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PREPARING FOR THE FLOOD: VIRGINIA LOCAL GOVERNMENTS’ STORMWATER MANAGEMENT LIABILITY

JAMES E. DAVIDSON*

INTRODUCTION

In 2025, a homeowner in a small Virginia city wakes after a night of heavy rain to find that his front yard is completely inundated with several inches of stormwater. As he careens down the stairs, he finds the ground floor carpets are wet at the edges of the home and the walls are stained. After flying down one more flight to the basement, he finds the foundation of his home submerged in muddy water that rushed onto his property from the street. Repairing his home will cost thousands of dollars. He later finds the stormwater drainage system that services his neighborhood, controlled by the city, has not been inspected or updated in years despite the increasingly heavy rains that have flooded the street time and time again. He is left with three options: foot the $50,000 bill himself, purchase a new home elsewhere, or sue the city and attempt to recoup the losses caused by its failure to plan for the effects of climate change. If he chooses to sue, will his suit succeed?

A significant increase in precipitation and rising sea levels are simultaneously putting stress on Virginia’s municipal stormwater management systems and making the just-described scenario a more common occurrence every year.1 Continued development and vegetation removal

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Contribute heavily to stormwater runoff and combine with changing environmental conditions. Stormwater management is, therefore, an increasingly urgent issue facing Virginia localities. However, local infrastructure and the legal framework that could hold localities accountable for its maintenance are unprepared for increased stormwater volume.

Common law doctrine originally dictated that Virginia localities had no affirmative duty to provide stormwater management infrastructure for their residents. When a locality decided to implement a stormwater management system, however, it assumed a limited duty of care in constructing and maintaining those systems. If the locality constructed or maintained its stormwater system negligently, it could be found liable for any resulting flooding damage. Historically, localities were occasionally liable when stormwater drainage systems or deteriorating infrastructure caused damage. Under this common law framework, could the hypothetical homeowner find legal relief due to ever-more-frequent heavy rains that the city failed to consider?

No, his claim would be dismissed. In several cases over the past thirty years, Virginia localities avoided liability for stormwater damage altogether under the shield of Section 15.2-970 of the Virginia Code.
During this period, several courts found that stormwater management systems constituted “structures or devices” under Section 15.2-970, meaning that the locality was protected from liability under the doctrine of sovereign immunity. This shield gives municipalities little legal incentive to invest in updated stormwater management systems to avoid negligence suits, even though more common, intense flooding due to stormwater increases will put lives and property at risk. In sum, if the homeowner sues for negligence, his claim will be dismissed.

He may, however, make a compelling claim on state constitutional grounds. Localities may still be found liable for stormwater damage through inverse condemnation actions if they intentionally act or fail to act and divert excess stormwater onto private property. This route provides citizens with a potential legal strategy to hold localities accountable for defective stormwater systems. However, a substantive inverse condemnation claim requires more than a showing of simple negligence in the operation of a stormwater management system. For the hypothetical homeowner, this presents another roadblock to legal accountability for negligent stormwater management practices.

This Note explains that modern interpretations of Virginia Code § 15.2-970 have made Virginia municipalities immune to tort suits arising from the negligent maintenance of stormwater systems. Due to the Virginia Supreme Court’s holdings in Livingston v. Virginia Department of Transportation and other inverse condemnation suits, localities may be found liable when their stormwater management decisions cause property damage. However, following the Court’s holding in AGCS Marine Insurance Co. v. Arlington County, which prevented inverse condemnation claims arising from municipal negligence, residents are still unlikely to find legal redress for negligent stormwater management that results in

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13 See id.
14 See id.
property damage. Therefore, this Note argues that Virginia municipalities are broadly protected from lawsuits arising from a failure to plan for climate change’s effect on local stormwater loads. It then demonstrates, through an examination of several Virginia cities and counties that are working to upgrade their stormwater infrastructure, that Virginia localities in general are nonetheless planning for increasing stormwater loads in several distinct ways.

First, this Note discusses the growing threat climate change poses to Virginia’s stormwater infrastructure as well as common stormwater problems Virginia’s localities face. Next, this Note discusses how localities currently manage stormwater and the common law framework that traditionally guided construction and maintenance of those systems. It explains the modern interpretation of Virginia Code § 15.2-970 that conclusively shields localities from stormwater-related tort liability. Then, this Note addresses several recent Virginia Supreme Court cases that sustained inverse condemnation actions against localities and the Virginia Department of Transportation when flooding, caused by poorly designed stormwater infrastructure, damaged property. It analyzes AGCS Marine Insurance Co.’s limiting effect on inverse condemnation claims and argues that those claims are also likely to fail in the climate change context. This Note examines Vermont’s stormwater liability framework, which provides residents some redress when stormwater injures them or damages their property. Finally, it discusses how three Virginia municipalities are taking proactive approaches to increased stormwater volume by updating infrastructure and creating programs to protect citizens and their homes.

16 See AGCS Marine Ins. Co., 800 S.E.2d at 166.
18 See infra Part VII.
I. STORMWATER DEFINED AND THE RISKS IT POSES TO VIRGINIA

Virginia defines stormwater as the “precipitation that is discharged across the land surface or through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff and drainage.” Stormwater generally consists of runoff from the surface of streets, lawns, construction sites, and other unabsorbent areas.

A. Unregulated Stormwater May Pollute Local Watersheds

Unmanaged stormwater can cause severe erosion and flooding, resulting in significant danger for those affected and their property. Stormwater runoff is also frequently contaminated with sediment, bacteria, animal waste, oil, metals, and other pollutants, causing extensive pollution when it is discharged into local waterways without oversight. Unmanaged stormwater, alongside agricultural runoff, is recognized as one of the main contributors to the Chesapeake Bay’s algal bloom and water quality issues.

Development, of note, causes an increased volume of stormwater runoff. Development often results in the loosening of soil or sediment and the removal of natural vegetation, both of which normally contribute to the absorption of stormwater. Disturbing this natural stasis and replacing it with concrete and lawns, both examples of surface types known as Impervious Surface Cover (“ISC”) material, allows water that

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22 Stormwater, supra note 20.
25 Id. at 391.
would normally be absorbed into soil to instead collect in stormwater management infrastructure and flow into local waterways.26

B. Changing Precipitation Patterns, Aging Infrastructure, and Sea Level Rise Create Greater Stormwater Loads That Threaten Virginia Municipalities

Climate change is causing dramatic increases in precipitation, and water movement patterns are quickly shifting.27 The southeastern region of the United States, including Virginia, has experienced a twenty-seven percent change in the average amount of precipitation falling during “heavy [rainwater] events” since 1958.28 Recent studies indicate that both average annual precipitation and heavy rainfall frequency are increasing statewide, with the fall and spring seasons becoming rainier than in previous years.29 The area of Virginia surrounding the Chesapeake Bay experiences approximately five more inches of precipitation than it did a century ago, representing a twelve percent increase over one hundred years.30 These drastic increases are overwhelming stormwater management infrastructure.31

Rising tides combined with increased precipitation create distinct risks for the Commonwealth’s densely populated coastal localities.32 For

28 Id.
29 Vogelsong, supra note 1.
example, the sea level in the Hampton Roads region has risen fourteen inches since 1950. This increase marks the highest rate of sea level rise on the East Coast, and makes the region the second-largest population center in the United States most at risk to the disastrous effects of rapidly rising sea levels. These effects are already measured on a day-to-day basis along the coast. Nuisance floods, also known as high-tide floods or sunny-day floods, are short-term floods that cause disruption, such as road closures. They are caused by extremely high tides, often combined with stormwater generated from precipitation, that back up municipal drainage systems and flood low-lying areas. Sewell’s Point, Virginia, experienced five nuisance flood days in 2000. The same area is projected to experience up to 15 nuisance flood days from May 2023 to April 2024, and up to 125 in 2050.

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33 See Virginia, SEALEVELRISE.ORG, https://sealevelrise.org/states/virginia/ (last visited Dec. 4, 2023); see generally Hampton, HAMPTON ROADS CHAMBER, https://www.hrchamber.com/page/hampton-roads/ (last visited Dec. 4, 2023) (explaining that the Hampton Roads region encompasses most of southeastern coastal Virginia and includes major cities such as Norfolk, Chesapeake, and Virginia Beach).


37 Id.


39 NOAA, NAT’L OCEAN SERV., TECH. REP. NOS CO-OPS 092, 2019 STATE OF U.S. HIGH TIDE FLOODING WITH A 2020 OUTLOOK 2 (2020), https://repository.library.noaa.gov/view/noaa/25241 [https://perma.cc/KjU4-9X7M] (explaining that nuisance floods (also known as sunny-day floods or high-tide floods) can be described as floods that often occur during high tide, inundate stormwater drains, and cause water to pool on roads. Even when these floods are not big enough to cause an obvious surface disturbance or pooling, they can wreak havoc on underground infrastructure.).

Tidal flooding is increasingly threatening Virginia’s coastal communities as sea levels rise and land sinks.\(^{41}\) Currently, there are over 45,000 properties at risk from tidal flooding in Virginia.\(^{42}\) More intense and frequent floods threaten to overwhelm current stormwater management systems.\(^{43}\) Stormwater infrastructure can be damaged in coastal communities when groundwater levels rise, erosion exposes pipes to damage, floods clog drains with debris, back-flow pushes water into streets, and saltwater corrodes the infrastructure itself.\(^{44}\) These problems cause pooling water on municipal streets and potentially severe property damage during storms or abnormal weather events.\(^{45}\)

Although Virginia’s inland communities face challenges distinct from those of coastal municipalities, they are also at risk of stormwater damage as climate change worsens.\(^{46}\) Increased stormwater volume may combine with rising groundwater tables to damage underground infrastructure.\(^{47}\) Septic systems are especially vulnerable to inundation and resulting backups.\(^{48}\) Inland cities may also experience frequent road closures and destructive flooding due to aging infrastructure and increased precipitation.\(^{49}\)

\(^{41}\) *Virginia*, supra note 33.

\(^{42}\) *Id.*


\(^{44}\) *Id.*

\(^{45}\) *Id.*


\(^{49}\) *Id.*

II. VIRGINIA’S CURRENT STORMWATER MANAGEMENT FRAMEWORK: DIVISIONS OF RESPONSIBILITY AND STATUTORY MANDATES

The Virginia Code considers the term “municipality” to encompass just cities and towns, not counties. The term “locality” refers to cities, towns, and counties depending on the context of the statute. Cities and counties are equivalent political bodies in Virginia. Localities incorporated as cities are not part of any county, but towns remain part of the counties in which they lie.

Because Virginia is governed by the Dillon Rule, localities may only exercise governmental powers explicitly delegated to them by the Virginia General Assembly. Virginia Code § 15.2-970 authorizes the Commonwealth’s localities to “construct a dam, levee, seawall or other structure or device, or perform dredging operations hereinafter referred to as ‘works,’ the purpose of which is to prevent the tidal erosion, flooding or inundation of such locality, or part thereof.” Section 15.2-970 also declares the “design, construction, performance, maintenance and operation” of these systems to be a “proper governmental function for a public purpose.” Courts interpret this provision to shield localities from tort suits arising from the construction or maintenance of any flood-prevention structure, including stormwater systems, under the doctrine of sovereign immunity.

50 VA. CODE ANN. § 15.2-102 (2022).
51 Id.
53 Id.
54 City of Richmond v. Confrere Club of Richmond, Va., Inc., 389 S.E.2d 471, 473 (Va. 1990) (“The Dillon Rule provides that municipal corporations possess and can exercise only those powers expressly granted by the General Assembly, those necessarily or fairly implied therefrom, and those that are essential and indispensable.”).
55 VA. CODE ANN. § 15.2-970 (West 2023).
56 Id.
57 This Note uses “stormwater management system,” “stormwater system,” or “stormwater drainage system” to refer to infrastructure localities install to drain excess surface water or runoff into local bodies of water. See Storm Drainage System, CITY OF FAIRFAX, https://www.fairfaxcounty.gov/publicworks/stormwater/storm-drainage-system [https://perma.cc/ZN2Z-PTSA] (last visited Dec. 4, 2023) (describing the City of Fairfax’s storm drainage system). These systems generally consist of man-made structures such as culverts, gullies, and storm drains. See id. They are distinct from sanitary sewer systems. Id.
58 See, e.g., Carter v. City of Norfolk, 54 Va. Cir. 195, 195, 196 (2000); infra Section III.B.
State and local regulation of stormwater infrastructure tends to focus more on stormwater’s ability to pollute local watersheds or the funding of local stormwater management, and less on stormwater’s potential to cause severe flooding. Localities often manage systems known as municipal separate storm sewers (“MS4s”). The Virginia Code defines this specific stormwater management system as:

[A] conveyance or system of conveyances otherwise known as a municipal separate storm sewer system or “MS4,” including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains, that is:
1. Owned or operated by a federal entity, state, city, town, county, district, association, or other public body, created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including a special district under state law such as a sewer district, flood control district, drainage district or similar entity, or a designated and approved management agency under § 208 of the federal Clean Water Act (33 U.S.C. § 1251 et seq.) that discharges to surface waters;
2. Designed or used for collecting or conveying stormwater;
3. Not a combined sewer; and
4. Not part of a publicly owned treatment works.

Municipalities build and maintain these stormwater systems through local service charges. MS4 stormwater systems are separate from local sewer systems. Localities generally enjoy legal deference in deciding where and how to build stormwater infrastructure within their jurisdiction. When it owns and manages an MS4 stormwater system, a locality must consider the environmental impacts of the system’s discharge into surrounding waterways. The Virginia Department of Environmental

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59 See, e.g., Stormwater, supra note 20 (discussing the Va. DEQ’s point-source regulation of stormwater discharge and mentioning flooding and erosion only briefly).
60 VA. CODE § 62.1-44.3 (2023) (effective July 1, 2024).
61 Id.
62 Id. § 15.2-2114(A).
64 See infra Part III.
65 Municipal Separate Storm Sewer System (MS4) Permit—Stormwater, VA. DEQ, https://
Quality ("DEQ") is the primary regulating authority that manages stormwater pollution control.66 Acting pursuant to the Virginia Stormwater Management Act, regulations proffered by the State Water Control Board, and the federal Clean Water Act, the DEQ regulates discharge from municipal stormwater systems.67 The DEQ issues MS4 permits to localities and other governing bodies to operate individual stormwater management systems.68 Permit holders must take affirmative steps to limit pollutant discharge from their systems by managing construction site runoff, responding to spills that could contaminate the discharged stormwater, and preventing illegal dumping, among other requirements.69

Many Virginia localities have established stormwater management utilities and delegate their management to appointed bodies; however, there is some variation in the way these utilities are established via ordinance. For example, Fairfax County established its stormwater management system by creating a service district comprised of a staff responsible for “designing, constructing, maintaining and operating County owned stormwater facilities and equipment,” conducting public outreach, and orchestrating flooding emergency responses related to stormwater.70 Localities are statutorily authorized to create these service districts “to provide additional, more complete or more timely services of government than are desired in the locality or localities as a whole,” and may collect fees to manage the specific service involved.71

A designated committee governs stormwater management in the City of Chesapeake.72 The committee is comprised of the city engineer, the city attorney, the director of public works, and eleven members appointed by the city council.73 The committee’s responsibilities include recommending utility rates, hearing permitting appeals, and preparing stormwater utility recommendations for the city manager.74 The committee meets monthly to review and complete these tasks.75

66 Stormwater, supra note 20.
67 Municipal Separate Storm Sewer System (MS4) Permit—Stormwater, supra note 65.
68 Id.
69 Id.
70 FAIRFAX CNTY., VA., ORDINANCES app. O.
71 VA. CODE ANN. § 15.2-2400 (West 2023).
72 CHESAPEAKE, VA., ORDINANCES § 2-506.
73 Id.
74 Id. § 2-509.
75 Bylaws: Chesapeake Stormwater Committee, CITY OF CHESAPEAKE, https://www.cityof
In some localities, stormwater management may be less reliant on official boards or government bodies. Dinwiddie County’s stormwater ordinances only outline the permitting process for construction projects that may increase runoff, pursuant to State Water Control Board regulations. The county ordinances do not establish an official stormwater utility or board to construct or manage stormwater infrastructure on county property. In these jurisdictions, confusion about stormwater management responsibilities may lead to conflict between residents and officials. When a broken drainage pipe flooded one Dinwiddie County resident’s property, he left the pipe in his front yard with a sign that read: “pick up your failed drain pipe.” County officials noted that the drainage easement that caused the flooding was private, and that “the County does not have staff or funds to maintain drainage easements.”

Virginia localities may also co-manage stormwater within their jurisdictions alongside the Virginia Department of Transportation (“VDOT”), homeowners’ associations, or individual property owners. VDOT maintains a large network of drainage structures on the state roads it maintains. VDOT controls drainage facilities and apparatuses on state-operated roadways and areas that fall within state-owned rights-of-way. VDOT also creates and maintains specific drainage easements through private property. Residents may be legally responsible for the maintenance of drainage equipment depending on the equipment’s location and origin.
III. COMMON LAW INTERPRETATIONS OF MUNICIPAL STORMWATER LIABILITY IN VIRGINIA

Throughout the nineteenth and twentieth centuries, Virginia residents consistently attempted to hold localities liable for property damage or injuries caused by inadequate or negligently constructed stormwater drains.84 When drainage systems overflowed, courts examined the merits of tort cases against localities in the context of the foreseeability of the flooding at issue and the locality’s knowledge of the infrastructure’s inadequacy.85 This understanding of stormwater liability86 changed in the second half of the twentieth century, when several courts found that tort suits against municipalities for negligently managing stormwater infrastructure were barred by Virginia Code § 15.2-970.87

A. Localities Were Potentially Liable for Damage Caused by Negligent Stormwater Management

Historically, planning and designing stormwater systems was recognized as a “quasi-judicial” municipal action, meaning that it is a task left solely to the local government’s discretion.88 As the Supreme Court of the United States explained in 1886:

The duties of the municipal authorities, in adopting a general plan of drainage, and determining when and where sewers shall be built, of what size and at what level, are of a quasi judicial nature, involving the exercise of deliberate judgment and large discretion, and depending upon consideration affecting the public health and general convenience throughout an extensive territory; and the exercise of such judgment and discretion, in the selection and adoption of the general plan or system of drainage, is not subject to revision by a court or jury in a private action for not sufficiently draining a particular lot of land.89

84 See, e.g., Town of Farmville v. Wells, 103 S.E. 596, 598 (Va. 1920).
86 This Note uses the term “stormwater liability” to refer to liability, or potential liability, incurred by negligent maintenance of stormwater systems that leads to injury or property damage.
89 Id.
Under the Court’s holding in that case, a city may be found liable if it constructs or maintains its drainage systems negligently.\textsuperscript{90} Several Virginia cases illustrate this doctrine in action.\textsuperscript{91} In \textit{Town of Farmville v. Wells}, the respondent owned a home and lot in the town of Farmville on Pine Street.\textsuperscript{92} A natural drainage path ran through her garden and into a lower-lying gully in the street in front of the property.\textsuperscript{93} The gully sufficiently carried stormwater away from the house and garden.\textsuperscript{94} The town changed the elevation grade of Pine Street and installed drainage pipes in the area where the gully had previously run.\textsuperscript{95} However, the town also leveled hills surrounding the property and raised the elevation grade of the street above the level of the respondent’s lot.\textsuperscript{96} With these significant alterations changing the flow of stormwater, the new drainage pipes were completely inadequate to carry off the water that previously flowed through the gully.\textsuperscript{97} During heavy rain, the respondent’s garden and cellar flooded.\textsuperscript{98} Eventually, the entire property flooded.\textsuperscript{99}

The respondent was able to demonstrate concrete financial harm in addition to the flood’s destruction of her property.\textsuperscript{100} Following the flooding, she was completely unable to rent her property as she had before.\textsuperscript{101} The Court found for the respondent: “[t]he complaint is not of the mere grading of the streets, a work which the council was authorized by law to do, but of the negligent and improper manner in which the work was done, causing damage.”\textsuperscript{102}

In \textit{City of Richmond v. Cheatwood}, the Virginia Supreme Court affirmed a jury verdict in favor of a plaintiff who successfully sued the city after a flood damaged his property.\textsuperscript{103} The plaintiff alleged that the city was negligent in failing to update its stormwater drainage system to handle increased volumes caused by expanding development.\textsuperscript{104} The city

\begin{itemize}
  \item \textsuperscript{90} \textit{Id.}
  \item \textsuperscript{91} See, e.g., \textit{Town of Farmville v. Wells}, 103 S.E. 596, 598 (Va. 1920).
  \item \textsuperscript{92} \textit{Id.} at 596.
  \item \textsuperscript{93} \textit{Id.}
  \item \textsuperscript{94} \textit{Id.}
  \item \textsuperscript{95} \textit{Id.}
  \item \textsuperscript{96} \textit{Id.} at 597.
  \item \textsuperscript{97} \textit{Town of Farmville}, 103 S.E. at 597.
  \item \textsuperscript{98} \textit{Id.}
  \item \textsuperscript{99} \textit{Id.}
  \item \textsuperscript{100} \textit{Id.}
  \item \textsuperscript{101} \textit{Id.}
  \item \textsuperscript{102} \textit{Id.}
  \item \textsuperscript{103} \textit{City of Richmond v. Cheatwood}, 107 S.E. 830, 838 (Va. 1921).
  \item \textsuperscript{104} \textit{Id.} at 833.
\end{itemize}
argued that the flooding was so intense and unusual as to be an “act of God.”  

Although the Court primarily reviewed the jury instructions at issue in the case, it also recognized that the city retained a duty to ensure that the stormwater drainage infrastructure it provided was adequate to protect private property.  

When the city created an infrastructure plan and “passageways which [the city] undertook to provide and maintain as a part of that plan were inadequate, and that such inadequacy was due to negligence on the part of the city, and was the proximate cause of the injury,” the city could be liable for negligence.  

Litigants continued to file similar tort claims against cities for negligent stormwater management. In a more recent case, the City of Alexandria avoided liability for flooding that damaged a resident’s property. Four Mile Run, a natural stream that flows through Fairfax County, flooded after a severe rainstorm and damaged the plaintiffs’ properties. The plaintiffs claimed that the city modified the flow of stormwater into the stream when it altered the stream to use it for drainage, and, because it negligently constructed the drainage enhancements, the city was liable for the property damage. However, the Court dismissed the plaintiff’s negligence claim because the city did not exercise control over the flooded area of the stream.

B. The Section 15.2-970 Shift: Tort Claims Relating to Stormwater Management Are Barred by Sovereign Immunity

Localities remain protected from stormwater management–related tort suits under several precedential decisions issued by federal and Virginia courts over the past thirty years. These decisions categorize stormwater management systems as “devices” used to prevent the flooding of private property, meaning that their operation and construction is a government function protected from tort liability under sovereign immunity.

105 Id.
106 Id. at 833–38.
107 Id. at 833.
109 Id. at 693.
110 Id. at 695.
111 Id. at 698.
113 See VA. CODE ANN. § 15.2-970 (West 2023).
In 1993, the plaintiff in *Continental Casualty Co. v. Town of Blacksburg* argued that the town negligently planned, designed, and maintained its stormwater management system, causing flood damage and a legal nuisance.114 The Court held that, because the town’s stormwater management system consisted of “structures” meant to “prevent the flooding or inundation of persons or property in Blacksburg,” the system qualified as an anti-flooding device under Virginia Code § 15.2-970.115 The Court reasoned that, because section 15.2-970 declares the “design, construction, performance, maintenance and operation” of all flood prevention apparatuses a “governmental function for a public purpose,” the tort claim against the town was barred under the doctrine of sovereign immunity.116

In the decade that followed the *Blacksburg* decision, Virginia state courts adopted that Court’s reading of section 15.2-970 in striking down tort claims that alleged negligent management of municipal stormwater systems. In *Carter v. City of Norfolk*, the Court dismissed the negligence claim the plaintiff filed against the city after she was injured by a failed drainage pipe that caused a hole in a city sidewalk, writing, “[e]ven if, arguendo, there were a defect in the sidewalk, the court finds that such defect would have been caused by the leaking storm drainage pipe, thus resulting from a governmental function.”117 Three years later, in 2003, the Court in *Mitcham v. City of Winchester* concurred, finding that “[t]he Courts which have considered this issue have all decided that the design and operation of a municipal storm drainage system is a government function protected by the mantle of sovereign immunity.”118

Negligence suits relating to stormwater management are not confined to cases involving flood damage to homes. The plaintiff in *Dixon v. City of Chesapeake* attempted to sue the city for the negligent maintenance of the stormwater system after she suffered a car accident on a

115 *Id.* at 485. Note, the Court refers to Virginia Code § 15.1-31; however, that section has since been updated and the same text can now be found at section 15.2-970.
116 *Id.* (discussing Virginia Code § 15.1-31, now section 15.2-970). Although stormwater management is a government function and therefore shielded from tort liability, maintaining a sanitary sewer system is considered a proprietary function. See *Robertson v. W. Va. Water Auth.*, 752 S.E.2d 875, 878 (Va. 2014). This means a municipality may be held liable for negligence if it fails to properly maintain a sanitary sewer system. *Id.*
city-owned overpass.\(^{119}\) She argued that the city failed to close or treat the overpass in a timely manner when icy conditions made it dangerous.\(^{120}\) The Court found for the city, holding sovereign immunity precluded the claim.\(^{121}\) The Court found that any ice accumulation on the overpass could be attributed to the road’s stormwater drainage design.\(^{122}\) It found that the road drainage system qualified as a “work” under Virginia Code § 15.2-970.\(^{123}\) “Therefore, . . . to the extent any design or depression on the Campostella overpass may have cause [sic] ice to form at the location alleged by the plaintiff, the City is immune pursuant to Code § 15.2-970.”\(^{124}\)

Collectively, these cases indicate a broad consensus that actions against municipalities for the negligent maintenance of stormwater systems will always fail against the defense of sovereign immunity. This represents a shift from the historical, common law understanding that localities maintained a basic duty of care in maintaining the stormwater infrastructure they provided.\(^{125}\)

IV. \textbf{Inverse Condemnation: An Alternative Legal Strategy for Citizens Affected by Negligent Stormwater Maintenance or Construction}

Litigants are more likely to find success in filing an inverse condemnation claim against a locality when poorly constructed stormwater systems combine with intense weather to cause damage. An inverse condemnation claim alleges that the government committed a taking of private property for public use in a way that decreased the value of that property to its owner.\(^{126}\)

A. \textit{Article I, Section 11 of the Virginia Constitution Forbids the Taking of Private Property for Public Use Without Just Compensation}

Inverse condemnation suits are breach-of-contract actions that, unlike tort claims, are not automatically barred by sovereign immunity.\(^{127}\)

\(^{120}\) Id.
\(^{121}\) Id. at 53.
\(^{122}\) Id. at 54.
\(^{123}\) Id.
\(^{124}\) Id.
\(^{125}\) Supra Section III.A.
\(^{126}\) See, e.g., Richmeade, L.P. v. City of Richmond, 594 S.E.2d 606, 608 (Va. 2004).
\(^{127}\) Id.
An inverse condemnation action is “based on an implied contract that the government will justly compensate landowners for land it has taken.” An inverse condemnation action is subject to a three-year statute of limitations in Virginia. The implied contract that is violated when inverse condemnation occurs is derived from Article I, Section 11 of the Constitution of Virginia. In relevant part, Section 11 states:

That the General Assembly shall pass no law whereby private property, the right to which is fundamental, shall be damaged or taken except for public use. No private property shall be damaged or taken for public use without just compensation to the owner thereof. No more private property may be taken than necessary to achieve the stated public use. Just compensation shall be no less than the value of the property taken, lost profits and lost access, and damages to the residue caused by the taking.

An inverse condemnation action may be appropriate when private property is used for the public purpose of storing or draining excess stormwater.

Inverse condemnation claims filed due to government-induced flooding received a boost in viability from the United States Supreme Court in Arkansas Game & Fish Commission v. United States. The Court held that government-induced temporary flooding was still subject to “Takings Clause inspection.” This holding rejected the defense that flooding is only temporary, and therefore does not qualify as a permanent taking of property by the government for public use.

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128 Id.
129 Id.; VA. CODE ANN. § 8.01-246 (West 2023).
131 VA. CONST. art. I, § 11.
133 Id.
B. The Virginia Supreme Court Recognizes Inverse Condemnation Claims Arising out of a Locality’s Intentional Damaging of Private Property for Public Use

Virginia courts may be receptive to inverse condemnation claims against government bodies when intentional stormwater management decisions result in property damage. In *Burns v. Board of Supervisors of Fairfax County*, property owners filed an inverse condemnation suit when a stormwater drainage system, maintained by the Board of Supervisors, discharged water onto their property that severely diminished the property’s value.\(^\text{135}\) The trial court sustained the Board’s demurrer, which alleged that the plaintiffs failed to state a claim under the theory of implied contract.\(^\text{136}\) Using a then-codified Virginia statute that authorized municipalities to “provide for adequate drainage” of stormwater, the Virginia Supreme Court found that the municipal goal of moving or draining stormwater constituted a “public purpose and that the use of property for that purpose is a public use.”\(^\text{137}\) Therefore, it held the plaintiffs’ claim was not demurrable because it stated a cause of action under the theory of an implied contract.\(^\text{138}\)

In *Jenkins v. County of Shenandoah*, the plaintiffs alleged that the county’s improper construction and maintenance of a drainage channel caused severe flooding on the plaintiff’s property.\(^\text{139}\) The plaintiffs argued that, due to the flooding, their property became “virtually unmarketable at any price, and that even if the flooding problem on [their property] were resolved, it would be more cost effective to demolish the house on that lot and build a new house.”\(^\text{140}\) When ruling on the County’s motion to strike evidence of its negligent maintenance of the channel, the trial court found that the County was protected by sovereign immunity.\(^\text{141}\) The Supreme Court of Virginia reversed and remanded that holding, relying on *Burns*.\(^\text{142}\) Again, it found that the County was not protected from the property owners’ suit by sovereign immunity because,

\(^{135}\) *Burns v. Bd. of Supervisors of Fairfax Cnty.*, 238 S.E.2d 823, 824 (Va. 1977).
\(^{136}\) *Id.*
\(^{137}\) *Id.* at 825.
\(^{138}\) *Id.* at 826.
\(^{139}\) *Jenkins v. County of Shenandoah*, 436 S.E.2d 607, 609 (Va. 1993).
\(^{140}\) *Id.*
\(^{141}\) *Id.* at 608.
\(^{142}\) *Id.* at 610.
in diverting stormwater onto their property, the County committed an Article I, Section 11 taking of private property for a public use. The Court again defined the public use as “establishing adequate drainage.”

The several plaintiffs in Livingston v. Virginia Department of Transportation filed suit against VDOT and Fairfax County after a tributary stream along the Potomac River flooded and damaged their property in 2006. When the stream overflowed, it filled the basements of the plaintiffs’ homes with sewage and stormwater. The plaintiffs argued VDOT and Fairfax County were liable for the flooding damage and sought compensation. Thirty years prior, VDOT, in cooperation with the County, redverted the stream, filled in the surrounding marshes, narrowed the channel of the stream, and blocked the northern flow of the stream with walls to protect a highway. These changes resulted in a forty-year buildup of sediment that clogged the stream and obstructed its natural flow into the Potomac River. The Court found that both VDOT and the County were aware of the dangers posed by the sediment buildup long before the 2006 flood.

The plaintiffs filed an inverse condemnation suit alleging that the County and VDOT damaged their property for public use—that use being to divert stormwater onto their property by making alterations to the stream for development purposes—without just compensation. They alleged that VDOT damaged their properties by failing to maintain the altered stream, ultimately leading to the damage their properties suffered. The trial court held that the flooding was an “extraordinary” and “one-time” event, and therefore could not sustain a cause of action for inverse condemnation.

The Supreme Court of Virginia granted the plaintiffs’ appeal but dismissed the claim against Fairfax County and only ruled on the claim.

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143 Id.
144 Id. at 610 (quoting Burns, 238 S.E.2d at 824).
146 Id.
147 Id. at 269.
148 Id. at 268.
149 Id.
150 Id. at 269.
151 Livingston, 726 S.E.2d at 269.
152 Id.
153 Id.
against VDOT.\footnote{\textit{Id.}} Again, VDOT argued that the inverse condemnation claim should fail because the 2006 flood was an “extraordinary event.”\footnote{\textit{Id. at 270.}} VDOT relied on the Supreme Court of Virginia’s holding in \textit{American Locomotive Co. v. Hoffman}, where the Court held that drainage structures constructed by private companies need not be built to ensure water flow “in times of unprecedented and extraordinary freshets” to avoid liability for flood damage relating to those floods.\footnote{\textit{Id. at 271.}} VDOT attacked the inverse condemnation claim on several substantive points, arguing that its alteration of the stream did not constitute a public use, it was not responsible for the urbanization, sediment buildup, and subsequent increase in flooding of the surrounding area, and its construction decisions did not directly affect the property interests of the appellants.\footnote{\textit{Livingston}, 726 S.E.2d at 272–77.}

The Virginia Supreme Court rejected this reasoning on several grounds. First, it held that the 2006 flood was not unprecedented, and therefore was not an “act of God” event incapable of creating takings liability.\footnote{\textit{Id. at 271.}} Rather, Hurricane Agnes, which struck Virginia in 1972, produced an even greater flood in the same stream system.\footnote{\textit{Id.}} The flood, therefore, was foreseeable, especially following the repeated warnings of the effect of increased sedimentation in the stream system.\footnote{\textit{Id. at 275.}}

However, foreseeability mattered little to the Court’s ultimate holding. Most importantly, the Court found that VDOT may have damaged the plaintiffs’ homes in furtherance of a public use when it \textit{failed to act} and decided not to maintain the altered stream.\footnote{\textit{Id.}} In doing so, VDOT implicitly opted to use the plaintiffs’ land to effectuate the public purpose of draining and storing stormwater:

\begin{quote}

Despite the concerns raised by local officials about the accumulation of sediment in the relocated Cameron Run and the resulting increase in the risk of flooding to neighboring residential developments such as Huntington, VDOT declined to maintain the channel. VDOT made this decision (at least in part) because it was willing to accept
\end{quote}
temporary flooding of the Beltway. In essence, then, VDOT elected to use the Beltway and nearby residential developments as makeshift storage sites for excess stormwater instead of allocating its resources to maintain the relocated Cameron Run.\footnote{\textit{Id.} at 275.}

The Court remanded the case, finding that the lower courts should not have granted VDOT’s demurrer.\footnote{\textit{Livingston}, 726 S.E.2d at 277.} In dissent, Justice McClanahan questioned the Court’s reading of Article I, Section 11 and argued that the plaintiffs’ claim was “nothing more than a claim for negligence, brought under the guise of the constitutional damaging clause.”\footnote{\textit{Id.} at 279 (McClanahan, J., dissenting).} She argued that the Court’s opinion attenuated the doctrine of inverse condemnation by guaranteeing compensation when property damage could be causally “traced [back] to a public improvement.”\footnote{\textit{Id.} at 278 (McClanahan, J., dissenting).}

The Virginia Supreme Court clarified the outer limits of the inverse condemnation doctrine in \textit{AGCS Marine Insurance Co}. In that case, two insurers paid property damage claims to a Harris Teeter grocery store after a county sewer line backup caused raw sewage to flow into the store and inflict $1.8 million of property damage.\footnote{\textit{AGCS Marine Ins. Co. v. Arlington County}, 800 S.E.2d 159, 161 (Va. 2017).} The insurers filed an inverse condemnation suit against the county.\footnote{\textit{Id.}} Their claim alleged that the sewer line served the public purpose of supplying the county’s residents with sewage disposal, and that the backup was caused by the county’s failure to properly maintain the sewer line and treatment plant.\footnote{\textit{Id.} at 161–62.} The Court’s opinion focused on the for-public-use principle of inverse condemnation suits.\footnote{\textit{Id.} at 162–69.} It surveyed similar takings cases such as \textit{Jenkins, Burns,} and \textit{Livingston,} and found that, in those cases, the government implicitly asked property owners to shoulder the cost of public improvement.\footnote{\textit{Id.} at 163–66.}

Ultimately, the Court labeled the insurers’ claim as a tort suit disguised as an inverse condemnation action.\footnote{\textit{Id.} at 162, 165–67.} It emphasized that, were it to...
find for the insurers, it would circumvent the doctrine of sovereign immunity by providing a remedy for “property damage of any nature, whether intentional, negligent, or wholly innocent, caused by a governmental entity.”172 Instead, the Court suggested that an inverse condemnation claim must involve an intentional decision to place the burden of public improvement or maintenance on private individuals, not mere negligence in carrying out a public function:

Nothing in [the complaint] expressly alleged or reasonably implied that the County purposefully damaged the Harris Teeter grocery store for a public use. No allegation suggested that the County planned or designed its system to allow the backflow in an effort to keep the entire county sewer system operating for all other users. Simply alleging that damage occurred incident to the operation of the public sewage system is insufficient to state a claim for inverse condemnation under Article I, Section 11 of the Constitution of Virginia.173

Localities are only liable for inverse condemnation when they intentionally take or damage private property in furtherance of a public purpose.174 Mere negligence in operating the sewer line, for example, will not sustain an inverse condemnation claim.175

V. THE DIFFICULTIES OF SEEKING LEGAL REDRESS FOR NEGLIGENT STORMWATER MANAGEMENT AS CLIMATE CHANGE INTENSIFIES

Virginia residents will inevitably suffer losses and damage due to more intense flooding.176 Some of that damage could be prevented by

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172 AGCS Marine Ins. Co., 800 S.E.2d at 167.
173 Id. at 168.
174 Id. The Court cited Hampton Roads Sanitation District v. McDonnel for another example of an intentional damaging of private property for public use. Id. at 165 (citing 360 S.E.2d 841 (Va. 1987)). In that case, the sanitation district handled overload conditions by deliberately diverting wastewater overflow onto a resident’s property. Id. (citing 360 S.E.2d at 842–43). The Court found this to be a compensable inverse condemnation claim. Id. (citing 360 S.E.2d at 843).
175 Id. at 167.
176 See Virginia, supra note 33.
proactive stormwater management planning and infrastructure updates. However, if a locality fails to take these steps, residents will be unable to hold their local governments accountable for failing to act due to the legal barriers of sovereign immunity and the limited application of inverse condemnation claims.

A. Tort Actions Arising from the Failure to Update Stormwater Management Infrastructure Will Fail

In examining the potential structure of future stormwater liability suits, the hypothetical homeowner discussed in this Note’s Introduction provides a useful example. The city-owned street outside his home has flooded several times over the course of a year. Worried that the flooding will eventually breach the curb and flow onto their property, he and his neighbors have repeatedly notified the city’s stormwater management department of the need for higher-volume stormwater infrastructure. When the flood they feared finally arrives and causes significant property damage to their homes, they sue the city for the negligent construction and maintenance of the stormwater infrastructure that serves their street.

Their claim alleges the city, as the owner and operator of the street and drainage system, had a duty to properly maintain the stormwater infrastructure that served their neighborhood. They will argue cases such as Town of Farmville provide common law support for the claim. The city breached that duty when, faced with overwhelming warnings about the upcoming flooding due to more intense precipitation, it failed to update the infrastructure to account for increased volume. The city’s failure to update the stormwater infrastructure directly caused the drains on the street to overflow, which in turn resulted in severe property damage to the homes on the street. The damages are, clearly, the thousands of dollars in property damage caused by the flood.

Because the city is protected by sovereign immunity, this claim will be dismissed before the court even considers the merits of the homeowners’ claim. To defend itself, the city will invoke Virginia Code

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177 See, e.g., Shutters, supra note 31.
178 See supra Introduction.
179 Town of Farmville v. Wells, 103 S.E. 596, 598 (Va. 1920).
§ 15.2-970. Because that statute labels stormwater management a “proper governmental function for a public purpose,” courts will inevitably find that the city is protected from tort suits arising from its stormwater management decisions and construction under the doctrine of sovereign immunity. Therefore, even in circumstances of extraordinary negligence or ignorance of risk, tort litigants will be unsuccessful against Virginia localities when stormwater flooding causes damage.

B. **Inverse Condemnation Actions Related to Stormwater Management Are Also Unlikely to Succeed**

Next, the hypothetical homeowners file an inverse condemnation claim against the city. Their complaint alleges that when the city refused to update its stormwater management infrastructure or manage it according to increased volumes, it forced the landowners to bear the cost of public stormwater management without just compensation. In doing so, the city violated the implied contract established by Article I, Section 11 of the Virginia State Constitution.

On its face, this complaint seems more likely to prevail than a tort suit. Using Section 15.2-970, the plaintiffs argue that the city intentionally left their street unprotected and used their land to further the public function of “prevent[ing] the tidal erosion, flooding or inundation” of the locality by storing stormwater there. Therefore, they should be compensated.

However, a close reading of the Virginia Supreme Court’s opinion in *AGCS Marine Insurance Co.* indicates otherwise. In that opinion, the Court was careful to emphasize that, to commit a taking, the government must intentionally place the burden of a public usage or purpose on its citizens without compensation. The Court upheld inverse condemnation claims in *Jenkins, Burns*, and *Livingston* because, in those cases, the government intentionally “used private property . . . to handle expected”

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181 See id.; VA. CODE ANN. § 15.2-970 (West 2023).
182 See supra Section III.B.
183 VA. CONST. art. I, § 11.
184 VA. CODE ANN. § 15.2-970 (West 2023); see generally Livingston v. Va. Dep’t of Transp., 726 S.E.2d 264, 275 (Va. 2012).
186 Id. at 161–63.
complications arising from its own stormwater drainage construction decisions.\textsuperscript{187}

Conversely, the Court held that “the mere negligence of a governmental actor incident to, or while participating in, a public function” is not sufficient to support an inverse condemnation claim.\textsuperscript{188} Applying this standard to the facts of \textit{AGCS Marine Insurance Co.}, the Court found that the original complaint alleged that the county negligently maintained its sewer system, but it did not allege that the county “purposefully damaged the Harris Teeter grocery store \textit{for} a public use.”\textsuperscript{189} If the Court were to sustain an inverse condemnation action on mere negligence, “sovereign immunity would no longer exist in the Commonwealth of Virginia for property damage claims.”\textsuperscript{190}

The plaintiffs, and others harmed by a municipality’s failure to plan for the impacts of climate change, will struggle to push an inverse condemnation claim through the barrier of this holding. Unless the city constructed new stormwater infrastructure that diverted water onto their properties, a claim alleging that the city failed to plan for increased stormwater volume would most likely be demurred. That claim would allege mere negligence in management, not an intentional act that placed the burden of increased stormwater on some individuals and not others. According to the Court’s reasoning in \textit{AGCS Marine Insurance Co.}, any inverse condemnation suit that alleges a quasi-tort claim, such as that of the hypothetical homeowners, does not state a true claim under that doctrine.\textsuperscript{191}

Virginia residents are, therefore, left without a legal option to hold their local government accountable for a failure to plan for increased stormwater volume. Because flood prevention and draining are public functions or purposes under Virginia Code § 15.2-970, municipalities retain broad authority to carry out those tasks without the risk of legal action.\textsuperscript{192} Unless the court finds that a locality intentionally \textit{chose} to force private citizens to bear the costs of these public functions, neither a tort nor inverse condemnation suit is likely to prevail,\textsuperscript{193} and property owners will be forced to foot flood damage bills themselves.

\textsuperscript{187} \textit{Id.} at 166.
\textsuperscript{188} \textit{Id.}
\textsuperscript{189} \textit{Id.} at 168.
\textsuperscript{190} \textit{Id.} at 167.
\textsuperscript{191} \textit{AGCS Marine Ins. Co.}, 800 S.E.2d at 167–68.
\textsuperscript{193} See \textit{supra} Parts III, IV.
VI. MUNICIPAL STORMWATER LIABILITY IN OTHER STATES: A BRIEF CASE STUDY OF VERMONT

Although Virginians are unlikely to successfully sue a locality for improper stormwater management, some states provide legal remedies that allow residents harmed by negligent stormwater system maintenance to recover damages from their municipal governments. Exceptions to sovereign immunity and specific statutes usually provide these remedies. Vermont’s stormwater liability framework provides individuals with statutory and common law causes of action against municipalities.

Vermont’s local governments may be held liable for failing to maintain stormwater drainage systems under several state statutes. First, when a municipal corporation or county purchases liability insurance, it waives its sovereign immunity to the extent of the policy’s coverage and may be found liable for claims arising from a responsibility covered by that policy. Additionally, when an individual or their property is injured or damaged due to a municipality’s failure to maintain a bridge or culvert, the municipality may be found statutorily liable for up to $75,000 in damages.

196 VT. STAT. ANN. tit. 29, § 1403 (West 2023).
The Vermont Supreme Court found that this statute granted broad relief when a plaintiff suffered an injury from a defective culvert, and held that “[t]he cause which sets the chain of events in motion must be at the culvert. The precise point where the final harm is done is thus not restricted.”

Vermont common law also provides a narrow exception to municipal sovereign immunity: a locality may be found liable if it “fails to repair a culvert necessary to allow a natural stream to pass unimpeded under a public roadway after notice that the culvert is not functioning as intended.”

In *Graham v. Town of Duxbury*, the Vermont Supreme Court denied the plaintiffs’ negligence claim under this principle. Because a culvert caused property damage but did not obstruct a natural stream, the Court found that the town was immune from common law negligence claims. The plaintiffs failed to include a statutory argument under Title 19, Section 985 of the Vermont Statutes, and so the Court dismissed their claim without deciding whether the town retained a statutory duty to maintain the culvert. Had the plaintiffs sued under that statutory provision, their claim would have likely prevailed because the town maintained control over the culvert at issue.

Vermont’s stormwater liability framework demonstrates that some states recognize a locality’s duty to maintain the stormwater infrastructure it controls. Vermont then allows citizens to bypass sovereign immunity and recover damages when the locality breaches that duty.

**VII. HOW VIRGINIA MUNICIPALITIES ARE PREPARING FOR INCREASED STORMWATER VOLUME**

Virginia citizens lack the legal remedies needed to hold localities accountable for failing to update outdated stormwater infrastructure. However, a local government’s preparation for the effects of climate change

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197 VT. STAT. ANN. tit. 19, § 985(a) (West 2023).
200 *Id.* at 1230.
201 *Id.* at 1232–33.
202 *Id.* at 1232–34.
203 *Id.* at 1231–32, 1234.
204 *Supra* Part VI.
on stormwater volume may be catalyzed through other means.\footnote{See Noelwa R. Netusil & Carolyn Kousky, Wharton Risk Mgmt. & Decision Processes Ctr., Univ. of Pa., The Coming Storm: How U.S. Cities Are Managing Stormwater from Increasingly Extreme Rainfall Events 4–5 (2021), https://esg.wharton.upenn.edu/wp-content/uploads/2023/07/The-Coming-Storm.pdf [https://perma.cc/D5FL-XKTF] (providing a general overview of how U.S. cities are addressing increased stormwater loads).} An examination of three specific Virginia localities—the City of Norfolk, Fairfax County, and the City of Petersburg—demonstrates three distinct approaches to updating stormwater management as increased precipitation and higher sea levels increase stormwater volume.\footnote{See supra Part I.} These examples show that local leaders are independently recognizing the danger of leaving stormwater management unattended as the climate changes, and that legislative or executive action can effectively spur necessary infrastructure updates.

A. Norfolk’s Storm-Focused Stormwater Project

Virginia localities must consider a variety of solutions to combat rising sea and stormwater levels, especially when precipitation combines with tidal flooding on local streets.\footnote{Id.} The City of Norfolk recently announced a multibillion-dollar project to defend against rising sea levels and frequent flooding.\footnote{Id.} The project will build miles of floodwalls, a dozen tide gates, and pump stations to help protect the city from inundation.\footnote{Id.} It will also allocate funding for buying some at-risk properties and elevating others to prevent landowners from bearing the cost of climate change-driven flooding.\footnote{Id.}

However, critics of the project argue that this rescue plan is too narrowly focused.\footnote{Id.} They claim that although the new infrastructure will help protect the city from storms that cause massive amounts of precipitation and potential storm surges, the plan completely ignores the daily nuisance flooding that already plagues the city.\footnote{Id.} Many advocate for
“green” resiliency infrastructure\(^{213}\)—such as artificial oyster reefs that counter storm surges or marshes that soak up excess runoff—in place of “gray” options, or non-organic, material-based preventative devices such as the planned flood walls.\(^{214}\) In April 2023, the Norfolk City Council approved the final plan, which will cost a total of $2.6 billion to implement.\(^{215}\)

Norfolk’s other resilience-focused programs, which combat increased stormwater with a more adaptive approach, show the disturbance and extent of these small but frequent nuisance floods. One program distributed real-time traffic data through the Waze app in an attempt to warn motorists about flooded roads in the city in real time.\(^{216}\)

Norfolk’s efforts demonstrate that infrastructure meant to mitigate severe weather events, such as pump stations and seawalls, may fail to address the important problem of nuisance flooding and leave some local concerns unaddressed. It shows that nuisance flooding caused by overmatched stormwater drainage systems is a major concern for community members. Also, the city’s use of the Waze app to divert traffic away from flooded areas provides an interesting example of stormwater management and flood preparedness that falls outside physical infrastructure.

**B. Fairfax County’s Innovative Approach to Flood Mitigation**

Fairfax County in Northern Virginia is one of many Virginia localities facing frequent flooding.\(^{217}\) It is taking a uniquely proactive approach to climate change–enhanced stormwater flooding through a Countywide resilience plan.\(^{218}\) The Potomac River borders Fairfax County to the north and east, and the County is at an increased risk of stormwater flooding due to substantial suburban development.\(^{219}\) Intense

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\(^{214}\) Cox, supra note 208.


\(^{218}\) Id.

\(^{219}\) For a map showing the Potomac River on Fairfax County’s north and east borders, see,
thunderstorms caused a 2019 flood that required water rescues and resulted in $14 million in property damage in the area.\textsuperscript{220}

In response to increased flooding and mounting stormwater concerns, the County created its “Resilient Fairfax” climate adaptation plan.\textsuperscript{221} The plan begins by discussing areas of the County that are at risk of increased flooding through precipitation projections and mapping.\textsuperscript{222} It also discusses the many factors that contribute to increased stormwater volume in addition to heavier precipitation, such as the loss of tree canopies, flood-plains, and wetlands.\textsuperscript{223}

Crucially, the plan distinguishes between the “historic” flooding figures in the county and the “projected” flood forecasts, which account for increased volume due to climate change, that it will use to inform its new initiative.\textsuperscript{224} The plan explains the role of intensity, duration, and frequency (“IDF”) curves, which measure projected precipitation and inform how municipal engineers set stormwater infrastructure capacity.\textsuperscript{225} In broad terms, the plan explores the possibility of adding resilience metrics into the County’s municipal ordinances.\textsuperscript{226} New additions to these code sections will focus on making new construction more resilience-based.\textsuperscript{227} The County also plans to pursue grants to update its stormwater management infrastructure.\textsuperscript{228}

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\textsuperscript{220} July 8 Storm Caused at Least $14 Million in Damages in Fairfax County, ANNANDALE TODAY (Aug. 5, 2019), https://annandaletoday.com/july-8-storm-caused-at-least-14-million/ [https://perma.cc/FG5X-8Y3C].

\textsuperscript{221} See generally Resilient Fairfax, supra note 217.


\textsuperscript{223} See id. at 78, 81.

\textsuperscript{224} See id. at 27.

\textsuperscript{225} Id.

\textsuperscript{226} Id. at 69.

\textsuperscript{227} Id.

\textsuperscript{228} FAIRFAX CNTY., OFF. OF ENV’T & ENERGY COORDINATION, supra note 222, at 50.
The Fairfax County Board of Supervisors adopted Resilient Fairfax in November 2022. County officials are already using it, or at least acting in tandem with its stormwater resilience goals, to address local stormwater issues. Fairfax residents can apply for county grants to fund their own stormwater management infrastructure projects. These projects include installing rain gardens, dry wells, and other landscape structures designed to retain and filter stormwater, thereby lessening the load on County infrastructure. These grants are funded through a $4 million state appropriation as well as an additional $75,000 County budget allocation. They generally cover about eighty percent of the cost of a single project. The County is also considering updates to its construction standards to require new buildings and developments to include additional drainage infrastructure.

The County also includes a detailed list of its current stormwater projects available for residents on its website. Most projects focus on restoring and/or dredging naturally occurring streams and lakes to provide enhanced stormwater retention. During the 2023 Virginia Flood Awareness Week, the County teamed up with other localities to inform residents of the risks of flooding through online information sessions.

232 Id.
233 ANNANDALE TODAY, supra note 230.
234 Id.
237 Id.
238 Virginia Flood Awareness Week 2023 Points to Preparation, ARLINGTON, VA. (Mar. 9,
Fairfax County’s comprehensive resilience plan shows that stormwater management is a key aspect of general resilience planning. It also provides examples of innovative solutions that can be implemented within Virginia’s Dillon Rule legal parameters, such as simple infrastructure updates to existing systems. Even though it is newly adopted and in its earliest stages, the plan has already begun to push the County toward modernized stormwater management.

C. Petersburg, Virginia, Uses State and Federal Grants to Conduct a Stormwater Improvement Study and Infrastructure Updates

The City of Petersburg, Virginia, experienced severe flooding in July and August 2021. Back yards turned into ponds, basements flooded, and washing machines floated as excess stormwater damaged properties. Flash floods closed streets and inundated cars.

In response to this incident and a history of flooding in the city, Petersburg secured several state and federal grants to update its aging stormwater infrastructure. First, it secured $21 million in federal funding through the American Recovery Act in the fall of 2021. It received an additional $2.6 million in state grants later that year.

City officials

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240 Id.; see also Nicole Dantzler, Concerned Residents Believe They Found the Culprit for Flooding Inside Their Home, ABC 8NEWS WRIC (July 9, 2021), https://www.wric.com/news/local-news/the-tri-cities/concerned-residents-believe-they-found-the-culprit-for-flooding-inside-their-home/ [https://perma.cc/4UVT-8BNE] (quoting Petersburg residents discussing flooding resulting from the city’s failure to maintain storm drains).
243 Shutters, supra note 31.
244 Hammond & O’Brien, supra note 242. Hampton, Virginia, also relies on state grant programs like the Community Flood Preparedness Fund to address stormwater and flooding issues by, for example, elevating roadways or improving drainage canals. Charlie
pledged to put those funds toward a comprehensive study of the city’s stormwater management infrastructure, which still includes pipes that were laid in the 1820s, as well as a resilience plan.\textsuperscript{245} It immediately allocated some funds to “shovel-ready” stormwater projects that would immediately relieve some of the worst flooding.\textsuperscript{246}

Petersburg’s stormwater struggles demonstrate the danger of aging stormwater infrastructure, which can quickly cause severe flooding, property damage, and road closures. However, the city’s response to these struggles shows when local political action is catalyzed, there is state and federal funding available for stormwater projects.

CONCLUSION

As climate change increases precipitation and raises sea levels, ever-heavier stormwater loads will stress municipal stormwater management systems. If these systems fail, the resulting flooding has the potential to cause substantial property damage and could endanger the lives of residents. Municipalities enjoy substantial protection from stormwater-related liability under the doctrine of sovereign immunity and the Virginia Supreme Court’s interpretation of Article I, Section 11 of the state constitution. However, Virginia localities are beginning to address the growing problem of inadequate stormwater management using a variety of different methods that will make stormwater infrastructure more resilient.


\textsuperscript{245} Hammond & O’Brien, supra note 242.

\textsuperscript{246} Id.