Infrastructure Replacement and Upgrades

Program Description

One of the primary roles for facility management in both government and private industry is to provide for the long-term needs of the organization's capital assets. This maximizes the life of the facilities, avoids their obsolescence, and provides for a planned program of repairs, improvements, and restorations to make them suitable for organizational needs. Infrastructure Replacement and Upgrades is the planned replacement of building subsystems such as roofs, electrical systems, HVAC systems, life safety systems, conveying systems, and plumbing systems that have reached the end of their useful life. Major renewal investment is required in facilities to replace old, obsolete building subsystems that have reached the end of their life cycle. Without significant reinvestment in building subsystems, older facilities will fall into a state of ever deteriorating condition and functionality and the maintenance and repair costs necessary to keep them functional will increase. This reinvestment also includes upgrades associated with Americans with Disabilities (ADA) compliance at County facilities.

Program Initiatives

The Facilities Management Department (FMD) currently provides support for evaluating facilities, identifying problems, developing costs estimates, establishing priorities, and performing required infrastructure replacement and upgrades. Some of the major work completed annually at County facilities includes the replacement of building subsystems such as roofs, electrical systems, heating, ventilation, and air conditioning (HVAC), plumbing systems, elevators, windows, flooring, parking lot resurfacing, fire alarms, fire suppression, building automation systems, and emergency generators that have reached the end of their useful life. Without significant reinvestment in building subsystems, older facilities can fall into a state of ever-decreasing condition and functionality, and the maintenance and repair costs necessary to operate the facilities increase. Fairfax County will have a projected FY 2025 facility inventory of over 12 million square feet of space (excluding schools, parks, and housing facilities). This inventory continues to expand with the addition of newly constructed facilities, the renovation and expansion of existing facilities, and the acquisition of additional property. With such a large inventory, it is critical that a planned program of repairs and restorations be maintained. In addition, the age of a large portion of this inventory of facilities is reaching a point where major reinvestments are required in the building subsystems.

Many County facilities have outdated HVAC and electrical systems that are susceptible to failure or are highly inefficient energy users. Based on an increased emphasis on developing energy efficient facilities, staff continue to install Building Energy Management Systems (BEMS) in older buildings to increase the efficiency and control of heating and cooling systems in addition to leveraging current technologies. Electrical demand meters are also being added to several facilities to track electrical usage and reduce peak demand, which is the main driver of electricity costs. Projects are prioritized based on maintenance reports and availability of parts. Roof and envelop replacement, repairs, and waterproofing are conducted in priority order based on an evaluation of maintenance and performance history. Repairs and replacement of facility roofs and envelopes are considered critical to avoid the serious structural deterioration that occurs from roof and envelop leaks. By addressing this problem in a comprehensive manner, a major backlog of roof and envelop problems can be avoided. In addition, emergency generator systems and life safety systems are replaced based on equipment age, coupled with maintenance and performance history. Critical emergency repairs and renovations are accomplished under the category of emergency building repairs. These small projects abate building obsolescence and improve the efficiency and effectiveness of facilities and facility systems. The following table outlines, in general, the expected service life of building subsystems used to project infrastructure replacement and upgrade requirements, coupled with the actual condition of the subsystem component:

General Guidelines for Expected Service Life of Building Subsystems

Conveying Systems		**HVAC**	
Conveying Technology	7 to 10 years	Boilers	15 to 30 years
Elevator	15 to 25 years	Building Control Systems	7 years
Escalator	15 to 25 years	Equipment	20 years
Electrical		**Plumbing**	
Fire Alarms	15 years	Fixtures	30 years
Generators	25 years	Pipes and Fittings	30 years
Lighting	20 years	Pumps	15 years
Service/Power	25 years		
		Roofs	
Finishes		Replacement	20 years
Broadloom Carpet	7 years		
Carpet Tiles	15 years	**Site**	
Systems Furniture	20 to 25 years	Paving	15 years

Each year, the Facilities Management Department (FMD) prioritizes and classifies infrastructure replacement and upgrade projects into five categories. Projects are classified as Category F: urgent/safety related, or endangering life and/or property; Category D: critical systems beyond their useful life or in danger of possible failure; Category C: life-cycle repairs/replacements where repairs are no longer cost effective; Category B: repairs needed for improvements if funding is available; and Category A: good condition.

In April 2013, the County and School Board formed a joint committee, the Infrastructure Financing Committee (IFC), to collaborate and review both the County and School's Capital Improvement Program (CIP) and infrastructure upgrade requirements. One of the goals of the Committee was to develop long-term maintenance plans for both the County and Schools, including annual requirements and reserves. The committee conducted a comprehensive review of critical needs and approved recommendations to support the development of a sustainable financing plan to begin to address current and future capital requirements. A Final Report was developed and approved by the Board of Supervisors on March 25, 2014, and the School Board on April 10, 2014. The Report included support for conducting capital needs assessments, the establishment of a capital sinking fund and increased annual General Fund support for infrastructure replacement, the adoption of common definitions related to all types of maintenance, support for County and School joint use opportunities for facilities, and continued support for evaluating ways to further reduce capital costs.

In February 2020, the Board of Supervisors and the School Board established a second joint CIP working group to continue the work of the IFC and enhance information sharing, prioritizations, and planning by both the County and Fairfax County Public Schools. The Committee spent its time reviewing the County's existing Financial Policies, considering the financing options available for capital projects, understanding the capital project requirements identified for both the County and Schools, and evaluating the current CIP Plan and processes. Following these discussions, the Committee arrived at a series of recommendations, which included gradually increasing General Obligation Bond Sale limits from $300 million to $400 million annually; dedicating the equivalent value of one penny on the Real Estate tax to the County and School capital program to support both infrastructure replacement and upgrade projects and debt on the increased annual sales; and increasing the percentage allocated to the Capital Sinking Fund at year-end, as well as including Schools in the allocation. Based on resource constraints, the Committee's recommendation to

dedicate the value of one penny has not been included in the FY 2025 Adopted Budget Plan. An investment totaling $5 million, split equally between the County and Schools, was included, with the anticipation that this investment will grow in the coming fiscal years. When fully implemented, these recommendations will provide significant funding for infrastructure replacement and upgrades in the future.

The Board of Supervisors establishment of the Capital Sinking Fund has provided a total of $84,020,366 since FY 2014 for FMD to address critical infrastructure replacement and upgrade projects. FMD has initiated several larger scale projects with funding from the Sinking Fund, including roof replacement at the Gerry Hyland South County Government Center, Huntington Community Center, and Juvenile Detention Center; HVAC system component replacement at the Herrity Building, Gerry Hyland South County Government Center, Annandale Center, Cathy Hudgins Community Center at Southgate and Michael R. Frey Animal Shelter; building improvements at the Bailey's Community Center, Adult Detention Center and Clifton Fire Station; milling and paving at the Kingstowne Fire Station; plaza deck drainage and concrete improvements at the Government Center; fire alarm system replacement at the Government Center and Fairfax County Courthouse; elevator modernization at the Adult Detention Center; security gates replacement at the Fairfax County Courthouse and Courthouse Expansion; electrical improvements at the Government Center, and building automation system upgrades at Fairfax Center Fire Station, Great Falls Library, Mott Community Center, Providence Community Center, Sherwood Regional Library and the Fire Training Academy.

Due to budget constraints in FY 2025, an amount of $2,500,000 is included to address several top priority category F projects. In addition, an amount of $12,500,000 was approved as part of the *FY 2024 Third Quarter Review* for a total of $15,000,000 to support the most critical FY 2025 identified projects. In recent years, it has been the Board of Supervisors' practice to fund some or all of the infrastructure replacement and upgrade projects using one-time funding as available as part of quarterly reviews. These projects, all Category F, are outlined in the table below which includes projects proposed to be funded as part of the FY 2025 Adopted Budget Plan and projects were approved as part of the *FY 2024 Third Quarter Review.*

FY 2025 Infrastructure Replacement and Upgrade Program

Priority	Project Type	Facility	Category	Existing Conditions/Deficiencies	Estimate
Projects funded as part of the FY 2025 Adopted Budget Plan*:*					
1	Elevator	Adult Detention Center	F	• Maintenance intensive and increased system failure • Parts are no longer available or are obsolete • Disruption to building operations/end users	$250,000
2	Fire Suppression	West Springfield Police, Fire and Government Center	F	• Existing system has exceeded its life cycle • Maintenance intensive • Elevated potential for loss of property and equipment	$250,000
3	Electrical	Fairfax County Government Center	F	• Shorter life expectancy of IT equipment • Shorter battery life due to frequent power outages • Limited operators' ability to access, control, and monitor building systems during power outages • Increased labor cost for IT personnel to reset equipment after each outage	$900,000
4	HVAC	Mott Community Center	F	• Maintenance intensive and increased system failure • Parts are no longer available or are obsolete • Disruption to building operations/end users	$550,000
5	Miscellaneous	Various Facilities	F	• Replacement of building subsystem components such as small water heaters and power distribution units • Projects are prioritized based on existing conditions, availability of parts, and critical nature of failure	$250,000
6	HVAC	Mount Vernon Government Center and Police Station (partial funding)	F	• Maintenance intensive and increased system failure • Parts are no longer available or are obsolete • Disruption to building operations/end users	$300,000

Priority	Project Type	Facility	Category	Existing Conditions/Deficiencies	Estimate
Projects funded as part of *FY 2024 Third Quarter Review*:					
7	HVAC	Mount Vernon Government Center and Police Station (partial funding)	F	• Maintenance intensive and increased system failure • Parts are no longer available or are obsolete • Disruption to building operations/end users	$400,000
8	Roof	North County Government Center and Reston Police Station	F	• Damaged areas of the roof • Water leaks • Lightning protection system requires certification	$350,000
9	Fire Alarm	Herrity Building	F	• Maintenance intensive • Parts difficult to obtain • Elevated risk due to potential system malfunction	$4,000,000
10	Miscellaneous (Doors)	Herrity Building	F	• Increased failure • Aluminum is corroding and seals are missing • Maintenance no longer feasible • Increased utilities costs • Safety hazard • Disruption to building operations/end users	$1,700,000
11	Building Envelope	Various Parking Garages (First phase of a multi-year program)	F	• Maintenance intensive and increased system failure • Leaks through openings and failed drainage systems resulting in flooding and ponding • Deterioration and corrosion of existing structures • Pedestrian and vehicle hazards	$2,000,000
12	Paving	Fire Training Academy	F	• Maintenance no longer feasible • Deteriorating conditions • Potential for injuries to pedestrians	$300,000
13	Roof	Kings Park Library and Braddock District Government Center	F	• Maintenance intensive • Water leaks • Increased utilities costs • Disruption to building operations/end users	$1,300,000
14	Electrical	Fairfax County Government Center	F	• Maintenance intensive • Safety hazard • Increased utilities costs • Disruption to building operations/end users	$1,150,000

Priority	Project Type	Facility	Category	Existing Conditions/Deficiencies	Estimate
15	HVAC	Old Historic Jail	F	• Maintenance intensive and increased system failure • Parts are obsolete • Disruption to building operations/end users	$600,000
16	Building Automation System	Old Historic Jail	F	• Maintenance intensive • Parts are no longer available or are obsolete • Increased utilities costs • Disruption to building operations/end users	$450,000
17	Generator	West Springfield Police, Fire and Government Center	F	• Maintenance intensive • Elevated potential for loss of operations controls due to inability to support power outages • Disruption to building operations/end users	$250,000
				Total	**$15,000,000**

In addition to the above projects identified as part of the FY 2025 plan, FMD has identified additional Category F projects. Analysis of these requirements is conducted annually, and projects may shift categories, become an emergency and be funded by the emergency systems failures project, or be eliminated based on other changes, such as a proposed renovation project.

Current Project Descriptions

1. **ADA Compliance - FMD (Countywide):** This is a continuing project to support County compliance with the Americans with Disabilities Act at County-owned facilities. Funding for annual ADA projects to support the continuation of improvements is required, as buildings and site conditions age. For example, over time sidewalks or pavers may settle or erosion occurs changing the slope or creating gaps/obstructions, program usage changes can result in new physical barriers, or ADA entrance ramps for pedestrians can fail due to increased usage for the movement of bulk materials and equipment. In FY 2025 an amount of $500,000 has been included for ADA projects.

2. **ADA Improvements – Old Firehouse (Dranesville District):** $500,000 has been approved to support ADA accessibility improvements at the Old Firehouse facility. The McLean Community Center uses the Old Firehouse facility as a venue for many community activities and programming. This funding will provide for accessibility upgrades to doors and bathrooms.

3. **Building Automation Systems (Countywide):** This is a continuing project to support the installation and upgrade of Building Automation Systems (BAS) within existing County facilities. BAS control facility, HVAC, bay door interlocking, and negative pressure room systems. Older facilities are retrofitted with these systems in order to increase energy efficiency.

4. **Capital Sinking Fund for Facilities (Countywide):** $84,020,366 has been allocated to date for the Capital Sinking Fund for FMD. The Capital Sinking Fund was established as a direct result of the Infrastructure Financing Committee (IFC). Funding for each sinking fund is approved annually as part of the Carryover Review and is allocated based on the following percentages: 45 percent for FMD, 25 percent for Schools, 15 percent for Parks, 7 percent for Walkways, 5 percent for County maintained Roads and Service Drives, and 3 percent for Revitalization areas.

5. **Electrical System Upgrades and Replacements (Countywide):** This is a continuing project for the repair, renovation and upgrading of electrical systems in various facilities throughout the County. Funding of $900,000 has been included in FY 2025 for electrical system upgrades.

6. **Elevator/Escalator Renewal (Countywide):** This is a continuing project for the replacement and repairs of elevators throughout the County. Funding of $250,000 has been included in FY 2025 for elevator upgrades.

7. **Emergency Generator Replacement (Countywide):** This is a continuing project for life safety and generator replacements at various sites throughout the County. Requirements are programmed based on equipment age coupled with maintenance and performance history.

8. **Emergency Systems Failures (Countywide):** This is a continuing project to support emergency repairs and replacements to County facilities in the event of a major systems failure, such as a large HVAC system or other unforeseen event. Currently, this is the County's only source to deal with potential emergency system failures. Infrastructure Replacement and Upgrades funding is encumbered quickly because it is earmarked for specific projects. As a result, specific project balances are unavailable for emergencies. If a system failure should occur, there is the potential that a facility may shut down, suspending services to residents and disrupting County business. Although the County's emphasis is on infrastructure replacement and preventative maintenance is intended to ensure these kinds of interruptions are avoided, this funding will enable potential disruptions to be corrected immediately.

9. **Flooring Replacement (Countywide):** This is a continuing project for carpet and flooring replacement at various County facilities where the existing carpet has deteriorated beyond repair or is in an unserviceable condition.

10. **HVAC and Plumbing System Upgrades and Replacement (Countywide):** This is a continuing project for the repair, renovation and/or upgrading of Heating Ventilation Air Conditioning (HVAC) and plumbing systems and /or components in various facilities throughout the County. In general, the useful life of HVAC systems is 20 years; however, some systems fail earlier due to operating conditions and due to obsolesce often emergency repairs are costly based on difficulty in obtaining parts and additional code requirements. FY 2025 funding of $850,000 has been included for HVAC upgrades.

11. **Life Safety System Replacements (Countywide):** This is a continuing project for the replacement of fire alarm and/or fire suppression systems based on age, difficulty in obtaining replacement parts, service, and overall condition assessment. This program provides for the replacement of life safety systems which are 15 to 30 years old, have exceeded their useful life and experience frequent failure when tested. FY 2025 funding of $250,000 has been included for life fire alarm replacements.

12. **Miscellaneous Building Repairs (Countywide):** This is a continuing project to support minor, but critical repair, renovation, remodeling, and upgrading of various facilities throughout the County. Requirements include abatement of health or safety hazards and emergency or unanticipated repairs to building exteriors. FY 2025 funding of $250,000 has been included for various building subsystem components such as small water heaters and power distribution units.

13. **MPSTOC County Support for Renewal (Springfield District):** $2,560,372 is currently in reserve to begin to address future capital renewal requirements at the McConnell Public Safety Transportation Operations Center (MPSTOC). This funding is appropriated at the end of each year and supported by revenues received from the State. This revenue represents funding associated with the state reimbursement for their share of the operational costs at MPSTOC such as security, custodial, landscaping, maintenance, parking lot repairs and snow removal costs. The County pays for all operational requirements and the State reimburses the County annually for their share of these costs.

14. **MPSTOC State Support for Renewal (Springfield District):** $994,869 is currently in reserve to begin to address future capital renewal requirements at the McConnell Public Safety Transportation Operations Center (MPSTOC). This funding is appropriated at the end of each year and supported by revenues received from the State. This revenue represents the state's annual installment of funds for their share of future repairs and renewal costs in order to avoid large budget increases for capital renewal requirements in the future. This contribution is based on the industry standard of 2 percent of replacement value or $3.00 per square foot.

15. **Parking Lot and Parking Garage Improvements (Countywide):** This is a continuing project for the repair and maintenance of parking lots and garages at various locations throughout the County. Parking lot surfaces are removed, the base re-compacted and a new surface course installed. In some cases, asphalt paving is milled down and resurfaced.

16. **Roof and Envelope Repairs and Waterproofing (Countywide):** This is a continuing project for the repair and replacement of facility roofs and waterproofing systems at County buildings. Typically, roofs at County facilities range in warranty periods from 10 to 20 years. Building envelope caulking, expansion joints, etc., typically experience product failures at 7 to 10 years.

17. **Window and Exterior Door Replacement (Countywide):** This is a continuing project for the replacement or repair of windows and exterior doors where water is leaking into County buildings.

Project Cost Summaries

Infrastructure Replacement and Upgrades

($000's)

	Project Title Project Number	Source of Funds	Budgeted or Expended Through FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Total FY 2025 - FY 2029	Total FY 2030 - FY 2034	Total
1	ADA Compliance - FMD	G	***C***	***$500***	$500	$500	$500	$500	$2,500	$2,500	$5,000
	GF-000001										
2	ADA Improvements - Old Firehouse	G	***$500***						$0		$500
	CC-000039										
3	Building Automation Systems	G	***C***		$2,000	$2,000	$2,000	$2,000	$8,000	$10,000	$18,000
	GF-000021										
4	Capital Sinking Fund for Facilities	G	***$84,020***						$0		$84,020
	GF-000029										
5	Electrical System Upgrades and Replacements	G	***C***	***$900***	$1,000	$1,000	$1,000	$1,000	$4,900	$5,000	$9,900
	GF-000017										
6	Elevator/Escalator Renewal	G	***C***	***$250***	$2,000	$2,000	$2,000	$2,000	$8,250	$10,000	$18,250
	GF-000013										
7	Emergency Generator Replacement	G	***C***		$1,000	$1,000	$1,000	$1,000	$4,000	$5,000	$9,000
	GF-000012										
8	Emergency Systems Failures	G	***C***		$2,000	$2,000	$2,000	$2,000	$8,000	$10,000	$18,000
	2G08-005-000										
9	Flooring Replacement	G	***C***						$0	$2,500	$2,500
	2G08-003-000										
10	HVAC and Plumbing System Upgrades and Replacement	G	***C***	***$850***	$6,500	$6,500	$6,500	$6,500	$26,850	$32,500	$59,350
	GF-000011										
11	Life Safety System Replacements	G	***C***	***$250***	$1,000	$1,000	$1,000	$1,000	$4,250	$5,000	$9,250
	GF-000009										
12	Miscellaneous Building Repairs	G	***C***	***$250***	$1,000	$1,000	$1,000	$1,000	$4,250	$5,000	$9,250
	GF-000008										
13	MPSTOC County Support for Renewal	X	***$2,560***						$0		$2,560
	2G08-008-000										

Project Cost Summaries

Infrastructure Replacement and Upgrades

($000's)

	Project Title Project Number	Source of Funds	Budgeted or Expended Through FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Total FY 2025 - FY 2029	Total FY 2030 - FY 2034	Total
14	MPSTOC State Support for Renewal	X	***$995***						$0		$995
	2G08-007-000										
15	Parking Lot and Parking Garage Improvements	G	***C***		$1,200	$1,200	$1,200	$1,200	$4,800	$6,000	$10,800
	GF-000041										
16	Roof and Envelope Repairs and Waterproofing	G	***C***		$1,500	$1,500	$1,500	$1,500	$6,000	$4,500	$10,500
	GF-000010										
17	Window and Exterior Door Replacement	G	***C***		$500	$500	$500	$500	$2,000	$2,500	$4,500
	2G08-006-000										
	Total		***$88,075***	**$3,000**	**$20,200**	**$20,200**	**$20,200**	**$20,200**	**$83,800**	**$100,500**	**$272,375**

Notes: Numbers in bold italics represent funded amounts. A "C" in the 'Budgeted or Expended' column denotes a continuing project.

Key: Source of Funds

B	Bonds
F	Federal
G	General Fund
S	State
U	Undetermined
X	Other