

# **The Commonwealth Readiness Project**

Education and Technology  
Subcommittee Report #2

March 3, 2008

# Roadmap

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# Report Overview

- To organize our work, the Education Technology Subcommittee examined three separate, yet interconnected components:
  - 1) System/structural issues
  - 2) The impact of technology on educators
  - 3) The impact of technology on students
- The Subcommittee identified and detailed 10 high-priority strategic goals across these three areas
  - Each strategic goal is supported by a set of proposed *actions*, *recommendations*, and *partners*
  - Concerning suggested *partners*, we recognize: 1) other partners could be engaged, 2) these partners might not be the right ones or best fit, and 3) partnerships also require an investment to ensure effectiveness
- The following set of goals and recommendations represent one, of thirteen possible, pieces to a larger strategic puzzle
  - The work of each Subcommittee must be reviewed in total to determine and align timelines and targets

# Our Working Assumptions about Technology and Education

- There is a well intended, often misguided, assumption that technology saves money. Technology requires initial and sustained investment, and the return on investment can be significant.

Technology investments enable work to be done more efficiently and effectively. Technology can support greater collaborations, limit the time spent traveling, and allow for the sharing of expertise and data in new ways. Used well, it can empower communities and schools to consider ways to reallocate resources to support new initiatives. Communities and schools should be given incentives to innovate.

- Technology is an important tool to advance, enrich and support innovations in education. Technology has its limitations – it is not a replacement for engaged teaching and learning; alone, it will not address concerns such as improving test scores; and it will not remedy the array of challenges that many children may carry with them into the classroom and that teachers are expected to manage.

# Our Working Assumptions about Technology and Education (cont.)

- We must deal with the whole child by engaging them in the process of learning, not as passive recipients but as active participants. Technology as a tool can help connect abstract concepts to real-world applications. As noted in a February 23, 2008 *Boston Globe* OpEd: “81% of business leaders look for such skills as collaboration, problem solving, critical thinking and oral communication.” As a result, technology must be infused into all subjects from STEM to arts and the humanities.
- We must consider and implement online practices that ensure, to the best of our ability, digital and physical safety. And, we must have practices in place that help assess the quality and legitimacy of online content; without this, access to technology could do more harm than good.
- We must avoid unnecessary duplication of efforts. It is time to learn from each other and make decisions about shared systems, access to data, and ways beyond MCAS in which we can measure progress. We should also follow through on the standards and guidelines we already have in place; we need to support those that are working and eliminate those that are not.

# Roadmap

- Report Overview and Key Assumptions
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# Summary of 10 Proposed Strategic Goals

FOCUS AREA	GOAL
<i>Statewide Systems</i>	Develop and sustain a robust, secure, high speed technical architecture that provides the foundation to achieve and support critical, statewide education initiatives including: regional collaborations, <b>ubiquitous access*</b> , data collection and utilization, professional development for educators, and <b>21st century educational skill</b> development and content for students.
<i>Statewide Systems</i>	Develop and support strong, innovative regional networks/partnerships and models for statewide collaboration that 1) encourage and achieve economies of scale in purchasing, 2) identify, develop, implement, and evaluate best practices in professional development and support for educators, and 3) are responsive to regional concerns and opportunities, and Commonwealth priorities.
<i>Statewide Systems</i>	Develop statewide systems with the potential to pool data from a growing number of distributed systems and make that data readily available as appropriate and legal to a range of stakeholders.
<i>Educators</i>	Modify teacher preparation programs to better prepare educators for a technology-infused K-12 instructional environment, equipping them with the knowledge and skills necessary to instruct a diverse student population with different learning needs.
<i>Educators</i>	Provide every MA educator in grades PK-Higher Education access to <b>appropriate technology equipment</b> and resources and <b>24/7 broadband access</b> to reflect the tools used in workplace and post-graduate environments.

\*Any terms in **bold** throughout the document are defined and/or explained in greater detail in the Appendices

# Summary of 10 Proposed Strategic Goals (cont.)

FOCUS AREA	GOAL
<i>Educators</i>	Create an environment supporting systemic, continuous <b>in-service professional development</b> programs and initiatives that reinforce the use of technology-enabled instructional and assessment strategies, and prepare educators to adopt and use new and/or emergent technologies.
<i>Students</i>	Provide every MA student in grades 5-16 and every student's teacher and administrator in grades P-4 access to <b>appropriate technology equipment</b> and resources and <b>24/7 broadband access</b> to reflect the tools used in workplace environments.
<i>Students</i>	Establish a statewide repository of K-12 <b>online curriculum</b> and instructional resources across all subject areas for students.
<i>Students</i>	Establish a technology competency requirement for MA high school graduation.
<i>Students</i>	Support districts' and schools' efforts to identify and implement a more diverse array of technology-enabled assessment models that provide a more comprehensive and accurate profile of student capabilities and competencies.



# Guiding Principles for Success

Technology in education holds the promise of expanding the boundaries of teaching and learning: using data to evaluate and assess progress; improving communication among teachers, students, parents, and caregivers; helping students to become lifelong learners; and fostering continuous professional development for educators.

- ***A robust, sustained, statewide technology infrastructure is a necessity.*** Lacking such an infrastructure, the Commonwealth will not accomplish critical education and economic development goals.
- ***Infuse technology into the curriculum.*** Technology should not be regarded as a set of resources that exist “outside” the curriculum. Rather, it should be infused into the entire education system and enable new models of instruction, access to the latest data and information, and strategies for classroom management.
- ***Allow time for policies and planning to take hold.*** Time is required for the education system, at all levels, to convert policy and plans to action and impact; consistency of leadership, vision, and commitment are key factors.
- ***Sustained commitment and support for innovation and best practices.*** Too often, resources are reallocated from one priority to another. Long-term change requires a long term commitment and investment.
- ***Flexible technology guidelines are imperative.*** Trends and models can and do change quickly and unexpectedly; the education system must be able to adapt to technology shifts
- ***Assess the influence and impact of technology.*** Establish a research base demonstrating impact of technology on teaching and learning. Identify teaching and learning targets and expected outcomes to determine success, areas for improvement, and opportunities for replication.

# Summary Conclusion

- Up-to-date technology infrastructure is essential
- Sustainability must be built in to investments
- Educator preparation and professional development are sine qua non
- Foundation formula for PK-12 and for public higher education need to be reviewed and improved to ensure the outcomes identified in this document
- Critical milestones and measures of success rest in the hands of the Leadership Team as the next step after it integrates all the reports

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# Focus Area #1:

## Statewide Systems to Support Education Technology

- A statewide technology infrastructure is a prerequisite to enabling a **PK** through lifelong learning system of education that supports the economic, civic, and educational well-being of the entire Commonwealth and is one of the nation's vanguards.
- Regional collaborations and statewide partnerships hold the promise of achieving greater efficiencies and using resources in new ways – very rarely do they result in quantifiable reductions in costs.
- Linking educational and economic development priorities to the particular, dynamic needs of a region encourages innovative partnerships which are responsive to short-term, immediate needs and opportunities while engaging in longer-term, proactive planning and engagement. Strengthening all communities, and aligning local strategies with larger, statewide strategies and goals is essential.
- The Commonwealth's educational goals and priorities must be informed by **longitudinal data** that is accurate, consistent, and collected in an efficient manner. We must develop statewide systems with the potential to pool data from a growing number of distributed systems and make that data readily available to a range of stakeholders.

**Strategic Goal 1:** *Develop and sustain a robust, secure, high speed technical architecture that provides the foundation to achieve and support critical, statewide education initiatives including: regional collaborations, **ubiquitous access**, data collection and utilization, professional development for educators, and **21<sup>st</sup> century educational skill** development and content for students.*

<b>Action</b>	<b>Partners</b>	<b>Recommended Strategies</b>
<p>A. Sustained commitment/investment to extend and support wireless and/or fiber high speed networks to un-served and underserved communities. (Broadband Initiative – legislation has been filed.)</p> <p>B. Statewide infrastructure must also include <b>business continuity planning</b> along with data storage, privacy, and security measures.</p>	<ul style="list-style-type: none"> <li>• Secretaries of Economic Development, Administration and Finance</li> <li>• Adams Innovation Institute</li> <li>• <b>ITD</b></li> <li>• Dept of Public Utilities</li> <li>• Mass Tech Collaborative</li> </ul>	<ul style="list-style-type: none"> <li>• Other statewide initiatives may serve as models: Pennsylvania Act 183 and North Carolina Research and Education Network (NCREN).</li> <li>• Investigate tradeoffs of municipal gain by eminent domain for the expansion of state and local fiber networks.</li> </ul>
<p>C. Support and expand existing backbones, e.g., the <b>Mass Information Turnpike Initiative</b> (MITI).</p>	<ul style="list-style-type: none"> <li>• UMass/<b>UITS</b></li> <li>• Local Governments</li> <li>• Local School Systems</li> <li>• Local Colleges</li> <li>• ITD</li> </ul>	<ul style="list-style-type: none"> <li>• Upgrade began in 2007 and is ongoing; MITI is well established and has demonstrated success – investment and expansion support additional client access and keep costs competitive.</li> </ul>

**Strategic Goal 1 continued:**

<b>Action</b>	<b>Partners</b>	<b>Recommended Strategies</b>
<p>D. State budgeting process must incorporate funds not only to purchase and implement but to sustain investment in technology resources.</p> <p>E. Local government and school systems engage in collaborative budget/planning to sustain a refresh cycle and the ability to meet growing and changing needs for fiber, security, routers, etc.</p> <p>F. Districts must meet a technology competency standard and report progress annually.</p>	<ul style="list-style-type: none"> <li>• Towns and schools</li> <li>• State legislature</li> </ul>	<ul style="list-style-type: none"> <li>• Combined purchasing power results in savings and improved planning for communities.</li> <li>• Revisit SBAB reimbursement formula and technology specifications to align them more closely to Dept of Education EdTech recommendations including required refresh plans.</li> <li>• Identify community examples that are currently working – link with half dozen others that are interested in pursuing.</li> <li>• Dept of Education grant programs – similar to Lighthouse districts to serve as incentives</li> </ul>

**Strategic Goal 2:** *Develop and support strong, innovative regional networks/partnerships and models for statewide collaboration that 1) encourage and achieve economies of scale in purchasing, 2) identify, develop, implement, and evaluate best practices in professional development and support for educators, and 3) are responsive to regional concerns and opportunities, and Commonwealth priorities.*

Action	Partners	Recommended Strategies
<p>A. Invest in/support regional procurement/administrative collaboratives to achieve administrative economies of scale Including: hardware/software purchases and upgrades, 24/7 customer support, sharing of technical staff support, etc.</p>	<ul style="list-style-type: none"> <li>• PK-12, Higher Education – public and private, as well as other community groups with similar needs and interests.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide incentive pool for regional approaches – use to leverage local resources and investments. Commit to sharing framework and advising other regions. (e.g., <b>Assabet Collaborative</b>)</li> </ul>
<p>B. Invest in/support existing regional approaches to professional development that are responsive to community needs.</p> <p>C. Collaborations/networks should be closely linked to the economic and educational needs and strategies of a particular region.</p> <p>D. Use <b>best practice/promising practice</b> models to inform and improve.</p>	<ul style="list-style-type: none"> <li>• State college/ teacher prep programs</li> <li>• Local School Districts</li> <li>• Regional partnerships (e.g., <b>Connect, The Worcester Consortium, The Berkshire Compact</b>)</li> <li>• Regional Economic Development organizations</li> <li>• Secretary of Education</li> <li>• Secretary of Economic Development</li> </ul>	<ul style="list-style-type: none"> <li>• Invest in existing regional collaborations across the Commonwealth’s public higher education network already addressing these issues.</li> <li>• Develop and invest in Teacher Preparation <b>Centers of Excellence</b> in Education, long discussed at the state college campuses.</li> <li>• Successful regional collaborations must commit to sharing frameworks and advising other regions.</li> <li>• Develop a committee to review, evaluate, and promote promising practices; also address issue of defining best/promising practices.</li> </ul>

**Strategic Goal 2 continued:**

<b>Action</b>	<b>Partners</b>	<b>Recommended Strategies</b>
<p>E. Support initiatives that are driving progress: 1) <b>BHE Stem Pipeline</b> networks, 2) <b>CITI program</b>, and 3) <b>Commonwealth Portal Project</b> (BHE/DOE).</p>	<ul style="list-style-type: none"><li>• Board of Higher Education</li><li>• MA Dept of Education</li><li>• UMass</li><li>• State and community colleges</li><li>• Districts and schools</li></ul>	<ul style="list-style-type: none"><li>• Continue to invest in BHE STEM Networks; these have had early success and are developing promising models.</li><li>• Continue to invest in CITI; through this effort, UMass has helped develop a range of innovative approaches to using technology to strengthen education.</li><li>• Support Portal Project; BHE and DOE have already taken the lead on developing and supporting the portal and sustaining these efforts is important.</li></ul>



**Strategic Goal 3:** *Develop statewide systems with the potential to pool data from a growing number of distributed systems and make that data readily available as appropriate and legal to a range of stakeholders.*

Action	Partners	Recommended Strategies
<p>A. Establish data security and privacy protocols.</p> <p>B. Develop statewide <b>IT disaster recovery/business continuity plans</b>.</p>	<ul style="list-style-type: none"> <li>• <b>ITD</b></li> <li>• Board of Higher Education</li> <li>• MA Dept of Education</li> <li>• UMass</li> </ul>	<ul style="list-style-type: none"> <li>• Support UMass UITs long-term plans that call for a central data center in Shrewsbury to serve disaster recovery needs.</li> <li>• Institutions with common systems can rely on IT bench of others in emergencies.</li> </ul>
<p>C. Invest and support development of physical, statewide data warehouse efforts (e.g., UMass).</p> <p>D. Support DOE's <b>Data Warehouse pilot</b>.</p> <p>E. Extend <b>student unique identifier</b>.</p> <p>F. Investigate <b>open source</b> as well as proprietary options.</p>	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	<ul style="list-style-type: none"> <li>• The BHE is already looking at North Carolina as a model and has taken steps to develop ways to link PK-12 and higher education data. (Florida also provides an additional model for consideration.)</li> <li>• Develop statewide standards for SIS and local security protocols to limit the need for local, district-by-district submission of data.</li> <li>• Improved ability to track student progress across institutions.</li> <li>• Support BHE/DOE efforts to manage and link data.</li> </ul>
<p>G. Mandate specific systems and standards for preK-12 and public higher ed, including <b>student information and learning management systems</b>.</p>	<ul style="list-style-type: none"> <li>• MA Dept of Education</li> <li>• K-12 School Districts</li> <li>• Board of Higher Education</li> <li>• UMass</li> <li>• State and Community Colleges</li> <li>• MassCollege OnLine</li> <li>• UMassOnline</li> </ul>	<ul style="list-style-type: none"> <li>• This will require a multiyear commitment and may occur naturally as schools and college campuses take steps to refresh and upgrade existing systems.</li> <li>• DOE, BHE, and UMass have inventories of systems in place and in use – update inventories and determine tradeoffs and cost associated with migrating to standard systems.</li> <li>• Identify backroom supports that can be shared to support common systems, e.g., 24/7 support, data management and backup.</li> </ul>

# Summary Considerations – Statewide Systems

- To realize the full benefits of technology, there must be a sustained investment in a system that supports access across the commonwealth. Building and upgrading systems that affect public education – PK through Higher Education – requires a public commitment.
- We look to the State’s executive branch and administrative offices, as well as the legislature to identify and establish policy objectives for the Commonwealth. However, strategies and tactics to advance goals and objectives often occur more naturally at the local and regional level. We recommend that those regions of the Commonwealth that have already embraced collaborative approaches be supported, and that resources be provided to underwrite and reward these efforts. We also recommend that these strategies be exported, as appropriate, to other areas of the Commonwealth. (A few examples of collaborations can be found in the Appendices.)
- With 29 campuses, across the Commonwealth there is a natural locus of leadership and innovation, for each region, within our public higher education institutions – we expect a great deal from our college and university campuses, and we should. However, we must recognize that public higher education requires a renewed investment in physical plant/classrooms, technology infrastructure, and staffing.

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## Focus Area #2: Enhancing Educators' Technology Competencies

- All educators come to schools prepared with the knowledge and skills to use technology-enhanced instructional strategies that expand the boundaries of learning and teaching and improve and strengthen communication and sharing of information.
- All educators have reliable, **individualized** access to the latest technology and education resources to open the doors of learning and opportunity.
- Professional development programs leverage technology delivery methods and extend technology competencies of educators; they also establish state-and district-level incentives for innovative programs and provide support and encouragement to educators.

**Strategic Goal 1:** *Modify teacher preparation programs to better prepare educators for a technology-infused K-12 instructional environment, equipping them with the knowledge and skills necessary to instruct a diverse student population with different learning needs.*

<b>Action</b>	<b>Partners</b>	<b>Recommended Strategies</b>
<p>A. Change licensure model to include specific technology competency requirements for every <b>educator</b>; emphasis on use of technology is to 1) supplement and enhance teaching, 2) engage and excite students, and 3) connect students to the world of work.</p> <p>B. Create model whereby technology skills and competencies required are generally integrated into existing courses.</p>	<ul style="list-style-type: none"> <li>• MA Dept of Education</li> <li>• State teacher preparation institutions</li> <li>• Districts and local schools</li> </ul>	<ul style="list-style-type: none"> <li>• Forum to discuss/review current licensure model.</li> <li>• Create working group to investigate alternative models and/or modifications.</li> <li>• Propose new licensure requirements.</li> <li>• Adopt new licensure requirements.</li> <li>• Support investment in Teacher Prep programs</li> <li>• Support models that allow educators to use what they are learning and how to relate technological uses to actual teaching and learning needs.</li> </ul>
<p>C. Establish programs/initiatives (e.g., regional collaboratives, center of excellence within each of the State Colleges and UMass Campuses) to drive closer alignment between educator preparation institutions, school systems and other stakeholders to ensure that preparation is coordinated with student, higher education, employer, and community needs</p>	<ul style="list-style-type: none"> <li>• State teacher preparation institutions</li> <li>• MA Board of Higher Education</li> <li>• MA Department of Education</li> <li>• Districts and local schools</li> <li>• Employers</li> </ul>	<ul style="list-style-type: none"> <li>• Create online clearinghouse/portal highlighting leading state and national alignment/collaboration models.</li> <li>• Identify regional hubs (i.e., collaboration “footprint”) centered on state college teacher preparation programs to gain maximum impact and support ongoing work.</li> <li>• Establish “endowments” to support alignment efforts</li> <li>• Host statewide conference to profile best practices/promising practices</li> </ul>

**Strategic Goal 2:** Provide every MA educator in grades PK-Higher Education access to **appropriate technology equipment** and resources and **24/7 broadband access** to reflect the tools used in workplace and post-graduate environments.

Action	Partners	Recommended Strategies
<p>A. Provide educators access to appropriate technology equipment and resources and 24/7 broadband access to reflect the tools used in professional environments.</p>	<ul style="list-style-type: none"> <li>• STEM Pipeline Networks</li> <li>• Goddard Council</li> <li>• CITI</li> <li>• MA Dept of Education</li> <li>• Board of Higher Education</li> <li>• Districts and local schools</li> <li>• Regional higher ed partners</li> <li>• Regional service organizations (e.g., <b>EDCO, TEC</b>)</li> </ul>	<ul style="list-style-type: none"> <li>• Private/public consortium with broad based representation, similar to or connected to STEM Networks, assess more deeply issues and challenges and advance strategies.</li> <li>• Identify funding source for technology and professional development roll-out</li> <li>• Create an implementation plan</li> </ul>
<p>B. Deliver relevant professional development to educators in advance and in close proximity to technology distribution.</p> <p>C. Require district technology plans to include annual professional development programs supporting long-term implementation and teacher effectiveness in the use of technologies.</p>	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	<ul style="list-style-type: none"> <li>• As above, engage broad-based consortium to identify what a successful implementation model looks like for MA.</li> <li>• Review effective implementation models in MA districts and across other states.</li> <li>• Connect with regional higher education partners to support professional development.</li> <li>• Create mechanism for capturing and evaluating leading practices driving adoption and effective implementation.</li> </ul>

**Strategic Goal 3:** *Create an environment supporting systemic, continuous **in-service professional development** programs and initiatives that reinforce the use of technology-enabled instructional and assessment strategies, and prepare educators to adopt and use new and/or emergent technologies.*

Action	Partners	Recommended Strategies
<p>A. Create <b>centers of excellence</b>, both virtually and physically, that facilitate in-service educators' collaboration and sharing of best practices.</p> <p>B. Launch and host regional centers of excellence through state colleges, UMass teacher preparation institutions.</p>	<ul style="list-style-type: none"> <li>• Board of Higher Education</li> <li>• UMass</li> <li>• Higher education institutions</li> <li>• Districts and local schools</li> <li>• MA Dept of Education</li> <li>• E.g., <b>Leadership Initiative for Teaching with Technology, Harvard WIDE</b></li> </ul>	<ul style="list-style-type: none"> <li>• Identify centers of excellence, models, and funding.</li> <li>• Survey educators and administrators to secure feedback and recommendations.</li> <li>• Launch programs.</li> </ul>
<p>C. Establish a repository of technology <b>teaching/learning tools and objects</b> sharable across the Commonwealth.</p>	<ul style="list-style-type: none"> <li>• MA Dept of Education / <b>MassONE</b></li> </ul>	<ul style="list-style-type: none"> <li>• Assess what currently exists and bring together in MassONE</li> <li>• Procure other needed elements</li> </ul>
<p>D. Establish/reinforce partnerships among <b>UMass-Online, Massachusetts College Online</b>, Higher Education Institutions and existing and/or newly established K-12 virtual learning environments as appropriate and necessary to provide courses, programs, and professional development for educators that can serve to support and supplement ongoing/existing programs.</p>	<ul style="list-style-type: none"> <li>• UMassOnline</li> <li>• Board of Higher Education</li> <li>• Regional Partnerships</li> <li>• Higher education institutions</li> <li>• MA College Online</li> <li>• MA Dept of Education</li> <li>• Districts and local schools</li> </ul>	<ul style="list-style-type: none"> <li>• Examine efforts already underway</li> <li>• Develop recommendations and implementation plan that consider regional practices and programs for review by relevant state stakeholders.</li> <li>• Identify existing and new funding sources required.</li> <li>• Link academic initiatives to statewide technology platform and data management efforts.</li> </ul>

# Summary Considerations – Educators

- We must prepare educators in new ways to be successful in this rapidly changing, technology-driven environment. Teacher preparation/baccalaureate programs must develop approaches that incorporate technology into the curriculum so that the next generation of educators are increasingly adept as both users and savvy consumers of technology. Licensing requirements too, must be reconsidered, and the process for licensing streamlined. An investment in resources into teacher preparation programs will enable college and universities to respond more quickly and effectively to this critical need.
- Professional development programs must consider strategies that effectively engage experienced educators. Educators with limited exposure to technology may need different levels of support than their less experienced colleagues. Lifelong learning is not a one size fits all proposition.
- School districts and the MA Department of Education must ensure that educators have access to appropriate equipment and supports; ongoing professional development and equipment upgrades should be considered a necessity not a luxury.
- Preparation and support for educators effectively occurs at a regional level. The long, rich histories and expertise of our public teacher preparation programs (Normal Schools) continue to this day. There are many examples of innovative and responsive partnerships between higher education and PK-12 across neighboring communities. Sharing of resources, promising practices, and building strong communities of engaged educators advance and support educational and economic development goals for the Commonwealth.



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## Focus Area #3:

# Student Learning in a Technology-Infused Environment

- All students have reliable, **individualized** access to the latest technology and education resources to open the doors of learning and opportunity, enabling them to be successful in the rapidly changing, increasingly competitive 21<sup>st</sup> century.
- All students benefit from a technology-infused curriculum that includes online and Web-enhanced instructional programs supporting active, inquiry-based learning; models for responsible use of technology in the classroom and society; and access to health, safety, and wellness resources supporting the whole child.
- Student performance is captured through a more diverse range of digital formative and summative assessments and activities, furnishing a more accurate profile of student capabilities and competencies.\*

\* Education Technology Subcommittee outlined this as a key strategic goal, while also recognizing the issue may be more fully addressed by the Assessment Subcommittee.

**Strategic Goal 1:** *Provide every MA student in grades 5-16 and every student’s teacher and administrator in grades P-4 access to **appropriate technology equipment** and resources and **24/7 broadband access** to reflect the tools used in workplace environments.*

Action	Partners	Recommended Strategies
<p>A. Provide students access to appropriate technology equipment and resources and 24/7 broadband access to reflect the tools used in professional environments</p>	<ul style="list-style-type: none"> <li>• STEM Pipeline Networks</li> <li>• CITI</li> <li>• MA Dept of Education</li> <li>• MassTech Collaborative</li> <li>• Board of Higher Education, UMass</li> <li>• Districts and local schools</li> <li>• Regional higher ed partners</li> <li>• Regional business partners</li> <li>• Regional service organizations (e.g., <b>EDCO, TEC</b>)</li> </ul>	<ul style="list-style-type: none"> <li>• Assign private/public consortium with broad based representation (e.g.,STEM Networks) to assess more deeply issues and challenges and advance strategies</li> <li>• Review existing models of ubiquitous access and best/promising practices for technology integration.</li> <li>• Create an implementation plan.</li> <li>• Develop RFP and evaluate vendor proposals.</li> </ul>
<p>B. Develop financing and sustaining plan for long-term investment cycle and implement it consistently over time; plan must account for equipment, maintenance, professional development, and curriculum development.</p>	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	<ul style="list-style-type: none"> <li>• Assign private/public consortium with broad based representation (e.g.,STEM Networks) to assess more deeply issues and challenges and advance strategies</li> <li>• Review plans in place in other states and successful districts to identify best/promising practices.</li> <li>• Select and convene consortium.</li> </ul>

**Strategic Goal 2:** *Establish a statewide repository of K-12 **online curriculum** and instructional resources across all subject areas for students.*

Action	Partners	Recommended Strategies
<p>A. Develop statewide <b>virtual learning/school</b> from K-12 through combination of state-developed programs and resources and those already available through third-party partners.</p>	<ul style="list-style-type: none"> <li>• Advisory Board including MA DOE, BHE, Higher Education, faculty from public and private institutions, and K-12 educators</li> <li>• Regional service organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Assess existing virtual learning resources across the state</li> <li>• Convene representative group of stakeholders; determine effective model for MA and districts</li> </ul>
<p>B. Establish a repository of discrete technology <b>teaching/learning tools and objects</b> sharable across the Commonwealth for integration into existing classroom-based models.</p>	<ul style="list-style-type: none"> <li>• MA Dept of Education / <b>MassONE Harvard WIDE, ELTI, LIFT</b></li> </ul>	<ul style="list-style-type: none"> <li>• Assess currently used and/or available resources and bring together in MassONE</li> <li>• Procure other needed elements</li> </ul>
<p>C. Develop an interdisciplinary technology and citizenship program addressing responsible use of technology, ethics, civic contribution and collaboration, and community involvement.</p> <p>D. Develop Web-literacy so that educators and students are able to critically assess and evaluate content, identify sources, and determine legitimacy prior to application.</p>	<ul style="list-style-type: none"> <li>• MA Dept of Education</li> <li>• Higher education institutions</li> <li>• Vendors</li> <li>• Regional collaboratives</li> <li>• Districts and schools</li> </ul>	<ul style="list-style-type: none"> <li>• Assess currently used and/or available resources</li> <li>• Identify and convene appropriate stakeholders and partners to develop the curriculum</li> <li>• Pilot programs; apply feedback to further refinements/improvements</li> </ul>
<p>D. Create Web-based support and community functions such as access to student well-being information and cyber safety.</p>	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	<ul style="list-style-type: none"> <li>• Assess currently used and/or available resources and bring together in MassONE</li> </ul>

**Strategic Goal 3:** *Establish a technology competency requirement for MA high school graduation.*

<b>Action</b>	<b>Partners</b>	<b>Recommended Strategies</b>
<p>A. Develop a set of explicit technology competencies required for high school graduation; ensure that students meet these requirements.*</p> <p>B. Create a technology competency assessment model for review and implementation.</p>	<ul style="list-style-type: none"> <li>• MA Dept of Education</li> <li>• Board of Higher Education</li> <li>• Districts and local schools</li> <li>• State testing provider(s)</li> </ul>	<ul style="list-style-type: none"> <li>• Review the recommended student technology standards</li> <li>• Recast the high school ones as the benchmark for graduation</li> <li>• Use e-portfolios for assessment</li> </ul>
<p>C. Create a first-year technology course at MA public higher education institutions for matriculating students.</p>	<ul style="list-style-type: none"> <li>• Board of Higher Education</li> <li>• UMass system</li> <li>• State college teacher preparation institutions</li> <li>• Community colleges</li> </ul>	<ul style="list-style-type: none"> <li>• Develop an overview course</li> <li>• Create recommendations and strategies for implementing technology across the curriculum</li> </ul>

\* This action may be more appropriately located within the context of recommendations provided by the Assessment Subcommittee.

**Strategic Goal 4:** *Support districts’ and schools’ efforts to identify and implement a more diverse array of technology-enabled assessment models that provide a more comprehensive and accurate profile of student capabilities and competencies.*

Action	Partners	Recommended Strategies
<p>A. Establish a state-level clearinghouse for identification and dissemination of promising practices in the area of technology-facilitated assessment models</p>	<ul style="list-style-type: none"> <li>• MA Dept of Education</li> <li>• Board of Higher Education</li> <li>• Districts and local schools</li> <li>• Formative and summative testing providers)</li> <li>• Existing providers of school-based software and web-based applications (e.g., visual mapping, earth/sky mapping, design and presentation software)</li> </ul>	<ul style="list-style-type: none"> <li>• Review other states’ models</li> <li>• Identify elements to be assessed</li> <li>• Create RFP for a technology-based assessment system</li> </ul>
<p>B. Adopt state-supported, <b>alternative digital assessment models</b> such as <b>e-portfolios</b>, and <b>computer-adaptive exams</b></p>	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	<ul style="list-style-type: none"> <li>• Review other states’ models</li> <li>• Identify elements to be assessed</li> <li>• Create RFP for a technology-based assessment system</li> </ul>

# Summary Considerations – Students

- The spirit of adventure and curiosity for learning must be infused in all classrooms; with these building blocks in place, technology can support independent learning, while opening the door to anytime, anywhere learning. Along with this independence, must also come a deeper understanding of responsible, civic engagement.
- Investing in infrastructure and supporting educators are key ingredients to providing all students, PK- Lifelong learning, with a foundation of success in an increasingly competitive, global economy. While younger students appear to have mastered the art of text messaging – they may not have mastered the art of critical thinking, analyzing data, communicating clearly and advance “real-world” applications to solving problems. Technology is a resource that, if used well, can enhance and promote these skills.
- As with PK-12, Infrastructure investments must be made across the public higher education system as well. The cost of technology, infrastructure upgrades at our college campuses cannot continue to be passed along to students. The cost for creating a competitive, 21<sup>st</sup> century education system should be a Commonwealth responsibility and priority.
- Ultimately, we have to measure progress. Do these tools make a difference? Are we using data in a secure way that supports strengthening our education systems?

# Roadmap

- Report Overview and Key Assumptions
- Summary of Final Recommendations
- Detailed Recommendations
- Appendices
  - Glossary of Terms
  - References



# Appendices – Glossary of Terms

TERM	SUBCOMMITTEE DEFINITION
“STEM”	“Science, Technology, Engineering, and Mathematics”; use of the acronym refers to these academic disciplines
“PK”	Pre-kindergarten
“State-of-the-art technology architecture”	Technology that incorporates the most recent advances; selected technologies should be well tested and meet industry standards in addition to being in the forefront of development.
“Individualized”	Tailored to meet the student’s learning style
“Longitudinal data”	Data collected over several years
“Ubiquitous access”	24/7/365 access to technology
“21 <sup>st</sup> century skill development”	Comprehensive set of skills, knowledge, and expertise required for success; key areas in addition to core disciplines include learning and innovation skills; information, media, and technology skills; and life and career skills. See The Partnership for 21st Century Skills ( <a href="http://www.21stcenturyskills.org">www.21stcenturyskills.org</a> )
“Business continuity planning	Proactive process of identifying the Commonwealth’s mission critical education systems and developing procedures for restoring and providing continued support for them in crisis situations such as a natural disaster, power outage, attack, pandemic, etc.
“Best practice/promising practice”	Instructional approaches that appear to produce the desired results to be shared with other institutions, organizations as models to be replicated

# Appendices – Glossary of Terms (cont.)

TERM	SUBCOMMITTEE DEFINITION
“Centers of Excellence”	Build upon the history, experience and missions of regional higher education institutions bringing together innovative, expert models that can be replicated in other institutions; providing opportunities for educators to share theory and practice; viewed as a model supporting school change and improvement
“IT disaster recovery”	Recovering mission critical systems in the case of natural disaster, power outage, system failure, or attack. (See “business continuity planning”)
“Open source”	Technology development processes noted for sharing access to code, peer review, collaborative development, and the development of standards.
“Educator”	Teacher, administrator, guidance counselor
“Core technology equipment”	A computer for every child and educator; instructional devices for teachers, e.g. computers, projectors, smart boards
“24/7 broadband access”	High speed, internet access across the Commonwealth
“In-service professional development”	Training provided to educators once they are teaching in districts/schools

# Appendices – Glossary of Terms (cont.)

TERM	SUBCOMITTEE DEFINITION
“Teaching/learning tools and objects”	Collection of instructional resources including, but not limited to, lesson plans, teaching strategies, classroom materials, applets, websites, etc
“Virtual learning environment”	Software system that enables delivery of instructional materials and management of administrative processes
“Online curriculum”	Instructional program, including lessons and units, that can be accessed and pursued through the Internet
“Virtual school”	A complete learning environment with instructional and administrative services conducted through the Internet; online equivalent to a physical school
“Alternative digital assessment models”	Taking tests on line, using simulations, etc. not using paper and pencil
“E-portfolios”	Digital collection of learning artifacts that can be reviewed over a longer period of time to assess history and progression of learning and interests
“Computer-adaptive exams”	Computer-delivered assessment where the selection of the questions are influenced by the student’s responses on previous questions

# Roadmap

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  - References

# Appendices – References

FOCUS AREA 1 – STATEWIDE SYSTEMS to SUPPORT EDUCATION TECHNOLOGY	
<b>Goal 1, Action A</b> (first reference)	<ul style="list-style-type: none"> <li>▪ ITD refers to the Commonwealth of Massachusetts Information Technology Division</li> </ul>
<b>Goal 1, Action C</b>	<ul style="list-style-type: none"> <li>▪ The Massachusetts Information Turnpike Initiative (MITI) is a University of Massachusetts initiative that began in 1995. MITI provides network connectivity and other technology related services to Massachusetts public higher education institutions, ~260K students, 200+ libraries, State Police, State District Attorney, MA Turnpike Authority, and others; more information can be found at <a href="http://www.umass-miti.net">www.umass-miti.net</a></li> </ul>
<b>Goal 1, Action C</b> (first reference)	<ul style="list-style-type: none"> <li>▪ UITs refers to the University of Massachusetts Information Technology Services.</li> </ul>
<b>Goal 2, Action A</b>	<ul style="list-style-type: none"> <li>• Assabet Collaborative refers to partnership that involves purchasing, technology, other administrative supports for participating k-12 schools</li> </ul>
<b>Goal 2, Actions B-D</b>	<ul style="list-style-type: none"> <li>• Connect refers to partnership in Southeastern Ma, Bridgewater, UMassDartmouth, Bristol CC, CapeCod CC, MassMaritime</li> </ul>
<b>Goal 2, Actions B-D</b>	<ul style="list-style-type: none"> <li>• The Worcester Consortium is a 40-year-old alliance of 13 higher education institutions in the greater Worcester area; more information can be found at <a href="http://www.cowc.org">www.cowc.org</a></li> </ul>

# Appendices – References (cont.)

FOCUS AREA 1 – STATEWIDE SYSTEMS to SUPPORT EDUCATION TECHNOLOGY (cont.)	
<b>Goal 2, Actions B-D</b>	<ul style="list-style-type: none"> <li>The Berkshire Compact is a regional initiative lead by MCLA bringing together higher ed, K-12, business, government, healthcare, and other community stakeholders in Berkshire County to address a range of education and workforce challenges; more information can be found at <a href="http://compact.mcla.edu">http://compact.mcla.edu</a></li> </ul>
<b>Goal 2, Action E</b>	<ul style="list-style-type: none"> <li>STEM Pipeline was established to increase students in STEM programs, the number of qualified educators in these fields, and improve offerings in public and private schools; more information can be found at <a href="http://www.mass.edu/forinstitutions/prek16/pipelinetworks.asp">www.mass.edu/forinstitutions/prek16/pipelinetworks.asp</a></li> </ul>
<b>Goal 2, Action E</b>	<ul style="list-style-type: none"> <li>CITI is the Commonwealth Information Technology Initiative, a public/private partnership to promote IT education; more information can be found at <a href="http://www.citi.mass.edu">www.citi.mass.edu</a></li> </ul>
<b>Goal 2, Action E</b>	<p>The Massachusetts College and Career Readiness Web Portal is a fully interactive web-based platform to help students beginning as early as middle school research and prepare for college and careers.</p> <p><a href="http://www.ReadySetGoToCollege.com">www.ReadySetGoToCollege.com</a></p>
<b>Goal 3, Action D</b>	<p>The Dept of Education’s Data Warehouse pilot is “intended to explore the feasibility of offering a single, statewide data warehousing and reporting system” to state public districts and schools; more information can be found at <a href="http://www.doe.mass.edu/infoservices/dw/">www.doe.mass.edu/infoservices/dw/</a></p>

# Appendices – References (cont.)

FOCUS AREA 2 – ENHANCING EDUCATORS’ TECHNOLOGY COMPETENCIES	
<b>Goal 2, Action A</b> (first reference)	<ul style="list-style-type: none"> <li>• EDCO refers to the Educational Collaborative of Greater Boston; more information can be found at <a href="http://www.edcollab.org/">www.edcollab.org/</a></li> </ul>
<b>Goal 2, Action A</b> (first reference)	<ul style="list-style-type: none"> <li>• TEC refers to The Educational Collaborative; more information can be found at <a href="http://www.tec-coop.org/site/index.html">www.tec-coop.org/site/index.html</a></li> </ul>
<b>Goal 3, Action A-B</b>	<ul style="list-style-type: none"> <li>• The Leadership Initiative for Teaching with Technology is a professional development program for teaching STEM with technology; more information can be found at <a href="http://www.lift2.org/">www.lift2.org/</a></li> </ul>
<b>Goal 3, Action A-B</b>	<ul style="list-style-type: none"> <li>• Harvard WIDE is the Graduate School of Education’s virtual professional development program; more information can be found at <a href="http://wideworld.gse.harvard.edu/">http://wideworld.gse.harvard.edu/</a></li> </ul>
<b>Goal 3, Action C</b>	<ul style="list-style-type: none"> <li>• MassONE is the MA Department of Education’s portal; more information can be found at <a href="http://massone.mass.edu/">http://massone.mass.edu/</a></li> </ul>
<b>Goal 3, Action D</b> (first reference)	<ul style="list-style-type: none"> <li>• UMassOnline is the University of Massachusetts “virtual campus”; more information can be found at <a href="http://www.umassonline.net/Home.html">www.umassonline.net/Home.html</a>. It also serves as a hosting environment for a number of the state colleges.</li> </ul>
<b>Goal 3, Action D</b> (first reference)	<ul style="list-style-type: none"> <li>▪ Massachusetts Colleges Online (MCO) is a consortium of 15 MA community and state colleges offering online courses to students in MA and worldwide; more information can be found at <a href="http://www.mco.mass.edu">www.mco.mass.edu</a></li> </ul>

# Appendices – References (cont.)

FOCUS AREA 3 – STUDENT LEARNING in a TECHNOLOGY-INFUSED ENVIRONMENT	
<b>Goal 2, Action B</b> (first reference)	ETLI refers to Educational Technology Leadership Institute teaching Boston Public School teachers to use technology.



# Education & Technology Committee Members\*

- Adam Newman
- Anne B. Manning
- Kim Rice
- Mary Skipper
- Donna Stewartson
- Chris Moore
- Ann Marie Levins
- Bob Cornacchioli
- Isa Zimmerman
- Mary Grant – CoChair
- Rob Richardson - CoChair

\* While the original committee had a longer membership list, these are the members who were deeply engaged and made substantial contributions over the last several months. It should be noted that Susan Brown, from MCLA, provided invaluable administrative and logistical support and Rob Richardson was unable to continue with his role as co-chair due to a long planned sabbatical.