

MassCAN Annual Report

September 2016

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MassCAN
Massachusetts Computing
Attainment Network

EDC Learning
transforms
lives.

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Executive Summary

Now midway through our third year of operation, MassCAN continues to work toward two high-level outcomes:

- Preparing Massachusetts youth for 21st century success by inspiring them to develop their computer science, technology, and problem-solving skills and their analytic abilities, which can be applied in any capacity and to any field
- Expanding the Massachusetts workforce to increase success across all information-based sectors of our economy

MassCAN strives to achieve these outcomes by focusing on four goals:

- Expand opportunities for all Massachusetts K–12 students to learn computer science (CS)
- Promote opportunities for all students, especially many more females and underrepresented minorities, to pursue CS careers
- Inform and inspire educators, administrators, parents, and students about the extraordinary employment opportunities available in technology fields across all industries and nonprofits—locally, nationally, and globally
- Mobilize, organize, and collaborate with partners across Massachusetts in industry, education, nonprofits, and the public sector to achieve the above goals

MassCAN activities, coalition partners, and successes are outlined in both the [MassCAN Briefing Book](#) and this annual report, which is provided to the Massachusetts legislature and the public to present the past year’s activities and planned future efforts.

MassCAN’s Strategic Framework consists of four pillars: Policy, District Education Partner Engagement, Coalition and Collective Impact, and National Leadership.

- Our **Policy** roadmap has remained unchanged, even as our focus shifts from the Massachusetts K–12 [Digital Literacy and Computer Science \(DLCS\) standards](#)

MassCAN (the Massachusetts Computing Attainment Network) is a coalition comprising K–12 education, higher education, business, and nonprofit partners. When we use the term “MassCAN” in this report, we are usually referring to both MassCAN and its coalition partners. (See Appendix E for a summary of the many contributions of our coalition partners to MassCAN’s work.)

(recently approved by the State Board of Education) to teacher licensure, training, and inclusion of CS in MassCore.¹

- **District Education Partnership Engagement** represents the evolution of the teacher-focused education strategy we've pursued for the past several years to a district-focused one, in which our goal is to achieve deep (a large percentage of students learning CS at grade level) and broad (a large number of grades offering CS education) engagement within a handful of forward-looking school districts, charter schools, and other education partnership organizations.
- As the **Coalition** matures, we are adopting **Collective Impact**, a proven formal model for cross-sector metrics-based collaboration to achieve sustainable social change.
- **National Leadership** is a new priority in response to President Obama's [Computer Science for All](#) initiative. Massachusetts is already widely recognized as a national leader in K–12 CS education; under this initiative, the state is now positioned to receive federal funding for CS education.

MassCAN has been very lightly staffed over the past year, with fewer than two full-time people. As a result of successful fundraising in the first half of 2016 and the legislature's renewal of MassCAN funding for FY 2017, we are in our strongest fiscal position since inception. Staffing will expand in late 2016 to add a Communications Director, to improve communications within the coalition and for the public, and a Director of District and Teacher Engagement, to work with districts and their teachers to create a CS education technology plan and support its implementation through teacher professional development (PD), community development, and informational resource support.

Detailed information on MassCAN's Advisory Board, fundraising, teacher PD, and coalition partner activities is provided in the Appendices. Minutes from our Advisory Board meetings are available in Appendix G.

Strategic Framework

Policy

MassCAN's policy work has two strands:

- Expanding awareness among legislators, state administration officials, and business organizations of the importance of CS education and the efforts in Massachusetts to promote CS education as part of K–12 education

¹ MassCore (the Massachusetts High School Program of Studies) is designed to prepare Massachusetts high school graduates for college or the workplace and to reduce the number of students taking remedial courses in college.

- Establishing policy elements at the state level, such as standards and frameworks, to guide, encourage, and enable K–12 CS education

Raising awareness is an ongoing activity. MassCAN coalition members participate in the Governor’s STEM (Science, Technology, Engineering, and Math) Advisory Council (see Appendix F) and the Tech Hub Collaboration; meet regularly with state and national policymakers; work to establish ongoing communication channels with workforce and education administration officials and provide them with regular progress updates; present at state and national events, such as the STEM Summit, the MassCUE² Annual Conference, the Education Commission of the States’ National Forum on Educational Policy, and White House conferences on the President’s Computer Science for All Initiative; and meet regularly with superintendents and teachers.

At the forefront of MassCAN’s policy work is the formal adoption of the first [Massachusetts DLCS standards](#) by the Commonwealth’s Board of Elementary and Secondary Education (BESE) in June 2016. This was the culmination of a two and a half-year collaboration between the MassCAN coalition and the Massachusetts Department of Elementary and Secondary Education (DESE), as represented by an [assembled panel](#) of 40 educators, researchers, industry volunteers, and staff from DESE and Education Development Center, Inc. (EDC).³ The panel incorporated public feedback into a final draft and completed the Curriculum Framework in which the standards are framed. Over the next year, MassCAN partners and DESE officials will conduct public meetings across the state to broaden awareness of the standards and answer educators’ questions about them.

However, while a major milestone in policy progress, the standards are only one step in a sequence needed to put CS on a level playing field with other academic disciplines, such as math and science. In the coming year, MassCAN will engage in at least four key policy-related activities, listed in priority order:

- **Teacher Licensure and Training:** How should the state certify DLCS teacher preparation through licensure, and what guidelines re: training teachers to acquire licensure should it provide? These questions are the focus of a new panel being formed in a collaboration between MassCAN, MassCUE, and DESE. As with the standards panel, a broadly representative membership has been assembled to address both DLCS licensure and related teacher preparation programs over the coming 18 months. BESE is expected to act on recommendations to approve regulations for new DLCS teaching licenses in late 2016. However, due to a backlog in the development of new Massachusetts Tests for Educator Licensure and exams

² MassCUE (Massachusetts Computer Using Educators) is a leading state champion of digital literacy education.

³ EDC serves as both a coalition partner and MassCAN’s physical home.

for the Common Core and STEM, the work group may have to wait until 2018–19 before it can collaborate with Pearson (the state’s test developer) to create the new DLCS exams.

- **Inclusion of CS in [MassCore](#):** MassCore is designed to “help our state’s high school graduates arrive at college or the workplace well prepared and reduce the number of students taking remedial courses in college. MassCore [recommends](#) a comprehensive set of subject area courses and units as well as other learning opportunities to complete before graduating from high school.”⁴ MassCAN’s goal for the year is to collaborate with the Secretary of Education’s office to include a CS course in MassCore’s next iteration.
- **Standards and Course Alignment:** Due to the concurrent development of CS courses in the past few years and the development and release of the DLCS standards, there is now a need to align the courses with the standards. To support this process, MassCAN will establish work groups to do a crosswalk between all high-quality K–12 CS curricula and the DLCS standards, in collaboration with the curriculum developers. The crosswalks will then be shared widely throughout the state. MassCAN’s goal for the year is to complete the crosswalk to the DLCS standards for three CS course curricula.
- **University Admissions Standards:** MassCAN will set up a work group to explore whether the [Admissions Standards](#) for the Massachusetts State University System and the University of Massachusetts (UMass) should recognize one or more high school CS courses as satisfying math and/or science entrance credits for incoming freshman. MassCAN’s goal for the year is to form a work group and initiate discussions on this topic.

District Education Partner Engagement

Over the past three years, MassCAN has delivered CS PD to close to 700 teachers from about half the Massachusetts school districts and a number of charter schools serving K–12 students. (See Appendix D for a complete list of teachers and districts participating in the PD provided by MassCAN partners over the past three years, including more than 90 teachers participating this year.) These “early adopters” are a strong and cohesive cohort, teaching high-quality CS in their districts, advocating for greater CS offerings, and influencing other teachers and school districts. However, in general, Massachusetts school districts do not offer CS to most of their students, much less to all students at all grade levels, which is our goal.

Over the next year, MassCAN will work to promote deep engagement among school districts, charter schools, and other education organizations that support CS education in local schools and districts. We will collaborate with a small group of “pilot” school districts

⁴ Massachusetts DESE. (2016). *What Is MassCore?* Retrieved from <http://www.doe.mass.edu/ccr/masscore/>

who are committed to implementing the new state standards and providing a complete K–12 CS program over a four- to five-year period. This deeper engagement will involve MassCAN partners in a number of ways—advocating for CS education within schools and districts, collaborating in the development of an education plan at the district level for offering CS at all grade levels, arranging and offering PD on implementing the district plan, identifying out-of-school-time programs that complement the district plan, and helping to connect schools with experts and volunteers in the state or country.

MassCAN’s goals for the year include the following:

- Thanks to a major grant from General Electric (GE) that prioritizes CS education, MassCAN leaders and coalition members are actively assisting the Boston Public Schools (BPS) in planning a major CS initiative for all high school students.
- UMass Amherst has secured a National Science Foundation (NSF) grant to engage the Holyoke and Springfield school districts and their charter school partners in a year-long intensive planning process for implementing a K–12 CS education program.
- In collaboration with the Governor’s STEM Advisory Council, MassCAN will seek to support three to five additional school districts who are developing plans to implement a K–12 CS program. The Somerville and Burlington school districts have expressed strong interest in participating in such a pilot program.

MassCAN is actively encouraging and offering its support to several other activities to stimulate interest in CS education within school districts:

- In FY 2016–17, the STEM Advisory Council is budgeting significant funds to incentivize school districts to plan and offer CS education.
- The [Massachusetts Math & Science Initiative](#) is deeply engaged in providing teacher PD for the College Board’s Computer Science Principles course in the state’s [Gateway Cities](#).
- MassCAN is serving as [Code.org’s](#) Professional Learning Partner for Massachusetts and will work with the organization to expand opportunities for districts to develop plans to support CS education in their districts.

Coalition and Collective Impact

The MassCAN coalition seeks to expand and strengthen its ability to implement a comprehensive agenda that achieves the high-level outcomes referenced above. When MassCAN was established, we had no model or existing program to emulate. The coalition model was adopted so that many different programs in the state that are pursuing different aspects of CS education (e.g., research, tools development, curriculum

development, educational materials, PD, after-school programs) could collaborate on a shared agenda to drive the statewide expansion of CS education.

The coalition has had much success in its first few years, including increasing the visibility and priority of CS education in the state, catalyzing community-building across the public and private sectors, and establishing a statewide strategy for driving CS education in a loosely coupled, school district-centric educational system. However, despite all our progress, many improvements are needed to move the effort to a new level of impact, particularly around communication and building new collaborations between organizations.

A new model called Collective Impact, which coordinates multiple organizations who share a common agenda and a commitment to a metrics-driven outcomes process, has emerged nationally, and our initial due diligence suggests that it is a good fit for guiding the MassCAN coalition, as it specifically addresses our precise situation:

Large-scale social change requires broad cross-sector coordination, yet the social sector remains focused on the isolated intervention of individual organizations.⁵

The Collective Impact approach, as set forth in Kania and Kramer's article, is based on five elements:

- A Common Agenda
- Shared Measurement Systems
- Mutually Reinforcing Activities
- Continuous Communication
- Backbone Support Organizations

NSF strongly encourages adopting Collective Impact as a model for engaging a broad partnership in driving and sustaining CS education. This approach is also recognized and supported by GE, which recently relocated its headquarters to Boston and is investing heavily in the Boston Public Schools' CS initiative.

MassCAN has outlined a process for adopting the Collective Impact model. We plan to solicit proposals from three consulting teams. We will then engage a committee of Advisory Board members and coalition partners (Leads) to select the team most capable of implementing the model with the MassCAN coalition and supporting MassCAN in building its capacity to serve as the "backbone organization" (a critical element of the overall Collective Impact model). In parallel, MassCAN will slightly increase its staffing to fulfill the need for expanded communication and data-gathering.

⁵ Kania, J., & Kramer, M. (2011, Winter). Collective impact. *Stanford Social Innovation Review*. Retrieved from http://ssir.org/articles/entry/collective_impact

National Leadership

Funding is a challenge for all who have made CS education a priority. The MassCAN vision of CS for every student in every grade is an expensive undertaking, requiring roughly multi-millions of dollars over 8–10 years, predominantly for teacher PD. Other states proportionally face the same challenges. However, President Obama’s announcement of the [Computer Science for All](#) initiative transforms the state-level discussion of CS education to a national one, and provides a concrete foundation for a state-federal funding partnership.

MassCAN has responded to this changing landscape by prioritizing the positioning of Massachusetts as a national leader on CS education, with the following goals:

- Expand relationships with other state leaders and federal officials who are driving CS education in order to share best practices and increase awareness of Massachusetts’ activities
- Join other state and national leaders in advocating for and influencing the implementation plan for federal funding, and position Massachusetts to pursue new federal funding for states and/or school districts

Rick Adrion, a member of the MassCAN Advisory Board, has been pushing the national agenda forward for many years. The Expanding Computing Education Pathways (ECEP) Alliance, centered at UMass Amherst and led by Rick Adrion and Renee Fall, received a five-year funding grant from NSF to foster communication and collaboration between state leaders at the forefront of CS education. ECEP’s work includes hosting [annual conferences](#) and monthly phone calls between state educators and researchers to collaboration on CS research, curriculum, and policy activities.

Building on ECEP’s work, Google has funded MassCAN/EDC to host a [National Workshop](#) of state leaders in early 2017 to develop state strategies to do the following:

- Effectively engage a state’s elected and government leaders as K–12 CS champions
- Effectively engage a state’s business leaders as K–12 CS champions
- Build effective and diverse state coalitions
- Effectively communicate awareness of the urgency of maximizing the state’s diverse talent pool to provide all students with essential 21st century CS literacy skills

MassCAN’s Executive Director Jim Stanton organized a pre-conference planning meeting for fall 2016 and has been in discussions with prominent leaders who are driving CS education nationally, including [Ruthe Farmer](#) (White House Office of Science and Technology Policy), [Jan Cuny](#) (NSF), [Ted Wells](#) (STEMConnector.org), [Jennifer Zinth](#) (Exploring Computer Science), [Amy Hirotaka](#) (Code.org), [Michael Preston](#) (the New York

City Foundation for Computer Science Education), and [Leslie Aaronson](#) (National Center for Women and Information Technology).

Operations

Finances

With strong legislative support, MassCAN was guaranteed a \$1.5 million allocation in the FY16 state budget. As in the previous year, the state funds are released on a dollar-for-dollar basis as private funds are raised. For the period January 1, 2015, to June 30, 2016, MassCAN raised \$1,095,961 in private funds (see Appendix C), which released a corresponding \$1,095,961 in FY16 state funds.

The private funds were or will be used in the following ways to achieve MassCAN's goals:

- \$325,000 for public awareness
- \$225,961 for teacher PD
- \$200,000 for the “Building State Capacity for Leadership in K–12 Computer Science Education” national summit, planned for February 6–7, 2017
- \$160,000 for MassCAN's operations
- \$130,000 for business engagement (including the Technovation Challenge, Hour of Code, and teacher PD)
- \$55,000 to be held in reserve

The state FY16 funds were or will be used in the following ways to achieve MassCAN's goals:

- To be spent in FY16:
 - ◆ \$211,747 for staff salaries and benefits
 - ◆ \$100,636 for EDC's indirect costs
 - ◆ \$100,000 for a strategic consultant
 - ◆ \$45,492 for operational expenses (rent, communications, travel, printing, etc.)
 - ◆ \$7,875 for teacher stipends
- To be spent in FY17:
 - ◆ \$183,618 for staff salaries and benefits (for the period July 1, 2016, to December 30, 2016)⁶
 - ◆ \$150,000 for subcontracts (UMass Amherst, UMass Boston, Framingham

⁶ Note that there will be two additional full-time staff members during this period.

State, and the Massachusetts Technology Leadership Council (MassTLC)'s Education Foundation)

- ◆ \$99,518 for EDC's indirect costs
- ◆ \$89,000 for a strategic consultant
- ◆ \$59,805 to be held in reserve
- ◆ \$48,270 for operational expenses

Again, thanks to strong legislative support, MassCAN received a \$1.5 million allocation in the FY17 state budget with the same requirement of a one-to-one match of private funds. MassCAN is currently planning a private fundraising campaign and developing a budget for the state funds. The new private funds will be used primarily to support the work of MassCAN's coalition partners in implementing the four priorities in our Strategic Framework. The state funds will be used to expand MassCAN's modest infrastructure by adding an enhanced communications capacity, a new data-gathering and analysis capacity, and extending all operations through the remainder of FY17.

MassCAN has been most fortunate in that it has received extraordinary financial management support from both the Massachusetts Technology Collaborative, to which it reports all funds raised and all expenditures, and EDC, which provides budget forecasting, budget management, management of subcontracts, and payroll and vendor payment services. Both organizations also provide a wealth of valuable advice on MassCAN's programmatic and strategic work.

Staffing

During FY16, MassCAN operated with an Executive Director and added an Administrative & Equity Coordinator partway through the year. In FY17, MassCAN will add a Senior Administrative Coordinator, a Director of District and Teacher Engagement, a Communications Coordinator, and a Data Analysis Manager.

Coalition Partners

EDC has continued to provide both a physical home for MassCAN and an extraordinary work environment, including deeply knowledgeable, passionate, and collaborative colleagues who are eager to serve as a sounding board and to share their wisdom and experience, which has strongly informed MassCAN's work on the Strategic Framework. EDC colleagues and leaders Joyce Malyn-Smith, Joanne Brady, and Ilene Kantrov have been especially valuable partners.

The MassCAN coalition partners (Leads) have also richly informed our work this year. In particular, EDC and its University Hub partners have provided extraordinary leadership in raising awareness about K-12 CS education and delivering high-quality CS teacher PD

programs to districts and teachers in their respective regions. Rick Adrion and Renee Fall at UMass Amherst led the Western Mass. Hub, Deborah Boisvert led the Greater Boston Hub, and Irene Porro and Evan Pagliuca led the MetroWest Hub.

MassTLC's Education Foundation, under the leadership of Shereen Tyrrell, has been extraordinarily effective in mobilizing and preparing employees and business leaders to participate in an array of CS offerings in school-day and out-of-school-time programs.

Additional information on the work of MassCAN coalition partners to advance K–12 CS education in the state is provided in Appendix E.

Appendices

Appendix A: Legislative Language Related to Funding MassCAN

Note: This language is excerpted from Bill No. 4377; MassCAN-relevant text is highlighted in blue.⁷

HOUSE No. 4377

The Commonwealth of Massachusetts
In the Year Two Thousand Fourteen

An Act promoting economic growth across the Commonwealth.

Whereas, The deferred operation of this act would tend to defeat its purpose, which is to strengthen and promote forthwith economic growth across the commonwealth, therefore, it is hereby declared to be an emergency law, necessary for the immediate preservation of the public convenience.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. To provide for certain unanticipated obligations of the commonwealth, to provide for alterations of purposes for current appropriations and to meet certain requirements of law, the sums set forth in section 2A are hereby appropriated from the General Fund, unless specifically designated otherwise, for the several purposes and subject to the conditions specified in this section and subject to the laws regulating the disbursement of public funds for the fiscal year ending June 30, 2015. These sums shall be in addition to any amounts previously appropriated and made available for the purposes of those items. Unexpended balances of appropriations in section 2A shall be made available for expenditure in fiscal years 2016 and 2017.

SECTION 2A. EXECUTIVE OFFICE FOR ADMINISTRATION AND FINANCE

Office of the Secretary.

1100-6000 For a reserve to provide loan guarantees to small businesses pursuant to section 57 of chapter 23A of the General Laws to be administered by the Massachusetts office of business development, in cooperation with the Massachusetts business development corporation \$2,500,000 Reserves

...

7002-1512 For the Big Data Innovation and Workforce Fund established in section 6H of chapter 40J of the General Laws; provided, that \$150,000 shall be expended for the Venture Development Center at the University of Massachusetts at Boston \$2,150,000

⁷ The complete text of Bill H.4377 is available on the website of the 189th General Court of The Commonwealth of Massachusetts (<https://malegislature.gov/Bills/188/House/H4377>).

Massachusetts Office of Business Development.

7007-0210 For the purpose of the Brownfields Redevelopment Fund established in section 29A of chapter 23G of the General Laws \$10,000,000

7007-0952 For a competitive grant program for zoos not operated by the Commonwealth Zoological Corporation; provided, that in awarding such grants, the Massachusetts office of business development shall ensure that all zoos that received funding in fiscal year 2014 shall receive funding in fiscal year 2015 and shall award such grants to zoos in equal amounts to all grant recipients \$150,000

7007-1202 For the Massachusetts Technology Park Corporation established in section 3 of chapter 40J of the General Laws and doing business as the Massachusetts Technology Collaborative, to develop and implement a plan to promote and establish computer science education in public schools as required by section XX; provided however, that the Massachusetts Technology Collaborative shall seek private funds necessary to match contributions equal to \$1 for every \$1 contributed by the collaborative; provided further, that the report shall be filed with the chairs of the senate and house committees on ways and means and the senate and house chairs of the joint committee on economic development and emerging technologies that includes a 3-year strategic plan and annual goals and progress in achieving those goals; and provided further, that the reports shall be made available on the Massachusetts Technology Collaborative's website \$1,500,000

7007-1641 For a grant for the Smaller Business Association of New England for the layoff aversion through management assistance program for consultant and technical assistance to manufacturing companies to prevent business closure and employee displacement; provided, that the expenditure of the layoff aversion through management assistance program shall leverage at least \$1 in matching funds for every \$1 granted pursuant to this item; and provided further, that the president of the Smaller Business Association of New England shall file a quarterly report with the house and senate committees on ways and means, the joint committee on economic development and emerging technologies and the joint committee on labor and workforce development on the number of employees and manufacturing companies that have received financial assistance through this item, a detailed description of the services provided to manufacturing companies through the layoff aversion through management assistance program and a detailed account of the expenditures of the layoff aversion through management assistance program, including administrative costs \$250,000

...

Massachusetts Marketing Partnership.

SECTION 101. Notwithstanding any general or special law to the contrary, the department of housing and community development shall consider the town of Stoughton as an eligible location for the purposes of chapter 40R of the General Laws and shall assist the town in developing a plan to revitalize the town center by identifying projects that could accompany the construction of any planned new rail stations.

SECTION 102. (a) The Massachusetts Technology Park Corporation doing business as the Massachusetts Technology Collaborative shall, subject to appropriation, develop and implement a plan to promote and establish computer science education in public schools. The Massachusetts Technology Collaborative shall serve as the state agent in support of the objectives of the Massachusetts Computing Attainment Network, or MassCAN; provided, that the primary goal of MassCAN shall be to strengthen the growth and vitality of the state's technology industry and the technology dependent business sectors by implementing a broad-based education and workforce

strategy with the objective of increasing the number of students prepared to pursue computing technology careers. In furtherance of this goal, MassCAN shall seek to promote an environment in which all students in grades kindergarten to grade 12, inclusive, have access to computer science courses. MassCAN may, subject to the availability of funds: (i) promote the development and implementation of educational programs, courses and modules for students in grades kindergarten to grade 12, inclusive, and teachers; (ii) collaborate with the department of elementary and secondary education in developing new voluntary kindergarten to grade 12, inclusive, computer science standards; (iii) collaborating with the department of higher education to create computer science professional development hubs at universities in each of the regional PreK-16 science, technology, engineering and mathematics networks established by the department; (iv) develop a school district-based program to assist teachers and administrators with the implementation of new computer science courses; (v) develop and maintain a website to share computer science resources and broadly communicate best practices and successes; (vi) connect computer science students with industry professionals to enhance students' understanding of the relevance of their educational experience to the workplace and science, technology, engineering and math, or STEM, career opportunities; (vii) identify the particular needs of school districts with disproportionately high numbers of underrepresented minorities; and (viii) leverage at least \$1 in matching funds from non-state sources of funding for every \$1 expended within the commonwealth. MassCAN shall take into consideration the recommendations of the STEM advisory council when developing and implementing educational programs.

(b) MassCAN shall be guided by the MassCAN advisory board to be appointed by the governor, 1 whom shall be recommended by Massachusetts Competitive Partnership, Inc., 1 of whom shall be recommended by the Massachusetts Business Roundtable, 1 of whom shall be recommended by the Massachusetts Technology Leadership Council, Inc., 1 of whom shall be recommended by a federally-funded research corporation, 1 of whom shall be recommended by a public university computer science department chair, 1 of whom shall be recommended by the Massachusetts Association of School Superintendents, Inc., 1 of whom shall be recommended by the Greater Boston chapter of the Computer Science Teachers Association, 1 of whom shall be recommended by the METCO program and 1 whom shall be recommended by the Massachusetts chapter of the Society of Women Engineers.

(c) The Massachusetts Technology Collaborative shall file an annual report by September 30 for the duration of the program with the chairs of the senate and house committees on ways and means and the senate and house chairs of the joint committee on economic development and emerging technologies that shall include a 3-year strategic plan and annual goals and progress in achieving those goals. The reports shall be made available on the Massachusetts Technology Collaborative's website.

SECTION 103. The chief information officer of the information technology division shall establish an online business portal, which shall include a streamlined step-by-step guide to starting a business in the commonwealth and tools to complete this process. The portal shall include information on federal and state resources available to assist small businesses. Each page and link associated with the portal shall have a uniform layout, design and branding and shall limit its search results to information available within the portal. The portal shall reflect development procedures that enable functionality, security and interoperability across state entities. The chief information officer shall, within 12 months after the effective date of this section, develop and report to the secretary of administration and finance, the executive office of housing and economic development and the senate and house committees on ways and means on the status of the portal. The report shall examine the benefits of having an independent analysis to ensure that the commonwealth's investment in information technology supports the needs of users trying to start, expand or operate a business in the commonwealth. The report shall include the results of independent verification, validation and testing as a means to ensure that the technology being implemented satisfies the changing needs of businesses, life expectancy and budget of the commonwealth. The report shall include recommendations on ways to ensure that the commonwealth's

information technology small business strategy is meeting the needs of business people, entrepreneurs and other users of the portal. The report shall be made available on the division's website.

SECTION 104. (a) For the purposes of this section, the following words shall have the following meanings unless the context clearly requires otherwise:

"Affiliate", a nonprofit entity including, but not limited to, a hospital or a medical or research institution that is connected or associated with an institution through shared ownership or control, shared directors or trustees or contractual rights and obligations.

"Entrepreneurship institution," the University of Massachusetts at Lowell and the University of Massachusetts at Boston.

FY2016 State Budget Language for MassCAN Allocation

7007-1202

For the Massachusetts Technology Park Corporation established in section 3 of chapter 40J of the General Laws and doing business as the Massachusetts Technology Collaborative, to develop and implement a plan to promote and establish computer science education in public schools as required by section 102 of chapter 287 of the Acts of 2014; provided, that the Massachusetts Technology Collaborative shall seek private funds necessary to match contributions equal to \$1 for every \$1 contributed by the collaborative; provided further, that the Massachusetts Technology Collaborative shall file an annual report by September 30 for the duration of the program; provided further, that the report shall be filed with the chairs of the house and senate committees on ways and means and the house and senate chairs of the joint committee on economic development and emerging technologies that includes a 3-year strategic plan and annual goals and progress in achieving those goals; and provided further, that the reports shall be made available on the Massachusetts Technology Collaborative's website

\$1,500,000

Appendix B: MassCAN Advisory Board Members FY16

As of September 2016:

Nominating Organization		Representative	Representative's Organization
1	Massachusetts Competitive Partnership	Bryan Jamele , Executive VP	Massachusetts Competitive Partnership
2	Massachusetts Business Roundtable	Steve Vinter , Engineering & Site Director	Google
3	Massachusetts Technology Leadership Council	Tom Hopcroft , President	Massachusetts Technology Leadership Council
4	Federally funded research corporation	Carole Mahoney , Department Head, Agile and Adaptive Software Engineering	The MITRE Corporation (a federally funded research corporation)
5	Public university computer science department chair	Rick Adrion , PI, NSF Expanding Computing Education Pathways—Broadening Participation in Computing Alliance	UMass Amherst (College of Computer and Information Sciences)
6	Massachusetts Association of School Superintendents	Dr. Eric Conti , Superintendent, Burlington Public Schools	Burlington Public Schools
7	Computer Science Teachers Association (CSTA), Greater Boston Chapter	Hans Batra , Computer science, algebra, and robotics teacher	Needham High School
8	Society of Women Engineers, Massachusetts Chapter	Danielle Curcio , Chief Software Engineer	Raytheon Company
9	Metropolitan Council for Educational Opportunity (METCO)	Recommendation has been forwarded to the Governor	METCO
New Board Seats Authorized by Amendment of H.4461, July 2016			
10	The Partnership, Inc.	Recommendation has been forwarded to the Governor	
11	TechNET	Recommendation has been forwarded to the Governor	
12	MassTLC Education Foundation	In process of being recruited	
13	Society of Hispanic Professional Engineers	In process of being recruited	

Appendix C: MassCAN Contributors and Funding

From January 1, 2015, through June 30, 2016:

Contributors and Funders	Amount
Vertex Pharmaceuticals	\$50,000
State Street	\$50,000
Verizon	\$10,000
Facebook	\$30,000
Google	\$300,000
Kraft Family Foundation	\$10,000
Suffolk Construction	\$10,000
MassCUE	\$1,000
Mass Mutual	\$10,000
Liberty Mutual	\$40,000
Partners HealthCare	\$20,000
Eversource	\$20,000
Putnam Investments	\$10,000
Bank of America	\$10,000
Microsoft (MassTLC Education Foundation)	\$130,000
Google (Computer Science Teachers Association teacher PD)	\$35,000
Google (UMass Amherst PD)	\$34,961
Anonymous donor (Museum of Science)	\$325,000
TOTAL	\$1,095,961

Appendix D: Teacher Professional Development

The PD programs offered to schools and districts by MassCAN and its partners in the past 12 months (as of September 2016) are summarized in the table below.

			Number of teachers who have taken specific PD programs				
			grades K–5	grades 6–8	grades 6–8	grades 9–12	grades 9–12
	No. of programs	School/District	Code Studio ⁸	Bootstrap ⁹	GUTS ¹⁰	ECS ¹¹	CSP/BJC ¹²
1	2	Abington			1	2	
2	3	Acton		2	2	2	
3	1	Amesbury	2				
4	1	Amherst				1	
5	3	Andover	19		1	3	
6	3	Arlington	2	1		6	
7	1	Ashburnham			1		
8	3	Ashland	1		1	4	
9	1	Ayer	1				
10	2	Barre	1			1	
11	1	Bedford	2			1	
12	1	Belmont	1				
13	2	Beverly	3		1		
14	2	Billerica	2		1		
15	4	Bolton	2	1		1	1
16	5	Boston	14	12	6	51	2
17	2	Bourne	1	1			
18	1	Boxford	2				
19	1	Bradford	1				
20	2	Braintree			2	2	
21	2	Brookline			2	3	
22	1	Burlington	1				
23	5	Cambridge	2	1	2	5	1
24	1	Carlisle	1				
25	1	Carver	1				
26	1	Charlton		1			

⁸ A K–5 PD program that introduces basic computing concepts into the K–5 curriculum.

⁹ A middle school PD program that integrates CS concepts into Algebra I-level courses through video game design.

¹⁰ GUTS (Growing Up Thinking Scientifically) is a middle school PD program that introduces modeling and simulations into middle school life science, Earth science, and physical science courses.

¹¹ ECS (Exploring Computer Science) is a highly acclaimed high school-level broad introduction to CS.

¹² Mobile CSP and The Beauty and Joy of Computing are high school-level PD programs that prepare teachers to teach the year-long AP CS curriculum.

			Number of teachers who have taken specific PD programs				
			grades K-5	grades 6-8	grades 6-8	grades 9-12	grades 9-12
	No. of programs	School/District	Code Studio	Bootstrap	GUTS	ECS	CSP/BJC
27	1	Chelmsford	3				
28	2	Chelsea	5			2	
29	1	Chicopee			1		
30	1	Concord	1				
31	1	Dartmouth		3			
32	2	Dedham			1	1	
33	1	Denis-Yarmouth	2				
34	1	Dighton-Rehoboth	1				
35	1	Douglas			1		
36	2	Dover-Sherborn	3		3		
37	1	Dracut		1			
38	1	Dudley				1	
39	1	Easton				1	
40	4	Everett	4	1	1	1	
41	1	Fairhaven		1			
42	5	Fall River	2	1	1	1	1
43	2	Falmouth	2			1	
44	2	Fitchburg		1			1
45	3	Foxborough	1		1	2	
46	4	Framingham	5	1	2	3	
47	1	Franklin				1	
48	1	Gloucester	1				
49	2	Greenfield		1	2		
50	4	Groton-Dunstable		2	2	4	2
51	1	Hanson	1				
52	1	Harvard		1			
53	4	Haverhill	10	3	5	7	
54	1	Hingham	1				
55	1	Holbrook				2	
56	1	Holden			1		
57	1	Holliston				1	
58	2	Holyoke			1	1	
59	1	Hopkinton		2			
60	1	Hubbardston	1				
61	1	Hudson					1
62	1	Kingston	1				
63	2	Lawrence	4	1			
64	1	Lenox	2				
65	2	Leominster	2		1		
66	2	Lexington		1	1		

			Number of teachers who have taken specific PD programs				
			grades K-5	grades 6-8	grades 6-8	grades 9-12	grades 9-12
	No. of programs	School/District	Code Studio	Bootstrap	GUTS	ECS	CSP/BJC
67	1	Lincoln		1			
68	3	Littleton	1			3	1
69	2	Lowell	21		1		
70	1	Ludlow				1	
71	1	Lunenburg				1	
72	2	Lynn	4		1		
73	3	Lynnfield	3		1		1
74	1	Malden	15			1	
75	2	Mansfield	2		1		
76	1	Marblehead	1				
77	1	Marian				1	
78	3	Marlborough		2		8	1
79	2	Mashpee	1	2			
80	2	Maynard			1	1	
81	2	Medfield	2			1	
82	3	Medford		2	2	6	
83	2	Methuen	3	1			
84	1	Middleton	2				
85	1	Milford	1				
86	3	Millis	1	1		1	
87	2	Milton	1			7	
88	1	Nantucket		1			
89	3	Natick	7		2	4	
90	4	Needham	4	5	4	2	1
91	1	New Bedford	2			1	
92	1	Newbury	1				
93	1	Newburyport	1				
94	5	Newton	9	2	1	6	1
95	1	Norfolk	2				
96	1	North Andover	2				
97	1	North Attleborough			1		
98	1	North Brookfield	1				
99	2	North Reading	1			3	
100	1	Northampton		2			
101	2	Northborough-Southborough	2			1	
102	1	Northbridge				1	
103	1	Norwell	1				
104	2	Norwood	2		1		
105	1	Oakham-Hardwick	1				
106	1	Orange			1		

			Number of teachers who have taken specific PD programs				
			grades K-5	grades 6-8	grades 6-8	grades 9-12	grades 9-12
	No. of programs	School/District	Code Studio	Bootstrap	GUTS	ECS	CSP/BJC
107	1	Palmer			4		
108	4	Pembroke		3	1	2	1
109	1	Petersham			1		
110	2	Plymouth	2				
111	3	Reading	4			10	3
112	2	Revere	8			1	
113	1	Rochester				1	
114	1	Rockland	1				
115	1	Rutland	3				
116	1	Salem			1		
117	1	Sandwich			1		
118	1	Sharon	2				
119	1	Shelburne Falls				2	
120	1	Shrewsbury	1				
121	1	Somerville				2	
122	1	South Deerfield				1	
123	1	South Easton			1		
124	1	South Hadley	1				
125	1	Southbridge			1		
126	1	Southwick				1	
127	2	Springfield		3		4	
128	1	Stoneham	1				
129	1	Sudbury	2				
130	5	Swampscott	2	2	2	1	1
131	1	Taunton			1		
132	1	Templeton	1				
133	1	Topsfield	2				
134	1	Townsend			1		
135	2	Tyngsborough	3			1	
136	1	Uxbridge				1	
137	1	Wachusett Regional			2		
138	2	Wakefield	3	1			
139	3	Walpole		1	1	1	
140	3	Waltham	6			6	1
141	1	Wareham		2			
142	2	Watertown	6	1			
143	3	Wayland	2			4	1
144	1	Webster	1				
145	1	Wellesley				6	
146	1	West Boylston				1	

			Number of teachers who have taken specific PD programs				
			grades K-5	grades 6-8	grades 6-8	grades 9-12	grades 9-12
	No. of programs	School/District	Code Studio	Bootstrap	GUTS	ECS	CSP/BJC
147	1	West Newbury	1				
148	1	West Yarmouth	1				
149	3	Westborough	1		2	2	
150	2	Westford	1		1		
151	1	Westhampton				1	
152	1	Westminster	1				
153	1	Weston		1			
154	2	Westwood	2	1			
155	4	Weymouth	6	2		5	2
156	1	Whitman-Hanson	1				
157	1	Wilbraham				2	
158	1	Wilmington	2				
159	2	Winchendon	1			1	
160	4	Winchester	4	2		3	1
161	1	Winthrop			1		
162	1	Woburn	1				
163	5	Worcester	3	3	1	4	1
		Total # of Teachers	281	80	83	223	25
		LEGEND					
		1 program	95 districts have participated				
		2 programs	37 districts have participated				
		3 programs	16 districts have participated				
		4 programs	9 districts have participated				
		5 programs	6 districts have participated				
		Total # of schools and districts that have participated in PD	163				

Appendix E: MassCAN Coalition Partners' Activities

Massachusetts DESE–EDC Partnership

DESE and EDC are collaborating on **Broadening Participation of Elementary School Teachers and Students in Computer Science through STEM Integration and Statewide Collaboration**. The goal of this project, which was awarded NSF's STEM+C grant, is to integrate the CT strand of the DLCS standards into elementary school (grades 1–6) math and science activities through STEM Integrated Modules (I-Mods). Ten school teams comprising 51 educators were recruited in October 2015 to develop the I-Mods, with support from the Project Management team. The teams drafted 12 I-Mods by the end of June 2016. Piloting of the completed units will begin during the 2016–17 school year.

EDC

- NSF's CS10K initiative has funded a project titled **Workshop to Develop an Interdisciplinary Framework for Integrating Computational Thinking in K–12 Science, Mathematics, Technology, and Engineering Education**, which places Massachusetts as a leader in the national CT movement. The project will host a four and a half-day conference, with the primary goal of evolving an NSF CT "Think Tank" comprising NSF STEM+C and ITEST grantees whose work has focused on CT. Workshop participants will (1) identify underlying constructs that help to define and operationalize CT within the various disciplines represented in NSF's ITEST and STEM+C projects, (2) draft a Theoretical Framework for Computational Thinking from an Interdisciplinary Perspective, describing CT in ITEST and STEM+C projects, and (3) produce recommendations for the development of CT assessment instruments to support ongoing interdisciplinary CT work.
- The **Massachusetts Exploring Computer Science (ECS) Partnership** has exceeded its three-year CS PD goals. The collaborating partners—the Broadening Advanced Technological Education Connections (BATEC) Center at UMass Boston, the Commonwealth Alliance for Information Technology Education (CAITE) at UMass Amherst, and the McAuliffe Center for Integrated Science Learning at Framingham State University—have built the capacity of more than 150 teachers to use ECS teaching and learning strategies to broaden participation in computing. The project produced six highly qualified and nationally recognized ECS facilitators who now lead ECS PD in the state.
- The NSF-funded **Online Professional Development for Exploring Computer Science** project is a collaboration between EDC and the University of Oregon. This project strives to develop and implement an online PD option for the highly acclaimed ECS program, thus making ECS accessible to a larger and more diverse group of high school students. The project will provide a much-needed alternative to

the four quarterly in-person ECS workshops, which many teachers, particularly those in rural areas, are not able to attend.

Broadening Advanced Technological Education Connections (BATEC)

BATEC, an NSF-funded Advanced Technological Education National Center of Excellence for Computing and Information Technologies (IT), supports an urban mission that promotes linkages between and among organizations to provide the “system netting” critical for student entry into and advancement through computing and IT programs. This is achieved through the development and implementation of computing and IT pathways that connect high school, community college, and university as a seamless progression, using an industry-relevant curriculum that develops both strong technical knowledge and the professional and entrepreneurial attributes necessary for today’s workplace. BATEC forges strategic partnerships with education, business, government, and the community to build awareness, generate interest, and support learning opportunities for students. The center facilitates a variety of recruitment and retention strategies, including college and career days, dual enrollment, internships, and bridge programs. In addition, BATEC engages in actionable research on the IT landscape to inform policymakers, IT educators, and workforce development agencies.

- Exploring Computer Science (ECS)
 - ◆ In Summer 2016, 2 ECS facilitators trained 27 educators
 - ◆ A three-credit graduate course is offered, which extends the learning of ECS to analyze districts’ and schools’ needs and to identify ways to champion CS
- BATEC Summer Institute
 - ◆ Five courses serving 85 educators (24 of whom were high school teachers) across high schools, community colleges, and universities
 - ◆ The courses that focused on high school-relevant content included Python programming, Raspberry Pi and Arduino activities, and the CyberPatriot program
- Early College and Dual Enrollment
 - ◆ BATEC is involved in planning and advisory roles in five Massachusetts high schools: Charlestown, Excel, and Madison Park (Boston); Brockton; and Marlborough
 - ◆ Computing pathways allow programs of study in programming, Web development, networking, and security
 - ◆ Based on work in Chicago with five Early College STEM Schools, whose first graduating class in June 2016 achieved a 40-point increase in on-time rate for

graduation

- Summer Bridge
 - ◆ MassBay Community College offered an intensive 10-day course for college credit (CS/engineering) and four 2.5-day hands-on workshops (Raspberry Pi, Artbotics, Scratch, AppInventor) for 60 rising juniors, seniors, and recently graduated seniors
 - ◆ Bunker Hill Community College offered two Summer Bridge options—for rising freshman in the C-Town Tech program, and for rising seniors and recently graduated students—that netted a total of 40 students
- Tech Apprentice
 - ◆ Paid internship program that places approximately 120 tech-savvy Boston Public Schools' high school students per year in technology-focused summer jobs
 - ◆ Runs for seven weeks each summer
 - ◆ Prior to the program start date, students participate in mandatory business etiquette workshops
 - ◆ Most students receive an hourly rate of \$10 for 35 hours/week
 - ◆ Students work at companies throughout Boston in a wide range of industries; positions are determined by the employer's needs and the student's interests and skills
 - ◆ Assigned projects include but are not limited to help desk/troubleshooting support, Web design and programming, quality control, and social media and video production

Museum of Science

- Maker Media published and is promoting a full-length book titled *Start Making! A Guide to Engaging Young People in Maker Activities*, authored by The Museum of Science's Clubhouse Network and researchers at the MIT Media Lab. The book features curriculum promoting CT and STEM design activities.
- The Clubhouse @ the Museum of Science is launching Clubhouse-to-Career Pathways to provide real-world work experience to youth from under-represented populations. For youth who have high-level technology skills but who lack workplace readiness, this project gives them access to the social and cultural capital to enable them to succeed in professional jobs and meet their full potential.
- The Museum of Science, in collaboration with Pixar Animation Studios and the Science Museum Exhibit Collaborative, premiered "The Science Behind Pixar," an award-winning exhibition about the STEM and CS used in Pixar's production pipeline. The exhibition includes experiences designed to engage visitors in CT and

to pique their interest, build their self-efficacy, and foster a stronger understanding of the creativity and problem-solving practices used by programmers. An NSF-funded research study focused on these experiences is elaborating how design can be leveraged to support sustained engagement and improvement in interests, attitudes, and capacity for CT among diverse middle and high school students.

Appendix F: STEM Advisory Council

The vision of the [Governor's STEM Advisory Council](#) is to ensure that all students in the Commonwealth receive comprehensive STEM education from highly qualified educators so that they are better informed and better prepared to pursue post-secondary degrees or careers in these areas. In 2015, the Council established four recommendations as the Council's focus:

- Expand work-based learning programs
- Develop and grow STEM early college and career pathways
- Broaden and deepen CS and engineering initiatives
- Align the work of the [Regional STEM Networks](#) to the STEM Advisory Council priorities

Steve Vinter, a co-founder of MassCAN, serves on the Council and is chair of the Computer Science and Engineering Subcommittee that was formed to push forward its CS and Engineering initiatives. The Council is currently planning its 2017 programming; the following slide outlines the draft recommendation for CS and Engineering initiatives in 2017.



Update on Recommendations

Broaden and Deepen Computer Science & Engineering Initiatives

GOAL: *Strengthen foundational STEM skills, while deepening the pipeline of well-trained STEM teachers and school leaders*

WORK TO DATE:

- § **Strengthen and Expand Computer Science and Engineering Courses**
 - Board of Elementary and Secondary Education approved Digital Literacy & Computer Science Standards
 - Increase available courses work towards incorporating computer science into MassCORE
 - The STEM Advisory Council is proposing a \$350,000 grant program to incentivize schools and/or districts to adopt evidence-based curricula and teacher professional development
- § **Increase participation and scores of under-represented groups in Advanced Placement courses in science, mathematics, and computer science**
 - The STEM Advisory Council is proposing a \$250,000 grant to assist high schools in identifying students ready for AP courses, but who are not enrolling.

The Council's proposal aligns well with MassCAN's priorities, in its emphasis on funding school districts to drive CS PD and continuing policy activities related to the DLCS standards and the inclusion of CS in MassCORE.

Appendix G: MassCAN Advisory Board Meeting Minutes

Minutes of the 2015–16 MassCAN Advisory Board Meetings can be found here:

June 2016

MassCAN Advisory Board Meeting – Wednesday June 15, 2016

In attendance: JD Chesloff, Sherif Barakat, Bethann Steiner, Rick Adrion, Hans Batra, Eric Conti, Jim Stanton, Tripp Jones

On the phone: Carole Mahoney, Tom Hopcroft

Board and Meeting Chair: Steve Vinter

Time: 3:30 PM – 6:00 PM
Date: June 15, 2016
Location: Google Cambridge
5 Cambridge Center
Cambridge, MA 02142

Agenda

Welcome and agenda review
Approval of Board Meeting Minutes
Strategic framework for 2016-2017
Finance update
Board changes – add nominating organizations and resignation

Handouts

Financial report
Google Proposal for National Conference
Minutes of prior meetings
MassCAN Brief information
Briefing Book
Initiative Highlights
PD report

Welcome and agenda review

Approval of Board Meeting Minutes

Discussion

- Steve asked if there were any questions or comments.

Vote

Eric moves to accept meeting minutes from 9/23/15, 1/20/16, 2/14/16 and 3/23/16.

Brian seconds

Yeas = unanimous

Strategic framework for 2016 – 2017

Discussion

- Steve gives an update of the new strategic framework: district engagement, policy, coalition and collective impact, and national leadership

DISTRICT ENGAGEMENT

- We want to have deeper and stronger engagement with a handful of school districts rather than going broad and shallow. Focusing our efforts in this way helps with fundraising with Strategic Grant Partners (SGP). Project Lead the Way is interested in funding this
- GE and BPS starting the process of trying to plan for the \$15M that GE is giving the state for CS for All.
- Jim Stanton and Shereen Tyrrell are on the task force.

NATIONAL LEADERSHIP

- Jim explains how MassCAN can be and will remain a national leader in the push to get CS into schools
- Jim explains the background for the *Building State Leadership Capacity to Scale K-12 CS Education* conference it's purpose, the goal, the strategy for the combination of attendees from each state, etc.

POLICY

- Steve quickly explains that the primary goal is to develop board base of support for long-term, sustainable policy changes.

COALITION + COLLECTIVE IMPACT

Tripp lays out the goals around coalition building and how we can **leverage???**

- Strengthening the coalition
- Raising the visibility of our efforts
- Embracing the Collective Impact model

3 basic things that should be highlighted

- We are well poised to expand the list of people that can play a part once we secure funding
- We are waiting to get a proposal from FSG on how the work would be done. We're also talking with STRIVE from Ohio about working with us.
- Looking for a funder that would be very excited about working on this particular piece of work like Nellie Mae.
- Rick suggests that we talk with other initiatives that have used the collective impact model across the state for feedback on the effectiveness and how the model works.
- Eric suggests that the MassCAN team look to piggyback on some of the other conversations that are happening across the state. The state is saying that all students will need to be assessed on CS by 2019 but there isn't enough work going into teaching students CS. And going forward it will be difficult to focus on this with elections coming up, etc. Tripp and Steve both agree that this makes sense.
- More discussion around integrating CS questions into the student standardized tests to test the waters even though conversations are happening at a higher level

- Steve suggests that we should put together and recommend a few questions to put on the exams.
- Eric suggests that he could push our agenda with the superintendent's boards that he sits on and he's willing to play that role.

ACTION ITEM: Eric will take on mobilizing school district policy activities – short-term opportunities

Finance update

Discussion

- Steve gives an overview of the financial summary for the second and third quarters.
- Shereen suggests that there are a few other MassTLC EF donations – Verizon, Semantics and GoDaddy and a project that Rick shares (Google CS4HS to UMass Amherst) for a rough total of \$75,000 that can be considered match for MassCAN. **We need letters from the PIs by next week – must get them by the end of the month.**

ACTION ITEM – we need to stay on top of this

JD: There's a proposal in economic development \$75M for vocational programs and equipment grants for life science

- Jim will follow up on this.
- Shereen suggests that Jim includes a few examples of what the money was spent on going forward.

Board changes

Discussion

- Jim shares the board resignation of Kalise Wornum from Wellesley METCO, and we have reached out to another METCO director as a replacement.
- We reached out to the Partnership to advise and identify a new board member, however, we need to amend the legislature before proceeding.
- Jim will need to give the names of the 3 new nominating organizations to Bryan Jamele and JD Chesloff by end of week.

VOTE – the board wants to expand the board membership by three seats

Confirmatory vote – the Advisory Board supports this idea

Eric makes a motion that the board recommends that the board be expanded by three seats and that the legislature be changed accordingly

Rick seconds the motion

Unanimous – Yea

Discussion of qualifying "Match" funds

Match Fund Rules

Is the AB board comfortable with MACP (Pat Larkin) determining the % of the \$1.3M from the Pixar exhibit from the MOS?

Jacobson Family Foundation Proposal is tabled until the next meeting.

Vote

Recommendation to adjourn

Eric moves to adjourn

Bryan and Carol second

Yeas = unanimous

March 23, 2016**MassCAN Advisory Board Meeting – Wednesday March 23, 2016**

In Attendance: Advisory Board Members Bryan Jamele, Carole Mahoney, Danielle Curcio, Eric Conti, Rick Adrion, and Hans Batra; Invited Guests Jim Stanton, Sherif Barakat, Tripp Jones, Pat Larkin,

Absent: Advisory Board Members Steve Vinter, Kalise Wornum, and Tom Hopcroft

Acting Chair: Eric Conti

Time: 3:30 pm – 6:00 pm

Location: MITRE Corporation
202 Burlington Road (Route 62)
Bedford, MA 01730
MITRE Center (C Building) Room 1C103

Agenda

Review and Approve 2016 Budget Reallocation

Discussion of FY17 Budget Strategy

Progress on recruiting leadership teams for Policy and Teacher PD Work Groups

Review developments related to Presidents Obama's proposed \$4B "CS for All" Initiative

Review and Approve 2016 Budget Reallocation**Discussion**

- Fundraising has been very challenging for a variety of reasons. Jim Stanton shared his plans to keep necessary activities moving forward by engaging FSG to train MassCAN boards and working groups in Collective Impact.
- MassCAN, EDC and MTC signed the FY16 contract in January. All parties are in discussions to explore allowing for MassCAN to spend state funds beyond the fiscal year should additional private match funds be received 6/30/16.

VOTE: Eric Conti, acting chair, called for a vote
Bryan Jamele made a motion to: "approve a budget reallocation of \$100,000 from staff salaries to contracted services for the purposes of potentially contracting with FSG a consulting group specializing in a process known as Collective Impact."
Danielle Curcio seconds the motion
No further discussion. Vote was 5 For, 0 Against, 1 Abstention (Rick Adrion)

Discussion of FY17 Budget Strategy

- No discussion on FY17 – Given uncertainties of current legislative budget process Jim suggested we wait until there is more substantive information to discuss.

Discussion – Progress on recruiting leadership teams for Policy and Teacher PD Work Groups

- Jim has identified a leadership team for PD work group which will meet as soon as there is funding to support this group's work
 - Hans Batra – Teacher, Needham High School
 - Josh Shelton – MIT App Inventor
 - Sandra Cole – MITRE
 - Renee Fall – UMass-Amherst ECS Hub Leader, CAITE, ECEP
 - Fred Martin – UMass- Lowell CS Professor and National CSTA Board Member
- Jim is working on the Policy Workgroup and will continue discussions with perspective leadership.

Discussion – Review developments related to Presidents Obama's proposed \$4B "CS for All" Initiative

\$4B Computer Science Initiative

1/30/16 President announces \$4B **Computer Science for All** initiative to provide 5 yr grants to every state based on submitting 3+ year strategic plan--equity is key focus

Additionally, a \$100M initiative to funding school districts directly

House Appropriations Committee must allocate funds for any of this to be real

In conversations with Code.org to develop national campaign to get state government and business leaders to weigh in with House Appropriations Comm.

Steve, Tripp and Jim communicating with Jim Peyser re MA playing a lead role and collaborating with RI Governor and other NE State Leaders

- Steve, Jim and Tripp are working to have Governor Baker partner with other Governors and state leaders to take out a full page ad of the attached letter in a national newspaper to urge Congress to provide funding for CS for All.

Discussion – Review progress on hiring for three positions in FY16 Budget

- With fundraising being much slower than hoped, filling these positions will await sufficient funds to proceed.
-

Carole Mahoney moved to adjourn the meeting and the motion was seconded by Rick Adrion. The vote to adjourn was unanimous.

NEXT MEETING

The next meeting is scheduled for Wednesday April 20, but that turns out to be school vacation week. We will poll the members to see if the meeting can be moved to Wednesday April 27 3:30p – 5p or, if it will be necessary to postpone until the scheduled May meeting.

February 24, 2016

MassCAN Advisory Board Meeting – Wednesday February 24, 2016

In attendance: Hans Batra, Aimee Sprung, Shereen Tyrrell, Eric Conti, Bryan Jamele, Tripp Jones, Steve Vinter, Jim Stanton

On the phone: Rick Adrion, Carole Mahoney, Danielle Curio

Absent: Kalise Warnum, Tom Hopcroft

Time: 3:00 PM
Date: February 24, 2016
Location: Google Cambridge
5 Cambridge Center
Cambridge, MA 02142

Agenda

President Obama’s \$4B Computer Science Initiative
MassCAN Financial Update
Discussion of FY16 MassCAN Budget revisions
Discussion of Collective Impact process
Discussion of MassCAN Workgroups for

Discussion - President Obama’s \$4B Computer Science Initiative

- While this announcement is great news and an endorsement for computer science educations, no one is anticipating that all the proposed \$4B will be available due partisanship in DC and gridlock.

Discussion - MassCAN Financial Update

- GE moving Boston helps MassCAN’s argument and helps to move our agenda forward.
- Response from Secretary Peyser’s office favorable, the initiative won’t be in his top 5 items to prioritize.
- Bryan believes that tying this to Governor Baker’s agenda priorities will get traction
- Tripp shares that many of his contacts feel that MA is well positioned and is way ahead of other states in promoting CS.

MassCAN Financial Update

- MACP – Bryan raised \$250,000 and there will be an additional \$10,000. This positions MACP as a real leader in the business community.
- Had a productive meeting with MTC to discuss the match fund process and
- Share the GE Foundation paper on collective impact

Discussion of FY16 MassCAN Budget revisions

Discussion of Collective Impact process

- There are concerns about how much it will cost to work with FSG.

Discussion of MassCAN Workgroups

- We are actively working policy, teacher PD, and public awareness, but have not focused yet on business engagement, district engagement or equity. Getting the working groups up and running will help to involve more people in advancing our agenda.
- Steve explains who the Leads group is and what their function thus far has been. As both advisory groups mature, it will make sense to consider merging the two groups at some point.
- Each working group will be self-directed and may be comprised of Leads and Advisory members as well as other industry experts. Each working group will need to figure out leadership, team creation, work to date and strategic plan, charter and goals and logistics.
- There was discussion around getting a handle on local (MA) programs that are promoting CS in some way. Because there is so much going on, we should build a resource bank of programs with similar priorities
- Something to consider: If all the workgroups are successful, what does a kindergartner experience moving through the MA K-12 school system? CS could be integrated throughout all courses, a new pathway alongside of biology, chemistry, physics, etc.
- We are working with Heather Pesky to help develop the licensure requirements teacher must have.

January 20, 2016

MassCAN Advisory Board Meeting – Wednesday January 20, 2016

In attendance: Carol Mahoney, Tom Hopcroft, Hans Batra, Aimee Sprung, Shereen Tyrrell, Bryan Jamele, Eric Conti, Pat Larkin, Jim Stanton, Rick Adrion, Steve Vinter, Tripp Jones

Absent: Kalise Wornum, Danielle Curcio

Time: 3:00p – 6:00p
 Location: MITRE Corporation
 202 Burlington Road (Route 62)
 Bedford, MA 01730
 MITRE Center (C Building) Room 1C103

Agenda

1. Review of Q4'2015 highlights
2. Priority review and reset for 2016
3. Budget review for 2016
4. Legislative Amendment for Board expansion of +3 (MassTLC Education Foundation, The Partnership, Inquilinos Boricuas En Accion)
5. Discuss the roles of Board members and MassCAN Leads members in Work Groups
6. Wrap-up and next steps

Meeting Notes

Discussion - Review of Q4'2015 highlights

Funding	Public Awareness
<ul style="list-style-type: none"> • MACP commits \$165K • STEM Advisory Council +1's MassCAN • Microsoft in kink \$130K submission • Legislature declines "non-state" match • Briefing Book assembled 	<ul style="list-style-type: none"> • Hour of Code success – 1/3 of MA schools! Kudos to MassTLC and CAITE! • Vinter keynote @ MassCUE annual conf • MassTLC plans Technovation Challenge '16 • CodeGirl documentary screening

Discussion - Priority review and reset for 2016

- We are behind on fundraising, however the 9c cuts did not affect MassCAN

- Approx. 500 ppl have signed up for the Technovation Challenge '16 and Shereen is working to get more women mentors involved from Raytheon, MITRE, Google, etc.
- [MACP – Brian \\$250,000](#)

<p>Policy</p> <ul style="list-style-type: none"> • Board of Education presented with DL/CS Standards: “preaching to the choir” • Jim, Tripp et al. attend White House CS Week • Jim attends White House event for CS education leaders <p>CS in President’s State of the Union address</p>	<p>Professional Development</p> <ul style="list-style-type: none"> • ECS Cohort 3 recruitment begins • Mobile CSP recruitment begins • GUTS recruitment to begin in March • Code.org discussions for 2016 K-5 training • Collection of ECS Cohort 1&2 info <p>Discussions with PLTW</p>
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Discussion - Budget Review for 2016

- Discussion centers on the amount of funds that are anticipated to be raised between now and the end of the fiscal year and whether the total amount needs to be spent down before the end of the fiscal year.

Discussion - Tier 1 Program Priorities

- Discussion on whether to approve the Tier 1 - Steve recommends that we assume \$20000 cost therefore \$163,000 + \$20,000 for DL/CS standards

Vote: Eric moves that the board authorize Tier 1 + the \$20,000; seconded by Carol
Yea = Unanimous

Discussion – Legislative Amendment for Board expansion of +3

- Jim Stanton suggests that we consider engaging The Partnership and Inquilinos Boricuas en Acción for possible new members
- Aimee wonders if those on the Advisory Board are already working with organizations that represent POC. Jim is willing to consider other organizations besides IBA and the Partnership.
- Work with Tom, Brian and JD to work out the legislative change to include additional board members.

Discussion - Roles of Board members and MassCAN Leads members

- What are the areas of interest of the current board members? Initial working group are as follows:
Policy – Brian, Tom, Tripp, Pat
Professional development – Hans
District engagement and Equity (reach out to City Year)– Eric, Candace, Steve, Rick
Public Awareness – Shereen, Aimee, Carol

ACTION ITEMS

Send updated school list (MassCAN metrics) to Shereen – expanded school list

[September 23, 2015](#)

MassCAN September 23, 2015 Meeting at MITRE Corporation in Bedford MA

Meeting Minutes

Attendees: Steve Vinter, Carole Mahoney, Hans Batra, Danielle Curcio, Tom Hopcroft, Eric Conti, Bryan Jamele

Absent: Rick Adrion, Kalise Wornum

Guests: Patrick Larkin, Shereen Tyrell, Mary Rose Greenough, Tripp Jones, Jim Stanton and Candace Brooks

Jim Stanton open the meeting and asked members and guest to introduce themselves. Jim and Steve Vinter then led a discussion of the Future Strategy and Plan section of the Strategic Plan which is presented below. The full MassCAN 2015-2018 Strategic Plan had been provided to all board members in advance of the meeting.

Future Strategy and Plan

The high level objectives of the MassCAN 2015-2018 Strategic Plan, which will have a prioritized and staggered implementation over three years, are broken down into the following elements:

POLICY

- **Policy:** Work with partners and the public institutions in Massachusetts to establish the standards, policies and resource investments necessary to enable Massachusetts to offer K-12 computing education that is aligned with and of commensurate excellence as the full range of Commonwealth's educational offerings.

PROGRAMMING

- **Teacher Leadership and Professional Development:**
 - Establish an interconnected, collaborative cohort of teachers across the state that are trained to provide both broad and deep computing education throughout K-12 that is aligned with the state's new DLCS standards;
 - Offer, in collaboration with MassCAN partners, a range of state-of-the-art professional development opportunities and resources that scale in response to the ongoing demand from School Districts and, prepare an expanding group of teacher leaders each year to participate in train-the trainer program to become facilitators of computer science PD programs and fund teachers to attend and present at state and national conferences.

Discussion: In response to a question the executive director clarified that the lack of trained PD facilitators nationally threatened to become a huge bottleneck minimizing PD opportunities for teachers. MassCAN intends to provide opportunities for Train-the-Trainer programs for facilitators for each of its PD offerings K-12.

- **District Engagement:** Plan and implement a pilot program to work for several years with 3-6 school districts to ensure educational opportunities within districts are broad (span the full K-12 spectrum), deep (touch a large percentage of students), and long-lasting (don't disappear in response to organizational upheaves, teacher departures, etc.).

Discussion: In response to a question, the executive director answered that the 3-6 school districts would be in the Boston, MetroWest and western MA university hub regions. Jim and the Hub leaders would meet to define a set of criteria that interested districts would have to meet. The budget provide for \$35,000 for each Hub to lead a planning effort with one or two school districts in their region. Some advisors would be interested in knowing the schools that are chosen in the three regions so that they can encourage employee volunteerism in those districts

- **Equity--Engaging Females and Underrepresented Minorities:** Develop, fund and implement a programmatic strategy to dramatically increase the number of female and underrepresented minority students who are interested in and have the opportunity to participate in computing education programs.

Discussion: The chair reported that the current computer workforce is 80% white and 80% male and this is not a sustainable workforce growth model.

- **Assessment:** Collaborate with other partners at the state and national level, in coordinating semi-annual meetings of CS curriculum developers, their assessment teams and independent experts to expedite the development of effective assessment instruments for a range computer science courses and to establish interrelationships among CS assessment instruments developed for different courses.

Discussion: the executive director reported that while there is no national assessment currently for the Exploring Computer Science course, MA teachers will be among a small group nationally that are piloting the assessment this school year. Also, MassCAN is hoping to convene with several partners a semi-annual conferences to bring folks in to talk about how they are assessing student work in CS.

- **Business Engagement and Workforce Development:** Collaborate with industry leaders and the Department of Higher Education to propose a plan for a Work Group to recommend specific policy and higher education programmatic changes that will result in a range of near-term solutions to computer science and information technology workforce shortages. Create value proposition based on MassCAN engagement in K-16+ CS education and workforce solutions to more effectively engage industry leaders, in collaboration with our business partners, in supporting work of MassCAN and its programs

Discussion: Steve explained the rationale for responding to business leader concerns that we expand our focus to develop an larger and more diverse pipeline of students and a more effective transition from high school to two and four year college programs.

Tripp Jones, was introduced as MassCAN's Strategic Consultant who would help MassCAN address this priority

OPERATIONS AND COMMUNICATIONS

- **Coalition:** Enhance the engagement and effectiveness of the MassCAN Board and Leads and connect, inform, mobilize, and advise a wide range of additional partners who wish to advance the MassCAN mission and goals, to increase the overall impact of CS education experiences through better coordination of disparate efforts underway across the Commonwealth.

Discussion: The chair asked each advisor to take the opportunity to choose an area of interest/expertise where they can lead or participate in one of the work groups addressing the topics above.

- **Operations:**
 - Efficiently execute on the mission and goals of MassCAN with high integrity, transparency, and accountability
 - Recruit a diverse staff capable of providing outstanding leadership
 - provide frequent internal and external communications
 - Report on actions taken to achieve outcomes
 - Maintain relationships with state and national leaders
 -
- **Fundraising:**
 - double the impact of the annual \$1.5M of MA public funds that have been legislatively allocated to MassCAN by raising the required matching non-state funds sourced from foundations, federal grants, industry and elsewhere from the private sector.
 - Exceed the MA public funds that are raised to demonstrate to Commonwealth public leadership the strong support in MA for computing education and the importance of continuing its public funding in successive years, and to further expand the programs that we provide.
 - Bridge Span – looking to work with firms that have operated on the global area to work with us on fundraising.
 - Legislature requires MassCAN to raise matching fund but the outside bill says “non-state” funding, internal language says “public”.
 - Q: when companies are giving money are they writing checks to EDC? Yes
 - MS funding to the Ed whether that can be counted towards the MassCAN
 - Two types of match dollars 1) dollars that have already been applied and 2) match dollars that have not been applied. Monies that have already been applied doesn't have much

value to MassCAN because it's already been spent; _____; going forward what classification should be considered for future funding

- Tripp is pushing for the fundraising should be considered from the perspective of a multi-year effort. As soon as possible paint a picture for a 3 to whatever year effort. How does it relate to private monies; think more long term
- The partners will want to see that the monies are raised with a long-term goal and that the metrics and assessment is also in place

- **Public Awareness:**

- MassCAN will Implement a broad, internal and external communications strategy that involves a powerhouse website and a robust, regular, widely circulated eNewsletter
- MassTLC Education Foundation will play the lead role inspiring, educating, and motivating individuals and communities to get engaged in driving the adoption of computing education in Massachusetts schools.
- MassTLC Education Foundation will play the lead role supporting the annual roll-out of both the Hour of Code, the Technovation Challenge and other similar programs
 - Two MA teams are going forward in the international challenge – Winchester and Philip-Andover came in 3rd and 4th overall
 -
- The MassTech guy feels that the plan is well conceived and well constructed; the objectives are well codified. The strategy doc now should be a living document
- The plan needs an Executive summary and there will be those that will not read; address the mission and goal, metrics and outcomes along with the 1-pager; we want to move the ball from here to there. Mary Rose could/should work with the EDC team to come up with the summary.
- Tom – time permitting; look at the Advisors and Leads to get them in the same room to align capabilities to try to work out many of the current holes. MassTECH is impressed with the amount of work that has pulled this plan together.
- The document needs to be ambitious but not too outrageous and promise too much. Year 1 doing 3 districts is good.
- MassTECH in the bill itself was written to make the MassTECH org responsible for the plan rather than MassCAN and/or EDC. It may have been written so that the neck of MassTECH was on the line.
- EDC will clean this up starting tomorrow.
- VOTE: Brian moves to vote on the plan and congratulates Jim on his efforts, seconded for discussion by _____
- The 3-6 districts, how will the districts be determined. What are the criteria for selecting them? Not all districts will be able to be successful. Burlington, Boston, Somerville
- What would an ideal set of criteria be for; choose districts that can be successful and know the metrics that will help them be successful (?)
- District engagement hubs to work with working group – 1 year; how are volunteers going to be matched with districts;
- Each district will locate/identify their initial conception of their team; once the plans are produced funding will be found to carry out the plans
- Any further discussion? None.
- All in favor = unanimous
- All opposed = none
- **Budget document**
 - 8 month salaries – for all the positions
 - Q: is it typical to have rent separate from recovery? Yes, typical for EDC
 - This budget has not gone through the MassTECH system for review. This has gone to Pat so that his people can take a look at it.
 - Tom-this feels like a heavy budget in employing ppl; this was submitted to the legislature so that we could say that the infrastructure
 - He's wondering if the overhead is lower then more money can be pushed through to the program. Is EDC the best entity for the money to flow through to reduce overhead? The Globe did a report on universities that are in competition with EDC and their rates were around 45% overhead rates.
 - Are there ways that we can get creative with how the allocation

- Tom is trying to figure out if this is the best package; a lot of the people will be working at EDC which could argue for a lower overhead rate. How do the decisions get made around this - Jim the fact that EDC won the single largest grant and provide an array of support and can stack up against any competitor.
- If we were to go to other organizations to benchmark, what 2 – 3 competitors would we suggest? MassTECH? Who else?
- MassTECH guy thinks that the 25% recovery rate is not out of line and this doesn't need to be figured out immediately, good allocation of monies
- Budgets communicate your values; the Advisory board would hire a treasurer to make sure that the money is going where it's supposed to go.
- MassCAN send _____ monthly reports and MassTECH bears the burden for making sure that EDC is doing what they're supposed to be doing, monies are being allocated properly
- The board needs and wants justification for the budget.
- Are we planning to spend money on the right things?
- Tom is concerned with the amount of the costs; advisors don't have a voice in how the budget is constructed.
- Tom would like to talk off-line: what is the strategy?
- The budget is the what, but Tom is concerned with the how
- The budget was created according to the legislature and the document specifies that the project will have a website, etc. The budget amount comes out of best estimates for what is needed and the task will go out to bid.
- We have MassCAN, EDC, Ed Foundation, the MCCP will gravitate to the EDC website. Are they merging websites?
- The benchmarking can be done by MasSTECH group; they're trying to understand what should fall into the fringe category
- MasSTECH will benchmark. Tom sees the budget as the direct employees, the outsourced folks and then overhead.
- The advisors would like to see both the match budget and the expenditure budget side-by-side.
- Their looking for high level buckets.
- How much more money is needed above and beyond what has already been raised? (not sure that this is what she said....)
- EDC grants don't match to the budget because they involved different people.
- Add new budget lines
- Infrastructure budget and supplemental budget
- Most of the money that has been raised has already been spent. What does it cost to _____?
- \$700,000 to \$750,000
- are the numbers right, benchmarking, what's the explanation in a matter in which the details can be understood and is it reasonable?
- supporting documentation for the budget - Jim will provide job descriptions, responsibilities
- the packaging of the plan is just as important as the plan itself. What's the value proposition against the cost.
- Tom-Who in the coalition has a say in the governance?
- Tom-Does this group have oversight over all the other monies given through the fundraising?
- MasSTECH will act as the treasurer and must verify that the funds that are brought in and what expenditure against that and will be reported in
- Governance and decision making
- Oversight
 - The advisors job is overseeing governance
 - MTC role is to serve as the responsible entity to sign-off
- Any major deviation from the plan comes to the advisory board for approval
- MTC will not make decisions on who to hire for web development
- If there are entities with high profiles that are not currently involved, how do they get more involved?
- The important function of the board is the discussion that leads up to a vote not the vote. If more of the big players want to play, they are more than welcome to be involved.

- The Leads group was organized ages ago. They have focused on WHAT the problem is to solve. Now their job is what does the coalition really mean. There may be cross-pollination between the two groups – advisory and leads.
- Right investments and benchmarking
- Are these the right types of investments in these areas – the exposure is when there is an inconsistency
- Tom-wants to be sure that EDC is the right organization so that there is a justification that can stand up to public scrutiny.
- Brian – action item to review
- Documentation – the supplemental materials or services budget = Jim’s action item
- Technically there aren’t two separate budgets but rather two colors of money represented
- Cost-sharing about
- Total transparency of the plan with proper justification
- Planning, transparency, auditing
- ACTION ITEMS
 - Jim will work on supplemental budget
 - Brian will work on the review

MTC

The goal is to spend the money by the end of the fiscal year, which is June 30, 2016

The vote on the strategic plan is all what MTC needs. This is a base line budget with open actions

Eric moves
Seconds by

Black suit (Danielle) wants to see a high level schedule attached to the budget

Ayes = unanimous
Nays = none

Microsoft would be ex-officio position on the board; they could not be a voting member because it’s not in the legislature

If they want to be here they should be here as a full fledged member

Steve – ex-

Brian moves –
Floral

Ayes – unanimous

Microsoft as the first ex-officio
Aye – unanimous
Nays – none

Meeting dates to be determined via Doodle poll or every 4 wks at MITRE; blk suite (Danielle) will bring food for the next meeting.

Motion to adjourn
Moved by Tom.