

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 2024 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:

Infrastructure Replacement and Upgrades

General Guidelines for Expected Service Life of Building Subsystems

Electrical

Lighting	20 years
Generators	25 years
Service/Power	25 years
Fire Alarms	15 years

HVAC

Equipment	20 years
Boilers	15 to 30 years
Building Control Systems	7 years

Conveying Systems

Elevator	15 to 25 years
Escalator	15 to 25 years
Conveying Technology	7 to 10 years

Plumbing

Pumps	15 years
Pipes and fittings	30 years
Fixtures	30 years

Finishes

Broadloom Carpet	7 years
Carpet Tiles	15 years
Systems Furniture	20 to 25 years

Site

Paving	15 years
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Roofs

Replacement	20 years
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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

Infrastructure Replacement and Upgrades

dedicate the value of one penny has not been included in the FY 2024 Advertised 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 approved the establishment of the Capital Sinking Fund as part of the *FY 2014 Carryover Review*. To date, a total \$66,144,221 has been allocated to FMD for critical infrastructure replacement and upgrade projects through the year-end allocation to the Sinking Fund. 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 and Gerry Hyland South County Government Center; building improvements at the Bailey's Community Center; 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, and building automation system upgrades at Fairfax Center Fire Station, Great Falls Library, Mott Community Center, Providence Community Center, and the Fire Training Academy.

Due to budget constraints in FY 2024, an amount of \$1,500,000 is included to address one of the top priority category F projects. In addition, an amount of \$6,100,000 was approved as part of the *FY 2023 Third Quarter Review* for a total of \$7,600,000 to support the most critical FY 2024 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, will address fire alarm system replacement, HVAC system upgrades, roof replacement, envelope renewal and site work. The table below provides specific project details of the projects that are funded in the FY 2024 Adopted Budget Plan and the *FY 2023 Third Quarter Review*.

Infrastructure Replacement and Upgrades

FY 2024 Infrastructure Replacement and Upgrade Program

Priority	Project Type	Facility	Category	Existing Conditions/Deficiencies	Estimate
Project funded as part of the FY 2024 Adopted Budget Plan:					
1	Building Envelope	Various Parking Garages (Partial funding associated with the first phase of a multi-year program).	F	<ul style="list-style-type: none"> Maintenance no longer feasible Leaks through openings and failed drainage systems resulting in flooding and ponding Deterioration and corrosion of existing structures Pedestrian and vehicle hazards 	\$1,500,000
Projects funded as part of the FY 2023 Third Quarter Review:					
2	Building Envelope	Various Parking Garages (Remaining FY 2024 funding associated with the first phase of a multi-year program)	F	<ul style="list-style-type: none"> Maintenance no longer feasible Leaks through openings and failed drainage systems resulting in flooding and ponding Deterioration and corrosion of existing structures Pedestrian and vehicle hazards 	\$500,000
3	Fire Alarm	Annandale Center	F	<ul style="list-style-type: none"> Maintenance intensive Parts difficult to obtain Elevated risk due to potential system malfunction 	\$100,000
4	HVAC	Pennino Building	F	<ul style="list-style-type: none"> Maintenance intensive and increased system failure Water leaks and air infiltration Parts are no longer available or are obsolete Increased utilities costs 	\$4,600,000
5	Roof	Fairfax County Government Center	F	<ul style="list-style-type: none"> Caulking has exceeded its life cycle Water leaks Lightning protection requires recertification Increased utilities costs 	\$500,000
6	Paving	Fairfax County Courthouse	F	<ul style="list-style-type: none"> Maintenance no longer feasible Deteriorating conditions Potential for damage to vehicles and injuries to pedestrians 	\$400,000
Total					\$7,600,000

In addition to the above projects identified as part of the FY 2024 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.
- 2. 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.
- 3. Capital Sinking Fund for Facilities (Countywide):** \$66,144,221 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.
- 4. 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.
- 5. Elevator/Escalator Renewal (Countywide):** This is a continuing project for the replacement and repairs of elevators throughout the County.
- 6. 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.
- 7. 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.
- 8. 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.

Infrastructure Replacement and Upgrades

9. **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.
10. **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.
11. **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.
12. **MPSTOC County Support for Renewal (Springfield District):** \$2,401,226 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.
13. **MPSTOC State Support for Renewal (Springfield District):** \$941,585 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.
14. **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.
15. **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.
16. **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 Number	Project Title	Source of Funds	Budgeted or Expended Through FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Total FY 2024 - FY 2028	Total FY 2029 - FY 2033	Total
1	ADA Compliance - FMD	G	C		\$500	\$500	\$500	\$500	\$2,000	\$2,500	\$4,500
	GF-000001										
2	Building Automation Systems	G	C		\$2,000	\$2,000	\$2,000	\$2,000	\$8,000	\$10,000	\$18,000
	GF-000021										
3	Capital Sinking Fund for Facilities	G	\$66,144						\$0		\$66,144
	GF-000029										
4	Electrical System Upgrades and Replacements	G	C		\$1,000	\$1,000	\$1,000	\$1,000	\$4,000	\$5,000	\$9,000
	GF-000017										
5	Elevator/Escalator Renewal	G	C		\$2,000	\$2,000	\$2,000	\$2,000	\$8,000	\$10,000	\$18,000
	GF-000013										
6	Emergency Generator Replacement	G	C		\$1,000	\$1,000	\$1,000	\$1,000	\$4,000	\$5,000	\$9,000
	GF-000012										
7	Emergency Systems Failures	G	C		\$2,000	\$2,000	\$2,000	\$2,000	\$8,000	\$10,000	\$18,000
	2G08-005-000										
8	Flooring Replacement	G	C						\$0	\$2,500	\$2,500
	2G08-003-000										
9	HVAC and Plumbing System Upgrades and Replacement	G	C		\$6,500	\$6,500	\$6,500	\$6,500	\$26,000	\$32,500	\$58,500
	GF-000011										
10	Life Safety System Replacements	G	C		\$1,000	\$1,000	\$1,000	\$1,000	\$4,000	\$5,000	\$9,000
	GF-000009										
11	Miscellaneous Building Repairs	G	C	\$1,500	\$1,000	\$1,000	\$1,000	\$1,000	\$5,500	\$5,000	\$10,500
	GF-000008										
12	MPSTOC County Support for Renewal	X	\$2,401						\$0		\$2,401
	2G08-008-000										

Project Cost Summaries

Infrastructure Replacement and Upgrades

(\$000's)

Project Number	Project Title	Source of Funds	Budgeted or Expended Through FY 2023						Total FY 2024 - FY 2028	Total FY 2029 - FY 2033	Total
				FY 2024	FY 2025	FY 2026	FY 2027	FY 2028			
13	MPSTOC State Support for Renewal 2G08-007-000	X	\$942						\$0		\$942
14	Parking Lot and Parking Garage Improvements GF-000041	G	C		\$1,200	\$1,200	\$1,200	\$1,200	\$4,800	\$6,000	\$10,800
15	Roof and Envelope Repairs and Waterproofing GF-000010	G	C		\$1,500	\$1,500	\$1,500	\$1,500	\$6,000	\$4,500	\$10,500
16	Window and Exterior Door Replacement 2G08-006-000	G	C		\$500	\$500	\$500	\$500	\$2,000	\$2,500	\$4,500
Total			\$69,487	\$1,500	\$20,200	\$20,200	\$20,200	\$20,200	\$82,300	\$100,500	\$252,287

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
G	General Fund
S	State
F	Federal
X	Other
U	Undetermined