

**Appendix 1**  
**Mathews PC Survey**  
**Comments/Results/ and Follow up**

**1. What are your top concerns about Mathews County as it relates to coastal resiliency and mitigation?**

As a body, you're not concerned about loss of people? Two indicated loss was an issue. Why? Without economic diversification, your tax burden will increase or you have to reduce fixed costs? The financial revenue/expense side of the equation will eventually crumble.

However, three indicated that preservation and diversification of tax base and impact of environmental regulations on development was a concern? Who are you diversifying the tax base for? Do you want to adopt a "build it and they will come approach? Is it your concept to let out migration happen as it will, and hope that others will move into Mathews?

What incentives do you have in place to attract new businesses and or citizens to move into Mathews?

- 5 Preservation/Diversification of tax base  
I believe the county's traditional reliance upon single-family dwelling waterfront residential development as the principal tax base needs to be looked at. Other types of uses such as senior housing, shellfish aquaculture, ecotourism and heritage tourism and wetlands mitigation banks need to be promoted
- 2 Out migration of citizens
- 3 Impacts of environmental regulations on future development
- Other
- Other Preservation of the unique character of the County with its been here's and come here's in a rural, forested, waterfront locale.
- Other Quality of Life Impacts on Citizens and protection of real property
- Preserving the value of our natural resources for our property owners and \_\_\_\_\_ our tax payers

**2. What approach do you feel local government should take in addressing the issues you have identified?**

Clear that from the answers that you want to "live with the water"—That's a very important policy position, its something that you can capitalize on. You can build consistent policy statements on it. Living with the water can become part of your values statements.

However, to live with the water will come expectations of what the governments is going to do or not do. And if the govt is going to do something, how shall if be paid for?

(Received one qualifier that each of the below would depend on the budget impacts and public comment)

- 4 Take measures to protect local communities, resources and infrastructure from the impacts of recurrent flooding.
- 5 Formulate and implement strategies to accommodate (mitigate the damage) the flood waters thereby mitigating damage to community, resources and infrastructure.

Comment [LL1]: Whats the magic number?

Comment [LL2]: Live with water

- 2Formulate and implement measures to **remove** existing development and infrastructure out of high risk areas. (While preserving the integrity of the development and \_\_\_\_\_ the marketability of the resource
- 3Formulate and implement measures to discourage and/or limit future development in high risk areas.
- Local government should not do anything in regards to this matter.(they already do this— lots of practice )

Other I would also like to be made aware of management/retreat strategies that have been successful in coastal communities in Virginia as well as in other states. Information regarding strategies such as vertical setbacks, zoning, redevelopment restrictions, etc. should be presented. In addition, funding sources for offshore breakwaters and other living shoreline erosion control measures should be indentified.

I would like us to find ways to turn this problem into an opportunity. For example, install the VIMS planned breakwaters along the Bay coastline to create and significant beachfront, which could be leveraged as a tourist attraction. Think “Mathews Bayfront State Park” with camping, cottages, hiking, 15 miles of beach, etc  
Seek to maximize the funds available to owners of real-estate who lose their property to floods.

Comment [LL3]: CRS need

## Appendix 2



**Tools for a Resilient Virginia Coast:  
Designing a Successful TDR Program for Virginia's Middle Peninsula**

*Jessica Lung & Michael Killius - Class of 2017*

**Introduction**

Situated at the Eastern tip of the Commonwealth's Middle Peninsula, Mathews County, Virginia, is a historic and charming rural community nestled against the Chesapeake Bay. But the same waters that sustain life in Mathews County threaten its continued existence. As sea levels rise and recurrent coastal flooding razes Virginia's Middle Peninsula, too many citizens of Mathews can only watch as their homes and land slip slowly into the Bay. In order to preserve the beauty and safety of the community for current residents and future generations, Mathews County must look to developing strategies and tools to combat this threat. This paper adapts the transfer of development rights (TDR) concept – a community-planning tool most frequently used for farmland preservation – to alleviate to the financial burdens that recurrent flooding and sea level rise impose on Mathews County and its citizens.

A TDR program diverts development from a designated area of a community where the locality seeks preservation or reduced growth towards another designated area of the community where it seeks more growth.<sup>1</sup> The fundamental TDR process is as follows:

1. The community identifies an area in which it does not want further development, referred to as a “sending” area.
2. The community identifies an area for added development, referred to as a “receiving” area. The community seeks further growth in this location.
3. Sending area property owners or TDR partners elect, if compensated, to sever their rights to develop their property, placing a permanent easement on the land.
4. Meanwhile, developers looking to develop in receiving areas agree to pay extra for added development rights above that which they would otherwise be entitled.
5. This extra fee, paid by developers, is passed to the sending area property owners as compensation for voluntarily relinquishing their development rights.

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<sup>1</sup> Rick Pruetz & Noah Standridge, *What Makes Transfer of Development Rights Work?*, 75 J. AM. PLAN. ASS'N 1 (2009).

In summary, developers thereby pay for an added development bonus with the payment serving as compensation to the sending area property owner for foregoing development and agreeing to preserve his property (most frequently in perpetuity).

Few, if any, such existing programs are designed to encourage sustainable development away from areas vulnerable to sea level rise and recurrent coastal flooding. Burdened by economic and political challenges, TDR programs are, as discussed below, inconsistent in accomplishing the land use objectives of the implementing community. This paper explores the history of TDRs in Virginia, summarizes existing research on TDR effectiveness, describes the challenges in Mathews, and proposes TDR models as land-use tools for sustainable development in Virginia's Middle Peninsula.

### **A History of Transfer of Development Rights in Virginia**

The Virginia General Assembly adopted enabling legislation for TDRs in 2006.<sup>2</sup> Subsequent to its adoption, the General Assembly amended the TDR law to allow for transfers across county-city lines and to remove a requirement that the transferred or severed rights from the sending area be immediately attached to another property after severance.<sup>3</sup> In 2010, a group of stakeholder representatives consisting of lawyers, planners, developers, and others, created a model ordinance.<sup>4</sup> Although many locations within the Commonwealth explored creating TDR programs, currently, only Frederick, Stafford, and Arlington counties utilize a TDR program.

Purchase of development rights programs (PDR) are far more common in Virginia, with 21 participating local governments across the state.<sup>5</sup> PDRs provide governmental compensation to landowners while restricting development on the owner's land which is located within a governmentally designated area.<sup>6</sup> In return for compensation, participating landowners place an easement on their land.<sup>7</sup>

Virginia Beach's PDR program is one of the most successful in the Commonwealth, preserving over 9,265 acres as of 2015.<sup>8</sup> Adopted in 1995<sup>9</sup>, the City of Virginia Beach's PDR program arose out of necessity. In the 1980s and 1990s Virginia Beach experienced unprecedented and extraordinary growth, resulting in land scarcity. Residential development steadily encroached upon the city's greenline, the geographic boundary between the urban/suburban and rural regions of the City. This was problematic because the city's rural areas accounted for roughly one third of the local economy. Virginia Beach determined that extending infrastructure into the rural areas

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<sup>2</sup> BENSON, ET AL., A MODEL TRANSFER OF DEVELOPMENT RIGHTS ORDINANCE FOR VIRGINIA LOCALITIES (2010).

<sup>3</sup> VA CODE ANN. § 15.2-2316.1 (West 2009).

<sup>4</sup> BENSON, ET AL., *supra* note 2.

<sup>5</sup> *Farmland Preservation Tools*, VIRGINIA DEPARTMENT OF AGRICULTURAL AND CONSUMER SERVICES, <http://www.vdacs.virginia.gov/preservation/tools.shtml> (last visited Dec. 2, 2015).

<sup>6</sup> *Id.*

<sup>7</sup> *Id.*

<sup>8</sup> CITY OF VIRGINIA BEACH, AGRICULTURAL RESERVE PROGRAM FISCAL YEAR REPORT FOR 2015 (2015) [hereinafter *Fiscal Report*].

<sup>9</sup> *See Id.*

would be very expensive and cause significant harm to the city's economy and culture. Additionally, rural landowners faced substantial costs and expenses that threatened forced sales of their property. Inheritance taxes on an inherited farm, for example, could sometimes be so large that selling the land was the only option. Virginia Beach's PDR program enabled landowners to retain ownership of their land by providing cash through the purchase of the development rights attached to their property.

A large portion of the Virginia Beach's population supported the establishment of a PDR program. A TDR program was also proposed during this same time period, but it did not garner the same level of public support. Thus, the city moved forward with a plan to develop a PDR program and abandoned the TDR alternative.

Frederick County adopted a TDR ordinance in 2010 to preserve the county's farmland and rural areas.<sup>10</sup> Located in the northwest part of the Commonwealth, Frederick County encompasses the city of Winchester and is mostly rural. Aimed primarily at farmland preservation, Frederick County intended its TDR program to simultaneously accomplish two additional goals: increase development opportunities in Urban Development Areas (UDAs) and benefit the county overall. During the inception of the TDR program, the county found that 30% of all new housing development occurred in the rural areas of the county.<sup>11</sup> Having a significant portion of residential development in rural areas creates challenges for localities since rural areas lack the same level of infrastructure present in the urban and suburban communities. More residential construction in rural areas places a heavier burden on local governments to provide additional schools, transportation, public water and sewer, among other services.

Frederick County's TDR program proposes to preserve farmland and alleviate financial burdens on landowners. Frederick County's TDR program grants residential density rights to qualified landowners, which can then be severed from the land and sold to developers on the open-market. The goal is to allow the landowners to remain solvent and retain ownership of their land. Frederick County subdivided its sending area into three categories determined by land attributes. The county then assigns different density bonuses to each of these categories.

#### PROPERTY RIGHTS AND TDRs AND PDRs

Pruetz and Standridge argue that Virginia Beach was at the time of its adoption of its PDR program fundamentally a conservative community. They share their conclusion that many citizens viewed a TDR program as government intervention with private property rights and the private market. Even though TDRs are often transacted through the private marketplace, the local government serves as a third party to the transaction by enabling the program, determining the sending and receiving areas, and establishing zoning law framework. Interestingly, a PDR program arguably involves more government entanglement with private property rights than TDRs: With TDRs, the government is merely a party enabling the private market transaction while with PDRs it is the marketplace. Moreover, funding for PDRs, as in Virginia Beach, is often obtained through real estate tax levies on all landowners whereas funding for TDRs is obtained through a transaction involving a willing buyer and seller. It is interesting that Virginia Beach opted for a taxing tool to provide economic recovery for landowners and resisted use of the supply and demand of the market alternative.

<sup>10</sup> *Transfer of Development Rights*, <http://www.co.frederick.va.us/departments/o-z/planning-development/transfer-of-development-rights> (last visited Dec. 2, 2015).

<sup>11</sup> FREDERICK COUNTY DEPARTMENT PLANNING AND DEVELOPMENT, TRANSFER OF DEVELOPMENT RIGHTS (TDR) PROGRAM IN FREDERICK COUNTY, VA, <http://www.co.frederick.va.us/home/showdocument?id=1036> (last visited Dec. 2, 2015) [hereinafter *TDR Program in Frederick County*].

Because a TDR programs' success depends on demand for bonus development in the receiving areas,<sup>12</sup> Frederick County's TDR program is designed to be attractive to developers. As with most TDR programs, when developers purchase rights they gain increased development density in a residential development project within a receiving area. An increase in residential densities means an increase in units available for sale and consequently an increase in the property's market value. In addition, gaining additional density rights through participation in a TDR program is often designed to be a faster process than a traditional rezoning for increased density.

Frederick County has completed only one severance and transfer of a development right: a private transfer where the owner of the land in the sending area was the same individual who owned the land in the receiving area. Essentially, the individual transferred development rights from himself to himself. Additionally, though the county approved several farms to transfer their rights, no developers to date have sought to purchase these rights. According to the county's senior planner, the lack of demand for bonus density is primarily due to a stagnant economy and stymied residential development in general in the county.

The current results of Frederick County's TDR program are an example of how the market can dramatically influence the success of a program, regardless of whether a locality has done all it can to enable the TDR process. It is the hope of Frederick County that eventually the market will rebound.

### **TDR Success Factors**

Rick Pruetz and Noah Standridge's article, "What makes TDRs work? Success Factors From Research and Practice"<sup>13</sup> is a useful framing document for localities desiring to implement or improve upon a TDR program. The authors analyzed the 20 most successful TDR programs nationwide, in terms of land area preserved, and identified 10 TDR success factors in those individual programs. The authors ranked the factors by frequency of occurrence:

- 1) Demand for bonus development
- 2) Customized receiving areas
- 3) Strict sending-area regulations
- 4) Few alternatives to TDR
- 5) Market incentives
- 6) Certainty of TDR use
- 7) Strong public preservation support

**TDR ECONOMIC BENEFITS**

Frederick County derives significant benefits from a TDR program. The TDR plan is designed to increase growth in specified urban areas of the county, the Urban Development Area (UDA). When residential development increases, so does the county's tax base. However, homes in the rural areas of the county do not pay proffers or provide transportation improvements. The county must fund these expenses, making residential development in rural areas more costly to the county. UDA's can accommodate a higher density and residential growth than rural areas. When residential density increases within the UDA, and development shifts from rural areas to urban areas, the additional cost of services decreases, which alleviates financial stress on local government. *TDR Program in Frederick County*, note 13.

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<sup>12</sup> See Pruetz and Standridge, *supra* note 1.

<sup>13</sup> *Supra*, note 1.

- 8) Simplicity
- 9) Promotion and facilitation
- 10) TDR bank

Pruetz and Standridge assert that program success depends on the existence of at least one of the following factors:

- Strict sending-area regulations
- Market incentives
- Few alternatives to TDR

They also note that demand for bonus development and customized receiving areas is also a critical factor for success.

The three most successful programs Pruetz and Standridge cite, as of 2008, are King County, WA; New Jersey Pinelands, NJ; and Montgomery County, MD. All three TDR programs exhibit three of these four factors (demand for bonus development, customized receiving areas, and strict sending regulations) and New Jersey Pinelands and Montgomery County also display a fourth factor, few alternatives to TDR.

Demand for bonus development is the highest-ranking factor for successful TDR programs. As reflected in the Frederick County summary, for a transfer of development rights program to work, developers must actually want the rights the landowners are willing to transfer. Locality stimulation of demand for TDRs is not a simple action. Downzoning can be an effective tool to assist in increasing demand for bonus density; however, downzoning can be politically unpopular and combined with the threat of lawsuits, localities may be loath to embrace this solution. An alternative, potentially less-polarizing option, is to connect the transfer with a benefit or a perk other than increased density. For example, localities could allow bonus floor area, or exemptions from road improvement requirements, or expedited building permit processes. This paper discusses this concept in later sections.

Tailored receiving areas are a second critical, factor to success. Successful TDR programs customize their receiving areas to their individual community. Context is key, and necessitates a “boots on the ground” approach. Community stakeholders must buy into the TDR program, so the areas of the community receiving additional density must target the locality’s development goals. Citizens might resist such a proposal due to a “Not in My Backyard” attitude. Pruetz and Standridge suggest creating new receiving areas in previously undeveloped areas, separating new development from existing communities to mitigate this type of resistance.<sup>14</sup>

For most communities implementing a TDR program, the ideal transfer is from rural areas to cities with greater infrastructure and resources. Some counties have experienced success with interjurisdictional transfers. Boulder, CO signed intergovernmental agreements to facilitate transfers of development rights between the

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<sup>14</sup> *Id.*

county and six cities and three unincorporated communities in close proximity to Boulder.<sup>15</sup>

Transfers not only rely on demand for density and customized receiving areas, but also on the supply of TDRs flowing into the market. Strict sending-area development regulations inherently increase the supply of TDRs.<sup>16</sup> Several problems arise when a locality fails to strictly regulate its sending areas. Without strict sending area regulations, the development value of the property may exceed the value of the transferable development rights. As a result, the property owner can either charge more for the right (which could deter developers) or simply develop the property (against the goals of the TDR program). In either scenario, demand for TDRs decreases.

To combat this type of resultant market failure, Montgomery County downzoned their sending areas from one unit per five acres to one unit per twenty-five acres.<sup>17</sup> By downzoning, Montgomery County increased demand for TDRs amongst the development community. Montgomery County's TDR program is now among the most successful TDR programs in the nation.<sup>18</sup> But downzoning sending areas, much like downzoning receiving areas, can incite political backlash,<sup>19</sup> depending on the political climate of the locality. Many opponents to such a downzoning may assert that it is a form of a government taking under the Takings Clause of the Fifth Amendment.<sup>20</sup>

### **Why Do TDR programs fail?**

Localities nationwide have implemented TDR programs, with varying degrees of success. Most of these programs have been directed at agricultural area preservation rather than environmentally sustainable development. Nonetheless, existing TDR schemes, including those that are underperforming or failing entirely, offer insight into how to construct a successful TDR program. While certain design principles predispose a TDR program to success or failure, any successful TDR program must be specifically designed for its local market so as to ensure an optimal supply and demand ratio.<sup>21</sup> A suboptimal ratio of supply and demand incentives within a particular locality can determine the make-or-break of the program.

### **Supply**

If a locality fails to offer a sustainable “supply” of development rights, it effectively stunts the transfer process. While analysts conclude that in general, there are

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<sup>15</sup> Pruetz and Standridge, *supra* note 1, at 82.

<sup>16</sup> Zoning districts that prohibit development densities greater than one unit per five acres are typical examples of “strict sending area regulations.” *Id.* at 83.

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *See id.*

<sup>20</sup> *Id.* *But see*, Kate Kramer, “Coastal Preservation and Transferred Development Rights” *Sea Grant Fellows Publications* (2010),

[http://docs.rwu.edu/cgi/viewcontent.cgi?article=1016&context=law\\_ma\\_seagrant](http://docs.rwu.edu/cgi/viewcontent.cgi?article=1016&context=law_ma_seagrant) (analyzing TDR's under the Takings Clause and concluding that TDR's do not rise to the level of a taking).

<sup>21</sup> Customized receiving areas are ranked second in the success factors listed above.

fewer problems optimizing the “supply” side,<sup>22</sup> most of the TDR programs analyzed were programs meant to preserve agricultural land, not already-developed properties facing coastal flooding and sea-level rise effects.

In some failed TDR programs, the zoning of the sending area undercuts the landowner’s incentive to exchange the development rights. For example, in sending areas with a high baseline density, a parcel of land typically has a somewhat elevated development value.<sup>23</sup> A landowner, aware of this value, is therefore incentivized to retain his development rights, develop the land, and realize that value. In aggregate, a “sending” area would have little to send, and the TDR program would be anemic. In fact, baseline density does not even need to be excessively high for the market to simply sidestep an available TDR program. If zoning density in the sending area merely satisfies (rather than exceeds) market demand, there is little value added by a TDR program that offers bonus density elsewhere. Comprehensive downzoning in a sending area would stimulate a “supply” of transfers by devaluing the retention of these rights, but such a comprehensive downzoning commitment has intimidated some localities.

TDR programs are also prone to fail where there is either burden or uncertainty inherent in the transaction.<sup>24</sup> Because active managerial oversight is similarly important to a program’s maintenance and success, localities must take particular care that this oversight does not burden the process of transfer so as to deter participation. In some jurisdictions, for example, TDR use is not “by right,” and instead requires the approval of local government at some point in the process.<sup>25</sup> The introduction of some discretionary local-government approval process adds an element of risk to investment in the transaction, which in turn can cause participants to flinch. A streamlined, “by right” TDR process minimizes the actual or perceived risks of the transaction and encourages participation. Local government may stimulate the transaction by aggregating and disseminating information to potential participants, establishing a TDR “bank” to mediate the transaction, or even entering the market to stabilize prices, but to reduce the risk that deters investors, localities must accept a reduced amount of control over individual land uses.<sup>26</sup>

### **Demand**

Optimizing the “demand” side – the receiving areas and those seeking to develop within them – is trickier. For the TDR market to thrive and accomplish the locality’s policy goals, demand for development in receiving areas must match or exceed the supply of “exported” development rights from sending areas. Several factors, however, diminish this demand.

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<sup>22</sup> MARGARET WALLS & VIRGINIA MCCONNELL, TRANSFER OF DEVELOPMENT RIGHTS IN U.S. COMMUNITIES: EVALUATING PROGRAM DESIGN, IMPLEMENTATION, AND OUTCOMES 125 (2007).

<sup>23</sup> *Id.*

<sup>24</sup> *Id.* at 124.

<sup>25</sup> *Id.*

<sup>26</sup> *Id.* at 27-28.

TDR programs fail where there are sufficient alternatives to participation in the TDR market. If there are other avenues to receive density bonus in a desired development area without using the TDR program, demand for the TDR is thereby reduced. In some jurisdictions, TDR's are only one of several ways a developer can secure a desired density bonus<sup>27</sup> and these available workarounds dilute the incentive to enter the TDR market to achieve the desired result.

Similarly, TDR programs fail when an alternative to the TDR market is nonparticipation entirely. If the existing density levels in the receiving areas satisfy the market, developers have no need to secure any additional development rights, and therefore no need to enter the TDR market. As discussed above, creative and strategic zoning decisions can stimulate or facilitate demand, but cannot create it entirely; developers must want to develop in a receiving area from the outset.

Just as burdensome government oversight can discourage property owners from severing their development rights, cumbersome restrictions and requirements for eligible developers can discourage participation in the program. Developers will likely be wary of the added transaction costs associated with a clunky, overregulated, or inefficient TDR process.

TDR Failure Factors	
Supply (Transferring Owners in Flood-prone Communities)	Demand (Receiving Area Developers)
In sending area, Development Value $\geq$ Transfer Value	Alternatives to acquire desired density without TDR
Burdensome process deters participation	Existing zoning density satisfies market
Discretionary government approval adds uncertainty, risk	Developers disinterested in receiving area
	Burdensome oversight deters participation
	Discretionary government approval adds uncertainty, risk; development is not "by right"

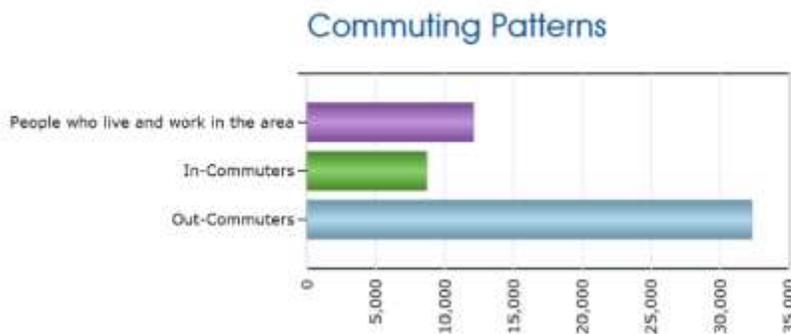
### **Making a TDR Work in the Middle Peninsula and Mathews County**

A successful TDR program in Mathews County, part of Virginia's Middle Peninsula, must be designed for the Mathews County market. First, a locality must incorporate their TDR design into their growth strategies and reconcile a new system of

<sup>27</sup> Qualifying recreational land or improvements, for example. *Id.* at 68.

development incentives with the locality’s long-term interests. Additionally, a locality must apply the factors for TDR success and failure, identified above, when crafting the balance of supply and demand incentives for effective TDRs. In the Middle Peninsula, for example, demographic and economic pressures implicate specific challenges and opportunities in balancing supply and demand.

In the Middle Peninsula, residents overwhelmingly travel out of the area for work.<sup>28</sup> The top 3 destinations of these out-commuters are nearby Newport News, Henrico County, and Richmond.<sup>29</sup> If these residents’ properties are reclaimed by sea-level rise, or razed by recurrent flooding, there may exist a strong incentive for these residents to resettle outside of the Middle Peninsula and nearer to their places of employment. Any TDR program in Mathews County, therefore, must be mindful of the incentive towards diaspora, where property owners transfer their development rights, accept the perks of the program, and flee the county. The locality’s interest in averting redevelopment of threatened property may be accomplished, but at the cost of splintered communities and an eroding tax base. Inter-jurisdictional transfers of development rights are, for this reason, may be a less attractive strategy if it allows for an incentive to resettle out of the area. In effect, Mathews County’s goals are somewhat in tension: to achieve the desired policy goals of relocating residents away from flood prone areas, flood-displaced residents must be encouraged to leave their existing properties, but not the county itself.



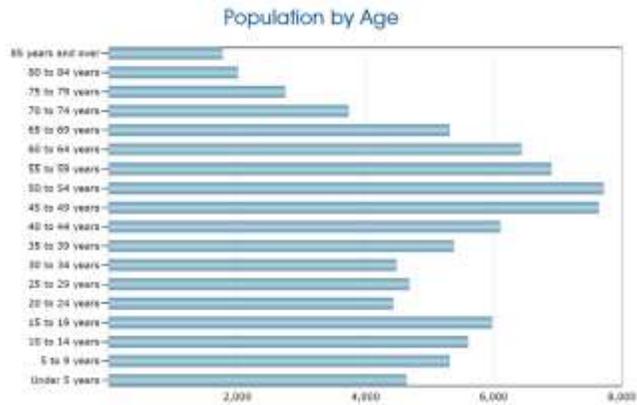
Commuting Patterns	
People who live and work in the area	12,083
In-Commuters	8,690
Out-Commuters	32,308
Net In-Commuters (In-Commuters minus Out-Commuters)	-23,618

Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics, 2012.

<sup>28</sup> VIRGINIA EMPLOYMENT COMMISSION, COMMUNITY PROFILE-MIDDLE PENINSUNA PDC 10 (2015).

<sup>29</sup> *Id.* at 11.

For many in Mathews County, however, shoreside living is a lifestyle choice. The Middle Peninsula population is aging,<sup>30</sup> and older retirees hold many of the threatened waterfront properties prone to recurrent flooding. There may not be strong inclination for some of these residents to forsake the waterfront homes in which they've chosen to spend their golden years.



In turn, “supply” side property owners may not find sufficient compensation to justify relocation. Because of these localized factors, the “demand” side of the market may find little value in added development density. There simply may not be much value in transferring development density.

A successful TDR program for coastal flooding impact mitigation might therefore convert the transferred “development rights” into some valuable bonus other than density. The Middle Peninsula Planning District Commission’s April 2013 Economic Development Strategy documents a variety of prospective development projects in the Middle Peninsula.<sup>31</sup> In essence, a successful TDR program in Mathews County or the Middle Peninsula might necessitate “converting” the development right into some other valuable perk for developers, demand for which would sustain the TDR market and offer a steady stream of demand to entice supply-side homeowners.

The Economic Development Strategy identifies projects of both “strategic” and “vital” importance in the Middle Peninsula. The projects for private industry may be opportunities to entice those private developers to fund TDR’s in exchange for development incentives. Localities like the Middle Peninsula could be endlessly creative in what incentives they tailor for these projects and their developers. Incentives might include tax incentives, streamlined licensure or permitting processes, and even favorable zoning.

Vital Projects	Strategic Projects
<ul style="list-style-type: none"> <li>• Water supply/sewer infrastructure</li> <li>• Broadband infrastructure</li> <li>• Tappahannock Main Street revitalization</li> <li>• Regional tourism</li> <li>• Pellet plant and silviculture</li> </ul>	<ul style="list-style-type: none"> <li>• Upscale retirement home</li> <li>• Regional tourism</li> <li>• Middle crossing of the York River (bridge)</li> <li>• Compressed natural gas filling station</li> </ul>

<sup>30</sup> *Id.* at 6.

<sup>31</sup> MIDDLE PENINSULA PLANNING DISTRICT COMMISSION, COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY (2013).

Localities could therefore align a TDR program – their environmentally-conscious land use interests – with their strategic and economic interests, offering development incentives of real value to developers in particular industries in exchange for funds that would make whole the transferors in flood-vulnerable communities. On this “demand” side of the TDR transaction, widely accepted to be the trickier side to optimize, there is ample room for experimentation to make the program economically viable.

Meanwhile, on the supply side, localities can capitalize on the real, measurable threat of recurrent flooding and sea level rise to stimulate the “supply” of rights transfers. First, localities bear the cost of providing emergency services to flooded areas. If the locality levies were to levy an impact fee on the areas that most require these emergency services (instead of raising taxes on the County at large to bear these costs) homeowners in these areas would be inclined to consider alternatives to continually redeveloping these repeatedly damaged properties. Impact fees could therefore encourage sending area property owners to enter the TDR market and transfer their development rights.

Second, as homeowners face the inevitable loss of their investments by rising water levels, a locality might be able to take advantage of the resulting urgency by structuring its TDR program like a corporate “tender offer.” The locality would limit participation to a finite amount of transfers at a set level of compensation to the transferor. Once the threshold number of homeowners development rights are “tendered” by the right-holders, the TDR program suspends. Each owner, presumably recognizing he will inevitably lose his investment, is incentivized to act immediately to offset that loss, before his similarly-situated neighbors exercise the option and the TDR program closes.

In fact, the locality could be quite flexible in structuring the “tender offer,” tailoring the program to the locality’s specific strategic goals. By structuring the tender offer in tiers, the locality could greatly customize the program and prolong its use if the locality is unwilling to close the program completely. Tenderers in the first “tier” – e.g., the first 20 property owners to tender – receive more attractive or more generous compensation than tenderers in the second tier, who will receive more or different compensation than those in the third, and so forth. A graduated structure would incentivize homeowners to transfer sooner, in competition with other threatened homeowners for increasingly scarce returns.

The front-loaded, tiered tender offer is derivative of hostile corporate takeovers; thus, a tiered transfer program may create the misperception of the locality coercing already-threatened property owners instead of trying to make them whole and keeping them financially solvent. One way to avoid this misperception would be to assure that the compensation offered at each tier – and the differences between the tiers – are used to fairly distribute a finite amount of certain compensation benefits, or could even be tailored into a “sunset” provision, used to attenuate or even extinguish over time the locality’s involvement in the TDR program as its ends are achieved. Moreover, a government program that naturally provides for its own extinction could also alleviate the

anxieties of certain political constituencies that prefer minimal governmental involvement in the management of private property.

### **Political and Cultural Considerations**

As noted earlier, a significant success element in implementation of a TDR program is constituent support. This can be particularly difficult in communities where private property rights is a fundamental pillar of concern. Some members of the community may view TDRs as a form of a “taking” or as government intervention with private property rights. (See, for example, the prior discussion re. Virginia Beach’s experience with proposing TDRs during the early 1990’s where the community reaction was one of opposition in part due to the perception of excessive government intervention.)

An additional level of tension can arise when using TDRs in response to sea level rise and recurrent flooding. Some minimize these existence of these climate change impacts. For some, going under water literally may not be a potential reality to necessitate a TDR program. Increased education and honest, persuasive messaging – in combination with the documentation of the frequent flooding of streets and parking lots – can help shape the understanding of the need.

### **Proposal A- “Traditional TDR”**

The proposal chart below is a series of traditional approaches to a TDR program for the County, Peninsula, and Region. These proposals apply the basic TDR features and components analyzed above to stimulate supply and demand in each scenario. Note that they vary in the following ways:

- In a traditional TDR program, sending area rights holders receive “bonus” density to sell to developers in the receiving areas. This difference of county-, area- and, region-wide bonus levels aims to compensate for the varying size of the program’s “market”; the higher density bonus in Mathews county attempts to incentivize resettling in-county, in the interest of preserving a Mathews county culture, community, and tax base.
- The varying downzoning is meant to adjust for the different size of the TDR market, from Mathews County (relatively small) to the Tidewater Region (relatively large). Aggressive downzoning induces developers to enter the market. The sheer difference in scale at the larger market should be enough to achieve a demand for rights sufficient to compensate the threatened property owners.
- Deferred taxes (common to all scenarios) is chiefly meant to avoid any actual or perceived penalty to any receiving area developer or sending area property owner, while they navigate the TDR transaction.

	Receiving Area		
	Mathews County	Middle Peninsula	Tidewater Region
Supply	Impact fee (sender) TDR bank Defer taxes on rights until severance (sender) High density bonus (receiver) 30 years to exercise (sender) Tiered “tender offer” model (sender)	Impact fee (sender) TDR bank Defer taxes on rights until severance (sender) Moderate density bonus (receiver) 20 years to exercise (sender) Tiered “tender offer” model (sender)	Impact fee (sender) TDR bank Defer taxes on rights until severance (sender) Low density bonus (receiver) 20 years to exercise (sender) Tiered “tender offer” model
Demand	Aggressive downzoning	Moderate downzoning	Minimal downzoning
Potential legislative changes	State law  Zoning ordinance	State law  Interjurisdictional agreements  Zoning ordinance	State Law  Interjurisdictional agreements  Zoning ordinance

**Proposal B- “Nontraditional TDR”**

Bonus density, used in a traditional TDR program, may not always be the solution for creating demand for development rights. For some localities, such as Frederick County, VA, offering bonus density in exchange for rights failed to work because the low general demand for residential development. This proposal suggests an alternative to the traditional bonus density as a TDR feature. By providing an incentive other than residential density, a county might achieve greater success.

One strategy is using local projects as the driver for the purchase of TDRs from property owners by private developers. As previously referenced in this paper, the Economic Development Strategy identifies the economic development initiatives of the Middle Peninsula, and leaves for elected officials the possibility to link some of these

initiatives to a TDR program. For example, Mathews County might offer expedited permit processing to a private silviculture company if it built a pellet plant in the County and purchased TDRs from sending area property owners. The projects and goals set out in The Economic Development Strategy offer creative ways for the Middle Peninsula to generate the funds for achieving the goals of a TDR program.

Low-lying coastal areas like Mathews County might also consider linking the TDRs to wetland mitigation credits as an alternative to bonus density. The County might consider brokering a transaction that “converts” the bonus densities into wetland mitigation credits which the County has established through conversion of the sending area properties upon the severing of the development rights. Developers in need of these credits, either in the county or in the region, could purchase them from the county with all or a part of the purchase price compensating the sending property owner. As in a traditional TDR program, this approach preserves a landowner’s property value, while simultaneously accomplishing the locality’s land use goals.

### **Conclusion**

The concept of TDRs as a vehicle for providing economic relief to properties threatened by sea level rise or recurrent coastal flooding while serving to move development away from these shoreline areas to is one which could offer the Middle Peninsula and Mathews County a new avenue for moving forward. This paper does not look at whether any of the specific proposals or creative alternatives are allowable under Virginia’s existing TDR enabling law, but should the concept merit detailed consideration, and one of the alternatives – or some other alternative – generate discussion and deliberation, the next step would be to establish the framework for such and then take the steps to ensure implementation through the necessary changes to local and/or state law.

## Appendix 3

## Capital Improvement Program



### *Description*

The Capital improvement program or plan (CIP) is a growth management tool available to local government to summarize and guide funding and timing of any planned public physical improvements such as construction of infrastructure and public facilities. CIPs must be based on the comprehensive plan, are short-term, detail-oriented, and include cost-estimates (including a life cycle cost estimate). In Virginia, if directed by the governing body, local planning commissions are authorized to develop and revise CIPs every five years. Unless a locality has a capital improvement program, it may not accept proffers for rezonings or special use permits.

**Through the project ranking, scheduling, and funding prioritization process, the CIP can facilitate or discourage development, major physical improvements and economic growth in specific areas as designated by the comprehensive plan. Conceivably, a locality can use sea level rise projections to identify areas vulnerable to sea level rise and recurrent flooding in the comprehensive plan and recommend that all CIP projects be located out of those areas then through ranking, scheduling and funding in the CIP, direct infrastructure and public facility projects away from those vulnerable areas to areas identified by the comprehensive plan as suitable for growth and development. The CIP also can prioritize green infrastructure or public facilities projects that preserve open space areas with high ecological value to provide recreational amenities, stormwater management, floodplain management, or resource protection. Through the CIP, existing infrastructure repeatedly flooded or vulnerable to storm surge can be relocated and retrofitted or a locality may discontinue funding for these costly maintenance and repair projects. Localities have also used CIPs to leverage funding for other hazard mitigation measures, such as flood abatement projects and land acquisition. Finally, may use the CIP and the comprehensive plan to direct funds to CIP projects through proffers.**

### *Benefits*

- Considering sea level rise when siting CIP projects can ensure public infrastructure is not at increased risk to damage. Furthermore, this can have the added benefit of reducing private development in vulnerable areas.

### *Barriers*

- There is some likelihood of a legal challenge to certain adaptation actions taken through a Capital Improvement Plan. If a CIP attempts to refuse to maintain or rebuild existing infrastructure that would limit private property access, for example, the locality could potentially be liable for a taking.

### *Implementation*

The Capital Improvement Plan is required to be consistent with a locality's Comprehensive Plan. Capital assets and infrastructure funded through a CIP can include land, parks, playgrounds, streets, bridges, bike/ped systems, and water and sewer systems.

#### *Case Study*

The James City County CIP classifies "the acquisition of land for a community facility such as a school, a park, or for green space or conservation purposes" as a Capital Improvement. The CIP funds stormwater projects as a line item, which include the acquisition of property or easements to protect watersheds.

#### *Tools*

The Landscape Fragmentation Tool (Digital Coast) analyzes land cover fragmentation to identify core regions without fragmentation, which have higher ecological values. This can be a valuable tool in identifying areas where infrastructure should not be sited.

#### *CRS*

- 1: Up to 70 points (Activity 540, Capital Improvement Program (CIP), Manual pg. 540-13): Credit for implementing a Capital Improvement Program or Plan that makes "permanent, structural changes within the drainage system" to reduce flood or maintenance problems.
- 2: Up to 75 points (Activity 430, Protection of Critical Facilities (PCF), pg. 430-21): Credit for regulations that prohibit critical facilities in the 100 and/or 500 year floodplains or require higher standards of protection against flood damage.
- 3: Up to 2,250 points (Activity 520, Acquisition & Relocation of Critical Facilities (bCF), pg. 520-7): Credit for removing critical facilities from the 100 and 500 year floodplains.

#### *Authority/Legislation*

Code of Virginia, § 15.2-2223: The comprehensive plan *may* include a capital improvements program, a subdivision ordinance, a zoning ordinance and zoning district maps, agricultural and forestal district maps

Code of Virginia, § 15.2-2239: A capital improvements program is not required; however, if directed by the governing body, the planning commission must prepare and revise a capital improvements program every five years and the program must be based on the locality's comprehensive plan. The code allows localities to use "value engineering" (see Code of Virginia § 2.2-1133) for any capital improvement project

Code of Virginia, § 15.2-2289: No proffer shall be accepted by a locality unless it has adopted a capital improvement program pursuant to § [15.2-2239](#) or local charter. In the event proffered conditions include the dedication of real property or payment of cash, the property shall not transfer and the payment of cash shall not be made until the facilities for which the property is dedicated or cash is tendered are included in the capital improvement program, provided that nothing herein shall prevent a locality from accepting proffered conditions which are not normally included in a capital improvement program.

### *Funding*

#### Resilience Bonds

Resiliency Bonds are an innovative idea from the RE.bound Program to help finance necessary capital investments, similar to catastrophe bonds. The concept involves managing the financial risk of a natural disaster while generating capital investments for risk-reduction projects. The report on resiliency bonds is available [here](#).

### *Sample Ordinance Language*

“The county shall consider the most current and credible sea level rise data when planning long term infrastructure and capital improvement expenditures and land use amendments in areas less than 10 feet in elevation.” (St. Lucie County, Fl. Coastal Management Element Policy 5.2.1.6)

### *Final Thoughts*

- Feedback from one locality underscored the importance of considering sea level rise impact in capital projects. There was concern about the height of a bridge currently under construction and whether it would be affected by sea level rise too quickly to warrant the construction costs. A capital improvement project is a lengthy undertaking, and ensuring it will be accessible through its lifespan helps to ensure public funds are being used efficiently. This could be achieved by establishing standards for useful lifespans of different CIP projects, and requiring that sea-level rise be taken into account over the functional working life of a project. For example, Poquoson, VA has recently installed all new pump stations above the 100-year flood level, using capital investment.
- The Virginia Governor’s Commission recommended that the state discourage the use of public funding on infrastructure in areas highly vulnerable to flooding from sea level rise.
- In Virginia, localities have been required to have a CIP to accept proffers. It should be noted that recent regulatory changes have affected the proffer system. ([link to more detailed section here](#))

### *Resources*

Chandler, M. (2015) “The CIP in Virginia: An Overview and Explanation.” Virginia Tech, Land Use Education Program Workshop: Funding the Future – the Role of the CIP. Richmond, VA.

Grannis, J. (2011). Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use. Georgetown Climate Center

Jarbeau , S. H., & Stiff, M.-C. (2015). Flood Protection Pay-Offs: A Local Government Guide to the Community Rating System. Wetlands Watch.

Ruppert, T., & Stewart , A. (2015). Summary and Commentary on Sea-Level Rise Adaptation Language in Florida Local Government Comprehensive Plans and Ordinances.



## Comprehensive Plan



### *Description*

The Comprehensive Plan contains the official land use planning policies and, at a minimum, requires a locality to establish a framework for future development, a transportation plan and provisions for affordable housing. Legal authority to implement the Plan is achieved through an Official Map, zoning and the subdivision ordinance. The Plan and associated policies may also be funded for implementation through a Capital Improvement Program.

**During the Comprehensive Planning process a locality may study and map community and natural resource vulnerabilities to sea level rise, recurrent flooding and other coastal hazards. Adaptation and mitigation strategies to reduce risk and vulnerabilities can be incorporated into the Plan through land use designations, a local hazard mitigation plan, comprehensive coastal resource management guidance, transportation plan, establishment of Urban Development Areas and/or into the system of community service facilities. As the locality's principal guiding document, the Plan can be used to site critical infrastructure and Urban Development Areas outside of high hazard areas and establish low-density lands to conserve for a transfer of development rights (TDR) program. Lands adjacent to natural infrastructure of high ecological value such as riparian and coastal buffers, floodplains, wetlands, dunes and beaches, (natural resources typically protected through environmental regulations) can be designated for conservation, active or passive recreation, historic preservation, water quality protection, water supply protection, floodplain and/or drainage use and/or incorporated into a system of community service facilities as open space in parks, greenways, forests, or sports playing fields. The Plan also can prioritize areas for conservation easements, restoration activities or property acquisition to preserve valuable ecological areas, historic resources, and/or restore floodplains and improve drainage. The Virginia Institute of Marine Science (VIMS)-developed Comprehensive Coastal Resource Management Guidance on preferred shoreline management options and consideration of marine resource conservation, development and use is a required inclusion in Comprehensive Plans in the Tidewater Region. The Guidance must include "consideration the resource condition, priority planning, and forecasting of the condition of the Commonwealth's shoreline with respect to projected sea-level rise" (Code of Virginia, § 28.2-1100). Additionally, localities in the Hampton Roads Planning District are required to include comprehensive plan strategies to "combat projected relative sea level rise and recurrent flooding" (Code of Virginia, § 15.2-2223.3) in the next Comprehensive Plan update. With the Guidance provided projected sea-level rise scenarios and the consideration of conservation of marine resources (defined as seafood, waters, bottoms, shorelines, tidal wetlands, and beaches), protecting natural open space adjacent to floodplains and inland from the marine resources and siting critical infrastructure out of those areas is an adaptation and mitigation strategy that localities should incorporate into their Comprehensive Plans.**

### *Benefits*

- The Comprehensive Plan is potentially the most useful planning tool to anticipate sea level rise impacts, as it can use studies and mapping to provide evidence of which areas are most vulnerable to flooding.
- Review process provides an opening to plan for SLR
- Provides opportunities for public participation
- Studies undertaken during plan development can assess and identify sea level rise impacts

### *Barriers*

- There is no standard estimate to how much localized sea level rise will occur. The projections vary considerably, and planning for substantially different scenarios is time consuming and expensive.
- While nearly all of the recent comprehensive plans in coastal Virginia mention sea level rise, actual implementation of adaptation and mitigation strategies proposed here are difficult to achieve and sometimes politically unfavorable.
- Localities may lack the administrative time or resources to adopt new policies.

### *Implementation*

The Code of Virginia mandates that the Comprehensive Plan be reviewed at least once every five years and include “comprehensive surveys and studies of the existing conditions and trends of growth, and of the probable future requirements of its territory and inhabitants” (Code of Virginia, § 15.2-2223). These surveys and studies inform the Comprehensive Plan development and revisions. Although the process varies by locality, amendments to the Comprehensive Plan typically require a public review process, as well as public hearings before the Planning Commission and Board of Supervisors. The Board of Supervisors votes to adopt any amendments to the plan. Those localities required to incorporate Coastal Resource Management Guidance can request technical assistance from VIMS. For public facilities, the 2232 review process is required by the state. This process determines if the location, character, and extent of a potential facility are in accordance with the Comprehensive Plan.

### *Case Study*

The 2009 Virginia Beach Comprehensive Plan update included a sea level rise projection of 2.3-5.2 ft. by 2100. Virginia Beach’s Plan is currently undergoing another revision, and resiliency has been a key focus area. In planning for a wide range of SLR scenarios, Virginia Beach has adopted near, middle, and far-term estimates, which is a measure most localities in the region have not yet undertaken.

### *Tools and Resources*

- CanVis (Digital Coast) provides an easy alternative to Photoshop, which allows for the visualization of potential community impacts, including sea level rise, new development, shoreline armor, etc.

- Habitat Priority Planner (Digital Coast) inventories specific habitats and conditions, and allows for “what if” scenarios showing the potential impact of new development or habitat restoration.
- InVEST (Natural Capital Project) includes 18 models for mapping and valuing ecosystem services.
- SLAMM View visualizes SLR projects using the “Sea Level Affecting Marshes” model, and also considers local conditions of the Chesapeake Bay region.

### *CRS*

1: Up to 100 points (Activity 510, Natural Floodplain Functions Plan (NFP), Manual pg. 510-235): Credit for plans addressing habitat conservation and restoration, green infrastructure, open space, and natural floodplain functions in the Comprehensive Plan.

2: Up to 10 points (Activity 420, Open Space Incentives (OSI), pg. 420-20): Credit for recommending open space use or low-density development of flood-prone areas in the Comprehensive Plan.

### *Authority/Legislation*

Code of Virginia, § 15.2-2223: The local planning commission shall prepare and recommend a comprehensive plan for the physical development of the territory within its jurisdiction and every governing body shall adopt a comprehensive plan for the territory under its jurisdiction

Code of Virginia § 15.2-2223.1. Any locality may amend its comprehensive plan to incorporate one or more urban development areas...B.7. A portion of one or more urban development areas may be designated as a receiving area for any transfer of development rights program established by the locality

Code of Virginia, § 15.2-2223.2: A Comprehensive Coastal Resource Management Plan must be included in comprehensive plans [Required for Tidewater localities]

Code of Virginia, § 15.2-2223.3: Comprehensive plans must incorporate strategies to combat projected sea-level rise and recurrent flooding. [Required for localities within the Hampton Roads Planning District Commission]

Code of Virginia, § 15.2-2232: The Comprehensive Plan shall control the general and approximate location, character, and extent of each feature shown.

### *Final Thoughts*

- The barrier discussed above, namely the lack of standard SLR projections, is one that we heard repeatedly from all localities we interviewed. There are too many scenarios to plan for in an efficient manner. The Army Corp of Engineers has created a sea-level change curve calculator that is useful in that its projections are based on specific geographies, and include low, intermediate, and high projections. The Calculator is available here.

- Localities can use their comprehensive plans to target measures specific to their own needs. For example, while some localities are seeking ways to accommodate rising waters, higher-lying cities we've interviewed mentioned the need to prepare for migration within their boundaries. James City County has a policy to implement several watershed management plans within the Comprehensive Plan. One of these, the Powhatan Creek Watershed Management Plan, has called for a minimum 200 ft. riparian buffer along the main tidal stem of the Creek to preserve its ecological value. Incorporating specific, localized plans within the Comprehensive Plan can help ensure the long-term planning vision of the locality is realized.
- The Comprehensive Plan alone has no teeth for enforcing adaptive measures, but it can be highly influential if planning and regulatory tools, including zoning, building codes, subdivision ordinances, floodplain management plans, and green infrastructure plans, are all modeled closely after it.

#### *Call-Out Box*

Beyond prioritizing ecologically valuable areas, the Comprehensive Plan can outline goals to enhance or protect natural resources. The City of Norfolk, for example, has a stated action item within the Comprehensive Plan to expand the current tree canopy from 33% of land area coverage to 40%, through a combination of regulatory action and the city's street tree planting program.

#### *Resources*

CCRM. (2013). *Comprehensive Coastal Resource Management Guidance*. Virginia Institute of Marine Science, Center for Coastal Resources Management.

Moser, S., & Ekstrom, J. (2012). *Identifying and Overcoming Barriers to Climate Change Adaptation in San Francisco Bay*. California Energy Commission .

FEMA. (2015). *Plan Integration: Linking Local Planning Efforts* .

Grannis, J. (2011). *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use*. Georgetown Climate Center .

HRPDC. (2013). *Coastal Resiliency: Adapting to Climate Change in Hampton Roads*. Hampton Roads Planning District Commission.

Mitchell, M., Hershner, C., Herman, J., Schatt, D., & Eggington, E. (2013). *Recurrent Flooding Study For Tidewater Virginia* . Virginia Institute of Marine Science.

Stiles, W. (2010). *A "Toolkit" For Sea Level Rise Adaptation in Virginia* . Wetlands Watch .

VA APA. (2014). *Managing Growth and Development in Virginia: A Review of the Tools Available to Localities*. Virginia Chapter of the American Planning Association .

# Green Infrastructure Plan

## *Description*

A green infrastructure plan is not mandated, but localities who implement their own plans, or who collaborate in regional GI planning efforts, may find them extremely useful. The creation of a green infrastructure plan can provide opportunities for public participation, to inventory and map existing ecological services, and provide strategies for maintaining and expanding those services.

**In many cases, green infrastructure can provide the most cost-effective measures to address flooding and coastal protection. A Green Infrastructure Plan can ensure a locality is aware of the valuable natural services located within it's boundaries, and can act as a blueprint to ensure that those resources are protected and enhanced.**

## *Authority/Legislation*

Executive Order 13690: establishes the Federal Flood Risk Management Standard, which calls for agencies to use natural systems, ecosystem processes, and nature based-solutions when developing flood management alternatives.

Code of Virginia, § 28.2-104.1: Establishes a general permit that encourages the use of living shorelines as the preferred alternative for stabilizing tidal shorelines

## *Benefits*

- A FEMA study (prepared by Atkins) entitled "Flood Loss Avoidance Benefits of Green Infrastructure for Stormwater Management" found that widely adopting green infrastructure on new development and redevelopment could result in \$66-136 million of flood losses avoided, annually (Atkins, 2015).
- FEMA has quantified the economical benefits of open and riparian space, and found the total estimated benefits of green open space to be **\$7,853 per acre, annually**. Riparian space has been found to have a total estimated benefit of **\$37,493 per acre, annually** (Atkins, 2015).
- Provides opportunity to identify multiple benefits and foster collaboration between departments

## *Barriers*

- Maintenance is a critical component of the success of green infrastructure solutions, but many landscapers and contractors lack the experience necessary to ensure projects are operating properly. To overcome this barrier, the Chesapeake Bay Landscape Professional Certification will offer a credentialing program to ensure landscaping professionals are thoroughly trained in the design, installation, and maintenance of BMPs.

## *Implementation*

Typical components of a green infrastructure plan can include a tree canopy assessment or tree inventory, a review of ordinance language to see where GI can be implemented,

## Green Infrastructure Plan

development strategies, mapping, and public involvement, which is especially useful given the opportunities to implement green infrastructure on private property. Implementable actions within a Green Infrastructure Plan can include prioritizing ecologically valuable land for acquisition (fee simple purchase or acquisition of property rights).

Green infrastructure in particular provides many opportunities for multiple benefits, including habitat and water quality protection, stormwater management, recreational opportunities, and credit-generation for MS4 and TMDL programs, as well as the Community Rating System. A green infrastructure plan can help identify these multiple benefits and encourage collaboration between different departments.

### *Virginia Case Study*

The Southern Watershed Area Management Program was first created before the term Green Infrastructure entered the planning lexicon, but it provides a good example of what a GI plan can accomplish. The SWAMP has been referenced in the Virginia Beach Comprehensive Plan, and the HRPDC's green infrastructure network was used by Virginia Beach in the selection process for buffers between military airports. The Chesapeake 2026 Comprehensive Plan calls for the preservation of conservation corridors based on the recommendations contained in the SWAMP.

### *Tools*

- i-Tree (USDA) is a rural and urban forestry software suite that helps quantify the environmental services provided by tree canopies.
- The Green Values Stormwater Calculator (CNT) compares the cost and benefits of green infrastructure to conventional stormwater practices.
- The Landscape Fragmentation Tool (Digital Coast) analyzes land cover fragmentation to identify core regions without fragmentation, which have higher ecological values.
- The CCVI (NatureServe) is a climate change vulnerability index for relative vulnerability of flora and fauna to climate change.

### *CRS*

1: Up to 100 points (Activity 510, Natural Floodplain Functions Plan (NFP), Manual, pg. 510-35): Credit for adopting plans that protect natural floodplain functions.

### *Financing*

- NFWF's Chesapeake Bay Stewardship Fund awards between \$8-12 million annually, which has been used for wetland and forested buffer restoration, oyster reef creation, and open space preservation.
- The Virginia Clean Water Revolving Loan Fund is currently being expanded to establish the Living Shoreline Loan Program, which authorizes low interest loans for the purpose of establishing living shorelines.
- Stormwater utilities and fees raised through permits, inspections, and impact fees on new development can be used to fund GI projects

## Green Infrastructure Plan

- Green infrastructure can be incorporated into projects financed by the HUD Community Development Block Grant Program.

### *Final Thoughts*

Green Infrastructure Plans should prioritize actions based on their effectiveness and ease of implementation. Forest restoration, for example, is a cost-effective way of enhancing stormwater infiltration. GI plans should protect and preserve natural assets first. Following preservation, low-impact development should be encouraged, followed by green infrastructure practices to mitigate negative effects from new development. Recently, Living Walls have been increasing their market-share, as they are both easy to implement, and require less space than green roofs.

Beyond the SWAMP, many localities in the Tidewater Region are working towards green infrastructure plans. The HRPDC released the Hampton Roads green infrastructure plan in 2010, and the Green Infrastructure Center has been working extensively in the region, including Accomack, Essex, Tappahannock, Suffolk, and Norfolk. In 2015, green infrastructure planning grants were awarded to 11 Virginia localities to receive technical assistance from the GIC.

The Chesapeake Bay Landscape Professional Certification program will seek to address one of the biggest barriers to successful green infrastructure implementation, namely the lack of qualified professionals to construct and maintain stormwater BMPs and conservation landscapes. The CBLP program will create a credential system to ensure that landscape professionals have the requisite skills and experience for proper BMP installation and maintenance.

### *Resources*

Atkins. (2015). *Flood Loss Avoidance Benefits of Green Infrastructure for Stormwater Management*. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds.

Bitting, J., & Kloss, C. (2008). *Managing Wet Weather with Green Infrastructure*. Low Impact Development Center.

EPA. (2010). *Green Infrastructure Case Studies: Municipal Policies for Managing Stormwater with Green Infrastructure*. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds.

Kidd, S., McFarlane, B., & Walberg, E. (2010). *A Green Infrastructure Plan for the Hampton Roads Region*. Hampton Roads Planning District Commission.

Rouse, D., & Bunster-Ossa, I. (2013). *Green Infrastructure: A Landscape Approach*. American Planning Association.

## **Green Infrastructure Plan**

Walberg, E. (2007). *Green Infrastructure in Hampton Roads*. HRPDC.

### *Call Out*

The City of Philadelphia hired a consulting firm to conduct a cost-benefit assessment on green infrastructure when compared to traditional grey stormwater approaches. In their report, Stratus Consulting found that using green infrastructure to manage 50% of runoff in the city would provide city-wide benefits (including recreation, property value, heat-island reduction, water quality, and air quality) of over \$2.8 billion through 2049.

## Hazard Mitigation Plan



### *Description*

A Hazard Mitigation Plan (HMP) allows for a locality to identify policies and actions that can be implemented to reduce the risks from hazards. The planning process includes identifying local hazards and assessing risks to both life and property. Communities are required to engage in hazard mitigation planning to be eligible for FEMA hazard mitigation assistance.

**In 2015, FEMA revised its guidance for State Hazard Mitigation Plans to require consideration of climate change. These requirements apply to all State HMPs submitted beyond March 2016. Plans do not need to use the term “climate change”, but they need to plan for future natural hazard events, which include changing weather conditions and flood vulnerability.**

**FEMA now funds hazard mitigation projects that include sea level rise estimates. Hazard Mitigation Plans are not federally mandated to have a sea level rise component. However, if a locality does not incorporate a sea level rise element, funding eligibility is limited to projects that do not take sea level rise into consideration, which would make projects more difficult to justify during the benefit-cost analysis.**



### *Benefits*

- Provides an opportunity for citizen engagement, increasing public awareness of local natural hazards
- Allows for regional cooperation between localities vulnerable to the same hazards



### *Barriers*

- Most localities in the Tidewater region have used Hazard Mitigation money for home elevation, a costly, band-aid approach to resiliency. In 2014, Wetlands Watch released a **study** on the challenges of mitigating sea level rise impacts in Virginia, which found a backlog of over \$430 million in mitigation costs for private structures within four cities in Hampton Roads. FEMA hazard mitigation funds alone are woefully inadequate to address these challenges.
- Quality, enforcement, effectiveness of the plan will vary based on a locality's available resources

### *Implementation*

Both the EPA and NOAA have recommended incorporating hazard mitigation plans into a locality's Comprehensive Plan. FEMA has recommended a 10-step process for hazard mitigation planning, which is also eligible for CRS credit (Activity 510). The FEMA process includes

1. Organize to prepare the plan
2. Involve the public
3. Coordinate with other agencies
4. Assess the hazard

5. Assess the problem
6. Set goals
7. Review possible activities
8. Draft an action plan
9. Adopt the plan
10. Implement, evaluate, and revise

Localities have the opportunity to participate in regional HMPs or to create an individual plan. Single jurisdictional plans have the benefit of sole autonomy in the plan's creation, and reduced administrative complexity. The cities of Poquoson and Chesapeake are two examples of localities that have elected to create individual plans. Multi-jurisdictional plans offer an opportunity to foster collaboration between localities, and can be more efficient by avoiding duplicative documents. Regional HMPs also have the benefit of enabling comprehensive mitigation approaches that affect multiple localities similarly. As such, neighboring communities vulnerable to the same hazards may benefit from a regional approach. This approach, however, has limitations, in terms of local needs and administration. Examples of regional mitigation plans include the Accomack-Northampton Regional Hazard Mitigation Plan and the Middle Peninsula Regional Hazard Mitigation Plan.

#### *Authority/Legislation*

Code of Virginia, § 44-146.18: VDEM will coordinate with localities on preparedness plans to prevent, respond, and recover from all disasters.

44 C.F.R. §201.4: State risk assessments must provide an overview of all natural hazards, including the probability of future hazard events.

44 C.F.R. §201.6: Localities must have an approved mitigation plan to receive HMGP grants.

44 C.F.R. §201.6(b)(1): The planning process shall include an opportunity for the public to comment on the plan

#### *Case Study*

The City of Poquoson updated its Hazard Mitigation Plan in 2015. The Plan contains maps detailing flood hazard areas, storm surge inundation areas, and vulnerabilities to sea level rise. It details flood events occurring within the City over the past decade, as well as vulnerability to future events with estimates for potential losses. The Plan identifies essential facilities and infrastructure within the 100 and 500-year floodplain. The goals of Poquoson's HMP include the protection of existing buildings by implementing both structural and non-structural mitigation projects, as well as the coupling of hazard information with planning initiatives. Mitigation actions include the City's continued participation in the CRS program, the elevation, relocation, and retrofit of structures vulnerable to extreme weather events, the elevation of new critical facilities, and the protection of natural resources to act as a buffer against sea-level rise.

#### *Tools*

- The Weather and Hazards Data Viewer (Digital Coast) is a mapping tool combining weather forecasts with hazard planning data, which can be useful especially for emergency managers.

- NOAA Coastal County Snapshots provides simple, understandable data assessing a locality's exposure and resilience to flooding.
- FEMA's Hazus Average Annualized Loss Viewer provides localities with an average annualized loss due to flooding.
- FEMA has released a Hazard Mitigation Assistance Guidance document to provide detailed information on HMA funding.

### *CRS*

1: Up to 382 points (510, Floodplain Management Planning (FMP), Manual pg. 510-4): Credit for developing a hazard mitigation plan (following a designated process)

2: Up to 115 points (Activity 610, Flood Response Operations (FRO), pg. 610-11): Credit for creating a detailed flood warning and response operations plan

### *Funding*

Wetlands Watch has released a primer on the FEMA Hazard Mitigation Assistance Program FY15 Policy Updates, available [here](#).

### FEMA Pre-Disaster Mitigation Grant Program (FY 2016)

- Up to \$400,000 is available for new mitigation plans
- Up to \$150,000 for local mitigation plan updates

### FEMA Hazard Mitigation Grant Program

- Funding is available after a Presidential major disaster declaration
- The Grant provides up to 15% of the first \$2 billion of estimated disaster assistance, up to 10% of amounts between \$2-10 billion, and up to 7.5% of amounts between \$10-35.3 billion.
- States with enhanced mitigation plans are eligible for assistance of up to estimated disaster assistance, not to exceed \$35.33 billion.

### NOAA Regional Coastal Resilience Grants

- Awards (\$9 million annually) for project proposals that advance resiliency strategies, including hazard mitigation planning.

Virginia has an enhanced state hazard mitigation plan, which increases available FEMA HMA funding. There are a number of hazard mitigation planning-related activities that are not eligible for FEMA funding, including

- Hazard identification/mapping
- GIS software and data acquisition
- Public awareness/education about mitigation
- Project scoping or development (project planning)

### *Final Thoughts*

Disaster planning is a different frame to look at resiliency, and one which might generate support in areas where there is typically opposition. Some localities have made citizens aware that emergency response personnel don't respond to calls they cannot get to safely, underscoring the need for resilient infrastructure.

In practice, many localities use general language in these plans, to ensure eligibility for FEMA funding. More detailed, localized planning would increase the efficacy of hazard mitigation efforts.

*Call Out Box*

The City of Poquoson has used FEMA Hazus data to estimate that a 100-year flood event would cause over \$400 million in damages. However, it was also estimated that the structural elevation projects already undertaken within the City would save \$100 million in damages during a 100-year flood event.

*Resources*

City of Poquoson. (2014). *Hazard Mitigation Plan*. City of Poquoson.

FEMA. (2015). *Plan Integration: Linking Local Planning Efforts*.

Thomas, J., & DeWeese, J. (2015). *Reimagining New Orleans Post-Katrina: A Case Study in Using Disaster Recovery Funds to Rebuild More Resiliently*. Georgetown Climate Center.

# Long Range Transportation Plan

## *Description*

The US Department of Transportation requires both states and regions to complete long range transportation plans in order to receive federal transportation funds. Additionally, a long-range transportation plan is a required component of a locality's Comprehensive Plan. While the current VDOT long-range planning document, VTRANS2035, references climate change, there is no action proposed within the plan to address risks.

**Sea level rise directly impacts infrastructure in the Tidewater region, and many transportation segments are already experiencing regular inundation. By considering sea level rise in transportation planning, localities can shift infrastructure away from areas prone to flooding. This, in turn, helps shift development away from the same vulnerabilities.**

## *Benefits*

- Considering sea-level rise when siting public infrastructure during the planning process can reduce the need for expensive retrofits in the future

## *Barriers*

- There is no mandate for state or regional long-range transportation plans to consider climate change.
- Outside of future siting, adapting infrastructure to sea level rise can be extremely expensive.

## *Implementation*

State and regional long-range transportation plans must be updated every five years. The transportation component of a locality's comprehensive plan must be reviewed by VDOT prior to adoption. VDOT is also available for technical support in the development of this plan.

## *Legislation*

Code of Virginia § 33.1-430 : Allows for the creation of transportation improvement districts.

23 CFR § 450.206: Requires states to complete long range transportation plans in order to receive federal funding.

## *Example*

The Boston Region MPO has made climate change a point of emphasis in their Long Range Transportation Plan. The Plan highlights areas where critical infrastructure will be vulnerable to climate change and identifies policies for adaptation.

Poquoson has a 4.5 ft. elevation standard above mean sea level for new roads.

# Long Range Transportation Plan

## *Tools*

In 2008, the FHA released guidelines for incorporating climate change into transportation planning, available [here](#).

## *Funding*

- The DOT offers approximately \$500 million annually for Transportation Investment Generating Economic Recovery (TIGER) grants. Resiliency is an expressed factor in the selection process.
- The FHA announced in 2012 that federal cost sharing would be made available for “Activities to plan, design, and construct highways to adapt to current and future climate change.”
- A Transportation Improvement District can be used to help fund localized infrastructure improvements. For example, a grouping of commercial owners in a vulnerable area can be used to directly fund infrastructure that would benefit them directly.

## *Final Thoughts*

- There is some legal issue as to how much liability a locality has in reasonably maintaining public roads. *Jordan vs. St. Johns County* held that a government entity has a duty to reasonably maintain public roads, and that “government inaction—In the face of an affirmative duty to act—can support a claim of inverse condemnation”.
- The Long-Range Transportation Plan should consider climate change when determining the useful life of infrastructure within the planning horizon.
- VDOT is the biggest stakeholder capable of adapting infrastructure to sea level rise, especially in rural localities. Localities have noted a lack of guidance from VDOT about adaptation actions.
- The Virginia Commission on Climate Change recommended that VDOT work with regional and local governments to synchronize state transportation plans and local land use plans on the same five-year schedules.
- The locality should develop a critical infrastructure list that considers sea level rise impacts. When considering expensive infrastructure elevation, the priority should be on arterial streets that can be used as evacuation routes during emergencies.

## *References*

## Beach Replenishment



### *Description*

Beach Replenishment (or Nourishment) is a ~~form of natural infrastructure~~ a soft armoring technique that involves pumping sand onto an eroding shoreline, to widen the existing beach. While this does not prevent erosion, it can reduce storm damage to coastal development and infrastructure.

**Beach nourishment increases the area of beach, which allows for more dissipation of wave energy during storm events, and acts as a buffer for coastal flooding.**

### *Benefits/Strengths*

- Protects infrastructure and development from beach erosion and storm surge, without the implementation of hard armoring.
- Programs are already established in many coastal localities

### *Barriers/Obstacles*

- Expensive band-aid solution
- Some ecological concerns (sea turtle nesting may be impacted)
- Concern that nourishment encourages development in high-hazard areas

### *Professions/Stakeholders*

- Local Government
- Beachfront Business or Homeowners
- Marine Resources Commission
- Army Corp of Engineers



### *Authority/Legislation*

- Code of Virginia, § 10.1-704: Prioritizes the use of dredged material for beach nourishment. Considers beaches as the priority disposal sites of dredged material suitable for beach nourishment.
- Coastal Primary Sand Dunes and Beaches Guidelines
- Code of Virginia, § 15.2-2400 Creation of service districts.



### *Sample Ordinance Language*

#### Virginia Beach Ordinance No. 2297, 11-1-94. Sec. 35.1-5

The plan is to accumulate dedicated revenue generated for use within the Sandbridge Special Service District to fund the creation and maintenance of a beach berm having an elevation approximately six (6) feet above mean sea level and a width of approximately fifty (50) feet from the nourishment line with a slope of approximately twenty to one (20:1) to the Atlantic Ocean. Implementation of the plan is expected to produce a designed dry beach area of approximately one hundred and twenty (120) feet, which in combination

with the fifty-foot berm will yield a dry beach of approximately one hundred and seventy (170) feet at mean tide level. Actual or planned elevations, slopes and beach area may vary from time to time as determined by the district engineer of the Army Corp of Engineers, Norfolk District, and the city's director of public works.



#### *CRS Credit*

Up to 100 points (Activity 540, Coastal Erosion Protection Maintenance (EMP), Manual pg. 540-21): Creditable for using beach nourishment as part of an erosion control protection program.

#### *Case Study*

Virginia Beach has the oldest continuous fill program on the East Coast. The local government pays a substantial portion of the cost, which is included in the annual budget. The program has succeeded in protecting economic investment. The Corp of Engineers has estimated that this nourishment protected oceanfront properties from over \$104 million in damages during Hurricane Irene. Nearby Sandbridge has enacted a Special Service Tax District to help fund their own replenishment efforts.



#### *Financing Options*

Virginia localities have financed replenishment efforts with the state's Beach Nourishment Funding Program, special tax districts, and funding from their annual budget. During the recession, the city stopped funding regular beach restoration in the budget, but as of 2016 Virginia Beach has proposed putting between \$1.2-2.5 million into the restoration fund annually for the next six years.

#### *Final Thoughts*

- One innovative technique used in Dutch beach replenishment is known as mega nourishment, where much larger amounts of sand are deposited every 20 years, as opposed to smaller 1-5 year periods. This requires less maintenance than conventional nourishment projects and may offer habitat benefits. A study has looked at the feasibility of this type of replenishment along Virginia Beach, and found that local stakeholders were interested in mega-nourishment for the ecological benefits and long-term cost savings, but had more negative responses to the aesthetic implications of a much larger beachfront and the upfront investment. -
- The economic cost is something to consider, as a report entitled "National Assessment of Beach Nourishment Requirements Associated with Accelerated Sea Level Rise" estimated that the cumulative cost of using sand replenishment to protect Virginia's coast from a 50-200 cm rise in sea level by 2100 was estimated at between \$201 and \$798 million.

#### *Resources*

Basco, D., Colburn, C. (2006). *The State of the Region's Beaches (Hampton Roads, Virginia)*. The Regional Studies Institute at Old Dominion University.

Silton, A., & Grannis, J. (2010). *Stemming the Tide: How Local Governments Can Manage Rising Flood Risks*. Georgetown Climate Center

## Building Code

### *Description*

 **More stringent ordinances could be required in properties in the 100-year or 500-year floodplain. Traditionally adaptation actions implemented through the building code can include freeboard, setbacks, and buffers. Permits for new development could include special conditions, such as impact fees, land use restrictions, conservation, harm armoring restrictions, etc.**

### *Implementation*

Localities can require stricter standards than those provided in the statewide building code.

### *Benefits*

- The permitting process is an opportunity to implement adaptive actions with teeth, as approval is necessary for a proposed development.
- Localities have limited means to implement adaptation actions, but a stringent building code can force developers and contractors to prioritize resiliency.

### *Barriers*

- Enhanced building regulation can have a significant administrative cost
- Permitting comes relatively late in the project development process.

## Uniform Statewide Building Code

### *Description*

 The Uniform Statewide Building Code does not supersede special exceptions, conditional use permits, conditions imposed through cluster development, or local floodplain regulations. This allows a locality to adopt more stringent floodplain regulations, to increase adaptive capacity, while gaining CRS points.

The Uniform Code has several baseline requirements for flood protection. Flood hazard areas require an elevation certification, the inclusion of flood-damage-resistant materials below the design flood elevation, and restrictions on fill.

The USBC supersedes building codes and regulations of the localities, but “shall not supersede proffered conditions accepted as a part of a rezoning application, conditions imposed upon the grant of special exceptions, special or conditional use permits or variances, conditions imposed upon a clustering of single-family homes and preservation of open space development through standards, conditions, and criteria established by a locality pursuant to subdivision 8 of Section 15.2-2242 of the Code of Virginia or subdivision A 12 of Section 15.2-2286 of the Code of Virginia, or land use requirements in airport or highway overlay districts, or historic districts created pursuant to Section 15.2-2306 of the Code of Virginia, or local floodplain regulations adopted as a condition of participation in the National Flood Insurance Program.”

### *Legislation*



## Va. Code § 36-98: Adoption of a Uniform Statewide Building Code

### **National Flood Insurance Program**



#### *Description*

The NFIP creates a series of minimum requirements, but encourages localities to implement stricter floodplain ordinances. NFIP requirements are found in 44 CFR Sections 59 and 60.

#### *Implementation*

Requiring a permit for all development in the SHFA allows localities to ensure proposed development meets all NFIP and local ordinance requirements. The NFIP require that all utilities in new construction be located/designed to prevent water damage during flooding. Elevation is the preferred protection method.



#### *Legislation*

44 CFR Section 59.22: Prerequisites for the National Flood Insurance Program

### **Low Impact Development**



#### *Description*

Including Low-Impact Development in a building code can generate a number of credits for localities, while helping to increase the resiliency of new construction.

#### *Example*

The Town of Marineland requires new development to provide an additional 50% of additional stormwater storage capacity than previously required.



#### *Legislation*

Va Code §62.1-44.15:33: Encourage low-impact development designs for controlling stormwater



#### *Sample Ordinance Language*

##### Norfolk, VA Code: Chapter 15

Chapter 15-5.1: Off-Street Parking and Loading General Requirements: Design and Maintenance Surfacing: Surfacing of parking areas and driveways may be of a material designed to encourage infiltration and shall be subject to approval by the director of public works for material approval, design, and proper drainage provisions.



#### *CRS*

- 1: Up to 250 points (422e, CRS Manual 420-20): Requirement or incentives to reserve floodplain portions of new development as open space
- 2: Up to 25 points (452a, Stormwater Management Regulations 450-8): Creditable for regulations that require LID to mitigate runoff

3: Up to 40 points (452c, Erosion and Sediment Control 450-18): Creditable for regulations that manage the impact of construction on erosion and sediment loads

4: Up to 20 points (452d, Watershed Quality Regulations, 450-20): Creditable for regulations that require the use of BMPs to improve watershed water quality

### **Design Standards**



#### *Description*

Design guidelines should be developed that promote resiliency, such as low-impact development, natural infrastructure, etc.

#### *Implementation*

The NFIP requires that any new construction in flood prone areas be constructed with materials below the BFE that are resistant to flood damage.

#### *CRS*



1. Up to 650 points (432k, Coastal A Zone regulations, 430-32): Creditable for adopting some or all V-zone requirements in the coastal A-zone.



#### *Sample Ordinance Language*

The City/County shall require all new construction within the Accommodation Zone to adhere to performance standards designed to enable development to withstand permanent and/or temporary inundation due to rising sea levels.

### **Building Footprint**



#### *Description*

Building codes can be used to limit a building's footprint, reducing impervious surface.



#### *Sample Ordinance Language*

The City/County shall limit the building footprint for all new residential structures within the \_\_\_\_ zone to \_\_\_\_ square feet and commercial structures to \_\_\_\_ square feet.

#### *Final Thoughts*

Virginia's building code is not in compliance with the NFIP.

### **Building Siting**

In the V-Zone, the NFIP requires that new development "shall be landward of the reach of the mean high tide". FEMA recommends strengthening that requirement to site new construction landward of the long-term erosion setback.

When planning coastal development, it is especially critical to consider the life-cycle costs of the development in question. Coastal homes tend to be more expensive to construct, design, repair, and especially insure, and siting away from hazard areas can minimize homeowner costs long-term.

### **Community Rating System**

#### *Description*



The Community Rating System is one of the most valuable programs available to local staff, because of its potential for tremendous reductions in flood insurance rates. Depending on the extent of eligible activities undertaken, a locality can reduce flood insurance premiums up to 45%.

#### *Implementation*

Localities apply to the FEMA regional office for to receive a CRS insurance premium reduction. CRS activities eligible for credit include public information, mapping and regulations, flood damage reduction, and flood preparedness. Communities can also receive credit for retrofitting projects funded by property owners, state or regional regulatory programs, or other programs implemented by another organization.

#### *Benefits*

- Huge flood insurance reductions to property owners
- Technical assistance is available for free i designing and implementing some CRS activities
- Provides an avenue for tracking a community's floodplain management program

## Building Elevation



### *Description*

The NFIP requires that the lowest floor of a building be elevated above the base flood elevation (BFE). The term “lowest floor” includes a basement, as all usable portions of a building must be protected from flood damage.

Building utility systems (including ductwork) must be elevated above the BFE as well.

### *Implementation*

There are a variety of methods available for structure elevation, including elevating on continuous foundation walls, open foundations (piles, posts, etc) or fill. FEMA recommends using an open foundation system.

### *Benefits*

- Reduces flood risk
- Reductions in insurance premiums can subsidize the cost of structure elevation.
- FEMA has estimated that an average elevation project provides benefits of \$175,000. (FEMA HMA Guidance 2015)

### *Barriers*

- Height limitations, through building codes or historic district standards, could prohibit building elevation. Building elevation can increase the longevity of an existing home, but this is an expensive, Band-Aid measure.
- The USACE has estimated that the total estimated construction cost for an average elevation project to be \$192,000.
- Building costs increase substantially for higher elevations.
- When considering elevation as an adaptation action, it is important to consider associated costs. Raising houses can create a need to elevate large road segments and stormwater systems, and create additional costs for reconnecting driveways, and regrading. In Norfolk, over \$1.2 million was spent on infrastructure elevation for one block, following the raising of twelve homes. Furthermore, other services still have to be provided to citizens following a home elevation, the cost of which could be compounded by increased flooding.



### *Funding*

Building elevation is available for funding under the FEMA Unified Hazard Mitigation Assistance Grant Programs (HMGP, PDM, FMA, RFC, SRL)

### *Example*

Saco, ME has a 3-foot freeboard requirement built into their flood protection ordinance, which requires elevating the structure if any work involved is greater than 50% of the value of the development.

### *Final Thoughts*

- There is a proposal to allow for historic properties that have been elevated by FEMA to maintain their eligibility for historic preservation tax credits. This may have the unintended consequence of encouraging short-term, “business as usual” practices. In the Tidewater Region, many localities have had issues with home elevation projects using FEMA funding, although it is a common practice in the region.
- One locality on the Eastern Shore is considering developing a policy against raising houses.
- Elevation tends to be one of the major actions that localities use for adaptation efforts, but considering the drawbacks, administrative time and funds may be used more efficiently with other measures.

## Ditching Authority



### Description

Poorly maintained roadside ditches can lead to inadequate stormwater drainage. The creation of a Roadside Drainage Authority could help repair the system and reduce flooding events, while helping to meet nutrient reduction requirements in the Chesapeake Bay TMDL and Virginia's Watershed Implementation Plan. A regional ditching authority could help overcome a common inhibitor of effective stormwater management. VDOT does not want to be responsible for additional ditches, so they are unlikely to maintain ditches out of a right of way. Localities are also unlikely to want responsibility for additional ditches. Abandoned ditches that are not receiving necessary maintenance can reduce the overall effectiveness of a stormwater system and contribute to local flooding. Non-vegetated ditches also create sediment problems.



### Regulation

Va. Code 15.2-5102: Any locality (or localities) is/ are authorized to create a water, sewer, or stormwater control authority.

Va. Code 15.2-2400: Any locality (or localities) may create service districts.



### CRS

1. (540, Drainage System Maintenance, 540-1): Creditable for drainage system maintenance.
2. Up to 200 points (542a, Channel Debris Removal, 540-5): Locality regulations that require regular and emergency maintenance of watershed channels.

### Barriers

There is some question as to whether a ditch that rarely dries out would be considered a jurisdictional wetland. Following the *Rapanos* ruling, the EPA and the USACE issued a memo clarifying their jurisdiction through the Clean Water Act. That guidance states that, "Upland ditches (including roadside ditches) that do not carry relatively permanent flow **generally** do not fall under the jurisdiction of the Corps."

### Example

The MPPDC has released a report assessing the feasibility of creating a drainage and roadside ditching authority.

(<http://www.deq.virginia.gov/Portals/0/DEQ/CoastalZoneManagement/FundsInitiativesProjects/task94-01-14.pdf>)



### Ordinance Language

#### Kent County, MD Code of Ordinances. Chapter 46: Public Drainage Association

##### 46-1 Creation; Composition

The Kent County Public Drainage Association is hereby created. It shall have five (5) members appointed by the County Commissioners to serve for one (1), two (2), three (3), four (4) and five (5) years on the original appointment and, for each subsequent appointment, for a five-year term or until their successors are appointed and have taken their positions. The Board of County Commissioners of Kent County, Maryland, shall designate one (1) of its members to be an ex officio member of the Association. From time to time, the members of the Association shall select their Chairman. Vacancies

among the appointive members shall be filled by the County Commissioners for the unexpired terms. Any person may be reappointed to the Association for successive terms. All members of the Association shall be residents, property owners and registered voters of Kent County.

#### 46-4 Powers and duties

It shall be the duty of the Association to recommend to the Board of County Commissioners of Kent County the location or locations to establish ditches, drains or canals and to cause to be constructed, straightened, widened or deepened any ditch, drain or watercourse for the purpose of draining wet, swampy or overflowed lands or lands subject to overflow and to assist the Board of County Commissioners of Kent County in performing its duties as set forth under Article 25, § 52 et seq., of the Annotated Code of Maryland (1957 Edition) pertaining to draining lands.

## Floodplain Management



### *Description*

A floodplain ordinance satisfying a minimum set of requirements is necessary for participation in the National Flood Insurance Program. Floodplain development restrictions can include freeboard requirements, rebuilding restrictions, etc.



### *Financing*

- The USDA Emergency Watershed Protection (through the Natural Resources Conservation Service) provides up to 75% of the construction costs of emergency measures. These funds can be used for floodplain easements, jeopardized water control structures and public infrastructure, and vegetated buffer strips that have been damaged, among others.
- Clean Water Revolving Loan Fund
  - CWSRF funding is readily available and affordable, and interest rates can be as low as 0%. This type of funding is useful for projects where matching funds cannot be acquired. However, repayment to the Fund is required.
- FEMA PDM Grant
  - Prioritizes flood control measures
- USDA Watershed Protection and Flood Prevention Program
  - Provides technical and financial assistance for planning and installing watershed projects.

### *Implementation*

DCR developed guidance for local floodplain ordinances within Virginia, available <http://www.dcr.virginia.gov/dam-safety-and-floodplains/document/fp-va-model-fp-ord.pdf>, which contains standards that satisfy the minimum requirements communities must meet in developing floodplain management ordinances. The guidelines also include suggestions for higher standards and a model ordinance. FEMA has recommended buildings in flood zones subject to breaking waves between 1.5-3 feet, erosion, and scour be constructed to V zone standards.

### *CRS*



- 1: Up to 100 points (512c, Natural Floodplain Functions Plan, 510-35): Creditable for plans addressing natural floodplain functions
- 2: Up to 1,450 points (422a, Open Space Preservation, 420-3): Creditable for protecting undeveloped land in the floodplain.

### *Example*

- Virginia Beach used the DCR model ordinance to develop their Floodplain Ordinance, but included higher standards. For example, the Beach's ordinance includes a requirement of two feet of freeboard above BFE for both residential and nonresidential development, as well as a restriction limiting fill in the southern part of the City, which helps minimize impacts on floodplain storage volume.
- Portsmouth has enacted a cumulative substation damage provision, which requires structures be brought into compliance with the current floodplain ordinance if the

structure has been damaged two times or more during a ten-year period, with cumulative losses exceeding 50% of the building's value.

### *Ordinance Language*

The VA DCR has created a sample floodplain ordinance.

### *Final Thoughts*

- Prohibiting all construction in the floodplain without acceptable mitigation measures is one way to ensure that future development is not at a higher risk for flooding, while at the same time safeguarding land with high ecological values for flood mitigation and floodwater absorption.
- Virginia's Code does not require a permit for all floodplain development, but FEMA regulations dictate that all development be permitted. If this requirement was enforced, every locality within Virginia would be out of compliance.

## **Rebuilding Restrictions**



### *Description*

Rebuilding restrictions can be used to restrict a property owner's ability to rebuild a structure destroyed by flooding. Restrictions can also increase freeboard or setback requirements to increase building resiliency, or limit the construction of hard armoring.

### *Implementation*

Federally, rebuilding restrictions exist through FEMA's "50 Percent Rule", which states that a facility is only considered repairable if the cost of repairs is less than 50% of the value of the property. In Virginia, a structure in a coastal zone may not necessarily be authored to be rebuilt if the structure is destroyed by natural events and condemned by local building officials. In those instances, a new development application would need to be submitted.

### *Barriers*

- Legal concerns over a regulatory takings?

## **Fill**

The Statewide Uniform Building Code places restrictions on fill within the floodplain.



### *Legislation*

44 CFR 60.3: Requires that until a regulatory floodway is designated, no development (including fill) be permitted within Zones A1-30 and AE on a community's FIRM



### *CRS*

1. Up to 280 points (432a, 430-6): Creditable for restricting fill in floodplains
2. Up to 1,330 points (432a, 430-6): Creditable for prohibiting fill in the SFHA.

### *Barrier*

It can be difficult to disallow a property owner from filing yards to reduce flooding on their own property, which can contribute to more serious flooding elsewhere. It could be

beneficial to introduce a regulation prohibiting this practice. One locality we interviewed during the development of this Guide mentioned they were interested in prohibiting any filling on parcels for flood reductions, with no variances permitted. Ordinance language could include “No fill permitted to build up land adjacent to structures for the purpose of flood reduction”.



### *Ordinance Language*

#### Virginia Beach, VA

For area designated as “Floodplain Subject to Special Restrictions” Sec. 4.10. (b). The following provisions shall apply within the floodplain subject to special restrictions. (2) The City Manager, or his designee, may approve the placement of fill provided that the following criteria are met: (b) The combined areas of fill and mitigation shall not exceed five (5) percent of the total area within the floodplain located on the site that will incur the fill.

### **Repetitive Loss**

Adding Repetitive Loss language to a floodplain ordinance can help damaged properties be eligible for Increased Cost of Compliance funds, which can help to pay for an elevation project.

### **New Development**

Discouraging new development within floodplains generates CRS credit and helps reduce expensive repairs or reconstruction following a weather event. Development along the coast has additional considerations, such as ensuring buildings can withstand higher flood levels, velocities, and wave actions. Coastal development should be sited away from shorelines and high-hazard areas, and include freeboard requirements, and as well as mandated utility elevation above the BFE.



### *Sample Ordinance Language*

“When a developer holds property both within and outside the Special Flood Hazard Area, all subdivisions of 5 lots or greater shall be condensed exclusively to land outside the Special Flood Hazard Area when possible and the area within the Special Flood Hazard Area shall be held as open space by a conservation easement.”

### *Final Thoughts*

Localities need to adopt floodplain ordinances according to their own specific geologies. There is a great demand for updated, high-quality flood maps and projections.



## Freeboard Requirement



### *Description*

Freeboard: Elevating a building's lowest floor to a height above the minimum base flood elevation (BFE) required by the NFIP. Typically regulation calls for an additional 1-3 feet above BFE. A freeboard mandate can be added in a locality's ordinances, with height requirements based on zone or level of risk. A number of localities in coastal Virginia already impose freeboard provisions.

### *Benefits/Strengths*

- Significantly reduces the flood insurance premium of a structure.
- Decreases damages caused by tidal and weather events
- Already implemented in many localities in Coastal VA
- CRS Credit
- Useful in both urban and rural areas
- Freeboard is cost-effective. FEMA estimates that the up-front costs are between 0.25-1.5% of total construction costs for each foot of freeboard, which is easily paid off through reductions in insurance premiums.

### *Barriers/Obstacles*



- May face resistance from the building community due to increased construction costs.
- High freeboard levels may necessitate the eventual elevation of infrastructure, a costly "band-aid" solution.
- Freeboard could create inconsistency with utility heights, increasing the complexity of service.
- May be an issue in localities with height restrictions (such as Portsmouth)

### *Implementation*

Freeboard requirements are typically implemented through a locality's building code. Freeboard requirements can be increased in an overlay zone where development is especially vulnerable to recurrent flooding.



### *Authority/Legislation*

- Freeboard is not required by NFIP standards.
- Virginia Construction Code Appendix G1001.6: Mechanical, plumbing and electrical systems must be elevated or flood-proofed to Base Flood Elevation or Design Flood Elevation.



### Sample Ordinance Language

#### Portsmouth Ordinance: Sec. 14.1-11

The following provisions shall apply for the VE or V Zones (Coastal High Hazard areas). a. All new construction and substantial improvements in Zones V and VE (V if no base flood elevation is available) shall be elevated on pilings or columns so that:

- 1) The bottom of the lowest horizontal structural member of the lowest floor (including all HVAC and duct work but excluding the pilings or columns) is elevated above the base flood level by at least three feet; and
- 2) The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one percent chance of being equaled or exceeded in any given year (one-percent annual chance).



### CRS Credit

Up to 500 Points, Probable Credit, Activity 432b, Freeboard (FRB), *CRS Manual*, 430-10. Creditable Activity: Adoption and enforcement of a freeboard provision in the floodplain.

### Case Study

A number of tidewater localities have already enacted freeboard requirements, as shown in the table below.

Locality	Freeboard in SFHA	Freeboard Outside SFHA
Accomack County	2 Feet	N/A
Cape Charles	1 Foot	N/A
Chesapeake	1.5 Feet	N/A
Chincoteague	2 Feet	N/A
Franklin	BFE	N/A
Gloucester	2 Feet	N/A
Hampton	3 Feet	18" above grade in Shaded X
Isle of Wight County	1.5 Feet	N/A
James City County	2 Feet	N/A
Lancaster	1.5 Feet	N/A
Mathews County	BFE	N/A
Newport News	2 Feet	N/A
Norfolk	3 Feet	18" above grade in Shaded X
Northumberland County	2 Feet	N/A
Poquoson	3 Feet	N/A
Portsmouth	3 Feet	N/A
Richmond	1 Foot	N/A
Roanoke	2 Feet	N/A
Southampton County	1 Foot	N/A
Suffolk	BFE	N/A
Virginia Beach	2 Feet	
<u>Wachapreague</u>	3 Feet	N/A
Williamsburg	BFE	N/A
York County	3 Feet	N/A

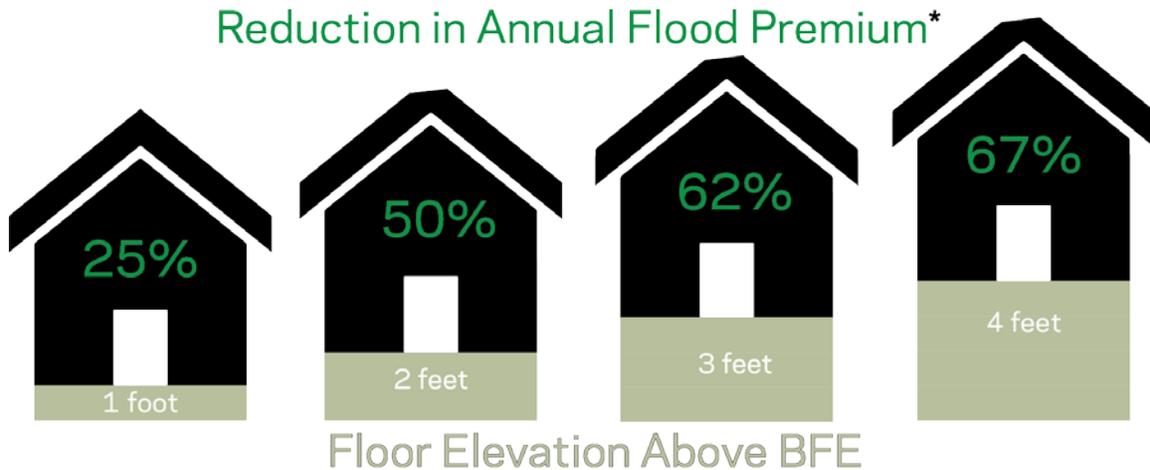


### *Financing Options*

As a regulatory measure, there are no additional costs to a locality to implement a freeboard requirement. The increased construction costs are minimal, with a recent FEMA study (*Evaluation of the National Flood Insurance Program's Building Standards*) concluding that freeboard adds approximately 0.25% to 1.5% of total construction costs for each additional foot of height. These costs tend to be offset by reductions in insurance premiums.

### *Final Thoughts*

The Virginia Beach Public Utilities Department has an unofficial policy of adding 3 feet of freeboard for all locality projects. The Hampton Roads Planning District Commission passed a resolution in 2015 encouraging local governments to consider adopting higher freeboard requirements.



\* Example: V-Zone building with an open foundation. \$250,000 building coverage, \$100,000 contents coverage. Reductions compared to lowest flood at BFE. Note: This does not include recent rate increases. (FEMA Home Builder's Guide to Coastal Construction)

## **Flood Insurance**

### *Description*



An average homeowner is five times as likely to suffer flood damage than fire damage. Property owners may assume that flood insurance is only necessary in Special Flood Hazard Areas, where there is at least a 1-4 chance of flooding over the life of a 30-year mortgage. However, over 20% of insurance claims come from property owners outside of mapped high-risk flood areas.

## **Private Insurance**

### *Barrier*

In areas with old housing stock that has already been paid off, some people would rather pay out of pocket for flood damage instead of insurance premiums, which is a huge risk.

## **National Flood Insurance Program**

### *Description*



Over 23,000 communities nationwide are enrolled in the NFIP. Participation is voluntary, but requirements include mapping flood hazards and creating an approved floodplain management ordinance. Flood insurance is mandated for homes with a federally-backed mortgage in a high risk zones. Those property owners who have received a federal grant for previous losses are also required to have insurance to qualify for any future aid. Typically, under the NFIP, homeowners may purchase up to \$250,000 of building coverage and \$100,000 of personal property coverage. Excess flood insurance can be purchased privately.

### *Funding*

#### FEMA Flood Mitigation Assistance



- Goal of reducing/eliminating claims under the NFIP
- Available for flood hazard mitigation projects and hazard mitigation plan development
- Localities are sub applicants that must apply to the state (DEQ)



#### CRS

1: Up to 15 points (442b, FIRM Maintenance, 440-8): Creditable for maintaining historic FIRMs and related products

## **High Water Mark Initiatives**

### *Description*



The High Water Mark Initiative is a program under the National Flood Insurance Program that aims to increase community awareness of local flood risk. A key component of the program includes installing signage highlighting flood risk.



#### CRS Credit

1: Up to 200 points (332a, Outreach Projects, 330-6): Creditable for public high water mark initiatives.



## Living

## Shorelines



### *Description*

Living shorelines mimic natural functions to provide erosion control, but unlike their hard-armored counterparts, also improve water quality, enhance shoreline habitat, and help maintain coastal processes.



### *Legislation*

§15.2-2223.2: Establishes Living Shorelines as Virginia's preferred tidal shoreline management.

62.1-229.5: Expands the Virginia Water Facilities Revolving Fund to authorize loans for establishing living shorelines.

§28.2-104.1: Authorizes the VMRC to establish and implement a general permit authorizing and encouraging the use of living shorelines

### *Financing*

- Vegetation management for shoreline stabilization is eligible for all FEMA HMA programs.
- Virginia Shoreline Resiliency Fund  
The VSRF was created to act as a revolving loan program for shoreline protection. Although it is as of yet unfunded, the program may one day be a useful tool in living shoreline implementation. Local guidelines for the revolving loan fund are available at DEQ's website:

### *Benefits*

- Can be more cost-efficient than hard-armoring techniques, which can require expensive repairs.
- Provides ecological, recreational, and aesthetic benefits
- Mitigates some of the negative aspects of hard-armoring, including downstream erosion.

### *Barriers*

- As a relatively new advancement, there is much to learn about the efficacy of living shorelines. For example, oyster filtration capabilities tend to be dramatically overstated, as most of the nitrogen an oyster is capable of filtering returns to the water, excluding that which is stored in its tissue. However, there is research underway concerning the ideal conditions needed for bacteria to process nitrogen in oyster fecal matter, which would vastly increase oyster reefs ability to treat water quality.
- Living shorelines that incorporate oyster reefs can also vary widely in construction cost. Projects implemented by the Army Corps can be significantly more expensive than those undertaken by localities or NPOs.

- There is a shortage of properly trained contractors with experience installing living shorelines.
- There can be increased complexity with a living shorelines project, as designs need to be more-site specific.
- Living shorelines require periodic inspection and maintenance, and are not always suitable for areas with high energy wave action.



*CRS*

- 1: Up to 120 points (422g, 420-28): Creditable for localities that have adopted regulations prohibiting armoring on private or public lands
- 2: Up to 1,000 points (532, Flood Protection, 530-6): Creditable for small scale flood control projects that protect insurable buildings
- 3: Up to 1,600 points (532, Flood Protection: Retrofitted Buildings 530-2): Creditable for installation of individual property barriers including levees, berms, and floodwalls.

*Final Thoughts*

- Successful living shoreline programs will need to consider long-range planning. Shorelines will need to have space to migrate as sea level rises.
- While living shorelines are technically the preferred method of shoreline management in Virginia, in practice local Wetlands Boards will often accept rip rap. In Maryland, living shorelines are also the preferred method, but there is more enforceability. Maryland law requires living shorelines unless they are not practical.

## Real Estate Disclosure Statement



### *Description*

A real estate disclosure statement is required by the state of Virginia. It is designed to increase transparency in the real-estate market, by ensuring there are no enforcement actions pursuant to the Uniform Statewide Building Code that would affect a property. Currently, Virginia's Residential Property Disclosure Act does not require that sellers disclose flooding potential.

**A policy requiring all sellers of real property within a vulnerable overlay district to provide notice about a property's risk of recurrent flooding.**



### *Legislation*

Va. Code 55-517: Virginia Residential Property Disclosure Act

### *Issues/Barriers*

One real estate issue especially relevant to Hampton Roads occurs when nonlocal citizens migrate into flood prone regions. With the large influx of military personnel, families may purchase properties sight unseen, or without fully understanding local flood risks.

Flood insurance is a cost many prospective homeowners do not consider until the later stages of the home buying process. However, federally mandated flood insurance can be a huge expense, especially when one considers the cost over the life of a 30-year mortgage.

Localities can earn CRS credit by meeting with and educating real estate professionals about sea level rise. It was noted in our meetings that many localities already field calls from realtors.

### *Example*

Texas has real estate disclosure notices for homes with high coastal erosion.  
[Texas Natural Resources Code § 61.025. Disclosure to Purchaser of Property](#)

## Shoreline Protection



CRS

Up to 120 points (422g, 420-28): Creditable for localities that have adopted regulations prohibiting armoring on private or public lands

### **Joint Permitting/Army Corps Permitting:**



*Legislation*

Clean Water Act, Section 404, River and Harbors Act Sec. 10: Grants Corps authority for essentially all ground-disturbing activities in navigable waters and adjacent wetlands.

Va. Code §15.2-970: Localities may construct a dam, levee, seawall or other structure to prevent tidal erosion, flooding, or inundation.

*Implementation*

It has been proposed that Sec. 404 permitting contributes to the over-armoring of shorelines. Activities that are inland of the mean high tide line do not require an Army Corps' permit. It is easier to build an armored structure entirely above the mean high tide line and bypass this additional regulation, than it is to install a soft shoreline practice that would require either a general or individual permit. Furthermore, the CWA exempts maintenance of hard-armored structures specifically, but no such provisions exist for soft-armoring practices.

The Army Corps issues two types of permits- a streamlined general permit, and a much more onerous individual permit. In the past, this has also inhibited the development of living shorelines, which would typically require an administration-intensive individual permit. Fortunately, Virginia has developed a general permit for living shorelines through the Joint Permit Application, which fulfills permit requirements from Local Wetlands Boards, the VMRC, and the Army Corps.

### **Coastal Sand Dunes/Beaches Permit**

No construction that has the potential for encroachment on or damaging primary sand dunes or beaches can occur without review and approval by the VMRC and a local Wetland Board.

### **Hard Armoring**

Traditional shoreline protection measures have included constructing bulkheads, seawalls, revetments, dikes, tide-gates, and groins, among others.



CRS

1. Up to 1,000 points (532, Flood Protection, 530-6): Creditable for small scale flood control projects protecting insurable buildings, or for channel modification.
2. Up to 1,600 points (532, Flood Protection: Retrofitted Buildings 530-2): Creditable for installation of individual property barriers including levees, berms, and floodwalls.

### *Implementation*

Areas with considerable development and critical infrastructure may often require hard armorment. However, a stringent permitting process can prohibit implementation in instances where natural infrastructure would be more effective. The CCRM has developed a decision tree that is useful in determining when it is appropriate to construct/reconstruct.

### *Drawbacks/Barriers*

There are significant drawbacks to hard armoring a shoreline. These practices can be expensive to construct, as well as maintain. Obviously, failure rates vary based on a litany of factors, but seawalls and levees can give residents within the area a false sense of security. For smaller measures, like bulkheads, repair or reconstruction of a failing system is very costly. From an environmental perspective, hard armoring tends not to mitigate, but rather shifts, erosion downstream to other vulnerable areas.

### **Natural Infrastructure**

Along the coast, dunes are the first line of defense against storm surge. Some localities have required more stringent coastal setbacks to allow for the upland migration of beaches or tidal wetlands.

### **Tidal Wetlands**

The USACE has estimated the cost of wetlands restoration to average approximately \$565,000 per acre.

## Stormwater Management



### *Description*

Traditional stormwater management projects, such as culverts, drain pipes, floodgates, and detention basins, are eligible projects under all FEMA HMA programs. Low Impact Development can help mitigate stormwater, through the use of rain gardens, bioswales, permeable pavement, and other BMPs. Localities can use BMPs on private property to generate a number of credits. When siting BMPs, developers need to be required to consider sea level rise to ensure structures won't be compromised.



### *Financing*

- Nonpoint Source Pollution Control Program
- Chesapeake Bay Program
- Virginia Stormwater Management Fund
- Clean Water Revolving Loan Fund
  - CWSRF funding is readily available and affordable, and interest rates can be as low as 0%. This type of funding is useful for projects where matching funds cannot be acquired. However, repayment to the Fund is required.
- FEMA PDM Grant
  - Prioritizes stormwater management, as well as any mitigation activities that utilize green infrastructure.
- Stormwater Local Assistance Fund
  - SLAF grants provide (50/50% locality match) funds for stormwater BMPs and stream restoration. Grants range from \$100,000-\$5,000,000. Recent SLAF funding has totaled around \$23 million annually in Virginia.
- Virginia Agricultural BMP cost-share program
  - 75% cost share, up to \$50,000, for the voluntary installation of BMPs
- Virginia Conservation Assistance Program
  - Reimbursements to property owners for BMP installation, including cistern installation and rain gardens.



### *Legislation*

Va. Code §62.1-44.15:27: MS4 localities are required to adopt a VSMP

Va. Code §62.1-44.15:33: Localities are authorized to adopt more stringent stormwater management ordinances

VA. Code §62.1-44.15:34: Construction General Permit required for the development of single family lots with 1 acre or greater of land disturbance.

### *Implementation*

Stormwater management falls under two major jurisdictions- MS4 and non-MS4. While the regulatory landscape for MS4 communities is relatively understood, there is a great deal of confusion in non-MS4 localities.

Stormwater management is required on erosion and sediment projects greater than 10,000 square feet. Permanent stormwater management facilities require long-term and enforceable maintenance, as well as minimum annual inspections. Ensuring proper maintenance and inspection of stormwater BMPs is critical for their continued performance.

### *Barriers*

- The Virginia Department of Environmental Quality doesn't require VSMP permits for the redevelopment of single family lots with less than an acre of land disturbance. This is especially problematic in developed cities with high residential land use. In areas subject to the Chesapeake Bay Preservation Act, however, single family residences may be regulated when land disturbance exceeds 2,500 square feet.
- One barrier that has often been repeated in locality meetings is the issue of local liability for flood damages. For example, a locality may be hesitant to try and repair a failing stormwater BMP out of concern over liability or future maintenance needs.
- Proper maintenance of stormwater BMPs is critical for their continued operation. Common mistakes include mowing wetlands, failing to replant or water vegetation in buffer strips, etc.
- The EPA has advised that nutrient credits should not be traded between watersheds, but Virginia allows for credits to be purchased in the same or adjacent HUC.

### *CRS*



1: Up to 1,000 points (532, Flood Protection, 530-6): Creditable for small scale flood control projects that protect insurable buildings, or storage facilities with natural buffers or wetlands.

2: Up to 110 points (452a, Stormwater Management Regulations, 450-5): Creditable for regulations requiring restrictions on land-disturbing activities over a given size threshold

3: Up to 225 points (452a, Stormwater Management Regulations, 450-6): Creditable for regulations that plan for stormwater discharge amounts resulting from various sizes of storms.

4: Up to 20 Points (452a, Stormwater Management Regulations, 450-10): Credible for regulations that require the maintenance and inspection of stormwater facilities

5: Up to 120 points (542e, Storage Basin Maintenance, 540-18): Creditable for regulations or policies requiring the annual maintenance of storage basins for stormwater management

6: Up to 350 extra credit points (422c, Natural Functions Open Space, 420-13): Creditable for prohibiting development in areas that are preserved for natural stormwater management.

7: Up to 80 points (332c, Program for Public Information, 330-12): Creditable for raising public awareness of stormwater issues.

### *Tools*

The DCR has created a stormwater management model ordinance.

### *Sample Ordinance Language*

Fluvanna, County VA

## Section 3. Stormwater Management Program Permit Procedures and Requirements

### 3.3 Stormwater Management Plan Required

E. Maintenance Plan- The design and planning of all stormwater management facilities shall include detailed maintenance procedures to ensure their continued function...

G. Maintenance Easements- The applicant must ensure access to all stormwater treatment practices at the site for the purpose of inspection and repair by securing all the maintenance easements needed on a permanent basis...

H. Maintenance Agreement- The applicant must execute an easement and an inspection and maintenance agreement binding on all subsequent owners of land...

#### *Virginia Example*

James City has produced Special Stormwater Criteria. These criteria are more stringent than traditional stormwater management regulations, with an increased emphasis on site design and source control. Conditions of the criteria can be met if high-priority soils are saved, as to sufficiently maintain the natural recharge of the soil. If natural recharge is impacted, then SSC measures- including the use of on-site BMPs (including rain gardens, rain barrels, swales, pervious pavers, etc), shared parking agreements, are required.

#### *Final Thoughts*

- Virginia released new stormwater regulations in Summer 2014.
- Amendments to VA Code 15.2-2303.4 will go into effect in July 2016 that affect conditional rezoning proffers. This will prevent localities from requesting or accepting an "unreasonable proffer" when approving new development. An "unreasonable proffer" is defined as one that fails to address an impact specifically and uniquely caused by the development. So while traditional proffers like infrastructure will likely be unaffected, there is great concern among localities as to what is and is not "unreasonable", and what impacts can be "specifically attributable" to a proposed development. Specifically, things like parks, public facilities, and preserved open space that could have benefits for stormwater and flooding may be rejected. High-density neighborhoods and neighborhoods targeted for revitalization are exempt from the new restrictions, meaning that rural and suburban areas experiencing high degrees of growth will be most affected.
- Localities are directed to encourage low-impact development and nonstructural means for controlling stormwater management.
- Recently, the Stormwater Consolidation Bill was passed, which has strong implications for stormwater management.
- There is confusion among non-MS4 localities about who the designated VSMP is. If localities are required to self-identify as the VSMP, as opposed to designating DEQ as the authority, there are major complications. The VSMP is ultimately responsible for the BMPs, so if a locality is acting as the VSMP authority they would have to require a cash surety for every BMP installed, to ensure funding for maintenance and repair. The high cost of this cash surety (at least 10X the cost of the BMP) would effectively stop development within the locality.

## **Tree Canopy**



### *Description*

It is important to preserve and restore the urban tree canopy, which can be especially valuable for stormwater management, among a litany of other multiple benefits.

### *Implementation*

Different species have significantly different ability to absorb stormwater.



### *Sample Ordinance Language*

#### Town of Cape Charles Zoning Ordinance Appendix F: Tree Conservation and Preservation Ordinance

##### Section 1.2: Intent and Purpose

The intent of the Cape Charles Tree Master Plan is to develop vibrant green infrastructure in all town districts by promoting the planting of appropriate new trees, and protecting appropriate existing trees. The Plan's purpose is to ensure the beauty and ecological health of Cape Charles for its citizens and guests. The general intent and purpose of this Tree Conservation and Preservation Ordinance is to implement the Cape Charles Tree Master Plan.

The specific purposes of this ordinance are: to perpetuate tree growth; to encourage tree preservation; to provide adequate tree canopy and density; and to protect water quality by minimizing erosion and sedimentation, enhancing the infiltration of stormwater runoff, and maximizing nutrient intake. The intent of these regulations is also to preserve and enhance the aesthetics of the Town, and to reduce the negative impact such as noise and glare of uses and structures which are in close proximity to each other and which are generally regarded as incompatible, and to promote attractive landscaping in residential, commercial and industrial districts of the Town. A comprehensive plan for each individual lot or parcel is essential for the visual enhancement of the Town and for the protection and promotion of appearance, character, and economic values. The purpose and intent of such landscaping requirements are to reduce the visibility of paved areas from adjacent properties and streets, moderate climatic effects, minimize noise and glare, and enhance public safety. Landscaping will provide transition and buffers between neighboring properties.

The terms and provisions of this article shall apply to real property in the town as follows:

- (a) All undeveloped property and property undergoing redevelopment.
- (b) Streetscape area of all developed property including existing developed areas and the historic district.
- (c) Public rights-of-way, parks and public grounds.

### *Example*

In their recent zoning rewrite, the City of Norfolk has included provisions to protect specimen trees on private property. The City is determining if there is authorization to further expand protection efforts of street trees on private property.

# Zoning Ordinance



## *Description*

Following the vision of the Comprehensive Plan, zoning provides the legal framework for land governance. Each zone within a zoning ordinance states design requirements that govern development. There are a number of traditional zoning requirements that can be used in adaptation efforts to sea level rise.



## *Authority/Legislation*

Code of Virginia, § 15.2-2280: Authorizes localities to establish zoning districts.

## *Benefits/Strengths*

The Chesapeake Bay Act Preservation Act requires zoning ordinances in all Tidewater localities, so localities vulnerable to sea level rise have at least some zoning regulations already enacted.

Zoning is one of the major tools available to preserve open space. FEMA has quantified the economical benefits of open and riparian space. FEMA found the total estimated benefits of green open space to be **\$7,853 per acre, annually**. Riparian space has been found to have a total estimated benefit of **\$37,493 per acre, annually**.

## *Implementation*

While rezones occur frequently, a comprehensive zoning rewrite is a rare undertaking. As a result, zoning codes can often seem confusing and disorganized to those inexperienced with a locality's specific ordinance requirements. While rezonings that restrict a property owner's development are likely to encounter opposition, localities can use overlay districts to enact additional regulations that can increase resiliency to flooding.



## *CRS*

1: Up to 250 points (422e, Open Space Incentives, 420-20): Creditable for requirements or incentives to reserve floodplain portions of new development as open space.



## *Sample Ordinance Language*

### Franklin County, VA. Code of Ordinances. Zoning Article 1- General Provisions.

#### Sec. 25-4. Relation to the Comprehensive Plan

In drawing the Zoning Ordinance and districts with reasonable consideration of the Comprehensive Plan, it is a stated and express purpose of this Zoning Ordinance to create land use regulations which shall encourage the realization and implementation of the Comprehensive Plan. To this end, development is: to be encouraged to take place in clusters to promote efficient and cost effective use of land; to be situated as to make possible future economies in the provision of services by the private and/or public sector; and to be so located as to protect the watersheds and shoreland areas, protect surface and groundwater supplies, discourage development in floodplains, wetlands, and conservation areas and strips.

## *Example*

The Virginia's Governor's Commission on Climate Change has recommended that localities revise zoning to address projected climate change impacts. While zoning codes are regularly amended, the Norfolk Department of City Planning is currently undertaking the

## Zoning Ordinance

first comprehensive re-write of the code since the early 1990's, and is placing an emphasis on resiliency. The (draft) zoning ordinance shapes future development by identifying “safe growth” areas, and incentivizing development in those areas by prioritizing capital improvements within them, in addition to a more efficient building process. The draft also promotes green infrastructure in vulnerable areas, strengthens tree protection and open space requirements, and calls for the consideration of sea level rise when reviewing development proposals.

The draft zoning ordinance is available at <http://www.zonenorfolk.com/work-products>.

### Overlay District

#### *Description*



Overlay zones allow for the implementation of additional regulatory requirements onto an existing zone. A locality creates an overlay zone by establishing the purpose for creating the district, mapping the district, and establishing the regulations that can achieve the zone’s purposes. Overlay zones can be designated by specific adaptation needs. Localities have implemented zones based on protection, accommodation, retreat, and preservation. Other communities base overlay zones on 100 or 500-year flood zones, or elevation.

**The overlay zone can incorporate freeboard requirements, increased setbacks and buffers, and allow for the hard armoring of critical infrastructure, while limiting armoring in areas better served by living shorelines.**



#### *Authority/Legislation*

Va. Code § 15.2-4405

#### *Example*

An Agricultural and Forestal District is a type of overlay district that protects valuable agricultural land and forests by restricting developing and using low-intensity usage. The establishment of this type of district is voluntary.

#### *Implementation*

Localities within the Chesapeake Bay Preservation Area are already using overlay zones. The CBPA contains three types of overlay zones. Intensely developed areas are the preferred location for new development. Limited development areas require that new development protect habitat. Resource conservation areas, which consist largely of wetlands, only allow for limited residential development. The CBPA requires a buffer area of at least 100 ft. between the shoreline and Resource Protection Areas. Many localities have prohibited any development within the 100 foot area buffer.

### Incentive Zoning

#### *Description*

# Zoning Ordinance

## *Implementation*

Localities can provide density bonuses to developers who build on the lowest-risk areas of a subdivided parcel.



### *Authority*

Va. Code § 15.2-2286: Localities may administer incentive zoning provisions.



### *CRS*

1: Up to 250 points (422e, Open Space Incentives, 420-20): Creditable for tax incentives to keep land undeveloped.

## **Subdivision Ordinance**



### *Description*

A subdivision ordinance provides regulation of the division of larger tracts of land into individual lots, which can be useful in specifying minimum conservation requirements.

Traditionally, Virginia localities have been able to use subdivision ordinances to ensure open space conservation through cluster development. Street tree requirements in a subdivision ordinance can improve the urban tree canopy, which can support stormwater management in addition to a litany of multiple benefits. Developers could be required to provide the requisite infrastructure.

### *Benefits*

- A proposed subdivision must go through a review process which may include an environmental impact assessment

### *Drawbacks*

- It may be difficult to decline to approve a subdivision due to potential sea level rise hazards

### *Example*

The City of Charlottesville uses subdivision ordinances to encourage low impact development strategies. For example, the City rewards developers with density bonuses when additional LID stormwater BMPs are installed. While the developer benefits from increased density and being able to market the development as more environmentally-friendly, the City gains water quality treatment for runoff.



### *Legislation*

Va. Code § 15.2-2242.8: Authorizes locality to include provisions for cluster developments in subdivision ordinances

### *Final Thoughts*

## **Zoning Ordinance**

A locality's zoning ordinance represents, perhaps, the most effective way to adapt to sea level rise. Due to the high percentage of shoreline held in private property, zoning is one of the only legally enforceable tools at a locality's disposal.

## Implementable Action



### *Description*

Zoning is a fundamental tool in shifting development away from sensitive areas and preserving the ecological functions of open space.

### *Multiple Benefits*

Open space preserved through these compact forms of development can generate credits within the Community Rating System, especially if this preservation occurs within the floodplain.

### *Barriers*

Zoning areas are not static, but comprehensive zoning rewrites occur very rarely. The reduction of a property owner's development rights often results in public outcry and legal challenges.

## Buffer/Setbacks



### *Description*

Building requirements establish a distance from a boundary line where building is prohibited. Likewise, coastal development is also regulated by a shoreline setback, often measured from the mean low water line. For shoreline properties this buffer can help absorb floodwaters. More stringent setback requirements result in larger buffers, which can help to limit runoff in residential areas. Some regulations, like the Chesapeake Bay Act Program, contain provisions requiring the use of riparian buffers. Localities can use buffer zones to preserve room for migration of wetlands.

### *Authority*



Va. Code § 15.2-2279: A locality may regulate home building, including adopting minimum setbacks, side yards, and minimum lot sizes.

9 VAC 10-20-80: The CBPA requires a buffer of at least 100 ft from the shoreline and adjacent wetlands (Resource Protection Areas)

Va. Code § 58.1-339.10: Authorizes the Riparian Forest Buffers Protection for Waterways Tax Credit

### *Implementation*

Setbacks can be based on a fixed mandate (ex. 100 ft.), but other localities can explore basing setbacks on different tiers (based on flood risk) or erosion-based. For example, The NC Coastal Resources Commission has increased setbacks for homes greater than 5,000 sq. ft. to 60 times the erosion rate. For all structures between 10,000 and 100,000 sq. ft., there is a graduated setback that increases with structure size.

Applications to develop in a coastal area reviewed by the Marine Resources Commission and local wetlands boards, which establish a minimum coastal back to prohibit encroachment.

### *Example*

While only localities in the Tidewater Region are required to participate in the Chesapeake Bay Act Program, other localities have the ability to adopt the Program's land use planning tools as well. The City of Charlottesville, for example, has adopted Bay Act provisions to protect forested buffer zones along important streams.

Ogunquit, Maine has increased its shoreline setback without changing the setback itself, but rather by amending the definition of normal high water, which is what the setback is based on. Typically, the region's highest annual tide is around 7 ft. above mean high water, but this definition was increased to 11 ft above mean sea level, allowing for a margin of 4 ft of sea level rise.

### *Sample Ordinance Language*

#### Code of the City of Norfolk: Zoning Ordinance- Chesapeake Bay Preservation Area Overlay District 11-2.9 Performance Standards

##### (c) Buffer Area Requirements

To minimize the adverse effects of human activities on the other components of resource protection areas, state waters, and aquatic life, a 100-foot buffer area of vegetation that is effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff shall be retained if present and established where it does not exist unless the site/parcel is a designated IDA. Development and redevelopment within IDAs shall retain and establish vegetation in the buffer area to the extent practicable in a manner consistent with [Chapter 45](#) of the Norfolk City Code.

The buffer area shall be located adjacent to and landward of other RPA components and along both sides of any water body with perennial flow. The full buffer area shall be designated as the landward component of the RPA, in accordance with section 11-2.3 and Article V, [Chapter 26](#) of this ordinance.

#### Erosion-Based Setback (Florida Sea Grant)

The City/County shall establish an erosion-based minimum setback for shoreline development within the managed relocation zone based upon the (annual coastal erosion rate ) x (a planning period representing the economic lifetime of the coastal structure) + (an additional buffer).



### *Finance*

The Department of Forestry Riparian Buffer Tax Credit provides incentives for landowners who keep riparian buffers forested for a minimum of 15 years.

### *Final Thoughts*

Chesapeake Bay Preservation Act buffers are not necessarily eligible for CRS credit for open space preservation. Localities using local ordinances to prohibit development and fill in RPAs (without exception) would likely earn credit.

### **Low Density Zones**

#### *Description*

Many localities employ conservation zones that include agricultural, recreational, and open space uses, and allow for the construction of single-family dwellings by conditional use permit.

#### *Barriers/Drawbacks*



While low-density zones reduce development intensity, they can contribute to sprawling land use patterns depending on the level of residential use permitted.



*CRS Credit*

1. Up to 600 points (422f, Low-Density Zoning, 420-26): Creditable for using low-density zoning to preserve open space.



*Sample Ordinance Language*

Code of the County of James City, VA. Sec. 24-211. General Agricultural District.

**Statement of Intent**

The General Agricultural District, A-1, is intended for application to the rural areas of the county generally outside of the primary service area and where utilities and urban services generally do not exist and are not planned for the near future. The purpose of the district is to maintain a rural environment suitable for farming, forestry and low-density rural residence and at the same time to provide for certain recreational and public or semipublic and institutional uses which may require a spacious site and which, with proper conditions imposed, are compatible with rural surroundings. The district also serves to limit the scattering of commercial, industrial and urban residential uses into rural areas where such uses are not planned. The area regulations of the district are intended to provide a measure of flexibility in lot size and arrangement if coupled with a design review to ensure more careful use of the land.

Locality	Minimum SFD lot size in Agricultural Subdivision
Accomack County- Agricultural District	5 Acres (by right)
Chesapeake- Agricultural District	3 Acres (by right)
Isle of Wight- Rural Agricultural Conservation District	1 Acre (by right)
James City County- General Ag District	3 Acres (by right)
Lancaster County- Limited Agricultural District	2 Acres (by right)
Poquoson- Conservation District	0.5 Acres (by right)

**Cluster Development**



*Description*

Whether through a PUD, a subdivision ordinance, or otherwise, clustering new residential development can preserve open space and generate a number of benefits. Typically, localities incentivize clustering by allowing increased densities, in exchange for open space to be preserved.



*Authority/Legislation*

Va. Code § 15.2-2242.8: Authorizes locality to include provisions for cluster developments in subdivision ordinances.

Va. Code § 15.2-2286.1: Requires certain localities (population growth >10% between census counts, exempting those with pop densities >2,000 people per sq. mile) to include standards for clustering SFD, preserving open space.



*CRS*

1: Up to 25 points (422e, Open Space Incentives, 420-20): Creditable for regulations allowing cluster development.

## Mixed Use/Planned Unit Development



### *Description*

A Planned Unit Development is a grouping of land uses contained within one subdivision. The PUD can be used to preserve open space by increasing density.



### *Authority*

Va. Code § 15.2-2286: A zoning ordinance may include regulations for areas designated for mixed use or planned unit developments.



### *Sample Ordinance Language*

#### Code of the City of Charlottesville Article V Sec. 34-490. - Objectives.

In reviewing an application for approval of a planned unit development (PUD) or an application seeking amendment of an approved PUD, in addition to the general considerations applicable to any rezoning the city council and planning commission shall consider whether the application satisfies the following objectives of a PUD district:

(1) To encourage developments of equal or higher quality than otherwise required by the strict application of zoning district regulations that would otherwise govern;

(2) To encourage innovative arrangements of buildings and open spaces to provide efficient, attractive, flexible and environmentally sensitive design.

(3) To promote a variety of housing types, or, within a development containing only a single housing type, to promote the inclusion of houses of various sizes;

**(4) To encourage the clustering of single-family dwellings for more efficient use of land and preservation of open space;**

(5) To provide for developments designed to function as cohesive, unified projects;

(6) To ensure that a development will be harmonious with the existing uses and character of adjacent property, and/or consistent with patterns of development noted with respect to such adjacent property;

**(7) To ensure preservation of cultural features, scenic assets and natural features such as trees, streams and topography;**

(8) To provide for coordination of architectural styles internally within the development as well as in relation to adjacent properties along the perimeter of the development; and

(9) To provide for coordinated linkages among internal buildings and uses, and external connections, at a scale appropriate to the development and adjacent neighborhoods;

(10) To facilitate access to the development by public transit services or other single-vehicle-alternative services, including, without limitation, public pedestrian systems.



### *CRS Credit*

1. Up to 25 points (422e, Open Space Incentives, 420-20): Creditable for regulations that allow for cluster development (through a PUD or otherwise).
2. Up to 1,450 points (422a, Open Space Preservation, 420-3).

## Conservation Easement



### *Description*

Conservation Easement: A voluntary, but legally-binding, agreement between a property owner and a land trust, in which development rights of a property are limited in perpetuity to preserve its ecological values. In Virginia, conservation easements can be held both by land trusts and local governments; land trusts hold conservation easements, while governmental entities hold open space easements. A large number of the easements in the state are held by the Virginia Outdoors Foundation. FEMA has quantified the economical benefits of open and riparian space preservation. FEMA found the total estimated benefits of green open space to be **\$7,853 per acre, annually**. Riparian space has been found to have a total estimated benefit of **\$37,493 per acre, annually**.

**Easements can be used to limit development in priority areas that have valuable ecological benefits to sea level rise adaptation. Protecting land located in the floodplain under an easement can help localities to receive TMDL, MS4 and CRS credit.**

### *Benefits/Strengths*

- Virginia provides some of the highest tax credits in the country for easements (40% of the value of donated land to be used as a tax credit), providing a financial incentive for property owners
- Easements are voluntary
- Removing development rights from a property lowers its market value, which can lower estate tax when the property is inherited.
- Easements exist in perpetuity, ensuring land will never be developed and its ecological value retained.

### *Barriers/Obstacles*

- As a voluntary program, participation relies on a range of factors including incentives and marketing.
- While there is funding assistance available, localities need to secure funds for easement acquisition.
- Expensive

### *Tools*

- The Virginia Department of Conservation and Recreation has developed **sample conservation easement language**.
- The Virginia Outdoors Foundation has produced a **template** for landowners to use in preparing easements.

### *CRS Credit*

- Up to 1,450 points (Activity 420, Open Space Preservation (OSP), Manual pg. 420-3): Credit for preserving open space in the floodplain. Extra credit for open space land protected by Deed Restriction (Activity 420, DR, pg. 420-11). Extra credit for open space parcels preserved in or restored to their natural state (Activity 420, NFOS, pg. 420-13).
- Up to 250 points (Activity 420, Open Space Incentives (OSI), pg. 420-20): Credit for tax incentive programs to keep land undeveloped.

### *Case Study*

Virginia Beach has been successful in managing conservation easements, while maintaining its high population and economic growth. Beginning in 2001, the city appropriated \$30 million to fund land acquisitions, which has led to the preservation of over 4,000 acres. The City prioritizes properties based on their environmental management plans. Collaboration between land conservation organizations and the Department of Defense have helped to subsidize the City's acquisition efforts.

### *Legislation*

- VA §10.1-1009: Virginia Conservation Easement Act
- VA §10.1-1700: Virginia Open-Space Land Act
- VA §58.1-512: Land Preservation Tax Credits for Individuals and Corporations

### *Sample Ordinance Language*

#### Code of the City of Virginia Beach, VA. Appendix J. Agricultural Reserve Program

##### Sec. 6. Applicability

The agricultural reserve program shall apply in that portion of the city delineated on the map entitled "Area of Applicability, Agricultural Reserve Program..."

##### Sec. 7. Eligibility Criteria

Preservation easements may be purchased only upon property meeting all of the following criteria:

- The property shall be no less than ten (10) acres in area, or be included in a batch in which the combined area of contiguous property is no less than ten (10) acres in area.
- The property shall be wholly located within a residential zoning district, an AG-1 or AG-1 Agricultural District or a P-1 Preservation District...
- The property shall be capable of being subdivided or developed for nonagricultural uses without the approval of the city council;
- No uses or structures, other than those permitted by preservation easements, shall be located upon the property;

### *Financing Options*

- The **Conservation Reserve Enhancement Program** provides agricultural landowners with an annual rental rate, in exchange for introducing conservation practices and removing environmentally sensitive land from production. This voluntary program is not permanent, like a conservation easement. Contract periods typically last 10-15 years. The Enhancement Program is an offshoot of the Conservation Reserve Program, and targets high-priority conservation issues which can be identified by localities.

- The **Agricultural Conservation Easement Program**, through the NRCS, can be used for both agricultural land and wetland preservation. Easements on working farms do not restrict agricultural uses. Regarding wetlands, land is eligible to be placed in either a permanent or 30-year easement.
- The **North American Wetlands Conservation Act** has established a grant program for the long-term preservation and restoration of wetlands. Since its establishment, the grant has funded over \$1.29 billion for wetlands conservation.
- The **Virginia Land Conservation Fund** has been funded over \$45 million since the program's inception for the acquisition of conservation easements.
- The **Open Space Lands Preservation Trust Fund** helps fund acquisitions managed by the Virginia Outdoors Foundation.
- The **Virginia Coastal and Estuarine Land Conservation Program** awards funds for easements or acquisitions of land with significant ecological values.
- The **Virginia Clean Water Revolving Loan Fund** was amended in 2003 to authorize low interest loans for the acquisition of land or conservation easements.

### *Final Thoughts*

Conservation easements can be especially useful for adaptation along the shoreline. Keeping land undeveloped allows for the shoreline to migrate landward. A rolling easement could be used for this purpose (see the rolling easement section for more details). Maryland has taken measures to prioritize shoreline conservation, by creating a Coastal Resilience Easement, which is designed to protect coastal areas from sea level rise and storm surge. It may be easier to implement strong conservation easement programs in localities with large tourism industries that benefit from the conservation of beaches and other natural resources.



### *Call Out Box*

The Land Preservation Tax Credit in Virginia is worth 40% of preserved land value, one of the highest in the country.

### *Resources*

Englander, J. (2015). *Shoreline Adaptation Land Trusts: A Concept for Rising Sea Level*. Institute on Science for Global Policy , St. Petersburg.

FEMA. (2013). *Local Mitigation Planning Handbook* .

FEMA. (2015). *Hazard Mitigation Assistance Guidance*. FEMA.

Gore, J., Lam, T., & Vargas-Castro, T. (2011). *The Public Funding of Land Acquisitions and Easements Purchases in Virginia*. College of William & Mary, Thomas Jefferson Program in Public Policy.

Grannis, J. (2011). *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use*. Georgetown Climate Center .

VA APA. (2014). *Managing Growth and Development in Virginia: A Review of the Tools Available to Localities*. Virginia Chapter of the American Planning Association .



## **Local Fees**

### *Description*

Typically, the biggest barriers for localities implementing adaptation programs are financial. For innovative and emerging practices, this can be especially difficult. Green Infrastructure projects, for example, can be help up because they do not always fit into traditional funding frameworks.

### Development Impact Fee

- Fees collected during the approval of a building permit. These fees are required for the purpose of creating public facilities that serve the development. At the state level, courts have generally required a rational nexus between the fee and the needs of the development. Melbourne, Florida has a policy requiring new developments to pay a portion of the cost for services and facilities.

### Floodplain Development Permit

- Can be required for new development within the floodplain, or if a new development does not meet an approved land use. Fees generated with this permit can be used to mitigate flooding events.

### Overlay District Assessment Fee

- After the creation of an overlay district, a fee can be assessed to mitigate sea level rise hazards in the given area.

### Real Estate Taxes

#### Sales Tax

- Some localities have increased sales taxes to fund stormwater management. In Lenexa Kansas, a  $\frac{1}{8}$  cent sales tax was approved to fund green infrastructure projects to protect against future flooding events.

### Capital Recovery Charges

- Some utilities charge capital recovery fees to new customers, to recover a share of the costs that existing ratepayers have paid to construct facilities for both current and future customers.

## **Stormwater Utility Fee**

- Stormwater fee seeks to internalize the costs associated with runoff from developed properties, which can then be leveraged to fund green infrastructure solutions or other stormwater management practices. The utility fee provides an equitable method of charging people who benefit directly from

### Fee Discounts

- Fee discounts, when used in conjunction with a stormwater utility fee, can incentivise implementing green infrastructure solutions. For example, localities can base stormwater fees on impervious surface area, thereby incentivising open space preservation. Fee reductions can also be based on on-site management or volume reduction.

### *Benefits/Strengths*

- Funding source that internalizes environmental costs of development
- Floodplain Development Permits are already required by NFIP

### *Barriers/Obstacles*

- Utility fee increases often face public backlash, or inequitably burden low-income households. Development fees can face resistance from developers and the construction industry.
- Fees need to be substantial enough to fund services in order to be effective.

### *Professions/Stakeholders*

- Homeowners/Developers
- Floodplain Administrator
- Local Government
- National Flood Insurance Program



### *Authority/Legislation*

- Code of Virginia, § 15.2-107: All levies and fees imposed or increased by a locality pursuant to the provisions of Chapters 21 (§ 15.2-2100 et seq.) or 22 (§ 15.2-2200 et seq.) shall be adopted by ordinance.
- Code of Virginia, § 15.2-2119: Enables localities to charge a fee for connection to a water or sewer system.
- Code of Virginia, § 15.2-2317-2327: Authorizes localities to enact an impact fee program for road improvements



### *Sample Ordinance Language*

#### Virginia Beach Code of Ordinances Sec. 32.5-4- Imposition of Utility Fees

Adequate revenues shall be generated to provide for a balanced operating and capital improvement budget for maintenance of the stormwater management system by setting sufficient levels of utility fees. Income from utility fees shall not exceed actual costs incurred in providing the services and facilities described in section 32.5-3. Utility fees shall be charged to owners of all developed property in the city; provided, however, where a tenant or occupant is the person to whom water or sewer service, or both, are billed, the utility fee may be charged to such tenant or occupant.

(a) For purposes of determining the utility fee, all properties in the city are classified into one of the following classes:

- (1) Developed residential property;
- (2) Developed multifamily residential property;
- (3) Developed nonresidential property;
- (4) Undeveloped property; or
- (5) Agricultural property.

(b) The monthly utility fee for developed residential property shall equal the ERU rate. Provided, however, where more than one (1) residence or dwelling unit is located on a single lot or parcel the owner of the lot or parcel shall be charged a utility fee which is equal to the ERU rate multiplied by the number of residences or dwelling units located on the lot or parcel.

(c) The monthly utility fee for developed multifamily residential property shall be the ERU rate multiplied by the numerical factor obtained by dividing the total impervious surface area of a developed multifamily residential property by one (1) ERU (2,269). The numbered factor will be rounded to the nearest tenth (0.1) of a unit.

(d) The monthly utility fee for developed nonresidential property shall be the ERU rate multiplied by the numerical factor obtained by dividing the total impervious surface area of a developed nonresidential property by one (1) ERU (2,269). The numbered factor will be rounded to the nearest tenth (0.1) of a unit. The minimum utility fee for any developed nonresidential property shall equal the ERU rate.

(e) The utility fee for vacant developed property, both residential and nonresidential, shall be the same as that for occupied property of the same class.

(f) Undeveloped property shall be exempt from the utility fee.

(g) Agricultural property shall be exempt from the utility fee. Provided however, each developed residential unit situated on a parcel devoted to agricultural use shall be charged a fee equal to the ERU rate.



### *CRS Credit*

up to 315 points Activity 450, Watershed Master Plan (WMP), Manual pg. 450-14) can receive extra credit if the plan includes a dedicated funding source for implementation, such as a stormwater utility fee.

### *Example*

Staunton Virginia uses a stormwater utility fee program for the maintenance, repair, inspection, and replacement of existing stormwater infrastructure, as well as the implementation of new projects. The fee is charged based on impervious area, which provides an incentive for low-impact development. There are thirteen tiers ranging from <3,400 to >1,000,001 sq. ft, with charges ranging from \$6 to \$2,460, bimonthly and before reduction credits.

Minnesota's stormwater credit program awards a 50% reduction on a property's stormwater management fee, if the property owner can demonstrate that stormwater from a 10-year flood is controlled on-site. 100% of the fee is waived if it is demonstrated that stormwater from a 100-year flood can be controlled on-site.



### **Tax Exemption**

#### *Description*

Localities can offer tax exemptions to property owners to preserve wetlands or riparian buffers.

#### *Implementation*

The landowner grants an easement permitting inundation in the wetland portion of the property. The wetlands are then exempted from property taxes.

### **Downzoning**

#### *Authority/Legislation*

Code of Virginia, § 15.2-2286.11: Allows a locality to enter into a voluntary agreement with a landowner to downzone property in exchange for a tax credit.

Code of Virginia, § 15.2-2288: Allows localities to administer incentive zoning, establish areas for planned unit developments, and provides tax credits for property owners willing to downzone property.





### *Description*

Downzoning can be used by localities to reduce development in priority areas. Virginia allows for localities to enter into voluntary agreements with property owners to reduce permitted development density on their property, in exchange for tax credit.

### *Barriers*

One issue with downzoning is that it limits the economic development value of the land in question, which reduces a locality's potential tax base. However, the ecological services provided by prioritized areas may far outweigh these potential revenue reductions. In the case of voluntary downzoning agreements, there are no legal concerns about potential regulatory takings. An involuntary downzoning is not recommended, as it is likely to face opposition among property owners.



### *CRS*

1: Up to 600 points (422f, Low-Density Zoning, 420-26): Creditable for using low-density zoning to protect open space.

### **Resilience Bank**

New Jersey created the first public infrastructure bank in the nation that focused on energy resilience. The Bank supports the development of distributed energy sources at critical facilities within the state.

### *Resources*

CCRM. (2013). *Comprehensive Coastal Resource Management Guidance*. Virginia Institute of Marine Science, Center for Coastal Resources Management.

DEQ. (2015). *Virginia's TMDL Implementation Cost-Share Best Management Practice Guidelines*. Virginia Department of Environmental Quality, Office of Watershed Programs, Richmond.

New Jersey Board of Public Utilities. (2014). NJ Energy Resilience Bank Now Accepting Applications.



## **Land Use-Value Tax Assessment**

### *Description*

Taxing real estate based on its usage instead of its fair market value. As a result, agricultural lands and open spaces can be subject to lower taxes that disregard the potential value of the land should it be intensely developed. This provides a good opportunity for Virginia localities to preserve long-term public benefits from land preservation.

## **Agricultural and Forestal District**

### *Description*

In establishing a District, property owners agree not to convert their farmland or forestland to a more intense land use. The major economic benefit for a property owner is that the property qualifies for lower property tax, as these districts are eligible for land use-taxation. Taxes are assessed on the current, not the potential use value of the property. Minimum land requirements for a A&F District vary by locality, but the minimum for a state district is 200 acres.

### *Benefits*

- Preserves essential open space without the need to acquire property
- Property owners receive tax benefits, without the need to permanently restrict development rights.
- Local governments must take districts into account for planning decisions, and cannot unreasonably restrict agricultural or forestal activity within the district.
- Additional land parcels can easily be added to existing districts.
- Ag & Forestal districts discourage land uses that do not keep with agricultural, forestal, or open space uses. This is a greater degree of development restriction than an agricultural zone, which can encourage low-density residential sprawl.

### *Barriers*

- As development is not restricted in perpetuity, a land-use value assessment may only temporarily impede development in ecologically-sensitive areas.

### *Implementation*

Both Ag & Forestal Districts and use-value taxation accomplish the goal of assessing land based on its use-value. The difference between the two exists in the structure of the program. An Agricultural and Forestal District allows for contiguous tracts of land owned by multiple property owners to be combined into one large district. A local advisory committee responsible for their management must approve these districts.. Additionally, these districts are not created in perpetuity. They exist for a period, typically between 4-10 years, which is negotiated between property owners and the locality. Land use-value taxation, on the other hand, applies to an individual landowner. Additionally, there are minimum or maximum size requirements for individual parcels.

### *Tools*

Fairfax County has developed criteria for the establishment of an Ag & Forestal District.

### *CRS Credit*

1. Up to 1,450 points (422a, Open Space Preservation, 420-3): Credit for using an agricultural and/or a forestal district to preserve open space.

### *Case Study*

Both land use-value assessments and ag & forestal districts have the benefit of reducing a property owner's tax bill. This can be especially valuable for farmers who reside in a locality with high land values. In James City County, for example, the ag & forestal district program has helped preserve farm operations within county boundaries. The program has existed since 1986, and currently encompasses over 15,000 acres throughout the County.

### *Legislation*

- Va. Code § 15.2-4405: Localities shall have the authority to create agricultural and forestal districts of local significance...
- Va. Code § 58.1-3229: Allows for the locality to provide for land-use value assessment of land devoted to ag/forest, horticulture, and open-space use.

### *Sample Ordinance Language*

#### Loudon County Ordinance: Chapter 1226 Ag & Forestal Districts

##### 1226.01 Purpose

It is... the policy of the County to conserve, protect and encourage the development and improvement of its agricultural and forestal lands for the production of food and other agricultural and forestal products. It is also the policy of the County to conserve and protect agricultural and forestal lands as valued natural and ecological resources which provide essential open spaces for clean air sheds, as well as for aesthetic purposes.

##### 1226.02 Effect of Districting

(a) All land use planning decisions, special exceptions, special use permits and variances affecting any parcel of land within or adjacent to a District shall take into account the existence of the District and the purposes and policies of this chapter... All subdivision of land within a District at a density greater than ten acres is hereby deemed to be in conflict with the purposes and policies established by this chapter... except that clustered development at three-acre density leaving eighty percent of the land in open space shall be permitted.

(b) Land used in agricultural and forestal production within a District shall automatically qualify for an agricultural or forestal value assessment on such land pursuant to Sections 58.1- 3229 et seq. of the Code of Virginia of 1950, as amended, if the requirements for such assessment contained therein are satisfied...

### *Call Out Box*

By 2011, 338 districts had been created in 30 localities, covering nearly 750,000 acres. (Schmidt, K. "Recent Changes to the Virginia Agricultural and Forestal District Act", 2011. USDA)

### *Final Thoughts*

- Land-use value assessments provide many the benefits of more expensive easement or land acquisition programs.

- An update in 2011 streamlined the process for applying to create an Ag & Forestal District. This update allowed for a planning commission to serve as the District's advisory committee, and clarified that additional parcels could be added to existing districts at any time.

*Resources*

Jarbeau , S. H., & Stiff, M.-C. (2015). *Flood Protection Pay-Offs: A Local Government Guide to the Community Rating System*. Wetlands Watch.

Moser, S., & Ekstrom, J. (2012). *Identifying and Overcoming Barriers to Climate Change Adaptation in San Francisco Bay*. California Energy Commission .

# Living River Restoration Trust

## Shoreline Adaptation Land Trust Overview

### SALT Overview

A Shoreline Adaptation Land Trust (SALT)<sup>1</sup> incorporates a land trust or governmental entity's use of rolling easements<sup>2</sup> as a way to address sea level rise adaptation. SALTs help communities adapt to sea level rise using a managed retreat or relocation approach. Parcels donated to or held by a SALT via conservation easement would prohibit future development and allow for the natural land ward migration of the water. Land eventually underwater under easement would never be recovered, becoming "lost" property.

### SALT Purpose

Prohibit development on coastal land at risk from sea level rise inundation; transfer property into public sector before land is lost to sea level rise; prohibit individual property owners from making bad shoreline management decisions that have negative impacts on surrounding area(s).

### Rolling Conservation Easement

SALTs can use various forms of rolling easements, although a rolling conservation easement,<sup>3</sup> as described in the Georgetown Climate Center's Sea-Level Rise Adaptation Toolkit, may offer the best fit for LRRT. There are many different ways the rolling conservation easement could be written, however, the primary purpose could be to best allow wetlands and other shoreline resources to migrate landward naturally over time. To achieve this end, the easements could prohibit all future development on the parcel, limit development in the upland portion of the parcel, prohibit all forms of shoreline armoring, or simply prohibit development along the shoreline directly. The "rolling" element of the easement could be defined by a tidal line that moves inland – this rolling line could trigger more restrictive conditions. Similarly, as the tidal line rolls upland, it could trigger the removal of structures. The tidal line could be defined by a sea level rise/erosion projection, created via scientific research.

### Important Deciding Factor: *What triggers "transition" of the parcel? What determines the rolling line?*

Englander recommends that the locality should determine when the property is no longer habitable. LRRT could leave this determination to the locality or it could make the decision parcel specific or dependent on a date using projected SLR levels.

### SALT Benefits

To land owner: tax incentives

To locality: no longer required to service parcel in emergency scenarios; land doesn't need to be bought out in the future; locality could work with the LRRT to identify at risk areas

To LRRT: helping protect against future flood losses and future bad development decisions; prohibits hardened shorelines if prohibited in easement; once land owner dies or leaves the property on their own, LRRT could rent out property for purpose of lodging or even recreation creating an income for the Trust to be used for parcel

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<sup>1</sup> Englander, *Shoreline Adaptation Land Trusts: A Concept for Rising Sea Level*, Institute on Science for Global Policy, 2015, <http://www.johnenglander.net/sites/default/files/Englander%20ISGP%20St.%20Pete%20PPP%20-%20Published%2010-3-15.pdf>.

<sup>2</sup> Titus, *Rolling Easements*, EPA Climate Ready Estuaries, June 2011, <http://www.epa.gov/sites/production/files/documents/rollingeasementsprimer.pdf>.

<sup>3</sup> Grannis, *Adaptation Toolkit: Sea-Level Rise and Coastal Land Use*, Georgetown Climate Center, October 2011, at 52, <http://www.georgetownclimate.org/resources/adaptation-tool-kit-sea-level-rise-and-coastal-land-use>.

monitoring or legal fees; locality could also contribute some funds to LRRT for its service to the adaptation planning efforts of the locality

### **SALT Limitations**

To land owner: once the land is lost, the asset of the parcel is lost for future heirs - families would need to be willing to lose the value of the property when it is not longer habitable; tax implications of a rolling conservation are largely unknown<sup>4</sup> – value of property may be less when loss of land is implicitly anticipated.

To LRRT: cost of demolishing structure on property could fall on Trust if easement doesn't require cost to landowner; once the easement is completely underwater, there is no longer a protected parcel.

### **Existing Virginia SALT**

Middle Peninsula Planning District Commission established the Middle Peninsula Chesapeake Bay Public Access Authority (MP-PAA). Government entity that serves Essex, Gloucester, King & Queen, King William, Mathews, Middlesex, Tappahannock, Urbanna, and West Point. MP-PAA established by the General Assembly in 2002 (Code of Va. §15.2-6601). MP-PAA accepts donated parcels and puts them into public access. In recent years, many property owners have given shoreline parcels to MPPDC outright when they're not longer able to afford flood insurance or cannot sell their homes because of flood risk and/or high flood insurance premiums.

### **Additional Resource**

Siders, *Managed Coastal Retreat*, Columbia Law School Center for Climate Change Law, October 2013, [https://web.law.columbia.edu/sites/default/files/microsites/climate-change/files/Publications/Fellows/ManagedCoastalRetreat\\_FINAL\\_Oct%202013.pdf](https://web.law.columbia.edu/sites/default/files/microsites/climate-change/files/Publications/Fellows/ManagedCoastalRetreat_FINAL_Oct%202013.pdf).

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<sup>4</sup> Titus, *Rolling Easements*, EPA Climate Ready Estuaries, June 2011, at 109, <http://www.epa.gov/sites/production/files/documents/rollingeasementsprimer.pdf>.





## **rMitigation Banking**

### *Description*

By implementing an approved nutrient reduction practice, a property owner can generate nutrient bank credits. These credits are available for trading to VPDES or VSMP permit holders, in order to comply with the Chesapeake Bay TMDL.



### *Legislation*

Va. Code § 10.1-603.8:1: Requires localities to allow the purchase of nutrient credits to comply with stormwater quality criteria.

### *Implementation*

To be eligible to purchase nutrient credits in Virginia, a development must disturb fewer than 5 acres of land, or less than 10 pounds of post-construction phosphorus control requirements. If a development exceeds these requirements, at least 75% of required phosphorus reductions must be controlled on-site, with remaining requirements eligible to be fulfilled through the purchase of nutrient credits. Offsetting credits can be purchased within the same or adjacent HUC. If there are none available, credits may be purchased within the same tributary.



### *Ordinance Language*

#### Virginia Beach Code of Ordinances Sec. 1408.1 Standards for the Use and Development of Wetlands

(a) The following standards shall apply to the use and development of wetlands and shall be considered by the Board in the determination of whether any permit required by this article should be granted or denied:

(1) Wetlands of primary ecological significance shall not be altered so that the ecological systems in the wetlands are unreasonably disturbed; and

(2) To the maximum extent practical, development shall be concentrated in wetlands of lesser ecological significance, in vegetated wetlands which have been irreversibly disturbed before July 1, 1972, in nonvegetated wetlands which have been irreversibly disturbed prior to January 1, 1983, and in areas outside of wetlands.

(b) The provisions of guidelines promulgated by the commission pursuant to Code of Virginia, section 28.2-1301 shall be considered in applying the standards set forth in subsection (a).

(c) When any activity authorized by a permit issued pursuant to this article is conditioned upon compensatory mitigation for adverse impacts to wetlands, the applicant may be permitted to satisfy all or part of such mitigation requirements by the purchase of credits from any wetlands mitigation bank that has been approved and is operating in accordance with applicable federal guidance for the establishment, use and operation of mitigation banks as long as:

(1) the bank is in the same U.S.G.S. cataloging unit, as defined by the Hydrologic Unit Map of the United States (U.S.G.S. 1980), or an adjacent cataloging unit within the same river watershed, as the impacted site;

(2) the bank is ecologically preferable to practicable on-site and off-site individual mitigation options, as defined by federal wetlands regulations; and (3) the banking instrument, if approved after July 1, 1996, has been approved by a process that included public review and comment.

(d) Where an agreed-upon permit condition requires the contribution of in-lieu fees to offset permitted wetland losses, the Wetlands Board shall credit the application for any in-lieu fee payments made to the Virginia Aquatic Resources Trust Fund or another decided wetlands restoration fund with reference to the same activity.

(Ord. No. 2198, 12-8-92; Ord. No. 2428, 10-29-96; Ord. No. 3360, 7-1-14)

## Property Acquisition



### *Description*



While expensive, property acquisition is a permanent solution to removing development in high-hazard areas and can generate a number of other benefits.

When undertaking a property acquisition, municipalities should consider policies for relocation. Areas for targeted development should be identified, and homeowners should be incentivized to move to these areas, which can help to retain both the tax base and a sense of community. Incentives can include bonus payments for homeowners who relocate within the same locality. Financial incentives for entire neighborhoods that relocate can also help improve the effectiveness of an acquisition effort.

### *Implementation*

Localities should begin the process of property acquisition in the Comprehensive Plan, by identifying priority acquisition areas. Priority areas should include land that serves valuable ecological functions, like absorbing floodwaters and improving air quality. As such, wetlands, forests, and areas that could enable living shoreline migration will generate the most benefits for the community.

### *Benefits/Strengths*

- Reduces need to maintain infrastructure in recurrently flooded areas
- Long-term adaptation strategy
- Reduces impervious surface in most vulnerable areas
- Provides support to homeowners unable to sell their property
- FEMA has estimated that an average acquisition project within the SFHA provides benefits of \$276,000. (FEMA HMA Guidance 2015)

### *Barriers/Obstacles*



- High initial cost. The USACE has estimated that the average costs of the acquisition and removal of one building total \$349,000.
- Requires homeowner participation
- Acquisitions are typically far more effective on a neighborhood scale. For example, city costs for services would remain the same for a neighborhood block that has not been completely bought out. Holdouts make the process much more difficult.
- Tedious administrative task and time consuming process
- Removing a property leads to a loss of revenue tax, and the former property owners may migrate out of the locality's boundaries.



### *Authority/Legislation*

- Code of Virginia, § 10.1-1701: Virginia Open Space Land Act
- Code of Virginia, § 62.1-229.3: Loans may be made for acquiring fee simple titles to protect the natural or open-space values of a property
- 16 U.S.C. § 1455a: State coastal zone management programs can allocate up to 10% of federal funding for land acquisition.
- Code of Virginia, § 15.2-6600: Authorizes the creation and powers of the Middle Peninsula Chesapeake Bay Public Access Authority



### *Sample Ordinance Language*

#### Albemarle County, VA Code: Appendix A.1

#### Acquisition of Conservation Easements Program Sec. A.1-101. Purpose.

The board of supervisors finds that between 1974 and 1992, twenty-five thousand (25,000) acres of farmland in the county were lost to development; that at present, almost onethird of the acres of forest land in the county is considered by the Virginia Department of Forestry to be too densely populated for timber production; that regulatory land-use planning tools acceptable to date have not been able to stem the conversion of farm and forest land to other uses; and that farm and forest land, clean water and airsheds, biological diversity, scenic vistas and rural character have a public value as well as a private value.

Therefore, the specific purposes of the ACE program include, but are not limited to:

1. Establishing a program by which the county can acquire conservation easements voluntarily offered by owners to serve as one means of assuring that the county's resources are protected and efficiently used;
2. Establishing and preserving open-space and preserving the rural character of Albemarle County;
3. Preserving farm and forest lands;
4. Conserving and protecting water resources and environmentally sensitive lands, waters and other natural resources;
5. Conserving and protecting biodiversity and wildlife and aquatic habitat;
6. Assisting in shaping the character and direction of the development of the community;
7. Improving the quality of life for the inhabitants of the county; and
8. Promoting tourism through the preservation of scenic resources.

#### Sec. A.1-103. Definitions and construction.

#### A. The following definitions shall apply in the interpretation and implementation of the ACE program:

(1) Conservation easement. The term "conservation easement" means a non-possessory interest in one or more parcels of one or more qualified easement holders under section A.1-109(E) acquired under the Open-Space Land Act (Virginia Code § 10.1-1700 et seq.), whether the easement is appurtenant or in gross, voluntarily offered by an owner and acquired by purchase pursuant to the ACE program, imposing limitations or affirmative obligations for the purpose of retaining or protecting natural or open-space values of the parcel or parcels, assuring availability for agricultural, forestal, recreational or open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural or archaeological aspects of the parcel or parcels.



### *CRS Credit*

Up to 350 extra credit points (Activity 422C, Natural Functions Open Space, 420-13) can be received for parcels restored to their natural state. Up to

### *Case Study*

The Blue Acres Buyout Program (NJ) has had a great deal of success acquiring flood-damaged properties, especially in the wake of Hurricane Sandy. Locally, Mathews County

recently received a \$1.8 million FEMA Mitigation Grant, a portion of which will be used to acquire and demolish two homes, converting the land into open space.

Newport News uses a Flood Assistance Program to acquire houses and convert the land back into open space. Funding for the voluntary program, which is a 50/50 split between city and federal funds, is around \$200,000 annually and is included in the city's Stormwater Management Fund.

### *Financing Options*



- Property acquisition and structure demolition is eligible for funding through the unified FEMA Hazard Mitigation Assistance Programs (HMGP, PDM, FMA, RFC, SRL). This includes both structure demolition or structure relocation.
  - To be eligible for FEMA funding, the acquisition must be voluntary, and the property must be deed-restricted in perpetuity for open space usages
  - FEMA has released a **Hazard Mitigation Assistance Guiding Document**
- The **Land and Water Conservation Fund** runs a state assistance program to provide matching grants for land acquisition or the development of public outdoor recreation areas. The program is housed under the Virginia Department of Conservation and Recreation
- Acquisition is eligible through the Community Development Block Grant Program.
- The Virginia Water Revolving Loan Fund Land Conservation Loan Program will provide low interest loans to localities for property acquisition.
- Virginia's Coastal Zone Management Program 306A Grants award \$200,000 annually for land acquisition.
- The Coastal and Estuarine Land Conservation Program awards matching funds to purchase threatened coastal land.
- Virginia Removal or Rehabilitation of Derelict Structures Fund: Has awarded \$6 million since 2012 in grants for localities to acquire and demolish, remove, or rehabilitate derelict structures.
- The Fish and Wildlife Service National Coastal Wetlands Grant awards approximately \$20 million to protect, restore, and enhance coastal wetlands and adjacent upland habitats.

### *Example*

Land acquisition does not always require a significant financial investment from a locality. The Middle Peninsula Public Access Authority began accepting land donations in 2006, with the goal of increasing public access to the coast. Since the program's inception, hundreds of acres along the coast have been preserved for public use.

### *Final Thoughts*

Some local governments have noted that FEMA requirements for eligible houses are too restrictive (FEMA Requirements are available at: [http://www.fema.gov/media-library-data/20130726-1507-20490-4551/fema\\_317.pdf](http://www.fema.gov/media-library-data/20130726-1507-20490-4551/fema_317.pdf)) The HRPDC is exploring new funding programs for property acquisition.

To make land acquisition financially viable, acquired parcels need to be an asset. Restoring wetlands or natural vegetation can increase the ecological value of the property in question, but this can also help a locality achieve CRS, MS4, or TMDL credit.

Land acquisition programs can be more difficult to implement in urban areas that are largely built-out, especially because localities can have concerns over encouraging migration beyond the city or county's boundaries. Beyond this, localities need to feel confident that the cost is worth the benefit, but acquisition efforts tend to be most effective at the neighborhood scale. Individual acquisitions can be an expensive undertaking for substantially smaller flood mitigation benefits.



## **Purchase of Development Rights Program**

### *Description*

A Purchase of Development Rights program is very similar to a TDR, without the created market to facilitate the transfer of rights without locality funding.

**Like a TDR program, purchasing development rights can preserve open space that has benefits for flood and stormwater mitigation. A PDR program also helps shift development upland, where it is less susceptible to future sea level rise.**

### *Benefits*

- Less administratively complex than a TDR program

### *Barriers*

- Unlike TDR, a PDR program puts the cost of purchasing development rights on the locality

### *Implementation*

The Office of Farmland Preservation is charged with establishing and supporting local PDR programs. However, the implementation of a TDR or PDR program can be complex and unwieldy. Generally, the process includes hiring an appraiser to evaluate the market value of the land. Following this appraisal, it must be determined if there are any existing restrictions on the parcel, and the application must be submitted to a review committee to determine if the stated appraisal is reasonable. In James City County, this process can last as long as six months.

### *Case Study*

James City County enacted a PDR program in 2001, and since that time has acquired property rights in over 500 acres of land. Virginia Beach also has a PDR program, which has resulted in over 5,000 acres of land being protected from intensive development.

### *Tools*

The Virginia Department of Agriculture Farmland Preservation Task Force has created a **model purchase of development rights program** for Virginia

### *CRS*

1: Up to 1450 points (422a, Open Space Preservation (OSP), Manual pg. 420-3): Credit for protecting undeveloped land in the floodplain.

### *Legislation*

Code of Virginia, § 3.2-201: The duties of the Office of Farmland Preservation include developing models and practices for localities to use in the creation of Purchase of Development Rights programs

### *Sample Ordinance Language*

Chesapeake, VA Code Chapter 26-580: Procedure for acquisition of development rights.

- (a)... In all cases, the fair market value of each lot reserved for a future single-family dwelling... shall be deducted from the overall value of development rights

(b) The city manager shall contract with a qualified, independent appraiser ascertaining the value of the development rights...

(d) All written offers made to a landowner shall clearly state that:

(1) The offer is contingent on city council approval, funding and appropriation;

(2) The funds used to purchase development rights may include federal and state monies subject to restrictions on use;

(6) The preservation easement will be perpetual and non-revocable.

### *Financing*

Some states fund PDR programs through general appropriations and bonds. In Virginia Beach, the PDR program is funded through appropriations on a case by case basis by the City Council.

### *Final Thoughts*

A Purchase of Development Rights program is more difficult to implement in urban localities, where there is a higher level of build-out. However, because there is no “receiving zone”, more developed localities may still have success with a PDR program, as shown in Virginia Beach and James City County.

### *Call Out Box*

A study by Gore & Vegas-Castro found that 11 out of 68 responding Virginia localities had enacted a PDR program. Within Virginia, PDR programs had funding levels varying from \$50,000 to \$20 million dollars.

### *References*

Gore, J., Lam, T., & Vargas-Castro, T. (2011). *The Public Funding of Land Acquisitions and Easements Purchases in Virginia*. College of William & Mary, Thomas Jefferson Program in Public Policy.

Grannis, J. (2011). *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use*. Georgetown Climate Center .

Jarbeau , S. H., & Stiff, M.-C. (2015). *Flood Protection Pay-Offs: A Local Government Guide to the Community Rating System*. Wetlands Watch.

Lausche, B. (2009). *Policy Tools for Local Adaptation to Sea Level Rise*. Marine Policy Institute at Mote Marine Laboratory .

McStotts, J. *A Preservationist Guide to Urban Transferable Development Rights* . National Trust for Historic Preservation .

Siders, A. (2013). *Managed Coastal Retreat: A Legal Handbook on Shifting Development Away from Vulnerable Areas*. Columbia Law School, Center for Climate Change Law.

Silton, A., & Grannis, J. (2010). *Stemming the Tide: How Local Governments Can Manage Rising Flood Risks* . Georgetown Climate Center.

## **Rolling Easement**

### *Description*

While coastal setbacks, buffers, or public easements are traditionally used to restrict development within a given distance from the shoreline, a rolling easement would have the added benefit of rolling along with shoreline encroachment.

**Development restrictions “roll” upland as sea level rise and coastal erosion cause coastline encroachment. This can help facilitate the migration of living shorelines and wetlands, preserving their value for flood mitigation.**

### *Benefits*

- Rolling easements can help to ensure that the migration of a natural shoreline will continue without impediment. ....need info on how it's an adaptation tool
- Rolling easements have the potential to reduce administrative complexities, as they would automatically account for shoreline erosion and sea level rise

### *Barriers*

- Takings liability
- To this point, rolling easements have largely been conceptual
- Property owner's reluctance to lose land as the shoreline migrates upland

### *Implementation*

Incorporating projected annual erosion rates into the creation of setbacks can accomplish similar goals of a rolling easement. Other proposals have called for local governments to use proffers to receive rolling easements. While a locality could argue that a rolling easement was necessary to offset the negative effects of coastal development, recent updates to the proffer system in Virginia may make this approach unfeasible in the near future.

The most plausible approach to using a rolling easement may be through a voluntary easement agreement. The rolling easement would likely need to be considered a variation from a more traditional open space easement. Coastal property owners could agree to limit development on coastal property in exchange for tax incentives. Conditions placed on the easement could include prohibiting hard armoring (but allowing for the construction of living shorelines) and requiring the removal of structures as they grow closer to the mean low water line.

### *Tools*

- A Shoreline Adaptation Land Trust is a conceptual idea to facilitate rolling easements, which would involve establishing a land trust encouraging property owners to donate land especially vulnerable to sea level rise. Proposed easement requirements are available here.

CRS

Up to 1,450 points (Activity 420, Open Space Preservation (OSP), Manual pg. 420-3): Credit for preserving open space in the floodplain. Extra credit for open space land protected by Deed Restriction (Activity 420, DR, pg. 420-11).

### *Case Studies*

- The Maine Sand Dune Rules are a combination of limitations on upland development and restrictions against hard-armoring. Projects are rejected if a proposed development is reasonably expected to be severely damaged after allowing for a two foot increase in sea level rise over two years. Existing sea walls may be repaired, but only if they are relocated landward or made less damaging to the system of sand dunes. Finally, structures located seaward of the mean high tide line for six consecutive months must be removed.
- Under the Texas Open Beaches Act, Texas has held a public right of use over the line of mean low tide to the line of vegetation bordering the Gulf of Mexico. In 2012 the Supreme Court of Texas ruled that rolling easements are created only through the gradual process of erosion, not through sudden land erosion following severe weather events. In 2013 the Texas Legislature passed an amendment to the Texas Open Beaches Act, which will affect public beach access, although to what extent remains undetermined.
- The North Carolina Administrative Code for Ocean Hazard Areas has established setback requirements based on annual erosion rates. One drawback of this approach is that erosion rates are specific to each part of the coastline, and creating projections is a complicated, time-consuming process.

### *Legislation*

Code of Virginia § 28.2-1200: Authorizes "all the beds of the bays, rivers, creeks, and shores of the sea in the Commonwealth to be used as a common by all the people of Virginia"

### *Final Thoughts*

The implementation of a rolling setback may face a lesser risk of being constituted as a takings as opposed to an easement, as no rights would convey to the public through a setback. In Virginia, the Commonwealth owns only the land below the mean low water mark, a smaller degree of control than many states retain. Rolling easements could be potentially used as an exaction, although new regulation governing the use of exactions in Virginia could be a complication.

### *Resources*

Englander, J. (2015). *Shoreline Adaptation Land Trusts: A Concept for Rising Sea Level*. Institute on Science for Global Policy , St. Petersburg.

Grannis, J. (2011). *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use*. Georgetown Climate Center .

Siders, A. (2013). *Managed Coastal Retreat: A Legal Handbook on Shifting Development Away from Vulnerable Areas*. Columbia Law School, Center for Climate Change Law.

Silton, A., & Grannis, J. (2010). *Stemming the Tide: How Local Governments Can Manage Rising Flood Risks*. Georgetown Climate Center.

Titus, J. (2011). *Rolling Easements*. Climate Ready Estuaries .

## Service District



### *Description*

Service districts are legally defined areas, established by a locality within their jurisdictional boundaries. Service districts are implemented in areas where specific public services are required.

**Service Districts can be implemented for areas suffering from a specific local issue, or simply to fund high-risk areas. Service districts can be used for a variety of adaptation techniques, including shoreline management, beach replenishment, and stormwater management.**

### *Benefits*

- Service districts have been used in the state for many years, and are easy to implement.
- Localities can implement service districts within their own jurisdictional boundaries, or in collaboration with neighboring localities.

### *Barriers*

The public may be resistant to tax increases, an issue that could be compounded depending on public acceptance for the need of the service provided.

### *CRS*

~~Up to 1,450 points (422a, Open Space Preservation, 420-3): Creditable for using service districts to preserve open space through restrictive zoning.~~

### *Case Study*

The Sandbridge Special Service District helps to fund beach nourishment projects. The current tax rate for the Sandbridge SSD is \$1.05 per \$100 of assessed value.

### *Legislation*

Va. Code §15.2-2400: Authorizes localities to create service districts.

Va. Code §15.2-2403: Authorizes localities to levy and collect taxes within a service district.

### *Ordinance Language*

Virginia Beach Code of Ordinances Chapter 35.1 Sandbridge Special Service District

Sec. 35.1-1. - Creation of the Sandbridge Special Service District.

...there is hereby created a Special Service District at Sandbridge for the purposes set forth in Code of Virginia, section 15.1-18.2(c)(1).

Sec. 35.1-4. - Facilities and services to be provided within the Sandbridge Special Service District.

The Sandbridge Special Service District is created for the purpose of providing financing for the local share of any beach and shoreline management and restoration project for the construction, maintenance, replenishment and restoration of the beach and shoreline on the Atlantic Ocean within the service district. Toward that end, there shall be provided within the Sandbridge Special Service District those facilities and services necessary or desirable to accomplish the purpose of the service

district, including, without limitation, administrative, engineering and other professional services, sand dredging, pumping, grading and hauling facilities and equipment and such other equipment and facilities as may, from time to time, be needed to accomplish the purpose of the service district.

Sec. 35.1-7. - Levy of additional taxes to pay, either in whole or part, the expenses and charges for providing additional governmental services with the Sandbridge Special Service District.

...the city council may levy and provide for the collection of additional taxes to fund the city's obligations to pay, either in whole or part, the expenses and charges for providing and maintaining facilities and services incident to beach and shoreline management and restoration on the Atlantic Ocean within the service district...

### *Final Thoughts*

### *Call Out Box*

### *Resources*

SFRPC. (2013). *Adaptation Action Areas: Policy Options for Adaptive Planning for Rising Sea Levels*. South Florida Regional Planning Council.

VA APA. (2014). *Managing Growth and Development in Virginia: A Review of the Tools Available to Localities*. Virginia Chapter of the American Planning Association .

## Transfer of Development Rights



### *Description*

A Transfer of Development Rights (TDR) program is designed to limit potential development in vulnerable areas, while compensating property owners for the reduction. A locality can identify vulnerable “sending” areas where development intensity should be lowered, and upland “receiving” areas where higher density can be incorporated. A market can be established where landowners in the sending area can be compensated for the transfer some of their development rights to a property owner in the receiving area.

**A TDR program can protect ecologically valuable land like floodplains and wetlands that have benefits for flood and stormwater mitigation. It can also help shift development upland, where it will be less susceptible to sea level rise.**

### *Benefits/Strengths*

- Provides design flexibility and fits into a range of growth management scenarios
- Provides a financial incentive for land conservation in especially sensitive areas
- Allows a locality additional control over which areas are further developed
- There is already widespread implementation of TDR in the US
- Provides a less expensive alternative to land acquisition

### *Barriers/Obstacles*

- Can create the perception of economic loss
- As a voluntary program, relies on property owner interest (marketing is important)
- Urban areas that are mostly built-out are unlikely to have many options to establish a TDR program. In our meeting with an urban locality located in Hampton Roads, it was noted that a TDR program has not been considered for this reason.
- Program complexity

### *Tools*

The Virginia Municipal League has created a **model TDR program** for Virginia localities.

### *CRS Credit*

1: Up to 70 points (420, Open Space Incentives (OSI), Manual pg. 420-21): Credit for regulations providing TDR away from the floodplain

2: Up to 250 points (420, Open Space Incentives (OSI), pg. 420-20): Credit for requirements or incentives to reserve floodplain portions of new developments as open space.

### *Case Study*

By 2012 there were at least 239 TDR programs in 35 states. In Collier County, Florida, a TDR program has been used to preserve 31,400 acres. In Collier, sites receiving increased development rights were separated in a “new-town” area, to underscore the idea that no economic development was lost, which had great success.

### *Authority/Legislation*

- Code of Virginia, § 15.2-2223.1: Allows localities to establish urban development areas, which can be designated as an area for transfer of development rights.
- Code of Virginia, § 15.2-2316.2: Localities may provide for transfer of development rights through ordinance.

### *Sample Ordinance Language*

#### Arlington, VA Code of Ordinances Article 9: Special Planning Area Regulations

##### 9.3.5. Transfer of Development Rights

A. The transfer of development rights in accordance with §15.5.7.B is permitted for historic preservation, open space and affordable housing purposes for sending sites specifically identified in the Plan and located in the “Conservation Area” designated in the Plan, subject to the following provisions. Additional sending sites that are located within the “conservation area” designated in the Plan may be approved by the County Board..

4. In order to achieve the goals of the Plan, it is preferred that density be transferred to sites within the “Revitalization Area” designated in the Plan...

### *Financing Options*

The appeal of the TDR program is that it passes the cost of the development rights onto a private party.

### *Final Thoughts*

Rising flood insurance rates are beginning to change the conversation about TDR programs at the local level, although local staff find difficulties in implementation. Some localities have comparable programs to TDR. Virginia Beach, for example, uses its Agricultural Preservation zone to downzone in priority areas. Poquoson has identified the highest part of the city, and created an overlay area which allows for greater density. These programs have the effect of reducing potential development in ecologically valuable areas.

### *References*

Grannis, J. (2011). *Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use*. Georgetown Climate Center .

Jarbeau , S. H., & Stiff, M.-C. (2015). *Flood Protection Pay-Offs: A Local Government Guide to the Community Rating System*. Wetlands Watch.

Lausche, B. (2009). *Policy Tools for Local Adaptation to Sea Level Rise*. Marine Policy Institute at Mote Marine Laboratory .

McStotts, J. *A Preservationist's Guide to Urban Transferable Development Rights* . National Trust for Historic Preservation .

Siders, A. (2013). *Managed Coastal Retreat: A Legal Handbook on Shifting Development Away from Vulnerable Areas*. Columbia Law School, Center for Climate Change Law.

Silton, A., & Grannis, J. (2010). *Stemming the Tide: How Local Governments Can Manage Rising Flood Risks* . Georgetown Climate Center.



## Appendix 4

## The Use of Land Donations for Property Owner Assistance in High Risk Areas

*Leveraging donated waterfront property to maximize economic benefit*

### Product #4

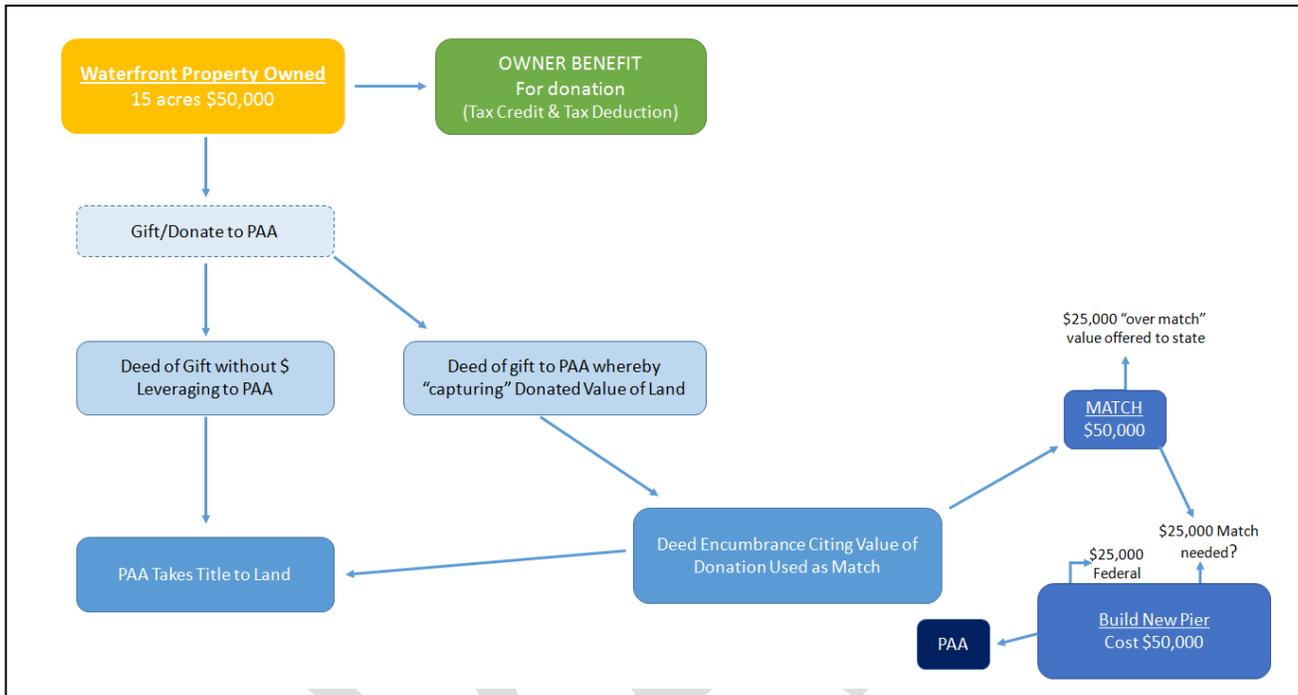
This report contains two sets of documents, each with a different targeted audience. One set of documents is related to how citizens can donate waterfront land for public benefit and associated tax benefits that accrue with the donation. The second set is a report from the Virginia Coastal Policy Law Center located at the William and Mary Law and focuses on how the donation of land value can be used for financial leverage by a political subdivision.

Together, these documents present a pathway for waterfront land owners looking to maximize economic gain against a changing real-estate market. Market conditions, repetitive flooding, Sea Level rise, increasing Federal Flood Insurance Premiums all present hurdles to selling waterfront land in high hazard areas.

### Trends: Waterfront Land Donated to the PAA

Donated Lands Now Owned by MP-PAA	Year Donated	Acres	Parcels	Value	Used as Match		
Shenk Tract	2006	14	1	\$ 226,500		Severn River	Gloucester
Mathews Heritage Park	2010	9	1	\$ 305,700		Billups Creek	Mathews
Capt. Sinclair Recreational Area	2014	97	21	\$ 1,423,700		Severn River	Gloucester
Sloop Landing Tract	2014	1.728	2	\$ 49,400		Mobjack Bay	Mathews
Dutchman's Tract	2014	5.5	1	\$ 167,900		Mobjack Bay	Mathews
Healy Creek	2014	8.86	1	\$ 1,300,000		Piankatank	Middlesex
Bethel Beach	2015	21	2	\$ 61,000	DEQ Coastal Match	Bay Side	Mathews
Winter Harbor	2015	5.06	1	\$ 111,800	DEQ Coastal Match	Bay Side	Mathews
Horn Harbor	2015	0.2	1	\$ 500		Horn Harbor	Mathews
Horn Harbor	2015	0.26	1	\$ 500		Horn Harbor	Mathews
Horn Harbor	2015	0.34	1	\$ 10,000		Horn Harbor	Mathews
Dea Donation (Adams Creek)	2015	9.2	1	\$ 152,250.00		York River (Adams Creek)	Gloucester
Redd Donation (Heron Point)	2015	2	1	\$ 190,000.00		York River	Gloucester
		174.148	35	\$ 3,999,250			

## Illustration of flow of match value from donated land



## **Money for Nothing: Leveraging donated property to satisfy federal grant match requirements.**

Funding is one of the greatest challenges facing state and local governments, especially for conservation projects. Many federal grants require “match” funding, often up to 50% of the project cost. In particular, local budgets are stretched amongst crucial underfunded obligations, leaving little room for conservation. Grant applicants may feel trapped between taking on additional liabilities and passing on federal funding. In Virginia, ingenuitive regional and state government officials are pioneering a third way: leveraging real property assets to satisfy match requirements.

In 2014, the Middle Peninsula Chesapeake Bay Public Access Authority (“MPCBPAA or Public Access Authority”) applied the land book value of a private waterfront land donation for public use as match against a related National Oceanic and Atmospheric Administration (NOAA) Virginia Coastal Zone Management Program (“Coastal Program”) grant by placing a specific deed-encumbrance on the gifted property for uses recognized as consistent with the purposes of the National Coastal Zone Management Program. This encumbrance provided a nexus between the donated land and the conservation goals of the Coastal Program. Cooperation with relevant state and federal authorities was crucial to ensure that the value of the donated lands would satisfy match funding requirements.

The grant match principles employed by the Public Access Authority have allowed the Commonwealth to realize the full value of land donations intended for conservation. This report (I) explains grant match funding generally and the use of in-kind property transfers as match; (II) analyzes the legal authority and requirements for using in-kind match for grants issued under Section 306A of the Coastal Program; and (III) outlines a case study in Virginia where innovative state and local authorities have leveraged existing assets to generate match for conservation programs. While this report focuses on matching funds for 306A Coastal Program grants, these principles could be applied to other federal grant programs. By formalizing the principles discussed herein, state and local authorities can realize the full value of donations for conservation.

### **I. In-Kind ("Soft") Match, generally**

Many states have reduced funding for conservation, passing this responsibility onto local and regional authorities. While prospective grant recipients may not have sufficient funds to meet match requirements, federal grant programs often permit “soft match” in lieu of cash. Prospective recipients may apply the value of “in-kind” donations of services and goods (including land and improvements) as match for a grant project. To determine whether and how a particular federal program allows in-kind match, one can look to the specific statutory or regulatory provisions governing those programs.<sup>1</sup>

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<sup>1</sup> See U.S. GOV'T ACCOUNTABILITY OFF., GAO-06-382SP, PRINCIPLES OF FEDERAL APPROPRIATIONS LAW (3d.), Vol. II, 10—5-6 (2006), available at <http://www.gao.gov/legal/red-book/overview>. If the statute is silent as to

For an in-kind donation to apply as match, federal agencies often require some nexus between the donation and the specific grant project or overall program. Traditionally, in-kind match involves a direct contribution to a particular project by the grant recipient or some related third party. For example, if a local government donates building materials to construct a pier that is being funded by a federal grant, that donation could be counted as match, thereby reducing that locality's required cash contribution by the value of the donated materials. If the cost of those materials exceeds the value of the federal grant, the locality would be relieved of any obligation to contribute match. In this latter scenario, the locality has generated "overmatch" that can be applied to other projects under the same grant.

The plain language of many grant regulations does not require the granting agency to limit this "nexus" to such a narrow category of expenditures. In fact, a broader view of the nexus and in-kind match can further state and federal conservation goals, while easing burdens on cash strapped localities. For example, many states encourage land conservation through donation or easement. In such cases, the recipient of the property can leverage that donation's value to match federal grants for conservation, as long as the donation furthers public access or preservation goals related to the respective federal grant program.

In Virginia, state and local authorities have begun to record the value of coastal land donated for public access and conservation purposes in order to satisfy match requirements under Section 306 of the National Coastal Zone Management Program ("Coastal Program"). The following process has allowed the Public Access Authority here to generate match value from the receipt of conservation lands:

- The open federal grant is related to conservation. This is an essential prerequisite to satisfy the nexus requirement.
- A third party seeking to donate land (a private citizen or, in the Public Access Authority case, a non-profit conservation organization) transfers coastal land to the regional public access authority.
- At closing, the grant recipient records the deed with an encumbrance: (1) reserving the property for public access and conservation, and (2) tying that property transfer to a related federal (Coastal Program) grant.
- The state agency charged with implementing the grant program applies the assessed or appraised value of the property as in-kind match for that grant.

In short, the process requires an open federal grant, a property donation to a public entity, and a nexus between the donated property and the grant. In the Public Access Authority case, the

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whether in-kind contributions count as match, that program should be construed to permit soft match for the reasonable value of property, services, and cash. *Id.*, at 10—97.

In the absence of agency specific law, or where that law is silent, state and local governments should determine general grant making principles pursuant to Office of Management and Budget (OMB) common rules, available in Circulars A-87 (regarding cost principles), A-102 (re: administrative requirements), and A-133 (re: audit requirements). See OFFICE OF MGMT. & BUDGET, *Grants Management, Grants Circular Attachment*, [https://www.whitehouse.gov/omb/grants\\_attach/](https://www.whitehouse.gov/omb/grants_attach/), (last visited 29 July 2016).

donated property (coastal land intended for conservation) directly furthers the conservation and public access goals of the Coastal Program, satisfying this nexus requirement.

Because the grant in question is part of an annualized block grant with several underlying projects (or “tasks”), any additional overmatch can be applied to those projects as needed. Note that the Public Access Authority does not receive anything of value in exchange for the overmatch; the disbursement of any “overmatch” is purely under the discretion of the state agency charged with implementing the grant.

## II. In-kind match funding for the Coastal Program

The National Coastal Zone Management Program<sup>2</sup> is a voluntary partnership between the federal government and participating coastal and Great Lakes states to reduce nonpoint source pollution and ensure the protection, restoration, and responsible development of shorelines and other coastal resources.<sup>3</sup> Participating states implement the CZMA through Coastal and Estuarine Land Conservation Programs (“State Coastal Programs”). In Virginia, the Department of Environmental Quality implements the Coastal Program.<sup>4</sup>

Section 306A of the CZMA provides funding for conservation and public access projects.<sup>5</sup> The state Coastal Program must match all 306A grants on a 1:1 basis.<sup>6</sup> However, nothing in the CZMA, attendant regulations, or relevant guidance requires each individual grant task to be matched 1:1, as long as the recipient state Coastal Program matches the entire block grant at the end of each fiscal year.<sup>7</sup> Each state has significant flexibility to define its conservation strategies and priorities through its NOAA approved Coastal Program Plan.<sup>8</sup> NOAA’s Coastal Program Director has issued a 306A Guidance document<sup>9</sup> to help state Coastal Programs identify and comply with relevant federal requirements. The Coastal Program Director must certify that each

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<sup>2</sup> Established by the Coastal Zone Management Act of 1972, as amended (“CZMA”). 16 U.S.C. § 1451 et seq. (2012).

<sup>3</sup> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, OFF. FOR COASTAL MGMT., *National Coastal Zone Management Program*, <https://coast.noaa.gov/czm/>, (last visited 29 July 2016).

<sup>4</sup> See Virginia Exec. Order No. 35 (2014), *Continuation of the Virginia Coastal Zone Management Program*.

<sup>5</sup> NOAA OFF. FOR COASTAL MGMT., *supra* note 3.

<sup>6</sup> CZMA, *supra* note 2, at § 306A(d).

<sup>7</sup> Conversations with Lewie Lawrence, Executive Director, MPPDC (March 2, 2016) and Laura McKay, Virginia Coastal Program Manager (March 17, 2016); see also Appendix 1, Virginia 306A Project List and Budget (FY14), Grant No. NA14NOS4190141.

<sup>8</sup> Dept. of Commerce Appropriations Act of 2002, Pub. L. No. 107-77. Plans are updated every five years. Many 306A projects must be designated under the State Coastal Program Plan. See 306A Guidance, *infra* note 8, at 3.

<sup>9</sup> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, *Coastal Zone Management Act: Section 306A Guidance* (1999) (“306A Guidance”), available at <https://coast.noaa.gov/czm/media/guide306a.pdf>.

project task meets these guidelines by signing the relevant 306A Project Checklist.<sup>10</sup> Upon certification, the project is approved for federal funding.

NOAA has explicitly authorized the use of in-kind match for 306A projects.<sup>11</sup> The in-kind acquisition must be sufficiently related to the program or grant (i.e., the donation must have some nexus to the purposes of 306A).<sup>12</sup> Details about 306A funding requirements are explained below.

#### **A. In-kind match funding permitted for 306A projects**

State Coastal Programs may use any combination of eligible state or local funds and in-kind donations as match. NOAA Coastal Program grant match principles are governed by the Office of Management and Budget (OMB) uniform grant regulation and guidance, codified at 2 C.F.R. pt. 200.<sup>13</sup> Section 200.306 governs costs sharing and match principles.

The OMB Uniform Guidance defines third party, in-kind contributions as “the value of non-cash contributions (i.e., property or services) that—(a) benefit a federally assisted project or program; and (b) are contributed by non-Federal third parties, without charge, to a non-Federal entity under a Federal award.”<sup>14</sup> This permits the match value of related, in-kind contributions upon approval from the relevant federal authority (in the Public Access Authority case, the Coastal Program Director) and the state Coastal Program (as the original grant recipient and party charged with implementing the grant program).<sup>15</sup> Any portion of donated property that is acquired with federal funds cannot be counted as match.<sup>16</sup> Match value is the lesser of either (1)

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<sup>10</sup> *Id.*, at 11.

<sup>11</sup> See 306A Guidance, *supra* note 9, at 11. Uniform grant regulations are available at 200 C.F.R pt. 200. These regulations repeal and replace NOAA specific regulations noted in the 306A Guidance and formerly found at 15 C.F.R. pt. 24. <sup>12</sup> § <sup>13</sup> See 306A Guidance, *supra* note 9, at 11. Note that properly promulgated agency regulations within the bounds of that agency’s statutory authority have the force of law and may not be waived on an ad hoc basis. GAO, FEDERAL APPROPRIATIONS LAW, at 10—45.

<sup>12</sup> § <sup>13</sup> See 306A Guidance, *supra* note 9, at 11. Note that properly promulgated agency regulations within the bounds of that agency’s statutory authority have the force of law and may not be waived on an ad hoc basis. GAO, FEDERAL APPROPRIATIONS LAW, at 10—45.

<sup>13</sup> See 306A Guidance, *supra* note 9, at 11. Note that properly promulgated agency regulations within the bounds of that agency’s statutory authority have the force of law and may not be waived on an ad hoc basis. GAO, FEDERAL APPROPRIATIONS LAW, at 10—45.

Former Dept. of Commerce (NOAA’s parent agency) grant regulations located at 15 C.F.R. § 24 have been repealed and replaced by the OMB Uniform Guidance. 2 C.F.R. § 1327.101. However, these new regulations do not materially differ from the prior regulations with respect to using donated property as in-kind match. 2 C.F.R. § 200.96; 306.

<sup>14</sup> 2 C.F.R. § 200.96.

<sup>15</sup> 306 A Guidance, *supra* note 9, at 11; 2 C.F.R. § 200.306(b)(6). In the Public Access Authority case, for example, the Public Access Authority (a political subdivision of the Commonwealth, and the local project sponsor) has acquired permission from the NOAA Coastal Program Director and Virginia Coastal Program. See Appendix 2.A., Task 53 signed 306A Checklist. Recall that a signed 306A checklist signifies that all elements of the project task have been approved. See *supra*, note 10 and accompanying text. <sup>16</sup> 2 C.F.R. 200.306(b)(2).

<sup>16</sup> 2 C.F.R. 200.306(b)(2).

the value recorded in the donor's accounting records at donation or (2) the current fair market value at the time that the grant is made.<sup>17</sup>

In-kind contributions qualify as match if they benefit a federally assisted *project or program*, not just one particular grant task.<sup>18</sup> In the Public Access Authority case, the value of property transfers donated to the Public Access Authority satisfied the match requirement for an entirely separate 306A land acquisition project under the same 306A conservation grant.<sup>19</sup> The Virginia Coastal Program closed both tasks (first, the donation and encumbrance of land, and second, the acquisition project) within the same grant period and under the same grant number to take account of the overmatch and ensure the recorded deeds of the donated properties were tied to the relevant grant number. The value of the donated property was determined by the assessed tax value of the property.<sup>20</sup>

### **B. Nexus—Eligible in-kind match**

OMB regulations authorize in-kind match only if the donated goods or services are sufficiently related to the purposes of the specific project or program.<sup>21</sup> In order to establish the “nexus” between the program and the match, grant recipients should look to the goals of both Section 306A and that state's implementation plan for the Coastal Program.

CZMA §306A allocates federal funds to the states for conservation, restoration, and public access projects. Eligible projects include:

- purchasing or conserving eligible coastal land;
- restoring coastal resources (*e.g.*, wetlands and shellfish habitat);
- rehabilitating certain urban waterfronts and ports; and
- providing public access to beaches and other coastal areas.<sup>22</sup>

Priority goals under Virginia's Coastal Program Plan include protecting and restoring coastal resources and habitats, reducing losses of coastal habitat, and improving public access to shorelines and coastal waters.<sup>23</sup> The Virginia Coastal Plan also establishes conservation priorities for several categories of coastal lands, including:

- designated CZM areas;
- lands connected to Chesapeake Bay National Estuarine Research Reserves;

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<sup>17</sup> 2 C.F.R. § 200.306(d).

<sup>18</sup> In order to be eligible as match, the in-kind donation must (i) be “necessary and reasonable to accomplish either project or program objectives, and (ii) be an “allowable cost” under Section 200, Subpart E. 2 C.F.R. § 200.306(b)(3-4). <sup>19</sup> See Part III of this report below for an explanation of this process. <sup>20</sup> Va. Code § 58.1-3201.

<sup>19</sup> See Part III of this report below for an explanation of this process. <sup>20</sup> Va. Code § 58.1-3201.

<sup>20</sup> Va. Code § 58.1-3201.

<sup>21</sup> 2 C.F.R. § 200.306(b)(3-4). Match is valid if eligible as an allowable cost under the Cost Principles, available at Section 200.400 *et seq.* *Id.* <sup>22</sup> CZMA *supra* note 2, at § 306A(b).

<sup>22</sup> CZMA *supra* note 2, at § 306A(b).

<sup>23</sup> See VIRGINIA COASTAL ZONE MGMT. PROGRAM, VIRGINIA COASTAL AND ESTUARINE LAND CONSERVATION PROGRAM PLAN, at 14, goals 1, 4, and 6 (2012), *available at*

<https://coast.noaa.gov/czm/landconservation/media/celcplanvafinal.pdf>. <sup>24</sup> *Id.*, at 16-21.

- dunes and beaches;
- wetlands, riparian areas, and coastal forests that support water quality;
- habitats for aquatic, migratory, endangered, and threatened species;
- lands targeted for acquisition in local or regional conservation plans;
- public access and recreation areas; and
- coastlines vulnerable to sea level rise impacts.<sup>24</sup>

In the case study below, several coastal properties were donated for public access to the waterfront and deed-encumbered for conservation. Such donations directly further the public access goals of the Coastal Program and the specific conservation values of the Virginia Coastal Program Plan. Therefore, these property transfers satisfy the nexus requirement for in-kind match under Section 306A.

### **III. Virginia Case Study—Property donated to the Middle Peninsula Planning District Commission used as match for a separate 306A land acquisition**

In Virginia, the Middle Peninsula Chesapeake Bay Public Access Authority (a political subdivision of the Commonwealth) assessed the value of donated land as match for the Virginia Coastal Program’s 306A grant program. This generated what is known as “overmatch”, or match value in excess of the 1:1 requirement for that particular project. The Virginia Coastal Program then applied this overmatch to another 306A grant project, or task, in need of additional matching funds. In order to tie this overmatch to the task seeking funds, the Public Access Authority recorded the deeds with an encumbrance that: (1) restricted the use of the property for preservation and public access, (2) certified that the property furthered the goals of the Coastal Program and Section 306A, and (3) explicitly tied the donation to the specific 306A grant number. Both the overmatch task (Task 53) and the task seeking match (Task 10) fell within the same 306A grant cycle, FY2014. Note that any overmatch generated is distributed by the Virginia Coastal Program; the Public Access Authority had no power to apply the overmatch to a preferred project or task.

A formal, institutional pathway for implementing these in-kind overmatch principles would increase flexibility and transparency. For example, allowing the creation of a “match only” task under the grant would simplify the property recordation process and prevent the co-mingling of unrelated project funds. Further, a “lookback” agreement with the relevant federal agencies would allow any unused overmatch to rollover from prior fiscal years. Such adjustments could facilitate transactions that generate match, ensuring a more reliable stream of funding for state Coastal Programs and project sponsors.

#### **A. Task 53 (FY14): Captain Sinclair Pier Project—Overmatch**

Task 53 was a 306A grant project sponsored by the Middle Peninsula Planning District Commission (MPPDC) and the Public Access Authority to construct a public pier and install

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<sup>24</sup> *Id.*, at 16-21.

native plants around public access property.<sup>25</sup> The 155 x 8 foot pier facilitates public access to the Severn River in Gloucester County, Virginia on Public Access Authority property,<sup>26</sup> while the native plantings helped to enhance the pier construction and natural environment around the project site.<sup>27</sup> The total federal grant award for the project was \$39,977.<sup>28</sup>

In order to satisfy the match requirement, Task 53 also provided for the closing and recordation of two properties in Mathews County, Virginia entirely unrelated to Task 53: Bethel Beach<sup>29</sup> and Winter Harbor.<sup>30</sup> A third party conservation organization had previously approached the Public Access Authority with an offer to donate those two properties. Upon transfer, these privately-held conservation lands were opened for public access, furthering 306A conservation and access priorities.<sup>31</sup> The deed encumbrance was essential to permanently bind these properties for conservation and public access purposes.<sup>32</sup> First, it established the nexus between the property donation and the purposes of CZMA § 306A.<sup>33</sup> Second, it tied the donation to the FY14 306A grant contract number.<sup>34</sup> Both the Virginia Coastal Program and the NOAA Coastal Program Director signed off on the grant project, authorizing the federal grant and associated overmatch.<sup>35</sup> This process allowed the Public Access Authority to record an additional match value of

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<sup>25</sup> Task 53 Scope of Work, Appendix 3.A.1.

<sup>26</sup> *Id.*, at Product #2.

<sup>27</sup> *Id.*, at Product #1.

<sup>28</sup> *Id.*, at VII; Appendix 1, 306A Project List (FY14). Final budget for the project was \$227,677, accounting for the federal grant award, the match value of donated properties, and additional in-kind contributions valued at \$14,100.

<sup>29</sup> Encompassing two separate parcels: Tax Map #31-A-116 B (18+- acres); #31-A-200 (3+- acres). *See* Appendix 4.A.

<sup>30</sup> Encompassing two separate parcels: Tax Map # 36-14-3 (2.53 acres); #36-14-4 (2.52 acres). *See* Appendix 4.B.

<sup>31</sup> “[The Public Access Authority] offered as matching funds for the project the donation, recordation, and encumbrance of 4 separate private waterfront land donations. . . These properties were previously managed and protected for private conservation by a local 501(c)3 which needed to dissolve. Upon transfer to the [Public Access Authority], the lands became publicly held and available for new water access sites. Upon recordation of donated fee simple interest, the waterfront land pivoted from private land to new public trust resources.” Task 53 Final Report, at 3.

<sup>32</sup> “The real property value of this [property—Tax Map #], determined and set by the Code of Virginia Title 58.1-3201 has been used as match for Federal financial assistance award NA14NOS4190141 through the Virginia Coastal Zone Management 306A Program. The land must be retained for conservation purposes and the purposes for which it was entered into the Virginia Coastal Zone Management 306A program. The Middle Peninsula Chesapeake Bay Public Access Authority shall not dispose of, encumber its title or other interest in this property, or convert it to other uses without notifying NOAA or its successor agencies. The Middle Peninsula Chesapeake Bay Public Access Authority is responsible for monitoring and managing of the property and shall not dispose of the property or modify the terms without notifying NOAA or its successor agencies.” Task 53 Final Report, at 10. *See* Appendix 4 for the deed-specific language.

<sup>33</sup> “The land must be retained for conservation purposes and the purposes for which it was entered into the Virginia Coastal Zone Management 306A program.” *See* Part II.B. of this report for a list of permissible purposes under 306A and Virginia’s Coastal Program (including public access).

<sup>34</sup> Grant No. NA14NOS4190141.

<sup>35</sup> Appendix 2.A., Task 53 Signed 306A Checklist.

\$173,600 to be applied to projects under Virginia’s FY14 306A grant.<sup>36</sup> After matching the remaining requirement from Task 53, the property donations generated \$147,723 in overmatch.<sup>37</sup> Lewie Lawrence, Executive Director of the MPPDC, described the overmatch as being directed into a “match bucket”, which other eligible projects funded by that year’s 306A grant could use to satisfy match requirements. Distribution of this overmatch was controlled by the 306A parent grant recipient and implementing agency, the Virginia Coastal Program.

**B. Task 10 (FY14): Beautiful Woods Acquisition—Applying the “overmatch” from Task 53 to compensate for match shortfall**

Task 10 provided 306A funding to the Virginia Department of Conservation and Recreation (“DCR”) for the fee simple purchase<sup>38</sup> of 1.145 acres of woodlands for conservation. *Id.* This acquisition expanded the Pickett’s Harbor Natural Area Preserve in Northhampton County, Virginia.<sup>39</sup> This acquisition was eligible for 306A funding because it was listed as a protection priority for the Virginia Coastal Program.<sup>40</sup> DCR originally requested \$226,176 under Task 10 for land acquisition and an economic study regarding the Eastern Shore.<sup>41</sup> However, DCR and the Virginia Coastal Program reprogrammed the grant request, using additional grant funding from FY12 to lower the total FY14 Task 10 federal grant request to \$117,351.<sup>42</sup> The overmatch from Task 53 was used to satisfy this match requirement.

**IV. Conclusion**

While federal 306A funding is an invaluable resource for conservation and public access projects, match requirements can prove a significant hurdle to potential project sponsors. However, many states and localities have substantial non-cash assets that they can leverage as match. The institutional pathway described above accounts for donative property transfers as in-kind match for projects within the same block grant program. A successful “match bucket” requires cooperation among the federal agency charged with implementing a particular grant program, the state grant recipient and administrator, and the project sponsor. This framework is only the beginning and could be further streamlined with two adjustments. First, a “match only”

<sup>36</sup> Appendix 3.A.1., Task 53 Scope of Work, at VI. Project sponsors also provided \$14,100 in match from other sources, for a total match value of \$187,700. *Id.*; Appendix 1, 306A Project List (FY14).

<sup>37</sup> The total match of \$187,700 minus the \$39,977 match requirement for Task 53 equals \$147,723 in overmatch.

<sup>38</sup> The FY14 funds were used to finance the purchase of 39.6% of the fee simple interest. Funds from FY12 Task 10.02 (Grant No. NA12NOS4190168) and FY13 Task 10 (Grant No. NA13NOS4190135) will be used to acquire the remaining interest in Lot 2. *See* Appendix 3.B.1., Task 10 Scope of Work, at III and Exhibit A.

<sup>39</sup> Currently owned by the DCR. *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *See* Appendix 1, 306A Project List (FY14), at Task 10; Appendix 5, Correspondence with April Bahen, Grants Coordinator, Virginia Coastal Program (May 2, 2016).

<sup>42</sup> Appendix 3.B.1., Task 10 Scope of Work, at IV (showing a final project budget of \$117,351); *see also* Appendix 5, Correspondence with April Bahen. The discrepancy between the 306A Project List and the actual project budget is explained in the Appendices below. *Compare* Appendix 1 with Appendices 2.B.1 and 2.B.2.

task would simplify the property recordation process and prevent the co-mingling of unrelated project funds. Second, state grant administrators could negotiate a “lookback” provision with the relevant federal agencies to allow unused overmatch to rollover from prior fiscal years. This would ensure a more reliable stream of match funding for the state Coastal Programs. The grant match principles discussed in this report could allow state and local entities to realize the full value of conservation lands and leverage federal dollars.

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## **Appendix 1— Virginia 306A Project List and Budget (FY14), Grant No. NA14NOS4190141**

### **Appendix 2—306A Checklists, Grant No. NA14NOS4190141 (FY14), Tasks 53 and 10**

#### **2.A. Task 53 Signed Checklist**

#### **2.B.1. Task 10 Signed Checklist**

This signed 306A checklist memorializes NOAA certification of Task 10. However, the Virginia Coastal Program reprogrammed the grant from the \$149,581 noted here to \$117,351. This amended grant amount is noted in the Amended Task 10 Checklist, Appendix 2.B.2. NOAA never resigned the checklist. However, this is the final grant amount for Task 10. *See* Appendix 5, Correspondence with April Bahen, Grants Coordinator, Virginia Coastal Program (May 2, 2016).

#### **2.B.2. Task 10 Amended Checklist (unsigned by NOAA)**

*See supra*, Appendix 2.B.1. for the signed NOAA Checklist, memorializing federal certification of FY14 Task 10. The grant amount listed herein—\$117,351—is the final federal grant request.

### **Appendix 3— Virginia 306A Project Documentation, Grant No. NA14NOS4190141 (FY14)**

#### **3.A.1—Task 53 Scope of Work**

#### **3.A.2—Task 53 Final Report**

#### **3.B.1—Task 10 Scope of Work**

#### **3.B.2—Task 10 Final Report**

### **Appendix 4—Deeds of Match Properties, Task 53 (FY14)**

#### **4.A—Bethel Beach Deed**

Tax Map #31-A-116 B (18+- acres); #31-A-200 (3+- acres).

#### **4.B—Winter Harbor Deed**

Tax Map # 36-14-3 (2.53 acres); #36-14-4 (2.52 acres).

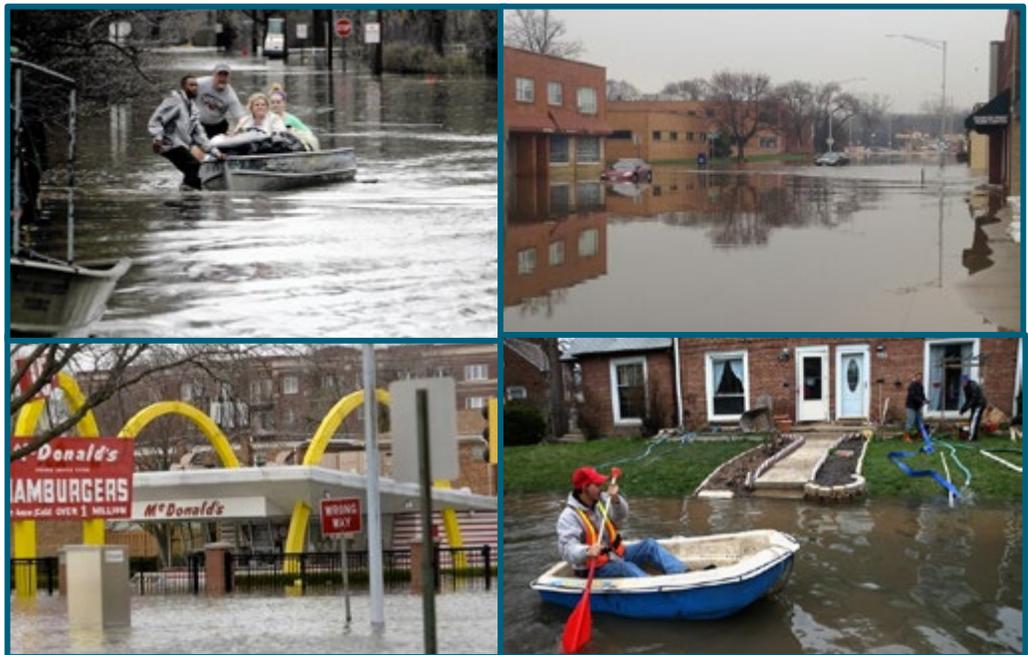
### **Appendix 5—Author Correspondence with Virginia Coastal Program (5/2/2016)**

Email Correspondence with April Bahen, Grants Coordinator, Virginia Coastal Program (May 2, 2016).

## Appendix 5

# State and Local Liability for Failure to Adapt to and Protect Against Recurrent Flooding: Applying Farmers Insurance's Legal Framework to Virginia Circumstances

James Andris, J.D.  
Virginia Coastal Policy Clinic  
at William & Mary Law School



## Contact Us

Please contact Roy Hoagland at rahoagland@wm.edu if you have comments, questions, or suggestions.



## About the Author

James Andris, J.D. recently graduated with honors from William & Mary Law School. During his years at William & Mary, he served as a staff member on William and Mary Law Review, competed with his school's National Trial Team, participated in the Virginia Coastal Policy and the Lewis B. Puller, Jr Veterans Benefits Clinics, completed internships with the Philadelphia District Attorney's Office, Clean Air Council, and Hill Wallack LLP, and served as a judicial extern for the Supreme Court of Virginia and Virginia Court of Appeals. Originally from Philadelphia, he graduated from Elon University in 2012 with a B.A. in Psychology.

## 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, providing 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, one of the largest marine research and education centers in the United States, and Virginia Sea Grant, a nationally recognized broker of scientific information – 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 College 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.

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. Whether it is working to understand the underlying realities of local zoning policies or attempting to identify and reconcile the concerns of multiple stakeholders, VCPC students experience the breadth of environmental lawyering while gaining skills that will serve them well regardless of the legal career they pursue upon graduation.

VCPC is especially grateful to Virginia Sea Grant for providing generous funding to support this project. VCPC also thanks the Virginia Environmental Endowment for its continuing support.

## Introduction

In April 2013, more than five inches of rain fell upon the city within twenty-four hours.<sup>1</sup> The precipitation turned major expressways into concrete-bottomed ponds, submerged hundreds of roads and homes, filled the city's flood control system past its 2.3 billion gallon limit, and forced the governor to declare a state of emergency.<sup>2</sup> Surprisingly, this disaster did not happen in New Orleans, Norfolk, or any other city that the United States expects to see featured as flooded on the news. Instead, Chicago found itself thrust into an unfamiliar limelight.

That April storm set a number of new records in Chicago and in the country. For example, the National Weather Service recorded record-high crests for five rivers at nine different sites in northern Illinois.<sup>3</sup> More pertinent to the legal community was the suit that Farmers Insurance Group subsequently filed against the City of Chicago and ninety-nine (99) other municipalities and organizations ("Chicago Municipalities").<sup>4</sup> According to the complaint, Chicago Municipalities "knew or should have known that climate change . . . [had] resulted in greater rain fall volume, greater rainfall intensity and greater rainfall duration . . . resulting in greater stormwater runoff . . ."<sup>5</sup> Consequently, Farmers Insurance argued that Chicago Municipalities should have increased the capacity of or updated its sewer and stormwater storage systems to prevent the foreseeable flooding.<sup>6</sup>

Farmers Insurance eventually dropped the suit, telling the press that it "believe[d] it had] brought important issues to the attention of the respective cities and counties, and that policyholders' interests [would] be protected by the local governments moving forward."<sup>7</sup> However, Michal Gerard, the director of Columbia Law School's Center for Climate Change, stated that these class action suits, the first of their kind, would not be the last.<sup>8</sup> The Hampton Roads area, which is particularly vulnerable to recurrent flooding and sea level rise, represents a primed fuse for such a suit.

This paper analogizes Chicago's 2013 flood and the corresponding lawsuit to the circumstances that haunt Norfolk and other Virginia municipalities. This analysis includes discussions regarding Farmers Insurance's legal arguments, the Virginia equivalent of those arguments, and the associated obstacles and success rates for each legal theory.

## I. Farmers Insurance's Legal Framework

Simplified, Farmers Insurance attempted to hold Chicago Municipalities liable for flood damage through a class action lawsuit under three separate, but similar, causes of action—negligence, negligence per se, and unlawful government takings. The following subsections provide the fundamental elements of these liability theories, explain how Farmers Insurance used said theories, and apply Virginia legal analysis to Norfolk's situation.

## II. Negligence

Negligence, a tort liability theory, is defined as "the failure to exercise the standard of care that a reasonably prudent person would have exercised in a similar situation ..."<sup>9</sup> Property owners in a successful negligence claim against a local government or municipality must prove four elements:

1. The municipality had a **duty**;
2. The municipality **breached** that duty;
3. The municipality's breach **caused the property owner harm**; and
4. The property owners incurred **damages** as a result of that harm.<sup>10</sup>

Although the existence of a duty is a question of law decided by a judge,<sup>11</sup> foreseeability is a persuasive factor in establishing that a duty exists.<sup>12</sup> Generally, a reasonable man, or a reasonable municipality, is only responsible for injuries or damages which are or could be reasonably foreseen. If a judge believes that a municipality owed a duty to property owners, then the trier of fact, usually a jury, must determine whether the property owners satisfied the remaining elements of the negligence claim.<sup>13</sup>

## **A. Recognition of Climate Change as a Factor of Foreseeability Leading to Duty**

In its complaint, Farmers Insurance maintained that Chicago Municipalities' formal recognition of climate change's scientific principles, specifically that it has caused increases in rainfall, intensity, and duration, created a basis to establish a "general duty" to properly maintain and improve upon sewer and stormwater storage systems.<sup>14</sup> As a result of that recognition, Farmers Insurance stated that Chicago Municipalities "knew or should have known" that climate change would result in greater stormwater runoff and flooding. According to Farmers Insurance, the foreseeability originated from the city of Chicago developing and adopting Chicago's Climate Change Action Plan ("CCAP").

### *i. Chicago's Climate Change Action Plan*

During his tenure as Mayor of Chicago, Richard M. Daley created a multi-stakeholder task force whose purpose, among other objectives, was to determine the challenges Chicago faced due to climate change and to describe the ways Chicago needed to adapt to the changes already affecting the region.<sup>15</sup> In 2008, that taskforce released the CCAP. In a report issued by Mayor Daley, he described the CCAP as "a road map of what [Chicago] hope[d] to achieve by 2020 to expand [Chicago's] successes in slowing the effects of climate change."<sup>16</sup>

Within the CCAP, the task force specifically identified that climate change would result in more frequent and intense rain and snowstorms.<sup>17</sup> Recognizing that "[f]looding and heavy rains ... create havoc with traffic and damage infrastructure,"<sup>18</sup> the CCAP stated that Chicago would both prepare a watershed plan which factored in projected climate changes and collaborate with other agencies to use available property, including vacant land and parking lots, to manage the resulting increase in stormwater runoff.<sup>19</sup> The CCAP also elaborated on Chicago's ongoing efforts to "support [its] aging water infrastructure" with onsite mechanisms that would help prevent future flooding.<sup>20</sup> Included in these efforts was the installation of permeable pavement, rooftop gardens, and other systems designed to catch stormwater runoff. Since issuing and adopting the CCAP, Mayor Daley and his taskforce have released at least one progress report, explaining that from 2008-2009 Chicago installed 1.8 million square feet of green roofs and 120 green alleys.<sup>21</sup>

Using these observations, Farmers Insurance alleged that Chicago Municipalities should have known that climate would result in a need for an increase in stormwater

storage capacity to prevent flooding. Although its complaint did not specifically argue that Chicago municipalities were negligent, this premise set an aggressive and somewhat forward-thinking tone to the rest of the document

### *ii. Virginia’s Governor’s Commission on Climate Change and the Commonwealth’s Climate Change Action Plan*

Similar to the CCAP, Virginia’s Governor’s Commission on Climate Change released a Climate Change Action Plan (“VaCCAP”) that recognized the dangers of climate change and severe weather events. In fact, the VaCCAP specifically states “Hampton Roads is particularly vulnerable [to the effects of climate change] due to the low elevation of the land and the existence of civilian and military ports, buildings, and infrastructure. *Stormwater systems will need to be designed to handle larger flows with increased storm intensity.*”<sup>22</sup> Unlike the CCAP, the VaCCAP does not promise that the Commonwealth or any of its municipalities will account for climate change in future watershed plans. Instead, it provides *recommendations* that would help Virginia agencies and local governments prepare for and adapt to the impacts of climate change.<sup>23</sup>

### **B. Virginia Municipalities Have a Duty to Maintain Sewer Systems**

There is no way of knowing if a judge would consider the statements from either the CCAP or VaCCAP determinative of foreseeability and indicative of a duty to property owners. However, it is clear that **Virginia municipalities have a common law duty to maintain sewer services.**<sup>24</sup> For example, in *Robertson v. Western Virginia Water Authority*, a sewer line burst causing the partial collapse of a retaining wall that bordered private property and caused extensive property damage. The Virginia Supreme Court ruled “there is a municipal liability where the property of a private persons is flooded, whether directly or by water being set back, when [the flood is] the result of . . . the negligent failure to keep [sewers] in repair and free from obstructions.” As seen in the 2013 Chicago flood, improperly maintained sewer systems have the potential to back up and flood roads, private residences, and cause damage to private property (e.g., cars in private or public parking lots). Furthermore, climate change may result in sewer systems encountering saltwater, which may corrode or otherwise deteriorate Norfolk’s existing sewer system. If Norfolk property owners could demonstrate that such corrosion contributed to floods, or that recurrent flooding otherwise caused damage to Norfolk’s sewer system which then contributed to flood damage, then property owners may be able to establish the necessary duty to move forward with a negligence claim. This argument does not parallel the argument made by Farmers Insurance, but is based on the same underlying principle—negligence.

## **III. Negligence Per Se**

Contrasting with negligence, the doctrine of negligence per se replaces the reasonable person standard with a standard enunciated in a legislative act.<sup>25</sup> Plaintiffs in a lawsuit can use both theories of liability in actions that involve personal injury or property damage. Property owners in successful negligence per se claims brought against a municipality must prove the following three elements:

1. The municipality **violated a statute enacted for public safety**;
2. The **property owners belong to the class of people** that the statute was enacted to protect; and
3. The **property owners incurred damage** as a result of the municipality’s violation.<sup>26</sup>

The first and second of these elements are issues of law that are decided by the trial court, while the final element is a factual issue that is decided by the trier of fact.<sup>27</sup> This means that if property owners request a jury trial, then a judge will decide if legislators enacted a statute for public safety meant to protect property owners, but a jury will determine whether the property owners actually incurred the alleged damage as a result of the municipality's violation.

### **A. Farmers Insurance's Statutory Sources of Liability**

Farmers Insurance identified two separate statutes that it claimed Illinois enacted to protect public safety. These statutes laid the foundation for two separate counts, or two separate factual situations that allow for a potential legal remedy.

Farmers Insurance first alleged that Chicago Municipalities owed Farmers Insurance policyholders a duty to safely and properly maintain sewer systems under 745 ILCS §3-102(1).<sup>38</sup> Under that statute:

[L]ocal public entit[ies have] the duty to exercise ordinary care to maintain [their property] in a reasonably safe condition for the use in the exercise of ordinary care of people whom the entit[ies] intended and permitted to use the property in a manner in which and at such times as it was reasonably foreseeable that it would be used...<sup>29</sup>

Farmers Insurance alleged that because Chicago Municipalities knew that its policyholders had experienced previous flooding from sewer and stormwater storage systems, that they were aware that the systems, as they existed, posed a risk to policyholders' "health, safety and welfare..."<sup>30</sup>

In its second count, Farmers Insurance cited to 745 ILCS § 3-103(a), which states that local public entities are not liable for injuries caused by the adoption of a plan or improvement to public property where a legislative body, or other entity exercising discretionary authority, has approved of the plan.<sup>31</sup> *However*, if, after the entity executes the plan, "it appears . . . that [the entity] has created a condition that is not reasonably safe," then public entities may be held liable.<sup>32</sup> Again, using the CCAP, Farmers Insurance argued that Chicago Municipalities knew, or should have known, that the various sewer and stormwater storage systems serving policyholders were defective and failed to employ flood mitigation strategies during the 2013 flood.<sup>33</sup> The complaint included a lengthy list of such strategies, such as raising the banks of nearby rivers with quickly-inflatable property protection systems or sandbags, increasing the capacity of stormwater storage structures using the same types of techniques, and failing to provide temporary stormwater-protection levees or walls.<sup>34</sup> Farmers Insurance alleged that Chicago Municipalities created conditions that were not reasonably safe because it did not implement these strategies.

### **B. Virginia Municipalities Do Not Have a Statutory Duty to Maintain Stormwater Storage or Flood Control Mechanisms**

Virginia municipalities do not have a duty to build or maintain stormwater storage systems, or any structure or device whose purpose is to prevent flooding of the municipality.<sup>35</sup> Virginia Code § 15.2-970 states that municipalities "*may* construct a dam, levee, seawall, or other structure or device . . . the purpose of which is to

prevent tidal erosion, flooding or inundation [of the municipality].”<sup>36</sup> Consequently, *municipalities do not have to build* such structures. Additionally, Code § 15.2-970 protects municipalities, such as Norfolk, whose stormwater storage systems might not serve their purpose by barring “any action at law or suit in equity . . . because of, or arising out of, the design, maintenance, performance, operation or existence of [such systems].”<sup>37</sup> Thus, unlike Illinois’ legal atmosphere, which includes potential statutory sources of liability for failure to construct flood-prevention structures, there is no authority that obligates Virginia municipalities to mitigate flooding.

Code § 15.2-970 does not shield municipalities from all liability theories. The section specifically allows for lawsuits premised upon a written contract between a municipality and property owners when a local government, governed by such a contract, chooses to exercise its permissive authority to take action to control flooding.<sup>38</sup> However, Virginia courts have not utilized this exception in any identified case. This could be because municipalities have not violated this type of contract or because municipalities simply do not enter into contracts that expose them to liability. Code § 15.2-970 also does not immunize improper government takings, which will be discussed later in this paper.<sup>39</sup>

#### *i. Protection From Common Law Claims—Sovereign Immunity*

After Farmers Insurance filed its claim, lawyers for Chicago Municipalities immediately informed the press that they were protected from prosecution by sovereign immunity.<sup>40</sup> If Norfolk property owners attempted to hold the city liable for flood damage, then Norfolk would most likely raise the same defense. The Virginia Supreme Court has described sovereign immunity as “a rule of social policy, which protects the state from burdensome interference with the performance of its governmental functions and preserves its control over state funds, property, and instrumentalities.”<sup>41</sup> When pled correctly, sovereign immunity bars recovery.<sup>42</sup>

In Virginia, municipalities perform two types of functions—governmental and proprietary. A governmental function is one that directly relates to the general health, safety, and welfare of a municipality’s citizens,<sup>43</sup> and one that involves a municipality utilizing its political, discretionary or legislative authority.<sup>44</sup> Municipalities are immune from liability for negligence when exercising a government function *and* for failing to exercise a government function.<sup>45</sup> Therefore, if property owners attempted to hold Norfolk liable for negligently planning or designing a sewer system, Norfolk could successfully use sovereign immunity to shield itself from liability.<sup>46</sup>

However, a municipality may be held liable when private property is flooded as a result of negligently maintained sewer systems.<sup>47</sup> This possibility exists because an allegedly negligent act that involves the routine maintenance or operation of a service provided by a municipality is considered proprietary, not governmental.<sup>48</sup> A proprietary function involves a privilege and power performed primarily for the benefit of the municipality. Municipalities are not immune from liability for negligence in the exercise of proprietary functions. When a municipality’s function is both governmental and proprietary, Virginia courts apply sovereign immunity using the rationale that “the governmental function is the overriding factor.”<sup>49</sup>

Because courts ultimately decide to apply sovereign immunity premised upon their own interpretation of a municipality’s actions, there is no way of predicting how

or when the defense would bar a negligence claim. If Norfolk property owners, like Farmers Insurance, argued that Norfolk failed to design an adequate sewer system, or even failed to update its sewer system, then courts would most likely apply the doctrine.

## IV. Unlawful Takings

Farmers Insurance’s last liability theory is grounded in the constitutional principle of government takings. At the federal level the Fifth Amendment guides takings claims, which reads “nor shall private property be taken for public use, without just compensation.”<sup>50</sup> Although Farmers Insurance cited the United States Constitution, the following subsections discuss the application of state takings clauses.

### A. Illinois’ Takings Clause

Unlike the Fifth Amendment, Article I, Section 15 of Illinois’ Constitution prohibits “seizing *and damaging*” private property without just compensation. Utilizing that language, Farmers Insurance asserted that its policyholders “suffered a direct encroachment upon their real properties when stormwater and/or sewer water invaded their real properties from [Chicago Municipalities’] sewers and subjected [their policy holders’] properties . . . to . . . public use as retention basins and/or detention basins...”<sup>52</sup> Farmers Insurance further asserted that “[the] properties became partially and/or totally uninhabitable and/or unstable as a result of . . . [the] sewer water invasions.”<sup>53</sup> Consequently, Farmers Insurance sought just compensation for policyholders whose property was damaged or “taken” as a result of the 2013 flood.<sup>54</sup>

### B. Virginia’s Takings Clause

Like Illinois’ takings clause, Article 1, Section 11 of the Virginia Constitution provides that “[n]o private property shall be damaged or taken for public use without just compensation to the owner thereof.”<sup>55</sup> To qualify as damage within the meaning of Virginia’s Constitution, the government does not need to have actually invaded or disturbed an individual’s property.<sup>56</sup> Instead, the government needs only to have adversely affected the individual’s ability to exercise his or her rights as a property owner.<sup>57</sup>

Virginia property owners have initiated unlawful takings claims, which are also called inverse condemnation claims, against Virginia municipalities as a result of flood damage on several occasions. For example, in *Kitchen v. the City of Newport News*, Robert Kitchen (“Kitchen”) alleged that Newport News permitted the over development of land above his residence, “which substantially, dramatically, and critically increased the amount of water flowing from the watershed through [a creek] and into [a pond] conveyance system.”<sup>58</sup> Kitchen further maintained that Newport News knew that the conveyance system was not designed to withstand the corresponding increase in use. He argued that “the City’s actions and conduct . . . created and caused” his residence to be “converted into a retention or detention pond” for public use and sought just compensation for the City’s taking.<sup>60</sup> Although the trial court initially dismissed his case for failure to state a cause of action, the Supreme Court of Virginia reversed that decision and remanded his case back to trial, explaining that Kitchen had “alleged specific, factual actions of [Newport News] which resulted in a taking of property.”<sup>61</sup>

Similarly, in *Livingston v. the Virginia Department of Transportation*, 134 homeowners (“Homeowners”) brought an inverse condemnation claim against the Virginia Department of Transportation (“VDOT”). In that case, Homeowners claimed that their homes flooded because VDOT straightened a curved section of a local stream, relocated the stream roughly 1,000 feet closer to their residences, and reduced the stream’s width by 38%.<sup>62</sup> They also argued that VDOT failed to maintain the manufactured channel, which resulted in their homes flooding substantially more than they would have but for VDOT’s project.<sup>63</sup> Once again, the trial court initially dismissed the claim, but the Supreme Court of Virginia reversed and remanded, holding that the stream’s relocation constituted a public use that could form the basis of an inverse condemnation claim.<sup>64</sup>

Neither the *Kitchen* nor *Livingston* case demonstrate a wholly successful inverse condemnation claim—any amount of money awarded to the plaintiffs could not be found on public record. However, they do allow Virginia residents the possibility of bringing municipalities to court without an immediate dismissal provided they allege specific municipal actions that led to an increase in flooding.

## V. Conclusion

Farmers Insurance undoubtedly attracted national attention to an international problem—recurrent flooding and increased severe weather events resulting from climate change. The corresponding complaint, which served as the legal catalyst for that attention, contained creative and complex arguments that attempted to hold Chicago Municipalities liable for flood damage through negligence, negligence per se, and unlawful takings liability theories. If Virginia property owners filed an analogous claim against Norfolk or other Virginia municipalities, they would have the highest likelihood of success with an unlawful takings claim, an unknown likelihood of success with a negligence claim, and the least likelihood of success with a negligence per se claim.

## References

- <sup>1</sup> NATIONAL WEATHER SERVICE WEATHER FORECAST OFFICE, <http://www.crh.noaa.gov/lot/?n=13apr1718> (last visited Dec. 15, 2014).
- <sup>2</sup> *State of Emergency: Massive Rains Create Widespread*, CBS NEWS (Apr. 18, 2013, 6:17 AM), <http://chicago.cbslocal.com/2013/04/18/massive-rains-leads-to-widespread-flooding-delays/>.
- <sup>3</sup> NATIONAL WEATHER SERVICE, *supra* note 1 (identifying the Des Plaines, Vermillion, Chicago, Du Page, Fox, and Illinois Rivers).
- <sup>4</sup> Original Class Action Complaint and Demand for Jury Trial, *Illinois Farmers Insurance Company v. Metropolitan Water Reclamation District of Greater Chicago* at 1-3, No. 1:14-cv-03251 *available at* <http://common-resources.org/wp-content/uploads/2014/05/Chicago-Flood-Insurance-Suit-.pdf#sthash.KNLUPSar.dpuf> [hereinafter *Farmers Insurance Complaint*].
- <sup>5</sup> *Id.* at 20.
- <sup>6</sup> *Id.* at p.21.
- <sup>7</sup> Robert McChoppin, *'Insurance Company Drops Suits Over Chicago-area Flooding*, CHI. TRIB. (June 3, 2014, 6:52 PM), <http://www.chicagotribune.com/news/local/breaking/chi-chicago-flooding-insurance-lawsuit-20140603-story.html>.
- <sup>8</sup> Mica Rosenberg, *Insurer's Climate Change Class Actions: More to Come?*, INS. J. (May 19, 2014), <http://www.insurancejournal.com/news/national/2014/05/19/329506.htm>.
- <sup>9</sup> Black's Law Dictionary (9th ed. 2009), negligence.
- <sup>10</sup> *McGuire v. Hodges*, 273 Va. 199, 205-06, 639 S.E.2d 284, 287 (2007) ("To establish negligence sufficient to sustain a judgment . . . [the plaintiff] was required to show the existence of a legal duty, a breach of that duty, and proximate causation resulting in damage.") (internal quotation marks omitted).
- <sup>11</sup> *Kellerman v. McDonough*, 278 Va. 478, 487 (2009).
- <sup>12</sup> See *N. & W. Ry. Co. v. Witt*, 110 Va. 117, 65 S.E. 489, 490 (1909) ("Negligence must be established by affirmative evidence, which must show more than a probability of a negligent act. The existence of negligence must not be left wholly to conjecture, and, in determining whether or not an act or omission of the master was negligent, it must be borne in mind that the master is not compelled to foresee and provide against that which reasonable and prudent men would not expect to happen.").
- <sup>13</sup> *Yuzefovsky v. St. John's Wood Apartments*, 261 Va. 97, 106, 540 S.E.2d 134, 139 (2001).
- <sup>14</sup> *Farmers Insurance Complaint*, *supra* note 4 at 26.
- <sup>15</sup> CHICAGO CLIMATE CHANGE TASKFORCE, CHICAGO CLIMATE ACTION PLAN 1 (2008), *available at* <http://www.chicagoclimateaction.org/filebin/pdf/finalreport/CCAP-REPORTFINALv2.pdf> [hereinafter CHICAGO CLIMATE ACTION PLAN].
- <sup>16</sup> *Id.* at 3.
- <sup>17</sup> *Id.* at 40.
- <sup>18</sup> *Id.* at 43.
- <sup>19</sup> *Id.*
- <sup>20</sup> *Id.*
- <sup>21</sup> PROGRESS REPORT: FIRST TWO YEARS 1 (2010), *available at* <http://www.chicagoclimateaction.org/filebin/pdf/CCAPProgressReportv3.pdf>.
- <sup>22</sup> GOVERNOR'S COMMISSION ON CLIMATE CHANGE, FINAL REPORT: A CLIMATE CHANGE ACTION PLAN 27 (Dec. 15, 2008), *available at* [http://www.sealevelrisevirginia.net/docs/homepage/CCC\\_Final\\_Report-Final\\_12152008.pdf](http://www.sealevelrisevirginia.net/docs/homepage/CCC_Final_Report-Final_12152008.pdf) [hereinafter VIRGINIA CLIMATE CHANGE ACTION PLAN].
- <sup>23</sup> *Id.* at 34-38.
- <sup>24</sup> *Robertson v. Western Virginia Water Authority*, 278 Va. 158, 752 S.E.2d 875 (2014) (There is a municipal liability where the property of private persons is flooded, either directly or by water being set back, when this is the result of . . . the negligent failure

to keep sewers in repair and free from obstructions.”) (alteration in original) (internal quotation marks omitted); *City of Richmond v. Gallego Mills Co.*, 102 Va. 165, 45 S.E. 877, 881 (1903) (“It is the duty of a city, from the time it acquires a sewer, to maintain it in a reasonably proper condition, without regard to what may have been the attitude of a former owner of the land through which it passes with respect to it.”).

<sup>25</sup> *Butler v. Frieden*, 208 Va. 352, 353, 158 S.E. 2d 121, 122 (1967).

<sup>26</sup> *Kaltman v. All American Pest Control, Inc.*, 281 Va. 483, 496, 706 S.E.2d 864, 872 (2011) (citations omitted).

<sup>27</sup> *Schlimmer v. Poverty Hunt Club*, 268 Va. 74, 79, 597 S.E.2d 43, 46 (2004).

<sup>28</sup> *Farmers Insurance Complaint*, *supra* note 4 at 26.

<sup>29</sup> 745 IL §3-102(1).

<sup>30</sup> *Id.*

<sup>31</sup> 745 IL §3-103(a).

<sup>32</sup> *Id.*

<sup>33</sup> *Id.* at 29-31.

<sup>34</sup> *Id.*

<sup>35</sup> Va. Code Ann. § 15.2-970(a) (2012).

<sup>36</sup> *Id.*

<sup>37</sup> *Id.* Many Virginia court cases support the application of Virginia Code § 15.2-970 to stormwater control systems. See, e.g., *Peerless Ins. Co. v. County of Fairfax*, 274 Va. 236, 239, 645 S.E.2d 478, 480 (2007) (holding sovereign immunity protected a municipality from a personal injury suit when a child fell and injured herself in a stormwater detention pond); *Mitcham v. City of Winchester*, 63 Va. Cir. 427, 427 (“Under the doctrine of sovereign immunity, a municipality is immune from liability for negligence in the exercise of its governmental functions. The design and operation of a municipal storm drainage system is a governmental function.”) (citations omitted).

<sup>38</sup> Va. Code Ann. § 15.2-970(b) (“[B]ut nothing herein shall prevent any such action or suit based upon a written contract.”).

<sup>39</sup> *Id.* (“This provision shall not be construed to authorize the taking of private property without just compensation therefor and provided further that the tidal erosion, flooding or inundation of any lands of any other person by the construction of a dam levee to impound or control fresh water shall be a taking of such land within the meaning of the foregoing provision.”).

<sup>40</sup> *Rosenberg*, *supra* note (“Lawyers for the localities will argue government immunity protects them from prosecution, said Daniel Jasica of the State’s Attorney’s Office in Lake County, which is named in the Illinois state court suit.”).

<sup>41</sup> *City of Virginia Beach v. Carmichael Dev. Co.*, 259 Va. 493, 499, 527 S.E.2d 778, 781 (2000) (internal quotation marks omitted).

<sup>42</sup> *Tomlin v. McKenzie*, 251 Va. 478, 480, 468 S.E.2d 882, 884 (1996).

<sup>43</sup> *Robertson v. Western Virginia Water Authority*, 287 Va. 158, 158, 752 S.E.2d 875, 876 (2014).

<sup>44</sup> *Carter v. Chesterfield County Health Comm’n*, 259 Va. 588, 590-591, 527 S.E.2d 783, 785 (2000).

<sup>45</sup> *Robertson*, 287 Va. 158, 158, 752 S.E.2d 876.

<sup>46</sup> *Id.* (“Thus, if the issue was negligence in the plan or design of the sewer system, the [municipality] would be immune from liability.”).

<sup>47</sup> *Id.*, 752 S.E.2d at 877.

<sup>48</sup> *Chalkley v. City of Richmond*, 88 Va. 402, 408, 14 S.E. 339, 341 (1891) (recognizing that “the obligation to establish and open sewers is a legislative duty, while the obligation to keep them in repair is ministerial.”).

<sup>49</sup> *Bialk v. City of Hampton*, 242 Va. 56, 58, 405 S.E.2d 619, 620-21 (1991).

<sup>50</sup> U.S. CONST. amend V.

<sup>51</sup> II. Const. Art. 1, § 15 (“Private property shall not be taken or damaged for public use without just compensation as provided by law. Such compensation shall be deter-

mined by a jury as provided by law.”).

<sup>52</sup> CHICAGO CLIMATE ACTION PLAN C, *supra* note 15 at 33.

<sup>53</sup> *Id.* at 35.

<sup>54</sup> *Id.* at 34.

<sup>55</sup> Va. Const. art. I, § 11.

<sup>56</sup> Prince William County v. Omni Homes, 253 Va. 59, 72, 481 S.E.2d 460, 467 (1997).

<sup>57</sup> *Id.*

<sup>58</sup> *Kitchen v. City of Newport News*, 275 Va. 378, 382, 657 S.E.2d 132, 134 (2008)

<sup>59</sup> *Id.*

<sup>60</sup> *Id.* at 388, 65 S.E.2d at 137.

<sup>61</sup> *Id.* at 389, 65 S.E.2d at 138.

<sup>62</sup> 284 Va. 140, 146, 726 S.E.2d 264, 267-68 (2012)

<sup>63</sup> *Id.* at 148, 726 S.E.2d at 268-69.

<sup>64</sup> *Id.* at 159, 726 S.E.2d at 275.

## Appendix 6

**Plan to Address Recurrent Flooding in Mathew County, Virginia**  
 Prepared by the Mathews Planning Commission and Planning Department  
 July 16, 2016

The Mathews County Planning Commission has identified recurrent flooding as a threat to the County. This plan is first step in understanding and addressing this issue. The overall theme of the plan can be summed up as “Live with the Water”.

**Situation Analysis**

Sea level rise is not a new phenomenon in the Tidewater area of Virginia, as the chart in Figure 1 shows.

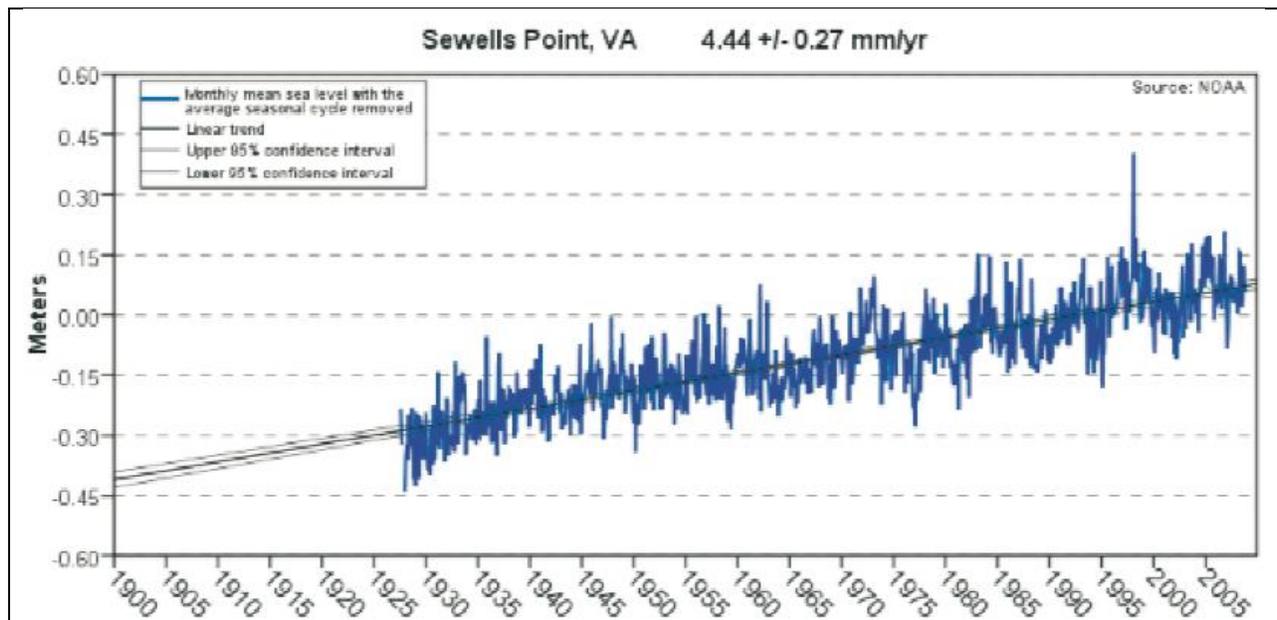


Figure 1. Sewell’s Point Tide Gauge Readings since 1927

With sea levels projected to continue rising, we can expect to see increasing recurrent flooding. According to VIMS, “recurrent flooding is flooding that happens repeatedly in the same areas, typically leading to economic losses”.

Recurrent flooding is a local phenomenon, with the threat and potential losses varying widely by locality. For example, even though the extent of recurrent flooding is potentially much greater for Mathews, Norfolk faces much greater potential economic impact than Mathews due to the much greater risk to buildings and infrastructure.

Locality	Population	Area in Acres	% Potentially Flooded	% Potentially Flooded that is Developed	Road Miles Potentially Flooded
Norfolk	247,189	34,723	12%	60%	119
Mathews	8,897	54,470	29%	2%	139

Table 1. Source: Recurrent Flooding Study for Tidewater Virginia, January 2013, VIMS

Even though the potential economic loss is much greater for Norfolk, the potential loss to Mathews could compromise the County’s viability. Thomas Jenkins, Mathew County Planner, did a study in 2014 of the land and improvements that lie in the 100-year floodplain. Here are his findings:

1. 28% of the land parcels in the County lie completely within the current flood plain. 56% of the land parcels in the County are all or partially in the flood plain.

	Intersect floodplain	Completely within floodplain
Parcels in floodplain	6512	3284
All county parcels	11667	11667
Percent	56%	28%

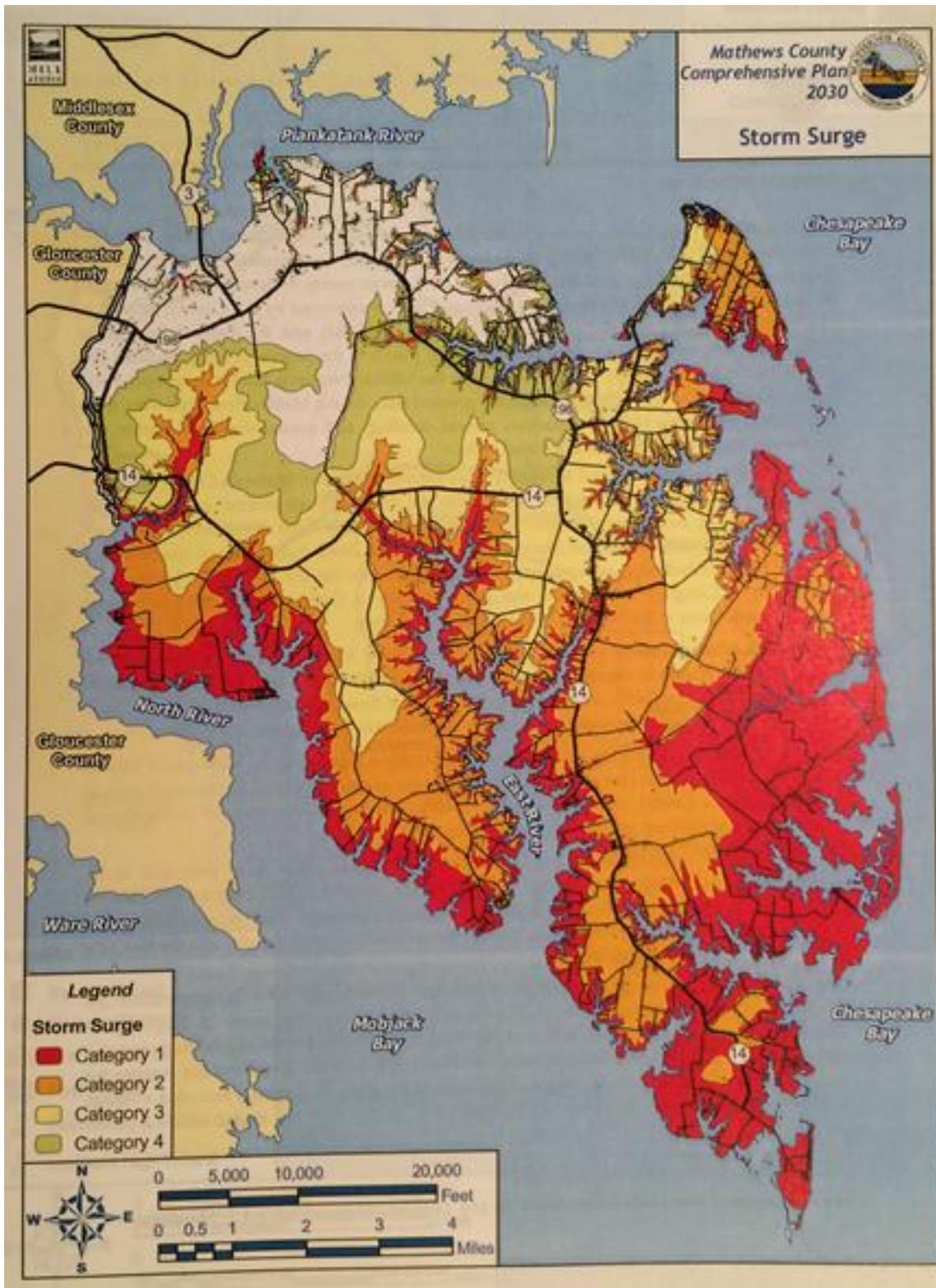
2. Every zoning type can be found in the flood plain, with R1 representing approximately 60% of the parcels.

Zoning district makeup of floodplain	
District	%
B1	1-2%
B2	0-1%
C	1%
I	0%
R1	58-61%
R2	5%
RU	30-35%
VMU	1%

3. 37% of the County’s assessed value of land, and 39% of the County’s assessed value of improvements lies within the flood plain. In other words, 38% of the County’s property tax revenue comes from flood plain property and is threatened by sea level rise.

<b>Real Estate Taxes*</b>			
		Land	Improvements
<b>Tax Rate</b> \$ 0.54 Per \$100 of assessed value	Total assessed value in floodplain	\$ 290,067,500.00	\$ 340,150,010.00
	Tax revenue in floodplain	\$ 1,566,364.50	\$ 1,836,810.05
	Total assessed value in the entire county	\$ 791,120,450.00	\$ 875,909,760.00
	Tax- entire county	\$ 4,272,050.43	\$ 4,729,912.70
	Percent of value in floodplain	37%	39%
<p>*-Based on 2012 Assessment. Does not include newly built structures, or newly subdivided parcels assessed after 2012.</p>			

This storm surge map reveals how susceptible Mathews is to rising sea level.



**Overall Goal**

We are advocating a “Live with the Water” approach to recurring flooding that envisions making and executing plans to adapt land use to the changes that sea level rise will bring to Mathews County.

**Plan Objectives**

1. Balance the protection of property rights with the protection of public health and safety.
2. Continually assess and keep all stakeholders informed of the progress of sea level rise and its likely effects on the County.
3. Implement a planning process and timeline for addressing recurrent flooding that evolves as the threat develops.
4. Seek opportunities to sustain or enhance the viability of the County as a result of steps taken to address recurrent flooding.

**Strategies**

1. Plan to plan, beginning an ongoing plan of action separate from but coordinated with the Comprehensive Plan.
2. Take a “watch and wait” approach that includes identification of future risks along with “trigger events” which will serve to activate planned actions to address recurrent flooding.
3. Utilize available resources (VIMS, VDOT, etc.) to create and publish a periodic (quarterly?) report on the status of sea level rise and recurrent flooding in Mathews.
4. Identify and map impact areas and their environmental vulnerabilities.
5. Identify the potential risk to homes, businesses and infrastructure.
6. Stay informed about the development and success or failure of potential land use and other tools to address recurrent flooding and its effects.

**Tactics**

1. Review and recommend zoning changes for threatened properties in the flood plain.
2. Identify and create a list of environmental liabilities in the flood plain.
3. Evaluate the potential cost versus potential benefit of participating in the Community Rating System program to see if the County should consider joining.
4. Identify and rank order potential land use actions that could beneficially be employed in Mathews.

## Appendix 7



**LETTER OF ENGAGEMENT  
Declaration of Need**

**COMMISSIONERS**

**Essex County**

*Mr. R. Gary Allen  
Hon. Margaret H. Davis  
Mr. A. Reese Peck  
Hon. Edwin E. Smith, Jr.  
(Chairman)*

**Town of Tappahannock**

*Mr. G. Gayle Belfield, Jr.  
Hon. Roy M. Gladding*

**Gloucester County**

*Hon. Ashley C. Chriscoe  
Dr. Maurice P. Lynch  
Mr. Sanford Wanner  
Hon. Michael R. Winebarger*

**King and Queen County**

*Hon. Sherrin C. Alsop  
Hon. James M. Milby, Jr.  
Mr. Thomas J. Swartzwelder*

**King William County**

*Hon. Travis J. Moskalski  
Mr. Eugene J. Rivara  
Hon. Otto O. Williams  
(Vice Chairman)*

**Town of West Point**

*Hon. Paul T. Kelley*

**Mathews County**

*Hon. O. J. Cole, Jr.  
(Treasurer)  
Mr. Thornton Hill  
Hon. Charles E. Ingram*

**Middlesex County**

*Mrs. Trudy V. Feigum  
Hon. Wayne H. Jessie, Sr.  
Hon. John D. Miller, Jr.*

**Town of Urbanna**

*Hon. Steve Hollberg*

**Secretary/Director**

*Mr. Lewis L. Lawrence*

October 19, 2015

The Middle Peninsula Planning District Commission is pleased to announce funding awarded from Virginia Coastal Zone Management (NOAA Grant # NA15NOS4190164 Task 54) for a project that will continue to explore solutions to recurrent flooding and sea level rise issues in Mathews County. Task#54 is funded by the National Oceanic and Atmospheric Administration (NOAA) and the Middle Peninsula Planning District Commission. No local appropriations are needed for this effort.

The purpose of this project is to provide planning options to be considered by rural coastal local governments in the Middle Peninsula to assist with mitigating the impacts of flooding and sea level rise in coastal communities. Using Mathews County as the pilot location, the project will identify and explore planning and development techniques that may be implemented at the local level to encourage and steer development to properties located outside of high risk flood hazard areas. The project will also provide information on how local government may implement incentives to encourage more elevations or relocations through commoditizing protected lands in high hazard areas.

The project includes the following tasks:

**1. Declaration of a Need for Local Public Policy Discussion**

**Through a letter of engagement and in accordance with** Virginia Code Sec. 15.2-2200 Legislative Intent, the Mathews County Planning Commission acknowledges the educational need to explore local planning options to address impacts of flooding and sea level rise which may impact public health, safety, convenience and welfare of Mathews' citizens and formally request

**2. Planning Techniques Commonly Used in Land and Natural Resource Protection**

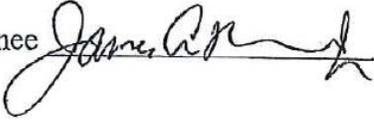
The project will provide insight into specific planning techniques and programs used to encourage developers and property owners to build or relocate outside of high risk areas. The research will focus on how such methods can be modified and implemented in Middle Peninsula localities as adaptation strategies.

### **3. A Mathews County Policy Analysis**

MPPDC staff will review the Mathews County Comprehensive Plan and local ordinances and identify possible barriers to implementation of new tools and methods and recommend solutions. The research will focus on local policy's current capacity to encourage programs that allow local government to assist Mathew's County property owners with alterations in or relocation out of high hazard areas.

### **4. The Use of Land Donations for Property Owner Assistance in High Risk Areas**

The project will look for nonconventional funding mechanisms as a means of subsidizing property enhancements and/or relocations for those owners in high hazard areas. At Mathew's County Planning Commission's September 15<sup>th</sup> meeting, the Planning Commission expressed an oral need for the work proposed under project. By providing a signature below, the Mathew's County Planning Commission is attesting to a declaration of the need for assistance with research and planning recommendations on planning policies to address recurrent flooding and sea level rise in Mathews County.

Planning Commission Chair/Designee  Date November 10, 2015