

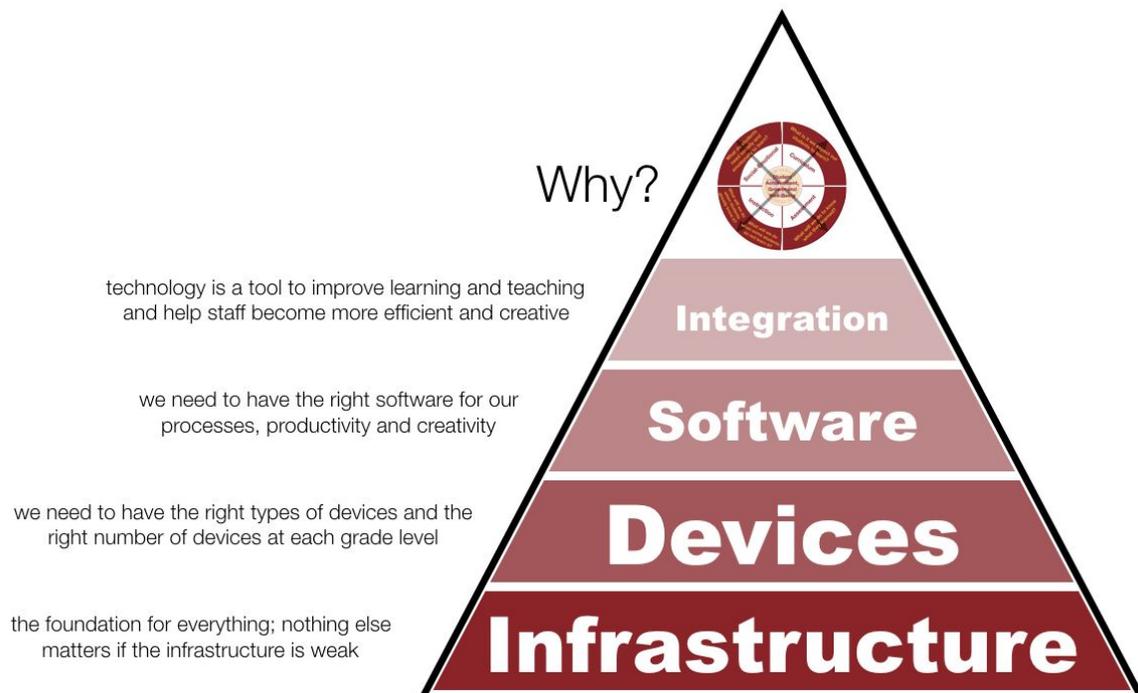
# New Albany-Plain Local Schools' Technology Roadmap

## Purpose

The New Albany-Plain Local Schools' Technology Roadmap is designed to provide district administrators, staff, students and community members both a vision of technology use in our schools, and information to help make future decisions. The Roadmap will align classroom integration, software, devices and infrastructure to ensure the district's technology resources are used effectively and efficiently. At the core of the Technology Roadmap is alignment to the district's purpose: To create a culture of accountability that achieves the best academic and developmental outcomes for each student.

## Overview

The Technology Roadmap contains three narrative sections illustrated by the image below (software and devices are combined into one section). Each of these sections describes the current state in the district based on survey results, interviews and observations. These sections also contain a description of an ideal state developed by a committee comprised of 22 district employees. After the three sections is a detailed plan with goals, benchmarks and action steps. This plan will allow the district to reach its ideal state in three years.

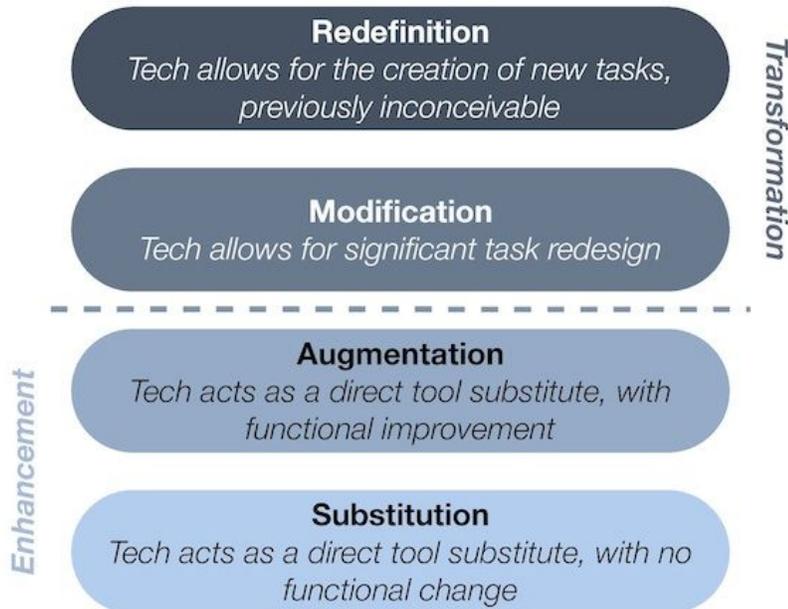


## Using Technology in New Albany-Plain Local Schools

"Before making decisions about technology, schools and districts need to articulate how students will use technology to learn. Learning objectives should drive the technology implementation and not the other way around." (Future Ready Schools, U.S. Dept. of Ed, p.12)

Current State - Where are we now?

The SAMR Model is one of the best ways to look at technology integration in schools (<https://www.common sense media.org/videos/ruben-puentedura-on-applying-the-samr-model#>). This model consists of four types of technology integration: Substitution, Augmentation, Modification and Redefinition. Technology integration in schools can be placed into one of these areas based on how it is being used by the audience (e.g., students, staff). The effectiveness of technology use in a classroom should be measured by how it is being used (i.e., SAMR) rather than the quantity or frequency of its use.



Podcasts on iTunes U: <http://tinyurl.com/aswemayteach>

In a technology-rich classroom, technology is used on a regular basis and in all four areas of the SAMR model. In this way, the SAMR model is similar to Bloom's Taxonomy; content may be presented and assessed at all levels of Bloom's, but the goal is to reach higher order thinking when possible. With technology integration, the goal is to reach the Modification and Redefinition levels when possible. If technology is just being used to Substitute or Augment the learning, then its true potential is not being reached. In fact, in some cases, using technology to substitute for a traditional tool may actually hinder student learning (e.g., note-taking on a computer: <http://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/>).

The amount, type and frequency of use of technology become less important when one considers the SAMR model. One-to-one (computers : students) computing may be less effective than one-to-three or one-to-five if the computers are just being used to Augment the instruction instead of Redefining it.

Like many other K-12 school districts, New Albany-Plain Local Schools has a wide range of technology integration in its classrooms, and there are many examples of effective technology integration that reach the Modification and Redefinition levels. There are third grade students programming robots and middle school students creating 3D models. The HS offers several blended courses that give students control over the time, place and pace of their learning. However, the majority of technology integration in the district would fall into the Substitution and Augmentation levels.

The district's use of its Learning Management System (LMS), Schoology, falls well short of the potential such a system has to offer. Much of what is done in Schoology could be accomplished without an LMS, or without technology at all. Posting the same notes for all students in the form of a PDF, PowerPoint, or Word document is Augmentation at best. There are very few formative assessments that provide instant feedback for students and that re-direct their learning based on their current needs. Using an LMS to personalize the learning experience for students would move the integration level from Augmentation to Redefinition. However, digitizing content and staying with the traditional pedagogy of teaching all students in the class the same way places the use of the LMS in the enhancement areas (i.e., Substitution and Augmentation) of the SAMR model.

The use of Google Applications like Docs, Slides and Sheets is another example of Substitution and/or Augmentation in the district. Using Google is almost ubiquitous in classrooms across the district, and there are many examples of teachers transforming their lessons (i.e., Modification and Redefinition) by using Google. However, too often Google Slides is used as a substitute for a poster board, and Google Docs as a substitute for a hand written paper. If the technology does not significantly change the pedagogy, then using it may actually be a waste of valuable instructional time.

**The lack of professional development available to staff is a major factor contributing to the current state of technology integration in the district. There are no technology coaches on staff to work directly with teachers to help them better integrate technology into their daily lessons, nor has there been a clear vision of what technology use should look like in the district. As a result, teachers default to using what they know, and no significant changes in pedagogy have taken place in a number of years.**

**Finally, when New Albany students were asked how they thought technology should be used in their classrooms, the most common response was to make their ability to take notes more efficient. The fact that students focused on improving the way they take notes gives one an insight into the technology integration experiences they have had during their years in the district.**

**Ideal State - Where do we want to be?**

**Learning and teaching must remain the primary focus in our schools and classrooms, and in the second decade of the 21st Century the use of technology in schools should be as routine, “invisible,” and uneventful as the use of traditional tools like pencils, pens and paper. Technology should also transform instructional practices so they are more effective and efficient, and it should never be used just for the sake of using it.**

**Student Use of Technology**

**Students should use technology both during the process of learning and while they are creating products that demonstrate what they have learned. Using technology during the process of learning will help students take ownership of their own learning, and give them the necessary skills to solve challenging problems as they arise. While classrooms will differ in the specifics of technology use due to age appropriateness and the content being taught, there are several things all classrooms in the district will have in common as students are engaged in the process of learning.**

**New Albany-Plain Local students will:**

- **Learn new content/skills and extend their knowledge by doing online research and exploration.**
- **Collect and organize digital resources and information to help them access what they need when they need it.**
- **Collaborate with other students using shared resources (e.g., Google Docs, wikis, online discussions).**
- **Receive instant feedback when completing formative assessments.**
- **Receive alternate lessons or information based on their formative assessment results.**
- **Work individually and in small groups based on their specific needs.**
- **Be engaged in the learning process outside of regular class times.**

In addition to the items listed above, technology will also help students asynchronously collaborate with each other and with persons not in their classes to deepen their understanding. Technology can also help to create opportunities to synchronously connect with experts and other students around the world.

Our students will also create products that can be used while they communicate and share what they have learned with teachers and peers. They will create products that demonstrate their mastery of content and/or skills by using a variety of digital tools, and they will learn how to use these digital tools during authentic experiences. Students will also make their products available to their peers for review and critique using systems like an LMS or Google. In some cases, students will publish their finished products online to collect feedback from a wider audience. Students will keep and organize their exemplar products in digital portfolios so they can document their learning over the years.

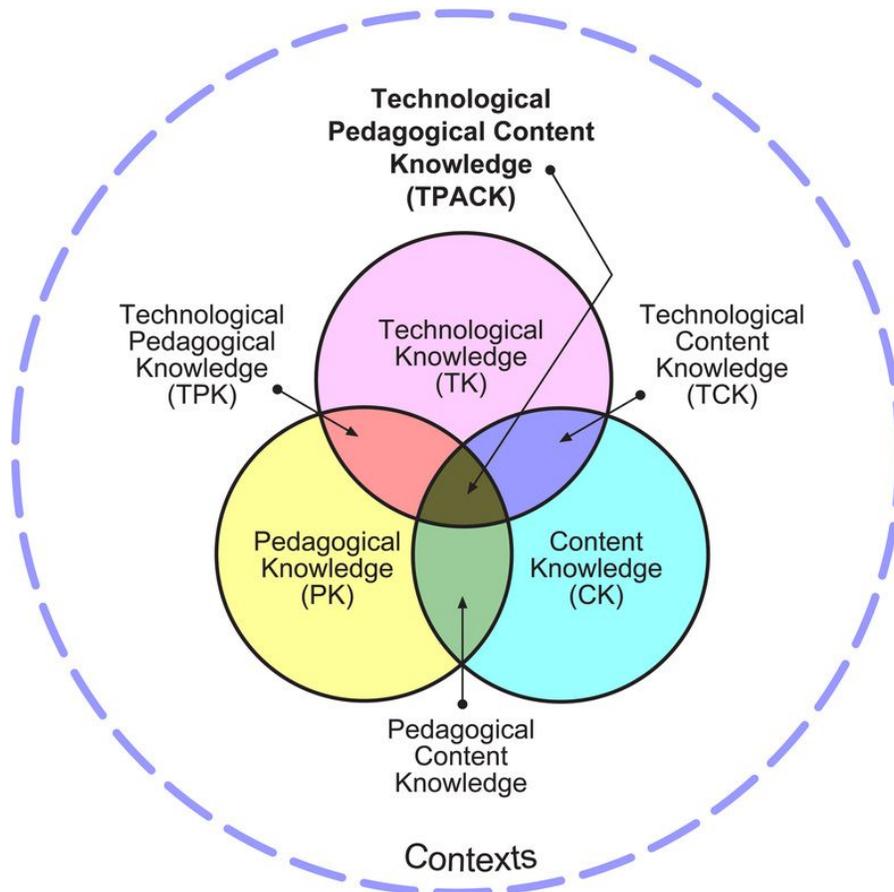
#### Teacher Use of Technology

Teachers in New Albany-Plain Local Schools will use technology to not only enhance what they are currently doing, but also to transform their instruction. All our teachers will use technology to actively engage students and to make the learning process more relevant by helping students build new knowledge and skills and challenging those students who already know the “basics.” Even though the use of technology by teachers will vary due to their current skill levels, the appropriateness for their students, and the content being taught, there are many things all our teachers will have in common.

#### New Albany-Plain Local Schools Teachers will:

- Provide digital resources to students based on their current needs.
- Give students the opportunity to digitally explore and learn new concepts.
- Create digital learning objects (e.g., videos, animations, infographics, documents, presentations) to help their students better understand concepts.
- Use an LMS or other district supported system to organize and deliver content to students.
- Collect and analyze formative assessment data.
- Provide relevant feedback to students.
- Create asynchronous learning opportunities for students.
- Intentionally teach students technology skills to help them become efficient or effective.
- Collaborate and share resources with other grade level or department teachers.
- Give parents access to digital resources and environments so they can better monitor and support their children.

Given the current state of technology use in the district, the above items will not occur immediately. The district must provide staff with relevant and ongoing professional development opportunities if we are to achieve this vision. These learning opportunities will be designed to help teachers better understand the SAMR model, and to help them improve their Technological Pedagogical Knowledge as described in the TPACK Contexts (see below).



So, rather than spending the majority of time conducting “how-to” software training sessions, the professional development opportunities offered to staff will focus on increasing the TPK area of TPACK. This area specifically addresses best practices when it comes to integrating technology into the classroom, and it also relates to the Modification and Redefinition levels of SAMR. The professional development opportunities will be delivered in a variety of ways to meet the needs of a diverse staff.

**TPK Professional Development will include:**

- Face-to-face sessions conducted by technology coaches and targeted for specific grade levels or subject area teachers.
- Opportunities for technology coaches to work directly with teachers in their classrooms to plan and implement effective technology use.

- **Specific LMS training for users at every level of blended learning expertise.**
- **Summer and/or weekend “camps” that teach specific skills in the morning and then provide time for participants to create digital learning objects using a variety of digital tools in the afternoon.**
- **Creativity and “think-tank” sessions that allow staff to discuss and explore cutting-edge technology.**

**In addition, the district will also create/acquire a digital library of resources staff can use to learn new skills when they are ready. In the same way we will be encouraging students to do research and take ownership of their learning, we will also encourage staff to do the same. To help focus the learning on SAMR, TPACK, and specific software training, the district’s digital library will be kept current and relevant by technology coaches.**

## **The Right Software and Devices**

*"Learning objectives and your vision for technology-enabled teaching and learning should be the primary driving factors in your selection of devices for teachers and students." (Future Ready Schools, U.S. Dept. of Ed, p.44)*

Where are we now?

**How technology is being used by students, teachers and staff should dictate the types of software and hardware purchased by the district. Unfortunately, like many other K-12 school districts, the exact opposite is the case for New Albany-Plain Local Schools; the software and hardware dictate what can and cannot be done in our schools and classrooms. And, to compound the issue, training on how to use new software and hardware is almost non-existent in the district.**

**It is also important to make sure the right types of devices (with the right types of software) are available in each building; not every device is the right fit at every grade level. For example, a Chromebook would not be the right device for a HS student who needs to do graphic design using Adobe PhotoShop. Similarly, a MacBook Pro would not be the right device for a third grade student just needing to create a Google Slideshow.**

**Deploying the right number of devices to each school is critical if we want students to use technology on a regular basis, and how the technology is used in each classroom should dictate the number of devices deployed. If the devices are only used for Substitution or Augmentation, then fewer devices per student are necessary since the same types of activities can be accomplished without the use of technology. Those schools and classrooms using technology to Modify and Redefine instruction should have a higher ratio of devices to students.**

There are currently 4009 computers and tablets in district ranging from 12 to less than one year in age. Of these 4009 devices, 1409 are considered to be end-of-life or near-end-of-life devices; these devices should all be replaced before the start of the 2018/2019 school year.

The table below shows the number and types of district owned devices deployed to each school.

Type of Device	District Total	HS Total	MS Total	2-5 Total	K12 LF Total	K-1 Total
Desktop	694	262	129	115	74	57
Laptop	852	459	100	121	67	48
Chromebook	1842	495	269	411	630	30
iPad	454	63	15	109	66	192
Other Tablet	167	62	35	50	20	0
<b>Total Devices</b>	<b>4009</b>	<b>1341</b>	<b>548</b>	<b>806</b>	<b>857</b>	<b>327</b>

The number of devices deployed to each school building is not the biggest problem as it relates to student access. Instead, the biggest problem is how the devices are deployed within the buildings. The 2-5 building has 710 students enrolled and 411 Chromebooks available to students. This is a 1:1.7 device to student ratio. Every classroom in the 2-5 building could have 12 to 15 Chromebooks in it all day, every day if desired. This would eliminate the need for sharing whole carts or having students take one or two devices out of a cart at a time. Similarly, the K12 building has 740 students and 410 Chromebooks (230 of the Chromebooks in the building are assigned to the MS pod), and a device to student ratio of 1:1.8. When combining the MS devices in both the Middle School and K12 buildings, there are a total of 489 Chromebooks for 1208 students, and a device-to-student ratio of 1:2.5. Combining the iPad and Chromebook totals at the K-1 building creates a 1:2.8 device to student ratio. The High School has the fewest number of Chromebooks, but it does have at least 300 laptops dedicated for student use, so its device-to-student ratio is 1:1.9.

In addition to district owned devices, New Albany-Plain Local Schools also allows students to bring their own devices to school (BYOD). This practice is most common at

the High School. Over the course of one week at the High School (Jan. 25-Jan. 31, 2017), 2370 unique devices were brought into the school by students. Of those 2370 devices, 508 were Mac laptops, 145 were Windows laptops, 74 were iPads, and 33 were Chromebooks. This means 760 High School students brought in technology comparable to or better than the devices the district provides. When combining the 760 student-owned devices with the 795 district-owned devices at the High School, the device-to-student ratio becomes 1:1.

Purchasing and deploying devices is useless, however, unless they are able to run instructional software and/or access cloud based systems. The most commonly used instructional software and systems available to New Albany-Plain Local staff and students include:

- G Suite (formerly Google Apps for Education) - cloud based
- Google Chrome - local installation
- Microsoft Office - local installation
- Adobe Creative Cloud Suite - local installation
- Schoology - cloud based
- ClassLink - cloud based
- PowerSchool - cloud based
- Achieve 3000 - cloud based
- Aleks - cloud based
- BrainPop - cloud based
- PebbleGo - cloud based
- MobyMax - cloud based
- Big Universe - cloud based
- Castle Learning - cloud based

When reviewing the list of software and systems used in the district, one can see that most of it is cloud based (i.e., accessed via a web browser). Of the three locally installed software applications, Microsoft Office is redundant because of G Suite, Adobe Creative Cloud cannot be installed on most of the district's devices due to incompatible hardware requirements, and Google Chrome is just a web browser. Using cloud based software makes the use of low-end devices like Chromebooks more practical, and it makes BYOD more viable.

Where do we want to be?

Based on the surveys given to administrators, staff and students, the software currently available in the district is able to support the learning and teaching in classrooms. Students and teachers have the necessary software tools to help them achieve the goals listed in the *Ideal State* portion of the *Technology Use* section above.

In order to ensure consistency in the future, software like Microsoft Office, Google (G Suite), and Schoology should continue to be made available to students and teachers, and professional development opportunities focused on using these tools should be increased. In addition to the productivity tools like G Suite and Office and an LMS like Schoology, the district should also continue using and add more multimedia tools like Adobe Creative Cloud. Combining multimedia creating and editing tools with productivity tools and an LMS will help teachers create a rich learning experience for their students.

Curriculum resources like Castle Learning, MobyMax, Aleks, etc., should routinely be evaluated for their impact on student learning and practicality for teachers. The district should create a Technology Advisory Committee to analyze usage data on a quarterly basis, and use benchmarks assessments to determine if these types of resources are having the desired effects on student growth. As more curriculum resources are added in the future, things to consider from an efficiency and support point of view include:

- Ability to integrate with PowerSchool (or other SISs)
- Ability to use LDAP authentication
- Ability to be rostered by One Roster (or similar systems)

Like the software used in the district, the devices used by the students and staff in New Albany-Plain Local Schools seem to be meeting their needs. Replacing end-of-life and upgrading near-end-of-life devices should be a priority for the district over the next 2 years. Having modern equipment is important for students and staff so they can take full advantage of the software the district has to offer and work as efficiently as possible. Delaying the replacement of these devices to later years only prolongs the problem, and it may limit the types of things students are able to do in their classes. Below is a list of end-of-life equipment that should be replaced in FY18:

- 308 desktop computers
- 211 laptops
- 168 Chromebooks
- 58 iPads
- 221 Galaxy tablets (to be replaced with Chromebooks)

The cost to replace the end-of-life equipment listed above is approximately \$600,000.

In addition to replacing old equipment, the distribution of current equipment both to and within the schools should be re-evaluated. The school district has an opportunity in the summer of 2017 to redistribute devices based on the needs of students in the newly configured schools. The table below lists the recommended changes:

Device	From	To	Reason
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<b>Horizon Desktops</b>	<b>K12 LF</b>	<b>Primary - 1st grade</b>	<b>These devices are consumer grade desktops, and are no longer supported by the manufacturer. The large touchscreens on these devices make them excellent computers for first grade classrooms.</b>
<b>iPads</b>	<b>all</b>	<b>ELC</b>	<b>Since these devices do not require students to login on them, they are a good device for Pre-K and Kindergarten students. The touchscreen and availability of many instructional apps also make them the right devices for ELC classrooms.</b>
<b>Chromebooks</b>	<b>K12 LF</b>	<b>MS</b>	<b>Chromebooks located in the current 2-5, K12 and MS buildings should be balanced among the 3 locations to give each school at least a 1:2 device to student ratio.</b>
<b>Chromebooks</b>	<b>K12 LF and 2-5</b>	<b>Intermediate and Primary</b>	<b>Chromebooks located in the current 2-5, K12 and MS buildings should be balanced among the 3 locations to give each school at least a 1:2 device to student ratio.</b>
<b>Galaxy Tablets</b>	<b>all</b>	<b>recycle</b>	<b>These devices can no longer be supported, and will be recycled during the summer of 2017. They will be replaced with Chromebooks.</b>

Once the equipment has been reallocated to new locations, the distribution within the schools should be considered. A plan for distributing a specific number of devices to each classroom should be developed by building staff. Having several devices available all day, every day in classrooms will make it easier for students to use them when needed, and it will make it easier for teachers to plan their lessons. Also, the number of damaged and lost devices should go down due to more oversight by staff.

Replacing older equipment and reallocating current devices to and within the schools will maintain the district's current device to student ratios. Based on the surveys given to administrators, staff and students, however, more devices are needed. Adding more devices will require additional money to be added to the Technology Department's annual budget. One possible source of the additional money is reallocation of building funds to the Technology Department's budget. This will require the buildings to reduce their expenditures to cover the costs for new devices. Another possible source of revenue for technology purchases is for the district to pass either a permanent improvement or bond levy. The money generated from either of these levies can be used by the district to purchase equipment to improve the technology infrastructure, thus

freeing up general funds to purchase more devices. Passing a levy will be a challenge for the district.

The district could also explore the possibility of charging students a general technology fee to help generate additional revenue. For example, if the district charged every student a \$50 technology fee, then over \$200,000 in additional revenue could be used to purchase or lease more student devices.

Assuming the district is able to find additional revenue sources for purchasing more student devices, then several things should be addressed almost immediately:

- 120 Chromebooks should be added to the High School to help provide more devices to students and to help make online testing logistically easier.
- 120 Chromebooks should be added to the Intermediate School (former K-12 Learning Facility) to bring its device to student ratio close to 1:2.
- 180 Chromebooks should be added to the Primary School (former 2-5 Elementary School) to bring its device to student ratio close to 1:2.
- A cart of 30 laptops should be added to the Middle, Intermediate and Primary Schools to help support their new technology classes.
- 10-20 Interactive displays and/or projectors should be added to both the High and Middle Schools to enhance the learning environment.

Once the district addresses the needs listed above, then it should develop a plan to implement a 1:1 program for students in grades 5 to 12. Starting the program with 5th grade students provides a natural 4 year replacement cycle. Students will receive their first device in 5th grade, and then it will be replaced when they are in 9th grade. For students in grades 5-8, a Chromebook will meet their academic needs, and it will allow them to learn basic skills and responsibility with a less expensive device. MacBook Pros will be given to High School students because they will be able to start to use professional applications like, but not limited to, Microsoft Office, Adobe PhotoShop, and GarageBand, and they will meet the more intense academic needs of advanced courses. Apple products like the MacBook Pro are the most common type of device already brought to school by High School students under the district's current BYOD policy. Approximately 500 Mac laptops are brought into the High School on a daily basis and connect to the naps\_student wi-fi network. In addition, about 1800 iOS devices are connected to the naps\_student network daily. We can infer from the High School network data that most High School students are already familiar with Apple products, so choosing a MacBook Pro as the High School student device should be the easiest transition for them. Students in grades 5-12 will be able to take their devices home with them, and potentially keep them after 4 years. Grade 1 through 4 classrooms will each be given a dedicated cart of 30 Chromebooks to give those students a 1:1 experience while at school.

**The Technology Advisory Committee should outline the goals of the 1:1 program (i.e., how will student learning be improved by the program), and determine the type of professional development necessary to make it a success.**

## **The Necessary Infrastructure**

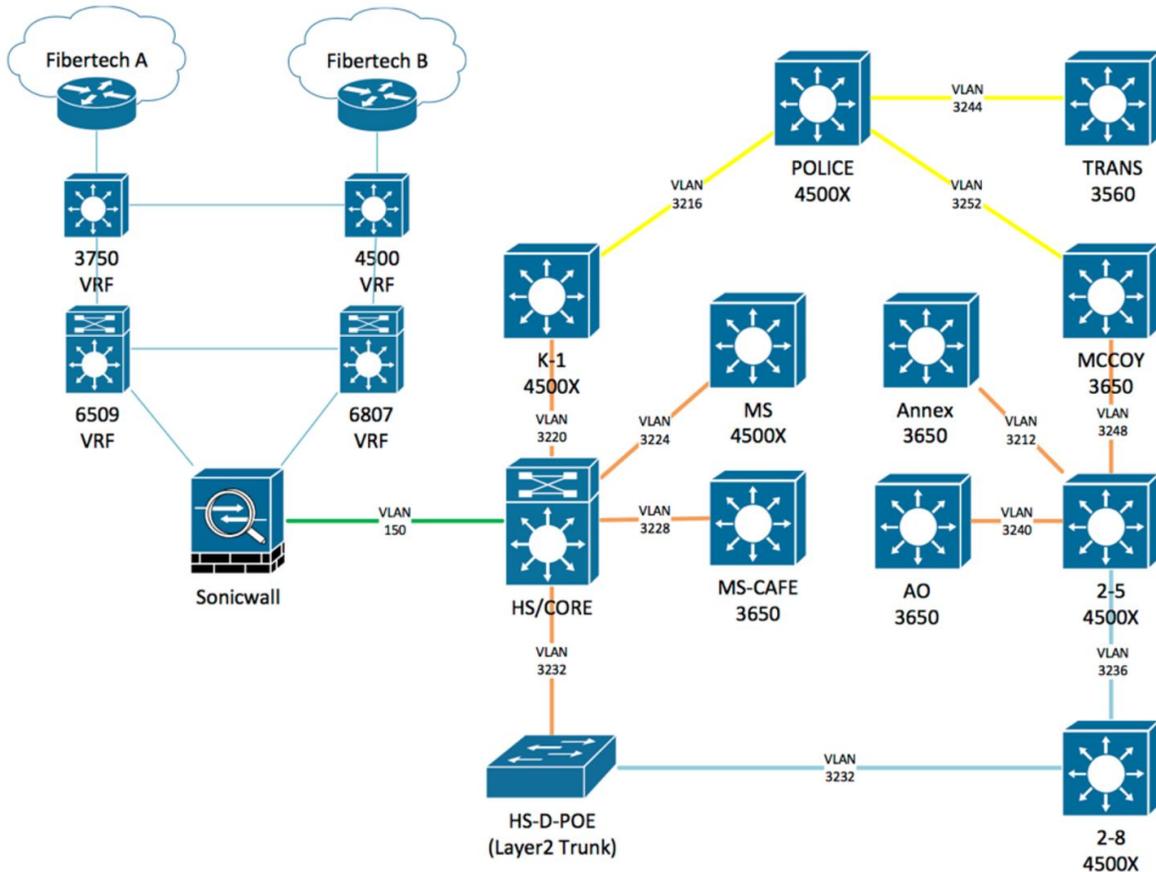
*"The U.S. Department of Education recommends a minimum connectivity speed of 100 Mbps and a target speed of 1 Gbps per 1000 students for schools by 2018." (Future Ready Schools, U.S. Dept. of Ed, p.17)*

Where are we now?

**The U.S. Department of Education partnered with the Alliance for Excellent Education and other organizations to launch Future Ready Schools in November 2014. Future Ready Schools provides information about building a technology infrastructure that is able to support the learning, teaching and assessment needs of schools, and a large portion of it focuses on connectivity and the need for schools to have robust Internet and internal network connections.**

**The New Albany-Plain Local Schools District accesses the Internet through two, 500 Mbps (megabits per second) connections to give it a total of 1000 Mbps, or 1 Gbps (gigabit per second) of Internet bandwidth for approximately 5000 students. The district's ratio of 0.2 Mbps/student ratio is twice the current Future Ready Schools recommendation of 0.1 Mbps/student, but well below the 2018 target of 1 Mbps/student. However, New Albany-Plain Local Schools only averages approximately 400 Mbps of Internet bandwidth usage at any given time during the school day, so it is only at 40% of its capacity.**

**The district's Internet point of presence (POP) is located at the New Albany Police Station where the two, 500 Mbps circuits come in from an Internet Service Provider (ISP). Two, 500 Mbps circuits are used instead of one, 1 Gbps circuit to provide the district with redundancy in case one circuit should fail. New Albany-Plain Local Schools is connected to the Police Station by a fiber optic network that comes into the district at the HS library building. The HS library contains the data center for the district that includes a Sonicwall firewall, a 10 Gbps core switch (6807), servers (both physical and virtual), and fiber connections to the other buildings in the district. The data center also has a 1 Gbps core switch (6509) that acts as a redundant switch in case the 10 Gbps core fails. All Internet traffic coming into and going out of all the district's schools goes through this data center. The district's "network" consists of the Internet connection, the hardware used to manage the flow of and to route data traffic, physical cables connecting buildings and rooms within buildings, and wireless access points.**



New Albany-Plain Local Schools  
*(Logical Topology July 2016)*

The wide area network (WAN) of the New Albany-Plain Local Schools provides the connections between buildings and consists of a district owned fiber optic network. The current K-1 building, MS, MS Cafeteria/Gymnasium, and K-12 Learning Facility are directly connected to the HS core. The current 2-5 building connects to the K-12 LF, and then provides connections to the AO, Annex and the McCoy Building. The district's Transportation building gets its connection from the Police Station. In addition to the district owned fiber, the K-1, and McCoy are connected to the city of New Albany's fiber network. This connection to the city's network provides New Albany-Plain Local Schools with redundant paths for network traffic to flow, thus minimizing the risk of downtime due to a local break in a fiber optic line. All connections coming into and going out of the different buildings are controlled by network switches in several data closets in each building. These switches vary in age and capabilities.

The local area network (LAN) provides connections within buildings and consists of both physical cables and a wireless network. The data closets in each building receive their Internet connection from the HS core and then connect to network ports and wireless access points in classrooms and offices. The majority of the cables used to connect the

switches in the data closets to network ports in the walls of the buildings in the district are CAT 5e, and are capable of handling up to 1000 Mbps of data at one time. The cables used to connect the switches to wireless access points are CAT 6, and are capable of handling up to 10 Gbps of data at a time.

The HS and current K-1 buildings have had their wireless network upgraded from an older Xirrus system to a new Cisco Meraki system. The new wireless networks are designed to handle 2-3 devices per user, and to cover all locations within those buildings. The HS is currently averaging over 2500 devices connected to the wireless network every day. The other buildings in the district will be upgraded to the Cisco Meraki wireless system one per year until the entire district is using Cisco Meraki.

The wireless network is accessed via 3 different secure service set identifiers (SSID), or more commonly referred to as wi-fi networks. District owned devices are set up to automatically connect to the *napls* SSID using a pre-shared key (password). Personal devices brought in by staff members can connect to the *napls\_staff* SSID; staff use their district username and password to join this SSID. Personal devices brought in by students can connect to the *napls\_student* SSID; students use their district username and password to join this SSID. There is no longer an open, unsecured SSID available to the public (per Board Policy 7540.04).

The district's data center also contains several servers that contain information and/or manage services for staff and students. There are 14 physical servers and over 68 virtual servers distributed across four host servers. These servers perform a variety of tasks vital to day-to-day operations of the district. These tasks can be divided into several categories including: security, network access, user management, file storage, software updates, phones, and curriculum resources. Below is a list of some of the most important servers and their functions:

- **Sonicwall** - there are two Sonicwall servers that act as the firewall for the district; they protect the district from network intrusions and control access to network resources
- **DHCP** - these servers assign IP addresses to devices connected to the network
- **Active Directory** - this serves as the user directory for the district; all user accounts are managed by this server; it also provides DNS services and does some device management via group policies
- **File Servers** - staff files are stored here
- **Windows Update Server** - manages updates to Windows OS
- **Apple Update Servers** - manages updates to Apple OSX and iOS devices
- **Key Management Server** - manages software licenses
- **Filewave** - manages computer images and software deployment; it also manages iOS devices
- **Lightspeed** - web filter for the district

- **Deploy Studio** - images Apple computers
- **Identity Automation** - compiles user data from PowerSchool (students) and PeopleWerks (staff) and automates the creation of Active Directory accounts
- **ClassLink** - a single-sign-on service to allow easier access to web based tools
- **ShoreTel** - manages the voice over IP (VOIP) phone system
- **Disaster Recovery** - critical virtual servers are backed up hourly to a disaster recovery appliance located in the K-12LF
- **SQL** - database server that contains transportation and user data that feeds into Identity Automation

In addition to the physical and virtual servers in the district's data center, New Albany-Plain Local Schools also uses many cloud services (i.e., services hosted offsite). Google is the most prominent cloud service used by the district. Google provides email, productivity applications and file storage space for all staff and students. Users are set up in Google by syncing this service with users in Active Directory. Another cloud service used by the district is PowerSchool. PowerSchool serves as the student information system (SIS), and it manages all student demographic data, courses, schedules and attendance for all the schools in the district. Other cloud services utilized by the district include: Schoology, Performance Matters, Freshdesk, Aesop, GoFMX, VeriTime, ClassLink, and various curriculum services (e.g., MobyMax, Big Universe, AIMSweb).

Another critical piece of the district's infrastructure is the IT staff. The IT department consists of the following positions: Director of Technology, Systems Manager, IT Secretary, Network Manager, Accounts Manager, PC /Helpdesk Technician, EMIS Coordinator, Registrar, and Attendance Secretary. The Network and Accounts Managers also spend much of their time acting as a PC/Helpdesk Technician. The persons in IT department are responsible for all aspects of the infrastructure, device setup, maintenance and repair, software deployment, account management, phone system management, management of all student data, and state reporting of student and school information.

Where do we want to be?

New Albany-Plain Local Schools' technology infrastructure has improved over the past few years, but there are still some areas in need. The first thing that needs to be addressed is the physical servers that act as the virtual server hosts. These four servers need to be replaced as soon as possible to prevent catastrophic failure and downtime for the entire district. These four servers could be replaced with four new models with higher specifications, or they could be replaced with one unified system (e.g., Cisco's UCS). Once this upgrade has been completed, then the district's virtual servers will perform better, and there will be room for expansion as needs arise. In conjunction with the virtual host server upgrade, the file storage server (Nimble) should be expanded to

meet the growing needs of the district. The current Nimble device is almost at capacity; its storage should be doubled to ensure efficient performance.

Next, the district should focus on replacing several switches in network closets located in each building. Power over ethernet (POE) switches are necessary for VOIP phones and wireless access points; many of the district's current switches are not POE, so they should be replaced as soon as possible. Also, some of the older switches can only handle 100 Mbps of data while newer ones can handle 1000 Mbps; the 100 Mbps switches should be replaced as soon as possible.

Along with the switches in the network closets, universal power supplies (UPS) should be replaced as soon as possible. UPSs power network equipment in the closets in case there is a power outage. This is not only important for keeping the district's phones and network up during critical times, it also prevents damage to the equipment due to sudden changes in the power being supplied. Power outages and surges can cause irreparable damage to network equipment, so having quality UPSs in place is a necessary expenditure.

Continuing to replace the Xirrus wireless system in the district's buildings with Meraki should also be a priority. This upgrade is covered by the Federal government's E-Rate program, so the district will receive up to a 40% reimbursement for wireless system upgrades. The MS is in the most need of an upgrade followed by the K-12 Learning Facility and then the 2-5 Elementary School. Along with the wireless upgrades, the interior data cables should be evaluated and upgraded as needed so they are all at least CAT6.

Since New Albany-Plain Local Schools owns its own fiber network, the district should make sure the fiber lines are maintained properly. While it is not an urgent need, replacing some of the fiber connections between buildings should be planned for in the next three fiscal years. The connection between the HS library and K-1 School should be addressed first, followed by the other inter-building connections. Making sure these connections are updated will help to ensure true redundancy in the district's network, and protect it against local breaks or failures in one connection.

Finally, the district should continue to monitor and maintain enough bandwidth to meet the needs of students and staff. More bandwidth should be added once the district reaches 80% capacity on a daily basis.

## 5-Year Infrastructure and Device Plan

### Infrastructure Upgrades (PI Funds)

Item	Avg Unit Cost	FY19 Qty	FY20 Qty	FY21 Qty	FY22 Qty	FY23 Qty	Total Qty	Total Cost
UPS	\$1,600.00	4	3	0	0	15	22	\$35,200.00
Router	\$20,000.00	0	2	0	0	0	2	\$40,000.00
Fiber	\$80,000.00	0	1	6	0	0	7	\$560,000.00
Core Switch	\$100,000.00	0	0	0	0	1	1	\$100,000.00
Physical Servers	\$10,000.00	0	6	1	0	0	7	\$70,000.00
<b>Totals</b>		<b>\$6,400.00</b>	<b>\$184,800.00</b>	<b>\$490,000.00</b>	<b>\$0.00</b>	<b>\$124,000.00</b>		<b>\$805,200.00</b>

### Infrastructure Upgrades (General Fund)

Item	Avg Unit Cost	FY19 Qty	FY20 Qty	FY21 Qty	FY22 Qty	FY23 Qty	Total Qty	Total Cost
Wireless Access Points	\$1,000.00	100	90	0	160	90	440	\$440,000.00
POE Switch	\$5,000.00	12	9	10	10	0	41	\$205,000.00
Internal Cabling	\$150.00	0	400	280	300	80	1060	\$159,000.00
<b>Totals</b>		<b>\$160,000.00</b>	<b>\$195,000.00</b>	<b>\$92,000.00</b>	<b>\$255,000.00</b>	<b>\$102,000.00</b>		<b>\$804,000.00</b>

### Device Upgrade/Replacements (General Fund)

Item	Avg Unit Cost	FY19 Qty	FY20 Qty	FY21 Qty	FY22 Qty	FY23 Qty	Total Qty	Total Cost
Chromebit	\$110.00	65	90	90	115	20	380	\$41,800.00
Chromebook	\$300.00	566	469	809	270	806	2920	\$876,000.00
Chromebox	\$200.00	0	18	0	0	0	18	\$3,600.00
Desktop	\$700.00	319	65	131	23	50	588	\$411,600.00
Digital Display	\$1,000.00	65	90	90	55	20	320	\$320,000.00
iPad	\$400.00	265	190	101	106	220	882	\$352,800.00
Laptop	\$1,000.00	200	119	180	200	200	899	\$899,000.00
Projector	\$800.00	20	0	0	0	0	20	\$16,000.00
Tablet	\$300.00	0	0	0	0	0	0	\$0.00
Peripherals	\$150.00	0	0	0	0	0	0	\$0.00
<b>Totals</b>		<b>\$787,250.00</b>	<b>\$484,700.00</b>	<b>\$654,700.00</b>	<b>\$407,150.00</b>	<b>\$587,000.00</b>		<b>\$2,920,800.00</b>

### Security Cameras

Item	Avg Unit Cost	FY19 Qty	FY20 Qty	FY21 Qty	FY22 Qty	FY23 Qty	Total Qty	Total Cost
Security Cameras	\$1,600.00	70	60	50	0	0	180	\$288,000.00
POE Switches	\$5,000.00	8	6	10	0	0	24	\$120,000.00
UPSs	\$1,600.00	10	6	10	0	0	26	\$41,600.00
<b>Totals</b>		<b>\$168,000.00</b>	<b>\$135,600.00</b>	<b>\$146,000.00</b>	<b>\$0.00</b>	<b>\$0.00</b>		<b>\$449,600.00</b>