



# Technology Leadership and Communication

## 2014 Bond Technology Update

### Progress of the Technology Network Infrastructure Upgrades Long Range Planning Committee – March 4, 2015





## 2014 Bond Technology Update

### Progress of the Technology Network Infrastructure Upgrades



# AGENDA



## Team Video and Introductions

- Components of the 2014 Technology Bond
- Challenges and Progress
- Implementation Plan



# Introduce the Technology Team

## *Award Winning Team!*



*Texas K-12 CTO Council*  
Texas K-12 CTO Council



***Recognized by the Texas K-12 Chief Technology Officer (CTO) Council  
as Team of the Year in 2014-2015***

***Received Honorable Mention at the National Level by the Consortium of School Networking***



# Introduce the Technology Team



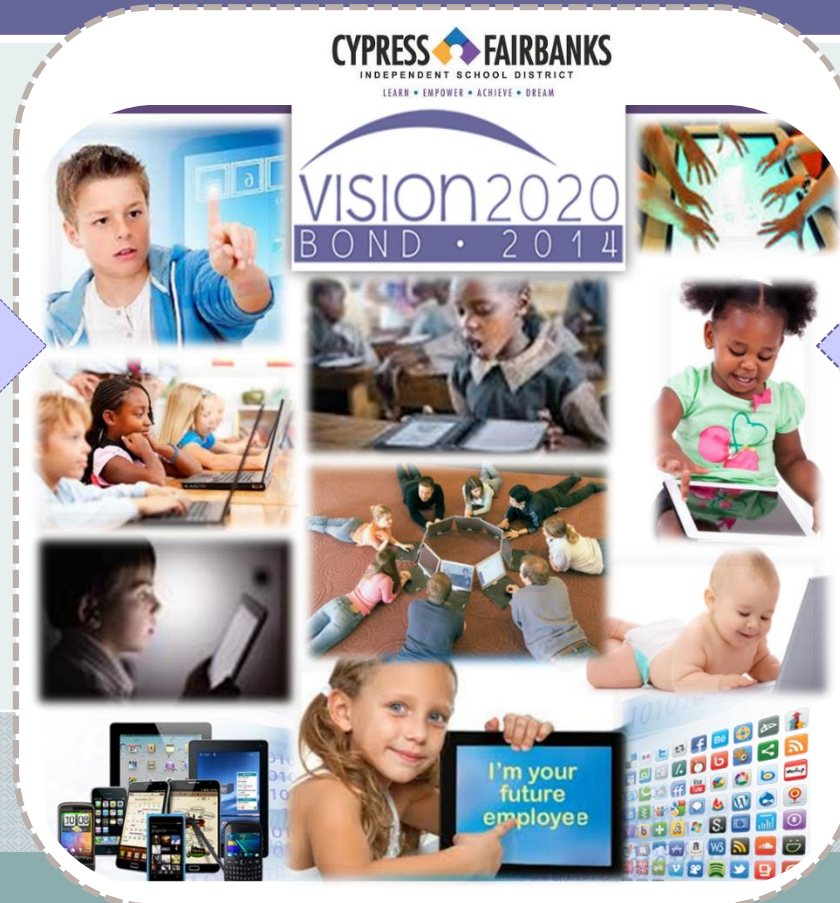
***Reminder about what is in the  
2014 Bond Technology Program***



# Review the 2014 Bond Technology Components

*The 2014 Bond for Technology includes both  
Technology Services and Instructional Technology*

**Instructional  
Technology**



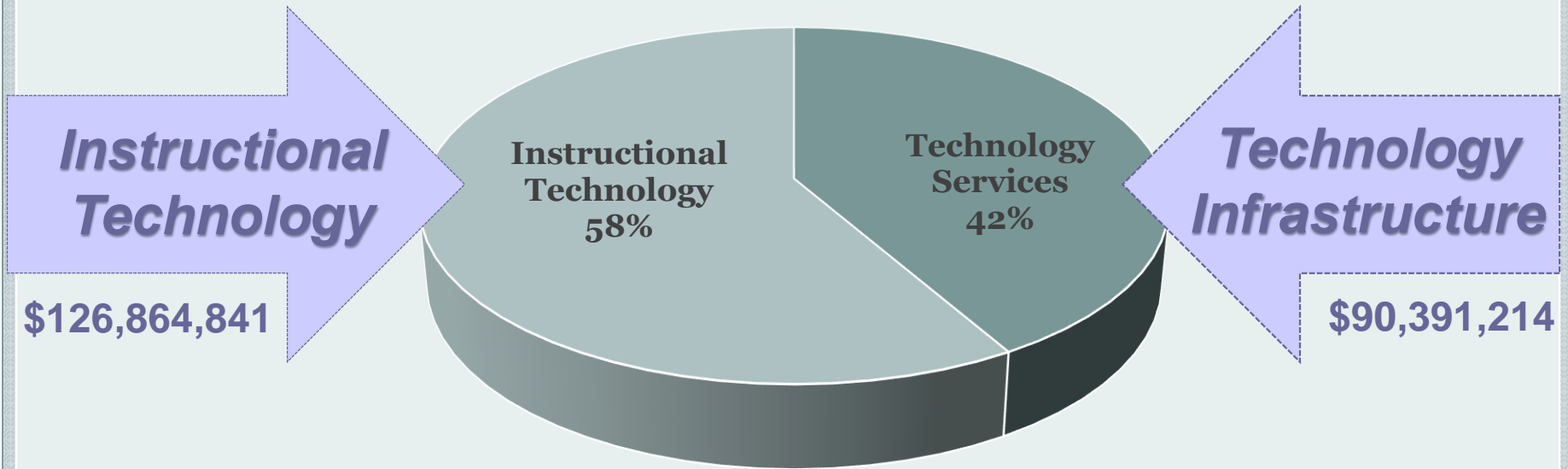
**Technology  
Infrastructure**



# Review the 2014 Bond Technology Components

*The 2014 Bond for Technology includes both  
Technology Services and Instructional Technology*

Total Technology Allocation for the 2014 Bond \$217,256,055





# Review the 2014 Bond Technology Components

*The 2014 Bond for Technology includes both  
Technology Services and Instructional Technology*

**Instructional  
Technology**

**\$126,864,841**

<b>Bond Project Category</b>	<b>\$ Allocation</b>
Standard Classroom Technology	\$93,243,466
Student Mobile Technology	\$8,269,076
High School Labs - CTE, USH, etc.	\$4,795,938
Library Technology	\$3,238,058
Special Campuses	\$1,931,724
New Campuses	\$14,674,615
Other Technology - ISC Labs	\$711,964
<b>INSTRUCTIONAL TECHNOLOGY</b>	<b>\$126,864,841</b>



# Review the 2014 Bond Technology Components

*Includes both  
Technology Services and Instructional Technology*

Bond Project Category	\$ Allocation
Install High Speed Wireless Access Infrastructure	\$12,934,270
Install Network Electronics Infrastructure	\$28,689,853
Upgrade Fiber and Cabling Connectivity	\$4,670,150
Upgrade Electrical Power and Air Conditioning	\$4,969,863
Build a Virtualized Server Data Center	\$3,105,236
Install a Storage Area Network (SAN)	\$4,684,504
Co-Locate Data Center at an External Facility	\$698,413
Build Backup, Recovery, and Business Continuity	\$1,660,506
Replace Telephone System with VoIP	\$7,469,294
Replace Administrative Staff Technology	\$8,097,716
Replace Network Printers and Print Servers	\$4,182,715
Install Technology Infrastructure in New Schools	\$3,315,248
Design Contingency	\$5,913,444
<b>TECHNOLOGY INFRASTRUCTURE</b>	<b>\$90,391,214</b>

**Technology  
Infrastructure**

**\$90,391,214**





# Consider Our Challenges

*The Bond passed so what comes first?*

**District News**

**BOND 2014**

Polls are closed.  
With 23 of 23 precincts reporting:  
68.71% FOR; 31.29% AGAINST.



# Consider Our Challenges

## *Where Do We Start?*

Lack of Power – Lack of Air Conditioning – Lack of Network Bandwidth





# Consider Our Challenges

*The instructional needs are so great*

**Instructional  
Technology**

**\$126,864,841**



**VISION2020**  
long-range plan

“We need technology in every classroom and in every student and teacher’s hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world.” – [David Warlick](#)



# Consider Our Challenges

*Before we could even begin, we had to stabilize and upgrade many systems*



**1st Priority**

**Technology  
Infrastructure**

**\$90,391,214**



# 1st Priority

## *Stabilize and Upgrade All Systems*

2013

2014

Bond

Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug

**1** Convert Network Systems from Novell to Microsoft

**2** Implement Mobile Device Management for Tablets

**9** Replace E-Mail

**3** Revise the Service Request Management System

**4** Stabilize eSchoolPlus and Upgrade eFinance Plus

**5** Upgrade the Technology Asset Tracking System

**6** Expand the Network Capacity and Implement Bring Your Own Technology (BYOT)

**7** Update the Technology Plan

**8** Prepare for an Upcoming Technology Bond

**10** Build a World-Class Quality K-12 Technology Service System



# 1st Priority

## *Stabilize and Upgrade All Systems*



Expand Internet services, secure the network, and increase network bandwidth capacity





# 1st Priority

## *Stabilize and Upgrade All Systems*



Upgrade servers and systems



Expand Teacher Access Center (TAC)



Replace old equipment



Upgrade Business and HR systems

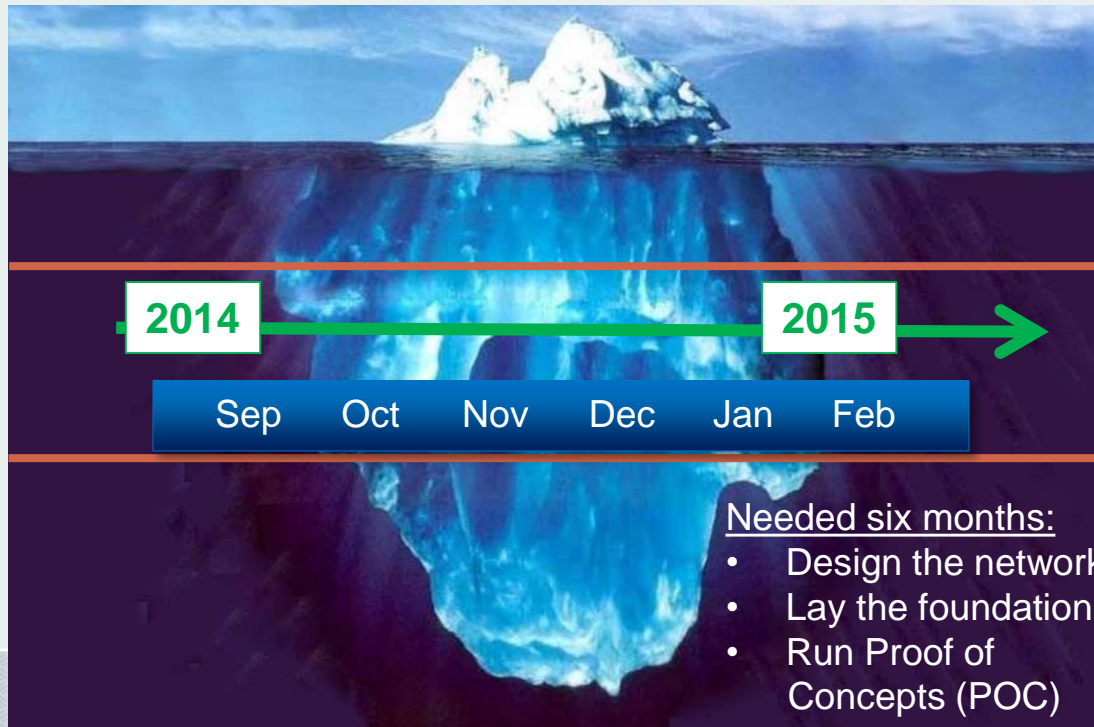


Provide campus technicians with tools and processes



# Consider Our Challenges

*Only until stable could we move forward with the 2014 Bond Technology Implementation*



**Technology Infrastructure**

**\$90,391,214**

Needed six months:

- Design the network
- Lay the foundation
- Run Proof of Concepts (POC)





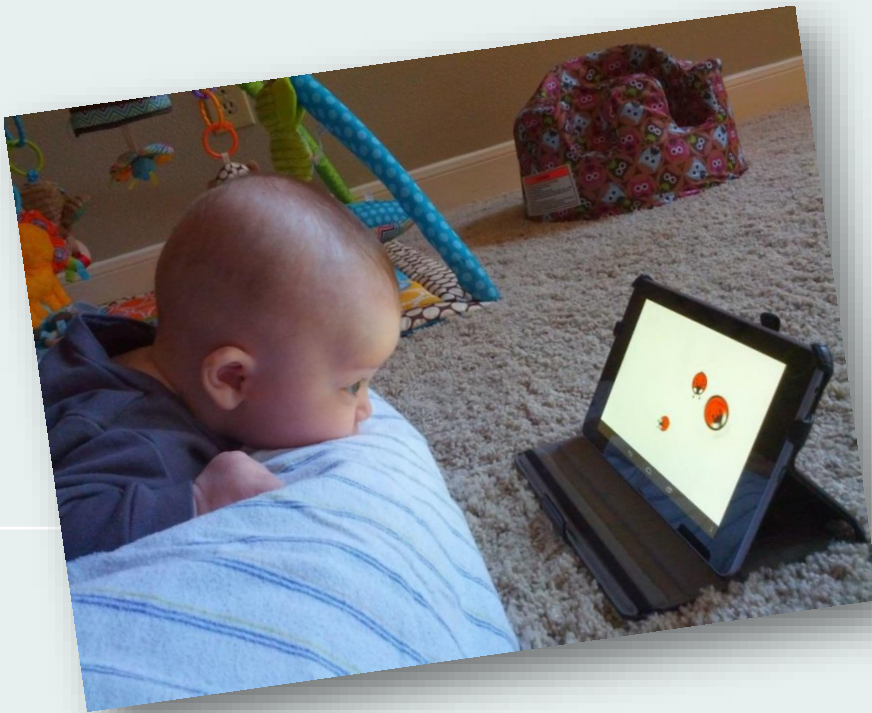
# Consider Our Challenges



We had to make significant network design decisions

“We need to prepare students for THEIR future not OURS.”

Ian Jukes, Educator and Futurist





# Consider Our Challenges



## Plan for Network Capacity Growth

Increased reliability and far more devices on the network

Category of Users	District Wireless Device Allocation	District Wireless Device Totals	BYOT Wireless Devices	BYOT Wireless Device Totals	Visitor Wireless Devices	District Wired Devices
Elementary School Student	0.5	30,382	1	60,763	15,191	31,535
Middle School Student	0.5	14,374	2	57,494	7,187	19,436
High School Student	0.5	19,060	3	114,362	9,530	32,747
Staff and Teachers	2	29,468	3	44,202	3,684	3,110
<b>Totals</b>		<b>93,284</b>		<b>276,822</b>	<b>35,591</b>	<b>86,828</b>

**Total Wireless Devices 405,697**  
**Total Wired Devices 86,828**  
**Total Devices on the Network 492,525**

One of the largest K-12 education networks in the nation

Smart Education Networks  
 by Design a CoSN leadership initiative

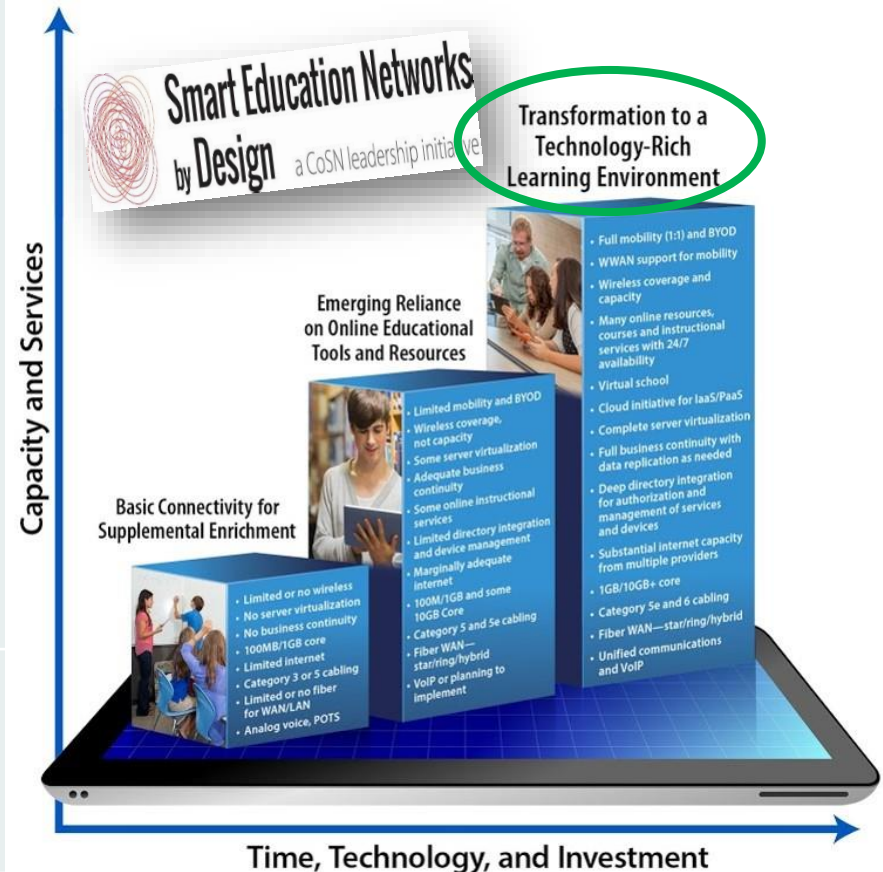


# Discuss Our Progress



## Network Design Based on World-Class Standards

- Multiple paths to the Internet
- Two or more data centers and/or cloud based services
- Design the network as a ring with no single points of failure
- Plan for as much bandwidth as possible
- Support for BYOT with 1:1 to 1:3-5 devices with high density WiFi demand
- Secure the network at a separate Tier 4 co-location facility with an Internet Point of Presence (POP)





# Discuss Our Progress



## Network Design Based on World-Class Standards

***“CyFair has been a wonderful partner and exemplar district in the work of the CoSN SEND initiative. As districts across the nation are struggling with the implications of new e-Rate opportunities, dramatic growth in requirements on networks, and budgetary challenges, the lessons we have learned from leading districts like CyFair allow us to provide resources to help them make technology decisions in a challenging and uncertain environment.” – Marie Bjerede***

Marie Bjerede is the project director for CoSN's Leadership for Mobile Learning (LML) and Smart Education Networks by Design (SEND) initiatives.



**Smart Education Networks**  
by **Design** a CoSN leadership initiative



# Discuss Our Progress



## Network Design Based on World-Class Standards

2014

2015

Aug

Sep

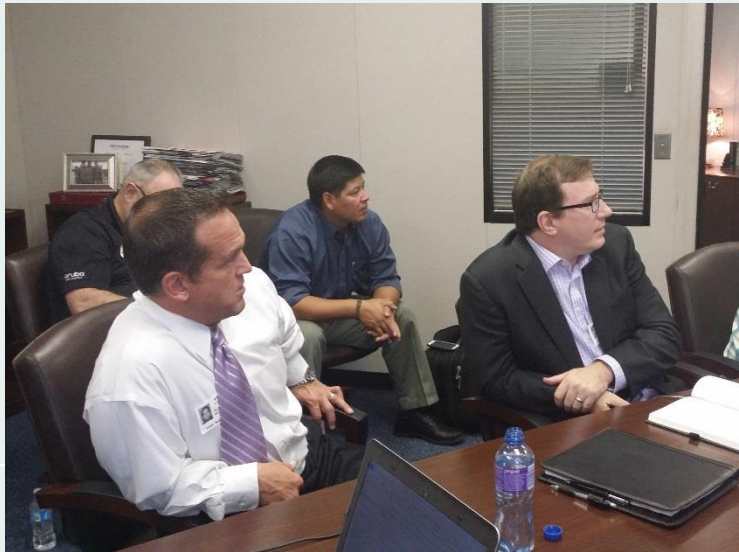
Oct

Nov

Dec

Jan

Feb





# Discuss Our Progress



## Network Design Based on World-Class Standards

2014

2015

Aug

Sep

Oct

Nov

Dec

Jan

Feb





# Discuss Our Progress



## Network Design Based on World-Class Standards

2014

2015

Aug

Sep

Oct

Nov

Dec

Jan

Feb





# Discuss Our Progress



## Network Design Based on World-Class Standards

2014

2015



Aug

Sep

Oct

Nov

Dec

Jan

Feb







# Discuss Our Progress



## Network Design Based on World-Class Standards

2014

2015



Aug

Sep

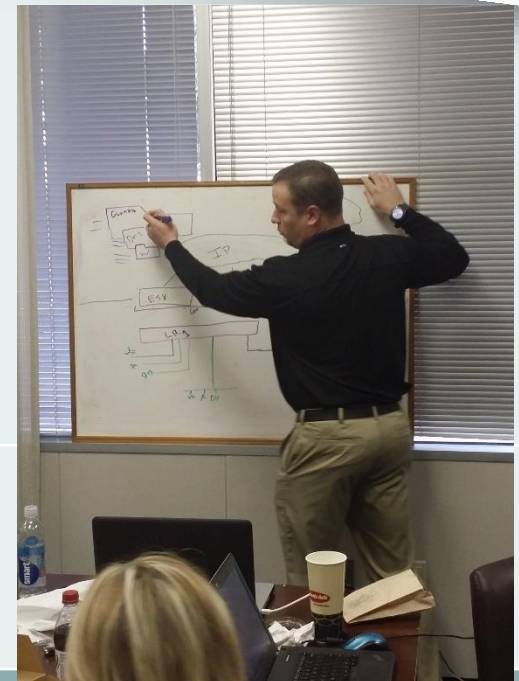
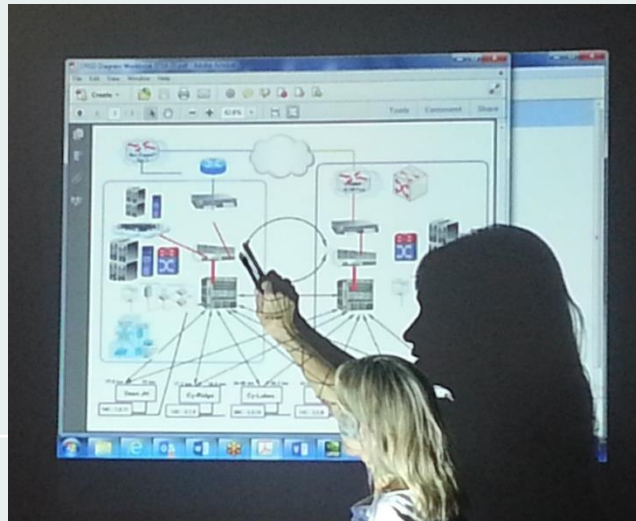
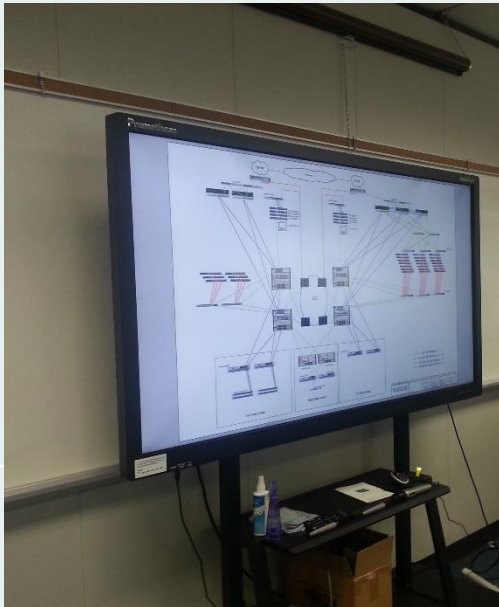
Oct

Nov

Dec

Jan

Feb





# Discuss Our Progress



## Network Design Based on World-Class Standards

2014

2015

Aug

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Feb



60+ Design Meetings held



Eight Months of Design Work



Proof of Concepts Implemented

“Best of Class” Technology Suppliers Selected



# Discuss Our Progress



## Vendor Commitment and Signoff To Ensure 100% Success

2014

2015

Aug

Sep

Oct

Nov

Dec

Jan

Feb





# Discuss Our Progress



**How are we going to upgrade this massive network?**



# Implementation Plan

## Three Levels of Infrastructure Upgrades

### District Level

- ✓ Increased Internet bandwidth by 800%
- ✓ Connected to 2 Internet service providers (ICTX and Cogent)
- ✓ Received approval to upgrade and expand our datacenters
- ✓ Received approval to build and move to CyrusOne, a co-location facility outside of the district
- Working to increase network bandwidth between ISC and CyrusOne (co-location facility)
- Working to replace all network electronics, firewalls, and core routing infrastructure

### Hub Site Level

### Campus Level

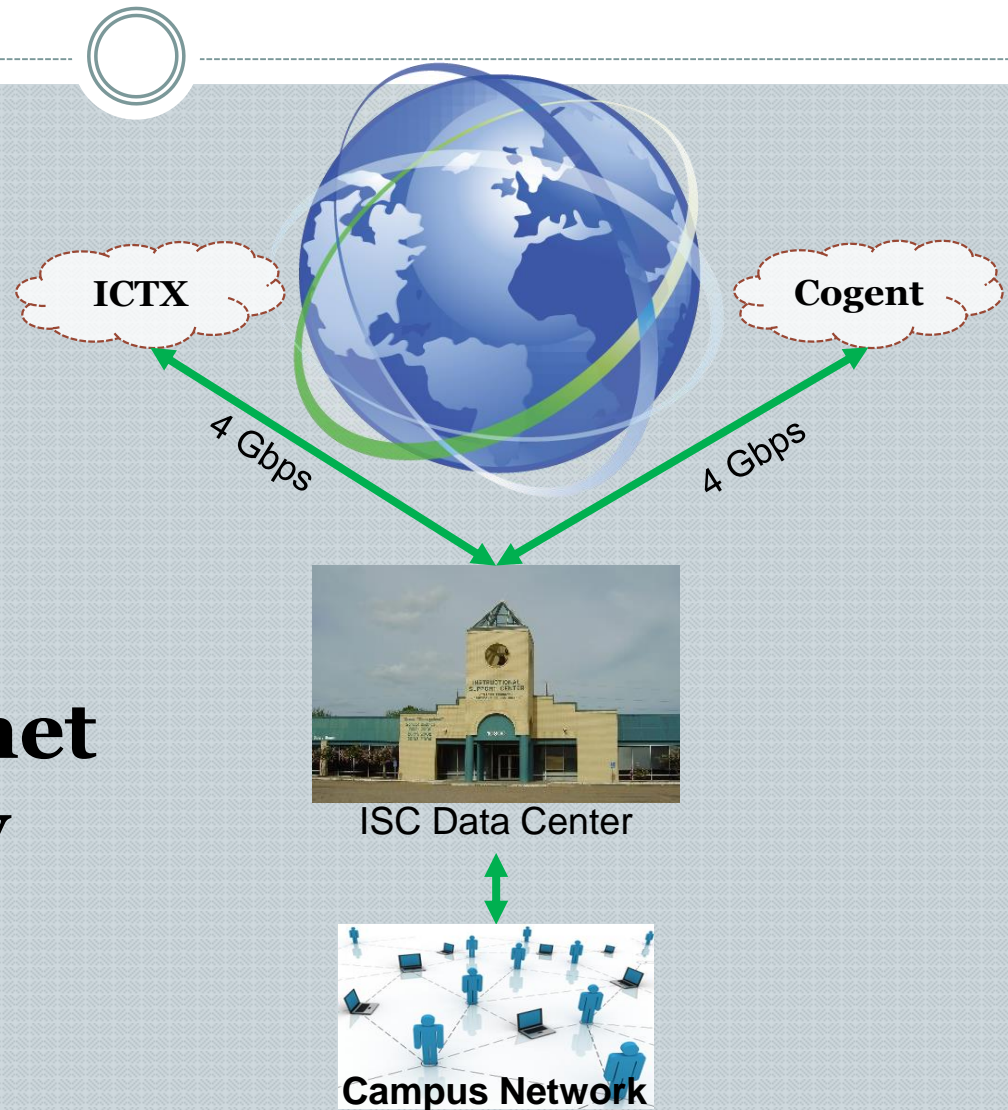


# Implementation Plan

**District  
Level**

**Completed  
February 2015**

**Current Internet  
Connectivity**



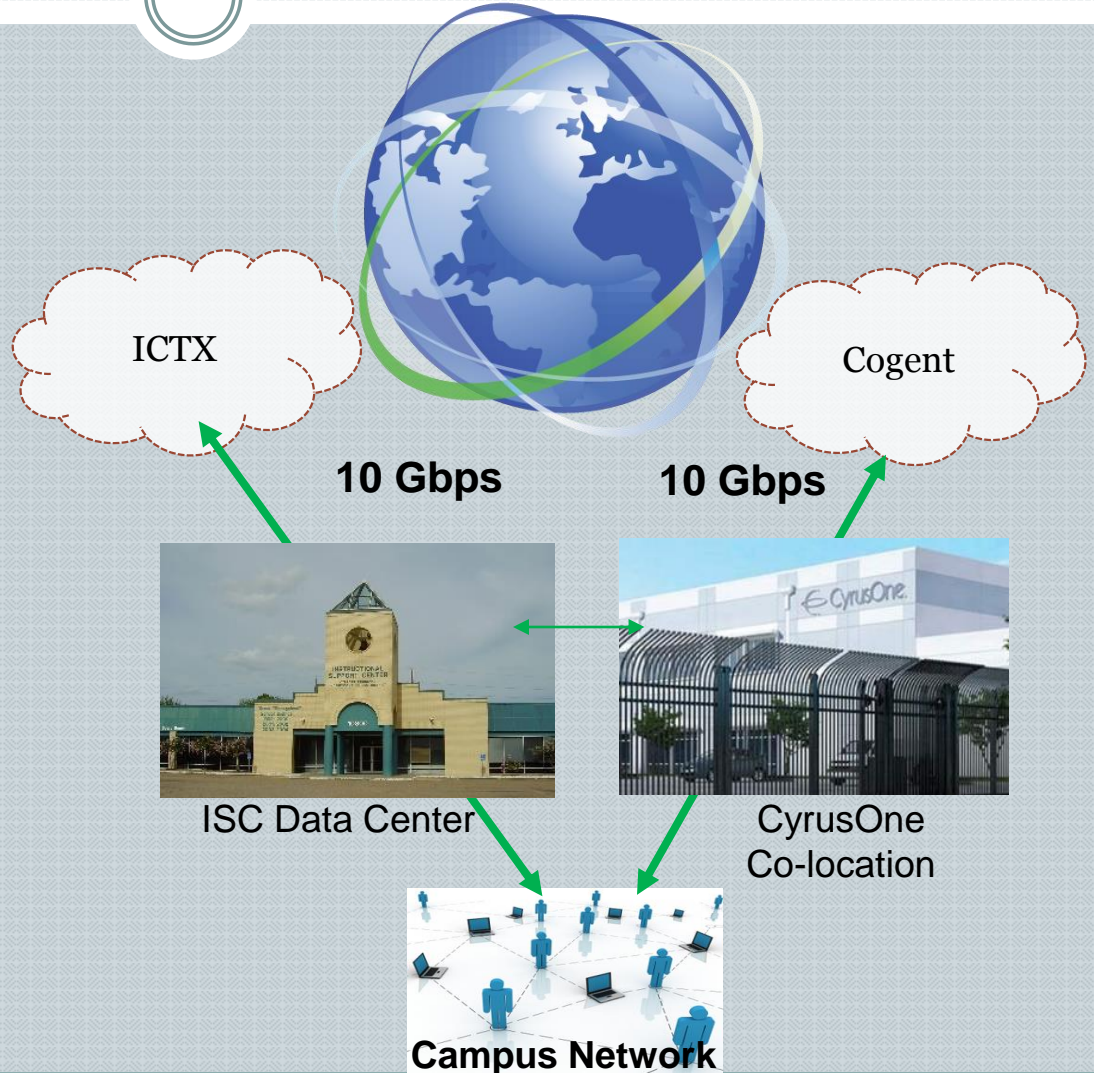


# Implementation Plan

District  
Level

Target Date for  
Completion  
July 1, 2015

Expanding  
Internet Even  
More



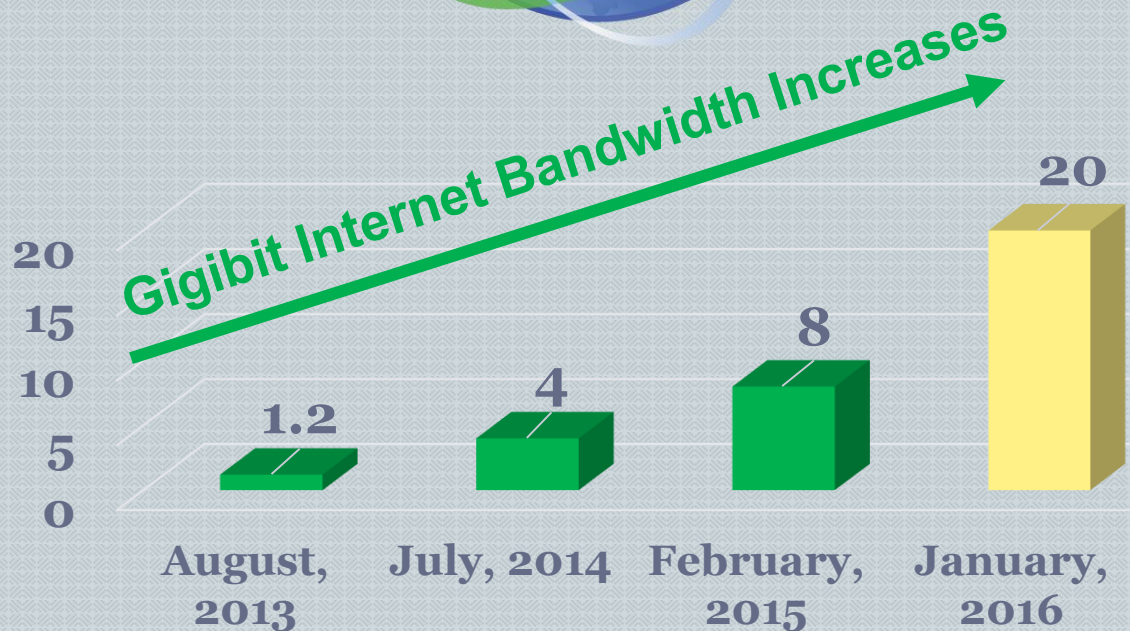


# Implementation Plan

District  
Level

Target Date for  
Completion  
July 1, 2015

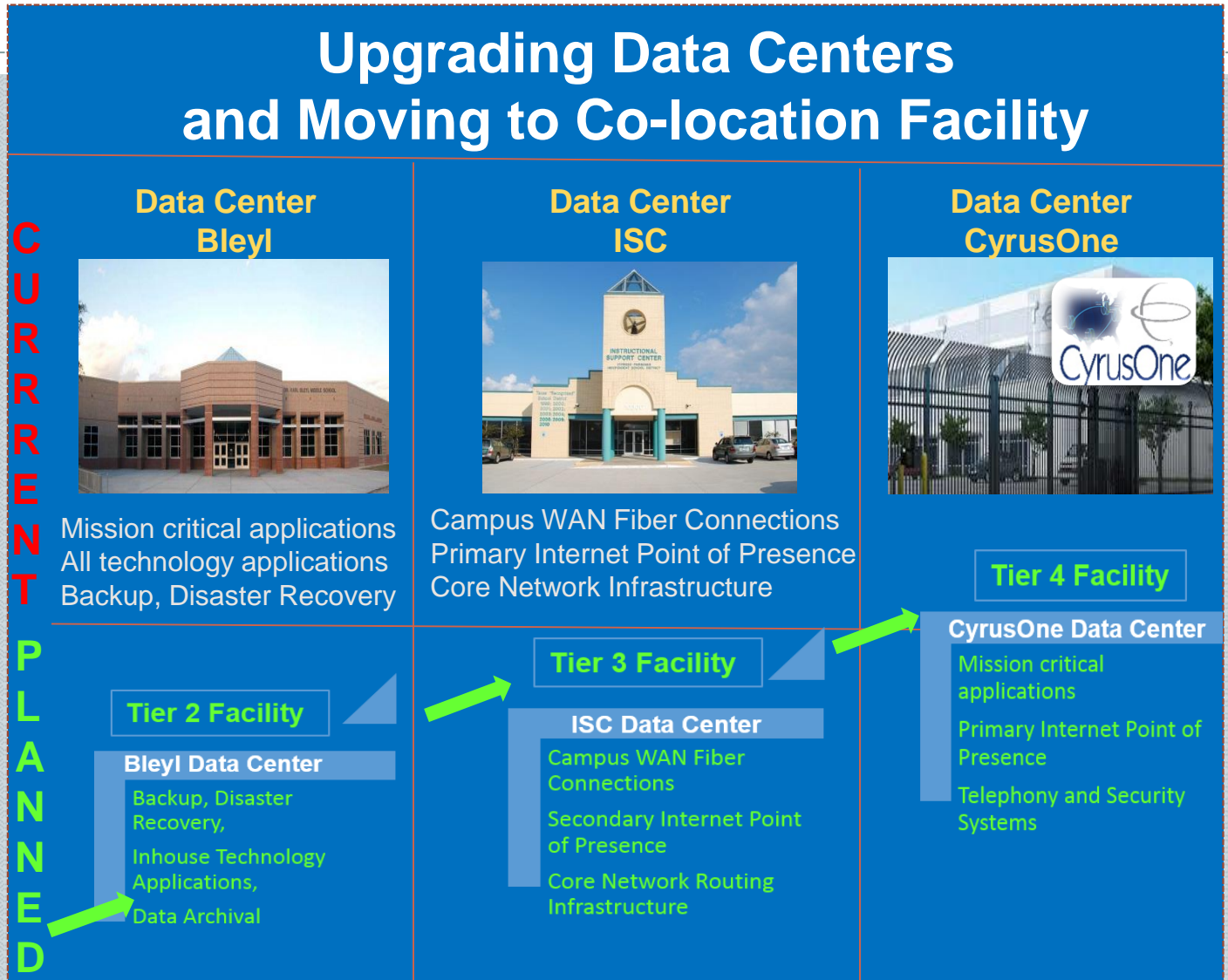
Planning to  
expand even  
more (as much  
as possible)







# Implementation Plan



**District Level**

**Target Date for Completion  
July 1, 2015**



# Implementation Plan

## Three Levels of Infrastructure Upgrades

District  
Level

Hub Site  
Level

Campus  
Level



1. Cy Woods Hub



2. Berry Center Hub



3. Cy Lakes Hub



4. Cy Ridge Hub



5. Bleyl Hub  
(data center)



6. Dean Hub



# Implementation Plan

## Hub Site Level - Infrastructure Upgrades

Hub Site Level

ISC – Core 1  
(data center)



CyrusOne – Core 2  
(data center)



1. Cy Woods Hub

2. Berry Center Hub

3. Cy Lakes Hub

4. Cy Ridge Hub

5. Bleyl Hub  
(data center)

6. Dean Hub

- Cy Ranch HS
- Anthony MS\*
- Goodson MS
- Hamilton MS
- Smith MS
- Spillane MS

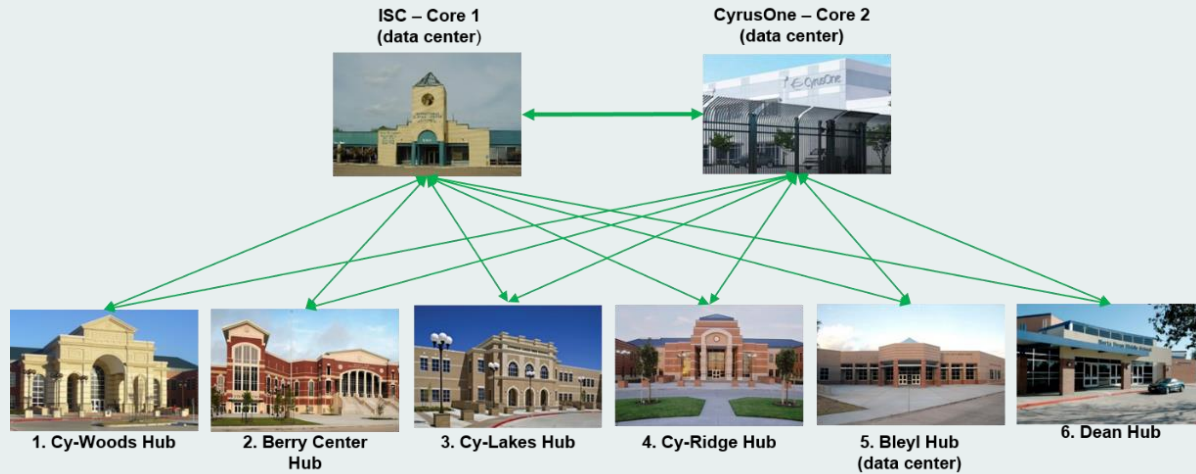
**Proof of Concept Schools**



# Implementation Plan

## Hub Site Level - Infrastructure Upgrades

### Hub Site Level



- Install high-speed network electronics, including wireless, BYOT, and secured access
- Replace cable in every classroom and building room
- Upgrade every network closet, switching cabinet, patch panel, electrical system, A/C
- Replace fiber between every network closet
- Replace phone system, phones, and devices



# Implementation Plan

## Campus Level - Infrastructure Upgrades

District  
Level

Hub Site  
Level

Campus  
Level

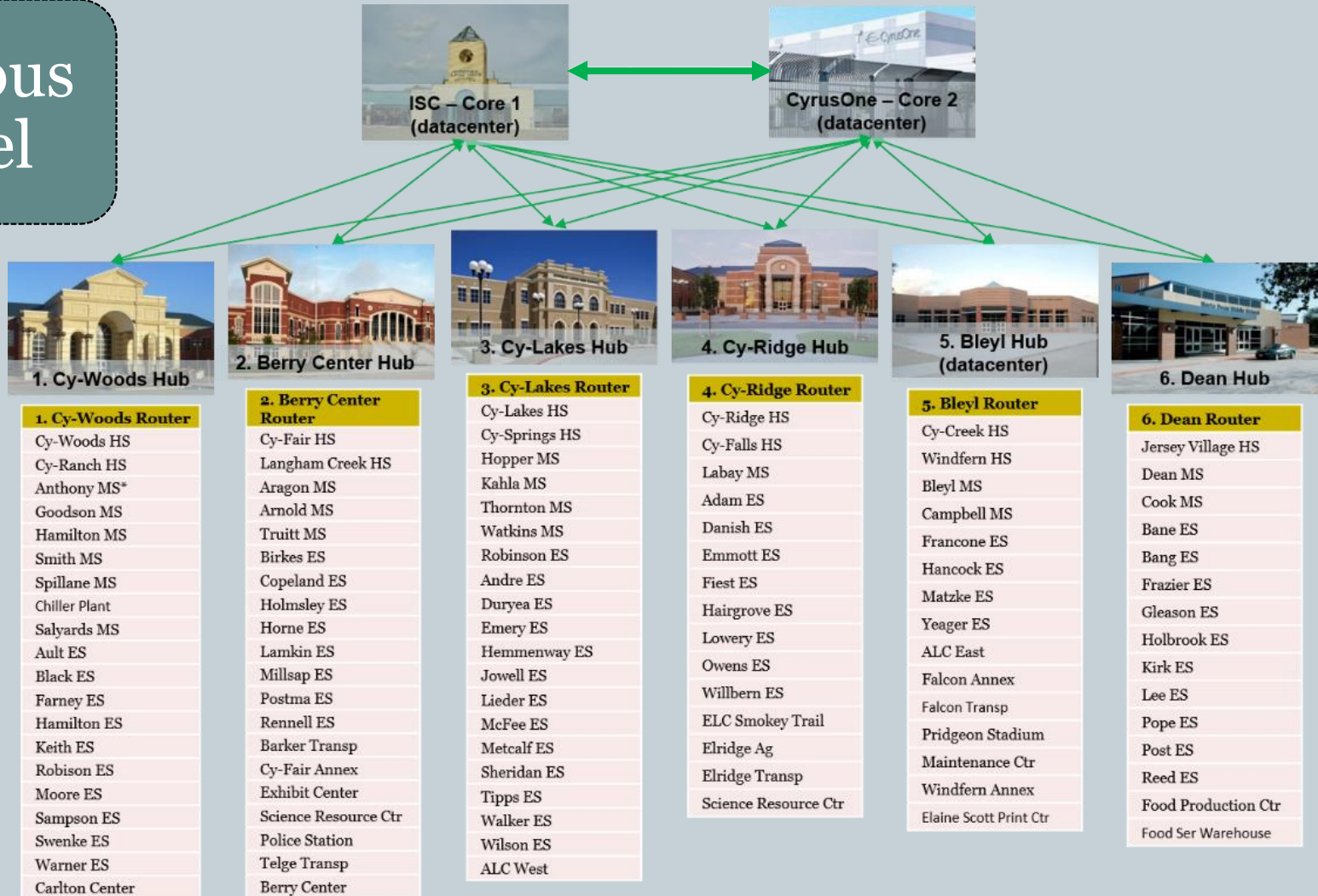
### Same as the Hub Site Level at Every Campus

- Install high-speed network electronics, including wireless, BYOT, and secured access
- Replace cable in every classroom and building room
- Replace fiber between every network closet
- Replace phone system, phones, and devices
- Upgrade every network closet, switching cabinet, patch panel, electrical systems, A/C



# Implementation Plan

## Campus Level





# Implementation Plan

## Three Levels of Infrastructure Upgrades

### Campus Level



### What is in a Typical High School?

17	Network Closets
28	Switching Cabinets
32	Network Electronics and Switches
5	Patch Wired Panels
220	Wireless Access Points
10	Miles of Category 6a Cable
8	Miles of Fiber
1000's	Devices, Printers, Phones, Technologies



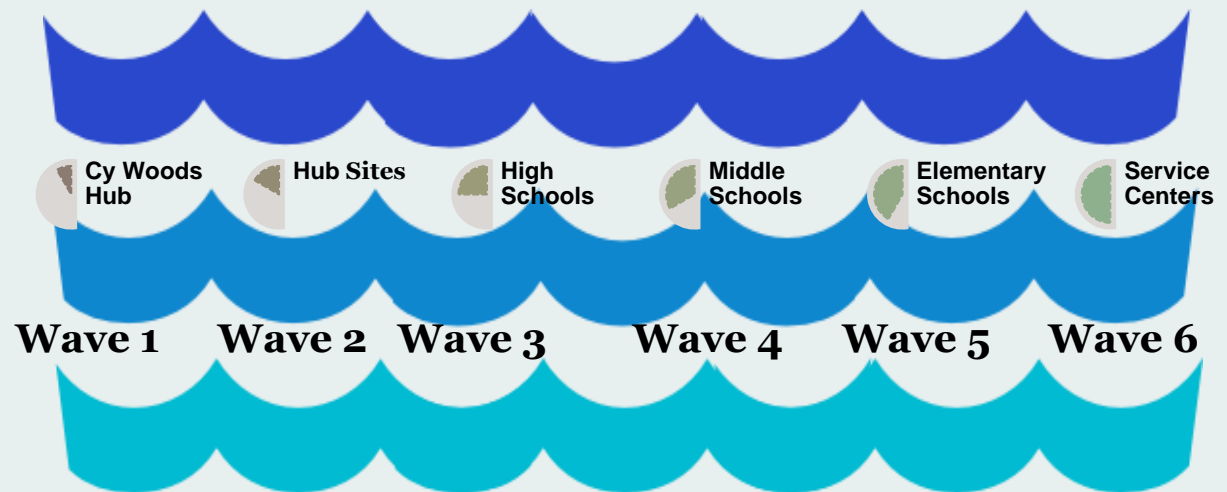
# Implementation Plan

## Deployment Strategy in Waves of Activity

District Level

Hub Site Level

Campus Level

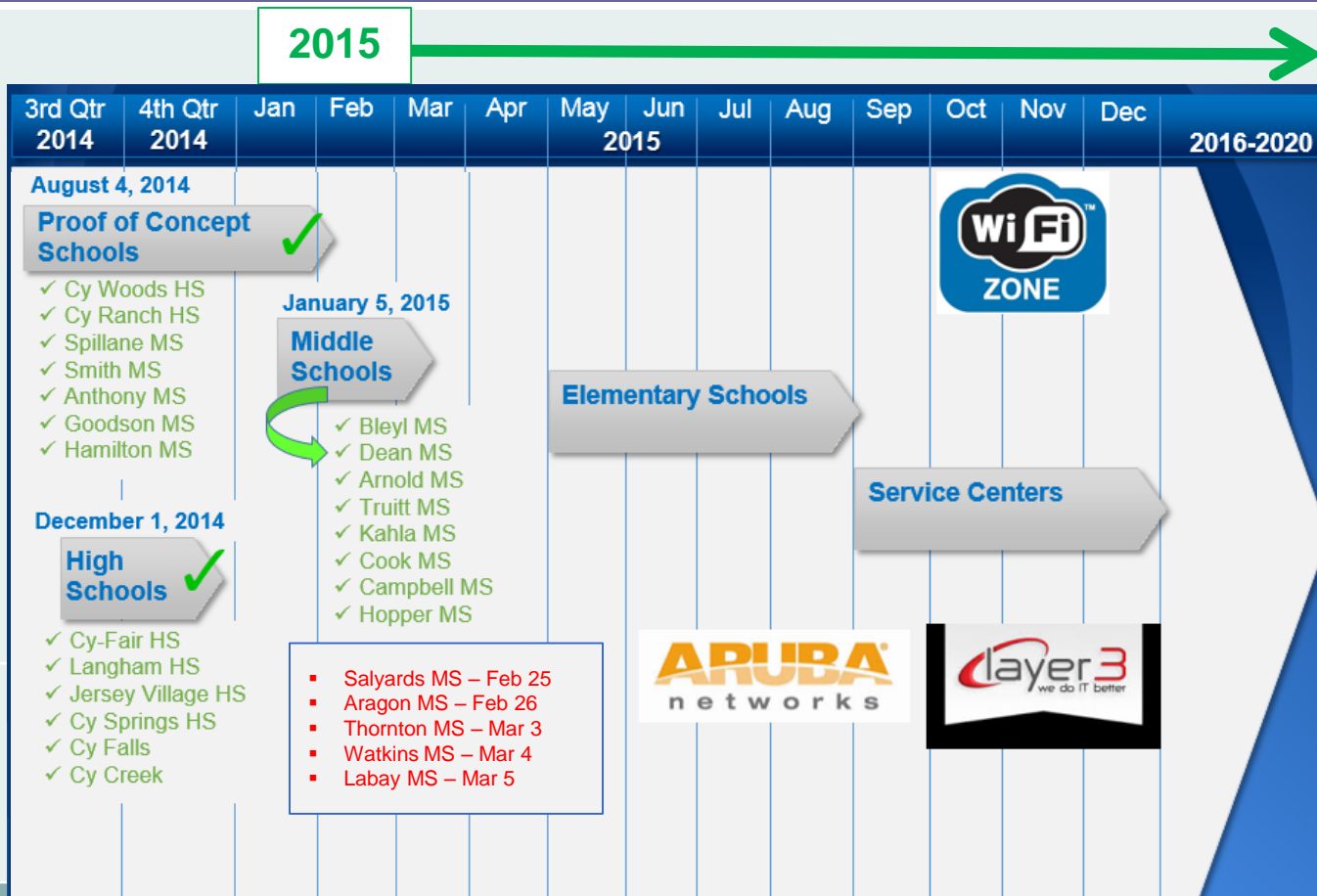






# Implementation Plan

## Deployment Strategy in Waves of Activity



### 1st Priority

Install high-speed network electronics, including wireless, BYOT, and secured access:

1. Cy Woods Hub
2. Hub Sites
3. High Schools
4. Middle Schools
5. Elementary Schools
6. Service Centers



# Implementation Plan

## Deployment Strategy in Waves of Activity

2015



Update all other Technology Infrastructure, starting with network electronics:

1. Cy Woods Hub
2. Hub Sites
3. High Schools
4. Middle Schools
5. Elementary Schools
6. Service Centers



# Implementation Plan

## Deployment Strategy in Waves of Activity

2015



Update all other Technology Infrastructure, starting with network electronics:

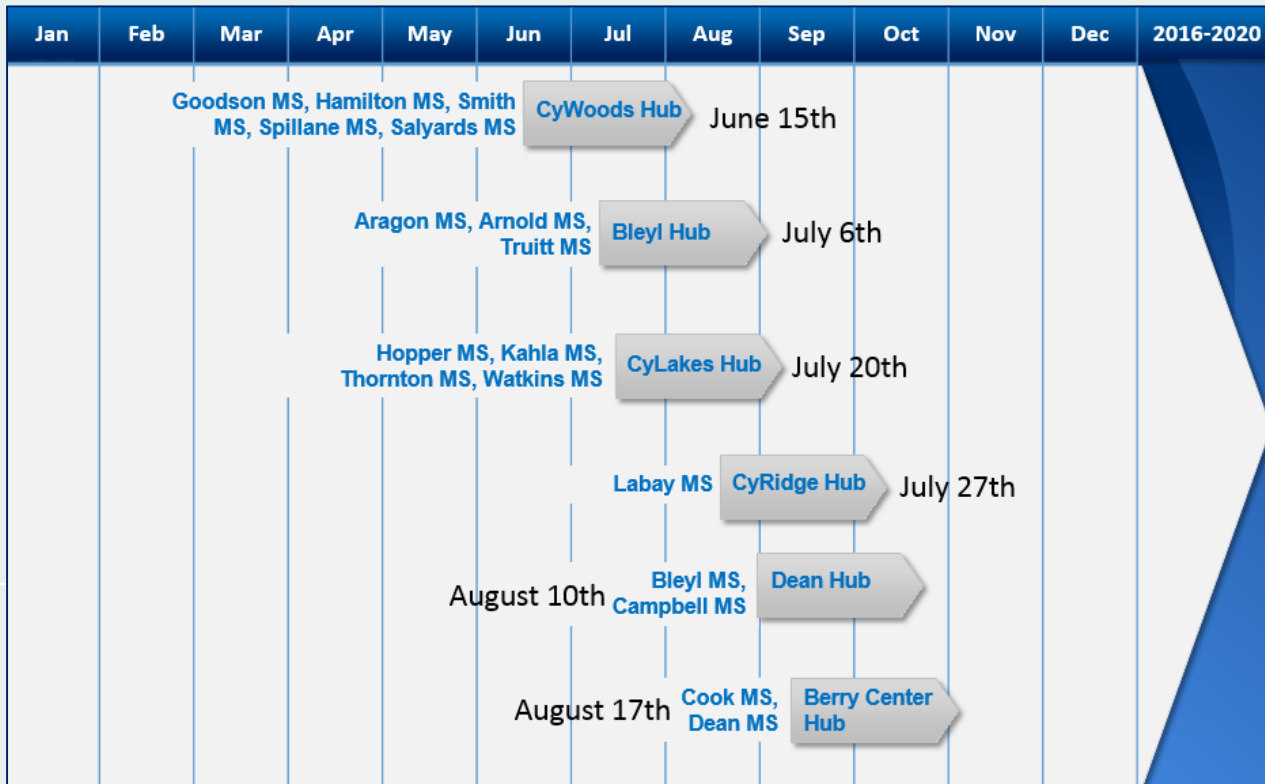
1. Cy Woods Hub
2. Hub Sites
3. High Schools
4. Middle Schools
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6. Service Centers



# Implementation Plan

## Deployment Strategy in Waves of Activity

2015



Update all other Technology Infrastructure, starting with network electronics:

1. Cy Woods Hub
2. Hub Sites
3. High Schools
4. Middle Schools
5. Elementary Schools
6. Service Centers



# Implementation Plan

Positioned at the end of 2015 to better serve the instructional technology needs

November 2015

2020

*Instructional Technology Implementation Will Begin*

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

**Instructional Technology**

**\$126,864,841**

VISION 2020  
long-range plan



Update all other Technology Infrastructure, starting with network electronics:

1. Cy Woods Hub
2. Hub Sites
3. High Schools
4. Middle Schools
5. Elementary Schools
6. Service Centers



# Technology Leadership and Communication

## Update on the 2014 Bond Technology Referendum QUESTIONS?

VISION 2020  
long-range plan



**CYPRESS FAIRBANKS**  
INDEPENDENT SCHOOL DISTRICT  
LEARN • EMPOWER • ACHIEVE • DREAM