

FREQUENTLY ASKED QUESTIONS (FAQs) *A comprehensive overview of STEAM ENGINE USA*

What is STEAM ENGINE USA?

STEAM ENGINE USA is an initiative, powered by Commerce RI, working to enhance the workforce and economic potential at the intersection of design and manufacturing. We are creating a network of people, companies, ideas, equipment, capabilities, educational opportunities and resources, and activating these assets to bridge the gap between these two critical industry sectors. Our goal is to create opportunities for companies to spur innovation, realize new business opportunities, diversify their products and markets, and grow their workforce talent.

The pilot for this is the STEAM ENGINE USA *Defense Industry Economic Diversification Initiative*, and involves working directly with manufacturers with defense industry contracts to help identify potential new business and market opportunities.

Who is STEAM ENGINE USA for?

- A manufacturer seeking to diversify a defense product for commercial application.
- A manufacturer wanting to access design services to make a product smarter, cheaper, stronger, or better
- A manufacturer looking for capabilities or equipment at another manufacturer to produce a product (B2B)
- A designer looking for a manufacturer to help make their idea a reality
- A manufacturer wanting to find existing "defense-related" Intellectual Property for new product development and enhancements to existing products
- A manufacturer in the defense supply chain that has intellectual property they want to license to another party
- A manufacturer in another state (DoD/OEA network) looking for intellectual property to support a new requirement, or new product in support of an existing DoD client
- Businesses that are part of the supply chain for manufacturers
- Researchers, existing companies, makers and investors who want to help drive the advanced manufacturing economy forward
- Workers and students who want to develop new skills and take on new opportunities
- Citizens who want to see a strong, nimble, and thriving manufacturing economy

What are the STEAM ENGINE USA goals?

- Accelerate manufacturing renaissance
- Company diversification and new product development
- Advance skills to meet new generation manufacturing growth
- Minimize up-front infrastructure costs of manufacturing
- Getting ahead of the curve in key industry shifts: design and manufacturing/defense
- A robust private-academic-public network to advance RI economic interests
- Attract interest and investment in the state
- Define a sustainable model for a design and manufacturing center that will serve other manufacturing sectors
- National center building the Rhode Island defense and manufacturing brand

How will STEAM ENGINE USA reach its goals?

Through the pilot, STEAM ENGINE USA is creating a network of assets – people, companies, equipment, tools, ideas, educational opportunities, and resources – that will act as the foundation for connection and opportunity. In activating these assets, we'll begin to bridge the gap between designers' ideas for new products and processes for innovation, and manufacturers' capabilities in producing products and potential needs for fully realizing their business potential.

STEAM ENGINE USA will also take 20 defense-related manufacturers through a Design Readiness Assessment, where they will be evaluated on over two dozen criteria, including their ability to utilize design thinking, and be given recommendations to enhance, grow or diversify their current business model. The network of assets then becomes a go-to resource for the tools or partners they need to implement the recommendations.

Through all this, STEAM ENGINE USA hopes to smooth the integration of design thinking, capabilities and process in manufacturing companies, and help manufacturers understand the benefits of new technologies such as additive manufacturing, 3D printing, and rapid prototype development.

Who is leading STEAM ENGINE USA?

STEAM ENGINE USA is a public-private partnership, convened by Commerce RI. Partners include universities, colleges, and K-12 schools; trade and industry associations; government stakeholders; investor groups; start-up accelerator and maker spaces; and arts, design and manufacturing-centered non-profit organizations.

Educational institution partners include: the Association of Independent Colleges and Universities of Rhode Island (AICU), Brown University, Rhode Island School of Design, Community College of Rhode Island, Bryant University, New England Institute of Technology, the University of Rhode Island, Rhode Island College, and the Providence Career and Technical Academy.

Government stakeholders include: Commerce Rhode Island (CRI), the Governor's Workforce Board of Rhode Island, the Naval Undersea Warfare Center (NUWC), Rhode Island Science and Technology Advisory Council (STAC) and Polaris MEP, a division of the URI Research Foundation and funded by NIST (National Institute of Standards & Technology) that guides RI manufacturers to sustainable growth, innovative technology strategies and cost efficient operations.

Trade and industry associations include: DESIGNxRI, Rhode Island Marine Trades Association (RIMTA), the Southeastern New England Defense Industry Alliance (SENEDIA), the RI Manufacturers' Association (RIMA), and the Rhode Island Manufacturing Collaborative (RIMC).

Other partners include:

AS220, Cherrystone Angel Group, Founder's League, Innovate Newport, and TinkerBristol.

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How is STEAM ENGINE USA funded?

STEAM ENGINE USA is currently being piloted in the defense industry, thanks to a grant from the U.S. Department of Defense's (DoD) Office of Economic Adjustment (OEA) Defense Industry Adjustment initiative to Commerce RI.

What benefit will it have on the Rhode Island economy?

STEAM ENGINE USA can benefit manufacturers, designers and engineers, workers, educational institutions, businesses that supply manufacturers, and the many sectors of the economy that will benefit from increased investment in the state. The project will bolster Rhode Island's opportunity to be the location for a national center for industrial design and manufacturing, and see job growth and enhanced competitiveness as a result.

During the pilot project, we will conduct an analysis of where possible future DoD spending reductions will impact the state's defense manufacturing companies. STEAM ENGINE USA can help those companies – which receive 10% or more of their revenue from DoD related contracts – adjust their businesses and identify pathways for growth.

Why the focus on design and manufacturing?

Design and manufacturing are two very prevalent and related assets in Rhode Island. In Rhode Island, the design sector added 500 businesses between 2007-2012 despite the recession. Providence has the 3rd highest concentration of industrial designers per capita in the nation. Further, the state has a workforce with over 41,000 (or 9%) directly employed by manufacturing, and 135,000 jobs indirectly created by the industry.

In today's global innovation, manufacturing, and maker economy, design is the key to staying ahead of the curve, fueling product iterations and market realizations. Because 40 to 70% of the manufacturing cost for a product is determined by design, linking designers and manufacturers can help manufacturers make a product more efficiently, control costs and make businesses more competitive. Designers can bring new products to manufacturers, and design thinking can help uncover new applications, new spinoff product lines, and new markets.

By leveraging the state's great strength in manufacturing and its wealth of design thinking talent, STEAM ENGINE USA ensures that Rhode Island businesses capitalize on a growing national trend that recognizes the value of bringing design into the next generation of manufacturing.

Why is the project named STEAM ENGINE USA if it's based in Rhode Island?

The vision for STEAM ENGINE USA is to create a design and manufacturing center that could become a national model for manufacturing industry innovation, business diversification and growth acceleration. Rhode Island has a high concentration of both design and manufacturing assets, making it an excellent place for a project that integrates design thinking and advanced manufacturing. A product's design accounts for 40-70% of its manufacturing cost; with designers and manufacturers working in tandem, products can be designed for lower-cost, efficient manufacture. Designers and manufacturers can collaborate to identify new applications and product lines, lean production systems, new ways to innovate, and new markets. Next-generation manufacturing will capitalize on the strengths a design-manufacturing partnership present.



Where did the idea come from? How did this get started?

In 2013, a group of stakeholders began a series of intensive discussions around realizing the potential of two of Rhode Island's great strengths - manufacturing and design - and incorporating the state's educational assets. A \$100,000 Planning Grant from the federal Investing in Manufacturing Community Partnership (IMCP) program for a Rhode Island Design and Manufacturing Center was awarded in September 2013. The opportunity to apply for Department of Defense funds to seed this plan was made available, and we saw this as a good point of entry for creating models of manufacturing that are lean, innovative, and sustainable. Commerce RI developed a Department of Defense Office of Economic Adjustment Proposal for \$1.575 million that was awarded in September 2014. That grant is funding STEAM ENGINE USA's defense-related manufacturing sector pilot project.

Why is the pilot focusing on defense-related industries?

The pilot project of STEAM ENGINE USA is focused on expanding opportunities and diversifying products produced by Rhode Island's defense-related manufacturers. In Rhode Island, defense-related industries are a vibrant sector of the economy and are well positioned to benefit from the re-shoring of manufacturing jobs. Because of this, we were able to obtain a grant from the Department of Defense's Office of Economic Adjustment. The goal of these funds is to help this industry sector and the businesses within it explore opportunities to potentially diversify and create new product and market options. The fact is many defense-related manufacturers and businesses have talent, equipment, space and know-how that can serve many other industry sectors. If connected with other vast assets in and around the state - including Rhode Island's designers, the state and national intellectual property database, and our esteemed educational institutions - these companies can realize exponential opportunities to their businesses' bottom-lines. STEAM ENGINE USA is working to connect these assets and create a healthy ecosystem for innovation, diversification, and growth.

Is this a federal or state project?

STEAM ENGINE USA is a public-private partnership driven by a team that was convened by Commerce RI, a quasi-state agency charged with growing Rhode Island's economy. Funding for the pilot comes from the federal Department of Defense's Office of Economic Adjustment, which has made similar grants to 18 other states for similar projects addressing defense industry diversification. The vision for the program is to begin in Rhode Island, incorporating neighboring states, and to create a national model for an industrial renaissance.

What happens after the pilot? Will STEAM ENGINE USA continue to exist?

The pilot is phase one of the STEAM ENGINE USA initiative, and the first round of funds to test the business plan developed with the initial IMCP funds. It builds off of two years of work with an engaged group of leaders and stakeholders, and the results will inform the following phases of the effort. Commerce RI and the STEAM ENGINE USA public-private partnership are currently being considered again for an Investing in Manufacturing Communities Partnerships designation through the U.S. Economic Development Administration. This designation will open doors for more funding to support the growth of STEAM ENGINE USA. In addition, we are in talks with the U.S. Department of Defense for a 2nd round of funds through their Office of Economic Adjustment. While these will be helpful

streams to continue to grow this business, STEAM ENGINE USA's business model identifies diversified revenue streams, including payment for services, access and implementation of viable new business opportunities.

Who is managing this project?

STEAM ENGINE USA is an initiative established and powered by Commerce RI in partnership with over 20 leaders and stakeholders in the RI manufacturing and design communities serving in an advisory capacity. The project is being managed by Fourth Economy Consulting and a nationally recognized team of consultants in innovation, workforce development, and communications.

Who else is on the FEC team?

As project lead, FEC manages other project partners: Thomas P. Miller & Associates, LLC (TPMA), a consulting and management firm based in Indianapolis, IN that incorporates workforce development and education advancement approaches into the mainstream of economic development strategy; Innovation Accelerator (IA), the private side of a public-private partnership with the National Science Foundation to promote our nation's competitiveness in the global economy by promoting our nation's innovation; MYRANDA Group, a communications firm with deep experience in economic development campaigns based in Providence; and Orange Square, a marketing communication strategy and design firm based in Pawtucket.

Does STEAM ENGINE USA have a headquarters?

Eventually there will be a need for a physical space component to STEAM ENGINE USA but for now we are able to get started without raising capital for bricks and mortar. FEC has a project team on site running the STEAM ENGINE USA initiative at the Commerce RI office, 315 Iron Horse Way, Providence, RI 02908.

Seems like there are a lot of moving parts in the STEAM ENGINE USA project – can you break it down for me?

To stimulate a manufacturing renaissance, the STEAM ENGINE USA initiative is working to create a productive ecosystem based on talent, partnerships, learning, equipment, tools and resources.

Within the ecosystem, **manufacturers** will need to understand new potential markets and product development based on their current operations. **Designers** will want to find manufacturers that can make their ideas a reality. **Workers** will need to learn new tools and techniques as companies shift focus and grow. **Gaps** will need to be found and resources and tools will need to be established to fill them. All parties will need to find each other and understand how the **relationship** will help them.

During the pilot stage, STEAM ENGINE USA is working to build this ecosystem and test the ideas and tools that hope to bridge the gaps towards larger business and economic success. The key levers of the STEAM ENGINE USA ecosystem are network development, design readiness assessment, industrial design and advanced manufacturing asset sharing, innovation pipeline, and workforce and skills development.

Design Readiness Assessments will lay the groundwork. These DRAs measure manufacturers' readiness to diversify and incorporate design thinking; and through recommendations, show how individual manufacturers can get on the road to innovation, diversification and growth. The **industrial design and advanced manufacturing asset directory** will develop a list of available facilities, equipment, excess capacity, tools and services for potential users to test ideas, connect with potential partners, and access the resources needed to innovate.

At the same time, STEAM ENGINE USA will continue to develop a **network** of manufacturers, designers, educators, investors, consultants, and others who can participate in an **innovation pipeline**. Here, we connect this network further to available intellectual property, through our national partner iBridge, which can help to find matches between the next great idea, and the talent, capacity and potential sitting within a manufacturer.

Finally, as businesses diversify, prototypes are developed, and new products and markets are explored, workers will need to develop the new skills and technological proficiencies they need. STEAM ENGINE USA is centralizing the available curriculum and skills training regionally, and working to fill the gaps in **workforce training and skills development** for the next generation of manufacturing excellence.

What is a Design Readiness Assessment?

A Design Readiness Assessment, or DRA, is meant to profile a company's needs and ability to utilize design-related thinking in its manufacturing business. It will look at core business attributes and existing product development activities to create a level and corresponding set of recommendations for a company to pursue to increase their revenue and profitability. The DRA framework looks at roughly two dozen category areas – including product portfolio, equipment capacity, and upstream and downstream supply chain dependence. It is the first step in diversifying product lines and production, and is conducted by teams of experts convened by STEAM ENGINE USA.

Does the Design Readiness Assessment already exist or is this a new concept? If new, where did the idea come from?

The DRA is modeled after similar measures, Manufacturing Readiness Levels and Technology Readiness Levels, that are used in manufacturing and technology sectors to assess the maturity of a given technology, component, or system from a manufacturing perspective. Those measures provide decision makers with a common understanding of the relative maturity and attendant risks associated with manufacturing the technologies, products, and processes being considered. For STEAM ENGINE USA, DRAs take into account a company's level of preparedness for incorporating design thinking into its business model.

Is there a fee to be part of STEAM ENGINE USA? Do manufacturers pay for the DRA?

No. At this stage, there is no fee to be part of the project or network, and there is no fee for the DRA. Because this is a pilot, costs associated with long-term sustainability of the initiative will be tested and considered during this phase, and then incorporated into the next phase development.

How will you manage the asset directory? Are you going to set up your own business?



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Use of the asset directory will be used based on agreements developed between parties. Organizations can choose to make space, tools, equipment and expertise available, but ownership of those assets will be retained by the original provider.

STEAM ENGINE USA is not going to set up its own business. Our goal is to facilitate economic development. One of our participating partners, the iBridge network, is the world's largest intellectual property marketplace, with over 170 participating universities and 22,000 listed patents and innovations. It engages in intellectual property licensing and enterprise creation. That marketplace model is one of the key elements of STEAM ENGINE USA – it's all about creating opportunity.

Who can be involved in STEAM ENGINE USA?

STEAM ENGINE USA will ultimately be a network of investors, makers, engineers, designers, manufacturers, supply chain experts, educators, and others.

STEAM ENGINE USA is currently putting out a request for qualifications (RFQ). We are seeking qualified industrial designers, supply chain experts, engineers, and others to assist in the DRA process.

How do I get involved?

If you are a **manufacturer**, there are several ways to get involved. You can join our network in order to be linked with designers, investors, and others; you can get listed on our resources directory so that others know if you have excess capacity or tools or resources to include in the marketplace; and you can list intellectual property that you would like to license to others or find intellectual property that is available for licensing. You can also contribute input – we will be holding a series of manufacturer input sessions.

If you are a **designer or engineer**, we invite you to join our network. Whether you have a product you would like to manufacture, or wish to contribute to lean systems development, adapting new manufacturing processes, or innovating within manufacturing companies, STEAM ENGINE USA is bringing together the individuals and organizations that will put your expertise and design talent to work.

If you are an **educator** or part of an **educational institution**, joining the STEAM ENGINE USA network means that you can get involved in workforce skills and development training programs, use your expertise to help drive this manufacturing renaissance, link students and programs with STEAM ENGINE USA opportunities, or list your facilities and/or equipment on the STEAM ENGINE USA asset map. In addition, you can access STEAM ENGINE USA's national partner - iBridge - to create a profile and list intellectual property coming out of your institution.

If you are an **investor**, joining the network gives you a front seat as this innovative project unfolds. The pilot is designed to uncover the potential – for new products, new lines of business, and new and expanding markets – at the point where manufacturing, design, and education strengths intersect. STEAM ENGINE USA's national partner, iBridge, hosts the world's largest intellectual property marketplace, with over 170 participating universities and 22,000 listed patents and innovations. Through this pilot, we'll connect Rhode Island's universities, patents, investors and partners into the iBridge network.

