Smart Schools Bond Act - Planning

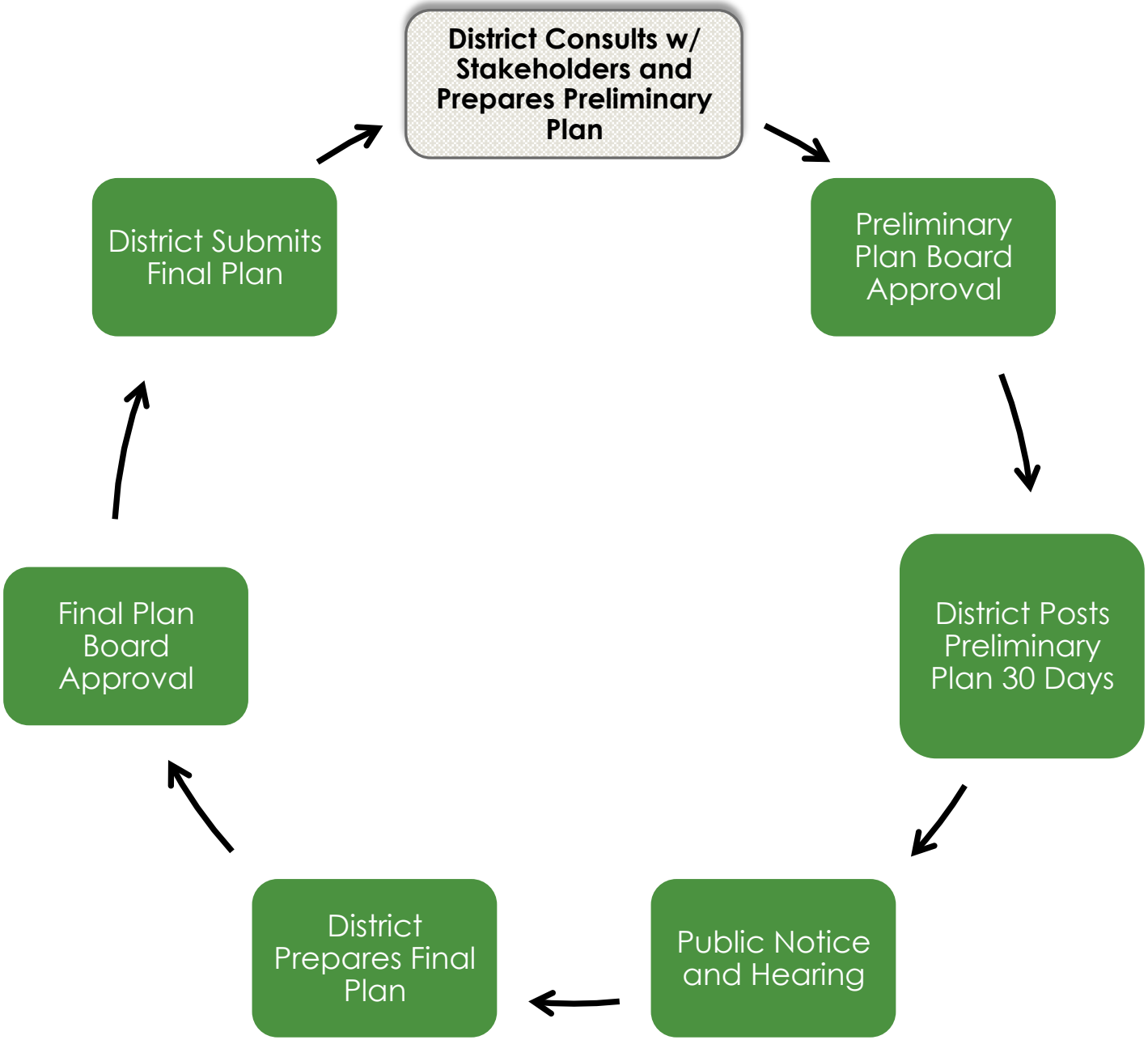
Rush-Henrietta Central School District

Smart Schools Bond Act of 2014

The Smart Schools Bond Act of 2014 was approved in a statewide referendum Nov. 2014

- **Authorizes state to borrow $2 Billion**
  - **Improve educational technology and infrastructure**
  - **To improve learning and opportunity for NYS students**
- **Rush-Henrietta allocation $2,944,081**
- **Fund availability does not expire**
- **An Improvement Plan must be submitted**
  - **Linked to district's long-term educational planning and technology investments**
  - **Provide learning opportunities beyond the class**

Smart Schools Investment Process



R-H TECHNOLOGY PLAN VISION

Seamless integration of technology devices in every R-H classroom that allows each student the automatic access to the Internet to obtain information, communicate & collaborate with others, and create products of their learning.

R-H TECHNOLOGY PLAN
Outcomes

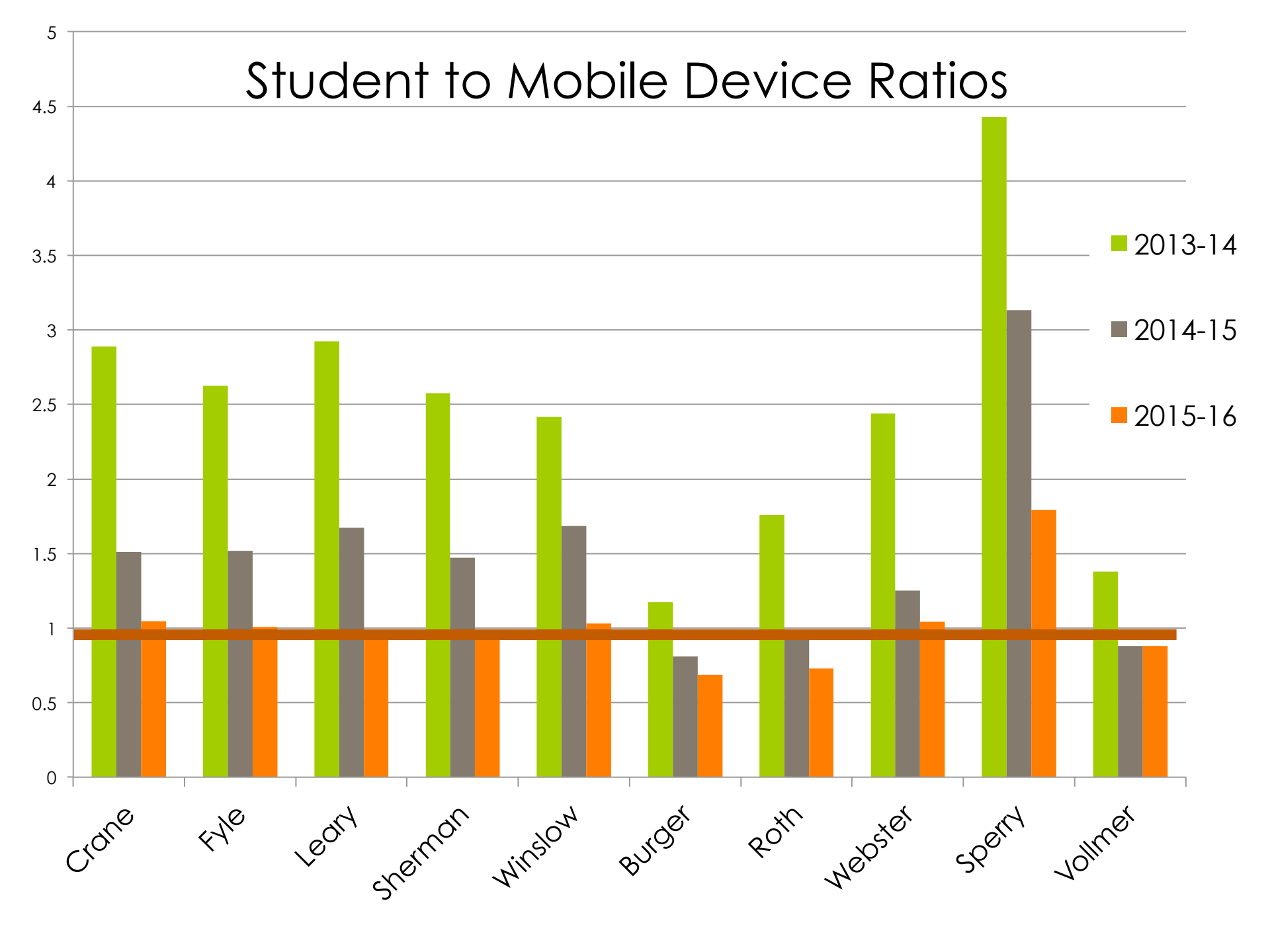
- A Student-Empowered Learning Environment
- 21st Century Skills and Literacy integrated into the curriculum
- Timely Access to Data to Inform Instruction

Categories Not Allowed in Requests

- Professional development
- Staffing
- Ongoing technical support
- Software
- Subscription services
- Phone system

Project Categories Allowed but Not Applicable to Rush-Henrietta

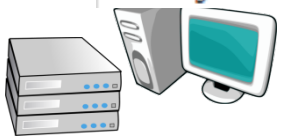
- Replacement of Classroom Trailers
- Connectivity Projects for Communities
- Pre-Kindergarten Classrooms- SED says we are unable to use for Kindergarten project at Vollmer
- Student Devices- With Current 5 year technology Plan no need to use this funding for devices


Student to Mobile Device Ratios
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2013-14
2014-15
2015-16
Crane
Fyle
Leary
Sherman
Winslow
Burger
Roth
Webster
Sperry
Vollmer

Start Dates of 1:1 Device Rollout

Years	September 2013	September 2014	September 2105	September 2016	September 2017
Grades K		X			
1	X				
2		X			
3			X		
4				X	
5				X	
6			X		
7		X			
8			X		
9				X	
10					X
11					X
12					X

By the start of the 2017 school year the entire district will be 1:1 for students.



Project Categories

- School Connectivity
  - High speed broadband
  - Wireless connectivity
- High Tech Security Features

School Connectivity Proposal

- Wireless Access Points
- Wired switch system
- Servers and storage
- Ethernet wiring

Internet

Camera

Wireless access point

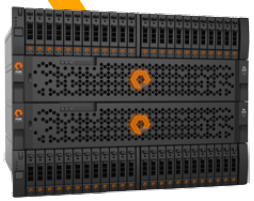
Laptop

Core switch

Edge switch

Printer

Servers



Storage

Desktop

Wireless Infrastructure Upgrade Benefits

- Enables increased density of student machines in classrooms
- Directly supports online testing
- Allows increased streaming of video and audio simultaneously
- Faster connections
- Commonality of Infrastructure
- Best scenario for Bring Your Own Device (BYOD)

WiFi Standards

Standard	Year	Theoretical Speed (Mbps)	Actual Speed (Mbps)
802.11b	1999	11	3
802.11ag	2003	54	20-30
802.11n	2009	600	40-70
802.11ac	2013	1,300	100-400

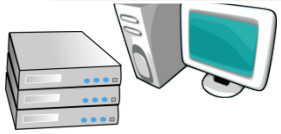
Wireless Access Point Upgrade

- Current fleet of Meru access points started being installed
  6 - 7 years ago
- Phase 1 (2016-17)
  - Wireless 802.11ac Wave 2 Upgrade – 300 devices
- Phase 2 (2018-19)
  - Replace 350 devices – current industry standard
  - Industry Standard- Meru bought out, technology being phased out
  - Select new district standard – Cisco or Aruba
  - Faster connections
  - Commonality of Infrastructure

Wireless Access Points Upgrade Costs

Phase 1 (2016-17)

Description	Cost
300 wireless 802.11AC Access Points	$240,000
Redundant controllers capable of supporting >700 WAPs each	$50,000
Web based wireless monitoring system	$2,000
Guest portal system that supports extended term BYOD and guest users	$25,000
Licensing to support 5,000 district devices, 2,000 BYOD student devices and 500 concurrent guest devices	$45,000
Phase 1 Wireless Upgrade	$362,000



Wireless Access Points Upgrade Costs
Phase 2 (2018-19)

Description	Cost
350 wireless 802.11AC Access Points	$255,000
Licensing & support for above units to support 5,000 district devices, 2,000 BYOD student devices and 500 concurrent guest devices	$70,000
Phase 2 Wireless Upgrade	$325,000
Total Wireless Upgrade	$687,000

Wired Switch System Upgrade

- Adoption of 2.5Gbps switch technology in network closets
  - Fully supports new 802.11AC wave 2 technologies
  - Required to support more intense end-user experience
    - Faster speed
    - Videos, etc.
  - Initiate three year upgrade to encompass all district buildings
  - Supports connections from new Wireless 802.11 access ports
  - Provides higher density of use, increased volume of content delivery (video, etc.)
  - Current 1 Gb switches will lose manufacturer support in 5 yrs

Wired Switch System

Description – Phase 1	Cost	Year
Top of Rack 2.5 Gbps switches	$200,000	2016 - 17
Edge port 1 Gbps switches	$180,000	2016 -17
Phase 1 Wired Switch Upgrade	$380,000	

Description – Phase 2	Cost	Year
Top of Rack 2.5 Gbps switches	$200,000	2018 -19
Edge port 1 Gbps switches	$180,000	2018 -19
Phase 2 Wired Switch Upgrade	$380,000	
Total Wired Switch Upgrade	$760,000	

Data Center Upgrade

- R-H currently has two Data Centers – HS and TOC
  - Provide redundancy/disaster recovery
  - Ongoing balances load to maximize capacity
- Data Centers host majority of district systems
  - Active Directory
  - Applications / Student file storage
  - Backup, monitoring and database servers

Data Center Upgrade

Description	Cost	Year
Replacement of current servers	$150,000	2018 -19
SAN (Storage Area Network) Replacement (1 each site)	$50,000	2016-17
Total for Data Center upgrade	$200,000	

Elementary Wiring – CAT6

- R-H currently has three types of data wiring – CAT 5, CAT 5e and CAT6
  - CAT5 (oldest) – is in elementary buildings
  - CAT6 is current standard – is in secondary bldgs.
- New wireless standard 802.11 works best with CAT6
  - Maximizes capacity and speed
  - Works with CAT5 but doesn't utilize full capacity
- Relocate ethernet drops in secondary buildings (center of room vs. corner for TV system)
- Upgrading each elementary building as funds are available

Technology Proposal Recap

- District Technology Infrastructure
  - Wireless Access Points
  - Wired switch system
  - Servers and storage
  - Ethernet wiring

Security Proposals

- Public Address Systems
- Security Cameras

Security Systems - PA Systems

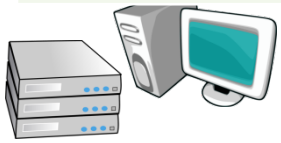
- **Mass notification / Public Address System- all schools**
  - Multi-function PA system
  - Signboard, synchronized clock, bell scheduler, two-way communication, scrolling text & configurable strobe flashers
  - Provides emergency notification – can also be sent to cell phones
  - Replaces current 15+ year old systems
  - Current system no longer has technical support

Security Systems - Security Cameras

- Upgrade Security cameras and servers
  - Many of current servers in building are at 5 year expected life
  - Seven buildings have servers with capacity less than recommended 30 days storage
  - No remote monitoring of building servers, failures not known until physically inspected
  - Consolidate to central storage – 24 hour system monitoring, 30 day + storage capacity for all buildings, reduces number of building servers to five Virtualize NVR servers, add to central cluster
  - Districtwide replace all analog cameras with 16MP cameras and add additional cameras

Security Systems Total

Description	Cost	Year
PA system replacement – all schools	$512,000	2018 -19
Up to 32 additional cameras	$90,000	2017 -18
Video management system upgrade	$84,000	2016-17
Centralized video storage server	$157,000	2016-17
Analog exterior zoom cameras replaced with 16MP cameras	$145,000	2017 -18
Total for All Security Projects	$988,000	



Smart Schools Investment Cost Summary

Description	BUDGET 2016-17	BUDGET 2017-18	BUDGET 2018-19	GRAND TOTAL
Technology				
Wireless Upgrade - 300 Access Points	240,000			240,000
Redundant controllers	50,000			50,000
Web based wireless monitoring system	2,000			2,000
Guest portal - BYOD & Guest	25,000			25,000
Licensing for devices	45,000			45,000
Wired switch - Top of Rack Phase I	200,000			200,000
Wired switch - Edge Port Phase I	180,000			180,000
SAN Replacement		50,000		50,000
Wireless Upgrade - 350 Access Points			255,000	255,000
Licensing for devices			70,000	70,000
Wired switch - Top of Rack Phase II			200,000	200,000
Wired switch - Edge Port Phase II			180,000	180,000
Data Center upgrade			150,000	150,000
Ethernet Upgrade to CAT6 - any remaining funds			309,081	309,081
Total Technology	742,000	50,000	1,164,081	1,956,081
Security				
Capacity for additional cameras		90,000		90,000
Video management system upgrade	84,000			84,000
Centralized video storage server	157,000			157,000
Convert analog cameras to 16MP		145,000		145,000
Public announcement system upgrade			512,000	512,000
Total Security	241,000	235,000	512,000	988,000
GRAND TOTAL ALL PROJECTS	**$983,000**	**$285,000**	**$1,676,081**	**$2,944,081**
Total Smart Bond Allocation				2,944,081
Remaining funds to be determined				0

Smart Schools Investment Process