



Prince William County

PUBLIC SCHOOLS

Providing A World-Class Education

®

FY 2020-25 Future Ready Technology Improvement Plan

January 15, 2020

Version 3.0

Innovative Learning and Engagement

Enabling learning and engagement anytime, anywhere on any device.



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*Notes: 1. All Plan Overviews and Objectives are based on the FY 2016 Budgeting for Results Plan.
2. FY 20 current year expenses are shaded in gray on all charts and are included for reference.*

Learning and Business Information Technology Systems Support

Plan Overview: Data Center/School Upgrades/Replacements

This section includes information regarding the operational, technical, and functional support of the Enterprise Data Centers, backup/restore services, disaster recovery services, and authentication services that are critical to delivering support to students, teachers, parents and staff.

Plan Objectives

Through the PWCS Technology Improvement Plan, data center systems, servers, and backups need to be replaced, refreshed, and maintained on a regular technology improvement plan schedule. This equipment is critical in maintaining and supporting core infrastructure and ensures instructional and business systems are able to access the data and resources needed to support teaching and learning and to perform other critical functions and/or provide data/communications to stakeholders.

The plan will meet the following objectives:

- Replace backup infrastructure to not over exceed capacity which will mean less downtime for school and core business functions Divisionwide.
- Upgrade network infrastructure in the data center on a regular maintenance schedule of five years.
- Upgrade the disaster recovery plan and develop a strategy that includes evaluating the effectiveness of using Independent Hill Complex (IHC) as a disaster recovery site.
- Maintain some physical servers and replace every five years for applications not supported in a virtualized environment.
- To make more efficient use of hardware and environmental resources, invest and maintain virtualization annually.

Data Center/School Upgrades/Replacements – listed in order of priority						
	FY20	FY21	FY22	FY23	FY24	FY25
Pure Storage Infrastructure Replacement				\$450,000		
Physical Data Center SQL Servers (2 per year)	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
AIX Finance Servers	\$500,000					

Data Center/School Upgrades/Replacements – listed in order of priority						
	FY20	FY21	FY22	FY23	FY24	FY25
Disaster Recovery/Iron Mountain Move/ IHC Data Center Upgrade	\$200,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
School Server and UPS Replacement	\$675,000					\$675,000
Server Virtualization	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
Backups			\$400,000			
Total	\$1,470,000	\$195,000	\$595,000	\$645,000	\$195,000	\$870,000

Network Services and Architecture

Plan Overview: VoIP/LAN/WLAN and Bandwidth Upgrades

This section includes information regarding the installation, management, and operational support for the PWCS I-Net wide area network (WAN) including the local area networks (LANs), wireless area networks (WLANs), and voice over internet protocol (VoIP) throughout the School Division. Upgrades to WAN, LANs, WLANs, and VoIP will improve network access and internet speeds Divisionwide and allow for enhanced instruction.

Plan Objectives

Through the PWCS Technology Improvement Plan, Network Services provides bandwidth and VoIP/LAN/WLAN upgrades Divisionwide. Locations are upgraded based on the end-of-life of their current phone system and in correlation, when possible, with PWCS facilities renovations and additions.

The plan will meet the following objectives:

- Increase bandwidth to meet Federal ConnectEd initiative and the Virginia Department of Education (VDOE) and Education Superhighway recommendations of 1 Mbps per student.
- Upgrade and maintain network infrastructure (Local Area Network, Wireless Local Area Network, and VoIP) Divisionwide for media-rich technology use.

* Every student has a technology-enabled learning experience during the school day.

- * Video and other rich media are used as a crucial part of the everyday learning experience.

**Note: This will have an associated increase of \$42,000 in internet service provider fees in FY22 and FY23.*

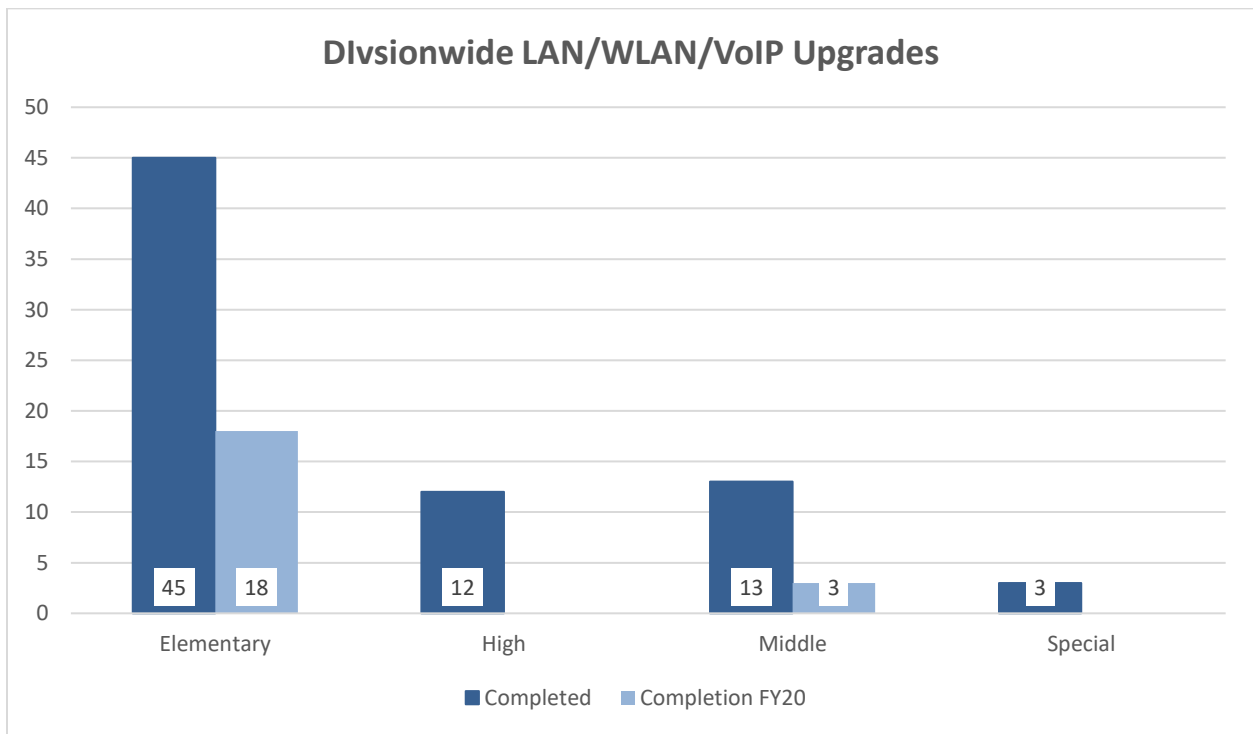
LAN/WLAN/VoIP School Upgrades and Replacements – listed in order of priority						
	FY 20	FY21	FY22	FY23	FY24	FY25
Bandwidth Increase (Iron Mountain/IHC)		\$100,000* 10Gb	\$200,000* 10Gb			
Network Infrastructure Upgrades	\$2,394,000	\$6,350,000	\$6,025,000	\$6,225,000	\$6,050,000	\$6,000,000
Maintain Wireless Trailers	\$275,000	\$275,000	\$275,000	\$275,000	\$275,000	\$275,000
Replacing UPS in LAN Closets	\$500,000	\$500,000				
**5G Build Out			TBD			
Upgrade existing VoIP Equipment		\$432,892				
Total	\$3,169,000	\$7,557,892	\$6,300,000	\$6,500,000	\$6,325,000	\$6,275,000

*** Note: 5G – Phase IV: 5g – Build out infrastructure in the schools for cellular service to work (would need repeaters/some type of solution)*

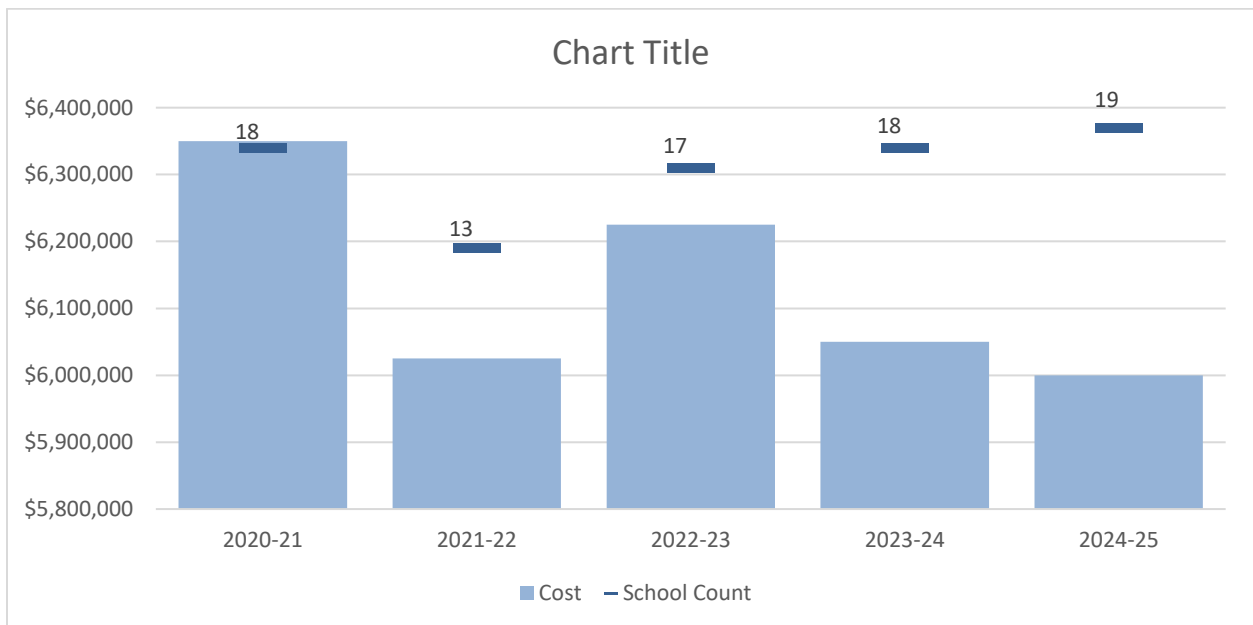
Plan Scope

LAN, WLAN, and VoIP Upgrades

The following chart shows Divisionwide LAN/WLAN/VoIP upgrades that have been completed and are in progress for FY20. **At the end of FY20, all school’s infrastructure Divisionwide will have been upgraded.**



All schools will be completed by FY20. FY21 LAN/WLAN/VoIP operations and maintenance will return to the initial schools that were upgraded over six years ago.



Information Security Services

Plan Overview: Security Infrastructure/Replacements

This section includes information regarding information security operations to provide confidentiality, integrity, and availability for all PWCS network and computer system assets. Information Security Services supports the design, implementation, management, and maintenance of all information security solutions Divisionwide to identify and prioritize security risks. The PWCS network is FERPA, CIPA and COPPA compliant ensuring the protection of student and staff data and their safety in our online environment.

Plan Objectives

Through the PWCS Technology Improvement Plan, Information Security Services provides firewalls, intrusion prevention systems, DNS, email/spam filtering, forward/reverse proxies, content filtering, malware and patch management, auditing, and security management.

The plan will meet the following objectives:

- Provide for enterprise wireless management, network system identification, access control, and segmentation.
- Meet future ready bandwidth requirements and replace end-of-life hardware with additional firewall, VPN, and intrusion prevention.
- Incident and event correlation solution to log and capture event data through SIEM.
- Decrypt encrypted network traffic and actively pass traffic to proxy, firewalls, and intrusion prevention systems.
- Analyze network traffic including spam, websites, and executables in a protected environment and detonate payloads in real-time to ensure malicious content does not get downstream to critical systems.

Security Infrastructure/Replacements						
	FY20	FY21	FY22	FY23	FY24	FY25
Firewall Upgrades to Support Increased Bandwidth		\$400,000			\$400,000	
Replacing Reverse Proxies (load balancer)	\$40,000		\$40,000		\$40,000	

Security Infrastructure/Replacements						
	FY 20	FY21	FY22	FY23	FY24	FY25
VPN Firewall Appliance	\$150,000					
KLC IPS	\$150,000					
Total	\$340,000	\$400,000	\$40,000	\$0	\$440,000	\$0

Note: The TIP has been modified to reflect the results of the FY 2016 internal audit.

Divisionwide Systems

Plan Overview: Replacement of Divisionwide Enterprise Systems

This section includes information regarding human resource management, financial, operational, technical, and functional support for applications within the School Division. These systems provide technical support for data analysis reporting, development, maintenance, hiring, and payroll.

Plan Objectives

Through the PWCS Technology Improvement Plan, Information Technology Services will replace PowerSchool student information system due to end-of-life. Financial Services will migrate current system to new servers and evaluate and implement a new enterprise resource planning system for greater functionality, efficiency, transparency, accountability and information access. The Office of Human Resources will implement a new hiring a personnel management that aligns with state and local requirements.

The plan will meet the following objectives:

- Replace the legacy Advantage financial system.
- Implement an improved human resources management system for hiring.

Divisionwide New Investments					
	FY21	FY22	FY23	FY24	FY25
Financial/HR Payroll Upgrade	\$2,750,000	\$2,750,000	\$2,750,000		
Learning Management System	\$737,330				

	FY21	FY22	FY23	FY24	FY25
Help Desk Call/Ticket System	\$161,640				
Content Management System (Website)	\$300,000	\$100,000	\$100,000		
*Interactive Display Refresh	\$963,375	\$963,375	\$963,375	\$963,375	\$963,375
Total	\$4,902,345	\$3,813,375	\$3,813,375	\$963,375	\$963,375

**Note: A refresh of all projector based interactive displays.*

Digital Equity

Plan Overview:

Currently, our limited access to high-quality, authentic resources is negatively impacting our students, hindering their opportunities to develop and apply twenty-first century skills, including communication, collaboration, critical thinking, and creativity. To ensure all PWCS students have equitable access to quality, authentic resources at home and school, implementing a three-year digital equity initiative would positively impact and prepare our students for their futures. The digital equity initiative goal is to move toward one-to-one devices in grades 3-12, and one device to three students in grades K-2. This initiative would not only positively impact our economically disadvantaged students, but will help bridge the digital inequities across the Division. Implementing equitable digital access to technology would also empower teachers to design authentic learning experiences that best serve all students, especially students with disabilities and students with limited English proficiency.

Implementation Plan:

FY20

1. Pilot a Learning Management System at Colgan, Patriot and Virtual Prince William.
2. Choose 5 pilot schools for Digital Equity Pilot – Spring 2020
3. 5 pilot schools receive professional development – Spring & Summer 2020
4. Choose a device – Spring 2020
5. Purchase devices – Spring 2020

FY21

1. Deploy Learning Management System Divisionwide – Fall 2020
2. Implement Digital Equity Pilot at 6 identified schools
3. Ongoing professional development for pilot schools
4. Begin professional development for middle schools
5. Include funding for all middle schools for deployment by August 2021

FY22

1. Fund all high schools for Digital Equity Project – implement August 2022

FY23

1. Fund all elementary schools for Digital Equity – implement August 2023

Digital Equity					
	FY20	FY21	FY22	FY23	FY24
*August 2020 Pilot School Rollout	\$2,429,500				
*Fall 2020 Pilot School Rollout		\$2,093,200			
*August 2021 Middle School Rollout		\$5,194,600			
*August 2022 Rollout			\$6,216,400		
*August 2023 Rollout				\$5,823,550	
*August 2024 Rollout					\$5,823,550
Total	\$2,429,500	\$7,187,800	\$6,216,400	\$5,823,550	\$5,823,550

**Note: Includes refresh for staff computers.*

TIP Summary

Plan Implementation Costs Overall

Comprehensive TIP						
	FY20	FY21	FY22	FY23	FY24	FY25
Data Center/School Upgrades/Replacements	\$1,470,000	\$195,000	\$595,000	\$645,000	\$195,000	\$870,000
VoIP/LAN/WLAN School Upgrades and Replacements	\$3,169,000	\$7,557,892	\$6,300,000	\$6,500,000	\$6,325,000	\$6,275,000
Security/Infrastructure Upgrades/Replacements	\$340,000	\$400,000	\$40,000	\$0	\$440,000	\$0
Divisionwide Enterprise Systems	\$4,902,345	\$3,813,375	\$3,813,375	\$963,375	\$963,375	\$963,375
Digital Equity	\$2,429,500	\$7,187,800	\$6,216,400	\$5,823,550	\$5,823,550	\$0
Projected Estimated Totals	\$12,310,845	\$19,154,067	\$16,964,775	\$13,931,925	\$13,746,925	\$8,108,375

Projected Local, State and Federal Revenue

Projected Revenue						
	FY20	FY21	FY22	FY23	FY24	FY25
PWCS Five-Year Budget* Plan	\$5,094,300	\$4,500,000	\$5,000,000	\$5,500,000	\$6,000,000	\$6,500,000
Federal E-Rate, Type II Modernization*	\$1,182,387	-	-	-	-	-
VPSA State Technology Incentive Program*	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000	\$2,338,000
Local Cable Franchise Fees*	\$400,000	\$200,000	\$400,000	\$200,000	\$400,000	\$400,000
LOCAL, STATE, AND FEDERAL TOTALS	\$9,014,687	\$7,038,000	\$7,738,000	\$8,038,000	\$8,738,000	\$9,238,000
Comprehensive Estimated Tip Totals	\$12,310,845	\$19,154,067	\$16,964,775	\$13,931,925	\$13,746,925	\$8,108,375
PROJECTED REVENUE (+/-) VS. PLAN	-\$3,296,158	-\$12,116,067	-\$9,226,775	-\$5,893,925	-\$5,008,925	\$1,129,625

*Notes: 1. These revenue sources have restriction on the technology and service that can be purchased. For FY21-FY24, E-Rate Type II revenue is not included pending available funding from the Federal Government.

2. These revenue sources do not include year-end funding that has supplemented the TIP over recent years.

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