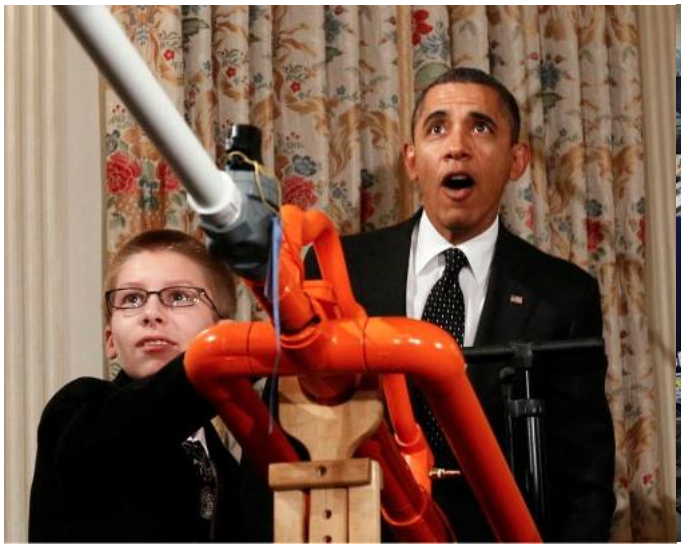
Maker Mayors Action Report

How Cities Are Fueling the Maker Movement Across the USA:

90 Mayors Dedicated to Building a Nation of Makers



REPORT FROM THE

Manufacturing Alliance of Communities

www.ManufacturingAlliance.us

June 2014

June 18, 2014

Mayors and local governments across the nation commend the Obama Administration for leadership on boosting American manufacturing and the "Maker Movement", and we convey that "Maker Mayors" are ready to take our partnership with the Administration to the next level so that we can foster new jobs, educational excellence, and economic and community revitalization.

American manufacturing is on the comeback, and this sector is helping drive new innovation, economic expansion and community revitalization, particularly in manufacturing communities that have struggled through the economic recession and shifts in industry. The manufacturing sector is now creating new economic momentum across the nation, and helping invigorate technological innovation, entrepreneurship and educational progress. As mayors, we believe that our best days for manufacturing innovation are ahead of us, and we intend to be actively working to boost this sector.

That is why we commend the Administration for their proactive leadership on these issues. Starting with the rescue and reinvigoration of the U.S. automotive sector and continuing now in your dedication to manufacturing communities, you have seen the potential of the manufacturing sector and are committed to investing in its growth. We recognize and commend the Administration's initiatives in this area including the Investing in Manufacturing Communities Partnership, the National Manufacturing Innovation Institutes, and agency programs to upgrade infrastructure, redevelop brownfields, train workers for advanced manufacturing jobs, expand R&D, and promote the exports of Made-in-America goods.

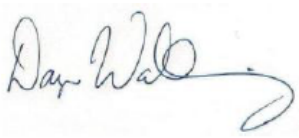
Now the nation has a new focus on boosting the "Maker Movement", which is bringing together inventors, entrepreneurs, students, educators, and local communities with advanced technology tools and collaborative approaches to create new innovation. We are glad that a variety of organizations and sectors are working together to support Makers, and we commend the Administration for holding the first-ever White House Maker Faire this June 2014.

To do our part to boost the Maker Movement and next-generation manufacturing in our own communities and beyond, we have launched the "Mayors Maker Challenge", a nation-wide campaign to encourage local government leaders to take action to boost the Maker Movement. We are pleased that, as you hold the White House Maker Faire, more than 90 local governments across the U.S.A. are rising to the Challenge and taking steps to boost making in our communities.

The enclosed "Maker Mayor Action Report" conveys the importance of makers to cities, and cities to makers. The Report showcases examples of bold actions that local communities across America are taking to boost the Maker Movement. We hope that our efforts as Maker Mayors can inspire other communities to rise to this important and exciting challenge.

We thank the Administration for recognizing that the Maker Movement can take our local communities to new levels of innovation and progress, and we look forward to our continued partnership with the Administration on these endeavors.

Sincerely,



Dayne Walling
Flint, MI
Chair, Manufacturing Alliance of Communities

This "Maker Mayors Action Report" highlights the efforts of mayors and cities across the U.S.A. to boost the Maker Movement in their own communities and drive 21st Century technological innovation.

Manufacturing is making a comeback in communities across America, and this innovation is boosting our economy, producing high-skills and high-wage jobs, and helping rebuild local communities. For example, in 2012, the manufacturing sector produced 12 million direct jobs, 17.4 million indirect jobs, $2.03 trillion in economic output (12.5% of GDP), significantly higher earning rates for workers than other sectors, and two-thirds of all private sector R&D.

These efforts to reinvigorate American manufacturing are further fueled by the Maker Movement, a grassroots effort to democratize the tools needed to design and build almost anything, and to build a community around creativity, design, and manufacturing. In the last decade, there has been a resurgence in do-it-yourself (DIY) activities throughout the U.S. using electronics, robotics, 3D printers and scanners, laser cutters, computer-numerically controlled machine tools, metal-working, wood-working and more traditional arts and crafts. The expansion of the Maker Movement is making it easier for individuals to bring their ideas to life, lowering the barriers to entry for product development, prototyping, and manufacturing. The Maker Movement is community-driven and brings together innovators at the local level to drive progress in manufacturing, engineering, industrial design, hardware technology, and education. More Americans have access to 21st century tools. Hundreds of thousands of entrepreneurs, students and families are participating in Maker Faires. Companies, libraries, museums, universities, schools, philanthropic foundations, and community-based organizations are investing in for-profit and non-profit maker spaces. Educators are using the Maker Movement to spark excitement about STEM learning. Labor unions are creating apprenticeship programs in advanced manufacturing. Experienced makers are passing it on by serving as mentors for young makers. The Maker Movement is on the forefront of technological, economic, civic and social change, and is empowering Americans – young and old – to become producers of things, not just consumers of things.

Keeping America at the cutting edge of technology and innovation is what is going to ensure a steady stream of good jobs into the 21st century.

President Barack Obama

February 2014

"Makers" has become the term now frequently-used to refer to those who are actively involved in these DIY activities. They are hobbyists, inventors, tinkerers, designers, artists, engineers and entrepreneurs who are passionate about building and crafting with technology and science. Many makers are developing new cutting edge technologies and tools for design and production as well as starting their own businesses based around the inventions they have developed. The maker community is diverse, spanning across all age groups and socioeconomic backgrounds.

Leaders at all levels see the potential of the Maker Movement. At the national level, the Obama Administration is building a series of Manufacturing Innovation Institutes to create hubs of advanced technology to drive national progress. *See* www.Manufacturing.gov. The Administration launched the "Investing in Manufacturing Communities Partnership" to help leading communities create a foundation of support for growing manufacturing. *See* www.Commerce.gov/IMCP. A federal interagency Manufacturing Task Force is putting resources to work for manufacturing by investing in infrastructure upgrades, promoting the revitalization of dormant manufacturing sites, boosting access to capital, enhancing research and development, fostering exports, and supporting supply chain networks. In mid-June 2014, the White House is announcing new manufacturing initiatives, and holding its first-ever "White House Maker Faire" to highlight the power of this movement and how it can contribute to advancing American manufacturing, education and entrepreneurship. *See* www.whitehouse.gov/makerfaire.

At the local level, every day it becomes more clear that *cities need makers*, because manufacturing and technological innovation are driving economic growth, creating jobs, promoting new collaborations, inspiring youth and reinvigorating STEM education. Cities that seek to thrive in the advanced manufacturing economy of the 21st century need to harness these opportunities.

Likewise, *makers need cities* and the leadership of mayors and other local officials, who can convene stakeholders to support maker innovation, provide maker spaces, tailor education and job training to support makers, support maker approaches in local incubators and accelerators, provide sites for promising technologies to grow into businesses, create zoning and regulatory incentives to support makers, and help small businesses understand how they can harness resources to support growth of their technological and manufacturing enterprises.

To boost local government efforts to support the Maker Movement in communities, the White House joined with a national organization called the Manufacturing Alliance of Communities (MAC) and other groups to call mayors to action on making. Working with the White House, the MAC recruited some of the most innovative mayors in the nation to launch the "Mayors Maker Challenge" to encourage other mayors to take action in their own communities to support the Maker Movement. *See* www.ManufacturingAlliance.us/Challenge. The Mayors Maker Challenge calls on mayors to pledge to take one or more simple actions in their own cities to support the Maker Movement, to conduct those actions in 2014, and to work with MAC to gather and report success stories in order to drive best practices in other communities.

To take the Challenge, a mayor must pledge to take one or more of the following actions in 2014:

1.) ***Maker Best Practices:*** Lead or participate in local efforts to identify, document and share "promising practices" in manufacturing and technological innovation so that others in your community and beyond can learn from local experimentation.

2.) ***Maker Liaison:*** Designate a Maker Liaison in the mayor's office or economic development department.

3.) ***Maker Roundtable:*** Host a roundtable in your community that convenes partners and helps catalyze public and private commitments that will strengthen the local Maker Movement.

4.) ***Maker Faire:*** Help celebrate the ingenuity and creativity of local makers by holding or participating in a Maker Faire event, which convenes stakeholders to promote innovative technology ideas. *See* www.MakerFaire.com.

5.) ***Maker Spaces:*** Host or help create or grow maker spaces in local incubators, accelerators, educational institutions, under-utilized buildings, and/or design-production districts, which can broaden access to tools needed for design, prototyping, manufacturing, and the growth of small business enterprises that are building new manufacturing and innovation technologies.

6.) ***Maker Manual:*** Issue a "Maker Manual" to explain the importance of the Maker Movement in your community, and to identify resources and incentives at local, regional, state and national levels that can support makers and small businesses seeking to grow their technology and manufacturing innovations.

7.) ***Make a Strategy for Education, Training & Workforce Development:*** Commit to working with your school district, libraries, museums, after-school providers, community colleges, universities, workforce investment boards, and job training organizations to give more students access to age-appropriate maker spaces and mentorship, and focus more education and training programs on the emerging fields of advanced manufacturing and technology innovation.

8.) ***Maker Business Development:*** Upgrade your economic and business development programs, incentives and services to provide support to manufacturing entrepreneurs and small businesses.

9.) ***Maker Support in Struggling Neighborhoods:*** Support initiatives to engage and support students, entrepreneurs and small businesses in under-served neighborhoods.

10.) ***Make It Even Better:*** Your community may have even more innovative strategies for promoting the Maker Movement. Make that part of your Challenge pledge and share the strategy with others!

In just one month after launching the Mayors Maker Challenge, more than 90 mayors and other local leaders from big cities to small towns across the nation have taken up the Challenge. This "Maker Mayor Action Report" highlights this initial launch of the Challenge effort and includes a listing of the cities and mayors leading this effort, a summary of the kinds of actions being taken, spotlight descriptions of specific activities in leading cities, and information on further resources for manufacturing communities and their maker efforts. This Report will be announced and distributed nationally in mid-June 2014 to coincide with the White House Maker Faire.

In the months following June and throughout 2014 and beyond, the Manufacturing Alliance of Communities will work with other organizations to build this Challenge into ongoing action at the local government level. MAC will recruit additional mayors throughout 2014 to take the Challenge, track the action underway in communities, report and share best practices by cities, and issue a year-end update on the Mayors Maker Challenge.

MAC is also now launching the "Maker Mayor Network," which will support ongoing partnership among cities and other key organizations; provide peer-to-peer networking and technical assistance including webcasts, an information clearinghouse, convenings, and consulting services; and foster collaboration for cities with Maker Movement leaders in the private sector, government, non-profit and educational institutions, and other sectors. This final section of this Report provides more information on the new Maker Mayor Network, and you can find more info at www.ManufacturingAlliance.us.

American communities are poised to make progress through the Maker Movement, and this report highlights some of the most exciting actions taking place at the local level today. We encourage you too to become a "Maker Mayor" and take advantage of these opportunities.

Maker Mayors in Action:

Pledges in the "Mayors Maker Challenge"

More than 90 mayors and other municipal leaders across the nation have pledged to take action to boost the Maker Movement in their own communities and beyond. These communities range from big places such as Los Angeles, Philadelphia, Detroit, Cleveland, Dallas, Boston, Phoenix and others, to small towns and villages such as Charles Town WV, Olathe KS, Clarence NY and Elyria OH; from recognized centers of innovation such as San Francisco, Portland OR, Seattle, Ithaca and Oak Ridge, to long-time manufacturing hubs such as Lansing, Toledo, Cincinnati, St. Louis, Kansas City, and many others. These communities are located from the northwest in places such as Beaverton OR to the tip of the southeast in Palm Bay FL, with localities in between in the Midwest, South, New England, Pacific Coast, Great Plains and other regions. These Maker Mayor initiatives are being led by officials who are Democrats, Republicans, and Independents. The mayors and communities who have taken up the Maker Mayors Challenge include:

Kim Adkins
Martinsville, VA

Miles Atkins
Mooresville, NC

Scott Avedisian
Warwick, RI

Rusty Bailey
Riverside, CA

Tom Barrett
Milwaukee, WI

Ralph Becker
Salt Lake City, UT

Tom Beehan
Oak Ridge, TN

Virg Bernero
Lansing, MI

Andy Berke
Chattanooga, TN

Richard Berry
Albuquerque, NM

Carl Brewer
Wichita, KS

Holly Brinda
Elyria, OH

Roy Buol
Dubuque, IA

Christopher Calbadon
West Sacramento, CA

Ann Campbell
Ames, IA

William Capote
Palm Bay, FL

Stephen Cassidy
San Leandro, CA

Chris Coleman
Saint Paul, MN

Michael Coleman
Columbus, OH

D. Michael Collins
Toledo, OH

Michael Copeland
Olathe, KS

Mick Cornett
Oklahoma City, OK

Tom Coyne
Brook Park, OH

John Cranley
Cincinnati, OH

Joseph Curatone
Somerville, MA

Karl Dean
Nashville-Davidson County, TN

Charlie Dooley
St. Louis County, MO

Denny Doyle
Beaverton, OR

Mike Duggan
Detroit, MI

Buddy Dyer
Orlando, FL

Kevin Faulconer
San Diego, CA

Bill Finch
Bridgeport, CT

Greg Fischer
Louisville, KY

Doug Franklin
Warren & Youngstown, OH

Eric Garcetti
Los Angeles, CA

Cedric Glover
Shreveport, LA

Vincent Gray
Washington, DC

Charlie Hales
Portland, OR

A. David Hamill
Ranson, WV

David Hartzell
Clarence, NY

Kevin Hinkley
Wixom, MI

Bobby Hopewell
Kalamazoo, MI

Kerri Howell
Folsom, CA

Kevin Hurst
Walton Hills, OH

Frank Jackson
Cleveland, OH

Sly James
Kansas City, MO

Frank Janakovic
Johnstown, PA

Tom Kant
Fairhope, AL

Chris Koos
Normal, IL

Rick Kriseman
St. Petersburg, FL

Marcia Leclerc
East Hartford, CT

Edwin Lee
San Francisco, CA

Lee Leffingwell
Austin, TX

Josh Maxwell
Downington, PA

Jan Marx
San Luis Obispo, CA

Nancy McFarlane
Raleigh, NC

William McLeod
Hoffman Estates, IL

Lydia Mihalik
Findlay, OH

Lee Moritz, Jr.
Conover, NC

Larry Morrissey
Rockford, IL

Alex Morse
Holyoke, MA

Ed Murray
Seattle, WA

Svante Myrick
Ithaca, NY

Richard Notte
Sterling Heights, MI

Michael Nutter
Philadelphia, PA

Mark Olson
Fayetteville, NY

Michael Pantelides
Annapolis, MD

Elizabeth Patterson
Benicia, CA

Bill Peduto
Pittsburgh, PA

Kitty Piercy
Eugene, OR

Jean Quan
Oakland, CA

Mike Rawlings
Dallas, TX

Stephanie Rawlings-Blake
Baltimore, MD

Madeline Rogero
Knoxville, TN

Jennifer Selin
Morgantown, WV

Francis Slay
St. Louis, MO

Kevin Smith
Anderson, IN

Peggy Smith
Charles Town, WV

Paul Soglin
Madison, WI

Greg Stanton
Phoenix, AZ

Johnny B. Thomas
Glendora, MS

Jay Tibshraeny
Chandler, AZ

William Miranda Torres
Caguas, Puerto Rico

Ken Ulman
Howard County, MD

Dayne Walling
Flint, MI

Marty Walsh
Boston, MA

Lovely Warren
Rochester, NY

Nan Whaley
Dayton, OH

A C Wharton, Jr.
Memphis

Jerry Willey
Hillsboro, OR

The communities that have taken the Mayors Maker Challenge pledge have taken a wide and creative range of actions to support the Maker Movement. The following 10 pledges are what Mayors across the country are doing, with examples of how communities are implementing the pledges in their community.

Maker Best Practices

- **24 communities** will convene diverse stakeholder groups to gather and spread the word on promising practices that can build the Maker Movement at the local level and help translate making into real jobs, real business growth, and real community revitalization.

  - Dayton, OH has pledged to utilize a multi-stakeholder Manufacturing Task Force that brings together leaders from business, labor, government, education, and agriculture to identify best practices and emerging opportunities to boost the Maker Movement and manufacturing expansion in the region. Members engage the community though a speakers series focused on best practices in manufacturing, by promoting collaboration between manufacturing facilities and local schools, and by advocating for manufacturing expansion. In partnership with the City of Cincinnati, the City of Dayton was recently awarded an Investing in Manufacturing Communities Partnership designation. Over the next year, Dayton will focus on collaborating with the 27 county region to promote aerospace manufacturing and supply chain growth.

  - Raleigh, North Carolina pledges to work with established partners such as the City's Urban Design Center, North Carolina State University, and Designbox, as well as newer ventures such as Innovate Raleigh and HQ Raleigh, to promote innovative product design, development, and production. NC State University provides educational support, the City's Urban Design Center provides innovative community design solutions for the built environment, and Designbox provides product and technology design solutions. HQ Raleigh is a collaborative workspace for entrepreneurs and Innovate Raleigh is a multi-stakeholder task force that connects innovators to opportunities in the Raleigh region.

Maker Liaisons

- **64 communities** will designate a specific lead person in municipal government to be a liaison to the Maker community in their area.

  - Lansing, Michigan will pursue an expansive maker strategy that includes appointing a "Making & Manufacturing Coordinator" in the Mayor's Office who will engage the city's

economic development, planning and workforce development teams to build partnerships with the Lansing Makers Network, Lansing Community College, Michigan State University, the Lansing Economic Area Partnership, regional business incubators, and other segments of the community. These efforts will foster entrepreneurship, drive innovation, and expand STEM education to strengthen the Lansing region's advanced manufacturing capabilities now and in the future. Lansing will also partner with the Impression 5 Science Center – the city's hands-on, children's science museum – to create a maker space called Innovation 5.

Maker Roundtables

- **45 communities** will hold "Maker Roundtables" to convene local and regional leaders from the public, business, non-profit, educational and other key sectors to identify strategies and forge renewed partnerships to support making.

  - The Louisville Metro Government in Kentucky will hold a "Mayors Conference on Entrepreneurship" in Fall 2014 that will focus on how mayors can boost the Maker Movement. Led by Mayor (and inventor) Greg Fischer and sponsored by the Kaufman Foundation, this gathering will convene 25+ mayors with private sector, academic, philanthropic and other leaders to share strategies to support making and manufacturing in their communities including strategies for workforce development, site zoning and reuse, and entrepreneurship incubation.

Maker Faires

- **32 communities** will hold Maker Faires or Mini-Maker Faires to get the public involved in show (and tell), hands-on learning gatherings to promote the Maker Movement.

  - As the home of major manufacturing centers like a Ford Motor Company Engine Plant, as well as numerous tool and die and small manufacturing entities, Brook Park, OH pledges to take its Maker Movement and advanced manufacturing efforts to new levels under the Mayors Maker Challenge by partnering with its Chamber of Commerce to hold a Maker Faire and Roundtable in 2014; to work with high schools, vocational programs, colleges and universities to give students access to age appropriate maker spaces and mentorships; and to focus more education and training programs on the emerging fields of advanced manufacturing and technology innovation.

- The Downtown Chandler Community Partnership, a consortium of interests that includes the City of Chandler, Arizona as a full partner, pledges to host a 2015 Maker Faire. This day-long street festival will highlight makers in the community while bringing citizens together to celebrate a renewed interested in manufacturing. While the roots of the festival will be technology related, there will be people focusing on DIY, organic food production, jewelry making, composting, and many other ventures -- bringing tech, non-tech and garage tinkerers together to be creators.

Maker Spaces

- **36 communities** will create, expand and/or support maker spaces that will provide a venue for developing new ideas, collaboration, invention, learning new skills, working with advanced tools and technologies, and entrepreneurship.

  - Madison, WI pledges to partner with the Sector 67 maker space to site and finance an expanded entrepreneurial hub known as Starting Block. This will provide additional co-working, innovation, and community space around the Sector 67 anchor. This effort will include making city-owned land available, funding the effort in the 2015 budget, and assisting in private fundraising for Starting Block.

  - St. Petersburg, FL will focus municipal resources including its partnership with the Downtown St. Pete Maker/Hacker Space to grow making and entrepreneurship into 21st Century advanced manufacturing. Mayor Rick Kriseman, an enthusiastic supporter of the maker movement, states "my goal is for St. Petersburg to be one of the truly great 21st Century cities. A focus on innovative manufacturing and technology will help us accomplish that goal. I am proud to take the Mayors Maker pledge."

Maker Manuals

- **12 communities** will provide a "Maker Manual" to their community with explains the importance of Making and provides information and resources to engage and support the Maker community.

  - Mayor Dayne Walling of Flint, Michigan pledges to work in his own community, and as a leader of the national Manufacturing Alliance of Communities, to create a "Maker Manual" in 2014 that will serve as an information guide, directory of resources and opportunities, policy toolbox, and call to action for the public sector as it relates to the maker community, manufacturers, educational institutions and other partners. Flint will seek to create a template that can be adapted by other communities by convening key stakeholders and

technical assistance entities to produce the manual and by using crowdsourcing and interactive web-based approaches to produce and disseminate this resource.

Maker Education & Workforce Strategies

- **30 communities** will develop and implement strategies to give more students access to maker spaces and mentorship, and/or focus more education and training programs on the emerging fields of advanced manufacturing and technology.

  - Elyria, Ohio will work with Lorain County Community College, the K-12 education community, businesses, government, nonprofits and other organizations to invigorate "young makers" to be future entrepreneurs and manufacturers in the region.

  - The Village of Hoffman Estates, Illinois pledges to work with the community's industrial and manufacturing companies to strengthen their workforce through new partnerships with Elgin Community College, workforce investment organizations, local high schools, the Golden Corridor Advanced Manufacturing Group, and other organizations. This workforce development initiative will include a focus on engaging students and parents on the opportunities in making and manufacturing.

Maker Business Development

- **43 communities** will upgrade economic and business development programs, incentives and services to provide support to manufacturing entrepreneurs and small businesses.

  - Beaverton, OR pledges to revise the core policies that guide the community's economic development in ways that will support the Maker Movement. In support of the manufacturing sector, the City of Beaverton recently adjusted the minimum investment criteria for its Enterprise Zone (EZone) down to $50,000 (the state minimum). The EZone allows industrial and commercial firms real property tax abatements for three and up to five years on qualified equipment and/or tenant improvements. The city has also made adjustments to its Workforce Training Assistance program, allowing the qualifying salary guidelines to include both wages and benefits, thereby providing smaller firms and start-ups with the same opportunity to receive training funds as larger firms. Additionally, the city's technology incubator, Oregon Technology Business Center offers low-cost office space, mentoring and support for all types of technology related firms including Maker Movement entrepreneurs.

- Working with one of the largest online universities in the nation, American Public University System, the adjacent cities of Charles Town and Ranson, WV will support the incubation of new maker and technology-based businesses started by veterans returning from service in Iraq, Afghanistan and other foreign posts. These small cities on the border of the Baltimore-Washington metro region will use tailored economic development and tax incentive approaches to attract and grow technology-based businesses, and focus the development of these entrepreneurs in brownfields and vacant buildings.

Maker Support in Struggling Neighborhoods

- **31 communities** will conduct initiatives to engage and support students, entrepreneurs and small businesses in under-served neighborhoods.

  - The Town of Normal, Illinois will open a new maker space in the Children's Discovery Museum and provide a new Innovation Institute for youth of families with limited resources, including through programming in local schools and community agencies.

Make It Even Better! The Maker Movement is about creating and innovation – and so the actions of Maker Mayors are not confined to the areas listed above. Communities across America continue to rise to the challenge to make it even better for their makers!

Many of the Maker Mayor communities participating in this endeavor are taking multiple actions to promote their Maker Movements. Here are a few highlights of the robust efforts underway in representative communities:

Transforming an Underutilized Manufacturing Site into A Polytechnic Institute and Maker Space: **Anderson, IN**

Anderson, Indiana will work with Purdue University's College of Technology at Anderson and the Flagship Enterprise Center (identified by the Small Business Administration as the top micro-lender in the State of Indiana in 2012) to construct a new building that will house advanced technology education and high-tech maker tools – the Purdue Polytechnic Institute - for as many as 500 students and hundreds of entrepreneurs, at the site of a former automotive plant.

The centerpiece of the Polytechnic Institute project will be a maker space where students, teachers and entrepreneurs come together to produce and test prototypes and refine new designs. Visiting and prospective students and industrial leaders will quickly see how learning takes place when a hands-on focus is available. Surrounding and integrated into the maker space will be a variety of spaces and tools ranging from specialized learning labs and incubator spaces, to a light industrial space where students can work for local established and developing businesses.

Anderson Mayor Kevin Smith, whose leadership on this issue has been paramount to its success, states that "the focus is on using the facility to foster an increased interest in the manufacturing industry. Simply put, this project's purpose is to raise a generation who wants to make things and have the skills to be the Makers."

Building a Creative Economy by Revitalizing Downtown Urban Spaces: **Holyoke, MA**

The City of Holyoke has established a strategy for transforming its downtown—which contains several underutilized former industrial buildings—into a space for creative enterprise. The City is leveraging public/private partnerships in order to develop these maker spaces and support the area's burgeoning creative economy. Holyoke has appointed a Creative Economy Coordinator to oversee the City's initiatives to fortify its maker economy.

One maker space in Holyoke is Gateway City Arts, a co-working space for artists that is located in the heart of Holyoke's Arts and Innovation District. Gateway City Arts aims to provide space and infrastructure for both creating and teaching the arts. Its facilities include an all-purpose art studio, woodshop, dance studio, meeting space, personal and communal workspaces, and event and performance spaces. Other maker spaces in Holyoke include Brick Coworkshop, a collaborative workspace for entrepreneurs that was constructed in a formerly industrial building.

In September 2013, Holyoke was awarded $75,000 by the Massachusetts Cultural Council to build its creative economy by helping people develop skills in the arts, media, design, crafts, and other areas that could lead to entrepreneurship or employment in creative industries. The new partnership resulting from this grant — the "ARTery" — will aggregate resources to provide space, tools, and instruction to help creative entrepreneurs succeed and make a living through their work.

Fostering the Development of Successful Maker Entrepreneurs: **Ithaca, NY**

The City of Ithaca will team with Cornell University, Ithaca College, Tompkins Cortland Community College, Governor Andrew Cuomo and others to launch a new $3.5 million "Downtown Ithaca Incubator." The Incubator will be used for programming and events that support entrepreneurship, providing tenant companies with access to work space, mentoring and resources. The Incubator will include a maker space with a prototyping workshop and access to a prototyping network of companies and resources. The Downtown Ithaca Incubator will serve as one node in the new Southern Tier Innovation Hot Spot, a regional economic development plan launched by Governor Cuomo to foster high tech entrepreneurship.

Ithaca is currently home to the Ithaca Generator (IG), a grassroots, member-driven maker space that provides public access to the technological tools and knowledge needed for the 21st century. IG is a part of Ithaca's technology ecosystem that includes the new Downtown Incubator for validating and developing scalable businesses, high end machine-shops such as INCODEMA for pre-production, and Cornell University for world class research. IG's place in this ecosystem is that it offers classes and workshops to the general public in design, science, electronics, programming, rapid prototyping and more. While several institutions in Ithaca own tools like 3D Printers and Laser Cutters, IG is the only space in the city providing public access to, and education on how to use these tools. IG offers an entry to 21st century technologies that may be used to expand skill sets, boost resumes, or discover new product ideas that can then flow into a business incubator.

Since it opened in January of 2013, IG has increased membership from 20 to 50 members; served over 300 students from a range of economic and cultural backgrounds; crowd-funded $10,000 for a "Made in USA" Epilog laser cutter; forged partnerships with educational institutions and business incubators; and supported three high-tech start-ups: BoxyBikes, an electric bike manufacturer; Physical Sky, a game design company; and Wicked Device, an electronics manufacturer and maker of Air Quality Egg (recently featured in FastCompany).

While IG's success is great, this maker space is 18 months into their operation and already reaching the limits of its space and volunteer staff. In order to grow its public offerings, IG is currently

seeking funding opportunities to expand its current space and hire part time instructors and staff. When this expansion is accomplished, IG will be able to offer more opportunities for youth and adult students to sharpen their skills for a 21st century economy.

Expanding City-Wide Opportunities for Making: **Los Angeles, CA**

In May 2014, the Mayor of Los Angeles named the city's inaugural Entrepreneurs in Residence, who will help the city create entrepreneur- and business-friendly policies. The Entrepreneurs in Residence will also measure and develop best practices for growing, assisting and sustaining entrepreneurs in L.A. "We want L.A. to be the leading destination for people starting new businesses, and there are no better guides for our efforts than successful entrepreneurs themselves," Mayor Eric Garcetti said of the program, sponsored by Ernst & Young. These Entrepreneurs in Residence will boost L.A.'s business climate with best practices around the country, partnering with foundations and institutions, working with schools to encourage entrepreneurship and helping connect startups with investors.

Meanwhile, the city has continued to develop as a hub for maker paces. One prime example is the LA Makerspace — a collaborative co-working environment with workshops and classes for skill development in fields as diverse as hardware and software engineering, art, game design, filmmaking, and robotics. Other maker spaces, like The Build Shop and CrashSpace further cultivate a maker-friendly environment across the city. In fact, seeing the development of an urban maker economy in the city, TechShop has announced plans for moving into a 20,000 square-foot facility in south L.A.

The Mayor of Los Angeles has also engaged in efforts to close the skills gap and allow everyone the opportunity to be a maker. One such initiative is the recently announced Summer of Learning program. The Summer of Learning program is a collaboration between the city and the Los Angeles Unified School District that will allow residents under the age of 24 to take free classes focused on science, technology, engineering, arts, math, and job-readiness. The Summer of Learning program will be part of the city's ongoing efforts to ensure technological access and education to populations that are deemed "in need."

Teaming Up with the City to Ensure Inclusion through Educational and Business Opportunities: **Oakland, CA**

Oakland is proud to have convened important Maker Events, including a Maker Roundtable under the auspices of the Oakland Makers (www.oaklandmakers.org), which was co-founded by the City of Oakland with leaders from education (Laney Community College), arts (Crucible, American Steel, NIMBY) and leading designer-fabricators (Form & Reform, Blank and Cables). Oakland also hosts the annual East Bay Mini Maker Faire attended by over 5,000 participants

over a single weekend day every Fall. The City is working with at least three new maker spaces/ hardware accelerators, including Blue Sprout and Hollisworks, through support on building and attracting tenants, permit guidance, and marketing.

The City's Senior Business Development Specialist is working to conform and adjust regulations and definitions of land use activities within the Planning Code (Custom-Light Manufacturing) to reflect nuances and the lighter impacts of advanced manufacturing processes. Such recognition will allow for more flexibility, where advanced manufacturing/ desktop 3D printing and production may suitably co-inhabit with office uses within flex spaces be it downtown office corridors or within industrial areas. And at the same time, Oakland is supporting the retention of industrial protection zoning such that land and facilities are available to Maker businesses and artists/artisans.

Oakland Makers has an Education & Equity Committee, which focuses on issues of inclusion and reaching out to diverse communities in Oakland. The City is home to *The Crucible*, a nationally-known industrial arts education center, which is a core member of Oakland Makers. The Crucible offers over $100,000 in maker technology education scholarships to Oakland youth, particularly those within its West Oakland neighborhood. The Castlement High School in East Oakland has a sustainability academy and is now being supported with maker education, provided by a Laney-associated Maker instructor. McClymonds High School in West Oakland has a STEM Academy and Oakland Makers will offer to connect such students with local businesses to learn more about Maker careers in Making and Manufacturing.

Finally, Oakland is reaching out to neighboring jurisdictions to form a larger East Bay Maker Movement, to help business network, access supply chains and share best business practices among a larger pool of makers, connect to mainstream industrial fabricators and manufacturers, and access resources. By mapping its local supply chain between makers and manufacturers, Oakland is spearheading a regional strategy which will strengthen the larger supply chain, growing the economy and jobs in the East Bay.

Oakland has ambitious plans to continue its Maker Movement through a variety of programs and initiatives in the coming year. The City will support the development of the Oakland Makers organization into an independent 501(c)(3) with a full-time executive director and expanded capacity. The City pledges to create and expand additional maker spaces, including by expanding the CTE FabLab at Laney College into a state-of-the-art digital technology hub for students in the fields of welding, machining, carpentry, and industrial repair. This CTE FabLab will be connected to other educational institutions to expand community access, including the Oakland Unified School District through a launch at Castlemont High School's Urban Design Academy, and also to the Oakland Library System and its Tool Lending Library. Laney College will pursue a new Maker Credential through its "Introduction to Manufacturing" and associated credential programs.

Oakland also plans to support private-sector development of maker spaces, including cooperative maker spaces that can utilize shared business development, insurance, patent support, tech transfer, legal, and other shared services to reduce costs to individual entrepreneurs and small businesses. One area for cooperative business development for makers will be in the city's robust food sector, where a new cooperative cold storage facility can help food and beverage entrepreneurs benefit from short-term storage in what can otherwise be expensive and space-consuming facilities. Oakland also seeks to expand its current Foreign Trade Zone in ways that can support hardware accelerators and maker companies with reduced custom fees and export opportunities.

Oakland is also determined to expand these maker opportunities to low income neighborhoods by providing access and outreach on the potential of manufacturing to elementary schools, community colleges, and technical education programs for children in need.

Sustaining Innovation for the 21st Century: **Pittsburgh, PA**

Pittsburgh, the steel capital of the United States, is an inspiring example of how a community can reinvent itself as a hub for technological development, entrepreneurship and innovation amidst a changing economy. As the steel industry declined in the 1970s and 1980s, the city suffered from economic depression, high unemployment and a decreasing population. However, thanks to visionary efforts by the city's leaders, Pittsburgh has successfully capitalized on both a national movement in Making and the city's deep existing resources to revitalize its manufacturing sector. Pittsburgh's manufacturers are now adding jobs and expanding their production lines. And new start-ups in robotics, advanced materials, and 3D printing are opening up shop thanks to the city's supportive environment.

Pittsburgh Mayor Bill Peduto, as part of his broader efforts to revitalize the region's industry and build on the strengths of Pittsburgh's workforce in manufacturing, has lent his support to significant efforts to train workers for new jobs in additive manufacturing ('3D printing') and to accelerate hardware entrepreneurship. Examples of ongoing collaborations include the New App for Making It in America, TechShop Pittsburgh, and AlphaLab Gear.

Innovators in Pittsburgh have also worked under the banner of "Kids+Creativity" to improve opportunities for children and youth to learn. One example is MAKSHOP, a family-oriented and kid-friendly maker space located in The Children's Museum of Pittsburgh. This hands on space for tinkering with technologies old and new was created with the help of Carnegie Mellon University's Entertainment Technology Center and the Pittsburgh-based Grable Foundation. The Children's Museum of Pittsburgh, with support from the Institute of Museum and Library Services, is now working in conjunction with the North Carolina State University Library, Exploratorium, Chicago Public Library, and Maker Education Initiative, among others, to build the capacity of libraries and museums to develop effective maker spaces and programs.

A Leading Center of Makers for Over a Century: **Rochester, NY**

Under the leadership of new Rochester, NY Mayor Lovely Warren, the Rochester / Finger Lakes Region in upstate New York was recently designated as one of 12 "Manufacturing Communities" under the Obama Administration's "Investing in Manufacturing Communities Partnership" (IMCP).

Anchored by the City of Rochester, the Finger Lakes region has been a center of manufacturing for more than a century. Up until the mid-1990s, the region led the state in manufacturing, exports, job creation and other measures due to major regional employers such as Kodak, Xerox, and Bausch & Lomb. However, the downsizing of these companies has led to the loss of nearly 50,000 manufacturing jobs in over the past 20 years. This job loss has contributed to a significant increase in poverty. Rochester is now considered the fifth poorest city in the country and the second poorest among cities of similar size. The high school graduation rate for Rochester schools is the lowest in New York State (43%) with only 4% academically prepared for college.

Despite these setbacks, manufacturing remains one of the top employment sectors in the Rochester region. Buoyed by the region's entrepreneurial spirit, intellectual capital and infrastructure, the area's manufacturing sector is resurging. Known as the "Imaging Capital of the World," the region is an international leader in Optics, Photonics, and Imaging. The advanced manufacturing and photonics technologies are critical for the manufacture of smart phones, cameras, microscopes, lasers, photocopy machines, and biomedical imaging equipment. For example, all of the cameras on the NOAA weather satellites and the cameras that take the Google Earth pictures are manufactured in Rochester.

Rochester and its partners in academia, job training, and the private sector are undertaking a number of unique initiatives to expand and enhance manufacturing in the region:

The Rochester Regional Optics, Photonics, and Imaging Accelerator (RRPA) is a partnership among the University of Rochester, High Tech Rochester, the New York State Department of Economic Development, the Rochester Regional Photonics Cluster, the Rochester Institute of Technology, and Monroe Community College. This initiative will focus on catalyzing accelerated growth for the 50+ small-to-medium sized enterprise photonics companies in the region, incubating new companies, and attracting others to the region.

The Multiple Pathways to Middle Skills Jobs Initiative is a unique partnership between higher education, community colleges, the Rochester City School District, local workforce investment boards, trade associations, and employers to create a program of seamless career pathways for at-risk urban students and displaced workers. In response to regional employer identified needs, the

initiative is targeting prospective students for middle-skills jobs in which an estimated 16,000 positions will need to be filled in the coming years due to industry growth and retirement.

The City of Rochester and its partners are taking steps to revitalize and enhance the **Eastman Business Park (EBP)**, a 1200 acre industrial technology center, which is home to more than 50 manufacturing businesses and 6,000 employees, and has plenty of room for new manufacturing. It serves as a center for R&D and manufacturing of the region's key technologies, including photonics, bio-materials, advanced manufacturing, and energy storage. A vertically integrated "city within a city," EBP consists of more than 100 buildings; 16 million square feet of laboratory, manufacturing, warehouse, and office space; 30 miles of roads; 17 miles of railroad track and on–site rail road carrier service linked to the Rochester Southern and CSX regional and national rail freight lines; and dedicated power generation, water processing, and wastewater treatment facilities. Within the park there are facilities for research, design, development, prototype, scale-up, and high volume manufacturing. Specifically, the region's partners are investing in upgrading and maintaining development tools at EBP to attract high-tech, entrepreneurial start-ups, providing operational improvement to help bridge lack of funding for commercialization for incubator graduates. In addition, Rochester and the EBP are taking steps to maintain and enhance EBP's unique infrastructure to ensure that the park has capacity to grow and develop.

Empowering Residents to be Financially Independent and Self-Sufficiency through Making: **Rockford, IL**

The City of Rockford, the Rockford Housing Authority, and Rockford Public Schools partnered with New York based Etsy and the Rockford Etsy Team to help pilot a "Craft Entrepreneurship" program (craftentrepreneurship.com) first introduced nationally to help support adult self-sufficiency and student entrepreneurship education. The program has already graduated adult public housing residents who have started Etsy shops and is now expanding nationally to other cities. Rockford has pledged to expand the program in 2014 to incorporate federal workforce training resources and a high school curriculum. Perhaps the most ambitious goal for 2014 is launching a co-op furniture making model for Etsy shops specifically targeting hard-to-employ populations like ex-offenders as part of a jail re-entry effort.

Mayor Morrissey sees the Maker Movement injecting a renewed spirit of small business entrepreneurship into his community's strong manufacturing foundation. The Mayor declared May 2014 Maker Month, and in 2013 launched the Rockford Maker Network, an open network which includes, among others, the local public library, public schools, community college, and a non-profit business incubator. The Maker Network also builds from successful community efforts in local foods and their community's city market, which brings thousands of visitors downtown each weekend during the summer to support the Rockford maker community.

The Maker Network secured a $75,000 competitive grant from a local economic development agency this year to support the Network and equip a downtown maker space. Mayor Morrissey is working with the Network members and other economic development partners to promote economic development strategies for recruiting and growing Maker businesses in the community and region.

Creating a Platform and Ecosystem for Makers to Design and Manufacture Locally: **San Francisco, CA**

In 2009, San Francisco collaborated with twelve existing manufacturers to launch a powerful regional Maker platform called SFMade. The platform combines a local brand and retail presence with resources to help makers find the training, capital, real estate, and workers that they need. This integrated, focused approach harnesses the creative power of a dense urban area to catalyze new ideas and maker-based businesses. Since the launch of SFMade, San Francisco's manufacturing sector has grown by more than 10% a year, outpacing most other industries. There are more than 540 local manufacturers now producing products in San Francisco, employing close to 5000 people. The sector added $395 million in direct economic impact in 2013.

In 2011, SFMade and the Pratt Center in New York City launched the Urban Manufacturing Alliance. The Alliance now includes more than 25 member cities and is pursuing a number of cross-regional initiatives, including launching locally-made brand and retail platforms in New York City, Philadelphia, Portland, and Chicago.

Inspiring the next generation of Makers: **Sterling Heights, MI**

As a partnership of the city of Sterling Heights and Utica Community Schools (UCS), *VELOCITY JR.* serves as an incubator for nurturing students' interest in Science, Technology, Engineering and Mathematics (STEM). Recognizing the long-term value of STEM education, the City and UCS have invested in this unique endeavor which benefits not only students, but their future employers who have a critical need for the STEM skill set. Students are enrolled in summer camp courses that are stimulating and fun, not always the words associated with a traditional STEM curriculum. *VELOCITY JR.* has attracted a group of dedicated volunteers from the business community and higher learning institutions who are committed to advancing the cause of STEM educational opportunities. *VELOCITY JR.*, a repurposed elementary school, derives its name from the *VELOCITY* Collaboration Center based in Sterling Heights. VELOCITY is home to a business incubator and other economic development initiatives involving local, state and regional partnerships.

Danny Bright is a 2014 graduate of Utica Community Schools who has had a passion for robotics and engineering since a very young age. He is also a real-life example of the Sterling Heights

vision for *VELOCITY JR.* to create an environment that nurtures and shares a love for Science, Technology, Engineering and Mathematics education.

Danny is a member of a FIRST robotics team in Utica Community Schools that has been honored at international competitions. Through *VELOCITY JR.*, he and his teammates annually sponsor a weeklong camp that promotes robotics for elementary and junior high school students. Through this camp, high school students mentor the younger students as they build, create and program a working robot using VEX Robotics parts. Students at the camp have direct access to engineers from BAE Systems, a global company headquartered in Sterling Heights. BAE engineers also mentor the campers about engineering careers.

Danny said the camps have succeeded in their goal of showing younger students the benefits of STEM-related areas of study. "You could really see the connection the younger students had with the process of building and automating their robot," he said. "There may have been some of the kids who were on the fence about the program, and you could see how this tips the scales for them so they were excited about robotics and engineering." As said by junior high school participant Nino Caiozzo after a week in the camp, "Robotics is my dream career."

Bright is attending Michigan Technological University this fall, a leading research university and recognized leader in technology, engineering and scientific degree programs. He feels well prepared for the challenges ahead based on his participation in robotics education and his time at the Utica Center for Science and Industry – a specialized program that provides study in engineering, mechatronics and multimedia technologies.

Resources for Makers and Communities

- **Manufacturing Alliance of Communities**
  www.ManufacturingAlliance.us/
  202-261-9880
  The Manufacturing Alliance of Communities (MAC) is a national organization of local government leaders that seek to promote policies and resources to keep American manufacturing strong and to ensure that there is solid infrastructure to support this job-generating sector. As part of the Mayors Maker Challenge, MAC is launching the "Maker Mayor Network", a collaborative effort to provide technical assistance and support to local governments seeking to advance their Maker initiatives. The Maker Mayor Network will support localities in the following ways:

  - ***Maker Mayor Advisory Team:*** MAC will convene an advisory group of public, non-profit, and private sector organizations who have expertise and tools for helping cities boost their makers. This Team will identify how to organize resources nationally and regionally to bring more cities into the maker movement in more robust ways.

  - ***Maker Mayor Manual:*** MAC will work with the advisory team and cities across America to craft a "Maker Mayor Manual" that will provide best practice strategies, practical guidance, and references to other resources for mayors and cities seeking to boost their maker movements.

  - ***Maker Mayor Hands-On Education Series:*** MAC will convene a series of webcasts and convenings, providing mayors and other local officials with information and education on maker strategies, interaction with leading peers, and access to leading resource providers.

  - ***Maker Mayor Technical Assistance Services:*** MAC will provide technical assistance that could include site visits, convening of local Maker Mayor Roundtables, planning and development of specific Maker campaigns in specific cities, and assistance in securing public and philanthropic funding to support city maker efforts.

The Manufacturing Alliance of Communities is managed by a team in Washington DC including:

Bill Hanka, National Director, BillH@HankaAdvisor.com

Matt Ward, National Policy Director, Matt.Ward@StrategiesDC.com

Stephanie Missert, Project Coordinator, SMissert@tfgnet.com

- **Adafruit**
  www.adafruit.com
  Offers a variety of electronic kits and hardware for interactive maker projects as well as a variety of resources including tutorials and guides and weekly video hangouts with experienced makers and engineers.

- **American Association of Community Colleges**
  www.aacc.nche.edu
  The American Association of Community Colleges (AACC) is the primary advocacy organization for the nation's community colleges. The association represents nearly 1,200 two-year, associate degree-granting institutions and more than 13 million students.

- **Arduino**
  www.arduino.cc/
  An open source electronics prototyping platform based on easy to use hardware and software that serves as the basis for many different types of maker projects. Specifically designer for all types of makers, including artists, designers, hobbyists and anyone interested in creating interactive objects or environments. Plenty of tutorials and project ideas for makers of all ages are available through this site.

- **Civic Ninjas**
  http://civicninjas.org/
  Civic Ninjas is part community, part organization, part business. They are a group that is focused on entrepreneurship, the Maker Movement and civic hacking because they are transformative movements that are democratizing how we live, work and play. They connect people by starting conversations, inspire community by producing events, and create solutions by developing code and other tools that solve problems.

- **Corporation for National and Community Service**
  www.nationalservice.gov/
  The Corporation for National and Community Service is a federal agency that helps more than five million Americans improve the lives of their fellow citizens through service.

- **Department of Commerce, Office of Innovation and Entrepreneurship**
  www.eda.gov
  Housed within the Economic Development Administration, the Office of Innovation and Entrepreneurship works to foster a more innovative U.S. economy focused on turning new ideas and inventions into new products and technologies that spur job growth and competitiveness and promote economic development.

- **Institute of Museum and Library Sciences**
  www.imls.gov
  The mission of IMLS is to inspire libraries and museums to advance innovation, lifelong learning, and cultural and civic engagement. IMLS has provided research, policy development, and grant making for maker spaces in communities across the country.

- **Instructables**
  www.instructables.com
  A free, online platform where anyone can explore, document and share do-it-yourself and maker projects involving technology, living, food and play.

- **The Kaufman Foundation Center for Entrepreneurism**
  www.kauffman.org/what-we-do/entrepreneurship
  The Kauffman Foundation works to advance entrepreneurship education and training efforts, to promote startup-friendly policies, and to understand what new firms need to start and grow.

- **Maker Media / Maker Faire**
  http://makerfaire.com/
  Part science fair, part county fair, and part something entirely new, Maker Faire is an all-ages gathering of tech enthusiasts, crafters, educators, tinkerers, hobbyists, engineers, science clubs, authors, artists, students, and commercial exhibitors. All of these "makers" come to Maker Faire to show what they have made and to share what they have learned.

- **Maker Playbook**
  http://www.manufacturingalliance.us/sites/default/files/Maker_Playbook.pdf
  A guide designed to provide public and private leaders at the national, regional and local level an overview of the Maker Movement, recommendations and illustrative examples of the ways that different stakeholders can support making in their local communities.

- **MakerBot Academy**
  www.makerbot.com/academy
  MakerBot, a heavyweight in the 3d printing enterprise market, announced in 2013 that it is on a mission to put a MakerBot Desktop3D Printer in every school in America.

- **Maker's Row**
  www.makersrow.com
  Maker's Row aims to make the manufacturing process for entrepreneurs in the U.S. easier and more efficient by providing a system that individuals and organizations can use to identify the ideal manufacturers nearby for specific products and production requirements.

- **The Public Lab**
  www.publiclab.org
  The Public Laboratory for Open Technology and Science (Public Lab) is a community which develops and applies open-source tools to environmental exploration and investigation. The core Public Lab program is focused on "civic science" in which we research open source hardware and software tools and methods to generate knowledge and share data about community environmental health.

- **Sparkfun**
  www.sparkfun.com
  An online retail store that sells the bits and pieces for electronics projects. SparkFun also offers classes and a number of online tutorials designed to help educate individuals in the wonderful world of embedded electronics.

- **Urban Manufacturing Alliance**
  http://urbanmfg.org/
  The Urban Manufacturing Alliance (UMA) is a national collaborative of non-profit, for-profit and governmental stakeholders working together to grow urban manufacturing, create living wage jobs and catalyze sustainable local economies.

- **White House Office of Science and Technology Policy**
  www.whitehouse.gov/administration/eop/ostp/about
  The mission of the Office of Science and Technology Policy is threefold; first, to provide the President and his senior staff with accurate, relevant, and timely scientific and technical advice on all matters of consequence; second, to ensure that the policies of the Executive Branch are informed by sound science; and third, to ensure that the scientific and technical work of the Executive Branch is properly coordinated so as to provide the greatest benefit to society.