



Resilient Fairfax  
Infrastructure Advisory Group – Meeting 2  
September 24, 2021 | 1:30 PM | Via Microsoft Teams  
**Meeting Minutes**

**Attendees:**

- Fairfax County Office of Environmental and Energy Coordination (OEEC) (Chair)
- Columbia Gas of Virginia
- Consultant Team: Cadmus, WSP, Nspiregreen
- Cox of Northern Virginia
- Engineers & Surveyors Institute (ESI)
- Fairfax County Department of Public Works & Environmental Services (DPWES)
- Fairfax County Department of Transportation (FCDOT)
- Fairfax County Office of Emergency Management (OEM)
- Fairfax Water
- Federal Emergency Management Agency (FEMA)
- Metropolitan Washington Council of Governments (MWCOG)
- National Association of Industrial & Office Properties (NAIOP)
- Northern Virginia Building Industry Association (NVBIA)
- Northern Virginia Regional Commission (NVRC)
- Northern Virginia Electric Cooperative (NOVEC)
- RUCA Capital
- Virginia Department of Conservation & Recreation (DCR)
- Virginia Department of Emergency Management (VDEM)
- Virginia Department of Transportation (VDOT)
- Washington Gas
- Washington Metropolitan Area Transit Authority (WMATA)
- WTS International/ American Society of Highway Engineers (ASHE)

**Unable to Attend:**

- Comcast
- Dominion Energy
- Fairfax County Public Schools (FCPS)
- Northern Virginia Transit Authority (NVTA)
- Transportation Advisory Commission
- Verizon
- Virginia Department of Environmental Quality (DEQ)
- United States Department of Defense (DOD) – US Army – Fort Belvoir

**Meeting Start:** 1:30 p.m.

**I. Introduction & Project Updates**

OEEC opened the meeting by welcoming the Infrastructure Advisory Group (IAG) members and introduced the project team. OEEC provided brief updates on the various ongoing project components. The Climate Projections Report examines what the climate in Fairfax County will be like in the future. This report is complete apart from potential minor edits. The Climate Vulnerability and Risk Assessment (VRA) analyzes the vulnerabilities and risks by sector that Fairfax County is anticipated to experience, in light of the climate projections. The VRA is in development and the IAG received a copy to review and provide feedback. The Audit of Existing Policies, Programs, and Plans evaluates the strength of Fairfax County's existing resiliency measures and identifies opportunities/gaps to inform strategies. The Audit is in development and the IAG received a copy to review and provide feedback. Strategies to enhance resiliency will be developed in the fall and winter. Following the strategies, the Implementation Roadmap will outline the strategy implementation plan. The Roadmap will be developed between winter 2021 and spring 2022. Resilient Fairfax will be completed in the summer of 2022. This plan will be the final, overarching plan that will combine the Climate Projections Report, Climate Vulnerability and Risk Assessment, Audit, and the Implementation Roadmap into one "Resilient Fairfax" plan and will include interactive maps, factsheets and resources.

The project team added an additional IAG meeting in December. This meeting will focus on strategy development. OEEC provided a reminder of the overarching timeline of the project. The project is currently on track to be completed within the anticipated timeframe, with Task 4 finalized in June 2022. The project team is currently in Task 2, which includes finalizing the VRA and Audit. Strategy development will occur in October through December 2021. IAG meetings will be scheduled for December 2021, January 2022, March 2022, and May 2022. The project team will engage with the public, Planning Team (PT), IAG, and the Community Advisory Group (CAG) at each major stage of development. Concurrent Plans, Programs, Policy Updates include the Virginia Coastal Adaptation and Resilience Master Plan, USACE Coastal Storm Risk, NOVA Hazard Mitigation Plan, and VMRC Tidal Wetlands Guidelines. Additional regulatory action and research include VDEQ Chesapeake Bay Preservation Act amendment, and Chesapeake Stormwater Network (CSN) IDF Curve Research. WMATA, MWCOG, and NVRC are coordinating resilience work and research regionally in parallel.

**II. Climate Projections Report Overview**

**a. Climate Projections Results**

Cadmus provided a brief, high-level overview of the Climate Projections Report structure and key results, directing the IAG to the report for further detail on the data, methodology, and results. Fairfax County is projected to experience warmer annual and seasonal temperatures, with temperatures rising by 4.4 to 8 degrees Fahrenheit by 2085; an increase of frequency and intensity of hot days; and a decrease in cold days. Fairfax County is projected to experience an increase of annual and seasonal precipitation, an increase in inland and coastal flooding due to precipitation and sea level rise, and an increase in storm

events, particularly tropical cyclones. Cadmus also shared the outcomes of the county's summer partnership with NASA Develop, who conducted an urban heat island vulnerability assessment.

**b. Questions**

Following the presentation, Cadmus facilitated a brief Q&A on the Climate Projections Report and NASA Develop assessment that were presented. There were no comments or questions from participants.

**III. Draft Climate Vulnerability & Risk Assessment**

Subconsultant WSP presented a review of the draft Climate Vulnerability and Risk Assessment (VRA), including an overview of the structure, the sectors/sub-sectors and climate hazards analyzed, the vulnerability scoring methodology, the vulnerability scores and score breakdown by sub-sector, and the current high scores informing the Risk Assessment. The Climate Vulnerability Assessment analyzes the level of exposure, sensitivity, and adaptive capacity of infrastructure, populations, and systems within Fairfax County, and identifies the top vulnerabilities. The Risk Assessment uses the top vulnerabilities to analyze the severity of the consequences and the climate projections to determine the likelihood of occurrence, identifying the greatest risks. There are seven sectors identified in the Climate Vulnerability Assessment: water infrastructure, energy and communications infrastructure, transportation infrastructure, buildings, populations, natural and cultural resources, and public services. These seven sectors are further divided into 23 sub-sectors. As previously outlined, there are six climate hazards: extreme heat, heavy precipitation, severe storms & wind, extreme cold, coastal flooding, and drought.

The vulnerability scores combine individual elements of exposure, sensitivity, and adaptive capacity scores multiplied together to determine the overall vulnerability score. Each element is scored on a scale of 0 to 3, with 0 being the lowest (i.e., indicating no exposure, no sensitivity, or full adaptive capacity) and 3 being the highest (i.e., highest exposure, highest sensitivity, or no adaptive capacity). Note that a high adaptive capacity score reduces overall vulnerability. The vulnerability scores are qualitative, but they provide a consistent comparison across sectors. WSP noted that the current vulnerability scores are preliminary and are subject to change based on feedback from the IAG.

**a. Discussion**

Following the Climate Vulnerability Assessment presentation, Cadmus facilitated a discussion to solicit feedback from IAG members on the vulnerability results and scores. The following questions and comments were raised:

1. One IAG member asked for clarification on what type of infrastructure is included in the Stormwater Infrastructure component of the Vulnerability and Risk Assessment research presented. WSP indicated that for stormwater infrastructure and across all infrastructure subsectors evaluated, WSP pulled the stormwater information from the available GIS data, with help from the county. Key stormwater infrastructure evaluated includes facilities and nodes, dams, etc. WSP also explained that the project team could

add more information within the sensitivity component of the assessment, regardless of whether there is GIS data if organizations and departments can help explain exposures/vulnerabilities. In the Climate Projections Report, WSP utilized a similar dataset and methodology to assess projected changes for various design storms return periods and durations. Data was also brought in from experts including the Chesapeake Bay Urban Stormwater Workgroup, as it is applicable to the county. WSP welcomes the opportunity to integrate additional data like this, as well.

2. An IAG member proposed a potential situation where some Best Management Practices (BMPs) may be more vulnerable than others. The participant asked if this nuance had been considered and, if not, thought that BMPs could help influence more accurate scoring. WSP noted that this nuance has not yet been considered but can be incorporated if the information is available.
3. Another participant asked a clarifying question regarding the preliminary findings on transportation infrastructure, as it seems the transportation infrastructure reviewed was most vulnerable to extreme heat. The participant asked if WSP had any insights into flooding and flash storms for this transportation infrastructure, as it was assumed this would have a larger impact on transportation than extreme heat. WSP clarified that the project team will review this again, though they do know extreme heat is going to be a problem across the entire county to varying degrees. For heavy precipitation, the project team saw that some transportation infrastructure would be exposed more to flooding and heavy precipitation, but it is not uniform across the county to the same extent as extreme heat. Capturing these nuances across the County will be important if the information is available. OEEC added that many of the metro stations in Washington, D.C. are underground, which make them more vulnerable to flooding and heavy precipitation. However, more of the metro stations are above ground in Fairfax County, so they are less vulnerable to flooding than those that are underground. WSP added that occurrences such as the ones described, like flooded bus stops that impact transportation access to vulnerable populations, will need to be captured in other components of the Vulnerability Assessment. WSP asked IAG members to please let the WSP and OEEC team know of occurrences such as these if you think it would impact scoring.

**b. Risk Assessment**

WSP described that the next step in the Risk Assessment process is to determine the top 10 vulnerabilities. OEEC pre-selected the top 5 vulnerabilities based on the VRA draft that are currently scoring high and are likely to continue to remain in the top vulnerabilities. These are already included in the Risk Assessment, including:

1. Extreme heat impacting populations
2. Heavy precipitation impacting populations
3. Heavy precipitation and inland flooding impacting roadways and stormwater infrastructure
4. Severe storms/wind impacting electricity
5. Coastal flooding impacting environmentally sensitive areas

WSP also selected five additional risks listed below, which are currently scoring high in the VRA but are subject to change based on score revisions resulting from the IAG's feedback.

6. Extreme heat impacting public transit
7. Severe storm/winds impacting roads
8. Extreme heat impacting buildings
9. Heavy precipitation/inland flooding affecting stream valley/floodplains
10. Heavy precipitation/inland flooding affecting natural features

**c. Discussion**

WSP facilitated an open discussion with the participants.

- i. One IAG member indicated surprise to see heat impacts on transit at the top of the vulnerabilities scoring list, but understood after some consideration, that there are impacts to walking and biking. If accessing public transit is impacted by extreme heat, then it may also be difficult, unappealing to walk, and/or bike to a public transit stop or destination. WSP further clarified that heat impacts on transit scored high in the Climate Vulnerability Assessment due to multiple factors (e.g., requiring people to wait outside during hot days, voltage interruptions or community-scale outages could impact operations of rail lines and wiring, etc.). Reduction in service could also be a result of high heat, reducing overall ability for customers to be served. The effects of extreme heat to airports was also considered; hot asphalt can limit operations for airlines and this effect was accounted for in the assessment.
- ii. A participant asked why only 80% of housing units were viewed as vulnerable to extreme heat and asked for clarification as to whether the overall Risk Assessment accounted for the possibility of additional building impacts in the future. WSP noted that when it comes to buildings and extreme heat, the urban heat island effect on housing is taken into account when evaluating vulnerability of the building stock. A large percentage of buildings evaluated fell under moderately amplified or significantly amplified heating impacts via GIS data and GIS data for the county, from which the 80% estimate originated. OEEC added that lower income populations and denser areas are often in more urbanized regions, making the impact from the urban heat island effect higher, often exposing populations with less access to cooling to higher temperatures. Wealthier areas often have greater access to cooling and more green spaces, reducing the impact of urban heat island impacts and boosting the resiliency against heat in these populations.

**IV. Break**

**V. Draft Audit of Policies, Plans, and Programs**

Cadmus introduced the Audit and provided an overview of the purpose, structure, scoring methodology, and key takeaways by sector. The Audit helps to identify where Fairfax has already begun to implement best practices for increasing resiliency, opportunities to expand, extend, or accelerate existing initiatives, and gaps where new strategies or policy updates may

be needed to address climate resiliency needs. Many IAG members have already reviewed the draft Audit to provide critical information on processes, programs, and gaps that would not otherwise be apparent from a secondary review of literature or policy. The preliminary scores are subject to change.

**a. Strengths**

1. Fairfax County has strong climate mitigation commitments and a commitment and policy “One Fairfax” for the inclusion of equity.
2. Internal and external collaboration is generally strong.
3. There is a great deal of work underway in the water infrastructure sector to assess vulnerabilities, update design standards, and manage stormwater.
4. At the state-level, there is progress in consideration of climate impacts on transportation sector, but upgraded standards have largely not yet been finalized
5. The county participates in the National Flood Insurance Program and Community Rating System (i.e., going above the minimum requirements). Policies in place to protect stream corridors including a 15-foot setback from the edge of the floodplain and regulate Resource Protection Areas.
6. Several policies in place supporting resilience coastlines and living shorelines, including an update underway of the Wetlands Zoning Ordinance.
7. Although there is no countywide green infrastructure plan per se, Fairfax County has numerous initiatives, pilots, and policies related to green infrastructure and nature-based solutions on County properties.
8. The county has limited influence on energy system but has taken actions related to back-up power and Solarize Fairfax discounts energy storage.

**b. Opportunities/Gaps**

1. There are opportunities to create new collaborative efforts (e.g., partner with Fairfax County Health and Human Services to reach vulnerable communities, expand partnerships with community-based organizations, businesses and community members to support climate resilience).
2. Neighborhoods built before 1970 often have aging/inadequate stormwater infrastructure, which is not designed to today’s standards. There is an opportunity for a neighborhood improvement program.
3. For county-owned buildings, including critical facilities, some resilience measures have been implemented, and there is an opportunity for more systematic approach.
4. There are opportunities to further explore energy storage and microgrids.
5. Climate resilience is not explicitly considered in capital budgeting.
6. Several key issues are outside of county jurisdiction, including state and federal transportation infrastructure, the electric grid, and building codes. There may be opportunities for the county to get more involved.

**c. Discussion**

Following the audit presentation, Cadmus facilitated a discussion about the findings and reminded IAG members they have until 10/15/21 to provide written feedback.

- a. One participant commented that Virginia, 12 other states, and Washington, D.C. receive electricity from the PJM RTO grid. Therefore, "grid vulnerability" is a regional concern and the ability for the county to have an impact on addressing vulnerabilities may be limited. Cadmus agreed and noted that the project team does try to document actions like this that need to be taken at a different level, and that are outside of immediate county jurisdiction.
- b. Another IAG member commented that it is key to include resilience requirements into contracts, design criteria, and technical specifications.

## **VI. Strategies Introductory Brainstorm**

Cadmus provided an explanation of the strategy development process and opened the floor to any initial reactions on strategies from the IAG. Strategy development will take place between October and December 2021. The Cadmus team will develop a strategy starter list informed by the Climate Vulnerability & Risk Assessment, audit of programs, plans, and policies, stakeholder and community engagement, and national best/emerging practices.

### ***a. Discussion***

OEEC prefaced the discussion by acknowledging that as infrastructure managers in the IAG, many of the strategies suggested by this group may also require collaboration across multiple agencies and departments. To open the discussion, OEEC shared some strategies that have been proposed by others:

- a. Add generators to support the operation of critical infrastructure.
- b. Adjust rest/work cycles for outdoor workers that may need to be adjusted due to extreme heat.
- c. Build on existing backflow programs for wastewater.
- d. Continue and expand building elevation programs.
- e. Apply for additional FEMA, VDEM, or other flood mitigation grants.

IAG members suggested the following strategies:

- f. Have additional shelters to shade residents waiting for public transit, in addition to having more shading via trees along sidewalks and trails to reduce heat impacts.
- g. Examine other counties/regions for examples of what to expect and how to prepare. For example, Fairfax County may benefit from looking at what regions are already experiencing the heat levels that Fairfax now anticipates and examine how they have adapted to these changes.
- h. Increase energy testing, which could help the county identify energy inefficiencies in old buildings and the building sector in Fairfax County as a whole. The opportunity to deploy an incentive for HVAC recycling programs, or other programs for phasing out existing old HVAC systems, could decrease emissions and increase resiliency.
- i. There was a brief discussion regarding cross-cutting resiliency strategies that generate emissions reduction benefits as well. For example, potential HVAC upgrades can be upgraded for both emissions reductions and increasing resiliency. Cadmus added that

another example of co-benefits would be solar canopies, which provide both shading resiliency benefits and GHG reduction/energy benefits from producing clean energy.

- j. DPWES is looking at integrating climate projections into their stormwater management standards which will ultimately be incorporated into their projects. DPWES is also considering targeting large-scale neighborhoods for water improvement projects with the understanding that existing issues with water management will only get worse over time.

**VII. Next Steps**

The meeting concluded with OEEC summarizing next steps. OEEC will be available to meet individually or in small working groups for questions surrounding the climate Vulnerability and Risk Assessment (VRA) and Audit. The OEEC requested IAG feedback on the Audit of plans, policies, and programs by 10/15/2021, and on the VRA by 10/22/2021. OEEC also asked that the IAG help promote the upcoming public meeting on 10/14/2021, and to bring strategy ideas to the upcoming strategy development IAG meeting in December 2021 (date to be finalized).

**Meeting Adjourned:** 3:30 pm.