

Countywide Infrastructure Replacement Requirements

PROGRAM DESCRIPTION

This section provides a compilation of the Infrastructure Replacement and Upgrade requirements associated with the various program areas contained in the Capital Improvement Program (CIP). Infrastructure Replacement and Upgrades is the planned replacement of building subsystems such as roofs, electrical systems, HVAC systems, plumbing systems and other infrastructure that has reached the end of its useful life. Without significant reinvestment in building subsystems, older facilities can fall into a state of deterioration and the maintenance and repair costs necessary to keep them functional will increase. One of the primary roles in facility management is to maximize the life of facilities, avoid their obsolescence and provide for a planned program of repairs, improvements and restorations. Infrastructure Replacement and Upgrades projects also include the reinvestment required for stormwater facilities and conveyance pipes, sewer lines, parks, trails, and bus shelters. It is important to support the reinvestment and maintenance of spaces, structures and infrastructure in a routine, scheduled, or anticipated fashion to prevent failure and/or degradation. More importantly, this type of infrastructure replacement and upgrade work can reduce the potential for the exorbitant cost and inconvenience associated with unanticipated failures and safety concerns.

LINK TO THE COMPREHENSIVE PLAN

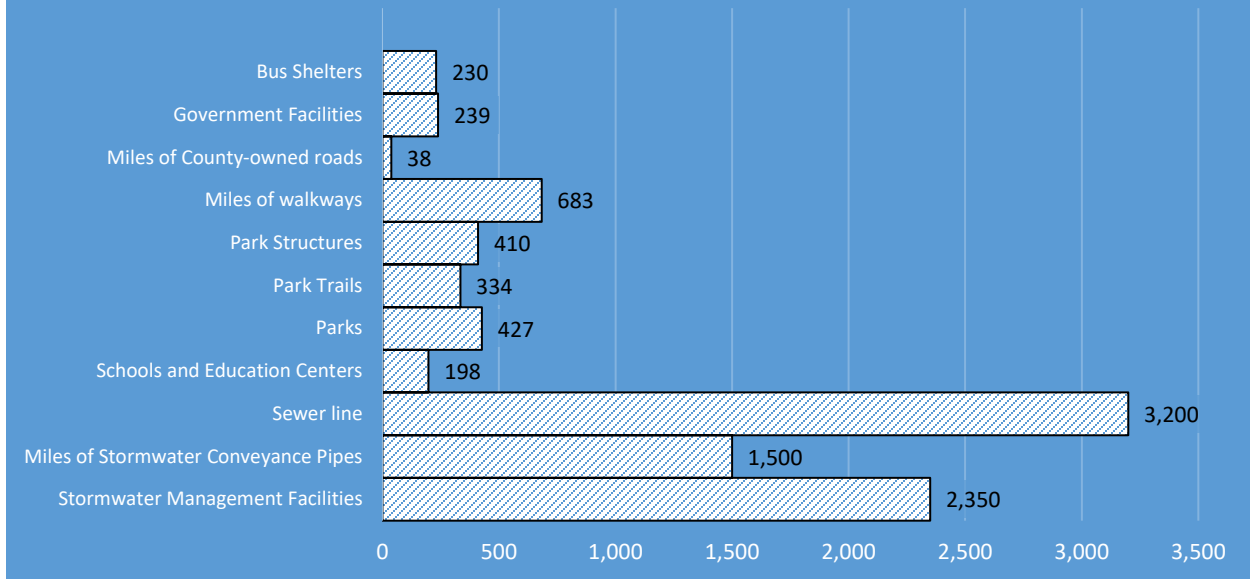
Fairfax County's Comprehensive Plan Policy Plan, Public Facilities Countywide Objective 2 states:

- ✓ Construct and maintain facilities in accord with expected levels of service objectives and fiscal limitations.

CURRENT INFRASTRUCTURE REPLACEMENT PROGRAM

As the County infrastructure ages, more frequent replacement and upgrades are required. Fairfax County's inventory of infrastructure includes not only government buildings, but housing units, miles of walkways and sewer pipe and many facilities such as residential facilities and fire stations that operate 24/7, 365 days per year. Infrastructure replacement and upgrades are prioritized based on life safety concerns, repair history and availability of replacement parts. The following chart displays some of the types of infrastructure that the County is responsible for maintaining.

INVENTORY OF MAJOR COUNTY FACILITIES



Infrastructure Replacement and Upgrades

In the Spring of 2014, the Board of Supervisors and the School Board approved the Infrastructure Financing Committee's Final Report and Recommendations regarding long-term maintenance plans for both the County and Schools. The Report contained many recommendations, one of which was to develop standard definitions. The Joint Board definition approved for Infrastructure Replacements and Upgrades is stated below:

INFRASTRUCTURE REPLACEMENT AND UPGRADES

Infrastructure Replacement and Upgrades refers to the planned replacement of building subsystems that have reached the end of their useful life. These systems, once replaced, will have an average life cycle of 20 years or more. Without significant reinvestment in facility 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. Currently these types of Infrastructure Replacement and Upgrades are funded within operational budgets or financed using municipal bonds. Examples of Infrastructure Replacement and Upgrades include:

- Roof Replacement
- Electrical System Replacement
- HVAC Replacements
- Plumbing Systems Replacements
- Replacement Windows
- Parking Lot Resurfacing
- Fire Alarm System Replacements
- Sprinkler Systems
- Emergency Generator Replacements
- Elevator Replacement

Infrastructure Life Cycles

For planning purposes, the County uses the following life cycle guidelines when projecting future replacement requirements. Some of the major work completed annually at County facilities includes the replacement of building subsystems: HVAC and electrical system repairs and replacement, roof repairs and waterproofing, carpet replacement, parking lot and garage repairs, window repairs/replacement, elevator/escalator repairs/replacement, fire alarm replacement and emergency generator replacement. Replacement of these building subsystems is based on not only age and lifecycle, but on repair history, safety concerns, and availability of replacement parts. The following chart includes the expected lifecycle of building infrastructure.

GENERAL GUIDELINES FOR EXPECTED SERVICE LIFE OF BUILDING SUBSYSTEMS	
ELECTRICAL	
Service/Power	25 years
Generators	25 years
Lighting	20 years
Fire Alarms	15 years
HVAC	
Equipment	20 years
Boilers	15 to 30 years
Building Control Systems	10 years
PLUMBING	
Pipes and fittings	30 years
Fixtures	30 years
Pumps	15 years
OTHER	
Elevator	25 years
Escalator	25 years
Systems Furniture	20 to 25 years
Roofs	20 years
Paving	15 years
Carpet Tiles	15 years
Broadloom Carpet	7 years

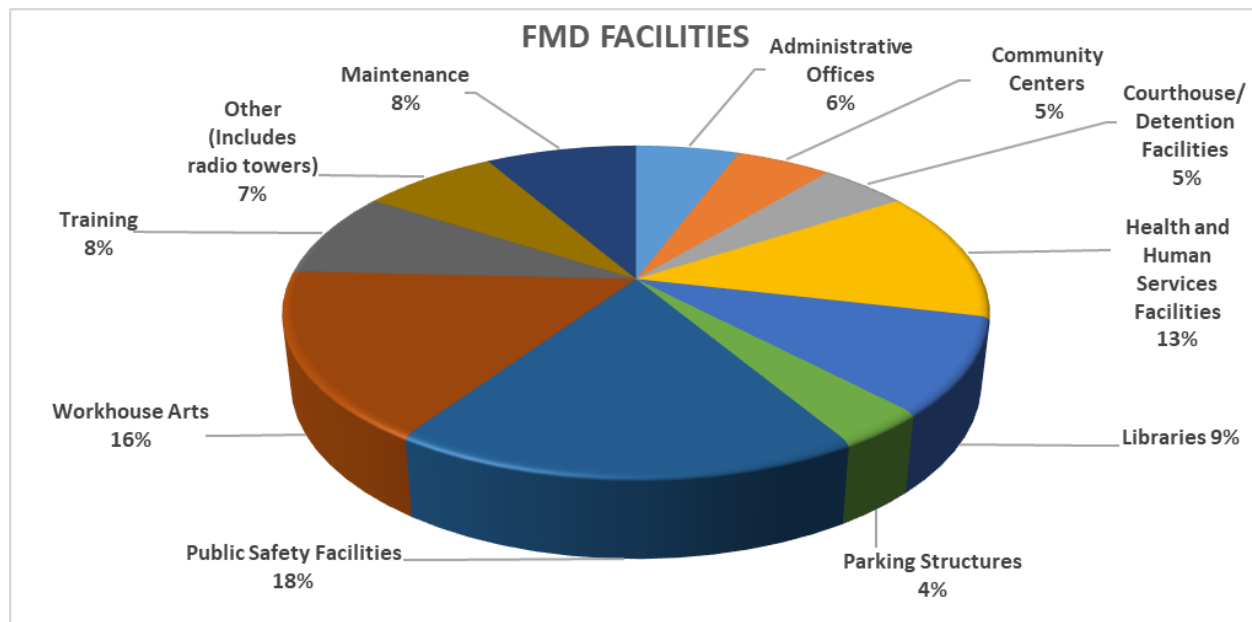
Program Area Requirements

The sections that follow are grouped by specific capital program areas. Each program area has identified slightly different methodologies for categorizing projects, measuring the facility conditions and identifying funding sources. Many program areas are assessed on an annual basis and some have developed multi-year plans for maintaining infrastructure.

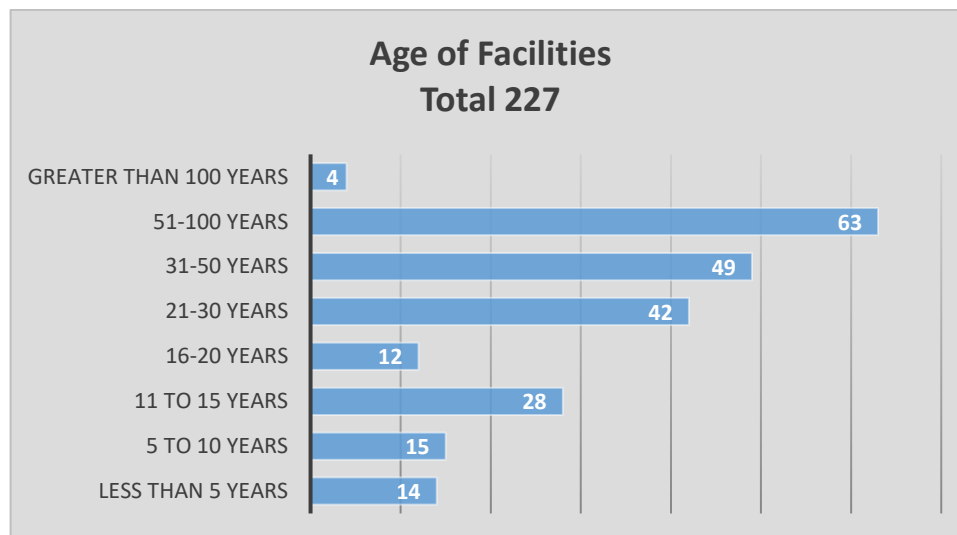
Each year, many County agencies prioritize and classify infrastructure replacement and upgrades projects into five categories. Projects are classified as Category F: urgent/safety related, or endangering life and/or property; Category D: critical systems beyond their useful life or in danger of possible 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. Other County organizations have other methodologies for prioritization of projects, including the Fairfax County Public Schools (FCPS). FCPS uses a Comprehensive Investment Capital Plan (CICP) which provides an assessment index (AI) to prioritize capital asset renewal projects, based on the capital asset's useful life and criticality.

County Facility Infrastructure Replacement and Upgrades - FMD

The Facilities Management Department (FMD) currently provides support for evaluating facilities, identifying problems, developing costs estimates, establishing priorities and performing the upgrades required to county-owned buildings. Fairfax County will have a projected FY 202 facility inventory of over 12 million square feet of space throughout the County (excluding schools, parks, and housing facilities). This inventory is expanding both with the addition of newly constructed facilities and with 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 major portion of this inventory of facilities is reaching a point where major reinvestments are required in the building subsystems. The chart below includes the types of facilities managed by FMD.



FMD is currently responsible for an inventory of 239 buildings. Of this amount, 12 facilities are maintained by FMD, but Infrastructure Replacement and Upgrade work is performed by another entity, such as the Department of Housing and Community Development. As the inventory of County facilities age, reinvestment in buildings and building equipment becomes critical. Currently, 70 percent of the buildings for which FMD has responsibility for infrastructure replacement and upgrades are over 20 years old. Per industry standards, most building systems require replacement at 20 to 25 years of age. Infrastructure replacement and upgrades extend the serviceability and life of a building and provide for the continued effective, efficient and safe operation of a building. These needs vary by building size and type, the extent of facility use, and maintenance management.



Many County facilities have outdated HVAC and electrical systems which are susceptible to failure or are highly inefficient energy users. Sites are identified and each individual project involves a two-step process normally requiring two years to complete design and construction. Roof repairs and waterproofing are conducted in priority order after an annual evaluation of the maintenance history. Based upon the results of that evaluation, critical requirements are prioritized, and a plan is established. Repairs and replacement of facility roofs are considered critical to avoid serious structural deterioration caused by water leaks. By addressing this problem in a comprehensive manner, a major backlog of roof problems can be avoided. Carpet replacement and parking lot resurfacing are evaluated annually and prioritized, based on the most critical requirements for high traffic areas. In addition, emergency generators and fire alarm systems are replaced based on equipment age, coupled with maintenance and performance history. Minor repairs and renovations are also conducted in priority order. These projects, usually generated by customer requests, are small projects which abate building obsolescence, improve facility efficiency and effectiveness and address major structural repairs.

Each year, FMD prioritizes and classifies infrastructure replacement and upgrades 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.

Acceptable levels of Infrastructure Replacement and Upgrades: For many years, the requirement for County infrastructure replacement and upgrades has been estimated at \$26 million per year. This estimate is based on collected assessment data, as well as industry standards (2 percent of the current replacement value). Based on current staffing levels, the complexity of many of the projects, and the timeline for completing replacement and upgrade projects, it is estimated that approximately \$15 million per year would be a good funding goal.

The following chart includes both funded and unfunded infrastructure replacement and upgrade requirements identified to date at County owned facilities. This list totals approximately \$124 million, of which \$8.98 million is proposed to be funded as part of the *FY 2020 Third Quarter or Carryover Review*. In addition, approximately \$52 million is associated with projects that are scheduled for renovation as part of the 5-10 year CIP period. As a result, the total requirement could be reduced to approximate \$72 million. However, this number is a moving target, as building systems and components can fail without notice and many buildings in the portfolio have not been assessed in over 15 years. In addition, many of facilities with category “F” and “D” upgrade projects identified may not be remediated for several years. The backlog requirements will continue to increase as capital components pass the end of their useful life.

Category	Proposed FY 2020 Third Quarter/Carryover	Unfunded	Total
Asphalt and Paving	\$0	\$6,991,144	\$6,991,144
Building Envelope	\$0	\$9,837,148	\$9,837,148
Electrical	\$0	\$18,943,218	\$18,943,218
Elevators and Escalators	\$40,000	\$5,120,298	\$5,160,298
Fire Alarms and Fire Suppression	\$200,000	\$9,737,874	\$9,937,874
Generators	\$0	\$1,266,132	\$1,266,132
HVAC & Building Automation	\$5,325,000	\$45,005,758	\$50,330,758
Interior & Exterior Repairs	\$1,685,000	\$5,445,945	\$7,130,945
Plumbing	\$0	\$7,747,304	\$7,747,304
Roof	\$1,130,000	\$3,684,476	\$4,814,476
Parking Garage	\$600,000	\$1,339,000	\$1,939,000
Total	\$8,980,000	\$115,118,297	\$124,098,297

Emergency System Failures Project: In addition to the planned replacement of building systems, unplanned emergencies often occur. As part of the *FY 2013 Carryover Review*, the Board of Supervisors approved an amount of \$5.0 million to support unexpected emergency system failures that occur at aging County facilities throughout the year. This project provides a source of funding for unforeseen emergency repairs and allows FMD to address projects not currently funded for which repairs are becoming more imminent. The Board makes every effort to replenish this fund annually as part of the Carryover Review in order to maintain this level of funding and address emergency repairs at facilities in the event of a major systems failure. Some examples of Emergency System Failure projects include: the replacement of a failed Uninterruptable Power Supply at the Jennings Courthouse, replacement of failed piping in the Pennino Building child care center kitchen, replacement of electrical service at West Ox Department of Vehicle Services Garage to correct safety issues, structural repairs to the Government Center cooling towers and platforms, replacement of a failed roof top unit at the Kings Park Library, and replacement of the failed/leaking roof at the Jennings Courthouse.

Fairfax County Public Schools (FCPS)

Fairfax County Public School (FCPS) maintains more than 27 million square feet of school buildings and office space. To date, FCPS has inventoried most major building systems, as well as the associated equipment, and developed analytics to identify life cycle expectations and optimize service by application of an effective maintenance and replacement strategy. Along with life cycle analysis, a process was established to assign a base condition and mission criticality rating to each asset. The base asset condition and criticality rating combine to provide an industry accepted asset assessment index (AI) value, which allows staff to prioritize resources for maintenance and replacement.

The core program provides the foundation to ensure proper Resource Stewardship but needs additional investment to engage a third party for comprehensive condition assessment of each asset. A recent review by the Office of the Auditor General recommended implementing a systemic assessment of all FCPS facilities over a 5-year period, or 20 percent of all facilities per year. FCPS met with the Facility Engineering Association (FEA) to review performing a comprehensive facility condition assessment and discuss similar programs that FEA provides to neighboring school divisions. For example, Montgomery County Public Schools initiated a program at the cost of \$.05 per square foot. Based on this pricing structure, it would cost an estimated \$1.35 million to implement at FCPS.

While critical building systems and components have been inventoried at most FCPS facilities, except for the schools currently under renovation there are other capital assets that remain to be inventoried such as; finished flooring, plumbing fixtures, building's exterior that will require capital investment to replace. Inventorying these assets will also increase existing financial requirements both in future needs and current deferred replacement backlog. Currently, the average asset age of capital assets inventoried is 17 years with 30 percent of these past their life cycle.

ASSET CATEGORY	TOTAL ASSETS	ASSETS PAST LIFE CYCLE	LIFE CYCLE (YEARS)	AVG ASSET AGE (YEARS)	EST REPLACEMENT COST
ADA ACCESSIBILITY	27	10	25	21	\$ 590,598
ATHLETIC INFRASTRUCTURE	470	79	24	15	\$ 71,683,186
ENERGY MANAGEMENT SYSTEM	213	60	17	13	\$ 169,263,229
FIRE SPRINKLER SYSTEM	3,440	1,056	25	19	\$ 17,403,286
HVAC INFRASTRUCTURE	24,884	7,452	22	17	\$1,074,180,034
PLAYGROUND SYSTEMS	247	129	15	15	\$ 34,139,495
PLUMBING SYSTEMS	2,020	491	18	12	\$ 27,148,025
ASPHALT/ PAVEMENT	1,298	409	22	16	\$ 54,796,026
MECHANICAL/ ELECTRICAL SYSTEMS	19,308	5,996	21	17	\$ 288,706,377
STRUCTURAL SYSTEMS	708	337	19	18	\$ 43,903,394
Grand Total	52,615	16,019	21	17	\$1,781,813,651

FCPS has a robust capital replacement program including renovations, new schools and capacity enhancements. Beginning in FY 2016, the County has transferred \$13.1 million annually to FCPS for capital infrastructure replacement in order to offset expenses previously funded by school bonds for facility infrastructure replacement. This \$13.1 million transfer supports infrastructure replacement in school system facilities such as HVAC, ADA, security, roof replacement, athletic infrastructure, life safety systems, and asphalt paving.

The following chart includes both funded and unfunded infrastructure replacement requirements throughout FCPS. Any renovation project that has been bid for construction has not been included below; however, infrastructure replacements associated with renovation projects planned over the 5-10-year period are included here as many of these building components will require replacement prior to scheduled renovations. FCPS' backlog requirements will continue to increase as capital components pass the end of their useful life.

SUMMARY-FCPS FY 2021 REPLACEMENT AND UPGRADE REQUIREMENTS

Fund	Funded FY21	Unfunded	Total
ADA-Facilities	\$1,250,000	\$0	\$1,250,000
Asphalt Capital	\$750,000	\$8,023,589	\$8,773,589
Athletic Capital	\$1,250,000	\$4,736,858	\$5,986,858
Electrical Systems	\$0	\$20,424,039	\$20,424,039
Health-Safety-ADA Equipment	\$0	\$19,133,905	\$19,133,905
HVAC Capital	\$3,625,000	\$108,992,458	\$112,617,458
Information Technology	\$2,000,000	\$0	\$2,000,000
Plumbing Systems	\$0	\$6,007,023	\$6,007,023
Roofing	\$3,625,000	\$0	\$3,625,000
Safety and Security	\$600,000	\$1,275,000	\$1,875,000
Total	\$13,100,000	\$168,592,872	\$181,692,872

Lack of adequate funding for facilities maintenance is allowing systems to run past the useful life cycle, is inefficient, and introduces a myriad of other risks and higher maintenance costs. The lack of funding support for a capital asset replacement program significantly increases the risk of critical equipment failure, which can result in the potential disruption of instructional time, though OFM strives to minimize both factors.

According to the National Research Council (NCR) report titled Committing to the Cost of Ownership: The Maintenance and Repair of Public Building "The appropriate level of Maintenance and Repair spending should be, on average, in the range of 2 to 4 percent of Current Replacement Value (CRV). FCPS' CRV is estimated at \$6.2 billion, but only receives funding totaling 0.4 percent of the CRV. This pattern of under-funded maintenance requirements has increased FCPS' deferred backlog at an average rate of \$10 million annually – (\$110 million in FY2016, \$128 million in FY2016, \$142 million in FY2018, \$157 million in FY2019 and \$162 million in FY2020). A review of FCPS 10-year cash flow of \$486,655,829 in End of Useful Life (EOUL) requirements. FCPS will need an increase in the Infrastructure Replacement Funding and FCPS Major Maintenance allocation to keep pace and become good stewards of the capital asset program prior to renovations.

Park Authority Infrastructure

The Park Authority has been working to address the backlog of reinvestment requirements at deteriorating facilities, athletic courts, pedestrian bridges, parking lots, and trails located throughout the County. The Park Authority is responsible for 410 structures at 427 Parks with 58 percent of this total inventory over 30 years old. In addition, the Park Authority owns a total of 23,584 park acres which equates to over 9.3 percent of the land mass of Fairfax County. In 2016, Parks Count, which is the Park Authority Needs Assessment was completed and provides recommendations for capital investments in the park system based on a body of data that the Park Authority will continue using for years. The total projected need for the ten-year period was \$939,161,000; that amount has been reduced by \$94,700,000 due to the approval of the 2016 Park Bond Referendum for a future need of \$844,461,000. The remaining needs of \$844,461,000 are broken out into three strategic areas in five-year increments.

- Critical, "Repairing what we have" makes the most of existing resources with the primary goal being for FCPA to maintain services. The plan addresses deferred maintenance at existing parks and facilities. The Critical funding need is \$91,892,000 over the next five years.
- Sustainable, "Upgrade Existing" looks at enhancing existing programs, beginning new alternative programs, or making other strategic changes that would require additional operational or capital funding. The Sustainable need for years 1-5 is \$107,945,000, the need for years 6-10 is \$172,350,000, for a total of \$280,295,000.
- Visionary, "New, Significant Upgrades" includes new and expanded facilities to fully meet needs desired by the community and ensure that the Park Authority remains a preferred provider of park and recreation amenities. The Visionary need is \$472,274,000 over the 10-year period, and if funding is made available in 1-5 years staff would accelerate visionary elements that include expansion and renovation of existing recreation centers and development of new athletic facilities.

Based on continual facility condition assessments, growing and shifting community needs and expectations, an ever-increasing amount of funding will be needed for capital maintenance and replacement of aging park assets in order to maximize the life of the existing facilities and to develop new facilities. The following table includes a total of \$148,503,671 in estimated Park Authority Category "F" projects and Category "D" projects combined. The FY 2021 estimate increased substantially over the FY 2020 estimate as more Category "C" items became Category "D" items. In addition, the Park Authority realigned their renewal projects to the categories as defined by FMD, resulting in additional Category "C" items being reclassified as "Category D" based on many subsystems categorized as beyond their useful life or in danger of possible failure. The impact of failed/failing/beyond end of useful life includes higher cost of operations, difficulty to repair and maintain, availability of spare parts, unhappy visitors, inefficient energy usage, and deteriorated/compromised structural systems and elements.

To further safeguard and align with County practices, the Park Authority established a Capital Sinking Fund within their Park Improvement Fund. Annual Net Revenue is designed to be transferred to this capital sinking fund to contribute to the funding of ongoing needs at revenue-generating sites. Recent analysis identified an unfunded annual need for lifecycle/capital renewal maintenance at revenue supported facilities. To date, the Park Authority has identified approximately \$19.9 million in category D and F projects associated with 9 RECenters. This critical funding element of sustainability cannot be realized through charging of fees. It is anticipated that this sinking fund will assist with funding for lifecycle/capital renewal maintenance of the revenue facilities.

Category	Total
Building/Structures	\$68,426,945
Recreation/Playgrounds	\$23,510,300
Trails	\$10,415,288
Roads & Parking Lots	\$11,382,166
Athletic Fields	\$22,690,000
Lighting and Irrigation Systems	\$3,178,000
Athletic Courts	\$5,870,168
Equipment	\$2,445,804
Fire and Security	\$585,000
Total	\$148,503,671

Athletic Field Infrastructure

The Athletic Field Program facilitates the development, maintenance, and replacement of athletic fields, including synthetic turf fields, throughout the County. The maintenance of athletic fields includes: field lighting, fencing, irrigation, dugout covers, infield dirt, aeration and seeding. These maintenance efforts improve safety standards, enhance playing conditions and increase user satisfaction. Athletic field maintenance is funded by the General Fund and is supplemented by an Athletic Services Fee. Annual funding of \$8,819,713 is included for the athletic field maintenance and sports program in FY 2021. This level of funding is supported by a General Fund transfer of \$7,344,713 and revenue generated from the Athletic Services Fee in the amount of \$1,475,000. Of the Athletic Services Fee total, \$800,000 will be dedicated to the turf field replacement program, \$275,000 will be dedicated to custodial support for indoor sports organizations, \$250,000 will be dedicated to maintenance of school athletic fields, \$75,000 will be dedicated to synthetic turf field development, and \$75,000 will partially fund the Youth Sports Scholarship Program. The Athletic Service Fee revenue is based a rate of \$5.50 per participant per season and \$15 for tournament team fees for diamond field users and indoor gym users and a rate of \$8.00 per participant per season and \$50 tournament team fees for rectangular fields users. The rate for rectangular field users is specifically to support the turf field replacement fund.

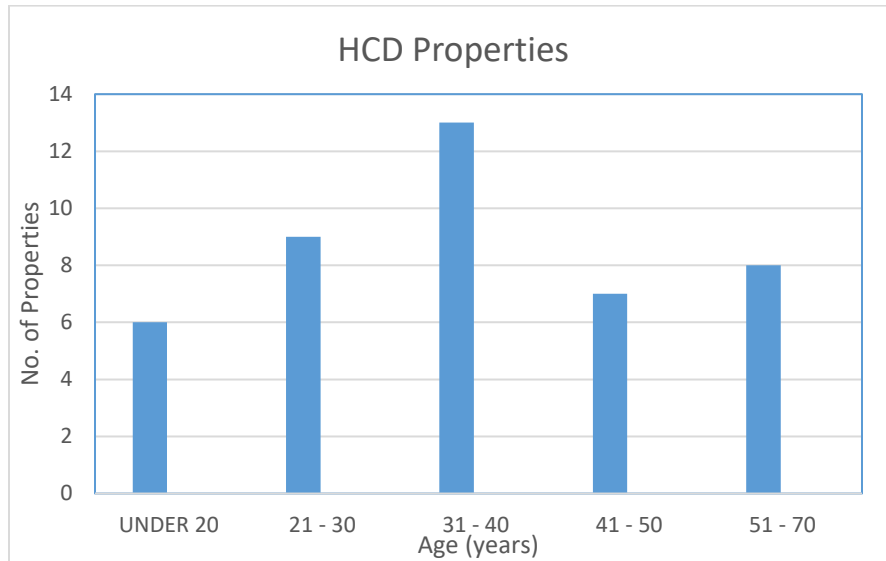
Maintenance efforts include: contracted services to improve the condition of 408 non-Park Authority athletic fields scheduled for community use at FCPS elementary schools, middle schools and centers; upgrades to athletic field lighting systems at middle and high schools; and the development and replacement of synthetic turf fields. A large portion of the program supports synthetic turf fields which allow for year-round use in most weather increasing playable hours, provide playing surfaces and conditions that are similar to grass fields, and eliminate the need for watering, mowing, and fertilizing. There are a total of 95 synthetic turf fields throughout the County, of which 24 are FCPS stadium fields and 71 are County park/FCPS non-stadium fields. Increased annual funding has been provide to begin to address the growing need for field replacement and to establish a 10-year replacement schedule. The first turf field replacement efforts began in 2013 for the first two fields developed. Most manufacturers provide an eight-year warranty for a properly maintained synthetic turf field; however, it is a generally accepted practice to assume a life expectancy of the synthetic turf field of no more than 10 years. The current projected replacement cost per field is approximately \$450,000.

The following chart outlines the 10-year Plan for turf field replacement at the current levels of both Athletic Service Fee revenue and General Fund support. The program includes the number of fields anticipated to be replaced per year and is fully funded through FY 2024. The level of funding support will need to be re-evaluated prior to FY 2025.

NCS - Turf Field Replacement Plan (Current Funding)										
10 year Replacement cycle	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Fund - Beginning Balance	\$777,498	\$698,703	\$1,648,703	\$1,698,703	\$2,548,703	\$1,298,703	-\$2,201,297	-\$1,401,297	-\$3,801,297	-\$4,751,297
Replacement Fund Contribution	\$2,250,000	\$2,250,000	\$2,250,000	\$2,250,000	\$2,250,000	\$2,250,000	\$2,250,000	\$2,250,000	\$2,250,000	\$2,250,000
Partner/Matching Funds	\$200,000	\$400,000	\$400,000	\$300,000	\$0	\$0	\$250,000	\$200,000	\$300,000	\$0
One-time Agency Contribution (from Application Fee)	\$171,205	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Total Available Funds	\$3,398,703	\$3,448,703	\$4,398,703	\$4,348,703	\$4,898,703	\$3,648,703	\$398,703	\$1,148,703	-\$1,151,297	-\$2,401,297
Estimated # of Turf Field Replacements Required	6	4	6	4	8	13	4	11	8	4
Estimated Cost	\$2,700,000	\$1,800,000	\$2,700,000	\$1,800,000	\$3,600,000	\$5,850,000	\$1,800,000	\$4,950,000	\$3,600,000	\$1,800,000
Year End Fund Balance	\$698,703	\$1,648,703	\$1,698,703	\$2,548,703	\$1,298,703	-\$2,201,297	-\$1,401,297	-\$3,801,297	-\$4,751,297	-\$4,201,297

Housing and Community Development (HCD) Facilities

HCD's housing inventory includes seventy-five residential properties, ten group homes, one mobile home park covering 115 land lots leased by individual owners and two office buildings. The inventory is significant, housing approximately 21,948 residents in 2,238 apartments, 551 townhouses, 10 group homes and 115 mobile home lots. As evidenced in the graph below 65 percent of the properties are 31 years or older. Many infrastructure replacement and upgrade projects have been deferred due to increasingly less funding from HUD. Some of the major items that have been deferred include replacement of central boilers, HVAC systems, roofs, electrical systems, flooring, windows, and resurfacing of parking lots. Deferral of these items results in inefficient utility usage as well as higher future maintenance costs.



The following table identifies the top 13 Housing facility priorities totaling \$1.5 million category "D" projects, which are scheduled to be funded in FY 2020. In addition, Housing and Community Development staff have identified an additional \$3.7 million category "C" projects that will require funding in FY 2021 totaling \$5.2 million.

INFRASTRUCTURE REPLACEMENT AND UPGRADE REQUIREMENTS: HOUSING						
PRIORITY	PROJECT TYPE	FACILITY	CATEGORY	EXISTING CONDITIONS/DEFFICIENCIES	ESTIMATE	Funding Status
1	Kitchen cabinets, appliances, flooring & vanities	Old Mill Gardens Apartments	D	Critical Systems beyond their useful life	\$122,533	FY 2020
2	Kitchen cabinets and counter tops, bath vanities	Barros Circle Townhomes	D	Critical Systems beyond their useful life	\$94,417	FY 2020
3	Seal & stripe parking lots, tub surrounds	Ragan Oaks Apartments	D	Critical Systems beyond their useful life	\$153,000	FY 2020
4	Point brick veneer, Flooring	Rosedale Manor Apartments	D	Critical Systems beyond their useful life	\$36,800	FY 2020
5	Replace doors, HVAC	Audubon Apartments	D	Critical Systems beyond their useful life	\$54,341	FY 2020
6	Water heaters, HVAC, Flooring	Waters Edge Townhomes	D	Critical Systems beyond their useful life	\$50,772	FY 2020
7	Replace water heaters	Westford Townhomes	D	Critical Systems beyond their useful life	\$90,250	FY 2020
8	Water heaters, appliances & electrical panels	The Atrium Apartments	D	Critical Systems beyond their useful life	\$179,988	FY 2020
9	Replace roofs, water heaters, HVAC, kitchen cabinets, appliances & flooring	Barkley Square Townhomes	D	Critical Systems beyond their useful life	\$33,840	FY 2020
10	Replace refrigerators	Briarcliff Townhomes	D	Critical Systems beyond their useful life	\$5,967	FY 2020
11	Kitchen cabinets, flooring & electrical panels	Colchester Condominiums	D	Critical Systems beyond their useful life	\$41,470	FY 2020

12	HVAC, kitchen cabinets, flooring & appliances	Greenwood Apartments	D	Critical Systems beyond their useful life	\$570,661	FY 2020
13	Appliances	Kingsley Park Townhomes	D	Critical Systems beyond their useful life	\$58,870	FY 2020
	Total				\$1,492,909	
14	Replace doors	The Atrium Apartments	C	Life cycle repairs where repairs are no longer cost effective	\$86,012	FY 2021
15	Seal & stripe parking lot, point & tuck brick veneer, replace siding, paint exterior, replace HVAC	Old Mill Gardens Apartments	C	Life cycle repairs where repairs are no longer cost effective	\$729,770	FY 2021
16	Replacing gas fired water heaters, kitchen cabinets and countertops/sinks and hard surface flooring	Reston Town Center Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$47,176	FY 2021
17	Seal & stripe parking lots, replace sliding glass doors, water heaters, HVAC, appliances, vanities & flooring	Robinson Square Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$432,364	FY 2021
18	Replace bathroom exhaust fans, kitchen cabinets, flooring, appliances & vanities (completed by PIMD - Keep)	Shadowood Condominiums	C	Life cycle repairs where repairs are no longer cost effective	\$111,203	FY 2021
19	Seal & stripe parking lot, replace fencing, playground equipment, siding, roofs, Paint exterior	Tavener Lane Apartments	C	Life cycle repairs where repairs are no longer cost effective	\$162,138	FY 2021
20	Roof replacement	The Green Apartments and Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$135,000	FY 2021
21	Seal & stripe parking lot, repair/replace walkways & replace siding	The Park Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$73,341	FY 2021
22	Replace HVAC	Villages of Falls Church Condominiums	C	Life cycle repairs where repairs are no longer cost effective	\$21,804	FY 2021
23	Replace gutters, sliding glass doors, entrance doors, roofs, kitchen cabinets, appliances, vanities & tub surrounds	Waters Edge Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$53,505	FY 2021
24	Seal & stripe parking lots, repair/replace walkways, HVAC, kitchen counter tops, flooring, appliances & vanities	Westford Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$423,059	FY 2021
25	Flooring & appliances	Audubon Apartments	C	Life cycle repairs where repairs are no longer cost effective	\$60,993	FY 2021
26	In-Unit HVAC and Replacing Kitchen Floor covering	Briarcliff Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$17,472	FY 2021
27	Replace HVAC	Colchester Condominiums	C	Life cycle repairs where repairs are no longer cost effective	\$62,356	FY 2021
28	Seal & Stripe parking lots, repair/replace walkways, paint exterior, replace roofs	Greenwood Apartments	C	Life cycle repairs where repairs are no longer cost effective	\$1,047,568	FY 2021
29	Seal & stripe parking lots, repair/replace walkways, replace playground equipment, entrance doors, water heaters, flooring	Kingsley Park Townhomes	C	Life cycle repairs where repairs are no longer cost effective	\$276,445	FY 2021
	Total				\$3,740,206	
	Grand Total				\$5,233,115	

Wastewater Infrastructure

There are 3 major infrastructure systems, within the Wastewater System: Pump Stations, the Noman Cole Pollution Control Treatment Plant, and Collections System. In any given year, the amount programed for infrastructure replacement and upgrades in each area may vary based on specific project schedules, however; staff is attempting to manage the system on a programmatic basis over a ten-year period.

There are 63 wastewater pump stations. Each station typically has multiple pumps for peak flows and emergency backup, motors associated with the pumps, a backup generator, a force main, electrical control equipment, communication equipment for monitoring and remote operation, and a building or other housing structure. County staff monitor the condition of each asset at each pump station and attempt to schedule rehabilitation or replacement before failure. Each pump station is also monitored as a unit, and prior to replacing a major component, an in-depth review is completed to determine if rehabilitation or replacement of other component systems are required at the same time. The current 10-year financial plan (FY 2021-FY 2030) includes an average \$12.9 million per year for reinvestment and rehabilitation of these facilities. This component of the system is currently fully funded.

At the Noman Cole Treatment Plant, there are over 4,000 assets monitored making up 32 major operating systems such as Odor Control, Primary Treatment and others. Each operating system consists of many components such as pumps and concrete tanks. Redundancy is built into all critical systems to allow for maintenance. The condition of each component is monitored during routine maintenance checks as well as by the age of system. Based on age and condition, reinvestment schedules are determined. Currently in the 10-year plan there is an average of \$74.5 million per year programmed for treatment plant capital improvements, the majority is for replacement and rehabilitation. Based on current information, the appropriate reinvestment amounts are being funded.

The Collection system consists of approximately 3,200 miles of pipe and 94,000 manholes. Approximately 70 percent of the system is 30 years or older. In the late 1990s the County began a significant reinvestment program by relining existing pipes utilizing a trenchless technology called cured-in-place-pipe (CIPP). Approximately 20 percent of the system has been rehabilitated utilizing this technology, primarily on the smaller, 8" to 15" lines. In recent years, the program has been expanded to include inspection and rehabilitation of the larger trunk lines. The 10-year financial plan includes a continual increase in funding for collection system rehabilitation with an average of \$46.4 million per year. With this gradual ramp up and based on current information, the appropriate reinvestment amounts are being funded. Failures in either the collection system, pump stations or treatment plant will likely result in discharges of untreated raw sewage into basements or streams, therefore, all three of these systems are considered critical. As a result, the wastewater rates are reviewed each year and the 10-year financial plan is reviewed and updated to ensure adequate funds are programed to safely maintain and operate the systems.

At this time, based on current information, there is not a funding gap to safely operate the wastewater systems. Annual infrastructure replacement and upgrades throughout the Wastewater system are reflected below:

INFRASTRUCTURE REPLACEMENT AND UPGRADE REQUIREMENTS: WASTEWATER FACILITIES						
PRIORITY	PROJECT TYPE	FACILITY	CATEGORY	EXISTING CONDITIONS/DEFFICIENCIES	ESTIMATE	Funding Status
1	Pump Stations	Countywide	C	Projected lifecycle is 30 years	\$12,900,000	Annual Requirement
2	Treatment Plan Improvements	Noman Cole Pollution Control Plant (NCPCP)	C	Projected lifecycle is 30 years	\$74,497,000	Annual Requirement
3	Gravity Sewer Lines	Countywide	C	Projected lifecycle is 50 to 75 years	\$46,380,000	Annual Requirement
	Total				\$133,777,000	

It should be noted that the Sanitary Sewer System also has an established Capital Reinvestment Reserve which is intended to address both anticipated and unanticipated increases within the Capital Improvement Program. This reserve provides for significant rehabilitation and replacement of emergency infrastructure repairs. A reserve of 3.0 percent of the five-year capital plan is consistent with other utilities and is recommended by rating agencies. Based on the total five-year capital plan, an amount of \$25 million would be required to reach 3.0 percent. The Sanitary Sewer System is currently maintaining a reserve of approximately \$27 million.

Stormwater Infrastructure

There are two major infrastructure systems associated with the stormwater program, the conveyance system including pipes, manhole inlets and open channels; and the management facilities including bio retention, infiltration, wet and dry ponds, porous pavements, manufactured devices and other items used to improve water quality or manage water quantity. There are currently 1,500 miles of pipes and improved channels, and approximately 69,000 manholes and inlets. The pipes range in size from 12 to 84 inches and are made with reinforced concrete, corrugated metal, or plastic. The life of the system varies with the material type and the original construction practices, but the general estimated lifecycle is 50-75 years. A study indicated the County should invest an estimated \$16 million per year in rehabilitating or replacing the existing system on about a 70-year cycle. In FY 2020, this program is funded in the amount of \$9.0 million.

The County currently maintains approximately 2,350 stormwater management facilities ranging from small rain gardens to large flood control dams. Reinvestment projects vary in scope and include replacement of plant materials as part of the treatment process for dredging the larger lakes and ponds. Because many of these facilities are newer and the routine and life cycle operating procedures are still being developed, a good life cycle cost model does not exist. The county has prepared estimates based on recent dredging experiences as well experiences with "green" infrastructure facilities and estimates an annual program expense of \$16.6 million. Because the plant material is an active component of the "Green" infrastructure and because routine maintenance relates directly to the life and function of the facility the \$16.6 million estimate includes both annual operating expenses as well as capital expenses such as dredging and dam repair. In FY 2021, this program is funded in the amount of \$11.0 million.

An ultimate rate of \$0.0400 per \$100 of assessed value had been estimated to be required to fully support the stormwater program in the future; however, staff is currently evaluating the long-term requirements for an expanded program. Some of the additional requirements under evaluation include debt service to support the Board's approval of the dredging of Lake Accotink, the anticipation of additional flooding mitigation requirements, and strengthening the role and financial support for the implementation of stormwater requirements associated with Fairfax County Public Schools sites under renovation. This enhanced program may require incremental changes to the rate over time and may result in a higher ultimate rate to fully support the program. Staff will be evaluating these requirements, as well as the staffing to support them, and analyzing the impact of increased real estate values and revenue projections. Staff will return to the Board of Supervisors at a future Budget Committee meeting to define the needs and opportunities for FY 2022 and beyond.

While staff continues to further evaluate the long-term requirements for the Stormwater Program, the FY 2021 rate is proposed to remain the same as the FY 2020 Adopted Budget Plan level of \$0.0325 per \$100 of assessed value. Actual revenue collected in recent years has been higher than projected as a result of increases in property values throughout the County. Based on capital project costs and projected revenues, no rate increase is recommended for FY 2021. It is anticipated that in the next several years, incremental rate increases will be required based on continued growth of stormwater facilities and infrastructure that must be inspected and maintained by the county, additional requirements in the new 2020 Municipal Separate Storm Sewer System (MS4) permit and several of the enhancements noted above. On an annual basis, staff will continue to evaluate the program, analyze future requirements and develop Stormwater operational and capital resource needs.

Annual infrastructure replacement and upgrades for the County's Stormwater Facilities are reflected below:

INFRASTRUCTURE REPLACEMENT AND UPGRADE REQUIREMENTS: STORMWATER FACILITIES						
PRIORITY	PROJECT TYPE	FACILITY	CATEGORY	EXISTING CONDITIONS/DEFFICIENCIES	ESTIMATE	Funding Status
1	Conveyance System	65,000 structures and 1,500 miles of pipes	D	Lifecycle is 50-75 years	\$16,000,000	Annual Requirement
2	Stormwater Management Facilities	2,350 county facilities and 4,900 private facilities including 20 state regulated dams	C	Projected lifecycle is 35 years	\$16,600,000	Annual Requirement
	Total				\$32,600,000	

Revitalization Infrastructure

The five geographical areas in the County that are defined as Commercial Revitalization Districts (CRDs) include: Annandale, Baileys/Seven Corners, McLean, Route 1 and Springfield. These five CRDs total approximately 821,521 square feet. Both routine maintenance (trash removal, quality control inspections, grass mowing, weeding, edging, pruning, mulching, pest control, leaf removal) and non-routine capital improvement projects are conducted annually. The non-routine improvements in the CRDs include streetscape improvements consisting of replacing/repairing items including, but not limited to: pavers, sidewalks, street furnishings, signage, landscaping and bus shelters. Several of these non-routine improvement projects have been initiated in the CRDs with the sinking fund allocation and have been focused on sidewalk and bus shelter repairs. The Route 50 Pedestrian Bridge Stairwell Redesign and Bland Street Public Private Partnership projects are currently underway and include infrastructure repairs consisting of tree box replacements, brick paver repairs, and a stairwell redesign.

Revitalization area maintenance includes both routine and non-routine maintenance in five major commercial revitalization areas (Annandale, Route 1, Springfield, McLean and Baileys Crossroads) and provide landscaping maintenance associated with the Tyson's Corner Silver Line area. The goal of this program is to provide an enhanced level of infrastructure and right-of-way features in these urbanizing areas to facilitate pedestrian movements and create a "sense of place." Routine maintenance in the commercial revitalization areas currently includes grass mowing, trash removal, fertilization, mulching of plant beds, weed control, plant pruning, and snow removal at commuter facilities. Non-routine maintenance includes asset maintenance or replacement (e.g., trees, plants, bicycle racks, area signs, street furniture, bus shelter, drinking fountains) to sustain the overall visual characteristics of the districts. Maintenance along the Silver Line also includes the upkeep of 27 water quality bioretention facilities under elevated tracks located in VDOT right-of-way. Typical maintenance for the facilities includes litter and sediment removal, mulching, vegetation care, and structural maintenance. An increase of \$100,000 to the FY 2021 proposed funding level is anticipated to be included in the *FY 2020 Third Quarter Review* to support the costs associated with maintenance of Phase 2 of the Silver Line to include the new Innovation Station and Herndon parking garages.

Staff is working to enhance the appearance, functionality and sustainability of the pedestrian environment in CRDs and to prevent CRD infrastructure and aesthetic improvements from falling into a state of disrepair. Goals include expanding the areas eligible for enhanced levels of service for landscaping, litter control and streetlight inspections. In addition, the plan includes routine street sweeping and the repair and replacement of sidewalks and curbs for areas within the CRD.

Transportation Infrastructure

The County maintains an assortment of transportation infrastructure that is beyond the service levels provided by VDOT. Some of these include bus shelters, street name signs, trails and sidewalks that provide pedestrian connections, and roads and service drives not maintained by VDOT.

Bus Shelters:

The County maintains 230 bus shelters. The infrastructure replacement and upgrade program focuses on repairs to damaged shelters. A fully funded program would include cleaning, trash collection and reinvestment. Some of the cleaning and trash collection is provided by the Office of the Sheriff's Community Labor Force. Annual funding is used to replace damaged panels and replace shelters destroyed by vandalism or accidents. If there is not adequate funding to perform these tasks, damaged shelters are removed until funding is identified. Some shelters are in need of replacement and a sustainable program to replace shelters on a 20-year cycle estimating \$10,000 per shelter, is \$140,000. This level of funding would replace 14 shelters per year.

Street Signs:

As part of the 911 emergency system all roads are required to have a name and street sign to assist emergency response personnel. These signs are not maintained by VDOT and are the responsibility of the County. There are approximately 40,000 signs at 20,000 intersections in the current inventory. The county currently replaces street signs only when they are damaged beyond repair. Over time signs lose their reflectivity and become more difficult to read at night. It is estimated that if the signs are replaced on a 20 year cycle the average annual capital cost would be \$665,000.

Walkways:

The County manages the infrastructure replacement and upgrades of 683 miles of walkways and 78 pedestrian bridges valued at an estimated \$220 million. Projects are prioritized based on condition as well as pedestrian usage. In 2013, a Rinker Study was conducted in order to build an accurate inventory and condition assessment of County walkways and revealed that there were approximately 10 miles of trails in extremely poor condition requiring \$3 million in initial reinvestment. The Sinking Fund allocation has provided \$5.5 million to date for reinvestment in these most critical trail needs and continues to provide for trails that have since been identified as deteriorating. The Rinker Study did not include an assessment of pedestrian bridges and sinking fund allocations have enabled some progress in this area. However, pedestrian bridges are being inspected in accordance with National Bridge Inspection Standards to determine repair needs. Since 2013, sidewalk and trail repair and replacement has been on going. A re-assessment of trails and sidewalks is in the planning stages, using current technology and computer software. In addition, a 5-year plan was developed identifying annual emergency funds to increase over time to a level of \$800,000 by FY 2021. Annual critical repairs include the correction of safety and hazardous conditions such as damaged trail surfaces, retaining wall failures, handrail repairs, and the rehabilitation of bridges. It is anticipated that \$100,000 will be included for this program as part of the *FY 2020 Third Quarter Review*, to increase the FY 2021 program to \$800,000. Assuming an average service life of 50 years for concrete sidewalks and 25 years for asphalt and bridges, a fully funded reinvestment program is estimated at \$5.4 million annually. In the last several years the sinking fund program has more than doubled the amount being invested in walkways and bridges.

County-Owned Roads:

The County is responsible for emergency safety and road repairs to 38 miles of County-owned roads, service drives and County-owned stub streets which are currently not accepted in the Virginia Department of Transportation (VDOT) highway system for maintenance. This infrastructure is valued at over \$230 million. In 2015, a Rinker Study was conducted in order to build an accurate inventory and condition assessment of County-owned roads and service drives and identified an amount of \$4 million in reinvestment funding required for the roadways with the most hazardous conditions. The Sinking Fund allocation has provided \$4.9 million to date for reinvestment in the most critical needs and continues to provide for roads that have been identified as deteriorating. In addition, a 5-year plan was developed identifying annual emergency funds to increase over time to a level of \$900,000 by FY 2021. Annual funding supports pothole repair, drive surface overlays, subgrade repairs, curb and gutter repairs, traffic and pedestrian signage repairs, hazardous tree removal, grading, snow and ice control, minor ditching and stabilization of shoulders, and drainage facilities. Based on the pace of spending to date and project requirements, funding of \$800,000, consistent with the FY 2020 Adopted Budget Plan, has been included in FY 2021.

Summary of Transportation Infrastructure	
Program Area	Annual Amount
Bus Shelters	\$140,000
Street Signs	\$665,000
Walkways	\$5,400,000
County-owned Roads	\$6,200,000
Total	\$12,405,000

Capital Sinking Fund

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. One of the components of the Final IFC Report included support for a capital sinking fund which would be populated each year as part of the Carryover Review based on 20 percent of the available year end balances. Funding was to provide for infrastructure replacement and upgrades, such as replacement roofs, electrical systems, HVAC and other facility requirements. The Board of Supervisors first approved the establishment of the IFC recommended Capital Sinking Fund as part of the *FY 2014 Carryover Review*. The Board of Supervisors also approved the allocation of the total sinking fund based on specific percentages for each infrastructure area, including: 55 percent for FMD, 20 percent for Parks, 10 percent for walkways, 10 percent for County roads and service drives, and 5 percent for revitalization. As part of the *FY 2018 Carryover Review*, the Board approved a one-time change to the allocation based on expenditures to date and work in progress. This change allocated additional funds to walkway reinvestment in FY 2018 to address this growing need. These funds support prioritized critical infrastructure replacement and upgrades projects throughout the County. The following table includes the allocation of Capital Sinking funds to date.

Program Area	Total Allocated to Date
FMD	\$27,120,573
Parks	\$9,862,026
Walkways	\$5,512,585
County Roads	\$4,931,012
Revitalization	\$1,883,932
Total	\$49,310,128

The breadth of the infrastructure upgrades and benefits of the sinking fund allocations can be seen in significant accomplishments throughout the County. Many projects have been initiated or completed in all of the program areas. Some examples of Capital Sinking Fund projects follow:

Athletic Court Repairs



Trail Repairs

Before



After



Window Replacement

Before



After

