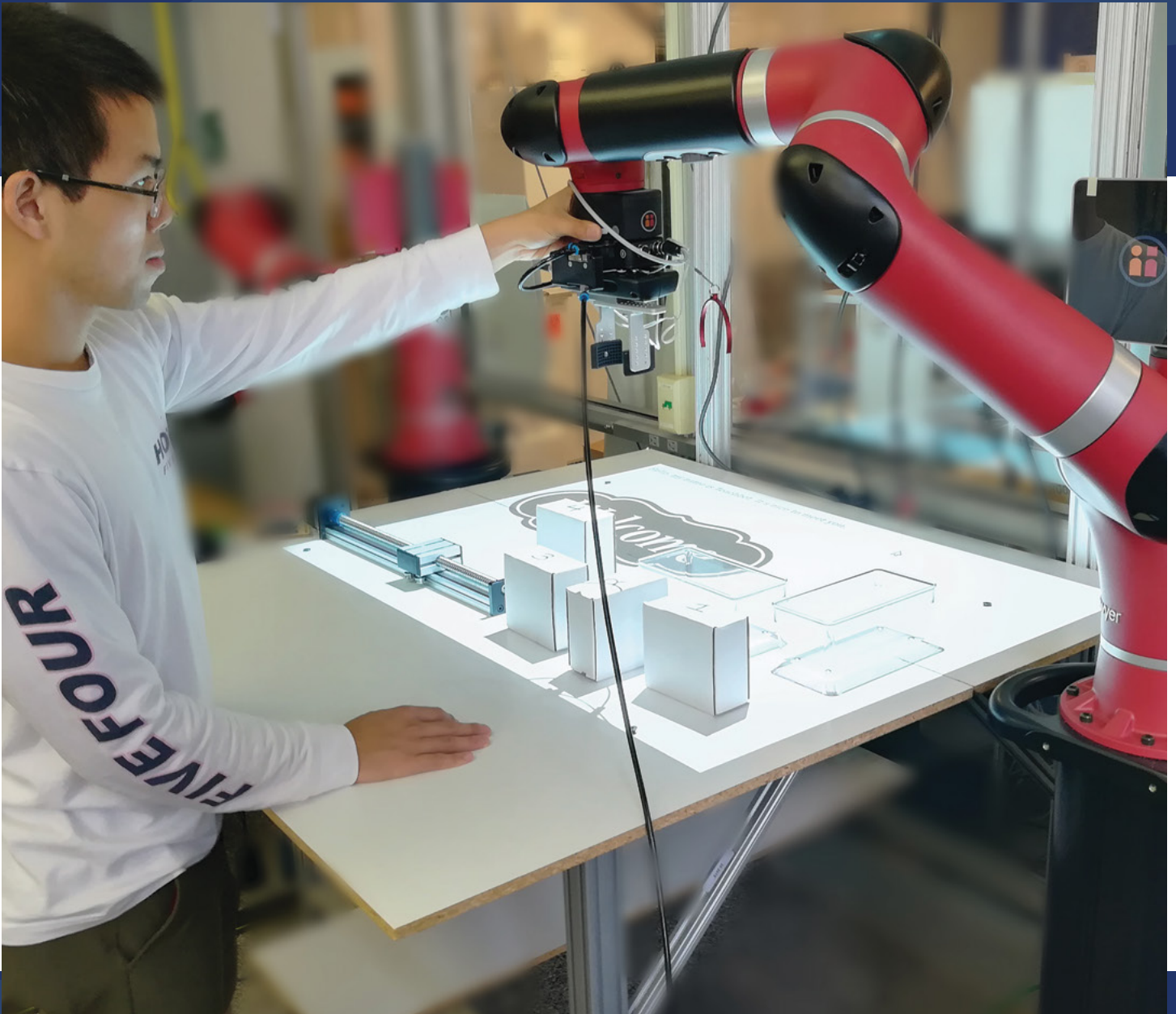# Massachusetts Technology Collaborative

Fiscal Year 2018 Impact Report

Supporting innovative emerging technology in Massachusetts

MASSACHUSETTS TECHNOLOGY COLLABORATIVE

MASSTECH & DIVISIONS

THE INNOVATION INSTITUTE
at the MassTech Collaborative

- Mass. Manufacturing Innovation Initiative (M2I2)
- TechHUB Collaborative
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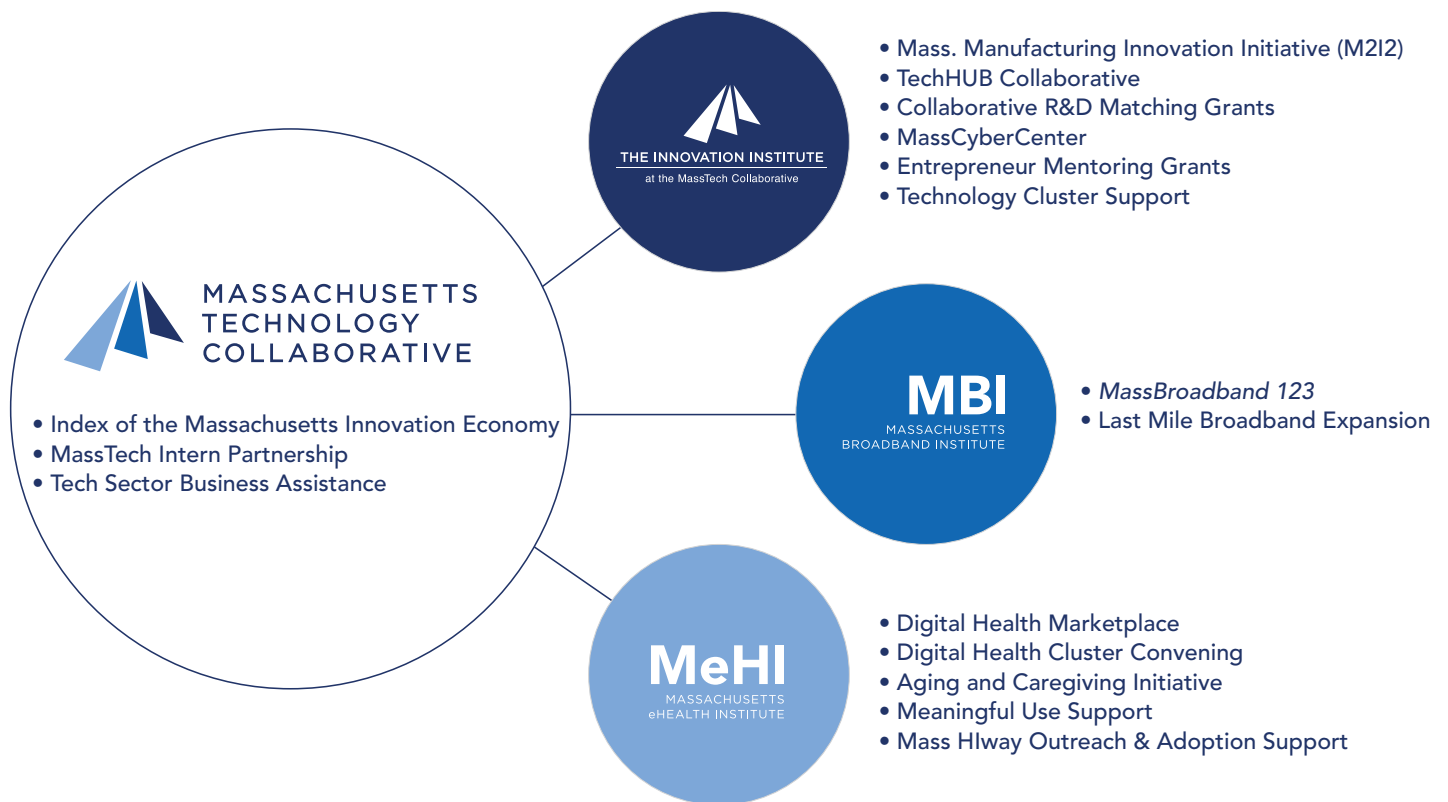- Entrepreneur Mentoring Grants
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MASSTECH: WHO WE ARE

Our mission is to support growth of the Massachusetts innovation economy, by strengthening the performance of individual firms and industry clusters in the Commonwealth.

The Massachusetts Technology Collaborative, or **MassTech,** is a unique state agency working to strengthen the Commonwealth's position as the leading hub for innovation and entrepreneurship. MassTech serves as a catalyst, convener, project manager, researcher, and partner within the technology community on behalf of state government, driving job growth and statewide economic impact.

We focus on:

- Cluster Development & Ecosystem Support;
- Talent Support & Workforce Development; and
- Business Assistance for Technology Firms.

MassTech is composed of three major divisions, each with a unique mission that drives innovation and supports a vibrant economy across the Commonwealth: the **Innovation Institute**, the **Massachusetts eHealth Institute (MeHI)**, and the **Massachusetts Broadband Institute (MBI)**.

We develop meaningful collaborations across industry, academia, and government which serve as powerful catalysts, helping turn good ideas into economic opportunity.

We accomplish this in three key ways, by:

- FOSTERING the growth of dynamic, innovative businesses and industry clusters in the Commonwealth, by accelerating the creation and expansion of firms in technology-growth sectors;
- ACCELERATING the use and adoption of technology, by ensuring connectivity statewide and by promoting competitiveness; and
- HARNESSING the value of effective insight by supporting and funding impactful research initiatives.

The Innovation Institute is the entity that advances a core mission of MassTech: improving the conditions for innovation and cluster growth across the Commonwealth.

Created in 2003, the Innovation Institute intervenes in the economy in the following four ways:

- Conducts research and analysis that improves the state's understandings of unmet needs and opportunities in the state's innovation economy;
- Serves as convener and key strategic broker on the landscape;
- Manages high value projects on behalf of the Commonwealth; and
- Makes strategic investments in support of innovation-based economic development.

In addition, the Innovation Institute provides support for priority industry clusters such as Big Data, Advanced Manufacturing, the Internet of Things (IoT), Cybersecurity, and Robotics; supports cluster growth through university investments; and manages specialty funds such as the Entrepreneur Mentorship Initiative, and the Global Entrepreneur in Residence (GEIR) Program.

The Massachusetts Broadband Institute at MassTech is working to extend high-speed internet access to homes, businesses, schools, libraries, medical facilities, government offices, and other public places across the Commonwealth.

The MBI managed the construction and rollout of *MassBroadband 123,* a 1,200-mile fiber-optic network that has delivered high-speed internet access directly to over 1,100 key facilities in more than 120 communities in Western and Central Massachusetts.

The Massachusetts eHealth Institute at MassTech, is the state's entity for health care innovation, technology, and competitiveness and is responsible for advancing the dissemination of health information technology throughout Massachusetts. This includes the deployment of electronic health records systems in all health care provider settings and connecting them through the statewide health information exchange, the Mass HIway.

MeHI oversees programs and makes investments which help accomplish these goals, and is the designated lead state agency for coordination of economic development programming to advance the Massachusetts Digital Health Initiative.

Innovation Institute by the NUMBERS

Advancing Cybersecurity in Massachusetts

In September 2017, MassTech hosted the first-ever Massachusetts Cybersecurity Forum which focused on advancing cybersecurity leadership, business, talent, workforce, and technology in Massachusetts. The Forum was attended by more than **200 cybersecurity-focused leaders** from across the Commonwealth.

New Jobs and Business Expansion

The Massachusetts Manufacturing Innovation Initiative (M2I2) projects and applications will directly result in **100 - 200 new, high-skill advanced manufacturing jobs** and significant business expansion at every company for which grant applications were received or grants announced.

NextGen Awards Given

The TechHUB Caucus hosted State House Technology Day: Megatrends and the Future of Tech in MA. The event featured over **200 attendees, company exhibitions, and the first-ever NextGEN Awards that recognized 6 companies scaling in MA**, creating a new disruptive technology, demonstrating best practices in diversity hiring, or having an impact on a regional economy.

M2I2 Grants Supports New Technology in Advanced Manufacturing

M2I2 supported innovation in textile research by providing **$10 million to the Fabric Discovery Center at UMass Lowell**. In addition, M2I2 provided **$4 million to help launch the AIM Photonics Lab for Education & Application Prototypes** which supports product development in the emerging field of integrated photonics.

Business Assistance

MassTech has provided direct business assistance to **200+ companies** with intentions of starting, growing, hiring, or moving to the Commonwealth.

University Partnerships

MassTech supported the IoT (Internet of Things) Forum at UMass Lowell, organizing and developing this statewide IoT forum in partnership with UMass Lowell and **75 key industry and academic leaders** to help understand emerging growth opportunities related to flexible hybrid electronics.

INNOVATION INSTITUTE

THE MASSACHUSETTS MANUFACTURING INNOVATION INITIATIVE (M2I2)

During FY'18, M2I2 significantly expanded both the spectrum of entities receiving awards or submitting applications as well the geographic reach across the state. We announced, or received applications for, grants across 5 academic, 12 business and 1 national lab entities. Projects reviewed or closed in FY'18 impacted almost 20 different communities across the state; 7 North/Northwest; 4 Central; 2 West; 4 South/Southwest; and 2 in Greater Boston.

In FY'18 we also engaged 17 additional companies, universities and labs in 15 communities for our pipeline of future M2I2 candidates. 8 were from North/Northwest; 2 from Central; 3 from South/Southwest; and 3 from Greater Boston.

Overall, M2I2 projects announced in FY'18, plus applications received, will directly result in 100 - 200 new, high-skill advanced manufacturing jobs and significant business expansion at every company for which grant applications were received or grants announced. In addition, we announced multiple, major collaborative facilities that expanded if not created new manufacturing innovation ecosystems in functional fabrics, integrated photonics, and robotics. These collaborative Discovery Centers and LEAP facilities will create new jobs by enabling companies to develop and prototype new products using equipment they would unlikely have acquired on their own.

In FY'18, we completed and cut the ribbon on the most ambitious of these facilities, the UMass Lowell Fabric Discovery Center, home to the first and only site in the nation that integrates discoveries from three Manufacturing USA Innovation Institutes (AFFOA, NextFlex and ARM).

Workforce training continued to be an equally critical focus of the M2I2 program. We announced multiple impactful accomplishments, including Vocational High School training programs, and collaborations between universities and community colleges that will develop stackable curricula in advanced manufacturing technology. These projects also spanned locations in North, Central and Southeast Massachusetts.

We presented and publicized M2I2 in FY'18 at over 20 events across the Commonwealth and in Washington, DC, advancing the M2I2 candidate interest as well as the state's overall reputation as a leader in advanced manufacturing.

The most fundamentally disruptive innovations come from development work that is both collaborative and convergent. The impact of M2I2 does not simply derive from the specific equipment funded, but from the connectivity that generates and leverages between companies, universities, community colleges, vocational high schools, national labs and other academic/training institutions. These opportunities would not exist without M2I2. To date, M2I2 has fostered dozens of such partnerships, helping to insure our ongoing leadership in innovation and the economic prosperity that results from it.

UMass Lowell Fabric Discovery Center Opening

Cutting the ribbon to open the Fabric Discovery Center were from left, state Rep. Rady Mom, Lowell Mayor William Samaras, Massachusetts Gov. Charlie Baker, UMass Lowell Vice Chancellor for Research and Innovation Julie Chen, UMass Lowell Chancellor Jacquie Moloney, UMass President Marty Meehan and Lowell City Manager Eileen Donoghue.

TECHNOLOGY SECTOR BUSINESS ASSISTANCE

MassTech has provided direct business assistance to 200 plus companies with intentions of starting, growing, hiring or moving to the Commonwealth. The MassTech Business Assistance program has tracked and supported well over 100 plus companies that are technology focused in areas such as digital health, cybersecurity, advanced manufacturing and internet of things (IoT). Through entrepreneurship grantees MassTech has increased the number of startups and expansions by 118.

Online Business Assistance

MassTech has created a "front door" to business development resources available in the Commonwealth, offering a one-stop shop for all incentives, initiatives, programs, and resources to help tech companies thrive within the Commonwealth's innovation economy. Through direct services, we provide insight, channels of opportunity, and triage to tech businesses in Massachusetts that are looking to start a business, grow a business, or access talent in Massachusetts.

Online Business Assistance can be found at masstech.org/business-assistance.

INTERNET OF THINGS (IoT)

MassTech supported the IoT Forum at UMass Lowell, organizing and developing this statewide IoT forum in Partnership with UMass Lowell and 75 key industry and academic leaders to help understand emerging growth opportunities related to flexible hybrid electronics.

In addition MassTech published an IoT white paper highlighting opportunities for the development of an IoT cluster in Massachusetts and worked with TechHUB Collaborative stakeholders to evaluate ways to leverage growth within this sector.

MASSTECH INTERN PARTNERSHIP (MTIP)

Supported by the Baker-Polito Administration and the Massachusetts Legislature, the MassTech Intern Partnership program provides stipends to digital technology companies that are starting and scaling-up across Massachusetts to directly support internships for Massachusetts college and graduate students. This program enables companies to hire interns, helping drive innovation and keeping our tech sector dynamic, vibrant, and growing across the Commonwealth.

In FY'18, more than 100 internship stipends were awarded to companies employing students from Massachusetts and for students attending colleges in the Commonwealth. Interns were placed in the key target industries of cybersecurity, digital health, internet of things (IoT), and robotics.

Learn more about the MassTech Intern Partnership at masstech.org/intern.

TECHHUB COLLABORATIVE

The TechHUB Collaborative works across the Commonwealth to support and grow the state's technology sector. Its Executive Committee – a committed group of leaders in industry, academia, and state government – routinely collaborates with other entrepreneurs, CEOs, state officials, professors, teachers, and industry organizations to strengthen the entrepreneurship environment, talent pipeline, brand identity and other aspects of Massachusetts' tech innovation economy.

In FY'18, The TechHUB leadership group convened quarterly with a focus on improving the conditions for growth in the state's innovation economy. The reinvigorated TechHUB policy working group engaged legislators through four roundtable discussions and in January 2018 supported the TechHUB Caucus in the hosting of the State House Technology Day.

2018 State House Technology Day

January 29, 2018, the TechHUB Caucus hosted State House Technology Day: Megatrends and the Future of Tech In MA. The event featured over 200 attendees, company exhibitions, and the first-ever NextGEN Awards that recognized six companies scaling in MA, creating a new disruptive technology, demonstrating best practices in diversity hiring, or having an impact on a regional economy. Following up, the Caucus hosted six roundtable discussions and site visits with the NextGEN Award winners.

Learn more about the TechHUB Collaborative at innovation.masstech.org/techhub.

2018 State House Technology Day

Kevin Klett, Vice President, Product Management & Product Marketing at 128 Technology, receiving a NextGen Award at the State House Technology Day, on January 29, 2018.

THE COLLABORATIVE R&D MATCHING GRANT PROGRAM

Working in close collaboration with the Commonwealth's Executive Office of Housing and Economic Development, the Innovation Institute at MassTech administers the Collaborative Research and Development Matching Grant Program to support large-scale, long-term projects that have the potential to spur innovation, promote cluster development, and grow jobs by investing in critical research & development (R&D) infrastructure. These investments support R&D partnerships that bring together the Commonwealth's world-class research institutions and class-leading companies.

By allocating matching funds to support capital expenditures, the Innovation Institute works with an Investment Advisory Committee composed of executives from academia, industry, and the venture capital communities to identify opportunities to strengthen and expand the state's innovation economy, with a specific focus on technology clusters where Massachusetts can achieve global leadership.

Research Center Support

In FY'18, MassTech actively participated in the grant activities at the Research Centers in each of the 6 funded programs, which include Woods Hole Oceanographic Institution (WHOI), Worcester Polytechnic Institute (WPI), Boston University (BU), University of Massachusetts Amherst (UMass Amherst), University of Massachusetts Lowell (UMass Lowell), and Northeastern University.

Innovation Institute staff worked with the leadership of each of these centers to support contributions to the Massachusetts Innovation Economy and its several innovation ecosystems. Examples of these contributions include:

On July 20-21, 2017, MassTech participated in the **3rd Annual Entrepreneur's Showcase & Leadership Forum at the Woods Hole Oceanographic Institution's Center for Marine Robotics**. The 3rd Annual Forum focused on strategic development of the marine robotics market space and brought marine robotics entrepreneurs together with representatives from emerging markets, government, and sponsors.

On October 3, 2017, the Third Annual Massachusetts Open Cloud (MOC) Workshop welcomed users of the MOC, researchers and startups interested in cloud computing, and its industry partners. A theme of "Cloud Infrastructure Research" included Micro-Talks on core MOC development and services to support users. Breakthroughs in medical imaging and data sharing were showcased in connection with research partner Boston Children's Hospital.

On March 15, 2018, UMass Lowell and PERC hosted a statewide workshop on IoT - Enabling Technologies and Emerging Trends. This interdisciplinary forum of academic, government and industry leaders and researchers explored the technology needs that will be critical in the advancement and application of IoT via a focus on technologies such as sensors and flexible electronics, materials and manufacturing processes. Keynote speakers were from Amazon and IDC.

Learn more about the Collaborative R&D Matching Grant Program at innovation.masstech.org/r&dgrants.

Launch of State-Funded Marine Robotics 'Maker Lab'

Lt. Governor, Karyn Polito and Pat Larkin, Director of the Innovation Institute at MassTech, celebrating Blue Economy investments at the Woods Hole Oceanographic Institution on July 20, 2017.

THE INNOVATION INSTITUTE
at the MassTech Collaborative

2017 MASSACHUSETTS CYBERSECURITY FORUM

Massachusetts' world-class cybersecurity ecosystem gathered on September 13, 2017 at the first-ever Massachusetts Cybersecurity Forum focused on expanding cybersecurity leadership, business growth, talent and workforce, and advancing technology in the global cybersecurity arena. The Forum took place at several locations across Cambridge and was attended by more than 200 cybersecurity-focused leaders from the Commonwealth's roster of companies, top-tier academic research institutions, and local, state and federal officials.

At the Forum, Massachusetts Governor Charlie Baker announced the creation of the "**Cybersecurity Growth and Development Center at the Massachusetts Technology Collaborative (MassCyberCenter at MassTech)**" - a new public center that aims to connect the cybersecurity ecosystem and train new cybersecurity workers across the Commonwealth. To advise and steer the center, MassTech will convene a Cybersecurity Strategy Council made up of leaders from both the private and public sector.

MassCyberCenter
at MassTech

"Massachusetts is home to many of the world's leading innovative companies, accelerators and educational institutions, as well as an economically competitive climate prepared to host the world's emerging cybersecurity industry," said Governor Baker. *"Creating the Cybersecurity Growth and Development Center at the Massachusetts Technology Collaborative and the Cybersecurity Strategy Council will ensure the state serves as a committed partner with businesses, colleges and universities, and the public sector to continue developing a talented workforce and to expand our cybersecurity ecosystem."*

As part of the Baker-Polito Administration's economic development strategy to support emerging sectors, the Cybersecurity Growth and Development Center (MassCyberCenter at MassTech) will work with the private sector to provide business development support, help existing cybersecurity firms grow in Massachusetts, oversee programs to increase the cybersecurity talent pipeline in the state, and collaborate with businesses to help inform the Commonwealth's cybersecurity strategy.

"In order for the Commonwealth to prepare for and withstand cyber threats, we need a strong pipeline of workers that are trained in cutting edge tools and techniques being utilized today," said Lt. Governor Karyn Polito. *"The participation of our Workforce Skills Cabinet and private sector leaders, along with leaders from our universities, will ensure that we are preparing students ready to make an immediate impact the minute they head into the workforce."*

The Forum was a direct result of the Baker-Polito Administration's trade mission to Israel last year and will raise the Commonwealth's profile as a national cybersecurity leader with global impact. The goal of the Forum was to further solidify a coordinated strategy focused on talent, ecosystem growth, and global leadership and to cement the Commonwealth's commitment as a strategic partner with the cybersecurity community. Since last December's trade mission, five

Governor Charlie Baker addressing an audience of cybersecurity leaders at the first-ever Massachusetts Cybersecurity Forum on September 13, 2017.

companies have opened or relocated their American headquarters to Boston, representing hundreds of jobs and hundreds of millions of dollars of investment in Massachusetts.

Among many other Boston-based businesses represented at the Forum was online retailer Wayfair. Steve Conine, the co-founder and co-chairman of Wayfair, outlined the importance of a strong regional cybersecurity ecosystem for a major publically traded company.

"At Wayfair, we are thrilled to see Governor Baker working to continue to make Massachusetts a place that grows and cultivates top talent for critical pieces of our future economy," said Steve Conine, co-founder & co-chairman of Wayfair. *"Cybersecurity is critical as we work on building a trusted, durable and nationally known retail brand. Initiatives like this help ensure Massachusetts is a top destination for talent. Cybersecurity professionals will be an important part of the technology workforce at Wayfair, and a critical piece to the broader technology ecosystem."*

Building on the success of the 2017 Massachusetts Cybersecurity Forum, the Massachusetts Technology Collaborative will be hosting a second forum in the fall of 2018. Here leaders will convene to discuss cybersecurity challenges facing the Commonwealth and how Massachusetts through leadership, talent, and emerging technology is prepared to face those challenges.

Massachusetts Broadband Institute by the NUMBERS

Facilitated Last Mile Direct Grants

$16.61 million: Direct grants facilitated by the MBI's technical staff and awarded by the Executive Office of Housing & Economic Development committed to unserved municipalities for the construction of municipally owned broadband networks, representing 46.3% of the unserved premises in the MBI programmatic geography.

Promoted Broadband Access

37 of 45: Unserved municipalities, at the close of FY'18, that the MBI had established or fostered a path forward for broadband connectivity within its programmatic geography.

Added Premises Covered in
Partially-Served Towns

1,303: Estimated premises to be covered under the MBI's Broadband Extension Program, an increase of 214 over the initial agreement. In August 2016, the MBI announced a grant to Comcast under the Broadband Extension program that would extend broadband connections to 1,089 premises in nine 'partially-served' communities in Western Mass. The MBI completed a reconciliation process with Comcast that revealed the project's footprint would extend residential broadband connections to 1,303 premises (rather than the lower amount that was contractually agreed to), representing an increase of 214 additional premises receiving coverage at no additional cost to Massachusetts taxpayers.

Public-Private Solutions Supported

$5.225 million: Total of the MBI executed grants to Charter and Comcast to provide service to six municipalities, representing 17% of the unserved premises in the MBI programmatic geography.

MASSACHUSETTS BROADBAND INSTITUTE

ABOUT

The mission of the MBI is to extend high-speed internet access to homes, businesses, schools, libraries, medical facilities, government offices, and other public places across Massachusetts, with a focus on the hard-to-serve areas of Western and Central Massachusetts. The MBI has two separate, but related, challenges to connectivity that it seeks to solve:

- Expanding broadband service in communities where an incumbent cable provider offers broadband service but with limited coverage; and
- Bringing broadband service to entirely unserved communities who lack any high-speed internet access.

Those underserved municipalities and unserved communities total 53 municipalities in the MBI's programmatic geography, with the town of Leverett having been completed in 2015.

In FY'18, the Commonwealth celebrated the completion of the second Last Mile project, with the launch of the new fiber-to-the-home network in Mount Washington, Mass., a project supported through both an MBI grant of $222,000 announced in June 2016 and a separate $230,000 grant from the Executive Office of Housing and Economic Development's (EOHED) infrastructure grant program, bring total support from the Commonwealth to over half a million dollars. The project officially launched in late 2017, connecting over 100 premises in the town to one of the fastest broadband networks in the Commonwealth, capable of delivering symmetrical gigabit speeds to customers. A full profile of the town is included on page 14.

With the launch, Mount Washington joined Leverett as the two previously unserved Last Mile communities that have closed the connectivity gap in their town, building upon years of planning by town leaders, as well as hundreds of hours of volunteer work by municipal committee members and citizens. Residents in both towns now have access to some of the highest-speed residential internet service in the entire Commonwealth.

During FY'18, MBI continued to work with its Board of Directors and the Baker-Polito Administration to continue shepherding projects for the remaining Last Mile municipalities. The MBI and the Commonwealth continued the plan launched in FY'17, to work with towns to move toward either:

- Broadband networks built, operated, and owned by the municipality (similar to Leverett and Mount Washington), which would require town investment of roughly 60% of the project's cost; or
- Identify and achieve town acceptance of a public-private partnership between the municipality and a private-sector broadband provider to construct a network which would be supported by a state grant, but eventually owned by the provider, greatly reducing the financial burden on the town.

Overviews of the two pathways and the progress made in FY'18 is summarized below:

Municipally-Owned Networks

During FY'18, the MBI continued to provide technical and grant support to the Last Mile Infrastructure Grant Program managed by the Executive Office of Housing and Economic Development, building on the success from the previous fiscal year, when 18 towns were awarded grants for municipally-run projects. During FY'18, an additional four towns – Alford, Blandford, Goshen, and Royalston – all completed the Readiness Process and were awarded Infrastructure Grants totaling $3,415,000.

Royalston was the recipient of a previous $45,000 MBI planning grant which it used to test a hybrid fiber/wireless system in South Royalston. The new EOHED award will build on that pilot project and allow the town to construct a municipally-owned hybrid network capable of bringing broadband connectivity to over 600 homes and businesses.

The MBI also awarded a $5,000 Last Mile planning grant to the Town of Montgomery for broadband planning efforts.

In May 2018, Lt. Governor Karyn Polito visited the Town of Otis to officially unveil the hut that will act as the network hub for the town's municipal broadband network. While premises in Otis are being 'lit up' in a rolling pattern and still need to be connected, the hut is a key technical piece for the fiber-optic network, acting as the technical brain of the new system. Otis received a $1.7 million dollar grant from EOHED's Last Mile Implementation Grant program and the backhaul connection to the state-owned *MassBroadband 123* 'middle mile', which provides high-speed connectivity to the main internet hubs in the other parts of the state. The network is expected to be fully complete in early 2019.

The Commonwealth's push to expand broadband connectivity received national and international attention in two data sets released during FY'18:

- In October 2017, analysts at the U.K. firm Cable,co,uk captured broadband speed test data from across the U.S., research which showed Massachusetts with the third highest average download speed of any state. The study also included municipal level information, showing Leverett had the 31st fastest download speed of all the American cities and towns included, and the 3rd highest speed of any municipality in Massachusetts.
- The analyst firm S&P Global Market Intelligence released a new report in February 2018 titled "Analyzing the State Of Municipal FTTH Broadband Deployments," written by authors Asaf Kamran and Neil Barbour. In their research, Kamran & Barbour stated that 28 municipalities in the U.S. had "either launched or secured necessary funding" for municipal broadband operations from the beginning of 2017 through January 2018. Of those projects, 16 were located in Massachusetts, highlighting the strong pace of broadband expansion over the end of FY'17 and beginning of FY'18.

Public-Private Partnerships

During FY'18, the MBI kept up the work on the Private Provider request for proposals (RFP) launched in FY'17, using the public procurement process to offer municipalities private sector options to close the connectivity gap.

In July 2017, the MBI announced a grant of $4,420,000 to Charter Communications to support the construction of state-of-the-art broadband networks in the towns of Egremont, Hancock, Peru, Princeton, and Tyringham. The five proposed networks aim to deliver broadband connections to more than 3,600 homes and, per the terms of the RFP, are contingent on Charter signing a cable franchise agreement with each town before the grant is awarded, a contingency critical to cementing a strong partnership between the town and the provider. As with similar awards made in FY'17, the Commonwealth's Last Mile grant agreement with Charter means each town will not have to contribute local dollars in support of network construction.

Significant progress was also made by Charter's upgrade and expansion of broadband service in the towns of Hinsdale, Lanesborough, and West Stockbridge. Following the grant award announcement in August 2016, Governor Baker visited West Stockbridge in May 2017, a tour which highlighted some of the businesses benefiting from the enhanced broadband connectivity.

MBI staff reported up to the MBI Board of Directors in July 2017 that Comcast's project to expand broadband in nine 'partially-served' towns was progressing ahead of schedule, even after the project faced delays in 'make ready' preparations. That award was funded by the Broadband Extension Program grant announced in August 2016. Comcast was also proceeding on the effort to build out a network in the Town of Montgomery, after the company received a grant of $805,800 at the end of FY'17.

During the first quarter of FY'18, the private provider Frontier continued discussions with three unserved towns (New Marlborough, Sandisfield, and Tolland), as a follow up to a town-run RFP (request for proposals). Frontier had initially increased its request for public funds, following the departure of the Town of Monterey from the project, leading to the MBI to make an initial vote of support for a $4.77 million grant to support the now three-town deal. However the Frontier proposal ultimately fell through after New Marlborough left the consortium in February 2018, causing the company to step away from the project and for the three towns to re-enter the search process.

By the end of FY'18, 18 of the 53 remaining Last Mile towns were working with private providers to complete broadband networks.

Mount Washington

A church located in Mt. Washington, Mass., one of the towns that now have access to some of the highest-speed residential internet services in the Commonwealth.

ALTERNATIVE FUNDING APPROACHES CONSIDERED

To build on the success of the Private Provider grant program, during FY'18 the MBI launched a new procurement aimed at spurring private sector proposals for the remaining Last Mile towns. In October 2017, MBI launched the Flexible Grant Program (FGP) to identify potential broadband solutions for unserved municipalities in the MBI's Last Mile footprint. The goal of the FGP is to provide grant funding to capable communications network companies willing to design, build, own, operate and maintain a broadband network which meets or exceeds the current FCC broadband benchmark of 25 Megabits per second (Mbps) download or 3 Mbps upload.

The FGP aimed to identify "creative, flexible solutions to meet this critical challenge" and is intended to serve as an open, rolling solicitation for innovative approaches that will permit MBI and the remaining unserved towns to establish partnerships with providers able to deliver reliable broadband access on a long-term basis to as many residents as possible based on available public funds. MBI staff estimates were that the FGP would help close gaps to the 13% of the premises remaining in the Last Mile program.

In January 2018, the MBI announced that it had received five proposals to address broadband access in 14 unserved municipalities in the Last Mile footprint. While no awards had been announced under the FGP at the end of FY'18, the MBI was working closely with numerous municipalities on proposals sourced under this procurement.

In June, the MBI Board received an update that the towns of Florida, Hawley, Monroe, and Savory were considering proposals from two wireless providers, WiValley and Redzone Wireless, proposals which came in under the FGP. Later that month, the four towns notified the Commonwealth of their intent to move forward with WiValley, leading to the MBI to work with the state to start an action plan to shepherd the project.

The Board also provided approval to the first grant under the FGP, an award of $2,213,809 to Comcast to cover the Town of Worthington, contingent on the execution of a cable franchise agreement between the Town and the company, as well as an agreement between the MBI and Comcast. Comcast also expressed an interest under the FGP to offer service to Blandford, Chesterfield, Charlemont, Cummington, and Middlefield.

The MBI Board also approved a Payment in Arrears model. Under this model providers would not receive state funds until a project is active, plus the Town and provider must certify that at least 51% of all potential customers to be passed by the network have pre-subscribed to take broadband service and have paid a pre-subscription deposit.

Crocker Communications also notified the MBI that they had received notification from the Federal Communications Commission (FCC) that Crocker was qualified to enter the upcoming FCC funding auction and would also be submitting an application to the U.S. Department of Agriculture (USDA) to serve the communities of Tolland and Sandisfield. Contingent on receiving the federal awards, Crocker would move forward toward an FGP grant.

ADDITIONAL BOND FUNDS SECURED

In November 2017, the Baker-Polito Administration announced a third bond authorization of $45 million to address broadband expansion, including $13 million dedicated to the MBI and a separate $32 million in bond funds provided directly to the Executive Office of Housing and Economic Development, funding approved by Chapter 133 of the Acts of 2017. Included in this new round of bond funding was a contingency fund of $12 million set aside for potential make ready cost over-runs in municipal fiber-to-the-home broadband projects, not for those public-private partnership.

MIDDLE MILE

The *MassBroadband 123* network continued operations during FY'18, delivering high-speed internet connectivity to hundreds of community anchor institutions and private businesses throughout Western Massachusetts and the Berkshires.

While litigation continued around the bankruptcy of the network operator, MBI's actions maintained seamless operation of the network with no disruption of service.

In April 2018, the Berkshire Eagle highlighted the 47 Railroad project in downtown Great Barrington, which connected into the fiber-optic network to deliver high-speed internet to several new businesses and apartments in that development.

MBI | MASSACHUSETTS BROADBAND INSTITUTE | at the MassTech Collaborative

MOUNT WASHINGTON GOES GIGABIT

With Support of the Commonwealth and the MBI, the Previously Unserved Town Launches New Fiber-Optic Broadband Network

One of the highlights of FY'18 for the MBI was the launch of the second network under the Last Mile program, the new fiber-to-the-home network in Mount Washington, Mass. The community is the third smallest in the Commonwealth when ranked by population (158) and the smallest in Berkshire County, situated at the far southwest corner of the state, abutting Connecticut to the south and New York State to the west.

Launched in late 2017, the new network delivers gigabit connectivity to the small town, building off of the connection to the *MassBroadband 123* fiber-optic 'middle mile,' which connected public facilities in the town when it was completed in 2014. Managed by volunteers in the town, construction of the network was overseen by private companies and the network is now managed by Crocker Communications, the town's Internet Service Provider, and NextGen, which manages the technical aspects of the network and maintenance of the miles of fiber strung throughout the town.

Mount Washington is the second active network supported by the Commonwealth's Last Mile program, following the launch of Leverett's municipal fiber-to-the-home network in late 2015. Mount Washington received two rounds of Last Mile program support for construction of the network, including a grant of $230,000 from the MBI in June 2016 and a follow on award of $222,000 from the Executive Office of Housing and Economic Development's Last Mile Infrastructure grant program in May 2017.

In an article just prior to the launch, Mount Washington Selectboard member Gail Garrett lauded the network's impact on local real estate, noting to the Berkshire Eagle in September 2017 that homes in the town had received "great interest because of broadband." In a separate Eagle article in May 2018, Selectboard chairman Brian Tobin noted that while cellular service is spotty in the heavily forested town, he laid claim to Mount Washington having the "fastest internet in Massachusetts" and boasted that speeds in the tiny town easily beat out what's available at Tobin's other residence - an apartment in Manhattan!

Governor Baker also celebrated the network's launch during his State of the Commonwealth address in January 2018, where he singled out Mt. Washington high school student Sarah Beckwith. The Governor noted that Sarah used to have to sit in a car outside of the town library in order to access the public WiFi, one of the few spots in town with consistent internet prior to the new network's launch. A few weeks later, **Sarah got the opportunity to visit with the Governor at the State House, along with another broadband advocate, State Representative 'Smitty' Pignatelli, who captured a photo from the visit.**

Photo credit: Smitty Pignatelli, State Representative for the 4th Berkshire District. Chairman of the Joint Committee on Environment, Natural Resources & Agriculture. @repsmitty

Students like Sarah can now take online classes, watch educational YouTube videos (and the occasional streaming TV show), or submit college applications online from their homes, no longer having to connect via slow satellite connections or while sitting in a car outside the public library. It's clear that for one of the Commonwealth's smallest communities, the switch to gigabit-level broadband is already having a very real impact on the town.

Mount Washington

Scenes from Mt. Washington, Mass., where broadband is making a big impact.

Massachusetts eHealth Institute by the NUMBERS

CONNECTED
COMMUNITIES

Awards Paid to Community Grantees

Supported **8 Connected Communities Implementation Grants** in moving their interoperability projects to production, and **paid $2,828,962 to Connected Communities Implementation grantees** and their collaborators during the grant period.

LTPAC Organizations Helped

32 long-term post-acute care and behavioral health organizations completed all four milestones in the eQuality Incentive Program.

Supported Behavioral Health

$193,000 distributed to four EHR vendors during the grant to develop and implement interfaces to allow behavioral health organizations to automatically send required Child and Adolescent Needs and Strengths data to the state's reporting system.

Funded Digital Health Accelerators

Awarded $250,000 in grants to two digital health accelerators in Boston and Springfield to support the growth of digital health startups and promote collaboration across the Commonwealth.

Supported Digital Health Startups

Supported 32 digital health startups as a Champion through PULSE@MassChallenge (now MassChallenge HealthTech). Sponsored the Executive Office of Elder Affairs to work with the caregiver support startup Tailored Care through the program.

Promoted Community Events

Hosted, spoke at, or partnered on **26 events** including national and international digital health conferences, the MA Coalition for Serious Illness Care Summit, and the MA Health Data Consortium Annual Meeting.

MASSACHUSETTS eHEALTH INSTITUTE

DIGITAL HEALTH CLUSTER DEVELOPMENT

In FY'18, MeHI continued its efforts to grow and nurture the Commonwealth's digital health ecosystem as part of the Massachusetts Digital Health Initiative launched by Governor Baker in January 2016. Building on work begun in FY'17, **MeHI overhauled the MassDigitalHealth website and launched the digital health marketplace**, assessment tool, and resources to help connect Massachusetts-based startups and customers. The updated website also included creation of a **digital health jobs board**, as recommended by the Massachusetts Digital Health Council. For the second year, MeHI provided $250,000 in grant funding to the **state's two primary digital health accelerators: PULSE@MassChallenge in Boston and TechSpring at Baystate Health in Springfield**. MeHI also worked with the Executive Office of Elder Affairs to sponsor them as a **Champion for Tailored Care, a startup participating in the 2018 PULSE program**.

MeHI expanded its focus on supporting **innovation in aging and caregiving** this fiscal year in alignment with the Administration's priorities. This included contracting with the Colorado Health Institute to develop a report and tool to quantify the impact of employee caregiver costs on Massachusetts employers, a report planned to be released in FY19. MeHI is also helping lead the efforts to advance the electronic sharing of advance care planning documents and released an RFI designed to gather more information that would help direct the Commonwealth's work in this area. MeHI will continue and build on these programs in FY19 to **support the work of both the Governor's Digital Health Council and the Governor's Council to Address Aging in Massachusetts**. See graphic on page 18.

CONNECTED COMMUNITIES

The Connected Communities Implementation Grant wrapped up on June 30th, 2018. This grant provided $3 million in funds to eight healthcare organizations working with 78 partner organizations. Working together these organizations enhanced collaboration and communication among healthcare providers within a community through the use of innovative technologies, electronic health records, and health information exchanges.

These grant projects contributed to improved outcomes among healthcare communities including a reduction in the average length of patient stay at a skilled nursing facility, a reduction in hospital readmission rates, an increase in clinical information available to a specialist before providing care to a referred patient, and a dramatic increase in the amount of secure electronic patient information that was shared among community providers.

eHEALTH eQUALITY

Focused on the behavioral health (BH) and long-term and post-acute care (LTPAC) provider communities, this initiative supports providers who have not yet adopted interoperable electronic health record systems and connects them to the Mass HIway. The eQuality Incentive Program (eQIP) was designed to support BH & LTPAC provider organizations through a milestone-based maturity model to integrate them into the statewide health IT infrastructure to improve

care coordination, ease transitions of care, and advance healthcare in Massachusetts. The program also aligned with Massachusetts health reform efforts by positioning grantees to participate in ACOs and new models of care.

MeHI distributed nearly $2 million in eQIP grant funding to 38 grantees (24 BH and 14 LTPAC organizations) with over 200 facilities across the Commonwealth. At the close of the grant period on December 30, 2017:

- 84% (32 of 38) of the grantees had met all four of their milestones; and
- 92% (35 of 38) met at least three milestones.

Also part of the eHealth eQuality Initiative, the CBHI / CANS grant program supported development of interfaces between Massachusetts BH providers' EHRs and the Massachusetts Children's Behavioral Health Initiative (CBHI) virtual gateway to streamline submitting court-mandated Child and Adolescent Needs and Strengths (CANS) assessments using the Mass HIway. The interfaces allow providers to directly and automatically upload the required reports, eliminating redundant work and improving providers' ability to deliver necessary care to patients.

The grant program supported four BH EHR vendors in developing, testing, and implementing an HL7 interface that leverages the Mass HIway to automatically extract data from the EHR system and compile and submit it according to the CBHI interface specification. Each of the four grantees successfully implemented a CBHI interface for three unaffiliated behavioral health provider organizations. These twelve organizations submit, on average, 2,638 CANS assessments per month. The EHR vendor grantees will provide two-years of no-cost support from the vendor to each of their three behavioral health provider organizations.

At the close of the grant period (June 30, 2018), all of the grantees met all four of their milestones and MeHI distributed $193,000 in payments to the grantees.

MEDICAID EHR INCENTIVE PROGRAM

In FY'18, MeHI staff processed 3,083 Program Year 2016 (PY2016) applications for the Medicaid Meaningful Use EHR Incentive Program. The process improvements implemented in FY'17 paid off as the application validation team completed all the PY2016 validations in time for the providers to attest again for PY2017. Ninety-two percent (92%) of PY2016 applications were approved for payment, and in FY'18, MeHI paid out a total of $26,133,930 in Medicaid EHR Incentive payments. For PY2017, the Adopt Implement Upgrade (AIU) option of the EHR Incentive Program was discontinued so providers could only attest to Meaningful Use (MU). For many providers, MU is significantly harder than AIU, as the MU measures require providers to significantly improve their health information exchange and patient engagement efforts, which can be difficult. As a consequence, the participation rate for PY2017 dropped to 1,950 and it became clear that providers need more assistance to achieve Meaningful Use. To respond to these needs, MeHI updated its education program to include change management

and process improvement workshops and Learning Collaboratives (LC). MeHI also began providing new Technical Assistance options to train new designees to participate in the program. The goal of these initiatives is to stimulate retention and bring back providers who have dropped out of the incentive program. These new education options will be promoted via extensive outreach efforts.

HIWAY OUTREACH & ACCOUNT MANAGEMENT PROGRAM

At the end of the third quarter of FY'18, the Executive Office of Health and Human Services contracted with MeHI to provide account management, consulting, and outreach efforts to promote and support the effective use of interoperability, health information exchange (HIE), and the Mass HIway. Since then, the HIway Account Management team has been working with organizations to assist with their submissions of the HIway Attestation Forms, answer questions about the HIway connection requirements, and recommend use cases that would meet the connection requirements. The team is also communicating with HIway participants to assist their progress

in migrating to HIway 2.0. Account Managers have been meeting with Community Partner organizations to promote their exchange of healthcare information with ACOs as part of the HIway Adoption and Utilization Services (HAUS) initiative.

MeHI's outreach work included supporting webinars and announcements to introduce both HIway 2.0 and the HIway attestation process, and providing support for the Mass HIway newsletter. MeHI also ran a three session Learning Collaborative (LC) to assist care providers in improving workflows on the receiving side of HIE. As part of the LC, MeHI staff presented change management and process improvement courses and obtained valuable input from the participants, which will be used to turn the courses into HIE workshops planned for the fall of FY'19. In the LC, participants created three process maps to handle incoming HIE-based referrals, which we have added to our HIE toolkit libraries to help other organizations with their HIE efforts. At the beginning of FY'19, MeHI hired a new Outreach and Education Specialist to help grow our outreach efforts under the HIway contract in the coming year.
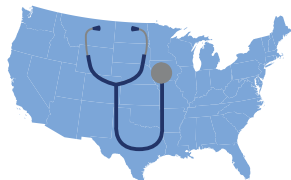
Aging and Caregiving in Massachusetts

MA specific Aging stats:

By 2030 **1** in **5**
residents will be **65 or older**

2 out of **3** ADULTS
have **4 or more chronic conditions**

MA specific Caregiving stats:

844,000 of MA total population of **6,690,00** people are **informal caregivers**

They provide **786 MILLION HOURS** *of informal care*

National Aging/Caregiving stats:

- **30-day readmission rate** was **13.9%** in 2014
- Incidence of **Dementia** in those age **65 or older is 11%**
- Estimated **5.2 million** people age **65 or older** are living with **Alzheimer's Disease**

Post Acute Care utilization:
- **12.2%** of patients discharged with **home health services**
- **21.8%** of patients discharged to **institutional Post Acute Care settings**
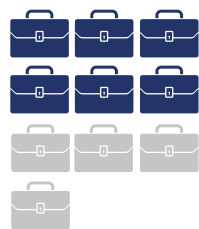
MA Aging/Caregiving stats:

- **30-day readmission rate** was **15.3%** in 2014
- Incidence of **Dementia** in those age **65 or older is 14%**
- Estimated **120,000** people age **65 or older** are living with **Alzheimer's Disease**
- Estimated **332,000** are informal caregivers to those with **Alzheimers Disease**

Post Acute Care utilization:
- **18.6%** of all patients discharged with **home health services**
- **21.8%** of patients discharged to **institutional Post Acute Care settings**

National Caregiving stats:

Long-distance caregivers account for approximately **15%** of all caregivers, or **5-7 MILLION CAREGIVERS**

6 in **10** Caregivers were **employed** at some point in the past year

More than **1** in **5** retirees **left the workforce earlier than planned** to care for an ill spouse or other family member

CONNECTED COMMUNITIES GRANT PROGRAM
Cape Cod Healthcare Use Case

The Connected Communities Implementation Grant program was designed to support organizations in demonstrating community collaboration using health IT to address real-world, practical and measurable healthcare needs among the patients they serve and to improve care coordination.

In 2016, MassTech awarded Cape Cod Healthcare (CCHC) a $434,000 grant through the Connected Communities program. CCHC had noted a concern in the methods the hospitals in the Cape region used to provide care for patients. The only way they could communicate discharge information to external providers was to send them the information manually, a slow and ineffective process which drove CCHC to look for electronic methods to both speed up and enhance the process.

CCHC engaged in a project to connect to the Mass HIway and develop new Health Information Exchange (HIE) workflows to manage and track the sending of clinical information to outside care providers electronically whenever a patient is discharged. The project required establishing electronic HIE connectivity, resolving bottlenecks and barriers surrounding direct messaging, and finalizing clinical documentation standards for all future information exchanges.

CCHC worked with multiple partner organizations separated into two groups:

- Organizations with active Mass HIway addresses or the technology in place to exchange information were included in the first wave; and

- Organizations that required more time to prepare for the implementation, which were handled in a second wave.

Implementation took place over the course of eighteen months. CCHC developed care coordination prototypes and reviewed and updated process improvement plans with an aim to improve performance and identify breakdowns in the process.

Because the information coming in was from different data sources, CCHC needed to develop a custom report system to measure how well the workflows were being integrated. The new reporting capability became a valuable addition to the system, as CCHC can now determine which referrals didn't have CCDAs (Consolidated Clinical Document Architecture documents) sent electronically when patients were discharged, and can now troubleshoot any transmission failures as necessary.

In the initial roll out phase, CCHC intended for 80% of CCDAs to be sent electronically, with a long-term goal to transmit 100% of CCDAs electronically. Over a three month roll-out period which ran from December 1, 2017, to February 28, 2018, actual measurements were tested to determine whether the targeted outcomes were met. The 80% goal was met by the majority of partnering organizations, with an overall average of 81% of discharges included CCDAs at the end of the three month roll-out period.

Overall, the new workflows have resulted in a major improvement from the previous methods of manual communication, accelerating messages between partnering providers.

Moving forward, CCHC intends to expand the process to other organizations throughout Cape Cod, and has already begun identifying future collaborators. The goal is to establish 'bi-directional' document exchange across the care system, an improvement which would allow CCHC to access real-time medical information for all patients immediately upon admission.

CONNECTED COMMUNITIES GRANTS & GRANTEES

$2,828,962 was paid to Connected Communities Implementation grantees and their collaborators during the grant period.

To learn about the impact these grants had on the grantees and their communities, view the project highlights at: **mehi.masstech.org/programs/past-programs/connected-communities**

MASSTECH FY'18
GOAL REVIEW & GRANTS

MASSACHUSETTS
TECHNOLOGY
COLLABORATIVE

Goal	Action	Measurement	Update
Innovation Institute **Improve understandings of the dynamics taking place within the Commonwealth's Innovation Economy.**	The Index of the Massachusetts Innovation Economy: Benchmark and compare Massachusetts innovation economy with the economies of other Leading Technology States (LTS) through the analysis of performance on 22 key innovation indicators.	Release the 21'st edition or 2017 edition of the Index of the Massachusetts Innovation Economy. Update website pages with graphics and interactive charts to engage Index readers online.	Innovation Index: The 2017 edition was released and the updated Index web pages were launched on May 31, 2018.
Increase opportunities for entrepreneurs & students and key skills of employees through the MassTech Internship Partnership Program and the Global Entrepreneur in Residence Program (GEIR).	Internship Support: Make Intern Stipend Awards to college students through the MassTech Intern Partnership. Target industries: • Cybersecurity • Digital Health • Internet of Things (IoT) • Robotics GEIR: Attract and retain more qualified entrepreneurs and their growing companies within Massachusetts, the Global Entrepreneur in Residence Program (GEIR).	Award 100 stipend awards for student interns from area colleges. Expand GEIR program and extend to 2 additional partners. Host quarterly GEIR Best Practices Community Meetings.	Internship Support: Awarded more than 100 stipends for students from Massachusetts and from the Commonwealth's colleges. Interns placed in target industries: • Cybersecurity - 5 • Digital Health - 22 • Internet of Things (IoT) - 25 • Robotics - 12 No updates to report on the GEIR program at this time.

Goal	Action	Measurement	Update
Innovation Institute **Facilitate the development of emerging technology clusters in MA in order to promote new business formation and job growth.**	Strategic Support: Organize and support industry-led Working Groups focused on economic growth strategies for industry clusters. Industry Partnership: Facilitate direct industry partnerships in a wide range of economic development projects focused on cluster growth. Cluster Support: Organize MA Robotics Industry Cluster in partnership with industry, academia and relevant technology trade councils.	Execute 5 high impact programs and services in the following clusters: Cybersecurity, Robotics, Analytics, Advanced Manufacturing, and Internet of Things ("IoT"). Facilitate cybersecurity workshops (series of 8 over 18 months). Develop "Doing Cyber Business" in Massachusetts point of entry welcome package. Define IoT based on key MA market segments (Enabling Technologies, Commercial Applications, and Consumer Applications). Reconvene Robotics Cluster segments to focus on high priority targets, such as autonomous vehicles and marine robotics. Engage through 100+ visits with firms in key clusters like Cybersecurity, IoT, and Robotics to support individual firm needs. Support strategic growth dialogues through 30 steering committee engagements, working group sessions, or roundtables with key industry representatives.	Major Cybersecurity Initiative: MassTech hosted three sessions for our Cyber Ecosystem Leadership Group, formalizing and organizing this group which is comprised of 60 academic, industry and non-profit members who established a strategic framework for the Commonwealth. Internet of Things (IoT): MassTech supported the IoT Forum at UMass Lowell, organizing and developing this statewide IoT forum to help understand emerging growth opportunities related to flexible hybrid electronics. In addition MassTech published an IoT white paper highlighting opportunities for the development of an IoT cluster in Massachusetts. Robotics: MassTech engaged with and supported the Governor's taskforce on Automated Vehicles resulting in better understandings of the embedded technologies and supporting sound policies to enable growth within this emerging cluster. Artificial Intelligence: in conjunction with the TechHUB Collaborative MassTech organized a program to assess the implications of Artificial Intelligence on the tech economy and to evaluate strategies to enhance growth and increase workforce opportunities. Advanced Manufacturing: MassTech, through the MA Manufacturing Innovation Initiative (M2I2) supported innovation in textile research by providing $10 million to the Fabric Discovery Center at UMass Lowell. In addition, M2I2 provided $4 million to help launch the AIM Photonics Lab for Education & Application Prototypes.

Goal	Action	Measurement	Update
Innovation Institute **Support large-scale, long term Collaborative Research Projects to strengthen competitiveness of industry in Massachusetts.**	R&D Match Fund: promote project pipeline, make awards and manage projects. Promote economic development activities from a legacy portfolio of 7 research center awards.	Actively participate in the grant activities at the Research Centers in of each of the 6 funded programs, which include: WHOI, WPI, BU, UMass Amherst, UMass Lowell, and Northeastern.	Due to budget restrictions, no awards were given in FY'18. In FY'17, one $5 million award was granted to WPI's PracticePoint project made in April of that year. Looking forward, the R&D grant fund expects to resume awards in FY 2019.
	Support industry engagement with research centers through Center Industry Advisory Committees or individual Technology or Sponsored Research Partnerships.	Assist ANSSeM in the engagement of 3-5 new industry partners annually, with a particular focus on small and medium-sized enterprises. Facilitate engagement between Center Directors from all 6 Research Centers to develop strategic partnerships with representatives from 60 key small, medium to large sized firms in the state. Support 12 business or technology development events at the 6 Research Centers.	Participated in multiple events and meetings including advisory board and other membership-based activities at all 6 funded research center programs. Participated in and spoken at DHS-Sponsored Idea and Technology Development programs at Northeastern, including meeting with students on recruiting programs. Spoke at the WHOI Leadership Forum event, and met with four companies. Developed follow-up information for a publicly traded company headquartered in Tennessee but with operating units in Massachusetts to support development of and R&D relationship with WHOI.
	Events: promote conferences, workshops or other events to promote idea generation and strategic partnerships around research agendas.	Participate in the WHOI July Leadership Forum and Entrepreneurship Showcase increasing industry participation in the Center. Participate in the development of an updated Market Assessment intended to identify opportunities in R&D and potential revenue streams. Refine MassTech R&D web presence in a way that it helps the Centers achieve economic development outcomes and financial sustainability.	Hosted or supported 12+ events, including Cloud Forum event at BU with the MOC; 10 meetings of the Business Working Group led by Intel for SME access to the MOC; 2 NSF-Sponsored SHAP3D conferences at UMass Lowell, business recruiting events at CSSM and others. Organized two meetings of the Research Center Directors. We supported more than 60 startups and established firms at various forums and workshops including the first joint conference for business community on the Internet of Things hosted by UMass Lowell with participation from multiple research centers.

Goal	Action	Measurement	Update
Innovation Institute **Provide access to incentives, initiatives, programs, and resources to help technology companies thrive within the Massachusetts Innovation Economy.**	Provide direct business assistance services to technology companies looking to start, grow, or hire in Massachusetts.	Provide direct business assistance services to 200+ technology companies looking to start, grow, or hire in Massachusetts.	MassTech has provided direct business assistance to 200+ companies with intentions of starting, growing, hiring or moving to the Commonwealth.
		Build pipeline of 6 qualified hands-on cyber engineers by creating a Cyber Engineering Learning Path Program in Massachusetts.	The Cyber Engineering Pipeline project was delayed due to the slow startup of the Cyber Center and funding challenges.
		Connect university talent with industry R&D interests via 6 Capstone Projects; identify capstone project opportunities with undergrad and grad programs at WPI, BU, UMass Amherst, Lowell and Boston, and others; and promote Capstone Projects to industry partners in focus sectors: Cybersecurity, Robotics, IoT, Analytics, and Advanced Manufacturing.	Funding challenges have prevented this project from being implemented.
		Create 4 special focus programs addressing workforce and talent beyond standard recruitment – address diversity, regions, retraining mid-careers, new training for millennials as well as community colleges.	While Workforce & Talent is an ongoing priority for MassTech no funding has been made available to fund stand-alone programming in this arena. However, there are numerous aspects of our cluster development activities that support diversity, regional economic development, mid-career training and community college programs.
		Track and support business development for 100+ companies focused on digital health, cybersecurity, advanced manufacturing, and Internet of Things. Through entrepreneurship grantees, increase the number of business startups or expansions by 100.	The MassTech Business Assistance program has tracked and supported well over 100+ companies that are technology focused in areas such as digital health, cybersecurity, advanced manufacturing and IoT. MassTech managers and executives have engaged individually or collaboratively with company representatives from over 100+ firms for the purpose of finding ways to help these companies do business in Commonwealth. Through entrepreneurship grantees MassTech has increased the number of startups/ expansions by 118.

MASSACHUSETTS
TECHNOLOGY
COLLABORATIVE

Goal	Action	Measurement	Update
Innovation Institute **Support and grow the state's technology sector.**	TechHUB Collaborative: Engage individually or collaboratively in steering committees, working groups and roundtables to support industry, academia and non-profits forward their innovation economy goals in all cluster development focus areas. These groups include: Workforce of the Future, MassCAN, MOC Business Assistance Cyber Education Training Consortium, Holyoke Innovation District, Greentown Labs Education Foundation, Northeastern ALERT's Industrial Advisory Board, and many more.	Support quarterly gatherings of the TechHUB Collaborative, a leadership group focused on improving the conditions for growth in state's innovation economy. Reinvigorate TechHUB Policy Working Group: engage Legislators through 4 roundtable discussions and hosting of Technology State House Day.	MassTech published an IoT white paper highlighting opportunities for the development of an IoT cluster in Massachusetts and worked with TechHUB Collaborative stakeholders to evaluate ways to leverage growth within this sector. These findings held inform the focus of MassTech efforts to support and brand the innovation economy and disseminate these IoT insights through communications and related activities. The TechHUB Collaborative hosted a meeting focused specifically on robotics in order to identify and develop a growth strategy for this cluster. This has led to a focus on high value verticals including the continued development of and participation in the Woods Hole Entrepreneurship Forum focused on Marine Robotics a sector in which we are a clear leader. The TechHUB Collaborative held two meetings in FY'18 (March & June) and a meeting is scheduled in November. These meetings were supplemented with numerous conference calls which made coordination of the group easier due to the busy nature of the professionals involved. The TechHUB Caucus hosted State House Technology Day: Megatrends and the Future of Tech In MA on January 29th. The event featured over 200 attendees, company exhibitions, and the first-ever NextGEN Awards that recognized 6 companies scaling in MA, creating a new disruptive technology, demonstrating best practices in diversity hiring, or having an impact on a regional economy. The Caucus hosted 6 roundtable discussions/site visits this year with the NextGEN Award winners.

Goal	Action	Measurement	Update
Innovation Institute **Ongoing commitment to the federal Manufacturing USA program.**	M2I2: Advance innovations and job growth within the state through cross-collaboration among companies, universities, national labs, government, incubators, accelerators and other academic and training institutions.	Increase volume of companies positively impacted by the program. Identify, co-develop, and approve qualified projects that benefit manufacturing innovation ecosystems. Create more jobs in the Commonwealth. Fabric Discovery Centers: work with AFFOA to establish product prototyping capability to demonstrate pilot level capability for preform/fiber. Support development of education and training facilities and train more workers in the key technology focus areas. Market M2I2 and advanced manufacturing initiatives at external conferences, summits, and similar presentation opportunities throughout the state. Engage with executive management teams of AFFOA, AIM Photonics, NextFlex and ARM Robotics.	During FY'18, M2I2 announced grants across a wide spectrum of academic, business, and national lab entities and will impact 13 different communities across the state. M2I2 received 6 additional applications now in hand that were drafted in FY'18. Finally, during FY'18 we identified companies, universities and labs in 15 different communities for our pipeline of future M2I2 candidates. Examples of key projects announced in FY'18 that expanded if not created new innovation ecosystems include: Lincoln Labs Defense Fabric Discovery Center (Round 2), WPI/QCC Laboratory for Education and Application Prototyping, and Expansion of the AFFOA Central Discovery Center/HQ. Projects announced plus applications received in FY'18 will directly result in 100 - 200 new, high-skill advanced manufacturing jobs. The UMass Lowell Fabric Discovery Center was completed in FY'18, the home to the first and only site in the nation that integrates discoveries from three Manufacturing USA Innovation Institutes. In FY'18 M2I2 presented and publicized M2I2 at over 20 events. In FY'18 M2I2 participated in the quarterly Board of Directors meetings of both AFFOA and AIM Photonics (8 events). In addition, we collaboratively submitted an application for Massachusetts to become a NextFlex node, which will give us a seat on the board of NextFlex.

Goal	Action	Measurement	Update
Massachusetts Broadband Institute **Broadband Extension Program: Finalize agreement with Comcast for the extension of broadband access in the nine partial cable towns.** **Manage the grant award to Comcast.**	Execute grant agreement with Comcast by August 2016. Develop detailed project schedule informed by Comcast field surveys and design and engineering work that will include buildout timeframes for each town. Comcast to commence make ready process and complete buildout of at least one partial cable town.	The MBI's ability to successfully monitor milestones established in the grant and provide value in helping towns understand and draw value from the contract.	Broadband Extension Program: MBI has worked successfully with Comcast to ensure compliance and progress on the contract, which was finalized and announced in August 2016. Additionally, MBI has worked with Comcast to successfully hold reconciliation meetings with nine (9) towns to ensure that Comcast obtained local feedback on its plant extensions. Comcast has expressed optimism that it will be able to complete the project well ahead of its two year commitment required in the grant agreement.
Help eight remaining towns without a current pathway to broadband connectivity to identify a solution for their community.	Work with each community to identify proposals via the MBI's Flexible Grant Program (see below), through EOHED's Last Mile Infrastructure Grant program, or another pathway.	Number of towns remaining with/without a defined pathway forward to broadband connectivity.	Only 1 community currently has no identified pathway to a broadband solution. Two of the 8 communities are considering a proposal from a cable broadband provider, but have not taken a vote on the proposal; two additional communities are working with MBI to finalize an action plan with a provider; and 4 communities are working on an action plan with a wireless provider.
Launch of Flexible Grant Program.	Publish a Flexible Grant Program procurement in fall 2017 and successfully develop, execute, and administer any contracts flowing out of the Program.	Publish RFP; Number of proposals received; Number of towns considering proposals.	The Notice of Funding Availability for a Flexible Grant Program (2018-MBI-01) was issued in fall 2017. Proposals were received from six companies. These proposals seek to provide service to seventeen different towns, including towns that had other options. *(Continued on next page)*

Goal	Action	Measurement	Update
Massachusetts Broadband Institute **Launch of Flexible Grant Program.**			MBI has engaged with the providers and towns to support the towns in determining their best solution. By the end of FY'18, one town had approved a private provider proposal and a grant award was made to a provider for one town. As noted above, numerous towns are in different stages of evaluating Flexible Grant Program proposals.
Manage Existing Private Provider Awards.	Oversee and administer contract deliverables for all private provider contracts that MBI has executed.	Manage six grant awards; continue moving six public/ private projects forward.	MBI is administering six grant agreements that were awarded under the initial private provider RFP 2017-MBI-02. As noted above, Comcast has continued its work under the Broadband Extensions Program grant, working with the nine underserved communities to ensure that they have reached 96% or greater coverage, and are fully operational.
Address Last Mile Hurdles.	Coordinate with Baker-Polito Administration stakeholders to facilitate solutions to any Last Mile programmatic hurdles that develop across any of the 53 towns in the MBI Last Mile and Broadband Extensions program. Assist EOHED in their oversite of direct town grants.	Number of towns that MBI is working with the Executive Office of Housing and Economic Development (EOHED) to provide technical and project support to help towns build municipal networks.	Twenty communities have entered into an agreement with Westfield Gas + Electric to act as their Owner's Project Manager to build a broadband network in their community. All communities are in various levels of design and make ready and 2 towns are in construction and some operational service is occurring.
Ensure Continued Operation of *MassBroadband 123* Network.	Optimize the operations of the *MassBroadband 123* network by providing quality network services and customer service. Increase customer base and annual revenue generated by the *MassBroadband 123* network.	Seamless operation of *MassBroadband 123* network; ensure zero downtime due to ongoing administrative issues surrounding the network.	MBI and MassTech have been working through the courts to ensure that the current network operator continues to perform under the terms of their contract despite the company declaring bankruptcy. *(Continued on next page)*

Goal	Action	Measurement	Update
Massachusetts Broadband Institute **Ensure Continued Operation of *MassBroadband 123* Network**			MassTech has also entered into an agreement with Holyoke Gas & Electric for emergency operator services to ensure uninterrupted services in the event that Axia is unable to fulfill its contractual responsibilities. Based upon sales data provided by KCST, the monthly network revenue increased over the course of FY'18, leading to a projected annual revenue increase of approximately $600,000.
Massachusetts eHealth Institute **Enhance Economic Growth.**	Convene and engage the digital health cluster. Help digital health companies find customers and markets in MA.	Leverage PULSE@MassChallenge to provide support to 20+ high-potential startups. Leverage TechSpring to bring innovative solutions to Western MA and provide opportunities for integration with the rest of the Commonwealth. Track, support, and measure the growth of 10+ high-potential digital health scaling companies. Support 100+ digital health startups and customers through a Marketplace Program.	Supported 32 startups through PULSE and worked with EOEA to serve as a champion for one of the startups. TechSpring supported 35+ companies, held 100+ events, and held workshops to bring Boston startups to Western MA. Began tracking # of employees at 9 high-potential digital health companies to develop baseline. Launched the Marketplace with initial uptake of approximately 50 digital health startups and customers by the end of FY'18.

Goal	Action	Measurement	Update
Massachusetts eHealth Institute **Accelerate Technology Use and Adoption.**	Build community-based approaches to health information technology and interoperability adoption.	All Communities Grantees move to production and 7 of 8 Communities Grantees achieve all 4 milestones. Support the Behavioral Health Consent Collaborative through pilot rollout and iteration at two health systems.	All 8 Grantees moved interoperability project to production and 7 of 8 Grantees completed all 4 milestones. BH consent materials successfully piloted and rolled out at Brockton Neighborhood Health Center, BAMSI and High Point Treatment Center.
	Share Knowledge / Best Practices on Health IT Adoption.	Develop and support one additional Learning Collaborative to increase care coordination use of the Mass HIway.	Developed and ran two HIE Learning Collaboratives on interoperability and workflow use case planning and change management and process improvement for the HIE receiving side.
	Support lagging healthcare communities in adopting technology.	Support 85% of eQIP Grantees without vendor issues in achieving all 4 milestones. Support all 4 CANS Grantees in deploying the interface in production. 10 of 12 CANS sites implement the interface. Document the ROI for the CANS interface.	84.21% of eQIP grantees met all 4 of milestones (92.11% made at least 3 milestones). All 4 CANS Grantees successfully deployed the interface in production. All 12 CANS sites successfully implemented the interface. All 12 BH sites have submitted baseline data and we have developed surveys to capture ROI metrics at regular intervals.
	Support providers in getting to Meaningful Use and continuing to progress.	Process 3,000 applications. Improve processing efficiency and cycle time for applications by 25%. Provide education and support to improve provider compliance and initial accuracy by 20%.	Processed 3,083 new applications. Finished PY16 about 8 weeks ahead of PY15, a 19% improvement, and improved the quality of validations. Improved initial accuracy, but the largest gain came from 2nd and 3rd time right, significantly reducing the cycling of applications. This timing corresponds to the majority of the support happening after the first validation.

Division	Organization	Grant	Award Amount	#Of Awardees
Innovation Institute	Lever, Inc.	Support for community-based entrepreneurship services and support in the Berkshire County region of Massachusetts.	$75,000	1
Innovation Institute	UMass - Boston	Support for the Global Entrepreneur in Residence (Global EIR) pilot program.	$50,000	1
Innovation Institute	Multiple	Intern Stipend Grants to technology start-up companies participating in the MassTech Intern Partnership Program.	$579,200	101
Massachusetts Broadband Institute	Comcast (Comcast of Massachusetts II, & Comcast of Massachusetts/Virginia, Inc.)	Last Mile Grant for Broadband Build-out in Worthington.	$2,213,809	1
Massachusetts Broadband Institute	Montgomery, Town of	Broadband Planning Assistance Grant.	$5,000	1
Massachusetts eHealth Institute	Colorado Health Institute	Support for development of a report on the state-level costs of informal caregiving to Massachusetts employers and a tool that will allow employers to estimate those costs for their specific organization.	$14,000	1
Massachusetts eHealth Institute	MassChallenge Inc.	Support for the Digital Health Hub.	$170,000	1
Massachusetts eHealth Institute	TechSpring	Support for the Digital Health Hub.	$80,000	1

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Lisa Erlandson, Chief Financial Officer, Massachusetts Technology Collaborative*
Philip F. Holahan, Deputy Executive Director and General Counsel, Massachusetts Technology Collaborative
Carolyn Kirk, Interim Executive Director, MassTech & Deputy Secretary, Mass. EOHED*
Patrick Larkin, Deputy Director, MassTech, and Director, Innovation Institute at MassTech
Laurance Stuntz, Director, the Massachusetts eHealth Institute at the Massachusetts Technology Collaborative
Maeghan Welford, Chief of Staff, Massachusetts Technology Collaborative*

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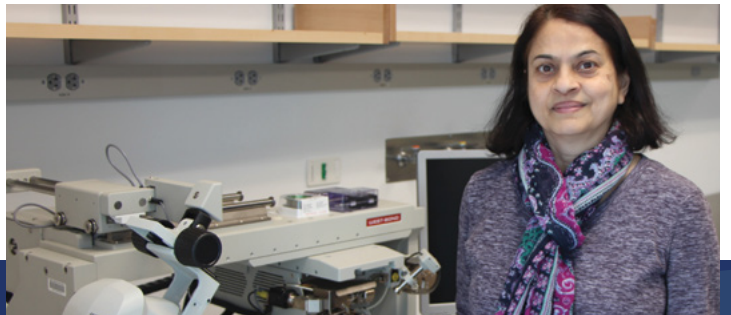flickr.com/photos/masstechcollaborative

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