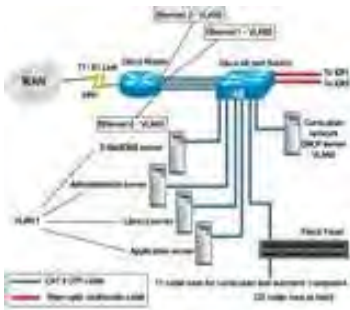




Massachusetts School Building Authority

Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities

MSBA policy demonstrating what is considered within construction costs compared to what is considered in the \$1,200/student allowance for technology.



Technology Infrastructure Components – Receive Full MSBA Reimbursement Participation



Non-fixed Technology Components – Subject to Limited MSBA Reimbursement Participation



Massachusetts School Building Authority

Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities



Designer Roundtable

Technology in Future Building Design

February 14, 2013



Massachusetts School Building Authority

Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities

Introductions and Presentation Format:

Infrastructure & Connectivity Projects in Massachusetts

Jason Whittet, Deputy Director, Massachusetts Broadband Institute

Dan Vortherms, CEO, Open Cape Corporation

Technology Standards, Education Trends, and Design

Luis Rodriguez, Director, Office of Digital Learning (DESE)

Phil Poinelli, Principal, Symmes Maini McKee

Michael Kerwin, Principal, Vanderweil Engineers

District Policies & Future Goals, Budget, and Impact to End-users

Craig Finley, Asst. Supt., Whitman-Hanson RSD

Robert Jokela, Asst. Supt., Eileen Spinney, Dir. Of Technology

Fitchburg Public Schools

**Jason Whittet,
Deputy Director,
Massachusetts Broadband Institute**

MBI Briefing School Building Authority

Massachusetts Broadband Institute
Jason Whittet, Deputy Director
February 14, 2013

MassBroadband 123
is an ARRA Funded Project



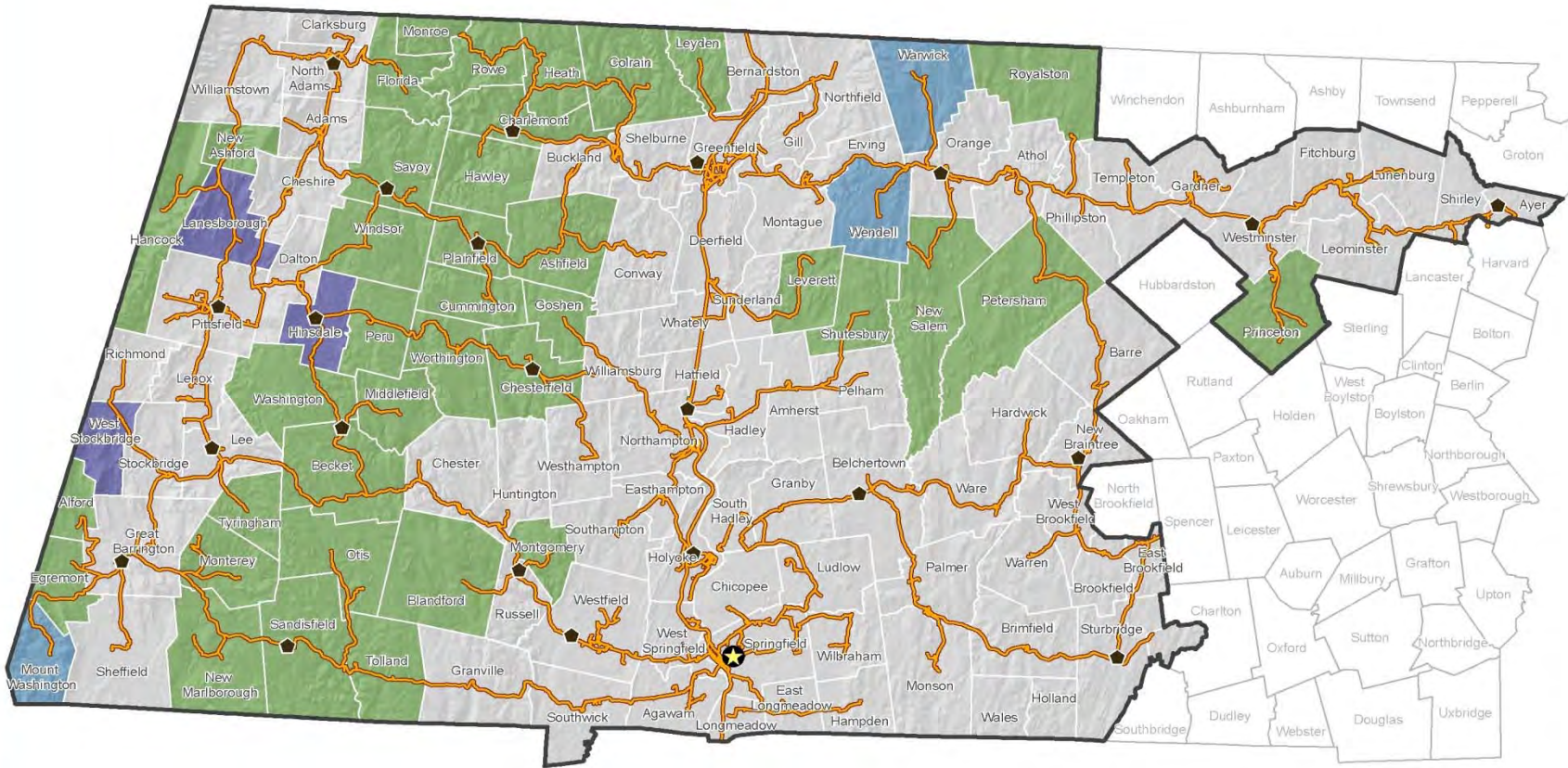


Massachusetts Broadband Institute



- Created by Governor Patrick and the Legislature in 2008
- Mission is to “Close the Digital Divide” in Massachusetts
- First priority is to extend affordable high-speed Internet access to unserved and underserved communities (less than 50% coverage)

MassBroadband 123 Service Area and Network Unserved Towns by Coverage Level



-  **MassBroadband 123 Service Area**
-  **MassBroadband 123 Fiber**
-  **Internet Point of Presence**
-  **Network Points of Interconnection**
-  **Partial DSL Only**
-  **Legacy Cable System**
-  **No Landline Broadband**



0 2.5 5 10 15 Miles

Map Date: 10 December 2012

ARRA Funded Project 



MassBroadband 123



- 1,200 mile state-owned, open-access regional, fiber-optic middle-mile network
- 1,200 schools, libraries, police and fire stations, town and state offices and healthcare facilities
- 335k households and 44k businesses in > 120 communities
- Axia NGN is invested network operator
- 30 retail service providers intend to use network
- Network operational between March and July



Benefits of *MassBroadband 123*



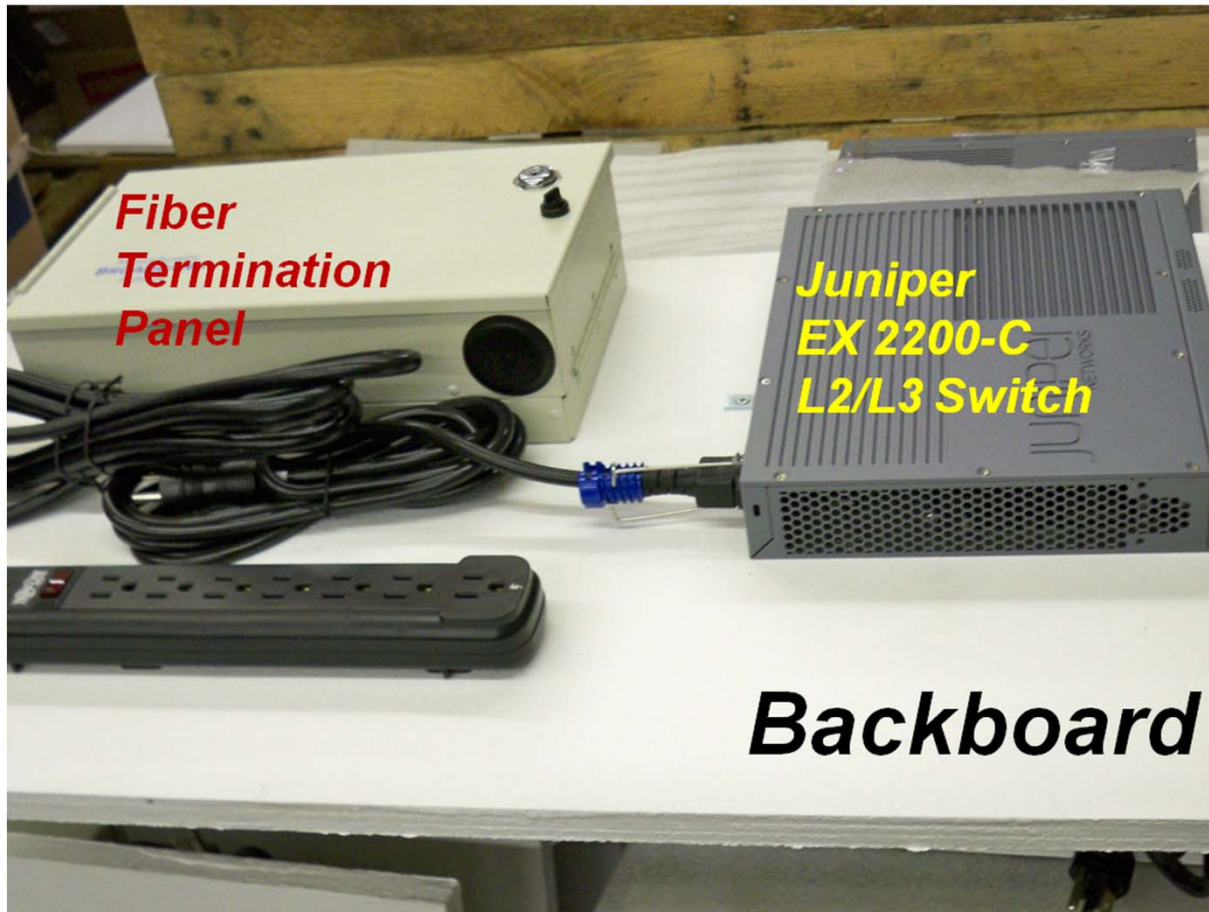
Education Benefits

- Virtual classrooms and field trips
- Distance learning and collaboration such as online study groups
- Online tools, interactive curricula, and specialized classes
- Video parent-teacher conferences
- Research enablement

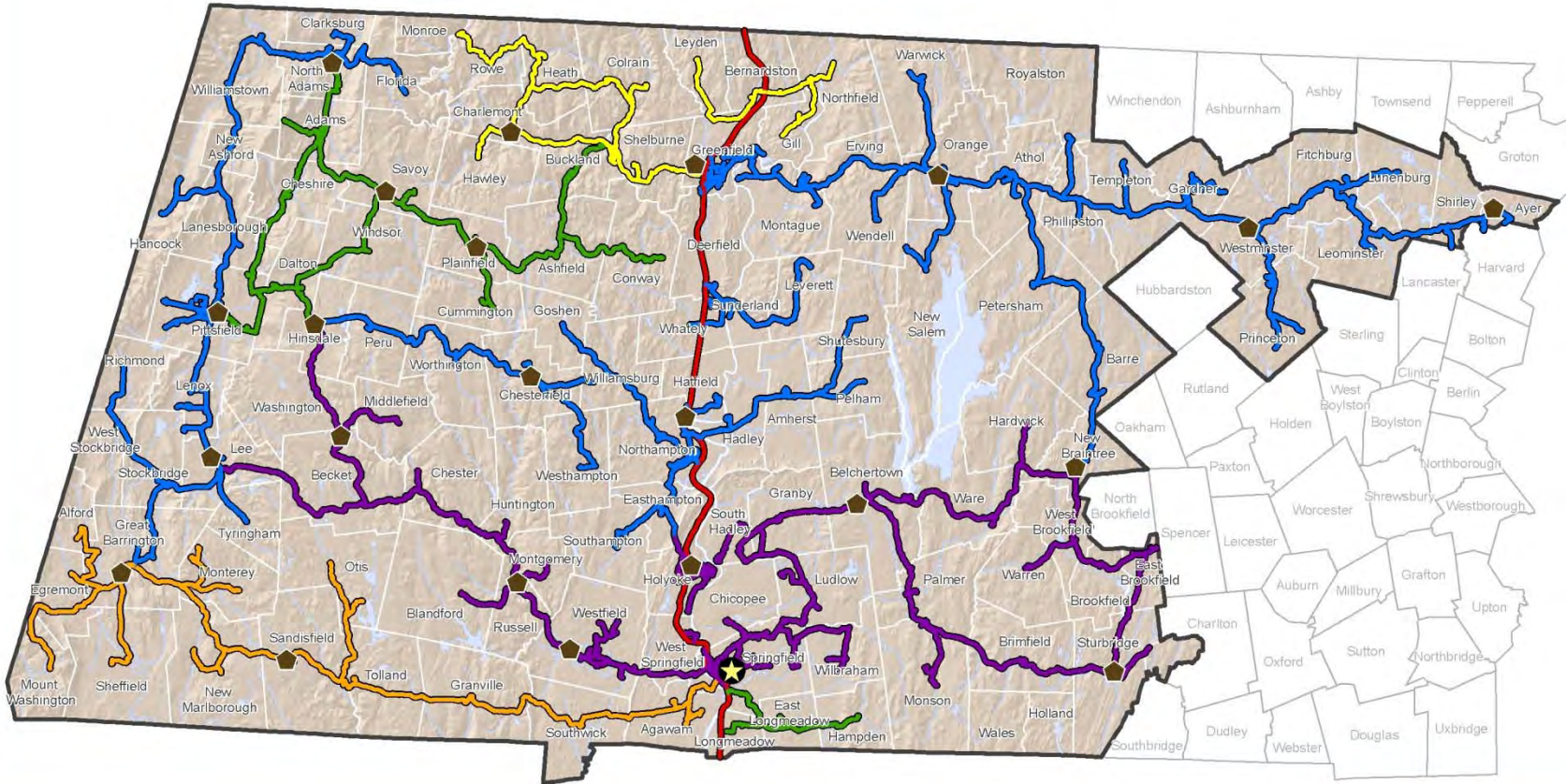
Connections

- 12 public higher education facilities will get much needed bandwidth and capacity for expanded course and workforce development programs
- 160 K-12 schools will also gain enhanced bandwidth

School Installation



MassBroadband 123 Service Area and Network Segment Target Completion by Month



Segment Target Completion by Month

Schedule is subject to change based on weather events, town or permitting delays, or other unforeseen events.



MassBroadband 123 Service Area

★ Internet Point of Presence

◆ Network Points of Interconnection



0 2.5 5 10 15 Miles

Map Date: 16 January 2013

ARRA Funded Project



CAI Completion Schedule - Towns by Month

March	April	May	June	July	
Agawam	Bernardston	Adams	Amherst	New Braintree*	Becket
Alford	Buckland*	Ashfield	Athol	New Salem	Belchertown
Egremont	Charlemont	Buckland*	Ayer	North Adams*	Blandford
Granville	Colrain	Cheshire	Barre	Northampton	Brimfield
Great Barrington*	Gill	Conway	Chesterfield	Orange	Brookfield
Monterey	Hawley	Cummington	Clarksburg	Pelham	Chester
Mount Washington	Heath	Dalton	Deerfield	Peru	Chicopee
New Marlborough	Leyden	East Longmeadow	Devens	Petersham	East Brookfield
Otis	Monroe	Hampden	Easthampton	Phillipston	Granby
Sandisfield	Northfield	Hinsdale*	Erving	Pittsfield*	Hardwick
Sheffield	Rowe	Longmeadow	Fitchburg	Princeton	Hinsdale*
Southwick	Shelburne	North Adams*	Florida	Richmond	Huntington
Tolland		Pittsfield*	Gardner	Royalston	Ludlow
		Plainfield	Goshen	Shirley	Middlefield
		Savoy	Great Barrington*	Shutesbury	Monson
		Springfield*	Greenfield	Southampton	Montgomery
		Windsor	Hadley	Sunderland	New Braintree*
			Hancock	Templeton	Palmer
			Hatfield	Tyringham	Russell
			Lanesborough	Warwick	South Hadley
			Lee	Wendell	Springfield*
			Lenox	West Stockbridge	Stockbridge
			Leominster	Westhampton	Sturbridge
			Leverett	Westminster	Ware
			Lunenburg	Whately	Warren
			Montague	Williamsburg	Washington
			New Ashford	Williamstown	West Brookfield
				Worthington	West Springfield
					Westfield
					Wilbraham

* Indicates town's completion spans more than one month



Contact



Jason Whittet

Deputy Director

Massachusetts Broadband Institute

whittet@masstech.org

(617) 378-7239

**Dan Vortherms, CEO,
Open Cape Corporation**



MSBA Designer Roundtable

February 14, 2013

Dan Vortherms, CEO
OpenCape Corporation
dvortherms@opencape.com

OpenCape Mission

To serve as a catalyst in improving government efficiency, research, education, healthcare delivery, public safety, and community and economic development through the establishment, promotion and operation of a state-of-the-art, open-access communications network serving Cape Cod, the islands of Nantucket and Martha's Vineyard and Southeastern Massachusetts.

OpenCape Background

- OpenCape Corporation
 - Non-profit 501(c)3 founded in 2006
 - Representative volunteer Board of Directors
 - Revenue in excess of operating costs and required reserves comes back to the community
- Funding
 - \$32 million ARRA BTOP grant
 - \$5 million MA General Obligation Bonds through MTC/MBI Incentive Fund of 2008
 - \$2 million in-kind cash match
 - \$750,000 in-kind match from Barnstable County
 - \$500,000 in-kind match from volunteer time

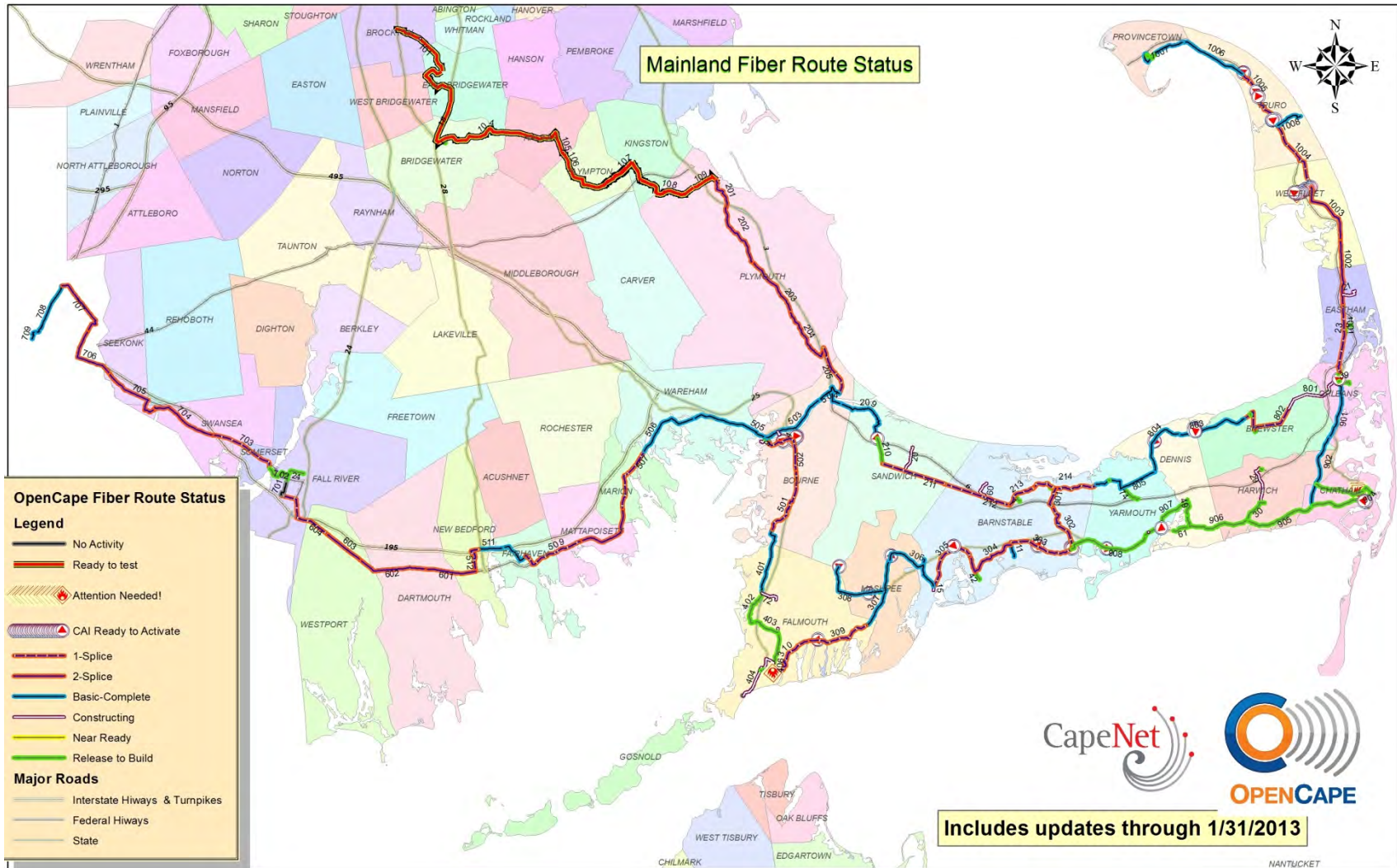
OpenCape Network Map



OpenCape Data Center

- Roughly 2,500 sq ft of data center space at Barnstable colocation center
 - 600 KW backup power generator
 - High efficiency UPS
 - Chilled water in-row cooling system
- Services will include colocation space by the rack unit up to whole rack
- Location to house Regional Umbrella Services to support towns on the Regional Area Network
 - VM/SAN

Construction Status Map



OpenCape Operations

- Operation and maintenance of network outsourced to CapeNet LLC
 - OpenCape retains ownership of network, including maintaining direct control over a percentage of the fiber
 - CapeNet controls remainder of fiber with obligation to sell part as dark fiber
- Allocation of fibers to the Commonwealth, NStar, OSHEAN, others
- Regional Area Network
 - Leverage fiber as extension of town network
 - Access to Regional Umbrella Services
 - Provide more cost effective internet connectivity
- Data center operator TBD

Community Anchor Institutions

Initial Grant Application

- 30 libraries
- 14 K12 schools
- 13 town locations
- 6 research institutions
- 5 colleges
- 4 public safety

Additional Sites Requested

- 19 public safety
- 6 K12
- 5 health care
- 3 other community sites
- 1 college

Schedule

- No-cost extension granted until September 30, 2013
- Anticipate fiber construction complete by end of March followed by 5-8 week test and acceptance period
 - Segmented acceptance
- Data center live ???
- Microwave before summer

**Luis Rodriguez, Director
Office of Digital Learning
Department of Elementary and
Secondary Education**

Office of Digital Learning

MSBA Designer Roundtable

February 14, 2013

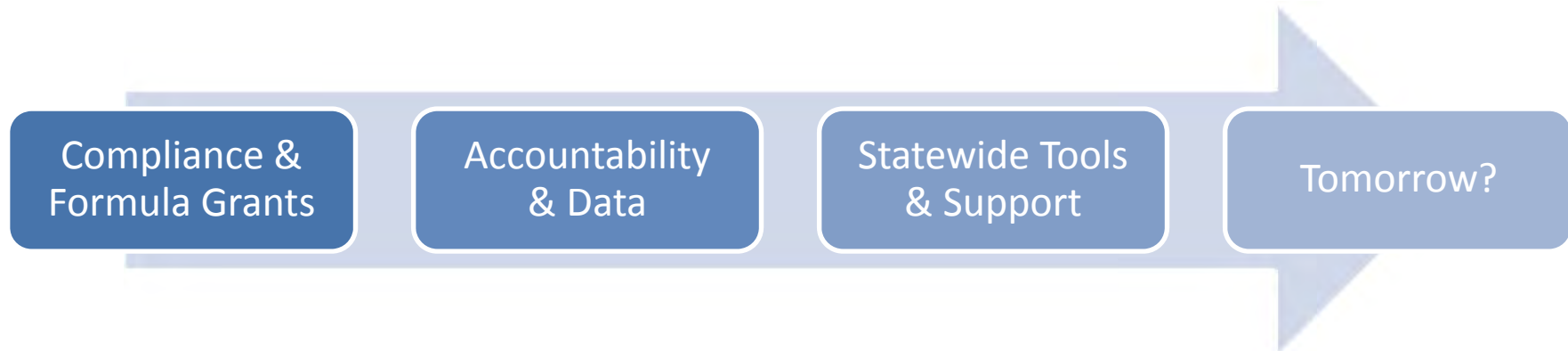
Massachusetts Department of
ELEMENTARY & SECONDARY
EDUCATION



Key Points

- Evolution of the SEA
- Office of [Digital Learning](#)
- ESE initiatives

Evolution of the SEA role ...



... what role does **Digital Learning** play?

- Sustainable innovation investments (pilots/competitive grants)
- Device independent content and data
- Big data insight
- Technology across other/all initiatives
- Transition to blended learning, eBooks, etc.

The Office of Digital Learning

- The Office of Digital Learning supports the expansion of digital learning capacity and literacy to advance learning for every student in the Commonwealth. We provide policies, guidance, professional development and support in the following areas:
 - District technology and infrastructure capacity
 - Classroom level instructional tools
 - Assistive technology resources
 - Virtual schools and online courses
 - Emerging digital learning trends



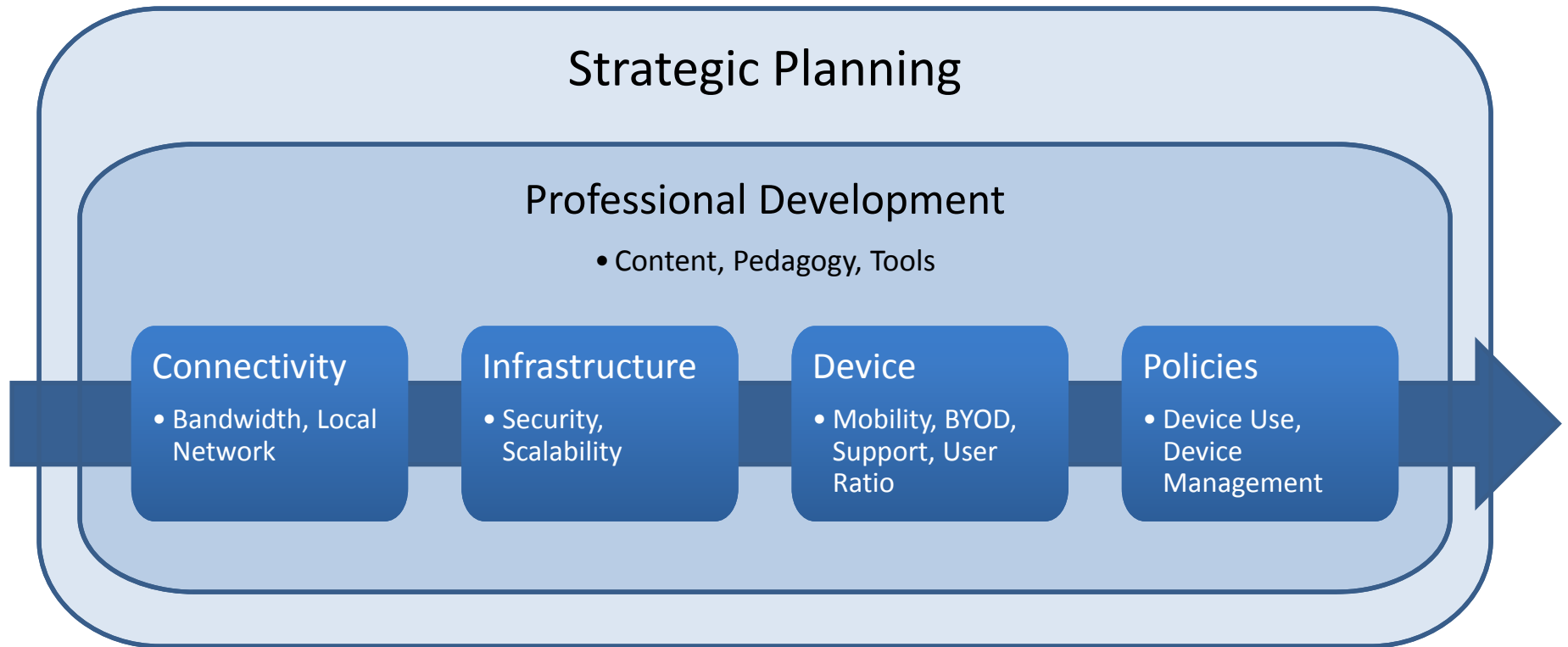
<http://www.doe.mass.edu/odl/>

ESE Activities

- Shifting the conversation – PARCC to digital learning
- Building **digital learning** capacity
 - Awareness, funding, guidance, standards
- Optional statewide Teaching, Learning and Analytics system
 - Thinkgate, digital content, model curriculum units, more analytics
- Interest in blended learning initiatives
- Commonwealth of Massachusetts virtual schools



Key Enablers of Digital Learning



How does it impact student learning?

Luis Rodriguez

Office of Digital Learning

781-338-3247

lrodriguez@doe.mass.edu



Massachusetts Department of
ELEMENTARY & SECONDARY
EDUCATION

**Phil Poinelli, Principal
Symmes Maini McKee**

MSBA Designer Roundtable

Technology in Future Building Design – Part 1

Philip J. Poinelli, FAIA, CEFP

SMMA
2/14/2013



SMMA

| 21ST CENTURY LEARNING SKILLS – 4 C's

- **Collaboration**
- **Communication**
- **Creativity**
- **Critical Thinking & Problem Solving**

**Technology = tool to access content,
differentiated learning; reinforce skills**

| 21ST CENTURY MOBILITY AT GHS

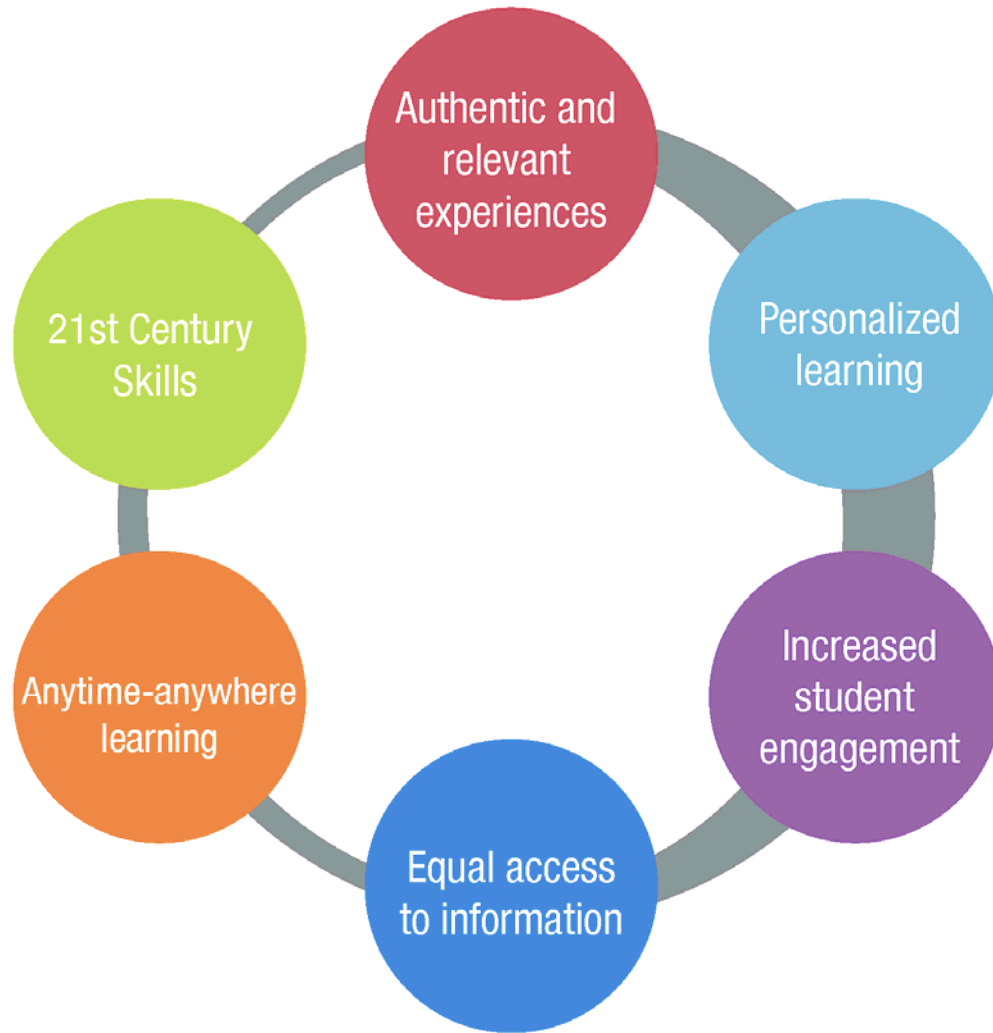
21st Century Mobile Learning

- Student centered
- Student iPads—mobility
- Learning anywhere, anytime
- Access for all students
- Online information is up-to-date and easily accessible
- Students assessed for 21st century outcomes
- Active Learning

20th Century Traditional Learning

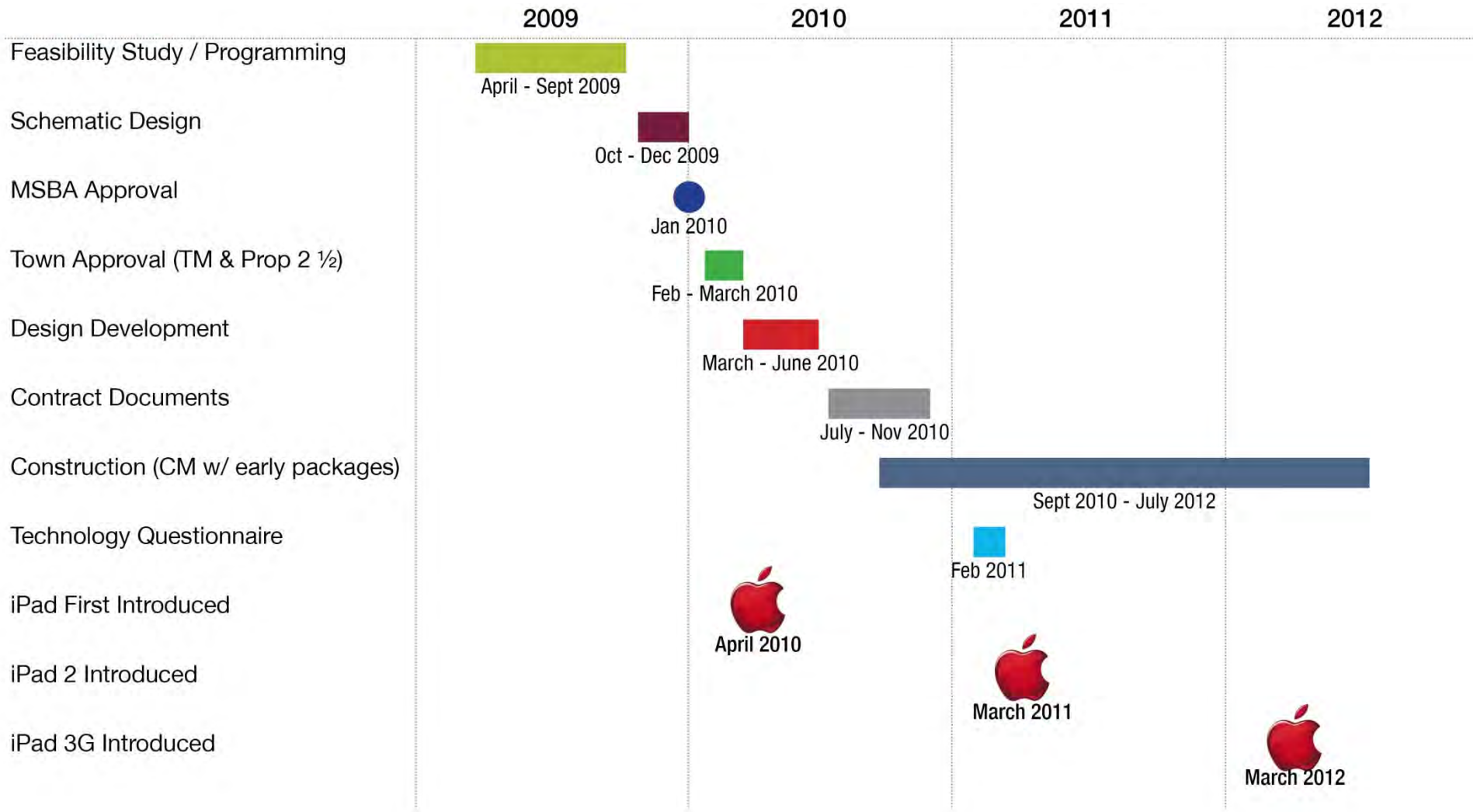
- Teacher directed
- Computer labs—to be scheduled
- Learning takes place in school
- Access for some students
- Information comes from a textbook and is dated
- Students assessed on knowledge learned
- Passive Learning

1:1 LEARNING GOALS



- **Need for Specialty Computer Labs:**
 - **STEAM, Graphics, Language Arts**
- **Otherwise the Future is Wireless & 1:1**
 - **BYOD or School Supplied**
- **Re-examine / Re-think Curriculum Delivery to Embrace Technology**

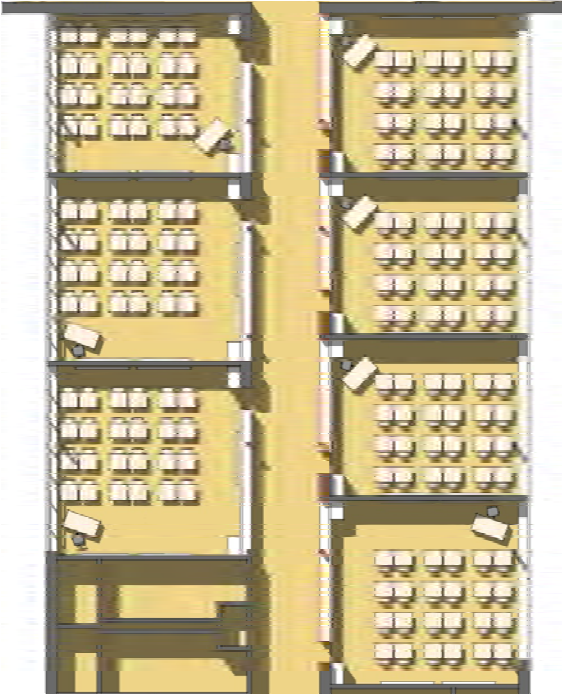
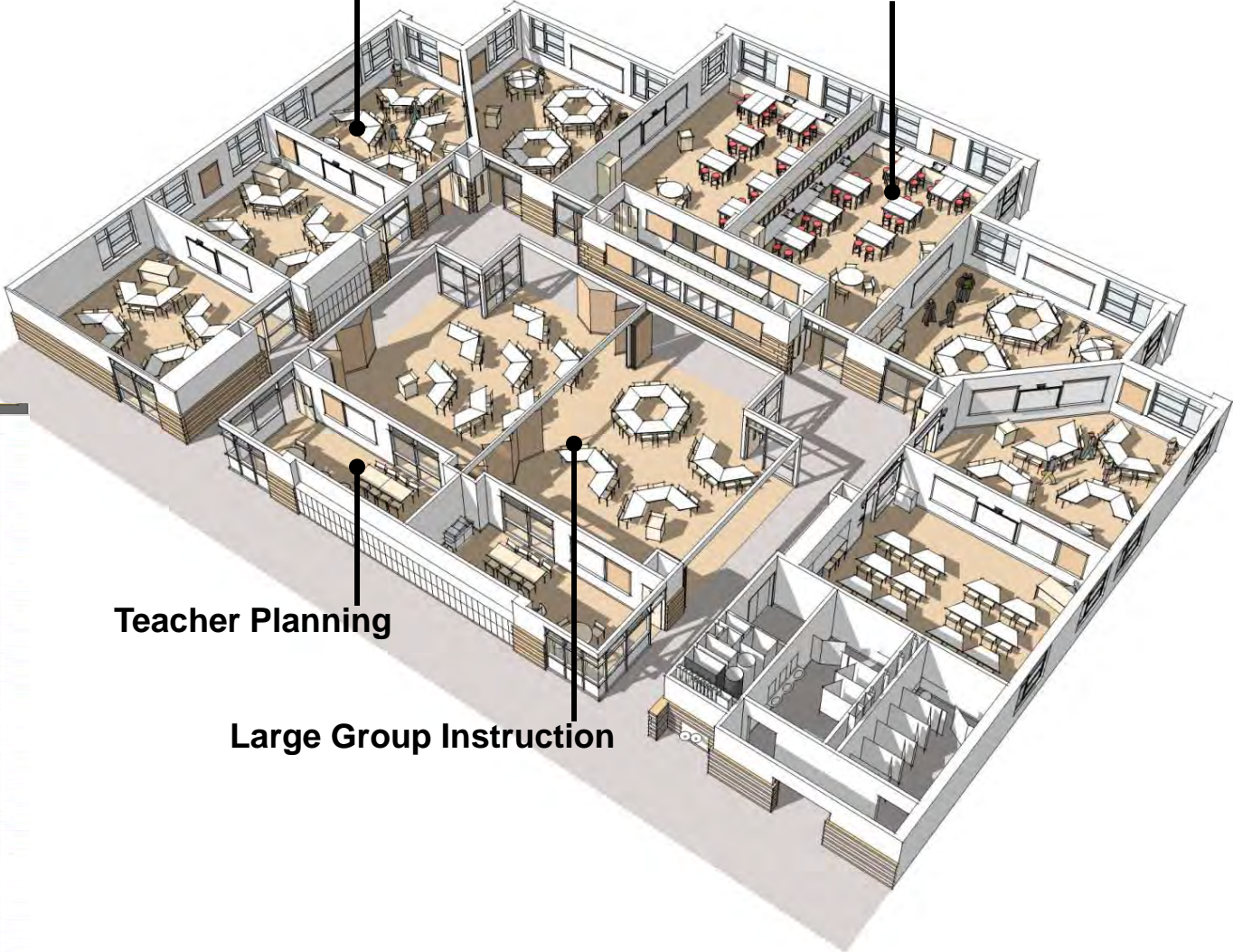
TIMELINE



ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING

Flexible Classrooms

STEM Labs



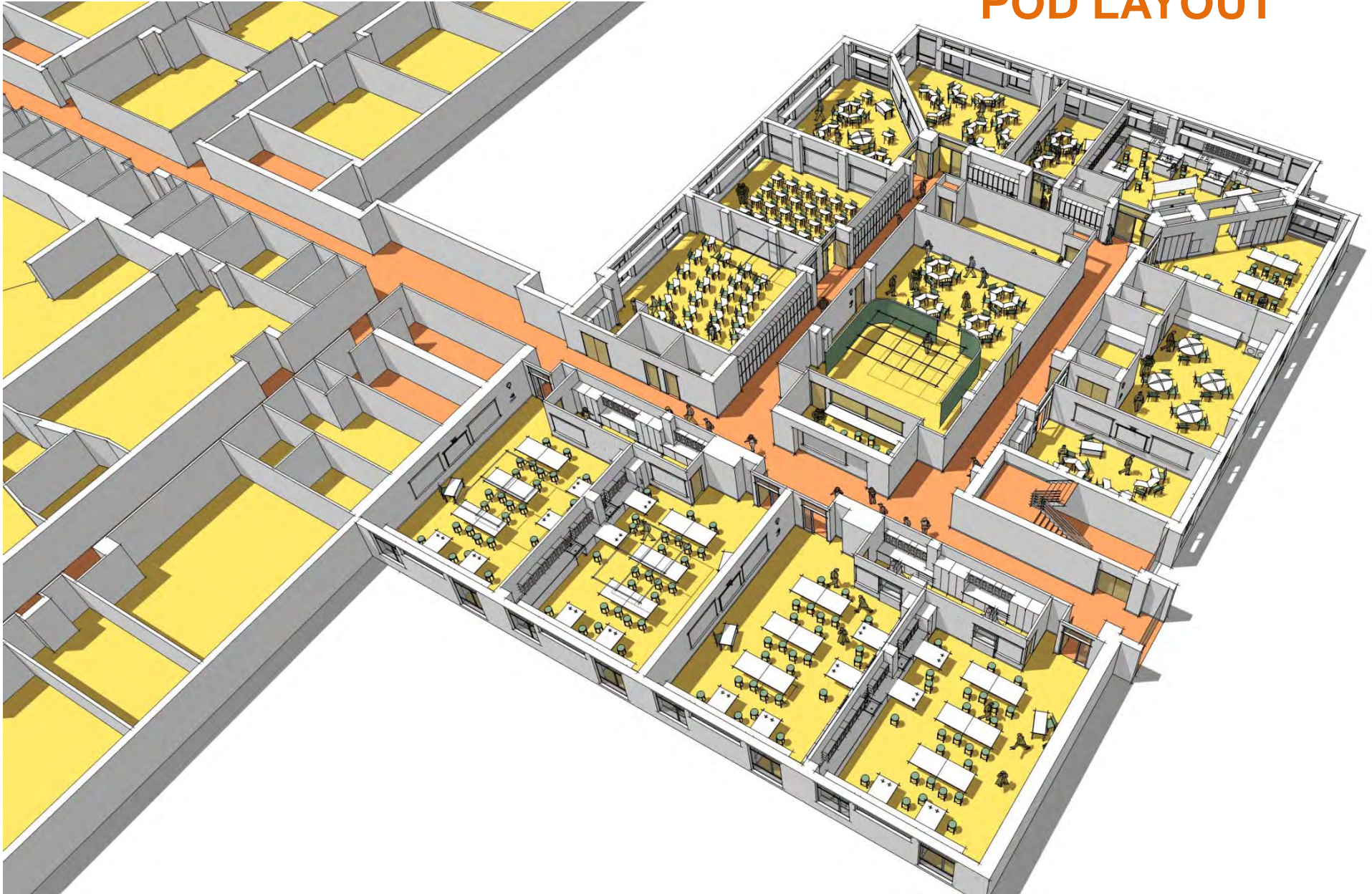
Teacher Planning

Large Group Instruction

SMMA

ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING

POD LAYOUT



| TECHNOLOGY IMPACTS

- **Types of Spaces: Replace Traditional Computer Labs with LGI, Small Group, Informal, Outdoor Classrooms, Use of the Entire School**
- Classroom Layout
- Furniture
- Future of Student Lockers?
- Charging Stations: Student Commons, Learning Commons
- Library Layout – fewer books, more collaboration spaces
- Retention of Specialty Labs: STEAM, Graphics, Language Arts

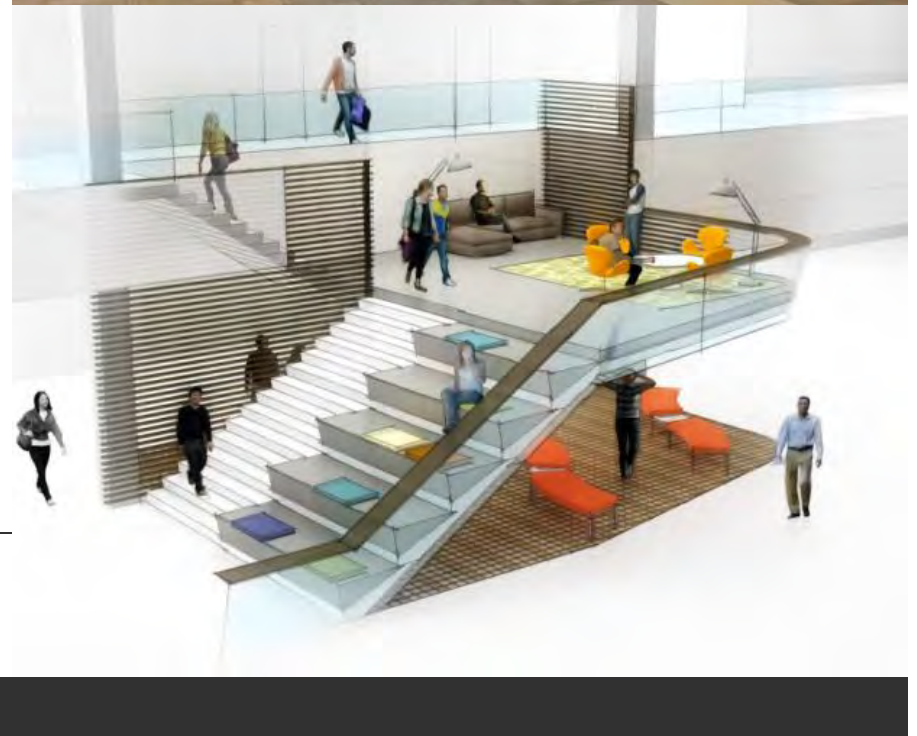
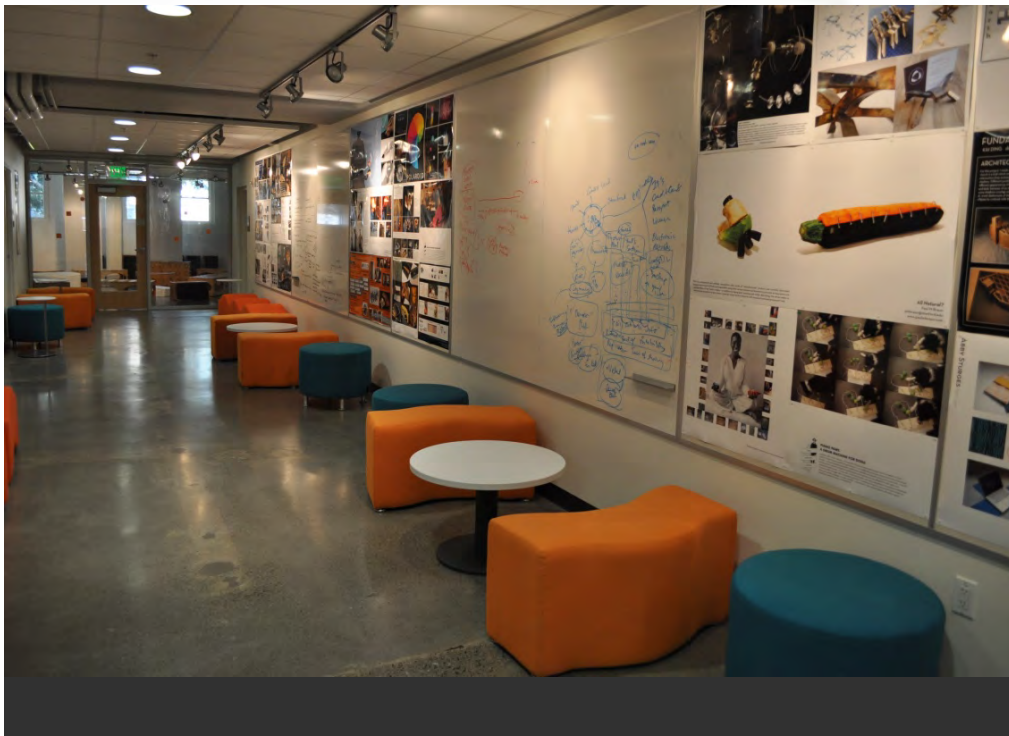
ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING



ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING



ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING



| TECHNOLOGY IMPACTS

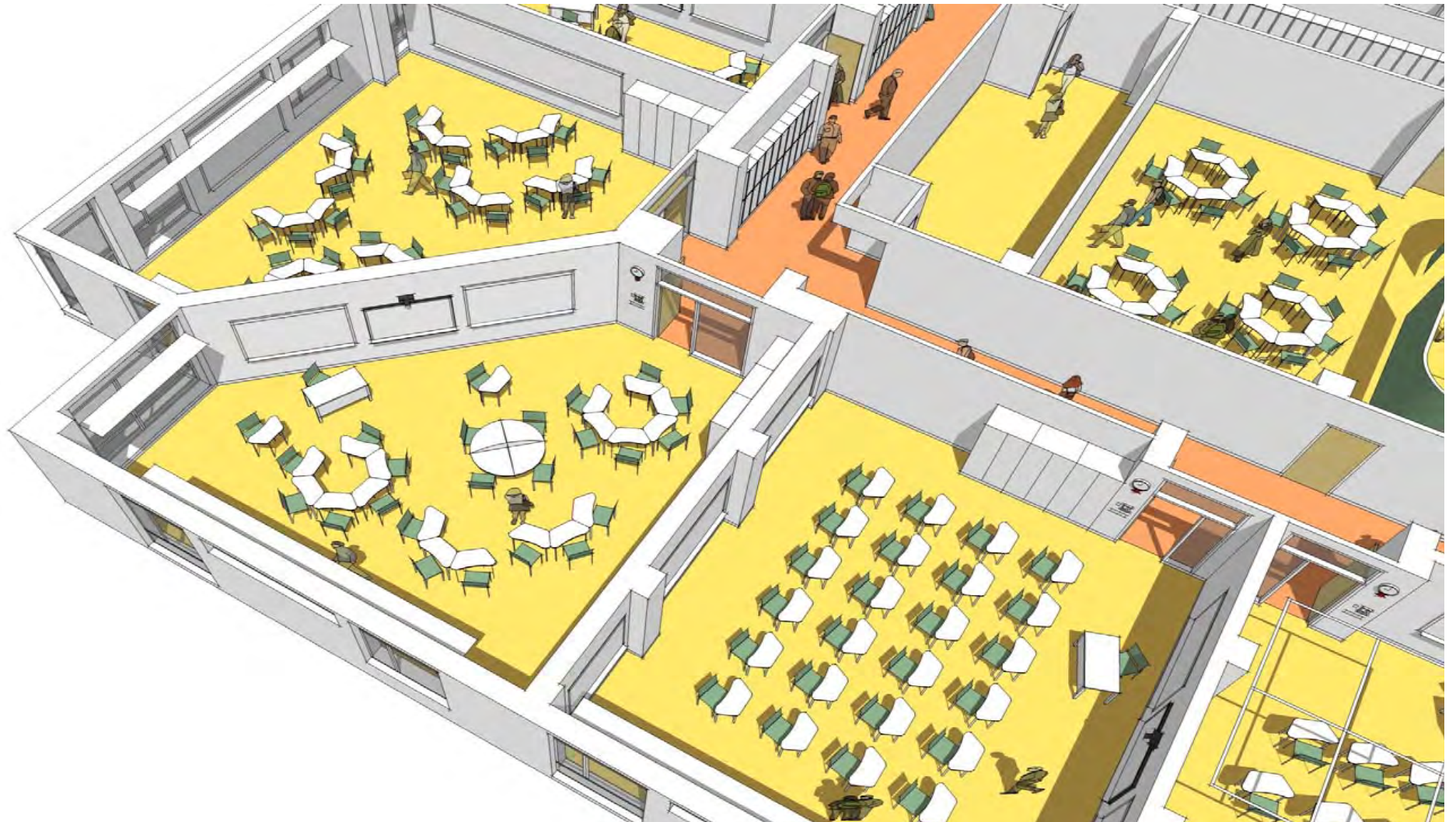
- Types of Spaces: Replace Traditional Computer Labs with LGI, Small Group, Informal, Outdoor Classrooms Use of the Entire School

- **Classroom Layout**

- Furniture
- Future of Student Lockers?
- Charging Stations: Student Commons, Learning Commons
- Library Layout – fewer books, more collaboration spaces
- Retention of Specialty Labs: STEAM, Graphics, Language Arts

ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING

TYPICAL CLASSROOM



| TECHNOLOGY IMPACTS

- Types of Spaces: Replace Traditional Computer Labs with LGI, Small Group, Informal, Outdoor Classrooms, Use of the Entire School
- Classroom Layout
- **Furniture – Flexible, Lightweight, Ergonomic**
- Future of Student Lockers?
- Charging Stations: Student Commons, Learning Commons
- Library Layout – fewer books, more collaboration spaces
- Retention of Specialty Labs: STEAM, Graphics, Language Arts

ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING



To



| TECHNOLOGY IMPACTS

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ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING



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ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING



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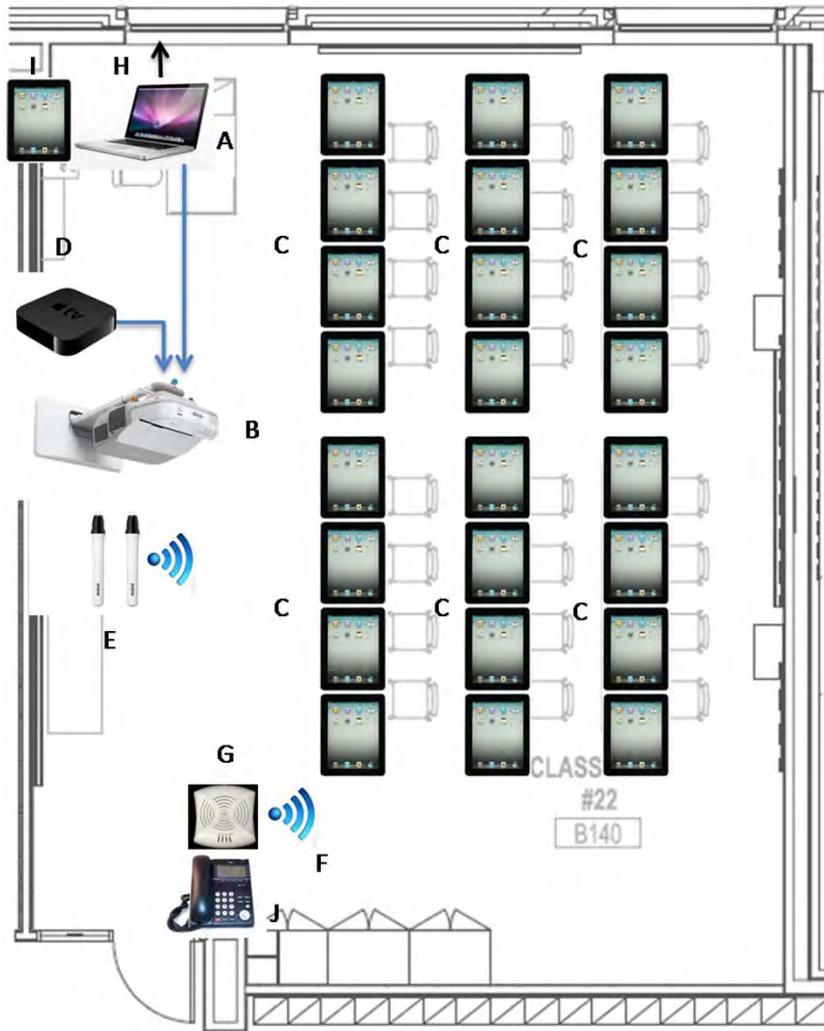
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ENVIRONMENTS FOR COLLABORATION, COMMUNICATION, CREATIVITY, & CRITICAL THINKING



TYPICAL CLASSROOM



INTEGRATED CLASSROOM

- A. Instructional Laptop
- B. Interactive Ultra Short Throw Projector
- C. Student iPads
- D. Apple TV
- E. Interactive Pen
- F. Wireless Network
- G. Wireless Access Point
- H. Wired Network
- I. Teacher iPad
- J. VOIP Phone

COLLABORATIVE ENVIRONMENTS



SMMA

ANYTIME / ANYWHERE LEARNING



ANYTIME / ANYWHERE LEARNING



Thank you.
Discussion.

SMMA

**Michael Kerwin, Principal
Vanderweil Engineers**

Vanderweil Company Overview

Founded in 1950, Vanderweil Engineers is a 400-person consulting engineering firm with offices in Boston, Philadelphia, New York City, Princeton, Washington, DC, Los Angeles, and Syracuse, NY specializing in MEP/FP and Technology Services Engineering and Consulting.

Full Service Engineering Firm

- HVAC
- Electrical
- Plumbing
- Fire Protection
- Technology Services
- Commissioning
- Energy Management
- Cogeneration
- Central Energy Plant
- Thermal Storage
- Sustainable Design
- LEED® Administration



Technology Services Group, Overview

Technology Services Group Provides Independent Engineering and Consulting Services, including:

- Technology Infrastructure and Systems
- Audiovisual Systems
- Security Systems
- Data Centers
- Extensive MA K-12 experience, Intel Model School, US Education Visionary Council



Approach, Technology in Design/Spec

- Challenges
 - Victrola/Kleenex Syndrome
 - Musical Chairs
- Approach
 - Acknowledge the budget from the beginning
 - Set expectations, high level, base building and FF&E
 - Focus on education, not equipment
 - Develop a Basis of Design, about teaching/learning
 - In plain English



WW Doesn't Work Here

How Budget Impacts Final Design

- Budget and expectations can liberate or lock-down thinking
 - Town-wide upgrade,
 - 200 interactive classrooms versus 120 “name brands”
 - Large high school
 - Only included speech amplification in 8 of 60 educational spaces
 - Focus on function and benefits to students
 - Demo, Trial, Evaluate, Discuss, Debate

Technology on the Design Team

- Focal point for technology discussions
- Advocate for emerging technologies/trends
- Translate “propeller head to English”
 - Within the context of design and construction
- Large High School
 - Each teaching space is equipped with blocking and raceways for additional collaboration areas



District Program and Budget

- Frame the project within the district
- Focus on educational goals
- Create a roadmap, the project is not the finish line
- Establish realistic goals and expectations
- Buy good bones, infrastructure
- 3 school campus, creatively used dark fiber



Issues and Trends

- Technology adoption gap, real life versus in-school
- Collaboration
 - Small groups
 - Video
 - Audio
 - Geographically independent
- Gesture based computing
- Black box theater
 - Combined spaces
 - Multi-personality spaces

**Craig Finley, Asst. Superintendent
Whitman-Hanson
Regional School District**



MSBA DESIGNER ROUNDTABLE

FEBRUARY 14, 2013

School Technology:

District Policies & Future Goals, Budget and End User Impact

■ District Policy and Future Goals

Infusion of Technology into our schools requires strong planning and coordination, but also must be adaptable



Clear Technology Plan with Defined Objectives

Documented and Communicated Policies

Standardized Specifications

Staffing / Training and Professional Development

Clear Technology Plan with Defined Objectives

- Involve all stakeholders; Parents, Teachers, Students, Administrators
- Administrator acceptance is critical



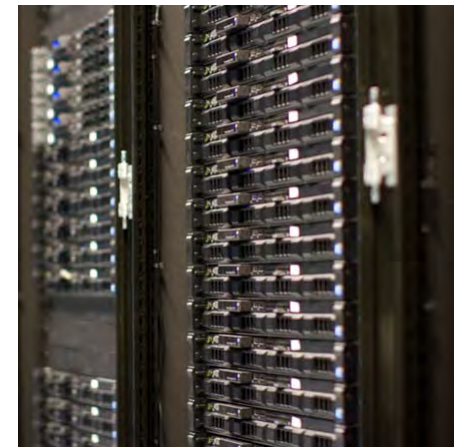
Documented and Communicated Policies

- Use and Access Policies
- Remote Devices Policies
- Standards Policies
- Curriculum and Materials Policies



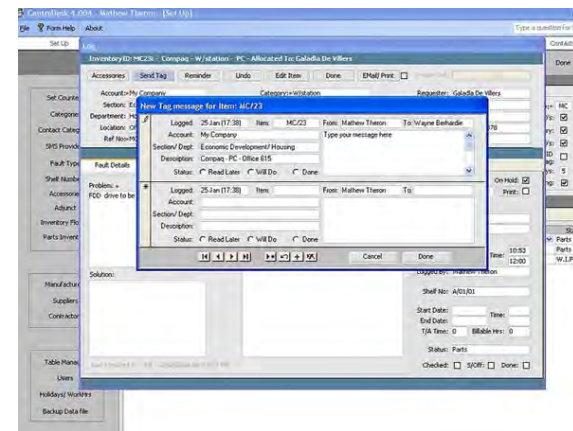
Standardized Specifications

- Infrastructure Equipment & Delivery
- Connectivity and Policy Management
- End Devices
- Software Standards



Staffing

- Qualified Management Teams
- Clear Vendor Contracts
- Flexibility
- Good Communications



Training & Professional Development

- Coordinated Roll-Out Plans before starting
- Direct Instruction
- On-Line / Self Service Instruction
- Time



|| Sustainable Budgets

- Initial Capital Purchases
- Staff Resources / Vendor Contracts
- Equipment Life Cycles
- Funding Sources



Software

Equipment

Training & Professional Development

Policies & Procedures & Curriculum

Infrastructure

Robert Jokela, Asst. Superintendent
Eileen Spinney, Dir. Of Technology
Fitchburg Public Schools



Fitchburg Public Schools

Robert Jokela, Asst. Supt. Fin. & Ops.

Eileen Spinney, Director of Technology

Fitchburg Profile

Metric	Data
Student Enrollment	5397
Teaching Staff	430
Schools	8 (+ 1 leased facility on campus of FSU)
Free + Reduced Lunch Eligibility	77%

- City Council originally approved a \$3M bond assuming 80% reimbursement under E-rate program
- 5 of 8 (e.g. those > 75% free and reduced lunch eligibility) schools likely to be funded under E-rate

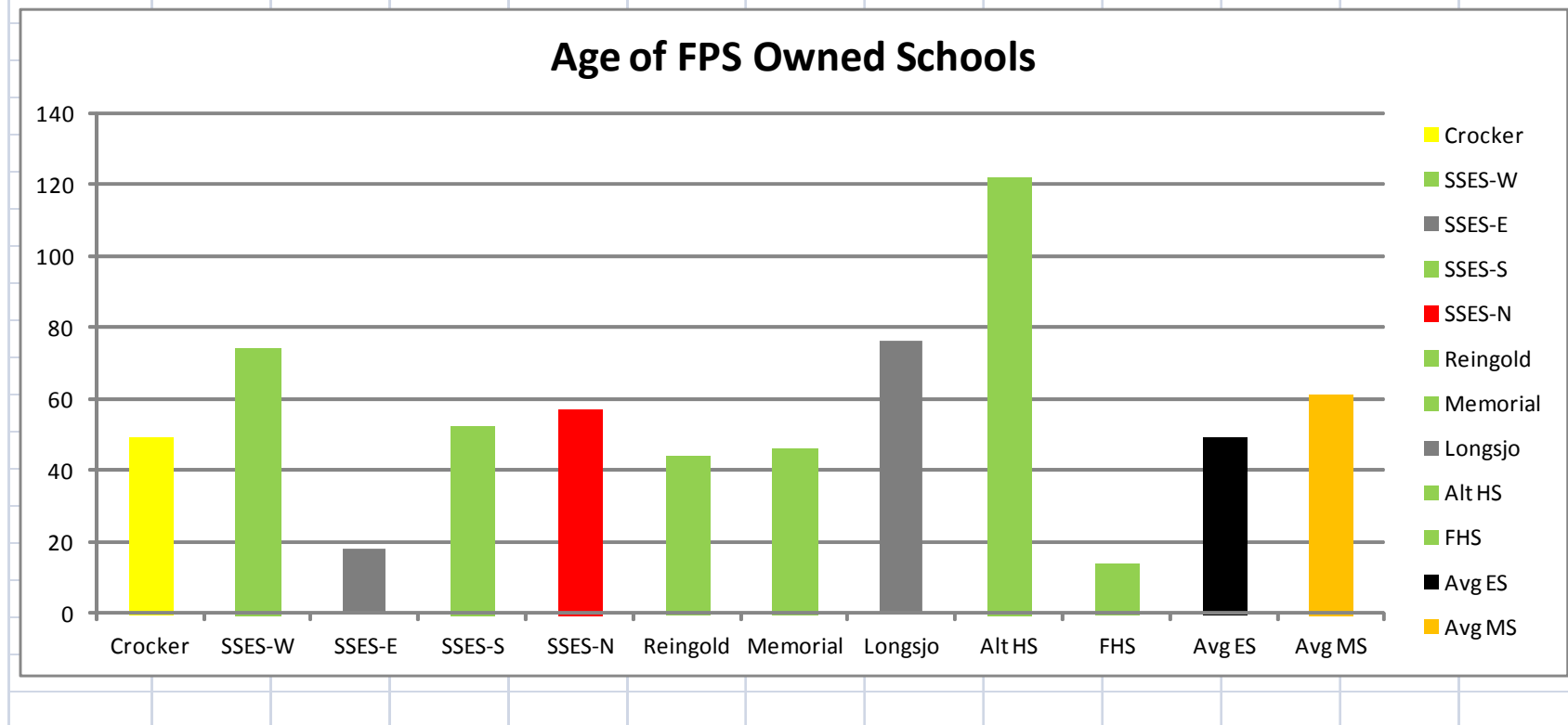
MSBA Recent History

- Two rounds of Green Repair projects
- 5 Schools' boilers, 2 Schools' roofs, and 3 Schools' windows
 - Preliminary results
- Annually submit Statements of Interest
 - Electrical infrastructure concerns

Building Needs

Age of Owned Facilities

School	Crocker	SSES-W	SSES-E	SSES-S	SSES-N	Reingold	Memorial	Longsjo	Alt HS	FHS	Avg ES	Avg MS
Age	49	74	18	52	57	44	46	76	122	14	49	61



LEGEND: Yellow= Priority SOI; Green= schools w/recently completed GRP projects; Red=closed

District Technology Goals

- Ubiquitous broadband and technology access
 - Upgrade network
 - Break down digital divide
 - 1-1 need-based end-user devices
 - Meet Commonwealth 2014-2015 MCAS testing requirements
- 21st Century learning and working environments
- Integrated data management systems
- Cloud-based management and delivery solutions

Current Situation

- E-rate funding will not address infrastructure of all schools- only those with F+R eligibility >75%
 - 3 of 8 schools probably not get funding under e-rate
- Community does not have financial resources to fully fund necessary investment, much like improvements to facilities
 - Fy14 budget impacted by structural commitments (e.g. health insurance increases)
- 2014-2015 MCAS testing requirement
- Supplement E-Rate funding for non 75% F+R Schools

What are we investing in?

A broadband network of adequate performance and reach, including abundant wireless coverage in and out of school buildings. “Adequate” means enough bandwidth to support simultaneous use by all students and educators anywhere in the building and the surrounding campus to routinely use the Web, multimedia, and collaboration software.

What are we investing in?

- Next-generation computing
 - Next-gen computing system architectures
 - Cloud computing
- Access to open and fee based resources
 - Interoperability standards
- Devices, servers, software, management systems, administrative tools

Impact to End Users

- Maximize access to education resources & service
 - digital textbooks – digital libraries – tutoring systems – simulations – augmented reality – online communities – comprehensive assessment systems
- Facilitate authoring, editing, disseminating & content management
 - audio/video capture/edit – programming platforms – wikis – blogs – instructional/course management
- Administrative
 - Scheduling – HR – plant/facilities management – procurement
 - attendance – student records

Impact to End Users

- Comprehensive and integrated assessment, intervention and reporting system
- Networking and collaboration with global experts and experiences
- Public and private network-connected clouds
 - Software services – data libraries - repositories

Technology Funding

3/11 Approved Bond*	E-Rate Revolving	RTTT	City Budget	School Choice
\$3M/\$600K	\$50K	TBD	?	Strategic Inv.

- Assumes 80% reimbursement of eligible investments on technology by Schools & Library Division of the Federal Communications Commission (“E-Rate”)
- Current Information Technology is the fourth utility. **MUST HAVE** for educational offerings, and **MAINTAIN** competitiveness!

Announcements:

Next Designer Roundtable Meeting is Thursday May 16, 2013 at 9:00am

Upcoming Events:

- MSBA is working with the Burlington and Grafton Public Schools to continue the technology discussion and are coordinating a series of events that will be open for folks to attend. Dates, times, and details to follow.
- **iCon 2013** March 22nd-23rd, Burlington, MA: iCon 2013 is a conference that focuses on conversations around how new and current technologies are affecting learning opportunities for our students, not just one device. This is not an iPad conference or a Chromebook conference, but a collection of educators coming together to share their ideas and thoughts on designing and creating innovative learning spaces.

The conference is **free** for all attendees and we welcome anyone involved in the education world as well as students.

For more information please visit www.icon2013.org