regulatory%20Requirements-FINAL.pdf>. The City directs that projects “shall include, but are not limited to: rainfall harvesting, permeable pavements, rain gardens, green roof installation, bioretention cells, urban forestation/reforestation and public education.” *Id.*

¹³⁰ CITY OF ALEXANDRIA, VA., GREEN SIDEWALKS BMP DESIGN GUIDELINES 6 (2014), <https://www.alexandriava.gov/uploadedFiles/tes/info/GreenSidewalksBMPDesignGuidelines%20.pdf>. *See also* CITY OF ALEXANDRIA, VA., ALTERNATIVES EVALUATION: GREEN INFRASTRUCTURE 3-1 (2015), <https://www.alexandriava.gov/uploadedFiles/tes/oeq/info/Green%20Infrastructure-FINAL.pdf>.

¹³¹ *Riverfront Park*, LYNCHBURG PARKS & RECREATION, <http://www.lyncburgparksandrec.com/our-parks/riverfront-park/> (last visited July 22, 2019).

¹³² *Green Infrastructure*, RVAH2O, CITY OF RICHMOND, VA., <http://www.rvah2o.org/green-infrastructure> (last visited July 22, 2019).

¹³³ *Id.*

¹³⁴ *Id.* In addition to NFWF and DCR, another potential funding source for these types of green infrastructure projects is the Stormwater Local Assistance Fund, which provides matching grant funds to local governments for certain projects. VA. CODE ANN. § 62.1-44.15:29.1 (2016).

¹³⁵ *14th Street Initiative*, CAPITAL TREES, <https://capitaltrees.org/projects/14th-street-initiative/> (last visited July 22, 2019). For more examples of green infrastructure projects, see CHESAPEAKE BAY FOUND., VIRGINIA GREEN INFRASTRUCTURE DIRECTORY, <https://www.cbf.org/document-library/sea-level-rise/nature-based-solutions.pdf> (last visited July 22, 2019).

¹³⁶ CITY OF ROANOKE, VA., STREET DESIGN GUIDELINES (2007), <https://www.roanokeva.gov/DocumentCenter/View/1500/Street-Design-Guidelines-Manual-PDF?bidId=>

¹³⁷ *Id.* at 74.

¹³⁸ *Id.* at 76-82.

native plants in the right-of-way.¹³⁹ The Program is funded through the purchase of two different license plates, which generates approximately \$240,000 a year.¹⁴⁰ Regardless of the funding, however, the Program serves as an example of VDOT actively encouraging a form of green infrastructure in the right-of-way.

c. Complete Streets

While the VDOT requirements attached to funding may not entirely encourage green infrastructure in the right-of-way, VDOT is, more generally, supportive of Complete Streets projects. VDOT has funded various aspects of localities' Complete Streets programs through its Transportation Alternatives program.¹⁴¹ Pursuant to the program, VDOT may fund construction of “on-road and off-road facilities for pedestrians, bicycles and other non-motorized transportation users,” among other projects.¹⁴² Recently, VDOT awarded funding to Hampton for the reduction of travel lanes to add a bike lane on a portion of Mercury Boulevard.¹⁴³ Though a part of Hampton's Mercury Boulevard will include green infrastructure, it seems that VDOT is only funding the bike path. However, what this could suggest is that VDOT will not actively penalize a locality implementing green infrastructure because VDOT is funding a project which, in part, includes green infrastructure.

1. Other Considerations

a. Historic Districts

FEMA gives special consideration to historic buildings by exempting such buildings from the NFIP floodplain management requirements so long as the buildings maintain their historic designation.¹⁴⁴ Though this exemption was meant to encourage homeowners of historically designated buildings to maintain the historic integrity of their homes, those homes are at greater risk if they are exempt from meeting the NFIP requirements, particularly considering increasing sea level rise and recurrent flooding. While exempt, historically designated structures are no less prone to flooding than other similarly situated homes. As a result, coastal localities should create

¹³⁹ *Pollinator Habitat Program*, VA. DEP'T OF TRANSP.,

http://www.virginiadot.org/programs/pollinator_habitat_program.asp (last visited July 22, 2019).

¹⁴⁰ JEWEL BRONAUGH, REPORT ON THE DEVELOPMENT AND MAINTENANCE OF THE VIRGINIA POLLINATOR PROTECTION STRATEGY 13 (2018), <https://rga.lis.virginia.gov/Published/2018/RD199/PDF>.

¹⁴¹ VA. DEP'T OF TRANSP., SMART SCALE, <https://www.virginiadot.org/VDOT-Funding-Sources.pdf>.

¹⁴² For information regarding the application process to receive funding for Alternative Transportation projects, see VA. DEP'T OF TRANSP., TRANSPORTATION ALTERNATIVES PROGRAM GUIDE 4 (2017),

https://www.virginiadot.org/business/resources/local_assistance/2017_TA_Program_Guide_Update_-_Interim.pdf.

Though VDOT may fund “[v]egetation management practices in transportation rights-of-way” pursuant to this type of funding, it mainly focuses on other projects, according to the projects that have been funded before. *See Transportation Alternatives (TA) Set-Aside*, VA. DEP'T OF TRANSP.,

<http://www.virginiadot.org/business/prehancegrants.asp> (last updated June 9, 2019).

¹⁴³ VA. DEP'T OF TRANSP., FY19/20 SURFACE TRANSPORTATION BLOCK GRANT SET-ASIDE FOR TRANSPORTATION ALTERNATIVES PROGRAM PROJECTS APPROVAL,

http://www.virginiadot.org/business/resources/local_assistance/FY19-20_Final_Tentative_TAP_Allocations.pdf.

¹⁴⁴ FED. EMERGENCY MGMT. AGENCY, FLOODPLAIN MANAGEMENT BULLETIN: HISTORIC STRUCTURES 2 (2008), https://www.fema.gov/media-library-data/20130726-1628-20490-7857/tb_p_467_2_historic_structures_05_08_web.pdf.

a comprehensive and standardized plan for historic districts that balances the need to maintain the historic character and appearance of the area with the need for resiliency measures. Portsmouth has recognized this important balance and is considering incorporating flood mitigation actions into its Historic District Guidelines.

Mandeville, Louisiana exemplifies one community's efforts to balance between historical appearance and flood hazard mitigation.¹⁴⁵ In the last half of the 20th century, the City of Mandeville was dominated by construction incorporating flood-prone "slab-on-grade development" alongside its historic homes.¹⁴⁶ Hurricane Katrina devastated the city.¹⁴⁷ Afterward, Mandeville sought to incorporate flood resilient measures into the city's historic district guidelines by confronting two different problems: "[h]ow [did] the local zoning code interfere with elevation, and what design standards [were] necessary to mitigate the visual impact of elevation?"¹⁴⁸ Ultimately, the city developed its Old Mandeville Business District Area Plan, which focused on minimizing the perception of elevation and regulating the use of space below elevated buildings.¹⁴⁹

In Virginia, the General Assembly has generally given authority to incorporate these resilience measures into guidelines. The Code states that in drafting its historic district guidelines, a locality may specify that "no building or structure . . . shall be . . . reconstructed, altered or restored . . . unless approved by the [architectural] review board or, on appeal, by the governing body of the locality as being architecturally compatible with the historic landmarks, buildings or structures therein."¹⁵⁰ While no city in Virginia offers the same level of comprehensive historic district guidelines as Mandeville, Norfolk has incorporated some resiliency measures into its Guidelines. The Guidelines specify that storm windows are a "recommended solution" for energy efficiency.¹⁵¹ In fact, Norfolk goes so far as to recommend exterior storm windows for residential projects, only limiting that suggestion by specifying that the storm windows should be one-over-one to reveal the historic windows and should match the color of the window and trim.¹⁵² The Guidelines also contemplate how a house should be raised above a floodplain "if environmental conditions necessitate" elevation.¹⁵³ The elevation should be completed using a "foundation of piers that are compatible, yet distinguishable from the original."¹⁵⁴ Similarly, to aid the installation of storm windows and doors, Alexandria has provided that its review board does not need to

¹⁴⁵ Homeowners in Owego, New York accomplished a similar project. Julie Nucci & Jim Overhiser, *Balancing historic preservation with flood mitigation*, THE ECONOMIST INTELLIGENCE UNIT (2019), <https://floodeconomics.com/how-homeowners-take-action/owego-ny/>.

¹⁴⁶ AM. PLAN. ASS'N, 6 ZONING PRACTICE 3 (June 2018), https://planning-org-uploaded-media.s3.amazonaws.com/publication/download_pdf/Zoning-Practice-2018-06.pdf.

¹⁴⁷ There were 423 NFIP claims and the local damage total was nearly \$24 million. *Id.*

¹⁴⁸ *Id.*

¹⁴⁹ Louisette Scott, *Hazard Mitigation in Historic Districts*, 50-51 (2018), <https://planning-org-uploaded-media.s3.amazonaws.com/document/PIE-Webinar-Hazard-Mitigation-in-Historic-Districts.pdf>.

¹⁵⁰ VA. CODE ANN. § 15.2-2306(A)(1) (2012).

¹⁵¹ CITY OF NORFOLK, VA., CITY OF NORFOLK HISTORIC DESIGN GUIDELINES 54 (2012), <https://www.norfolk.gov/DocumentCenter/View/1801>.

¹⁵² *Id.*

¹⁵³ *Id.* at 62.

¹⁵⁴ *Id.*

approve such improvements prior to installation.¹⁵⁵ Portsmouth could implement similar, or even more stringent, measures in its historic areas that are prone to flooding.

b. TDR Programs

As part of a more general plan to shift development outside flood prone areas, Portsmouth has identified TDR programs as a potential catalyst for such development.¹⁵⁶ In 2006, the General Assembly granted clear authority to localities to implement TDR programs.¹⁵⁷ To utilize such programs, the General Assembly set forth a list of requirements a locality *must* incorporate in its TDR ordinance, including, among ten other provisions, a map of sending and receiving areas and identification of parcels not eligible as receiving properties in the receiving area.¹⁵⁸ In authorizing TDRs, the General Assembly also seems to have allowed localities broad authority to designate sending and receiving areas. The Code states that a locality may “designate receiving areas . . . so long as the development rights permitted to be attached in the receiving areas are equal to or greater than the development rights permitted to be severed in the sending areas.”¹⁵⁹ Additionally, a locality may designate property as a sending or receiving area upon the request of a landowner.¹⁶⁰ Because TDRs are a relatively new creation in Virginia, there is minimal case law regarding restrictions on establishing sending and receiving areas.¹⁶¹ However, the Virginia Supreme Court has held that all twelve requirements must be found within a locality’s TDR ordinance for the ordinance to conform with the Code.¹⁶²

Virginia localities that have established TDR programs have tailored those programs to meet the specific needs of each location. For example, Arlington has established sending site areas for the purpose of open space, “historic preservation, affordable housing, community recreation, and/or community facilities.”¹⁶³ In conformance with these objectives, Arlington allows sending sites to be established at any parcel in the county that meets the TDR purposes.¹⁶⁴ Arlington then designated Clarendon, Columbia Pike, and Fort Myer Heights North as receiving areas.¹⁶⁵ In one project, Arlington transferred density in exchange for improvements to Mosaic Park, which

¹⁵⁵ *Parker-Gray District Guidelines: Windows*, CITY OF ALEXANDRIA, VA. (2016), https://www.alexandriava.gov/uploadedFiles/planning/info/Historic_Preservation/Policies/Adopted%20PG%201.24.16%20Windows.pdf.

¹⁵⁶ BUILD ONE PORTSMOUTH, *supra* note 2, at 64 & 104.

¹⁵⁷ VA. CODE ANN. § 15.2-2316.2 (2019).

¹⁵⁸ *Id.* § 15.2-2316.2(B). In its ordinance, a locality *may* also provide for additional requirements, including that the receiving area incorporate urban development areas established pursuant to § 15.2-2223.1 and that sending properties be required to generate one or more forms of renewable energy. *Id.* § 15.2-3216.2(C).

¹⁵⁹ *Id.* § 15.2-2316.2(D).

¹⁶⁰ *Id.* § 15.2-2316.2(C)(4).

¹⁶¹ One of the few cases in Virginia concerning TDR programs held that localities may not tax a sending area before a receiving area has been designated. *Johnson v. Arlington Cty.*, 794 S.E.2d 389, 393 (Va. 2016).

¹⁶² *Id.* at 392. For TDR model ordinance language, see VA. MUN. LEAGUE, A MODEL TRANSFER OF DEVELOPMENT RIGHTS ORDINANCE FOR VIRGINIA LOCALITIES (2010), https://www.vml.org/wp-content/uploads/pdf/ModelTDROrdinance_0.pdf.

¹⁶³ ARLINGTON CTY., VA., ZONING ORDINANCE § 15.5.7(B) (2019).

¹⁶⁴ ARLINGTON CTY., VA., TDRS: AN OVERVIEW OF THE TDR TOOL 4–5, <https://projects.arlingtonva.us/wp-content/uploads/sites/31/2017/05/4MRV-TDRs.pdf>.

¹⁶⁵ *Id.* at 6–7.

ultimately preserved open space in the County.¹⁶⁶ Meanwhile, Frederick County’s TDR program focuses on preserving open space and agricultural land¹⁶⁷ and sets forth specific requirements that must be met to designate parcels as sending or receiving areas in accordance with those goals.¹⁶⁸

Portsmouth does not currently utilize TDR programs,¹⁶⁹ but the City faces two potential challenges to adopting a successful TDR program. First, Portsmouth is built-out, meaning there may be fewer areas to designate as sending and receiving areas. In response to this challenge, Portsmouth could consider seeking an amendment to Virginia Code §15.2-2316.2(N), which allows any county and an adjacent city to “enter voluntarily into an agreement to permit the county to designate eligible receiving areas in the city if the . . . city also amended its zoning ordinance to designate the same areas as eligible to receive density being transferred from sending areas in the county.”¹⁷⁰ Any amendment would ideally allow coordination between a city and an adjacent city or “neighboring” county. Second, Portsmouth might not be experiencing enough demand for development to ensure the success of a TDR program. Demand for development has been deemed one of the most critical factors in determining the success of a TDR program because a program will not be successful if there is no demand for the rights landowners are willing to transfer.¹⁷¹ Portsmouth will have to contend with these challenges in crafting a TDR program.

IV. CONCLUSION

In response to the challenges posed by sea level rise and recurrent flooding, Portsmouth has identified various actions in its Comprehensive Plan, *Build One Portsmouth*, that relate to several overarching goals: making use of green infrastructure and sustainable land practices; considering overlay districts to address flood-prone areas; ensuring that its transportation, infrastructure, and roads are resilient; and other considerations, such as resilience measures for historic districts and the creation of a TDR program. Portsmouth has authority to enact many important changes that can help move it toward a more resilient future. By utilizing this authority, communicating with its citizenry to incentivize change, and collaborating with neighboring localities and state officials alike to obtain additional authority as needed, Portsmouth can become a more resilient city.

¹⁶⁶ *Board Approves Mosaic Park Construction Contract*, ARLINGTON CTY., VA. (Feb. 26, 2019), <https://newsroom.arlingtonva.us/release/board-approves-mosaic-park-construction-contract/>.

¹⁶⁷ FREDRICK CTY., VA, TRANSFER OF DEVELOPMENT RIGHTS (TDR) ORDINANCE § 165-301.01 (2010).

¹⁶⁸ *Id.* § 165-302.01-302.02.

¹⁶⁹ BUILD ONE PORTSMOUTH, *supra* note 2, at 298.

¹⁷⁰ VA. CODE ANN. § 15.2-2316.2(N) (2019).

¹⁷¹ JESSICA LUNG & MICHAEL KILLIUS, TOOLS FOR A RESILIENT VIRGINIA COAST: DESIGNING A SUCCESSFUL TDR PROGRAM FOR VIRGINIA’S MIDDLE PENINSULA 1, 6 (2016), https://law.wm.edu/academics/programs/jd/electives/clinics/vacoastal/reports/TDR_paper_LungKillius_p10.pdf.