

The Committee of 100

on the Federal City



Planning for Flooding in Washington

September 2020

DRAFT 3

Scope: This paper considers responses to safeguard developed land in floodplains. The Committee of 100 plans another paper on creating and preserving open land in floodplains.

Issue: The risk of floods in the Nation’s Capital is increasing and threatens the city. District government should respond now to the threat of 100-year and 500-year floods.

Summary: We urge District government to get in front of the problem, adopt the management principle of no adverse impact from flooding and create a floodplain management plan for all floodplains in the city. Areas in the city will be under water in 100-year or 500-year floods. As of 2018, 2,566 buildings in the city were in floodplains, and more are being built.¹ DC government also projects substantial increases in population and building between 2019 and 2045.² Developments in 500-year floodplains will be “permanently inundated” by 2050 and protecting them will require enhanced natural shorelines, raised roads, and/or berms for protection. To study responses to flooding we selected two neighborhoods in 100- or 500-year floodplains: Mayfair Mansions, a large historic apartment complex in Northeast Washington and Buzzard Point, SW which is undergoing rapid development, including the new \$50 million Pepco station. See Figures 1, 2, 3, and 4. In 2020, their combined value exceeds \$ 1 billion which is projected to increase to \$1.8 billion by 2050. See Exhibit A.

In addition to displacing people, flooding may also lower the District’s real estate tax base, adversely affect its bond rating, and lead to “climate gentrification” as the real estate industry reacts to the risk of flooding and bids up neighborhoods above floodplains, possibly displacing lower-income residents.

Parochial and piecemeal efforts at flood control are already planned at the Washington Navy Yard and Washington Harbor. We urge District government to get in front of the problem, adopt the management principle no adverse impact from flooding and create a floodplain management plan for all floodplains in the city. The city’s Commission on Climate Change and Resilience has made similar recommendations.³

¹ <http://committeeof100.net/what-we-do/planning/planning-for-flooding-in-washington>.
<https://doee.dc.gov/service/flood-risk-maps>

² Office of Planning, *Forecasting the District’s Growth, Results and Methodology*. (November 2016).

³ Association of State Floodplain Managers, “No Adverse Impact, a Toolkit for Common Sense Floodplain Management,” (2003). <https://www.floods.org/resource-center/association-of-state-floodplain-managers-nai-no-adverse-impact-floodplain-management/>. Internet; accessed 14 Aug. 2020. Commission on Climate Change and Resiliency

Possible responses include:

First, identifying the most cost-effective methods in each floodplain.

Second, taking one or more of the following actions:

- Abandoning developments in certain floodplains;
- Enhancing natural shorelines for flood resilience;
- Dedicating open space to capture and dissipate flood waters;
- Building flood barriers/berms; and
- Elevating roads in developed floodplains.

Third, to protect residents in developed floodplains, the District should fund the necessary climate adaptation projects by:

- Immediately and significantly increasing capital spending on climate adaptation projects;
- Floating a bond issue dedicated to climate-ready adaptation;
- Increasing sales taxes to fund flood mitigation;
- Increasing real property taxes on developments in floodplains and dedicating the additional tax revenues to building flood barriers and elevating roads in those floodplains;
- Imposing fees on new development projects in floodplains as part of the permitting process and dedicating payments to funding flood barriers and elevating roads in those floodplains;
- Requiring developers planning to build in floodplains to acquire and transfer to the District unimproved land in floodplains to be preserved as open space; and
- Encouraging resilience business improvement districts.

Communities and infrastructure in floodplains

Mayfair Mansions⁴

Mayfair Mansions, 3743-3817, 5819 Jay Street, NE, 3712-3820 Hayes Street, NE, and 770-778, 782 Kenilworth Terrace, NE, is an apartment community in square 5057, off Kenilworth Avenue, NE, 44.70 acres, on a cul-de-sac projecting into Kenilworth Park. See Figures 1 and 2. It was built in two sections:

In 1943, the first section, 410 units, 3721-3773, 3801-3821, and 5819 Jay Street, 3724-3784 and 3800-3820 Hayes Street, and 770-778, 782, Kenilworth Terrace, NE, “Mayfair Gardens,” 17

<https://doee.dc.gov/publication/commission-climate-change-and-resiliency>, report (2019). Internet; accessed 14 Aug. 2020.

⁴ DOEE, *Vulnerability and Risk Assessment* (2016) identifies a larger area around Mayfair Mansions as at-risk from flooding: **PRIORITY PLANNING AREA 2**

This area around the Watts Branch, a tributary to the Anacostia River, is currently at risk of flooding, and is projected to be at increased risk as early as 2020. This area has a significant concentration of community resources at-risk, such as medical services and public housing, including the soon-to be redeveloped Kenilworth Courts project, that serve vulnerable populations. p. 11.

buildings, was designed by Albert I. Cassell and built by the Kenilworth Co. for Mayfair Gardens, Inc.. They are listed on the National Register of Historic Places. Office of Planning notes that Mayfair Gardens “was one of the city’s earliest garden apartment complexes and one of the first conceived and designed for working- and middle-class African-American residents.” There were 409 apartments renovated in 2009 for \$91 million under the Tenant Opportunity to Purchase Act. The project qualified for \$12.4 million in historic tax credits and a four percent low-income housing tax credit. In 2013, an additional 160 units were renovated.⁵

In 1965, the Gospel Spreading Organization built the second section, 3578-3817 Hayes Street and 3699-3547 Jay Street, NE, consisting of 15 buildings at the northwestern section. A recreation center was added in 2010.

The value of the entire Mayfair Mansions complex, based on the 2020 real property tax assessment, is \$80,833,210. (The proposed 2021 assessment is higher.) The estimated value in 2050 will be \$146,418,171. See Exhibit A.

In 2010, 3,820 people lived in Mayfair Mansions’ census tract (96.02). In 2014-2018, median income in tract 96.02 was \$24,409 vs. a citywide median income of \$82,604.⁶ The Comprehensive Plan’s Far Northeast and Southeast Area Element proposed amendments (April 2020), recognizes the importance of Mayfair Mansions and the need to protect it from flooding:

Far Northeast and Southeast is known for its established neighborhoods and its diverse mix of housing. It includes ... apartment communities such as ... Mayfair Mansions. (1700.2)

Historic Resources

Protect and restore buildings and places of potential historic significance in Far Northeast and Southeast, including historic landmarks, such as ... Mayfair Mansions. (1709.610, Policy FNS-1.2.67)

Preserving affordable housing such as Mayfair Mansions is a key goal in the Comprehensive Plan proposed amendments. Housing Element, H-2 Housing Preservation: Retaining Our Housing Opportunities (509, 510, April 2020)). Preserving Mayfair Mansions also furthers the goal of the Housing Production Trust Fund.⁷

Buzzard Point

Buzzard Point is undergoing rapid development.⁸ See Figure 3.

⁵ Office of Planning, *Pairing Historic Tax Credits with Low-Income Housing Tax Credits in DC*, (2015).

⁶ <https://www.census.gov/quickfacts/fact/table/washingtoncitydistrictofcolumbia,DC/LND110210>

⁷ <https://dhcd.dc.gov/page/housing-production-trust-fund>. Internet; accessed 12 Aug. 2020.

⁸ DOEE, *Vulnerability and Risk Assessment* (2016) identifies a larger area embracing Buzzard Point as at-risk from flooding:

Peninsula 88, 88 V Street, SW

This condominium project is eight stories, 110 units, and two levels of underground parking. DOEE required that the ground floor units be raised by 19 inches, the flood wall along the building's rear be raised from 12.6 feet to 14.27 feet, and a 5-foot 4-inch passive flood gate be built at the rear corner.⁹ These condominiums are for sale. Their total assessed real estate value in 2020 is, \$ 77,871,900. In 2050 the value is expected to be \$ 141,072,282. See Exhibit A.

Watermark, 1900 Half Street, SW The project redeveloped an existing eleven-story office building into a new mixed-use residential and retail destination offering 419 luxury apartments and 236 parking spaces, more than 15,600 square feet of retail space, plus Eagle Academy Charter School.¹⁰ Its value in 2020 is \$51,008,960 based on its real property tax assessment. (The proposed 2021 assessment is higher.) The value in 2050 is estimated to be \$92,395,182. See Exhibit A.

River Point, 2121 2nd Street, SW

The River Point project redeveloped the U.S. Coast Guard headquarters into 481 apartments plus 50,000 square feet of retail (food hall, indoor-outdoor restaurants and headquarters for DC Central Kitchen). WhyHotel plans to lease up to 150 units for two years for a pop-up hotel. Completion is scheduled in 2020.¹¹ Its value in 2020 is \$54,201,340 based on its real property tax assessment. (The proposed 2021 assessment is higher.) The value in 2050 is estimated to be \$92,395,182. See Exhibit A.

Other planned Buzzard Point projects include Capitol Building Supply, Potomac Avenue and 1st Street, SW; 1800 Half Street, SW; 100 V Street, SW.¹²

Pepco Waterfront Substation, 1620 2nd Street, SW

PRIORITY PLANNING AREA 4. This area in Southwest DC extends from south of the Capitol to Buzzards Point and is primarily at risk of riverine and coastal flooding. This area is a mix of residential, commercial, government, and several large development projects and planning initiatives (The Wharf, Buzzard Point, DC United Soccer Stadium, etc.). The area includes a variety of community resource facilities and infrastructure at risk of flooding, including public safety, public housing, human services, transit, energy and wastewater. Several public housing properties are located in Priority Area 4, including the Greenleaf properties that are scheduled to be redeveloped in the near future and James Creek. Metrorail lines that cross through this area include the Green Line and Blue/Orange/Silver Line. p. 11.

⁹ *Urban Turf*, <https://dc.urbanturf.com/articles/blog/more-flood-measures-for-peninsula-88/13447>. Internet; accessed 2 Apr. 2020.

¹⁰ Nena Perry-Brown, "The 1,000 Residential Units Delivering in Buzzard Point This Year," *Urbanturf.com*. Internet; accessed 4 Aug. 2020.

¹¹ Nena Perry-Brown, "Zoning Commission Unanimously Approves WhyHotel at 481-Unit Coast Guard Headquarters Conversion," *UrbanTurf.com*. Internet; accessed 31 July 2020.

¹² Nena Perry-Brown, "The 1,000 Residential Units Delivering in Buzzard Point This Year," *Urbanturf.com*. Internet; accessed 4 Aug. 2020.

In 2017, Pepco upgraded its waterfront substation on Buzzard Point with a new 93,419 square-foot facility. See Figure 4. Pepco stated:

“We are always working to provide safe, reliable, and affordable energy to our customers, and to support the needs of the region.”

As part of this commitment, Pepco identified the need to construct a new distribution substation within the Ward 6, Buzzard Point area. The Waterfront Substation is needed to support existing customers and planned development in the Capitol Riverfront and Southwest Waterfront areas, and to replace aging infrastructure.

And in 2015 Pepco said:

Southwest and Southeast Washington, DC are experiencing intense residential and commercial growth. Distribution substations are a vital link in providing new and existing customers electric service by lowering transmission voltages to distribution voltages to deliver electricity. The existing distribution facilities located within Buzzard Point Substation presently serving the areas are forecasted to be over capacity by the summer of 2017. The new Waterfront Substation will support existing customers and planned development in the Capitol Riverfront and Southwest Waterfront areas.¹³

Clearly, Pepco’s Waterfront Substation is essential infrastructure. The substation’s value in 2020 is \$54,201,340 based on its real property tax assessment. The estimated value in 2050 will be \$94,721,658. See Exhibit A. In 2020, the substation is already vulnerable to flooding.¹⁴

The bottom line for Mayfair Mansions and Buzzard Point: preventing Venice on the Anacostia

Even if buildings are raised above the floodplain, access roads and infrastructure will be flooded. If nothing is done, these communities will suffer severe flooding and they will demand justice – elevated roads above the floodplain, barriers or berms, or other measures to prevent flooding. These actions must be taken, and they will be very expensive, especially if action is delayed. The time to plan and act is now.¹⁵

We urge District government to adopt the Association of State Floodplain Managers No Adverse Impact floodplain management:

¹³ Julia Cole, The Southwester Twitter feed, Aug. 2015.

<http://thesouthwester.com/2015/08/12/pepco-substation-sparks-sw-construction-project/>.

¹⁴ DOEE, *Vulnerability and Risk Assessment* (2016, p. 31).

¹⁵ Kristina Dahl et al., *Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate*. (2018, p. 11). Union of Concerned Scientists. www.ucsus.org/underwater. Internet; accessed 28 June 2020. *Urban Turf*, <https://dc.urbanturf.com/articles/blog/more-flood-measures-for-peninsula-88/13447>. Internet; accessed 2 Apr. 2020.

No adverse impact (NAI) floodplain management is an approach that ensures the action of any community or property owner, public or private, does not adversely impact the property and rights of others. An adverse impact can be measured by an increase in flood stages, flood velocity, flows, the potential for erosion and sedimentation, degradation of water quality or increased cost of public services. No Adverse Impact floodplain management extends beyond the floodplain to include managing development in the watersheds where floodwaters originate. NAI does not mean no development. It means that any adverse impact caused by a project must be mitigated, preferably as provided for in the community or watershed based plan.¹⁶

District government recognizes the threat from flooding but so far has failed to act

Comprehensive Plan (2018) Policy E-4.7.4: Flood Plains provides:

Restrict development within FEMA-designated flood plain areas. Consistent with the Federal Elements of the Comprehensive Plan, prohibit activities within these areas that could pose public health or safety hazards in the event of a flood. Regulation of land uses in flood plains, waterfronts, and other low-lying areas should consider the long-term effects of global warming and sea-level rise on flood hazards.

The Comprehensive Plan’s Far Northeast and Southeast Area Element proposed amendments (April 2020), recognizes the risk to Mayfair Mansions and the need to protect it from flooding:

Conserving and Enhancing Community Resources

The watershed of Watts Branch, a tributary of the Anacostia River, was identified as a priority area for resilience planning in the Vulnerability and Risk Assessment of Climate Ready DC. The Watts Branch watershed encompasses multiple neighborhoods, including ... Mayfair, Parkside There is also a significant risk to dozens of public and community-serving facilities, as well as public and affordable housing units. **This area is currently at risk of flooding and is projected to be at increased risk as early as 2020.** 1709.11709 FNS-1.2 [emphasis added]

And *Climate Ready DC 2.0* (2019) promised to focus on helping the most vulnerable people in the city. p. 49.

The District Government will require new development projects to **consider** climate risks and proactively identify adaptation solutions that would reduce eventual damage caused by climate change impacts. Relevant District Government agencies and stakeholders will create an assessment that balances climate adaptation with other District priorities such as affordable housing. p. 50. [emphasis added]

¹⁶ Association of State Floodplain Managers, “No Adverse Impact, a Toolkit for Common Sense Floodplain Management,” (2003). <https://www.floods.org/resource-center/association-of-state-floodplain-managers-nai-no-adverse-impact-floodplain-management/>. Internet; accessed 14 Aug. 2020.

Sustainable DC 2.0 (2019) advocates that “Any significant climate risks to energy, water, transit, and telecommunications infrastructure should be evaluated and addressed.”

DOEE, acting within its limited authority, issued flood hazard regulations and proposes floodplain regulation updates, on a building-by-building basis. DOEE is to be commended for this small step to mitigate flooding. 31 DCMR 3100-3112, 3199; Proposed Floodplain Regulation Updates (2020).¹⁷

Nevertheless, the District’s response so far to threats to people, the power grid, the environment, its tax base, and its bond rating has been completely ineffective.

Identifying the most cost-effective methods to respond to flooding in Mayfair Mansions, Buzzard Point, and other floodplains

The key questions are:

1. What is the climate-related loss over the coming decades?
2. How much of that loss can be averted and using which measures?
3. What investments will be required to fund those measures – and will their benefits outweigh their costs?¹⁸ See Figure 5.

Considerations to answer these questions include:

- Well-planned spending on climate adaptation is cost-effective. Insurance experts estimate that up to 65% of future climate losses can be averted through cost-effective adaptation measures. Economic losses from weather events are increasing. Weather events occurring in the past would cause higher economic damage if they occurred today.
- The value of land and buildings is increasing and, therefore, cost of loss will also increase. An early investment to prevent flood damage to existing infrastructure (roads, utilities, storm sewers) should be catalogued to determine useful lives, repair and replacement schedules, in order to coordinate upgrades and replacements on a citywide scale, and create a capital expenditure plan.
- Exposure is also accumulating. More people, more buildings, more infrastructure, more frequent and severe weather events are expected.¹⁹ This value and the cost of future losses need to be computed. Exhibit A is a start.

¹⁷ <https://doee.dc.gov/service/flooding>

¹⁸ Swiss Re, *The Economics of Climate Adaptation* (2009, 6, 8) <https://www.swissre.com/our-business/public-sector-solutions/thought-leadership/economics-of-climate-adaptation.html>.

Internet; accessed 27 June 2020.

¹⁹ An extreme rain event, eight inches of rain, is a "100 year rain event." As a result of climate change, a 100-year rain event is projected to occur once in 25 years by 2050 and once in 15 years by 2080. Annual precipitation is expected to remain approximately the same, but concentrated in fewer events, and coastal storms will be more intense. NASA, *Adapting to a Changing Climate: Federal Agencies in the Washington, DC Metro Area*. DOEE, *Wildlife Action Plan*, (2015, p.

- Locations for district-wide flood protection (e.g., berms) should be studied, and areas in need of protection should be ranked and construction prioritized. For example, after lower Manhattan flooded during Superstorm Sandy, the city planned a continuous resiliency project for the entire area, a system of landscaped berms, deployable and fixed flood walls, and multipurpose levees. This is a \$500 million project; construction will begin in 2021.²⁰ But here, piecemeal walls are planned. The Navy wants to protect the Washington Navy Yard from flooding by building a 14-foot wall running 1.5 miles along the river, costing \$20 million. Washington Harbour plans a new flood wall.²¹ District government needs to quickly engage these property owners to insure that these projects are integrated into a citywide floodplain management plan and have “no adverse impact” on other people and property on the river.
- Losses averted include uninterrupted operation of Pepco’s Waterfront Substation serving Southeast and Southwest Washington, protected quality of life for residents, and additional revenue from real estate, income and sales taxes from residents and businesses

122). In the future, fewer, more intense precipitation events, combined with more intense coastal storms, then added to the predicted rise in the rivers' water levels, is expected to further increase the risk of flooding, and put flood waters into more areas. By 2080, the water level in the Potomac and Anacostia Rivers is expected to rise an additional 3.4 feet. Sea levels (and river water levels) may rise higher and faster if the rates of ice loss accelerate, as reflected in Army Corps of Engineers’ estimate of a five-foot sea level rise, and NOAA's estimate of a 6.5 foot rise. DOEE, *Climate Ready DC*, pp. 2-3. DOEE, *Vulnerability & Risk Assessment*, p. 19. “For these reasons, we believe that the 500-year floodplain (2080) based on a four feet above the 100-year flood level, is a conservative estimate, not the worst-case scenario.”

Union of Concerned Scientists, *Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate*. (2018). www.ucsus.org/underwater. Internet; accessed 28 June 2020.

²⁰ *Lower Manhattan Coastal Resiliency Study*: <https://edc.nyc/project/lower-manhattan-coastal-resiliency>. Internet; accessed 14 Aug. 2020. See also, plans by Virginia Beach, Norfolk, and Galveston. Virginia Beach, VA "Sea Level Wise"

Plan: <https://www.vbgov.com/government/departments/public-works/comp-sea-level-rise/Pages/default.aspx>. City of Norfolk/USACE Coastal Storm Risk Management

Plan: <https://usace.contentdm.oclc.org/utills/getfile/collection/p16021coll7/id/8557>

This \$1.4 billion project includes storm-surge barriers, nearly 8 miles of floodwall, a 1-mile levee, 11 tide gates, and seven pump and power stations.

Rice University Galveston Bay Park

Plan: https://docs.wixstatic.com/ugd/d29356_5cde1ed3665a42d78ed7e4ac2b3bfea5.pdf.

²¹ Nena Perry-Brown, “A New Flood Wall Proposed in Georgetown,” *Urban Turf*, 26 Nov.

2019. <https://dc.urbanturf.com/articles/blog/flood-mitigation-measures-proposed-for-georgetown-washington-harbour/16186>. Internet; accessed 22 June 2020. Christopher Flavelle,

“The Navy Wants to Build a Wall to Stave off Climate Change.” *Bloomberg News*, 1 Feb. 2019. <https://www.bloomberg.com/news/article> Internet; accessed 26 June 2020. [s/2019-02-01/pentagon-weighs-14-foot-flood-wall-at-historic-navy-yard-in-d-c](https://www.bloomberg.com/news/article).

Michael Niebauer, “The Navy Yard may be walled off for flood protection. That’s not good news for neighboring developments.” *Washington Business Journal*, 1 Feb. 2019.

in floodplains. The costs of adaptive measures, capital expenditures, and costs to operate capital expenditures (e.g., maintaining walls).

Because there are thousands of lower-income residents living in Mayfair Gardens, many in renovated historic buildings, and many new residents expected to move to Buzzard Point, all of whom would be affected by flooding, abandoning these developments does not seem a likely option.²² Therefore, other cost-effective adaptation measures must be found and implemented to protect these neighborhoods.

District government must increase capital spending on climate adaptation

DC's 2020 capital budget for 2020-2025 funds a few minor projects: an integrated flood modeling tool, projects in Bloomingdale, and stormwater management projects here and there. In contrast, Boston, a city facing a climate-change fueled flooding crisis, is responding by spending \$30 million per year (10% of its budget) on capital projects to raise streets, harden infrastructure, and support public and private sector preparedness. New York City is spending \$500 million. The District must increase capital spending and should consider issuing a bond to fund climate adaptation, as was done in Miami. Other sources for capital spending include increasing sales taxes, increasing real property taxes on developments in floodplains, and imposing fees on new development projects in floodplains as part of the permitting process—dedicating all these funds to climate adaptation measures²³

Protecting the District's real property tax base/effect of flooding on the District's bond rating

While current property owners may decide to delay dealing with flooding threats, the District is the ultimate long-term investor in city land. In F/Y 2019 the District collected \$2.71 billion in real estate taxes, a key source of revenue.²⁴ The District must protect its tax base, to protect its

²² However, if FEMA buyouts are available, abandonment might still be an option. FEMA "For Communities Plagued by Repeated Flooding, Property Acquisition May Be the Answer." (2014). www.fema.gov/news-release/2014/05/28. Internet; accessed 14 Nov. 2016.

²³ "Boston thrived by the sea. Now, it fights rising water," *Washington Post*, 20 Feb. 2020. Miami voters approved Miami Forever Bonds, \$400 million, including \$192 million for protection from sea level rise. D. Smiley, 2017. "Miami gets \$200 million to spend on sea rise as voters pass Miami Forever bond." *Miami Herald*, 7 November 2017. www.miamiherald.com/news/politics-government/election/article183336291.html. cited in Union of Concerned Scientists, *Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate* (2018, p. 14).

²⁴ *F/Y 2021 Proposed Budget and Financial Plan, Executive Summary* (2020). <https://cfo.dc.gov/sites/default/files/dc/sites/ocfo/publication/attachment>. Sales taxes in Findlay, Ohio were increased to pay for flood mitigation. <https://www.floodsciencecenter.org/products/elected-officials-flood-risk-guide/success-stories/substantial-damage-determinations-and-sales-tax-to-fund-mitigation-findlay-ohio/>. Internet; accessed 27 June 2020. [s/DC_OCFO_2021_Budget_Vol._1.pdf](https://www.floodsciencecenter.org/products/elected-officials-flood-risk-guide/success-stories/substantial-damage-determinations-and-sales-tax-to-fund-mitigation-findlay-ohio/).

revenue and its bond rating. Moody's Investors Service finds that climate risk transmits to credit risk for municipal bond issuers.

Credit risks resulting from climate change are embedded in our existing approach to analyzing the key credit factors in our methodologies. Our analysis of economic strength and diversity, which signals the speed with which an economy may recover, captures climate-driven credit risks such as economic disruption, physical damage, health and public safety, and population displacement. Fiscal strength, access to liquidity and levers to raise additional revenue are also key to our assessment of climate risks as is evaluating asset management and governance. This provides the basis for our view of states' credit resiliency to climate change, and is the framework for evaluating the credit risk to local government issuers.²⁵

Moody's sees climate-driven credit risks to bond issuers from climate shocks (including floods) resulting in physical damage, economic disruption, health and public safety problems, displacement of residents, the cost of adaptive strategies (e.g., infrastructure investments for flood prevention). These factors can reduce tax revenue, increase expenses, impair assets, and increase municipal liabilities and debt.²⁶

Preventing wider economic harm

Damage from flooding expands outward: to harm residents, businesses, developers, insurers, and lenders. Figure 6. To see the future in DC, consider what is already happening on the New England coast, where rising sea levels have led to a \$403 million loss in property values and upended insurance underwriting and mortgage lending:

... [C]onsumers are finding coastal properties harder to finance and insure. Lenders are requiring larger and larger down payments, sometimes as much as 40 percent of a home's value. Federally backed flood insurance premiums continue to rise. And flood insurance doesn't cover the full worth of a home, leaving sea-side property owners exposed. If coastal property values are uninsurable, they're unmortgageable; and if they are unmortgageable, they are all but worthless.²⁷

Preventing climate gentrification

"Climate gentrification," displacement of lower income people living at elevations safe from flooding, may become a problem in the District of Columbia. Climate gentrification appears to be underway in Miami-Dade County, Florida: A statistical analysis found a positive relationship between higher prices in higher elevations (safer from coastal flooding) vs. lower prices in lower elevations (on the coast, threatened by flooding). Examples include rising prices in Little Haiti

²⁵ Moody's Investors Service, *Environmental Risks: Evaluating the impact of climate change on US, state and local issuers*. Nov. 2017, p. 1. www.southeastfloridaclimatecompact.org/wp-content/uploads/2017/12/Evaluating-the-impact-of-climatechange-on-US-state-and-local-issuers-11-28-17.pdf.

²⁶ *Id.* pp. 1, 3.

²⁷ Jeanne Shaheen and Sheldon Whitehouse, "Crashing coastal property values and the economic fallout of climate change," *Boston Globe*, 8 July 2020.

and historically African American Liberty City, which are at higher elevations than beach-front property.

Climate gentrification can be expected here and action is needed now to avoid or minimize displacement of lower-income people.²⁸ As the real estate industry realizes the threat from flooding, developers will likely begin acquiring property in higher elevation neighborhoods, and those neighborhoods will increase in demand and value, and as a result, displace low-income people living there. District government needs to identify likely locations for climate gentrification and take steps to prevent displacing low-income residents.

²⁸ Jesse M. Keenan, “Climate gentrification: from theory to empiricism in Miami-Dade County, Florida.” *Scientific American*, “*Environmental Research Letters*,” 2018. Carolyn Beeler, “Miami residents fear ‘climate gentrification’ as investors seek higher ground.” <https://www.pri.org/stories/2017-12-19/miami-residents-fear-climate-gentrification-investors-seek-higher-ground>. Internet; accessed 17 June 2020. Erica Bolstand, “High Ground Is Becoming Hot Property as Sea Level Rises.” <https://www.scientificamerican.com/article/high-ground-is-becoming-hot-property-as-sea-level-rises>. Internet; accessed 17 June 2020.

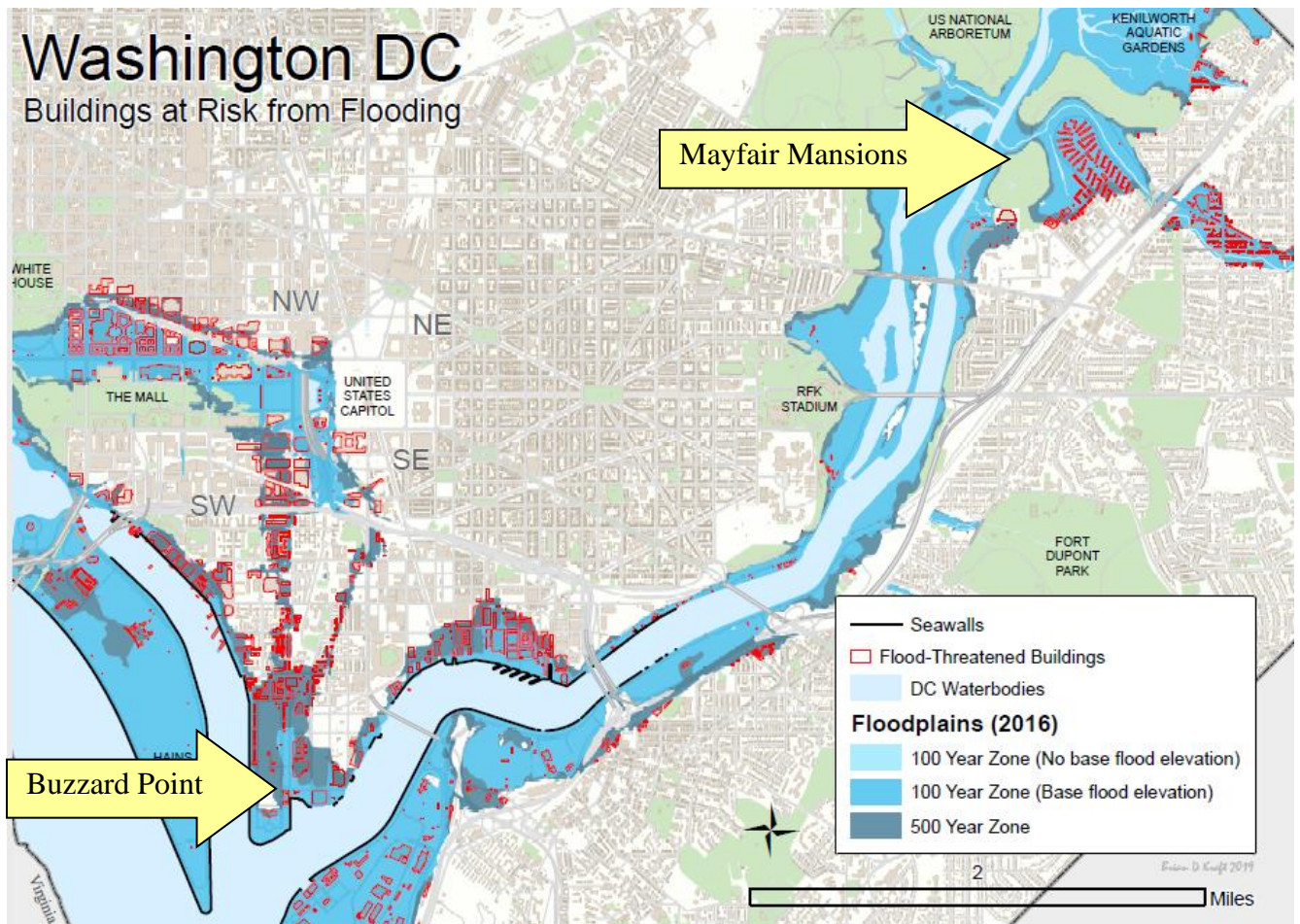


Figure 1. Committee of 100. Buildings at risk from flooding (2018). Mayfair Mansions and Buzzard Point.

Figure 2. Mayfair Mansions. Source: Propertyquest. Arrows added.

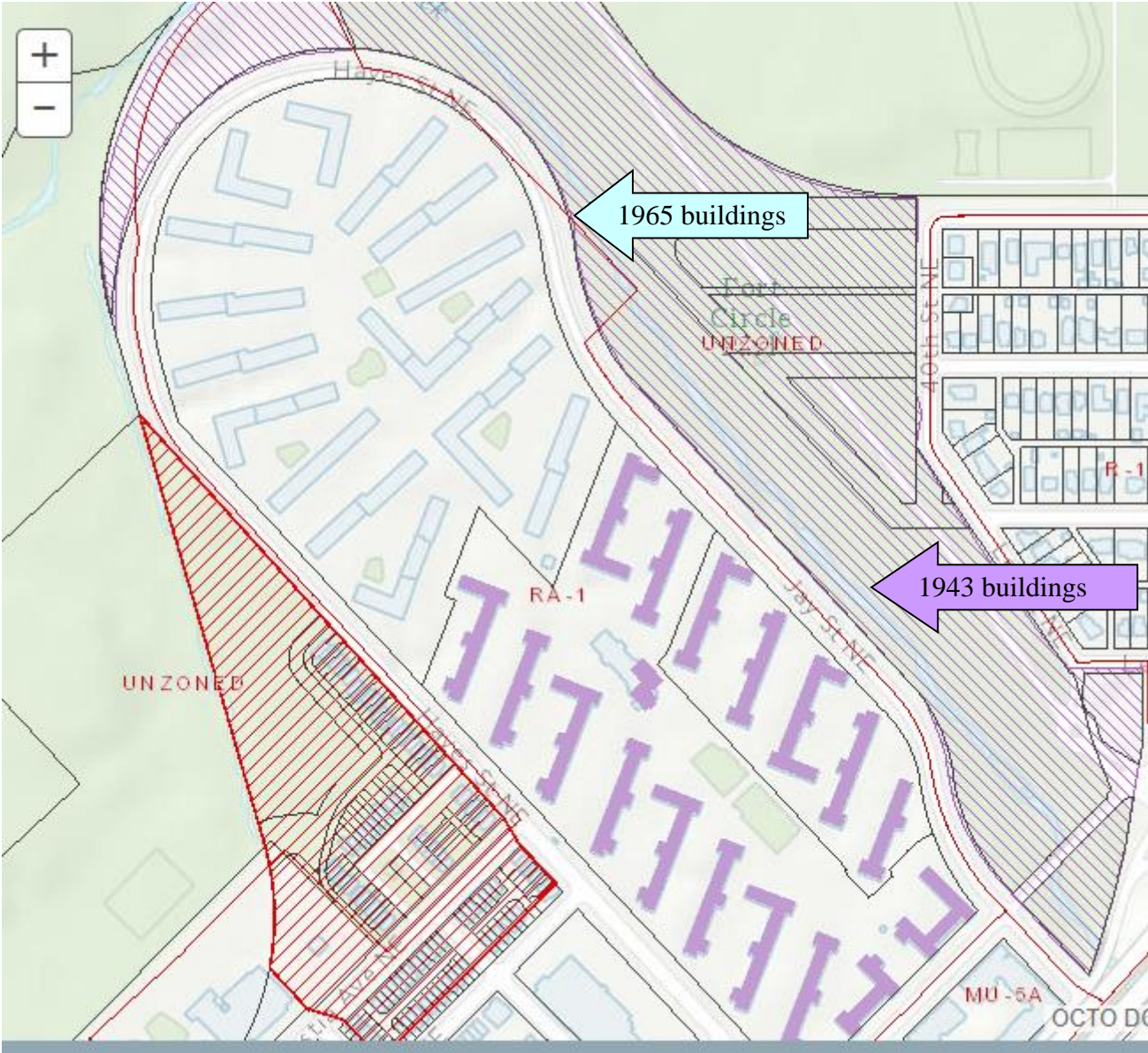


Figure 3. Planned development in Buzzard Point. Source: Peninsula 88. <https://www.peninsula88.com>. Internet; accessed 15 June 2020.



Figure 4. Pepco Waterfront Substation, 1620 2nd Street, SW (2017). Source: Soltesz. www.solteszco.com. Internet; accessed 27 June 2020.



- 1) **Climate risk identification:** Conduct an identification of climate risk in a defined region (e.g. urban area), identify areas and people at risk, spanning all significant climate hazards and the full range of possible impacts for different sectors
- 2) **Climate risk quantification:** Calculate the expected damage across multiple climate and economic scenarios
- 3) **Identification and prioritisation of CCA measures (using Cost Benefit Analysis of CCA measures):** Determine strategies including a portfolio of specific CCA measures with detailed cost/benefit assessment.

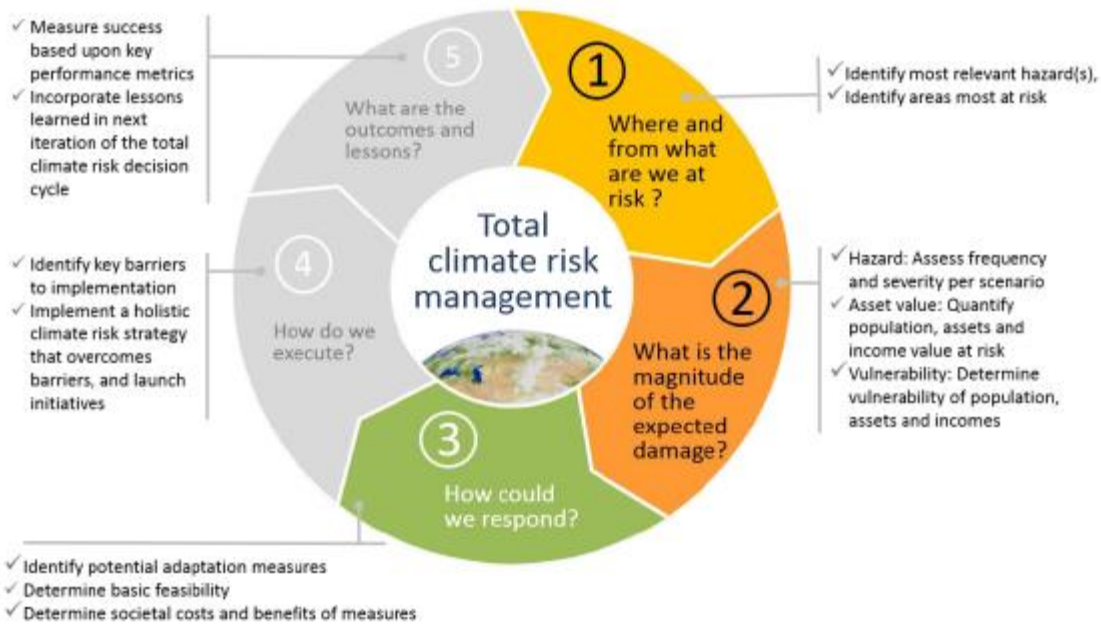


Figure 5 Presentation of the ECA elements (modified from ECA Working Group)

Figure 5. KfW Development Bank – *Materials on Development Financing*, No. 6, 2016, p. 17. https://media.swissre.com/documents/rethinking_shaping_climate_resilient_development_en.pdf Internet; accessed 27 June 2020.

FIGURE 7. The Potential Economic Reverberations of Chronically Inundated Properties

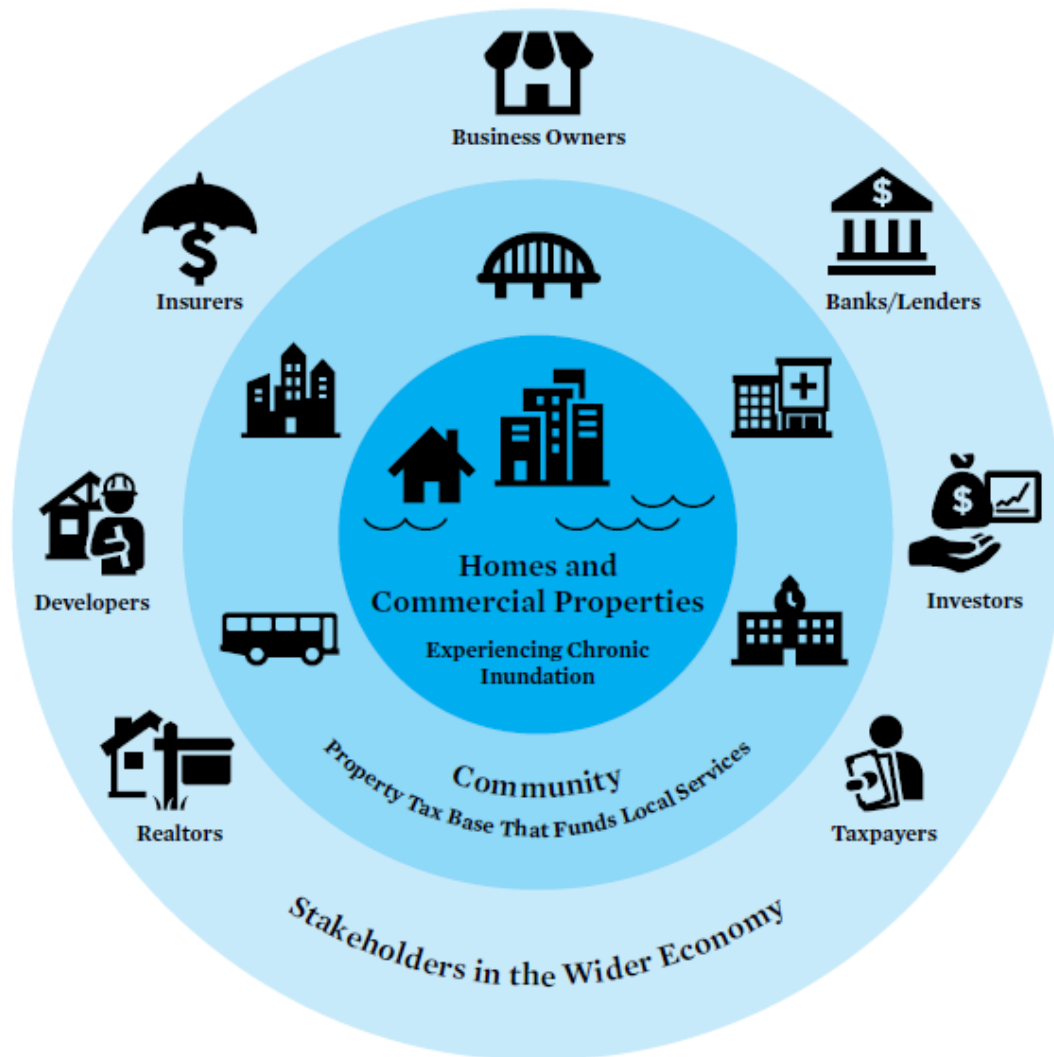


Figure 6. Kristina Dahl et al., *Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate*. (2018, p. 12). Union of Concerned Scientists (2018, 14). Internet; accessed 28 June 2020.

Exhibit A

Note: The calculation of value of land and buildings is based on 2020 real property tax assessments, where available, or in the case of the 1,002 other units planned for Buzzard Point, the mean assessed value of Peninsula 88 units (707,926) in 2020. Estimated values for 2050 assume the land and building values are unimpaired and will increase based on the Federal Reserve's systemic goal of 2% inflation compounded annually.²⁹

A. Calculation of land and building value at Mayfair Mansions

The value of Mayfair Mansions is based on the combined land and building values, as of 2020, using the real estate tax assessment by the Office of Tax and Revenue. (The proposed assessed values for 2021 are higher.) The combined value for all 32 buildings in 2020 is \$60,148,550. Mayfair Mansions would be worth \$146,418,171 in 2050.

B. Calculation of land and building value at Buzzard Point

There are at least 1,531 units in development at Buzzard Point: Peninsula 88, 88 V Street, SW; River Point, 2121 2nd Street, SW; 1530-1550 1st Street, SW; 1800 Half Street, SW; 1900 Half Street, SW; 100 V Street, SW.³⁰ Values are available for Peninsula 88, River Point and 1900 Half Street, SW, from real property tax assessments.

(1) Peninsula 88, 88 V Street, SW

Peninsula 88 condominiums, 110 units, are worth \$77,871,900 in 2020 based on the real estate tax assessment and the estimated value in 2050 will be \$141,072,282.³¹

(2) River Point, 2121 2nd Street, SW

The River Point project redeveloped the U.S. Coast Guard headquarters into 480 apartments plus retail. Its value in 2020 is \$54,201,340 based on its real property tax assessment. (The proposed 2021 assessment is higher.) The estimated value in 2050 will be \$98,178,225.

(3) 1900 Half Street, SW.

Here, 419 apartments and 236 parking places are planned. The value of 1900 Half Street, SW is \$51,008,690, as of 2020, based on the combined land and building values from the real estate tax

²⁹ Federal Reserve Chair Powell's press conference (29 Jan. 2020). Pre-pandemic, core inflation (which omits food and energy prices) was 1.6% for the 12 months ending November 2019, below the Federal Reserve's systemic goal of 2% inflation. For 2050 values compounded at 2%, see <https://www.investor.gov/financial-tools-calculators/calculators/compound-interest-calculator>

³⁰ Parcel B at Audi Field, scheduled for development as either 400 residential units, or as a hotel or live entertainment center, appears to be outside the floodplain, and is therefore omitted. Michael Niebauer, "D.C. United advancing Audi Field-adjacent development." <https://www.bizjournals.com/washington/news/2019/01/18/d-c-united-advancing-audi-field-adjacent.html>. Internet; accessed 24 June 2020.

³¹ Note: of the Peninsula 88 values excludes parking spaces, offered at \$45,000 per each and \$13,000 per storage space.

assessment by the Office of Tax and Revenue. (The proposed assessed values for 2021 are higher.) The estimated value in 2050 will be \$92,395,670.³²

(4) Value of 1,002 additional units planned for Buzzard Point

Based on Peninsula 88’s average real property tax assessment , the additional 1,002 units planned for Buzzard Point would have an estimated value in 2020 of \$709,242,216, and \$1,284,875,240 in 2050.

Pepco Waterfront Station, 1620 2nd Street, SW.

This new substation, built in 2017 to serve Southeast and Southwest Washington, is valued for real property tax assessment at \$52,273,070, in 2020. (The proposed assessed values for 2021 are higher.) Its estimated worth in 2050 will be \$94,685,430.

Location	2020 value	2050 estimated value
Mayfair Mansions	80,833,210	146,418,171
Buzzard Point		
Peninsula 88, 88 V Street, SW	77,871,900	141,072,282
River Point, 2121 2 nd Street, SW	54,201,340	98,178,225
Watermark, 1900 Half Street, SW	51,008,960	92,395,670
Additional 1002 units planned for Buzzard Point (estimated value)	709,242,216	1,284,875,240
Subtotal Buzzard Point residential and commercial	892,324,416	1,616,521,417
Pepco Waterfront Station, 1620 2 nd Street, SW	52,273,070	94,685,430
Buzzard Point Total	944,597,486	1,711,206,847
Combined total Mayfair Mansions and Buzzard Point	1,025,430,696	1,857,625,018

³² Nena Perry-Brown, “The 1,200 Units Poised for Buzzard Point – and the Thousands We Want to Hear About,” Urban Turf. https://dc.urbanturf.com/articles/tag/buzzard_point, Internet; accessed 1 Apr. 2020.