

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. The Virginia Outdoors Foundation holds a large number of the easements in the state. 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).

Conservation Easement

- 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:

- a) 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.
- b) 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...
- c) The property shall be capable of being subdivided or developed for nonagricultural uses without the approval of the city council;
- f) No uses or structures, other than those permitted by preservation easements, shall be located upon the property;

Financing

- 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.

Conservation 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.

Conservation Easement

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

DRAFT

Land Use Value Assessment and Ag & Forestal Districts

Land Use-Value 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/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

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.

Land Use Value Assessment and Ag & Forestal Districts

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 Assessment and Ag & Forestal Districts

- 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 .

DRAFT

Purchase of Development Rights

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.

Purchase 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'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.

Purchase of Development Rights

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

DRAFT

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).

Rolling Easement

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.

Rolling Easement

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 .

DRAFT

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

Transfer of Development Rights

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 .

Transfer of Development Rights

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.

DRAFT

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 rezoning 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

Capital Improvement Program

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 as a Capital Improvement. The CIP funds stormwater projects as a line item, which includes 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

Capital Improvement Program

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. 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 could achieve this. 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.

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.

Capital Improvement Program

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

DRAFT

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.

Comprehensive Plan

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.

Comprehensive Plan

- [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](#).

Comprehensive Plan

- 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, 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

Green Infrastructure Plan

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 can be incorporated into projects financed by the [HUD Community Development Block Grant Program](#).

Final Thoughts

Green Infrastructure Plan

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.

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 citywide benefits (including recreation,

Green Infrastructure Plan

property value, heat-island reduction, water quality, and air quality) of over \$2.8 billion through 2049.

DRAFT

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

Hazard Mitigation Plan

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

Hazard Mitigation Plan

- 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

Hazard Mitigation Plan

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.

Case Study

The [2035 Broward County Long Range Transportation Plan](#) incorporated sea-level rise adaptation in several ways. The Plan prioritizes roadway improvements that increase emergency evacuation capacity and response time within hurricane evacuation routes. This included a list of roadway improvements that could enhance Broward County's hurricane evacuation plan.

Tools

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

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.

Long Range Transportation Plan

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. In Florida, *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.

Call Out Box

Transportation planning is most effective if it is incorporated into multiple planning documents. The Poquoson Stormwater Management Plan addresses transportation and infrastructure in several ways. The City has a 4.5 ft. elevation standard above mean sea level for new roads, as most nuisance flooding occurs below this height. Furthermore, all utilities below the 100-year flood elevation must have watertight manhole lids, and the City’s pump stations are all sited above the 100-year flood elevation.

References

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

ICF International. (2008). *Integrating Climate Change into the Transportation Planning Process* . Federal Highway Administration.

Long Range Transportation Plan

Integrating Climate Change into State and Regional Transportation Plans,
Transportation Research Record: Journal of the Transportation Research Board, No.
2119, pp. 1-9, Gallivan, Ang-Olson, and Turchetta, 2009

Jordan v. St Johns County. District Court of Appeal of Florida, Fifth District. No. 5D09-
2183. Decided: May 20, 2011.

DRAFT