

# Local Government Planning Options to Address the Impacts of Recurrent Flooding and Sea Level Rise

*Planning Considerations for Mathews County to “Live with the Water”*

SEPTEMBER 30, 2016



This project, task # 54 was funded by the Virginia Coastal Zone Management Program At The Department Of Environmental Quality through grant # NA15NOS4190164of the U.S. Department of Commerce, National Oceanic And Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its sub agencies.

## Table of Contents

<b>FRAMEWORK</b> .....	<b>1</b>
<b>APPROACH</b> .....	<b>4</b>
<b>SURVEY AND FINDINGS</b> .....	<b>6</b>
<b>MATHEWS PLANNING COMMISSION GOALS</b> .....	<b>7</b>
<b>LOCAL GOVERNMENT OPTIONS</b> .....	<b>8</b>
<b>HAZARD MANAGEMENT AND MATHEWS COUNTY</b> .....	<b>9</b>
<b>PLANNING TOOLS</b> .....	<b>13</b>
<b>COMPREHENSIVE PLANS</b> .....	
<b>HAZARD MITIGATION PLANS</b> .....	
<b>CAPITAL IMPROVEMENT PLANS</b> .....	
<b>GREEN INFRASTRUCTURE PLAN</b> .....	
<b>REGULATORY TOOLS</b> .....	<b>15</b>
<b>ZONING CODE</b> .....	
<b>OVERLAY ZONES</b> .....	
<b>SETBACKS AND BUFFERS</b> .....	
<b>REBUILDING RESTRICTIONS</b> .....	
<b>BUILDING CODE</b> .....	
<b>CLUSTER DEVELOPMENTS</b> .....	
<b>DENSITY BONUS</b> .....	
<b>DITCHING AUTHORITY</b> .....	
<b>FLOODPLAIN MANAGEMENT</b> .....	
<b>FINANCIAL &amp; MARKETBASED INCENTIVES</b> .....	<b>21</b>
<b>CONSERVATION EASEMENTS</b> .....	
<b>TAX INCENTIVE</b> .....	
<b>TRANSFER/PURCHASE OF DEVELOPMENT RIGHTS</b> .....	
<b>REAL ESTATE DISCLOSURES</b> .....	
<b>LEVERAGING DONATED WATERFRONT PROPERTY TO MAXIMIZE ECONOMIC BENEFIT</b> .....	
<b>STATE AND LOCAL LIABILITY FOR FAILURE TO ADAPT TO AND PROTECT AGAINST     RECURRENT FLOODING</b> .....	
<b>TOOLKIT MATRIX</b> .....	<b>27</b>
<b>RECOMMENDATIONS</b> .....	<b>28</b>
<b>REFERENCES</b> .....	<b>32</b>
<b>APPENDIX</b>	
<b>APPENDIX 1: PC SURVEY</b> .....	
<b>APPENDIX 2: VCPC TDR-PDR REPORT</b> .....	
<b>APPENDIX 3: WETLAND WATCH TOOLS-FACT SHEETS</b> .....	
<b>APPENDIX 4: VCPC LEVERAGING DONATED WATERFRONT PROPERTY TO MAXIMIZE ECONOMIC     BENEFIT</b> .....	
<b>APPENDIX5: VCPC State and Local Liability for Failure to Adapt to and Protect Against Recurrent     Flooding</b> .....	
<b>APPENDIX6: Draft Mathews PC Annalysis of Flooding and Goals</b> .....	
<b>APPENDIX7: Leter of Engagement</b> .....	

## PLANNING FRAMEWORK

Over the past several years, the Middle Peninsula Planning District Commission (MPPDC) has partnered with federal, state and local governments to examine and address public concerns over repetitive flooding. 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 the welfare of Mathews' citizens

The purpose of this project is 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 Mathews County Planning Commission Chairman signed a letter of Engagement: Declaration of Need with the MPPDC dated October 19<sup>th</sup>, 2016 (appendix 7) requesting technical and professional assistance to help identify and explore planning and development techniques that may be implemented at the local level to “live with the water” or encourage and steer development to properties located outside of high risk flood hazard areas. The project also provided information on how local government may implement or leverage economic incentives to encourage more elevations or relocations through commoditizing protected lands in high hazard areas.

Over the past several years, professionals from the scientific, professional planning, and academic communities have begun to develop strategies and approaches to address flooding issue from various aspects. For the Middle Peninsula region, MPPDC continues to facilitate and broaden awareness to assist local communities with improved understanding of economic, social and cultural vulnerabilities to flooding.

In 2012, an MPPDC project funded through Virginia Coastal Zone Management Program Grant #NA10NOS4190205 Task 92.05 resulted in a report entitled “Initiating Adaptation Public Policy Development”. The report outlined five approaches to building resiliency in coastal communities focused on understanding potential impacts on people, property and environment through an economic assessment of public property and infrastructure. The project also identified local government’s role in protecting public welfare and safety from a public policy perspective. The report introduced necessary key steps required by local governments in a strategic approach to flood mitigation. These include:

- Planning
- Vulnerability Assessment
- Sea Level Rise Implications
- Public Engagement
- Formulate Policy
- Create Regulatory and Non Regulatory Strategies

Using the steps identified above, coastal communities in the Middle Peninsula have begun to broaden their focus with the understanding that planning and public engagement are continuous parts of the adaptation and resilience process. In order to determine suitable adaptation strategies to address sea level rise for a community or region, numerous studies including vulnerability (risk) assessments have been completed. Vulnerabilities have been outlined and well documented in several plans, including the 2016 Middle Peninsula All Hazards Mitigation Plan.

In 2013, MPPDC partnered with Mathews County through an effort made possible by funding from the National Fish and Wildlife Foundation to study drainage infrastructure problems. The findings of the project, outlined in the Mathews County Rural Ditch Enhancement Study, are a key milestone towards

building adaptation strategies and an implementation plan for Mathews' coastal communities. One of the primary results of the project was the reaffirmation that poor drainage due to lack of ditch maintenance and sea level rise compounds the flooding problems and flood management solutions utilized within Mathews County. These findings laid the foundation for two additional projects undertaken by MPPDC in partnership with Mathews County to address issues surrounding ditch maintenance including identifying maintenance responsibilities and development of a database to track ownership and maintenance information.

Specifically, this report, provides planning options which could be considered by rural coastal local governments in the Middle Peninsula to assist with further mitigating the impacts of flooding and sea level rise by identifying and exploring planning and development techniques that may be implemented to encourage development that is compatible with the water and or to steer development to properties located outside of high risk flood hazard areas.

The recommendations in this report have been reviewed and discussed by the Mathews County Planning Commission, but no formal position was taken on any of the recommendations. The recommendations provide guidance on addressing sea level rise through the use of local government planning, regulatory and policy making mechanisms. Although the recommendations in this report are specific to Mathews County's needs, measures identified in the toolkit may be incorporated by any local government in coastal Virginia.

## **APPROACH**

Flooding is a destructive natural hazard and results in significant economic loss to Mathews County businesses and homes. Sea level rise will contribute to the displacement of coastal populations, threaten infrastructure, intensify coastal flooding and ultimately lead to the loss of homes, businesses, public infrastructure, recreation areas, public space, coastal wetlands and salt marsh. Residential and commercial structures, roads, and bridges will be more prone to flooding. The effectiveness and integrity of existing flood control structures such as seawalls, which have been designed for historically lower water levels, will be reduced. Higher sea levels along coastal communities will create changes in surface water and groundwater characteristics and disrupt important coastal ecological systems. Salt water intrusion into freshwater aquifers and wells will contaminate drinking water supplies. Higher water tables will directly impact wastewater treatment plants in the coastal zone. Sea level rise will increase the extent of flood damage along the coast. Lower elevations along the coast will become increasingly susceptible to flooding as storm surges reach further inland due to sea level rise and the projected increase in storm frequency and intensity. Salt marshes are particularly vulnerable to the higher rise of sea level. The normal process of accretion, the build-up of live and decaying plants and sediments, will not keep pace. As salt marshes become submerged, they must migrate inland or drown. Development along the coast has decreased the amount of open space adjacent to salt marshes, limiting their ability to migrate landward. An increase in the rate of sea level rise will result in significant losses of coastal salt marsh habitat.

Local governments such as Mathews County, are aware of the potential impacts of sea level rise, however due to the impacts being gradual and long term, managing the problem is very complex with issues impacting many aspects of coastal living. The science and available information on the topic continues to evolve. The projected rate of sea level rise varies under various scenarios; and the rate and degree of sea level rise is dependent on many factors such as the rate of future greenhouse gas emissions, the rate of increases in temperature, ice sheet melt, and subsidence. Additionally, some areas of the coast are much more vulnerable to the impacts than others. Some areas of the coast are particularly low-lying or have highly erosive coastlines. However several mainstream approaches to addressing recurrent flooding due

to sea level rise have been consistently identified throughout the coastal academic and scientific community. These approaches are:

### **Accommodation**

*Strategies that do not act as a barrier, but rather alter the design of property and structures through measures such as elevation or storm water improvements, to allow the structure of infrastructure system to stay intact.* Rather than preventing flooding or inundation, these strategies aim to reduce potential risks associated with recurrent flooding.

The goal of an accommodation strategy is to allow continued development of new structures by managing risks by conditioning development so as to require that structures be built or retrofitted to be more resilient to flooding impacts by limiting shoreline armoring or requiring more open space.

### **Managed Retreat**

*Strategies that involve the actual removal of existing development, their possible relocation to other areas, and/or the prevention of future development in high risk areas.* Retreat strategies usually involve the acquisition of vulnerable land for public ownership, but may include other strategies such as transfer of development rights, purchase of development rights, rolling and conservation easements.

Managed retreat goals limit armoring, discourage development and redevelopment in threatened areas, and plan for the eventual relocation of structures from high risk areas to safer locations inland.

### **Protection**

*Strategies that involve “hard” and “soft” structurally defensive measures to mitigate impacts of rising seas in order to decrease vulnerability while allowing structures and infrastructure to remain unaltered.*

Two examples are shoreline armoring and beach nourishment. Protection strategies may be targeted for areas of a community that are location-dependent and cannot be significantly altered or relocated, such as downtown centers, areas of historical significance, or water-dependent facilities. The goal of protection strategies is to prioritize protection of people, property, and infrastructure from impacts; protection policies typically use hard-engineered solutions to prevent impacts.

### **Preservation**

*Strategies to preserve and enhance lands for natural resource and habitat values.* For lands at risk from sea level rise, a preservation objective could limit development of land surrounding wetlands and beaches to allow for their inland migration as the seas rise.

### **Avoid (retreat)**

*Avoiding recurrent flooding involves ensuring development does not take place in areas subject to coastal hazards or where the risk is low at present but will increase over time.* This may involve identifying future “limited development” or no development areas in local government planning documents. A wide range of planning tools may be involved.

## SURVEY AND FINDINGS

In order to implement a comprehensive strategy, policymakers will need to establish their overall adaptation goals for different regions, areas, and types of property. In January 2016, Middle Peninsula Planning District Commission staff provided a survey to the citizen members serving on the Mathews County Planning Commission to better understand the goals of the Planning Commission (Appendix 1)

The purpose of the questionnaire was to provide understanding and guidance to both MPPDC staff and Mathews Planning Commission about politically acceptable approaches to mitigate the ongoing impacts of flooding and sea level rise in the county. Survey results are intended to help the Mathews Planning Commission understand options and make possible recommendations to the Mathews County Board of Supervisors that will ensure Mathews County remains economically viable and culturally relevant.

Four questions were asked

- 1. What are your top concerns about Mathews County as it relates to coastal resiliency and mitigation?**
- 2. What approach do you feel local government should take in addressing the issues you have identified?**
- 3. What tools, if any, do you feel local government should use to help address the issues surrounding recurrent flooding in Mathews County communities?**
- 4. What do you anticipate or what would you like to see as the final result of the Local Planning Options to Address the Impacts of Flooding and Sea Level Rise Project?**

The survey answers were then loosely reclassified and assembled around the 5 standard classifications to help guide project discussions moving forward.

<b>Respondent</b>	<b>Avoid</b>	<b>Accommodate</b>	<b>Preserve</b>	<b>Retreat</b>	<b>Protect</b>
<b>1</b>		<b>1</b>	<b>1</b>		
<b>2</b>			<b>1</b>		
<b>3</b>		<b>1</b>	<b>1</b>		<b>1</b>
<b>4</b>	<b>1</b>				
<b>5</b>		<b>1</b>	<b>1</b>		
<b>6</b>					<b>1</b>

Based on the survey answers, general discussion and comments received from Planning Commission members, the Chairman of the Mathews Planning Commission proposed the following as a policy position that encourages Mathews Citizens to “Live with the Water”

The Mathews Planning Commission has not taken action to recommend or enact any positions on Flooding; more the goals of “Living with the Water” provide a foundation for ongoing policy dialog between the Planning Commission and the Mathews Board of Supervisors.

### **MATHEWS PLANNING COMMISSION GOALS (Draft)**

As proposed by the Chairman: *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 be beneficially employed in Mathews.

To advance forward the goals of “living with the water” the following local government tools were provided to the Planning Commission and discussed over the project period.

## LOCAL GOVERNMENT OPTIONS

§15.2-2210 requires that every locality shall by resolution or ordinance create a local planning commission in order to promote the orderly development of the locality and its environs. To meet this requirement, local Planning Commissions will need to strengthen their capacity to work across sectors, disciplines and levels of government in planning for future sea level rise. Adaptive planning is an ongoing process of coordination and collaboration. While many available options may be administered at the local level, the strategy may need to include partnerships with nonprofit or private entities to achieve stated adaptation goals.

The tables below provides information on how Mathews County is currently utilizing local government options which are in practice across the Commonwealth. This comprehensive collection identifies planning, regulatory and financial tools that may be implemented at the local level although some may be administered by private entities. The table identifies the tool, the purpose of the tool and how it may be used at the local level as a part of the local adaptation strategy. The final column identifies the approach the tool works to implement. Individual fact sheets on specific tools developed by Wetlands Watch, a state wide organization advocating for the use of adaptation and resiliency tools across the Commonwealth are included in Appendix 3. The Wetland Watch tools were very helpful and served as “one pagers” to learn about specific tools using an info-graphic style sheet. More specifics on each tool follow in the next section of the report.

The following color code is used it indicate if and how Mathews County is currently utilizing each tools.

- **Green- Tools that are already in place in Mathews. Revisions may be required to address specific issues .**
- **Yellow- In practice to some degree in Mathews**
- **Black- Not in practice or used in Mathews Note: Most of the black tools are used as methods for retreat which was not expressed as an adaptation strategy or desire of the Mathews Planning Commission.**



## HAZARD MANAGEMENT IN MATHEWS

POLICY TOOLS	What Does This Do	How To Use It	Measures It Take
Comprehensive Plan	Provide the long-range planning tool used to guide future development in a community. Includes Transportation, public facilities and land use	Incorporate adaptive strategies to sea level rise into their communities' long range land-use decision-making guidance. Incorporate language that will set the foundation for regulatory and policy creation to mitigate future impacts.	Protect Accommodate Preserve Retreat
Hazard Mitigation Plan	An assessment of the vulnerability of persons and property during major hazardous events. Provides a strategy for decreasing the impacts and a response to storm events and natural disasters.	Outlines the implementation strategy for addressing and responding to flooding attributed to sea level rise.	Protect Accommodate
Capital Improvement Programs	Guide future investments in public infrastructure based upon projections of the community's growth.	Use CIPs to site new infrastructure out of harm's way, discontinue maintenance and repair of infrastructure that is repetitively damaged, or relocate or retrofit existing infrastructure to be more resilient to sea level rise.	Protect Retreat Accommodate
Green Infrastructure Plan	Products, technologies and practices that use natural systems – or engineered systems that mimic natural processes – to enhance overall environmental quality and provide utility services.	Encouraging or requiring applicants to incorporate green infrastructure into development and redevelopment projects. Typically through a customized tree or planting plan or landscape plan	Protect Accommodate Preserve
REGULATORY TOOLS	What Does This Do	How To Use It	Measures It Takes
Zoning and Subdivision Ordinance	Provide the legal framework that governs the use and development of land in a community. Within designated zones, the ordinance specifies the uses and design requirements that govern development (e.g., setbacks, building heights, densities).	Amend the zoning and subdivision ordinances to include provisions that address the impacts of sea level rise in high hazard areas based on the chosen approach.	Preservation Protect Accommodate Retreat

<b>Overlay Zones</b>	<b>Overlay zones superimpose additional regulations on an existing zone based upon special characteristics of that particular zone.</b>	<b>Designate areas that are vulnerable to impacts and impose special regulations on those areas. Special regulations could prohibit or limit expansion or major renovation to existing structures and rebuilding of damaged structures, based upon their adaptation goals.</b>	<b>Accommodate Protect</b>
<b>Cluster Development</b>	<b>Developers are permitted to concentrate development in desirable areas using smaller lots in exchange for the developer's agreement to designate a certain percentage of open space.</b>	<b>Amend zoning and subdivision ordinance allowing for cluster developments to encourage concentration of development in upland areas and require dedication of vulnerable areas as open-space and flood buffers.</b>	<b>Accommodate Preserve</b>
<b>Density Bonuses</b>	<b>Provides an incentive to conserve land by increasing the number of units allowed per acre when building in designated areas or following other provisions.</b>	<b>Incentives may be considered and applied through the rezoning process and/or directly through provisions of the zoning ordinance text and available to anyone who meets the standards established in the zoning ordinance.</b>	<b>Protect Preserve Accommodate</b>
<b>Setbacks and Buffers</b>	<b>Require enhanced setbacks and buffers from baseline or shoreline features through local zoning and development codes. Require retention of natural vegetative state where possible.</b>	<b>Establish requirements for building location and construction by requiring more open space (buffering) to maximize protection from flooding.</b>	<b>Protect Accommodate Preservation</b>
<b>Rebuilding Restrictions</b>	<b>Amend Zoning and/or building codes to address rebuilding structures in flood prone areas by implementing stricter building provisions prohibiting rebuilding all together.</b>	<b>Limit a property owner's ability to rebuild structures destroyed by natural hazards such as flooding.</b>	<b>Protect Accommodate Retreat</b>
<b>Building Code</b>	<b>Amend building code to provide more stringent requirements in areas that are prone to repetitive flooding.</b>	<b>Extend building code regulations to properties in the 500-year floodplain and require that new structures be designed to be more resilient to flood impacts and require</b>	<b>Protect Accommodate</b>

		that structures in the 100-year coastal floodplain be further elevated.	
Building and Design Review Standards	Establish enhanced or additional provisions in the building and development codes that encourage new development or construction to take into account impacts of recurrent flooding and sea level rise.	Limit when and how structures are rebuilt by prohibiting reconstruction, requiring that structures be rebuilt using resilient design techniques, or conditioning redevelopment.	Protect Accommodate
Floodplain Management Ordinance	As a requirement to participate in the National Flood Insurance Program (NFIP) (does not include CRS), local governments must impose minimum regulation on development in floodplains (generally delineated as the 100-year floodplain	Impose additional restrictions on development in floodplains above NFIP minimum standards. Governments could impose use restrictions in the 100-year floodplain and design requirements in the 500-year floodplain (e.g., requirements that structures be elevated).	Protect Accommodate Preserve Retreat
Ditch Authority	Responsible for assessing and monitoring the conditions of conveyance systems such as roadside and outfall ditches.	Create permitting programs and other programs to manage stormwater conveyance systems.	Protect Preserve Accommodate
Virginia Stormwater Management Program	Provides guidelines and minimum performance standards imposed on land disturbing activity to reduce nutrient runoff.	Local governments include language in their planning tools that put more stringent requirements on development in flood prone areas.	Protect Accommodate
Shoreline Protection: armoring ( hard and Soft)	Facilitate coastal protection projects that replenish or mimic natural buffers, such as beach nourishment, living shorelines, or wetlands restoration	Require or at a minimum encourage shoreline protection measures on a case by case basis through wetland ordinances.	Protect Accommodate Preserve
<b>FINANCIAL INCENTIVE BASED TOOLS</b>	<b>What Does This Do</b>	<b>How To Use It</b>	<b>Measures It Takes</b>
Conservation Easement	Provide a flexible mechanism by which public entities can preserve land in its natural state while allowing land to remain in private ownership. Landowners grants an easement agreeing to restrict development of the land for compensation or tax benefits.	Prioritize acquisition of easements on properties vulnerable to sea level rise and acquire conservation easements to ensure preservation of lands that could serve as flood buffers, habitat, or migration corridors.	Preserve Retreat

<b>Land Donations</b>	Private property is donated to public or non profit entities to be conserved generally in exchange for tax benefits.	Create a program that encourages property owners to donate flood prone property fee simple in high risk areas with restrictions for conservation and/or public use.	Retreat Accommodate Preserve
<b>Tax Incentive</b>	Property tax relief in the form of preferential assessment programs, tax abatements, and tax credits	Encourage conservation of vulnerable properties by taxing properties at a lower rate based upon its restricted “use value;” encourage relocation or retrofit of flood-prone properties by providing a tax credit; or encourage upland infill development by providing tax credits or streamlined permitting.	Preserve Accommodate Retreat
<b>Transfer of Development Rights (TDR)</b>	Restrict development in one area (“sending area”) and allow for the transfer of development rights to another area more appropriate for use (“receiving area”).	Adopt a TDR ordinance in response to sea level rise that allows for transfer of development rights to upland parcels where development will be out of harm’s way.	Accommodate Preserve Retreat
<b>Real Estate Disclosures</b>	Require sellers to provide risk hazard information to potential buyers during a real estate transaction.	May adopt policies that encourage flood hazard risk information be provided to potential buyers of properties in certain areas.	Protect Retreat
<b>Purchase of Development Rights</b>	Purchase of that portion of the bundle of rights that allows landowners to develop the property.	Adopt the program by which the rights to developable land in high risk areas are purchased by local government for conservation in exchange for tax credits.	Accommodate Protect Retreat
<b>Acquisitions/ Capital Buyout Programs</b>	Acquire property at risk from flooding or other hazards.	Extend floodplain buyout programs to properties threatened from sea level rise and could prioritize for acquisition vulnerable properties with high natural resource value.	Protect Retreat
<b>Mitigation Banking</b>	Use conserved land to generate revenue in exchange for TMDL mitigations credits	Create a program that allows localities and entities in need to purchase mitigation credits generated by the locality through conserved land	Protect Retreat
<b>Financial Assistance</b>	Provides financial assistance to property	Adopt a program that assist property owners in high risk	Protect Accommodate

Programs	owners to retrofit or make alterations to structures in high risk area.	flood areas with altering and/retrofitting their structures.	retreat
Blue – Green Infrastructure	Blue or green infrastructure comprises those natural features on the land (e.g. forests, wildlife habitat) or in the water (e.g. anadromous fish use areas.)	Adopt language either through programming or policy that supports and/or encourages the use of various natural filtration systems such as wetlands, oyster reefs or underwater grass beds.	Protect Retreat

The following is a more concise narrative regarding how Planning, Regulatory and Financial/Market Based Incentives can be utilized in Virginia and more specifically in Mathews County

## PLANNING POLICY TOOLS

### COMPREHENSIVE PLANS

The comprehensive plan is the major policy guidance document by which all local planning decisions should be made. It enables local government and its residents to manage both short and long term community planning issues that arise. The comprehensive plan is required for all local governments by Section 15.2223 of the Virginia Legislative Code. The state code outlines the required elements of the comprehensive plan and identifies four primary tools for comprehensive plan implementation: Land Use Map, Zoning Ordinance, Subdivision Ordinance and Capital Improvement Plan.

Like any other locality in Virginia, Mathews County local officials may use the comprehensive plan as a guidance tool for managing flooding due to sea level rise issues in its communities. Comprehensive plan language is the first step to adaptation plan implementation regardless of the approach. Language is needed in the comprehensive plan that identifies a plan, strategy and objective for addressing recurrent flooding. Studies and evidence strategized in the comprehensive plan can serve as the evidentiary support needed to retool regulatory documents such as zoning and subdivision ordinances and building codes.

### *Master Plans*

As a part of the comprehensive planning strategy, local governments may create a master plan for communities that are frequently inundated due to flooding. A master plan is a conceptual layout of a property or community that helps to guide decisions regarding future development. The master plan should identify areas for preservation and conservation while directing sustainable development outside of the high risk areas. Because each community's need is different, the master plan is a more flexible approach in that it provides guidance on managing growth and development on a smaller community scale. Unlike the future Land Use Map, a master plan amendment is a simpler process.

Mathews County has utilized the master plan approach in the past to consummate a vision for community growth, therefore the concept is not foreign. Utilizing this tool to address recurrent flooding impacts would require a similar process.

## **HAZARD MITIGATION PLANS**

Hazard mitigation plan (HMP), is another policy document adopted by local governments to guide actions and approaches to addressing community issues pre and post major hazardous event occurrence. Local governments in Virginia are required to adopt a local hazard mitigation plan and may receive technical assistance from Virginia Department of Emergency Management with drafting and updating the plan.

Like any other event, the impacts of flooding due to sea level rise may and should be taken into account when considering long term strategies. While sea level rise may be one factor of several influencing a flood occurrence, failure to take this factor into consideration may reduce the effectiveness of other major efforts. Using hazard mitigation plans, governments develop a framework to lessen or avoid damages from natural disasters, such as floods and storms; disasters that may, over time, be exacerbated by sea level rise. Localities in the Middle Peninsula have developed and adopted a regional all hazards mitigation plan which takes into account the impacts of sea level rise. Neither local nor regional hazard mitigation plans are required by law to plan for sea level rise as a major event, however, it is strongly encouraged.

FEMA, Federal Emergency Management Agency, also offers competitive grants to state and local governments to help them develop and implement HMPs. Projects can include property acquisition and structure demolition or relocation, structure elevation and retrofitting, and minor localized flood reduction projects. Once governments have adopted a HMP, they are eligible to receive additional funds through FEMA in the event of a disaster to implement mitigation activities.

FEMA also offers incentives such as discounts on National Flood Insurance premiums to residents through local government participation in the Community Rating System. Local governments could include recommendations developed in HMPs into their comprehensive plans to ensure that they are implemented when land-use decisions are made. They may also incorporate certain provisions in regulatory tools for implementation. More information is provided in discussions on other regulatory tools.

Local governments could consider recommendations from other state and local plans developed to comply with different federal programs. Some federal statutes require the preparation of plans in order to be eligible to receive federal grants, and governments can consider sea level rise in these plans. For example, the Coastal Zone Management Act (CZMA) establishes a voluntary federal-state partnership where the National Oceanic and Atmospheric Administration works closely with states and territories to develop and implement coastal management programs (CMPs). CMPs are designed to balance competing demands on coastal resources, such as economic development and conservation. The CZMA explicitly calls on state governments to consider sea level rise in their CMPs. Some states require local governments to adopt shoreline plans or local coastal plans that are consistent with the state's CMP.

## **CAPITAL IMPROVEMENT PLAN**

Local governments in Virginia are authorized in the Code of Virginia § 15.2-2230.1 to study the cost of public facilities (roads, sewer, water, etc.) needed to implement a comprehensive plan. This authority would allow life-cycle cost planning at the local level. The information from the study is considered during development of the local capital improvement plan (CIP) authorized under Virginia Code §15.2-2239. The CIP is a short range financial tool used by government entities to forecast and match expenditures with identified needs. Many states' laws require their local

governments to prepare capital improvement programs for proposed investments in public improvements such as roads and sewers. CIPs budget for and site future public improvements based upon projections of the community's growth. This is a way of ensuring efficiency in government planning and expenditures.

Local governments should consider the impacts of flooding due to sea level rise when developing CIPs. CIPs are powerful growth management tools in that, if applied properly, could be used to encourage growth in desired areas by concentrating or centralizing infrastructure improvements. This tool may also be used to discourage investment in infrastructure projects in high risk areas. Through CIPs, governments could site new infrastructure out of harm's way, discontinue maintenance and repairs to infrastructure that is repetitively damaged, and relocate or retrofit existing infrastructure to be more resilient to sea level rise impacts.

### **GREEN INFRASTRUCTURE PLANS**

Green infrastructure plans are mechanisms put in place by local governments such as tree ordinances and landscape plan requirements that encourage vegetation maintenance and restoration. Green infrastructure provides a natural purification system for flood waters and acts a buffer for protecting property by allowing unobstructed inland and outward movement. Other measures aimed at slowing or retaining stormwater, include green roofs, rain gardens, parks, etc. Many local governments require landscape or replanting plans as a part of the land disturbance application process under the Virginia Storm water Management program.

During future amendments to the zoning or subdivision ordinance, green infrastructure planning tools such as landscape plans or replanting plans associated with development may be incorporated as a provisional requirement into the plan review application process.

## **REGULATORY TOOLS**

### **ZONING AND SUBDIVISION CODES**

Zoning and subdivision regulations are two of the primary tools used for comprehensive plan implementation. Local governments in Virginia are required by law to adopt a subdivision ordinance. Although the law states that they may adopt a zoning ordinance, only a few localities have chosen not to do so. The subdivision ordinance, as its name suggests, governs the division of land into smaller parcels. The provisions or guidelines (minimum lot size, dimensions, etc.) for the division are generally outlined in the zoning ordinance.

Similar to zoning ordinances, subdivision ordinances may specify minimum lot sizes, development densities, and the size and location of structures allowed on each individual lot. The subdivision ordinance will often impose affirmative obligations requiring the developer to install or pay for the infrastructure needed to service the development (such as requiring the dedication of land for roads and the installation of utilities). Subdivision ordinances can also be used to encourage certain types of beneficial development. Although generally found in the zoning ordinance, subdivision ordinances may be amended to include language for large lot developments, cluster developments, density bonuses, enhanced setbacks and buffers, overlay districts and rebuilding restrictions. Provisions for any or all of these may be included into the ordinances to address recurrent flooding due to sea level rise.

The Virginia Governor's Commission on Climate Change ("Governor's Commission") recommends that local governments "revise zoning and permitting ordinances to require [that] projected climate change impacts be addressed in order to minimize threats to life, property, and

public infrastructure and to ensure consistency with state and local climate change adaptation plans

### **OVERLAY ZONES**

One method of zoning employed by local governments is overlay zoning. Overlay zones allow local governments to superimpose additional regulatory requirements on an existing zone to add supplemental regulation in areas with special characteristics. They allow greater flexibility because they do not require the locality to disrupt existing zoning classifications. In order to create an overlay zone, local governments must (1) establish the purposes for creating the district, (2) map the district, and (3) establish the regulations to achieve the purposes for creating the district. Many localities already use overlay zones to protect areas with unique natural resources (e.g., beaches, wetlands, and barrier islands) or cultural resources (e.g., historic properties).

Local governments could create an overlay zone to protect people and property in high risk areas. Overlays can prohibit or condition expansion of major renovations to existing structures; prohibit or condition the rebuilding of damaged structures; or require that rebuilt structures be elevated. Depending on their adaptation goals for different areas, local governments could also create different overlay zones with emphasis on the following: larger lot developments, cluster development, building and land use restriction, etc.

### **SETBACKS AND BUFFERS**

Setbacks are building restrictions that establish a distance from a boundary line where land owners are prohibited from building structures. In urban areas, the boundary line is typically adjacent to a street or shared lot line. In waterfront areas, one of the boundary lines is often the tide line. Types of setbacks include vertical and horizontal setbacks. Horizontal setbacks requires that development be located a fixed distance landward while vertical setbacks require that development be located landward of a fixed elevation.

Buffers (or buffer zones), similar to setbacks, require landowners to leave undeveloped portions of their property that allow for important natural processes. Coastal buffers often prohibit landowners from building on or immediately adjacent to wetlands and sand dunes. These natural features buffer flood impacts, preserve views, provide recreational opportunities, and serve as important habitat. Wetlands also provide important water filtration benefits and are considered transition areas.

Setbacks and buffers can be established through zoning ordinances, subdivision ordinances, and/or floodplain ordinances. Some state-level coastal management statutes also establish special setbacks or buffer areas in coastal areas. Floodplain and coastal setbacks are typically designed to keep development away from portions of the property that are vulnerable to flooding and erosion. The Chesapeake Bay Preservation Act (CBPA) allows local jurisdictions to require that development adjacent to the Bay include a 100-foot buffer measured inland from the edge of wetlands, shores, or streams. Bay jurisdictions could use these buffers to protect against flood risks and water quality impacts posed by sea level rise by increasing buffer widths to account for future inundation and erosion. Local regulations may define a transition zone between the hazard area and built area to be protected and prohibit incompatible land uses that would convert open land in the transition zone. Local governments may use a comprehensive approach by reducing density allotted in areas of intrusion and increasing density in low risk areas.



## **REBUILDING RESTRICTIONS**

Rebuilding restrictions limit a property owner's ability to rebuild structures destroyed by natural hazards such as flooding. Rebuilding restrictions can prohibit redevelopment or require that it be more resilient to flooding impacts (e.g., requiring redevelopment to be elevated or set back from the coast). Similarly, retrofitting requirements can be imposed on existing structures when, for example, a landowner applies for a permit to renovate or expand a structure.

FEMA uses the 50 percent "substantial damage" rule as a threshold for triggering building restrictions. Structures that were erected prior to creation of the NFIP are grandfathered, meaning they do not have to comply with NFIP's minimum design requirements (e.g., elevation to or above the base flood elevation). Under the 50 percent rule, buildings must be rebuilt to conform to NFIP minimum standards if they are damaged to such an extent that the costs of repair will exceed 50 percent of the pre-damage market value of the structure. Similarly, retrofitting requirements can be imposed on existing structures when, for example, a landowner applies for a permit to renovate or expand a structure.

Another mechanism by which local governments can implement rebuilding restrictions is through downzoning certain vulnerable areas (i.e., reducing densities or permitted uses in the district where the property is located). After a local government has downzoned an area, existing structures can remain, but they become "nonconforming," meaning that if a building is destroyed or damaged, reconstruction has to conform to the current zoning and building requirements for new construction (which are likely to be more stringent).

## **BUILDING CODE**

The building code is a regulatory tool that provides minimum requirements for erecting a structure. All local governments are required to implement building code requirements. Before a building is authorized for its intended use, a certificate of its structural suitability for the proposed use has to be issued.

There are minimum standards that local building codes must adhere to, however, local governments may make building codes more stringent to increase safety and promote health and welfare in its communities. Coastal counties may strengthen local building codes to account for increased coastal flooding from sea level rise over the life of the structure. Some added provisions may include requiring an increase in freeboard requirements when building in flood hazard areas in an effort to increase resiliency. Another may be the increased elevation of a finished floor area and/or elevation certificates in certain flood hazard areas.

Design requirements are different in different zones (V-Zones have more restrictive requirements than A-Zones) and are different for different types of development (non-residential structures must be designed to a higher standard than residential structures). Under NFIP minimums, new construction must meet the following requirements:

### **Example: Residential structures in A-Zones**

The lowest floor of the structure (including the basement) must be raised to or above the base flood elevation (BFE). Buildings can be elevated on fill, piers, or columns, or extended foundation walls such as on a crawl space. Areas below the lowest floor can be useable space (such as parking space) but must be designed to allow flood waters to exit. Buildings must also be anchored to the foundation to prevent movement of the structure during flood events. Mechanical, electrical, and plumbing devices must also be elevated above the BFE.

In order to adapt to sea level rise, governments could extend building code requirements to currently unregulated areas that may become vulnerable to flooding in the future, such as applying A-Zone requirements in the 500-year floodplain (X-Zones). Local governments could apply more restrictive V-Zone design requirements in coastal A-Zones. Localities could also take advantage of CRS benefits and update building codes to require that structures in A-Zones be built or retrofitted to be more resilient to flooding. For example, freeboard requirements could be added or increased so that building elevations consider future sea level rise impacts over the life of the structure (including potential storm surge height).

Resilient design techniques are easier to require for new development, but can be more costly when retrofitting existing development. FEMA offers flood insurance premium discounts for houses built with freeboard, which may increase the cost effectiveness of implementation. Studies have shown that, within a short period of time, insurance premium reductions can pay for the costs of elevating structures. However, developers and homeowners may nonetheless resist calls to install design features that increase the cost of structures. In order to minimize the adverse environmental impacts of coastal development, resilient design requirements would need to be coupled with prohibitions on hard coastal armoring. While resilient design requirements allow some development in vulnerable areas, they can significantly reduce flood damage. However, they may not sufficiently protect communities from sea level rise in extreme storm events with added storm surge.

### **CLUSTER DEVELOPMENTS**

Residential development in which the lots are clustered on a portion of a site so that significant environmental/historical/cultural resources may be preserved or recreational amenities provided is termed clustering. A Rural Cluster Subdivision (RCS) is an alternative to standard subdivision development in certain rural and resource areas. Cluster development ordinances (or conservation subdivision ordinances) encourage developers to concentrate development in desirable areas on the tract while preserving the remaining areas as open space. Clustering can be mandatory or promoted through incentives such as density bonuses or permit streamlining.

The clustering technique allows a developer to group all potential lots into compact clusters of smaller lots, surrounded by designated open space encompassing a specified percentage of the overall site. RCSs are awarded a density bonus, depending on the developer's commitment to set aside open space. Clustering is generally allowed in certain zoning districts usually with zoning restrictions on lot size and lot coverage.

While smaller lot sizes are permitted in a cluster subdivision to preserve open space, the overall density cannot exceed that permitted in the zoning district if the site were developed as a conventional subdivision, unless coupled with a density bonus. Section 15.2-2286.1 of the Virginia Code provides regulatory guidance on the use of clustering of single-family dwellings so as to preserve open space by local governments. Localities may amend their zoning and/or subdivision codes to allow for cluster subdivisions and density bonuses.

### **DENSITY BONUS**

Density bonus is a development tool that is generally used as an incentive. As mentioned above, density bonuses are generally coupled with other zoning tools to achieve an overall goal or encourage a certain activity as a part of the development process. Density bonuses are allotted when another need desired by the local government is met as a part of a development. Like clustering, density bonuses may be a part of the zoning or subdivision ordinance and may be

allowed in certain zoning districts. Local governments may use density bonuses to encourage development in designated areas and away from high hazard areas.

### **DITCH AUTHORITY**

Ditching authorities, like water authorities, may exist to prioritize ditch improvement needs, leverage available funding, and work toward improving the functionality of the region's storm water conveyance system. A project conducted by MPPDC in 2015, funded by U.S. Department of Commerce, National Oceanic and Atmospheric Administration and Virginia Coastal Zone Management, allowed for research and analysis on enabling legislation to create ditch authorities as well as identify examples of existing ditching authorities and assessing implementation in Virginia. Two findings of the report were that legislation does allow localities to create ditching authorities with certain governing powers however none currently exist in Virginia.

Section 15.2-5102 of the Virginia State Code authorizes localities to create water, sewer, or storm water control authority and Sec. 15.2-2400 authorizes localities to create service districts. The closest entity in Tidewater Virginia to a ditching authority is York County Storm Water Advisory Committee. The Advisory Committee was created to focus on implementing a public education program, assisting in identifying drainage problems, and helping prioritize storm water projects throughout the County. This Advisory Committee consisted of seven members, one from each district and two at large, similar to the one subsequently created in Mathews County to assist with identifying issues and needs related to recurrent flooding.

### **FLOODPLAIN MANAGEMENT ORDINANCE**

Local governments could also use their powers to regulate floodplains in order to implement adaptive measures. The National Flood Insurance Program (NFIP) inspired many local governments to adopt special floodplain regulations. Participation in the NFIP is voluntary and is based on an agreement between local communities and the federal government. To participate in the NFIP, local governments must regulate development in floodplains. The agreement calls for communities to adopt and enforce floodplain management ordinances that meet minimum program requirements for regulating new construction in "special flood hazard areas" as mapped by the Federal Emergency Management Agency (FEMA). In exchange, federal flood insurance is made available to landowners in those communities.

As mentioned in the building code section, local governments may impose additional regulations in Special Flood Hazard Areas, high-risk areas that would be inundated by a flood. V-Zones are coastal floodplains that are subject to more severe damage from storm-induced velocity wave action and are more strictly regulated and subject to a different insurance rate structure. A-Zones are upland areas or riverine floodplains that are vulnerable to the 100-year flood, but are not subject to wave action. Typically structures in these areas must be constructed to minimize flood damage (e.g., elevated

Structures must be elevated to or above base flood levels, anchored, and constructed with materials resistant to flood damage. A more protective solution would be to limit the uses that can be permitted in vulnerable areas ("use restrictions"). Currently, the NFIP does not account for future sea level rise impacts. In order to fully protect against the risks, most jurisdictions will need to update their current practices of managing development in floodplains in consideration of sea level rise. In fact, local governments are encouraged to impose more stringent regulations (such as use restrictions) through NFIP's Community Rating System (CRS). Through the CRS, communities that impose more strict regulations can qualify homeowners in their communities for insurance premium discounts. Communities may be able to use CRS premium discounts to increase political support for new floodplain regulations.

## **ARMORING**

Typically, governments and private landowners have tried to control flooding in coastal areas through shoreline armoring. Armoring uses hard or soft engineered structures to protect coastal development from flooding and erosion.

**Hard armoring** can be built onshore or offshore and includes bulkheads, sea walls, revetments, dikes, tide gates, storm surge barriers, and groins. Currently, most regulators require that armoring be designed to withstand, at a minimum, a 100-year flood event, which is calculated based upon historical flood conditions. Therefore, these protection devices may be insufficient to protect against overflow in the event of an extreme flood event combined with increases in sea level.

Regulators, however, are increasingly moving away from use of hard structures because of impacts on surrounding properties and natural resources. Armoring can increase flooding and erosion on neighboring property and destroy beaches and wetlands that provide natural flood protections and other ecological services. They also encourage development in vulnerable areas and can increase risks to people and property in the event of catastrophic failure. If regulators decide to permit hard armoring, they should account for future sea level rise when reviewing the design and construction of protective structures.

**Soft armoring** is the use of natural or engineered swales and other permeable surfaces. Soft armoring will need to be designed to withstand sea level rise impacts as well. In order to ensure that soft armoring is sustainable given different scenarios, local governments must consider how sea level rise, increased flooding, and erosion will affect the shoreline. Construction of soft armoring may not be feasible in all areas; it requires consideration of geological conditions, flood dynamics, and risks to property from coastal flooding. Soft armoring also requires consistent maintenance to sustain its flood control benefits.

Most regulators require that armoring be designed to withstand, at a minimum, a 100-year flood event, which is calculated based upon historical flood conditions. Therefore, these protection devices may be insufficient to protect against overflow in the event of an extreme flood event combined with increases in sea level.

## **VIRGINIA STORMWATER MANAGEMENT PROGRAM**

Virginia Storm water Management Program or "VSMP" means a program approved by the Soil and Water Conservation Board between September 13, 2011 and June 30, 2013, or the State Water Control Board on and after June 30, 2013, that has been established by a VSMP authority to manage the quality and quantity of runoff resulting from land-disturbing activities. The program includes the use of regulatory tools such items as local ordinances, rules, permit requirements, annual standards and specifications, policies and guidelines, technical materials, and requirements for plan review, inspection, enforcement, where authorized in this article, and evaluation consistent with the requirements of this article and associated regulations

The purpose of the program is to reduce total daily maximum loads of pollution runoff into the bay and its tributaries. The storm water program monitors development, specifically land disturbance activity, to reduce the impacts of development on local and state waters. Localities that are subject to the provisions of the Chesapeake Bay Preservation Act must adopt requirements set forth under the Storm water Management Act as required to regulate Chesapeake Bay Preservation Act land-disturbing activities like the erosion and sediment control programs (Va. Code §10.1-560/4VAC30-50), municipal storm

water control programs (Va. Code § 10.1-603.3) regulate development to control shoreline runoff pollution. To the extent that these authorities affect shoreline development, they have the potential to be used in adapting to increased inundation risk and sea level rise. The Code of Virginia provides guidelines for implementation of the programs to include the plan review and permitting process, record keeping and enforcement.

Generally, storm water management programs build off regulations identified in local zoning and subdivision codes. In addition to the state requirements, local storm water management programs may incorporate additional instruments in existing tools to address sea level rise. Examples may include the requirement of a landscape and/or replanting plan for land disturbance activity. The zoning ordinance may also be amended to limit impervious surface and encourage other best management practices that also contribute to reducing flooding impacts.

## **FINANCIAL & MARKET BASED INCENTIVES**

### **ACQUISITIONS and DONATIONS**

Acquisition or Donation programs can be used to purchase or be gifted repetitively flooded lands for public purposes, such as to create open space, public parks, public highways, or other infrastructure. State and local governments (or private land trusts or non-profit organizations) could acquire developed and undeveloped at-risk properties in order to conserve natural resources, such as wetlands and beaches, provide upland migration corridors, preserve habitat, or provide flood buffers for existing development. Structures on the property can be demolished, and the property conserved as open space, public parks, or for natural resources.

Land acquisition or donation programs typically require landowner consent to sell or gift their property in fee to the government. Funds to acquire land through these types of programs are raised through taxes, fees, grants or the sale of government bonds. Governments can prioritize for acquisition of undeveloped lands that are vulnerable to development and that provide important ecological benefits by serving as flood buffers for existing development or corridors for migrating beaches and wetlands. This prioritization may be formalized through Capital Improvement Programs where funds are set aside for acquisition.

FEMA's Flood Hazard Mitigation program provides federal funding to local governments to buy properties in repetitive flood areas as well as provide financial assistance to property owners with retrofitting and alterations. Floodplain buyout programs could be extended to properties threatened by recurrent flooding. Governments can preemptively acquire developed properties in order to remove at-risk structures and restore floodplain function.

### **CONSERVATION EASEMENTS**

Conservation easements (sometimes called open space easements) are a special kind of easement created to preserve property in its natural state for habitat, open space, recreation, historic values, farmland, and other purposes. They are typically voluntarily sold or donated by landowners to state or local agencies or non-profit land trusts. In most cases, the landowner is either paid for the easement or receives a tax benefit for the donation. Conservation easements are useful because they may allow the property to remain in private ownership, but the landowner agrees to limit development on the land pursuant to the terms of the easement. This decreases responsibility and liability on the local agency or trust. The easement is recorded and binds all future owners of the property.

Conservation easements could be employed by local governments to prevent development in areas that are vulnerable to sea level rise impacts. Similar to acquisition programs, agencies could prioritize vulnerable properties and purchase conservation easements across parcels that have

particular utility as habitat or natural buffers, or where ecosystems can migrate inland as the seas rise. These conservation easements could include specific covenants, including prohibiting shoreline armoring, specifying the type of shoreline stabilization allowed, prohibiting removal of vegetation, and restricting land uses or activities on the parcel that could contribute to erosion or impair natural shoreline processes.

### **TAX INCENTIVE**

Tax policy can influence the use and development of land. Landowners are typically assessed taxes based upon the current assessed value of their real estate—the value of the land, its improvements, and its development potential (i.e., fair market value). This method of assessment tends to spur development in coastal areas because landowners are assessed taxes based upon the land's market value, which considers its development potential, not just its current use.

Diminution in value due to recurrent flooding is rarely considered in the local taxation process, however many rural coastal areas of the Commonwealth are experiencing downward trends in real-estate values that can be linked to excessive environmental regulations, increased permitting costs, increasing flood insurance cost, aging population and generational divide issues pulling down on land valuations. When land values dramatically increase along the coast, the taxes on property with a small residence may greatly exceed the property's real value. Landowners are often forced to sell or develop their property for more economically viable competing uses.

Virginia has one of the most generous tax incentive programs in the country. Landowners who donate conservation easements can deduct up to 40 percent of the value of the easement from their state income tax. Credits can also be sold and used by others who have a greater tax burden and, therefore, can receive greater financial benefits from the credit. Unused portions of a credit can be carried over for up to 10 consecutive taxable years. By implementing this form of taxation, governments can use tax incentives to encourage preferred development patterns (for example, redevelopment of blighted areas, limitation of urban sprawl, or preservation of farmland). The following three types of programs offer tax incentives:

*Relocation/retrofit tax incentives*—Governments could provide a one-time tax credit to property owners who move structures out of at-risk areas (either relocating on the same or a different parcel) or retrofit structures to be more resilient to flooding. Tax credits could be offered when the landowner exceeds the minimum standards required by existing ordinances (i.e., the minimum required setbacks or building elevations).

*Siting incentives*—Governments could provide tax incentives or density bonuses to encourage developers to site new development in lower-risk areas of a lot or a subdivision. For example, infill tax incentives could be used to encourage clustering of development in already urbanized upland areas.

*Conservation tax incentives*—Governments could offer preferential assessments to landowners who agree to conserve their property for flood control or open space purposes. Landowners who donate easements would be assessed lesser property taxes based upon the loss of value caused by the easement terms limiting uses of the property

### **TRANSFER OF DEVELOPMENT RIGHTS and PURCHASE OF DEVELOPMENT RIGHTS**

The Virginia Coastal Policy Center, located at the College of William and Mary Law School was commissioned to research and design how a successful transfer of development rights program

could be structured for Mathews County. A successful TDR program in Mathews must be designed for the Mathews County market. Mathews would incorporate their TDR design into their growth strategies and reconcile a new system of 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. Mathews will face a complex set of socio-demographic challenges to achieve the desired TDR 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. A successful TDR program for coastal flooding impact mitigation might therefore convert the transferred "development rights" into some valuable bonus other than density. Mathews could consider their alignment of a TDR program with their environmentally conscious land use interests against 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. Appendix 2

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 is one which could offer Mathews County a new avenue for moving forward. The VCPC did not research whether any of the specific proposals or creative alternatives are allowable under Virginia's existing TDR enabling law. Blending TDR's and PRD's to address sea level rise and flooding is an emerging topic area and may require enabling authorizations. The concept is offered for 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.

### **TRANSFER OF DEVELOPMENT RIGHTS**

Transferable development credits, also called transferable development rights or TDRs, create market incentives to shift development to areas where development is preferred. SEC. 15.2-2316.2 of the Code of Virginia authorizes local governments to implement transfer of development rights programs. Through zoning ordinances, local governments designate areas where they want to discourage development ("sending areas"). The ordinance allows property owners in these areas to sever development credits (monetized by the level of development the base zoning ordinance would allow, such as five units per acre) and to sell them to areas where the local government wants to encourage development ("receiving areas"). The buyer can then use the credit to exceed development densities, floor areas, or building heights in receiving areas. The property owner of the restricted parcel receives financial compensation for forgoing development and preserving his or her property. In order to ensure that property in the sending area is conserved, a permanent conservation easement is recorded against the sending property in conjunction with the sale of the development credit.

A TDR program could be designed to address sea-level rise. Local governments could amend zoning ordinances to (1) restrict development in vulnerable areas and designate them as "sending areas"; (2) designate inland "receiving areas" where development is appropriate and increased density is desirable; and (3) establish and calibrate a development credit market in a manner that gives affected landowners an incentive to transfer their development rights rather than build on threatened properties. More information on TDR's is provided in APPENDIX 2.

## **PURCHASE OF DEVELOPMENT RIGHTS**

Purchase of development rights (PDRs) are similar to TDRs except that they are typically purchased by public entities or private parties and then retired, rather than used to increase development in other areas. In this way, they function like a conservation easement. Local governments can also offer tax rebates to compensate landowners for development credits. Rather than use the TDR, the owner of the credit can receive real estate tax abatement equal to the fair market value of the development credits. The process is voluntarily initiated by the property owner.

State and federal funding is often available to assist with either the creation of a PDR program or its implementation. In the past several years, several localities in the area have been able to acquire funding through the Virginia Department of Agriculture and Consumer Services, Agriculture and Forestry Industries Development (AFID) Fund to assist with development of a local program and /or purchase of property for conservation. These localities include:

- Accomack County
- Amelia County
- Hanover County
- Isle of Wight County
- New Kent County

## **REAL ESTATE DISCLOSURES**

State and federal laws require sellers of real estate to disclose certain information (e.g., special taxes levied on a property and the presence of lead-based paints) to potential buyers either before or at the time of transfer. Disclosure laws may also require sellers to disclose natural hazards that can put property at risk, such as location in a known flood hazard area. The purpose of these disclosure laws is to ensure that buyers are fully informed about the conditions of the property prior to its purchase, which allows them to adjust their market decisions according to the risks.

Sec. 55, Chapter 27 of the Code of Virginia provides guidelines on certain disclosures to buyers during the real estate purchase process; however the disclosures are very general in nature. In regards to properties that may be in flood prone areas, the disclosure allows the owner to state that “owner makes no representation with respect to whether the property is located in one or more special flood hazard areas and purchasers are advised to exercise whatever due diligence they deem necessary.”

Similar laws could be enacted to require disclosure concerning property that is vulnerable to flooding and erosion from sea level rise. Implementation of this policy could take two forms:

- **Government dissemination**—Governmental bodies (e.g., state or local agencies) could compile data, erosion maps, inundation models, and other relevant information and make this information accessible to potential property buyers and developers.
- **Mandate private disclosures**—Governments could require sellers to disclose to potential buyers that a property is located in an area vulnerable to sea level rise.

To implement a policy requiring disclosure of future risks, governments will need to determine what properties are vulnerable. Enabling legislation may be required. Governments may need to develop maps and models of how different sea level rise scenarios will impact their locality to identify the properties subject to the disclosure requirements. Governments may also need to help



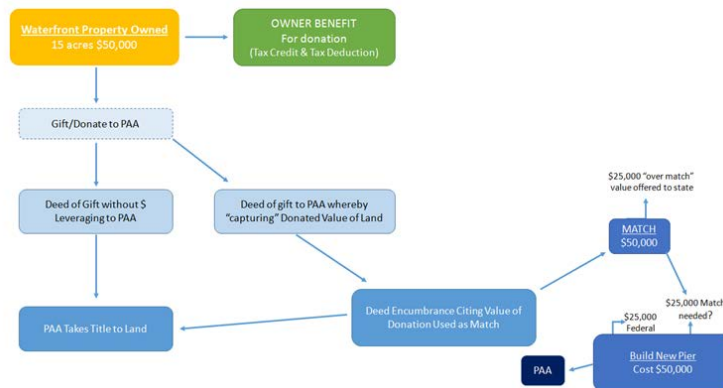
sellers and buyers understand sea level rise maps and the scientific data used to create maps and models. Landowners could also be required to disclose any regulations that restrict development of the parcel (such as setbacks and removal requirements)

## LEVERAGING DONATED WATERFRONT PROPERTY TO MAXIMIZE ECONOMIC BENEFIT

Funding is one of the greatest challenges facing state and local governments, especially for conservation or adaptation 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. Mathews is well positioned to pioneer a third way: leveraging real property assets to satisfy match requirements as a strategy to conserve tidal wetlands as a flood mitigation strategy and add economic value to the land.

The Virginia Coastal Policy Center, located at the College of William and Mary Law School was commissioned to research and report (Appendix 4) on how the Middle Peninsula Chesapeake Bay Public Access Authority (“MPCBPAA or Public Access Authority”) was able to use donated waterfront lands as match value for future grant projects. The lessons learned from the work of the MPCBPAA could help Mathews maximize less economically valued land for more valued purpose.

The MPCBPAA applied the land book value of a private waterfront land donation for public use as match to build a new public fishing/kayaking pier 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. While the

MPCBPAA focuses on matching funds for 306A Coastal Program grants, these principles could be applied to other leveraging opportunities for both federal and state grant programs for conservation or adaptation approaches.

To encourage the donation of waterfront land for public benefit, the MPCBPAA has developed a program to encourage altruistic giving for public benefit. More information can be found about coastal land giving by visiting: <http://www.virginiacoastalaccess.net/landgiving.html>

### **Land Banks**

Land banking is a more traditional approach utilized to acquire undervalued, devalued or distressed land that is repurposed and resold by a public body. Land Banking programs provide a similar alternative to donations by taking the same concept of acquiring private devalued or blighted property and reusing it for public benefit. The diverging premise is that land banking programs purchase blighted, vacant, tax delinquent properties then invest public resources into rehabilitating the properties for resale or redevelopment to coincide with local planning and economic development goals.

Land banks are governmental entities or nonprofit corporations that are focused on the conversion of vacant, abandoned, and tax delinquent properties into productive use. Mathews County could consider a program to add economic business value by acquiring wetland areas, making minimal infrastructure investment and then reselling or leasing for private business purposes, such as eco exploration for tourism.

Typically, land banks are created as public entities by a local ordinance, pursuant to authority provided in state-enabling legislation. The key purpose of land banking programs is to eliminate blight through the increased market value of land and generate tax revenue through redevelopment. Most land banks are vested with special powers that enable them to undertake acquisition activities more effectively and efficiently than other public or nonprofit entities. When thoughtfully executed, land banking can resolve some of the toughest barriers to returning land to productive use, helping to unlock the value of problem properties and converting them into assets for community revitalization. In this aspect, it is similar to the altruistic giving program developed by the Middle Peninsula Chesapeake Bay Public Access Authority.

Land banks are generally funded through a variety of sources, which may include revenue from the sale of properties, foundation grants, general fund appropriations from local governments, and federal and state grants.

Creation of a land banking program is generally done through new state enabling legislation, but depends on local and state law. Typically at the City or County level, but many state land bank bills enable and even encourage collaboration. Currently 120 land banks exist throughout the country, however none currently exists in Virginia.

Some jurisdictions may already have an entity or agency that is empowered with tools to effectively take control of large inventories of problem properties and return them to productive use, obviating the need for a land bank. In some cases, however, such entities are focused primarily on development, rather than on blight elimination and stabilization strategies in more distressed neighborhoods.

Successful land banks have established acquisition and disposition strategies that directly support the implementation of local land use goals and meet community needs. Some land banks tackle massive inventories of extremely unsafe and abandoned properties as part of an urgent stabilization and public safety strategy, while others operate selectively with extreme deliberation. Land banks should make sure ground rules and policies are established prior to any transactions and annually revisited with public input to maintain a high standard of transparency and accountability.

### **Mitigation Banking Credits**

Scientific research has demonstrated that certain wetlands can be established or re-established in areas where wetlands are not presently found. This has led to an increasing number of proposals calling for the destruction of wetlands in one area in order to accommodate development and the creation of wetlands in

another area in order to offset the loss of the natural wetland resource and thus, the creation of wetland mitigation banks (tidal VMRC and non-tidal DEQ).

Virginia continues to develop a robust trading system which presents many new opportunities to add value to land as a banking commodity

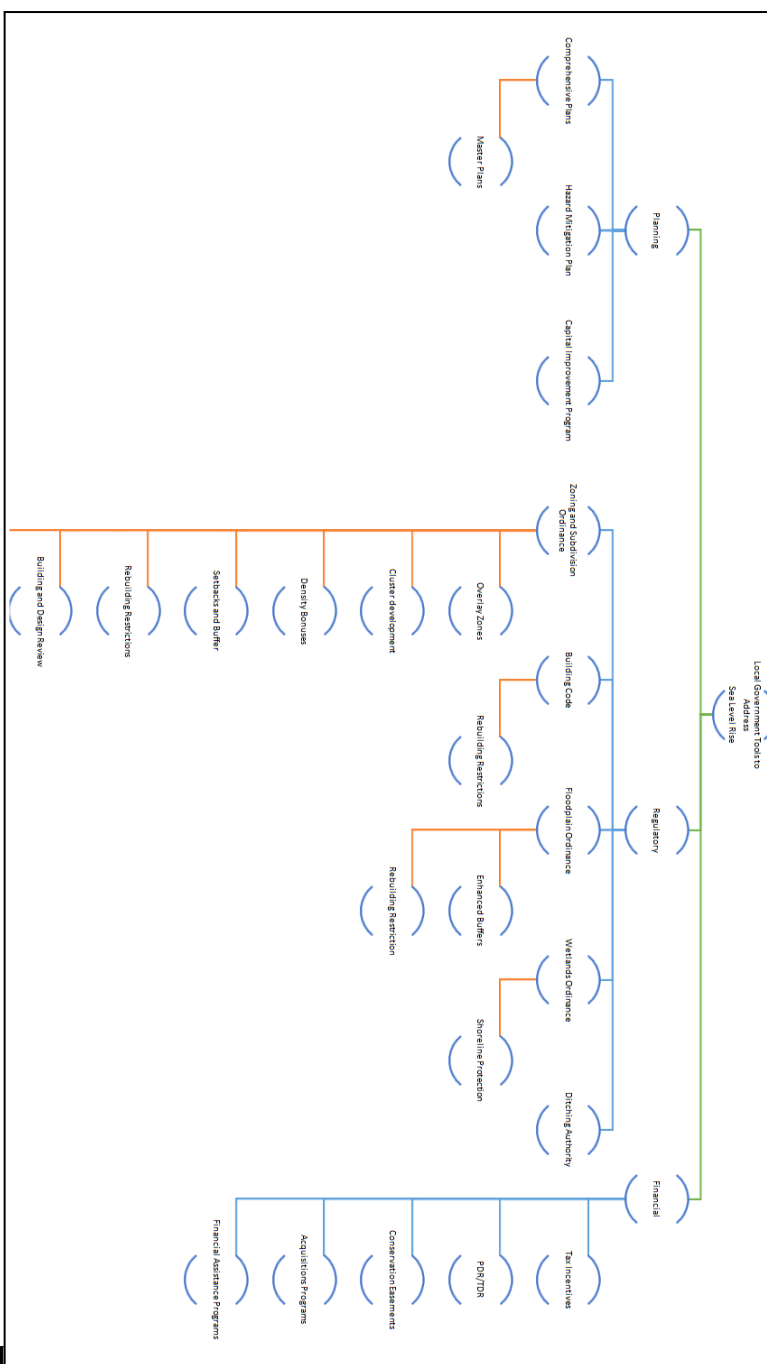
### **State and Local Liability for Failure to Adapt to and Protect Against Recurrent Flooding**

In late 2015, the Virginia Coastal Policy Center (VCPC) at the College of William & Mary Law School reported on an April 2013 flood event in Chicago (Appendix 5). 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. 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”). 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.

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. 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. The Hampton Roads area represents a primed fuse for such a suit (Mathews County is even more vulnerable to recurrent flooding and sea level rise). In the 2015 paper VCPC 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. Mathews County should review the Appendix 5 report to broaden its understanding of this potential liability.

### **TOOLKIT MATRIX**

Tools and approaches provided to Mathews County have been grouped into three general headings: Planning, Regulatory and Financial. Under each broad heading are specific tools that could be considered by Mathews County to address flooding.



**RECOMMENDATIONS**

As stated previously above, an effective strategy will require a comprehensive approach in which a variety of implementation tools will be needed. The recommendations outlined in the chart below are based on the goals and concerns expressed by the Mathews County Planning Commission. The implementation burden refers to the level of difficulty and amount of resources needed for implementation. Local governments have many policy tools already available to support local actions for sea level rise preparedness. These recommended tools seek to build on existing mechanisms already in place. While new policies will also be needed, existing tools provide the means to begin planning now.

As the Mathews Planning Commission and the Board of Supervisors review and consider planning options, the Planning Commission has expressed the need for policy solutions to be compatible with its goal of “*Live with the Water*” and not retreat from the water (see draft Mathews Planning Commission Goals, page 7 of this report).

	Advantage	Disadvantage	Implementation Burden
Comprehensive Plan	Easy to incorporate since policy is already in place No additional cost	Guidance document only May require longer horizon for effective long range planning	Low
Zoning Ordinance and Overlay Zones	Existing tool in already in place  Familiarity with Overlay Zone process	More restrictions on land use may meet opposition  Restrictions may affect property values	Low
Floodplain Management Regulations	Wetland Ordinance already in place  Eligibility in the CRS program	More restrictions may meet opposition  Restrictions may affect property values	Low to moderate
Building and Design Code	Regulatory tool in place Eligibility in the CRS program	Implemented with new or redevelopment requests	Low to moderate
Setbacks and Buffers	Already regulated by zoning ordinance  Commonly used	Short term fix as buffer lessens over time	Low
Rebuilding Restrictions	Commonly used  Eligibility in the CRS program	Only triggered through need for building permit	Low to moderate
Cluster Developments	Zoning Ordinance provisions already in place	Only triggered with intense development	Low

		requests	
Soft Armoring	Similar provisions may currently exist in wetlands ordinance	Property owners bear a significant expense	Low
Capital Improvement Programs	Already in Place	May be a low priority compared to other projects obligations on a financially constrained budget	Low
Virginia Storm Water Management Program	Required by Law Easy to incorporate into existing tools	Further strains the development process	Low
Acquisitions and Buyout Programs	Mathews has implemented buyout program in the past	Voluntary	Low
Conservation Easements	Already in place in the region  Reduces the burden to local government  May be used as economic driver for recreation purposes to support water dependent uses	Voluntary process  Removes property from tax rolls	Low
Purchase of Development Rights	Financial assistance to local governments available  Reduces the burden to local government	Voluntary process  Removes property from tax rolls	Moderate to heavy

	May be used as economic driver for recreation purposes to support water dependent uses		
Land Donation Programs	May partner with existing land donation programs operating through nonprofits or trust	Voluntary process Removes property from tax rolls	Low to moderate
Tax Incentives	Already in place to some degree  Maybe coupled with conservation easements or land donation programs	Voluntary process  Removes property from tax rolls	Low

REFERENCES;

*Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use How Governments Can Use Land-Use Practices to Adapt to Sea-Level Rise.* Jessica Grannis. 2011.

*Managing Growth and Development in Virginia: A Review of Tools Available to Localities.* APA Virginia Chapter. October 2014.

*Planning Today for Sea Level Rise Tomorrow.* National Oceanic and Atmospheric Administration. 2016 [Noaa.gov](http://Noaa.gov).

*Recurrent Flooding Study for Tidewater Virginia.* VIMS. 2013.

*Resilience toolkit.* National Oceanic and Atmospheric Administration. 2016. [Noaa.gov](http://Noaa.gov).

*Synopsis Of An Assessment: Policy Tools For Local Adaptation To Sea Level Rise.* Barbara J. Lausche, JD Deputy Director Marine Policy Institute at Mote Marine Laboratory. Technical Report #1419. 2009

## *APPENDIX*

**APPENDIX 1:** PC Survey.....

**APPENDIX 2:** VCPC TDR-PDR REPORT.....

**APPENDIX 3:** WETLAND WATCH TOOLS-FACT SHEETS.....

**APPENDIX 4:** VCPC LEVERAGING DONATED WATERFRONT PROPERTY TO MAXIMIZE ECONOMIC BENEFIT .....

**APPENDIX5:** : VCPC State and Local Liability for Failure to Adapt to and Protect Against Recurrent Flooding .....

**APPENDIX6:** Draft Mathews PC Annalysis of Flooding and Goals.....

**APPENDIX7:** Leter of Engagement



