UPDATE ON MILITARY INSTALLATION RESILIENCE REVIEW (MIRR) PROGRAM – NVRC MIRR STUDY

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Director, Climate, Energy, and Air Program (COG)

Transportation Planning Board
June 21, 2023

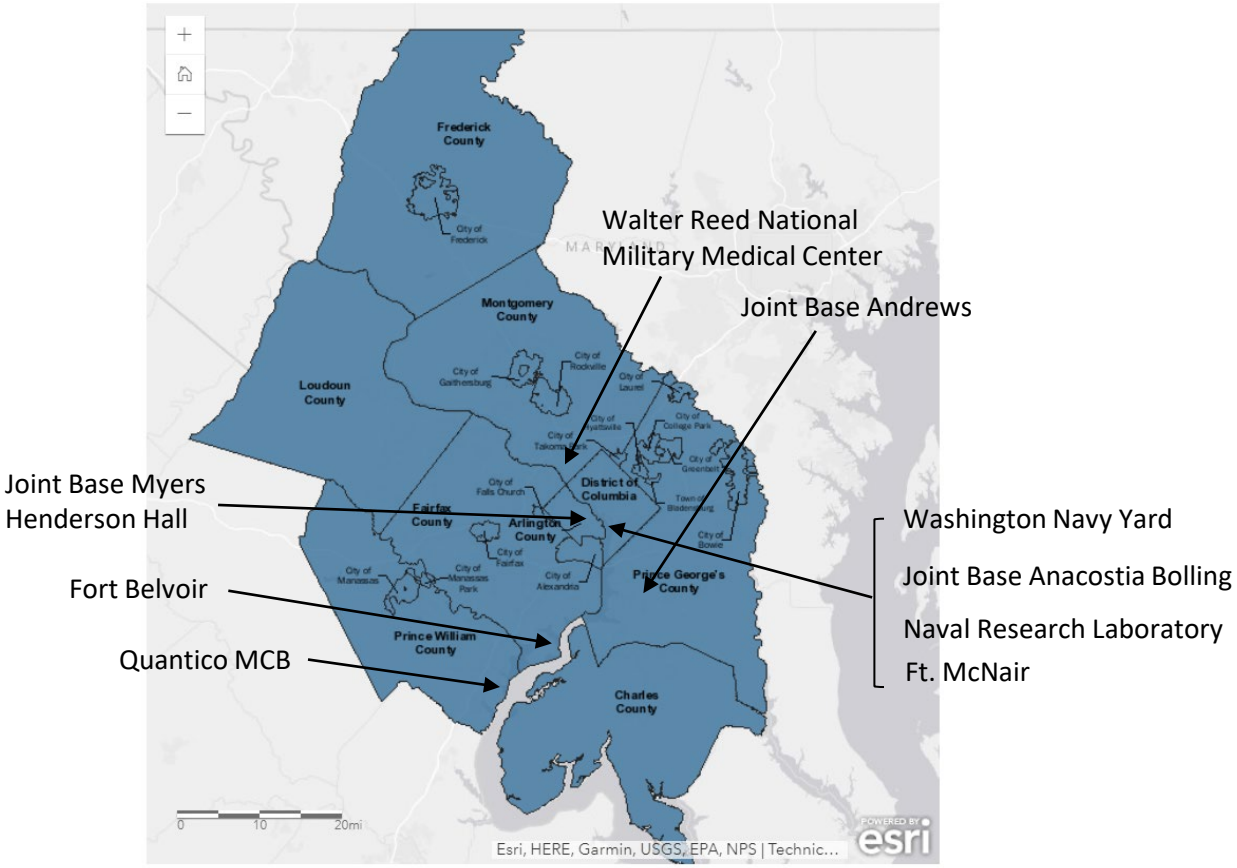
Military-Community Planning for Resilience

- Presented on COG's MIRR Projects in February 2023
- Refresher:
  - Department of Defense (DoD) Office of Local Defense Community Cooperation (OLDCC)
  - Planning Grants – Military Installation Resilience Review (MIRR)
  - Office historically managed the Base Realignment and Closure Program (BRAC) program
  - What investments can DoD make "Outside the Fenceline" in the Community to "Enhance Resilience of the Missions on the Base"

Military-Community Planning for Resilience

- Community-Led Planning Initiative
  - Vulnerability and Risk Assessment
  - Focus on Key Sectors and Infrastructure
  - Identify Strategies and Actions to Bolster Resilience
  - Fund Planning and Engineering Feasibility Studies
  - Not Construction

MIRR Projects in the Region



MIRR Projects in the Region

- COG – Joint Base Anacostia Bolling, Washington Navy Yard, Naval Research Laboratory, Ft. McNair
- NVRC – Fort Belvoir, Joint Base Myer Henderson Hall, Quantico
- Charles County – Indian Head
- Montgomery County – Walter Reed National Military Medical Center
- Prince George's County – Andrews AFB

COG MIRR Report Recommendations

- Continue Engagement and Coordination
  - COG Approach TBD
  - NVRC has regular Community, Military, and Federal Facility Partnership Meetings
- Advance Identified Measures to Address Vulnerabilities and Enhance Resilience
  - 4 top measures, 14 Total, + Honorable Mention

Top Resilience Measures and Key Actors

Measure	Actor(s)
★ Retrofit stormwater pumping stations	Leaders: DC Water; Partners: Electric utility (Pepco)
★ Assess and address key risks to telecommunications systems	Leaders: HSEMA and telecommunications service providers; Partners: Local and federal government actors, electric service providers, Communications Sector Coordinating Council first responders, and other major users
★ Support Blue Plains floodwall construction	Leaders: DC Water; Partners: HSEMA, Ward 8 representatives
★ Ensure Lower Anacostia Waterfront redevelopment is resilient	Leaders: DCOP; Partners: Fort McNair, WNY, NCPC, National Park Service, DOEE, HSEMA, Anacostia Parks and Community Collaborative
Provide financial support for Blue Plains microgrid	Leaders: DC Water; Partner: Pepco
Construct community electric vehicle charging stations	Leaders: Charging station site hosts; Partners: Pepco, MWCOG, DDOT, installations, EV service providers (e.g., ChargePoint)
Advance fuel resilience opportunities identified in RRAP study to benefit installationsand communities	Leaders: CISA, DC HSEMA, DC DOEE; Partners: RRAP study stakeholders, terminal operators, energy marketers, energy assurance planners, emergency management agencies, and electric power utilities
Expand connectivity to/from High-Capacity Transit Station Areas	Leaders: DDOT Vision Zero Department; DDOT Planning and Sustainability Department; WMATA; Partners: DCOP Citywide Strategy & Analysis and Community Planning & Design, Anacostia BID, Anacostia Coordinating Council, ANCs, HSEMA
Create installation viewshed security plan	Leaders: NCPC Heights and Views; Partners: HSEMA, DCOP, DHS, NRL, MWCOG, FBI Washington Field Office, Capitol Riverfront BID, Anacostia, ANCs
Implement congestion relief and traffic control measures	Leaders: DDOT and NVRC; Partners: MPD, WMATA, MWCOG
Increase shade cover and green infrastructure	Leaders: DDOT Urban Forestry, DOEE; Partners: NPS, USDA Forestry Service, MWCOG
Invest in workforce development for in-demand skills	Leaders: Department of Employment Services (DOES); Partners: DOEE Sustainable Energy Utility and Green Infrastructure, DC Water (especially Blue Plains AWTP), DDOT Public Space Management and Maintenance, DCOP Citywide Strategy & Analysis
Develop suspicious activity and trespassing prevention plan	Leaders: Installations,; Partners: MWCOG, HSEMA National Capital Region Threat Intelligence Consortium (NTIC), NPS Police, ANCs, BIDs, DCOP Development Review & Historic Preservation, NCPC Security of Federal & Public Spaces
Invest in affordable housing	Leaders: DC Department of Housing and Community Development, Development Finance Division and DC Housing Authority, DCOP Development Review, DCOP Citywide Strategy and Analysis Division; Partners: MWCOG, ANCs for Wards 6 and 8

★ Top priority measure

MIRR Contact Information

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Northern Virginia Regional Commission
Military Installation Resilience Review (MIRR)

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Transportation Planning Board
June 21, 2023

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The NVRC MIRR Process

Who we are

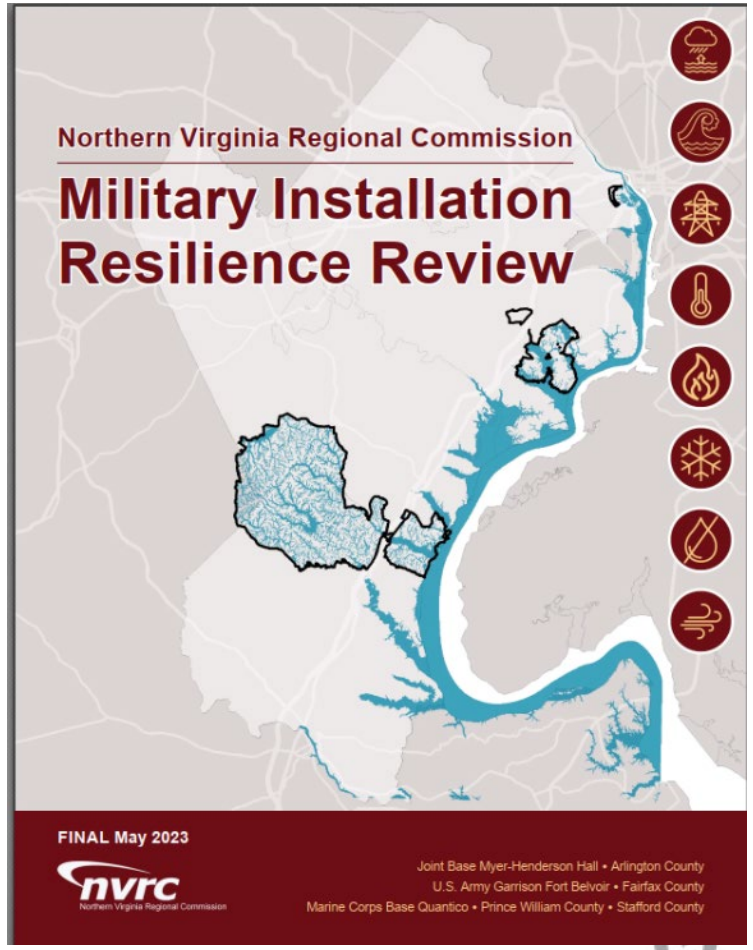
The Northern Virginia Regional Commission (NVRC) is a regional council of thirteen-member local governments in the Northern Virginia suburbs of Washington DC. NVRC is a political subdivision (a government agency) within the Commonwealth.

How we got here

NVRC applied for and received a Military Installation Resilience Review (MIRR) grant from the **Office of Local Defense Community Cooperation (OLDCC)**. During the MIRR process projects benefitting the communities and the installations were identified. A summary of the MIRR Projects follows.

Timeline

Final MIRR report was accepted by the NVRC Commission in May 2023.



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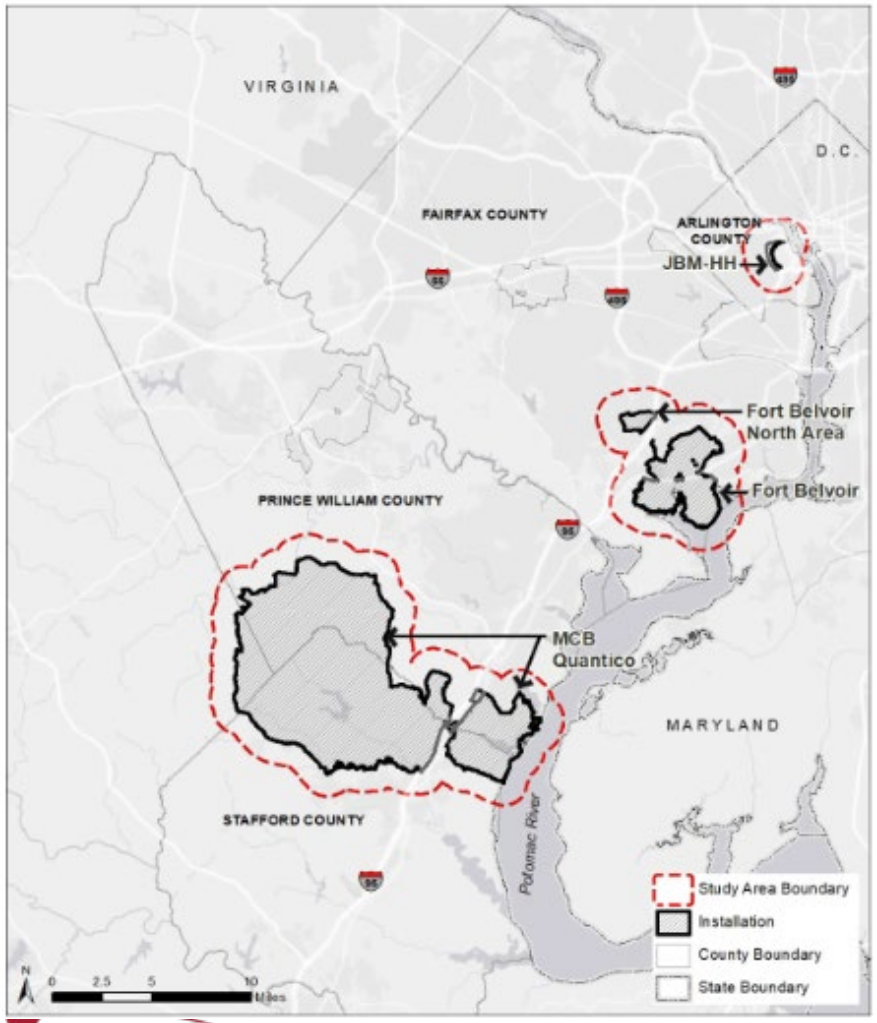
The NVRC MIRR Process



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Project Initiation
- Project kickoff meeting
- Virtual Room

Data Collection
- Virtual site visits and stakeholder interviews
- Existing conditions analysis and literature review
  Plans & policies
  GIS asset data
  Climate hazard data
- **Workshop 1** Validate existing conditions, climate data and scenarios, and primary hazards

Threats & Vulnerability Analysis
- Climate hazard mapping
  Asset Inventory
- Vulnerability assessment methodology
- Exposure analysis
  Vulnerability rating assignments
- **Workshop 2** Review hazard mapping and draft vulnerability analysis ratings

Strategy Development & Refinement
- Strategy focus areas
  Initial evaluation criteria factors
- Preliminary strategies and prioritization framework
- Regional strategies review and priority refinement
- **Workshop 3** Strategy review and refinement

Implementation Factors
- Assign timeframe, ROM and roles
- Benefit Cost Analysis for select strategies
- Refine strategies

Draft & Final Report
- Draft report
- **Workshop 4** Draft comment review
- Final report

- Policy Committee Meeting
- JBM-HH / Arlington County Technical Review Committee Meeting
- Fort Belvoir / Fairfax County Technical Review Committee Meeting
- MCB Quantico / Prince William County and Stafford County Technical Review Committee Meeting
- NVRC Commission Briefing

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Climate Hazards

High Priority Hazards

- High Temperatures
- Energy Demand
- Coastal/Tidal Flooding
- Pluvial Flooding
  Fluvial/Inland Flooding

Medium Priority Hazards

- Wind
- Winter Weather

Low Priority Hazards

- Drought
- Wildfire

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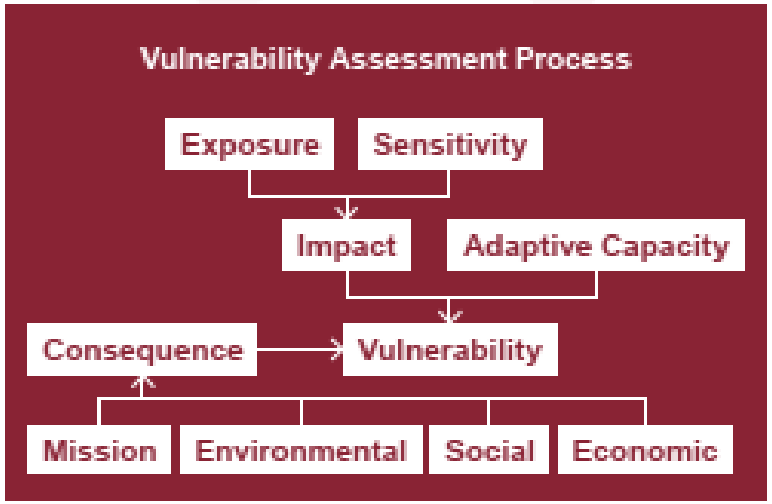
Asset Inventory and Vulnerability Analysis

100,000

assets across

11 asset categories

Building Assets
Stormwater Systems
Wastewater Systems
Water Supply Systems
Electrical Systems
Natural Gas Systems
Fuel Systems
Communications Systems
Transportation Systems
Natural Areas and Parks
Hazardous Materials Storage



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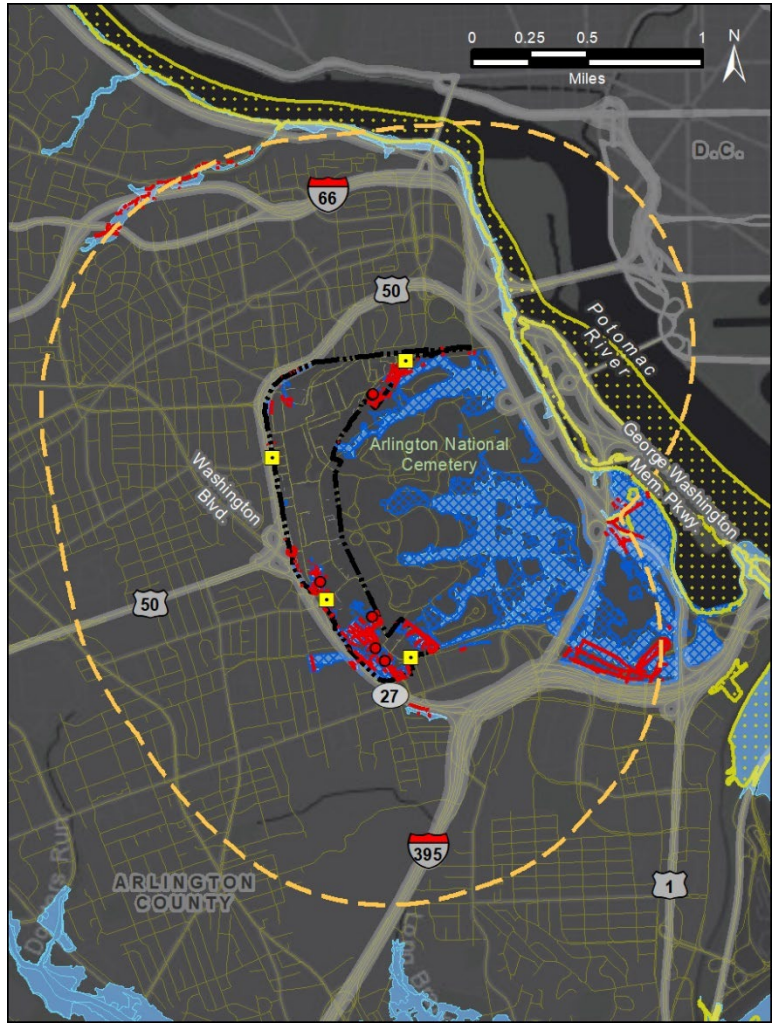
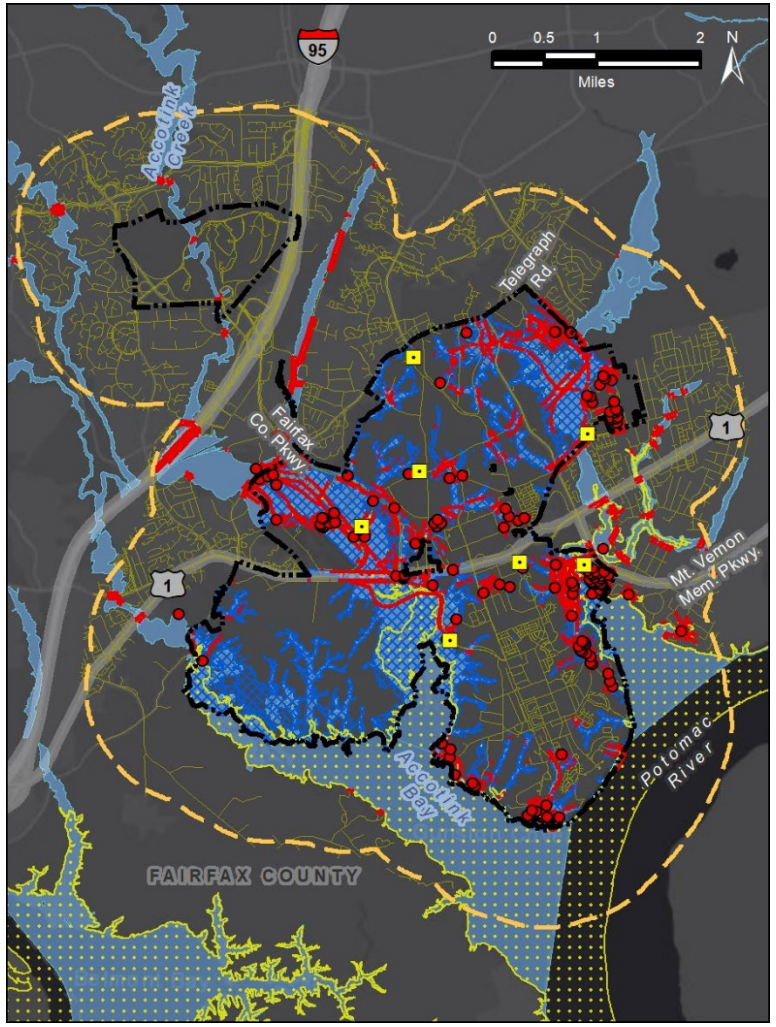
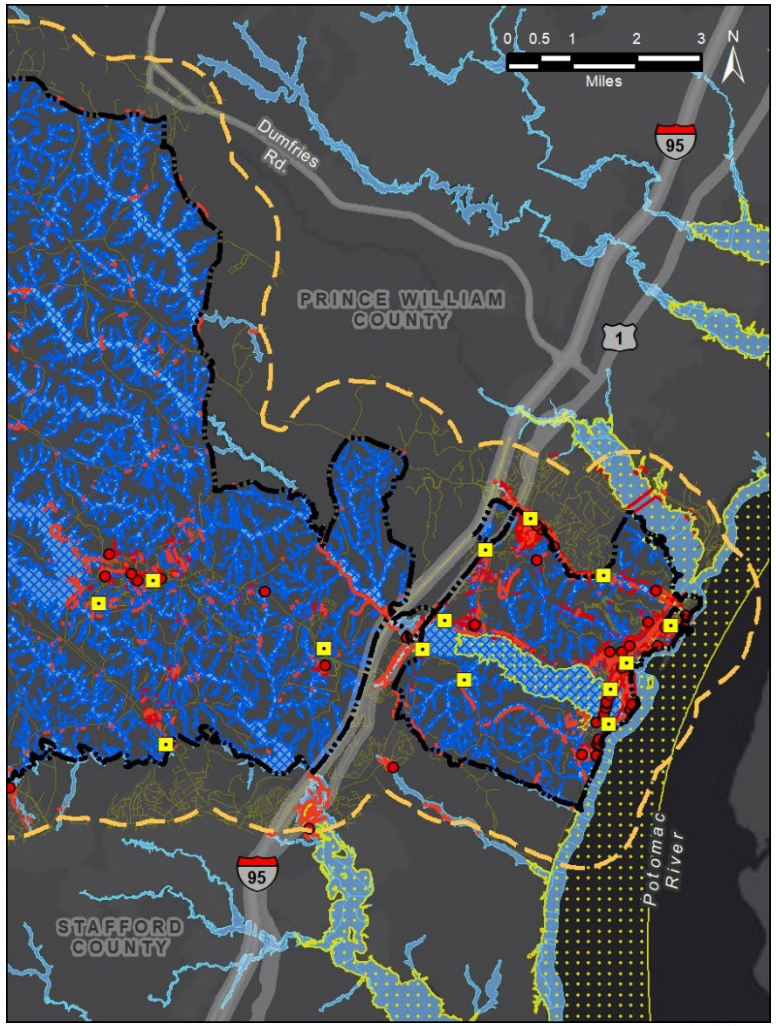
Exposed Networks



Joint Base Myer-Henderson Hall / Arlington County

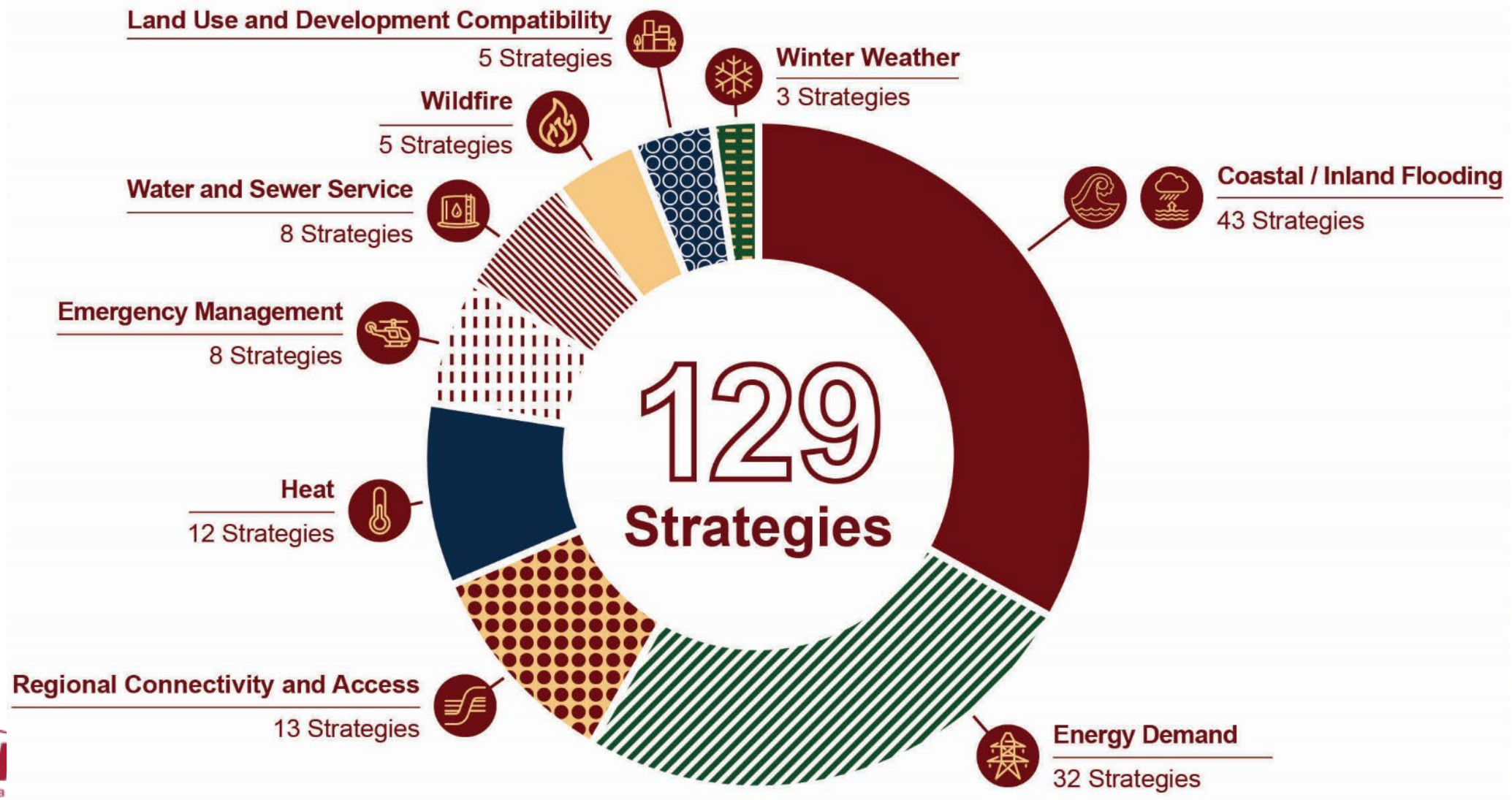


Fort Belvoir / Fairfax County



MCB Quantico / Prince William County and Stafford County

Breakdown of Strategies by Hazard or Topic



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Prioritization Criteria

15 criteria were used to qualitatively rank strategies

Most criteria are rated on a scale of negative, neutral, or positive (-1, 0, 1)

Mission criteria have higher impact on score than other categories

Project execution and funding scores were excluded from total scores in order not to penalize strategies that are difficult or complex

Category	Criteria
Mission	Installation System Redundancy and Robustness
	Alignment with Existing Policies and Priorities
	Connectivity and Access
	Regional Resilience
	Life Safety
Environmental	Environmental Goals, Standards, and Guidelines
	Habitat and Biodiversity
Social	Community Assets
	Access to Essential Services
Economic	Avoided Loss
	Infrastructure Modernization
Implementation	Hazard Reduction
	Adaptability
	Project Execution Complexity
	Funding

Tier	JBM-HH / Arlington County	Fort Belvoir / Fairfax County	MCB Quantico / Prince William County and Stafford County	Regional	Total (Regional + Installation / County
High	8	11	12	14	45
Mid	6	13	11	21	51
Low	7	8	7	11	33
Total	21	32	30	46	129

Military Installation Resilience Review (MIRR) Overview

- Hazards Identified
  - High Priority Hazards (Extreme Heat, Energy Demand, Coastal Flooding, Inland Flooding)
  - Medium Priority Hazards (Wind, Winter Weather)
  - Low Priority Hazards (Drought, Wildfire)
- Threats and Vulnerabilities Analysis Completed
  - Hazard Exposure
  - Sensitivity
  - Adaptive Capacity
  - Consequence
- Business Case Analysis Completed
- 129 Regional and Installation/County Specific Strategies Identified and Classified
  - Low-Tier
  - Mid-Tier
  - High-Tier
- Funding Sources Identified
- Industry Days Held in Sep 2022 and Mar 2023
- Final MIRR Report Presented to the Policy Committee 18 May

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Transportation Strategies

R3—Update roadway design guidelines to reflect:

1. Different emissions scenarios and temperature rise on pavement distresses
2. Up-to-date projections for future SLR, future rainfall, and storm surge

Affected design guidelines would apply not only to horizontal and vertical design elements, but also to the materials that are used in construction (i.e., materials that are more resistant to corrosion).

R4—Pursue a study to model the risks and impacts that future flood conditions could have on travel demand characteristic along major regional corridors such as, but not limited to, I-95, 395, Fairfax County Parkway, Route 1, George Washington Memorial Pkwy, South Washington Blvd and use the output to inform approaches for mitigating flood impacts from SLR and future precipitation to ensure access is maintained.

R5—Compare future flood elevations with bridge components and minimum design criteria to determine areas for action.

Transportation Strategies

R6—Update the Transportation Demand Management Plan to consider future flood impacts from coastal and inland flooding on primary corridors and overall installation access. Coordinate with VDOT and counties.

R21—Evaluate Metro railway tunnel and station to assess potential flood impacts to operations and assets.

R22—Continue to advocate for the development of expanded transit services to all installations, including long-term concepts for Metro access and commuter ferry service.

R23—Conduct a base wide transportation study of personnel commuting patterns to determine how personnel are getting to work, and what incentives they would need to reduce the number of days they drive a POV alone to work (better on-base shuttle service, ferry service, bike or scooter share on base, etc.). Share information with regional public transit providers (VDOT TDM Coordinators, MWCOG, VRE, OmniRide, WMATA, etc.).

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Transportation Strategies

R24—Consider different emissions scenarios and temperature rise impacts on rail track and update railway design guidelines accordingly.

R37—Incorporate cool and/or permeable pavements (including pervious concrete, porous asphalt, and permeable interlocking concrete pavers) into roadways and parking lots to minimize urban heat island effect and to support stormwater management.

R44—Installations to work with NVRC and OLDCC to pursue a second phase AV pilot program for on-base transportation; Scope could include last mile connector options at each installation (VRE/BRT connections).

Next Steps

- Socialize the MIRR report

- Identify funding sources for project planning
  - REPI Challenge Funds
  - MIRR Implementation Funds
  - IIJA Funds
  - State Programs

- Identify funding sources for project construction
  - DCIP Funds
  - DOE Funds
  - FEMA BRIC Funds
  - State Programs

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MIRR POC and Questions

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Solar Projects

1 Megawatt (MW) Floating Solar Array for Water Treatment Plant	$3.5M
Battery back-up for the 1 MW Floating Solar Array	$3M
Transmission lines for the 1 MW Solar Array	$2M
Battery back-up for the Landfill Solar Array (built by others)	$15M
Solar Panels for Fort Belvoir Elementary School	$2.4M
Solar Panels for Woodlawn Elementary School	$1.8M
2 MW Floating Solar at Quantico's Lunga Reservoir	$7M
2 MW Battery back-up for Lunga Reservoir Solar	$6M
Transmission Lines for Lunga Reservoir Solar	$4M
1 MW Floating Solar at Smith Reservoir	$3.5M
1 MW Battery back-up for Smith Reservoir	$3M
Transmission Lines for Smith Reservoir Solar	$4M
Floating Breakwater Protection for Smith Reservoir Solar	$3M
10 Solar EV Charging Stations at each Installation	$9M
Total	$67.2M

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Regional Energy Grid Projects

New Substation at Fort Belvoir	$100M
2 MW Battery back-up for the Community (at the new substation)	$6M
Micro-grid at the New Fort Belvoir Substation	$50M
Micro-grid at the Existing Fort Belvoir Substation	$50M
2 MW Battery back-up for the Community (at the existing substation)	$5M
Transmission Line Improvements for FB Switching Gear	$5M
Switch Gear for Fairfax County Covanta Plant	$5M
Switch Gear for Arlington/Alexandria Covanta Plant	$5M
Transmission Lines Improvements for A/A Switch Gear	$5M
Micro-grid at Existing JBM-HH Substation	$10M
Total	$241M

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Flooding/Shoreline Projects

Planning Effort for Little Creek and Quantico Shoreline		$0.9M
Natural Infrastructure Improvements for Little Creek		$35M
Shoreline Improvements at Quantico/Prince William County		$4M
	Total	$39.9M

Utility Projects

Gas Line Connections at JBM-HH		$0.7M
Town of Quantico Water and Wastewater Upgrades		$10M
	Total	$10.7M

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EXTRA SLIDES FOLLOW

For Each Measure:

Implementation profile:

- Measure description
- Vulnerabilities addressed
- Benefits
- Social and equity considerations
- Costs and funding opportunities
- Key actors
- Next steps
- Additional details

Assess and Address Key Climate Risks to Telecommunications Systems

Measure Description (icon)

Government actors, nongovernmental organizations, and telecommunications providers operating in the area will work together to 1) identify key specific risks that climate hazards may pose to critical telecommunications assets and 2) ensure service providers and relevant government stakeholders have the resources needed to manage risks and build resilience to climate change.

First, HSEMA and DOEE will share results from recent and ongoing asset vulnerability and climate risk studies (see Additional Details section below) with telecommunications providers in a format that telecommunications providers can use for risk management (e.g., geospatial hazard layers). Then, they may undertake additional analyses as needed, and synthesize findings to identify key risks. Roles of specific actors are described below in the Next Steps section.

If telecommunications providers are equipped with information about key climate hazards, they can make better-informed decisions about how to upgrade, design, or relocate existing facilities and where to site future infrastructure, which will ultimately result in more resilient communications systems.

Vulnerabilities Addressed (icon)

- Critical telecommunications assets (e.g., transmission towers; aboveground fiber optic and coaxial cables and associated facilities) vulnerabilities to hazards including ice storms and high winds

Other telecommunications assets may also be at future risk of flooding and/or power grid instability.

Benefits (icon)

- Installations: Installations use the civilian telecommunications system, with alternate, contingency, and emergency options to ensure service continuity. Addressing vulnerabilities to this system will increase the likelihood that installations can continue to communicate with their normal methods in emergencies.
- Community: Increased ability of support systems (e.g., first responders, service providers, community-based organizations, nonprofits) to continue communicating and coordinating to serve the community during events.
- Economy: Increased capacity of the local economy to continue operating during events.
- Environment: Potential for environmental benefits if nature-based resilience measures are applied (e.g., to manage flooding).

Social and Equity Considerations (icon)

Increasing communications resilience may particularly benefit populations that face higher risk or have less capacity to cope if communications systems go down.

Telecommunications service providers should also work with ANCs and BIDs to understand how outages and construction could impact different populations, and reflect community needs in resilience implementation plans and outage restoration plans.

Additionally, the quality of communications services and assets' resilience should be studied alongside wealth indicators to assess if the system is stronger in wealthier areas, and if it is, resilience investments should be prioritized to mitigate this inequity.

Costs and funding Opportunities (icon)

Potential costs associated with implementing this measure, and potential funding sources to support implementation, include:

Costs:

- Risk assessments to identify and inform the design or protection of critical equipment, buildings, and infrastructure may have a range of costs ($25,000—$250,000+) depending on the level of detail needed and the scope of the study.
- Undergrounding wires may cost ~$25,000 to $1,500,000 per mile, recognizing the need to ensure against flooding risks for buried lines
- Additional equipment may be used to increase reliability and capacity

Funding:

- Department of Defense Office of Local Defense Community Cooperation (OLDCC) grants to fund additional risk assessments as needed
- FEMA Building Resilient Infrastructure and Communities (BRIC) Program grants
- Homeland Security Grant Program (HSGP) grants
- National Telecommunications and Information Administration grants

Key Actors (icon)

- Leaders: HSEMA and telecommunications service providers
- Partners: Other government actors (MWCOG, National Labs, CISA, FEMA), electric service providers, Communications Sector Coordinating Council first responders, and other major users

Next Steps (icon)

Short-term (within 2 years)

- Public sector actors (e.g., governmental and NGOs) conduct R&D to develop climate risk data for telecommunications service providers
- HSEMA continues to investigate critical assets and vulnerabilities in local telecommunications system

Mid-term (2-6 years)

- Public sector actors make climate hazard data available to and easily accessible by telecommunications service providers
- Telecommunications providers integrate climate risk data into planning and decision-making processes

Long-term (7+ years)

- Telecommunications service providers coordinate as needed to build resilience and manage key climate risks
- Public sector continues to support service providers by providing updated high-quality climate data for risk management purposes
- Telecommunications service providers and public sector actors work together to target climate risks to telecommunications sector outside the scope of providers' capacity (e.g., improve flood resilience, harden the electric grid to increase its reliability)

Transportation Sector Measures

Construct community electric vehicle charging stations

Key Actors

Leaders: Charging station site hosts

Partners: Pepco, MWCOG, DDOT, installations, EV service providers (e.g., ChargePoint)

Immediate Next Steps:

- Identify and convene key stakeholders to develop plans for EV siting and construction; apply for funding to pay community stakeholders for their time
- Secure funds to build EV stations, begin construction if possible
- Keep tabs on additional funding opportunities that may support additional charging stations

Expand connectivity to/from High-Capacity Transit Station Areas

Key Actors

Leaders: DDOT Vision Zero Department; DDOT Planning and Sustainability Department; WMATA.

Partners: DCOP Citywide Strategy & Analysis and Community Planning & Design, Anacostia BID, Anacostia Coordinating Council, ANCs, HSEMA

Immediate Next Steps:

- Key actors to engage with partners about the existing transportation conditions between HCTs and the installations.
- Conduct analyses to identify gaps in infrastructure and any planned or implemented projects.

Implement congestion relief and traffic control measures

Key Actors

Leaders: DDOT and NVRC

Partners: MPD, WMATA, MWCOG

Immediate Next Steps:

- Analyze and prioritize areas of frequent congestion from their operations and workforce staff
- Engage with stakeholders to recommend the expansion of congestion mitigation measures proposed for those areas

Honorable Mention

Honorable mention physical & policy measures

- Continue to explore opportunities to add Potomac River Ferry stops near installations.
- Train workers to maintain green infrastructure and other capital projects.
- Coordinate and advocate for funding for water supply alternatives.

Next Steps

- Applying for Follow-on FY 23 Planning Grant from OLDCC
- Seeking community and base input on priorities (Feb)
- Top 3 of interest to date
  - JBAB Floodwall – Extend north to 11th St. Bridge
  - Energy Emergency Exercise – Extended Grid Outage
  - Follow up on DC HSEMA Telecommunications Resilience Project
- Other/Potential
  - Plan to connect new trail on JBAB/NRL to South Capitol St. Bike/Ped projects
  - Examine Connectivity Options to High-Capacity Transit

Priority Measures

Retrofit stormwater pump stations

Key Actors
DC Water

Partners: Electric utility (Pepco)

Immediate Next Steps:
Request additional funding (potentially from OLDCC, FEMA BRIC)

Assess and address key climate risks to telecommunications systems

Key Actors
HSEMA and telecommunications service providers

Partners: Local and federal government actors, electric service providers, Communications Sector Coordinating Council first responders, and other major users

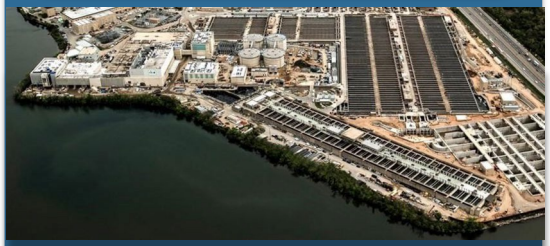
Immediate Next Steps:
- Public sector actors conduct R&D to develop climate risk data for telecommunications service providers
- HSEMA continues to investigate critical assets and vulnerabilities in local telecommunications systems

Support Blue Plains floodwall construction

Key Actors
DC Water

Partners: HSEMA, Ward 8 representatives

Immediate Next Steps:
- Funding BRIC and OLDCC
- Community outreach
- Design & Engineering studies
- Consultation with agencies



Additional Priority Measures

Ensure Lower Anacostia Waterfront development is resilient

Key Actors
DCOP

Partners: Fort McNair, WNY, NCPC, National Park Service, DOEE, HSEMA, Anacostia Parks and Community Collaborative

Immediate Next Steps:
- Develop resilience action plan
- Conduct flood studies
- Community engagement
- Secure funding
- Track progress of Poplar Point EIS effort and provide input as stakeholders
- Develop resilience guidelines
- Scope resilience measures
- Begin implementation

Provide financial support for Blue Plains microgrid

Key Actors
DC Water

Partner: Pepco

Immediate Next Steps:
- Request additional funding from DoD
- DC Water completes microgrid scoping phase supported primarily by FEMA funding
- DC Water begins microgrid implementation phase, supported by additional external funding

Advance fuel resilience opportunities identified in RRAP study to benefit installations and communities

Key Actors
CISA, DC HSEMA, DC DOEE

Partners: RRAP study stakeholders, terminal operators, energy marketers, energy assurance planners, emergency management agencies, and electric power utilities

Immediate Next Steps:
- Engage installations and utilities in conducting RRAP study
- RRAP stakeholders identify opportunities to build energy resilience for installations and critical staff

Other Measures

Increase shade cover and green infrastructure

Key Actors

Leaders: DDOT Urban Forestry, DOEE

Partners: NPS, USDA Forestry Service, MWCOG

Immediate Next Steps:

- Develop an initial baseline inventory of the area's tree canopy and impervious surface cover

Invest in workforce development for in-demand skills

Key Actors

Leaders: Department of Employment Services (DOES)

Partners: DOEE Sustainable Energy Utility and Green Infrastructure, DC Water (especially Blue Plains AWTP), DDOT Public Space Management and Maintenance, DCOP Citywide Strategy & Analysis

Immediate Next Steps:

- Identify workforce development organizations and programs
- Identify and prioritize the workforce needs of each installation

Invest in affordable housing

Key Actors

Leaders: DC Department of Housing and Community Development, Development Finance Division and DC Housing Authority, DCOP Development Review, DCOP Citywide Strategy and Analysis Division

Partners: MWCOG, ANCs for Wards 6 and 8

Immediate Next Steps:

- Prepare grant applications for funding
- Conduct roundtable discussions between actors
- Identify and convene stakeholders for project engagement
- Plan community engagement efforts to publicize the project

Other Measures

Develop suspicious activity & trespassing prevention plan

Key Actors

Leaders: Installations, DCOP Development Review & Historic Preservation, NCPC Security of Federal & Public Spaces

Partners: MWCOG Department of Homeland Security and Public Safety, HSEMA National Capital Region Threat Intelligence Consortium (NTIC), NPS Police, ANCs, BIDs

Immediate Next Steps:

- Identify past or current efforts to address suspicious activity leading to trespassing.
- Organize and commence roundtable discussions.