A2 Investment Project Description

Complete scope of work for the proposed EDA investment
As mentioned earlier, the planning efforts in this proposal build on a highly successful cluster-based economic cluster development strategy and encompass the foundational elements of a strong economic ecosystem including Capital Development, Workforce Development, Economic Ecosystem Development, Market Development, and most important in this day and age of ever-increasing international competition, Innovation Development.

A2.1 Innovation Development
While a well designed strategy requires a balanced approach, the first component supporting the advanced composites cluster we will address is possibly the most important. This is especially true when it is recognized that manufacturing clusters that support quickly evolving international industries such as aerospace, clean energy, and transportation must innovate rapidly to meet market demands. Specifically, we will address the Component of Innovation. In Utah’s cluster effort during the mid-2000’s under Governor Jon Huntsman, the most evidently missing piece of the advanced composites cluster work was that of innovation. The link between innovation and sustainable job creation is evident in any of the high technology fields where innovative companies move markets in a matter of years rather than decades. Thus, creating sustainable, regional jobs requires a heavy investment in innovation resulting in products able to gain unique market positions for regional companies.

As outlined in section A1, our innovation strategy will focus on:
- Using the highly successful Utah Science, Technology, and Research (USTAR) Initiative we will create a strategic plan to recruit a team or teams of named university-level, best-in-class researchers to work together with industry to feed the innovation needs of the advanced composites cluster.
- We will create a unique Intellectual Property roadmap to inform industry and researchers alike of the IP positioning needed for sustainable international competitiveness
- Finally, we will develop an implementable plan to site a regional research, development, and incubation center or centers to foster university and corporate innovation, offer shared services and training, and attract innovation capital.

Figure: The Utah Advanced Composites Cluster Strategy: Our plan will focus on creating an implementable plan based on strategies aimed at building the Economic Ecosystem Infrastructure, Innovation Environment, Workforce capabilities, Strengthening the National and Export Markets, and Recruiting a Capital Market to support our Advanced Composites Cluster.
A2.1.1 Research Recruitment

Our strategy to dramatically strengthen the innovative environment surrounding Utah’s advanced composite cluster leverages several Utah programs that have shown strong performance in recent years. Specifically, during the performance of the proposed work we will work with the Utah Science Technology and Research Initiative (USTAR) team to create a specific researcher recruitment plan to attract a team of named university-level, best-in-class researchers to work together with industry to feed the innovation needs of the advanced composites cluster. The steps to build this recruiting list are as follows:

1) Gather a panel of leading companies to advise on specific research areas that are relevant to the next 5- to 10-year horizon in advanced composites

2) Search the academic literature and patent databases to discover researchers in the areas defined by industry. Also, gather names of researchers already working with Utah companies

3) Reach out to the laboratories and researchers identified in steps 1) and 2) to create a “short-list” of potential research recruits. This list may include principal researchers or target their graduates and post-doctoral fellows

Industry members suggest the following research areas to enhance Utah’s innovation environment:

- Applied research geared toward lowering the cost and improving the properties of carbon fiber
- Applied research geared toward lowering the cost and enhancing the properties of improved resin systems
- Applied research in altering mechanical properties of composite structures with nano materials
- Research in embedding electo-optic assemblies in composite materials: nano and micro structures

A2.1.1.1 About USTAR

One of the primary foundations of this planning proposal is the team designing an implementation-ready strategy for growing and sustaining Utah’s advanced composite cluster will leverage many exiting programs in Utah. The various programs we will leverage have discovered general best practices and refined those best practices to regional relevance. An example is the USTAR Initiative.
USTAR Recruiting Innovation and Research Teams in Defined Focus Areas

To accomplish its objectives, USTAR collaborates with the University of Utah (U of U) and Utah State University (USU) to create world-class research teams in strategic innovation development areas. Highly regarded faculty members, supported by teams of cutting-edge researchers, lead these teams.

The characteristics of these innovation focus areas:
1. Are based on existing university strengths
2. Have vast commercialization opportunities
3. Address large and strategic global markets
4. Leverage Utah industry strengths

Leading Innovators

USTAR has gone to great lengths to secure some of the best talent to head up their research teams. Since its inception, USTAR has attracted 50 leading researchers from MIT, Harvard University, UCLA, Case Western, University of Arizona, Oak Ridge National Laboratory, and other top research institutions to work in the areas of biodevice/biopharma, energy, digital media, imaging technology, nanotechnology, medical imaging and brain medicine.

State-of-the-Art Facilities

State funding of USTAR includes a significant investment in world-class research facilities at the USU and the U of U to give our research teams top-of-the-line environments in which to conduct their work. The secondary purpose is also critical, and that is to foster connections among industry, entrepreneurship, and research.

A2.1.1.2 The Advanced Composites Cluster Use of the USTAR Model

The advanced composites cluster certainly meets the criteria for the USTAR recruiting model with one specific exception. The research community within the three major Utah universities in proximity to the concentration of the composites industry-- University of Utah, Utah State University, and Weber State University-- demonstrates relatively limited activity in the advanced composites space. The one exception is Dr. Daniel Adams’ laboratory at the University of Utah.

We will create a plan that leverages the USTAR recruitment model and the building and programming model. In recruiting over 50 high-end faculty members in its short 7-year existence, the USTAR program has discovered streamlined recruitment strategies and has refined the introduction of new faculty members to Utah’s capital, industrial, and academic communities. As a result, USTAR faculty have shown a very high level of performance:

<table>
<thead>
<tr>
<th>Metric</th>
<th>Ratio compared to Non USTAR faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extramural Funding</td>
<td>1.5</td>
</tr>
<tr>
<td>Invention Disclosures</td>
<td>8.4</td>
</tr>
<tr>
<td>Provisional US Patents Filed</td>
<td>5.8</td>
</tr>
</tbody>
</table>
### Intellectual Property (IP) Management

In an over-used business analogy, Hall of Fame Hockey Player Wayne Gretzky suggested, “A good hockey player plays where the puck is. A great hockey player plays where the puck is going to be.” With respect to business, good companies have IP that protects their business, and great companies build IP that protects their future. With this in mind, we will create an implementable strategy where the University of Utah’s Technology and Venture Commercialization (TVC) Group works with corporate partners in the advanced composites cluster to create IP maps that will guide collaborative research and development projects within industry and at the to-be-planned Advanced Composites Innovation Center.

In this planning phase we will explore the use of tools such as MDB Capital Group’s PatentVest. The TVC group is currently working with PatentVest and exploring similar tools to help analyze IP and plan IP development.

**About PatentVest**

To gain a perspective on the current IP landscape that is both broad and deep, the MDB Capital Group built and maintains PatentVest, a patent database that provides clients with an unrivaled perspective. PatentVest’s integrated database, search engine and analytics tools provide an objective framework to model IP for investment analysis and business intelligence.

PatentVest calculates a number of sophisticated and proprietary metrics relating to the strength and quality of a company’s patent portfolio. Each of these metrics is presented in a standard PatentVest Report.

A large number of patent classification tools and patent databases exist. In fact, the University of Utah is collaborating with a local company, Enclavix on a patent search and visualization tool. In creating an implementation-ready plan for IP property management we will explore many of these tools. As an example we will leverage the TVC’s recent experience in their use of PatentVest.

The expectation is that well-vetted, strong IP portfolios will secure our advanced composites cluster’s competitive position in the international marketplace.

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A2.1.3 **Advanced Composites Innovation Center(s)**

Moving innovations from university-based basic research to corporate research and development efforts is difficult. Add bringing strong management and capital to the mix and the task borders on impossible. Regions that have successfully accomplished this task have achieved densities of innovation and people that form a critical mass enabling their success.

As mentioned earlier, Utah’s advanced composite cluster represents one of the highest, if not highest densities of advanced composites industry in the nation. To drive this density toward critical mass we will create an implementation-ready plan to build a regional research, development, and incubation center or centers to foster university and corporate innovation, attract innovation capital, and in incubate innovation for the commercial market.

This center will house: the recruited university research teams as a collaborative of Utah State University (USU), Weber State University (WSU), and the University of Utah (U of U); shared space with industry research and development laboratories; incubator space for maturing innovations, and a variety of shared services and training missions with the applied technology colleges and community colleges.

In our planning efforts we will study a number of similar institutions including:

1) AC Corridor extending from Port Angeles to Bremerton, WA, a “not-for-profit collaborative center that will help ‘fast track’ innovative technologies to full-scale manufacturing and be a training resource closely aligned with regional composites training programs.” [http://www.olympiccomposites.org/](http://www.olympiccomposites.org/)

2) Composites Manufacturing Campus at the Port of Port Angeles, WA, co-located inside Angeles Composites Technology Inc. [http://www.olympiccomposites.org/campus.htm](http://www.olympiccomposites.org/campus.htm)


6) National Institute for Aviation Research Composites Laboratory at Wichita State University, Wichita, KS. Home of the FAA Center of Excellence for Composites and Advanced Manufacturing. [http://www.niar.wichita.edu/coe/cecam.asp](http://www.niar.wichita.edu/coe/cecam.asp)
The plan will focus on establishing the centers in economically disadvantaged locations and assuring that the following characteristics of site location are also addressed:

1) **The site is near a high density of advanced composite companies to help achieve a critical mass and use of resources:**

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>LOCATION</th>
<th>EMPLOYEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineering &amp; Support</td>
<td>Weber County</td>
<td>50-99</td>
</tr>
<tr>
<td>Aerospace Support &amp; Services</td>
<td>Davis County</td>
<td>50-99</td>
</tr>
<tr>
<td>American Valley Aviation</td>
<td>Davis County</td>
<td>1-4</td>
</tr>
<tr>
<td>ATK Launch Systems</td>
<td>Davis County</td>
<td>100-249</td>
</tr>
<tr>
<td>ATK Launch Systems</td>
<td>Box Elder County</td>
<td>1000-1999</td>
</tr>
<tr>
<td>ATK Space Systems</td>
<td>Davis County</td>
<td>500-999</td>
</tr>
<tr>
<td>Aviation Materials Mgt</td>
<td>Weber County</td>
<td>10-19</td>
</tr>
<tr>
<td>Barnes Group</td>
<td>Weber County</td>
<td>100-249</td>
</tr>
<tr>
<td>The Boeing Co</td>
<td>Davis, Weber, Box Elder Counties</td>
<td>500 - 999</td>
</tr>
<tr>
<td>Camonix Corporation</td>
<td>Davis County</td>
<td>1-4</td>
</tr>
<tr>
<td>Contour Composites</td>
<td>Davis County</td>
<td>10-19</td>
</tr>
<tr>
<td>Diverse Designs</td>
<td>Box Elder County</td>
<td>1-4</td>
</tr>
<tr>
<td>FMC Jetway Systems</td>
<td>Weber County</td>
<td>250-499</td>
</tr>
<tr>
<td>General Atomics</td>
<td>Davis County</td>
<td>100-249</td>
</tr>
<tr>
<td>Hexcel</td>
<td>Salt Lake County</td>
<td>100-249</td>
</tr>
<tr>
<td>Hill Air Force Base</td>
<td>Davis County</td>
<td>20,000+</td>
</tr>
<tr>
<td>HyPerComp Engineering</td>
<td>Weber County</td>
<td>10-20</td>
</tr>
<tr>
<td>Kihomac</td>
<td>Weber County</td>
<td>20-49</td>
</tr>
<tr>
<td>Lockheed Martin</td>
<td>Davis County</td>
<td>100-249</td>
</tr>
<tr>
<td>M1 Support Services</td>
<td>Davis County</td>
<td>20-49</td>
</tr>
<tr>
<td>MC Tech</td>
<td>Weber County</td>
<td>1-4</td>
</tr>
<tr>
<td>Mission Support INC</td>
<td>Davis County</td>
<td>20-49</td>
</tr>
<tr>
<td>New Matco</td>
<td>Davis County</td>
<td>10-19</td>
</tr>
</tbody>
</table>
Northrop Grumman | Davis County | 250-499
Orbital Sciences Corp. | Box Elder County | n/a
Parker-Hannifin Corp | Weber County | 500-999
Peterson, Inc | Weber County | 250-499
Williams International Co | Weber County | 250-499
Vexxel Composites | Box Elder County | 20-49
TCR Composites | Weber County | 100-249
TCB Composites | Weber County | 50-99

2) Located within adequate public and private transportation Mass transit (e.g. Frontrunner, TRAX, Bus routes)

Construction was completed in winter 2012 on a 88-mile FrontRunner commuter rail line from Provo in Utah County north to the northern end of Weber County (Ogden). The FrontRunner system has exceeded ridership projections, transporting over 7,000 travelers daily. This provides commuter rail along the entire Wasatch Front, where roughly 80% of Utah’s population resides.

TRAX

The 15-mile Salt Lake City to Sandy and 4-mile downtown to University of Utah TRAX light rail lines have been a huge success and transport, on average, over 55,000 travelers daily, greatly exceeding initial ridership projections. UTA is working on expanding the TRAX light rail system to include more east-west lines, including an extension from downtown Salt Lake City to the International Airport (Completed April 2013).

Bus System and Intermodal Hub

UTA operates 140 bus routes covering 1,400 square miles with a daily estimated count of 71,000 travelers. The new Union Pacific Intermodal Hub serves as a transportation nerve center in downtown Salt Lake City, complete with an Amtrak station, Greyhound bus depot, bus transfer station, light rail station, commuter rail station, taxi cab stands, amenities for bikers and ample parking space.
Air Travel
Salt Lake City International Airport served 21 million passengers in 2010, which ranks as the 24th busiest airport in North America and the 62nd busiest in the world. In 2010, there were 362,654 operations (take-offs and landings) including commercial air traffic, general aviation and military activity.

Freeway Access
Nearby Freeway access (I-15 and I-80 “Crossroads of the West”)

3) Adjacent to synergistic and/or complementary facilities
   - University/College facilities such as:
     - Ogden/Weber Tech College Advanced Composite and Non-destructive Inspection center at Business Depot Ogden
     - Utah Center for Aeronautical Innovation and Design at Weber State Univ.
     - Advanced Technology Colleges (ATC)
     - Manufacturing Extension Services
     - Military installations (Hill Air Force Base)

4) Relatively inexpensive space for Startup companies
   - Business Depot Ogden (BDO)
   - Ogden/Weber Tech College
   - Trackline Flex Business Park
   - Downtown Ogden
   - Ogden Intermodal Hub
   - Davis ATC campus
   - Brigham City/USU
   - Clearfield Freeport area)

5) An exciting environment and attractive facility/atmosphere to capture new engineering and science students from Utah’s universities

6) Area attractive to developers to create research parks

A2.1.3.1 Leveraging Existing Efforts in Private/Public Centers
As part of the establishment of an Innovation Center(s) we will engage strategies that leverage same style centers to create a network of capabilities and innovation creation and maturation.

We will develop an implementation-ready plan to extent the programming at Utah Valley University’s Rapid Development Center (RDC) to include rapid development techniques associated with advanced composites materials.

As part of the establishment of an Innovation Center(s) we will engage strategies that leverage same style centers. In this case, the RDC at Utah Valley University (UVU) is focused primarily
on creating software and/or physical product prototypes from customer concepts using cutting edge software tools and product modeling technologies. Typically the RDC services customers from the information technology, software development, engineering, and advanced manufacturing industries. Our plan calls for approximately 5000 square feet of additional production space using state of the art prototyping equipment such as 3D printers and scanners, mills, lathes and injection molders. The RDC is staffed with two professors and two industry experts and will have a continual staffing of six to ten students working on degrees ranging from computer science and software engineering to technology management.

Leveraging this program allows us easy access to a group focused on rapid development.
A2.1.4 Capital Development

The second component supporting the advanced composites cluster with which we concerned underlies our ability to move innovations into the market. Again, in Utah’s cluster effort during the mid-2000s under Governor Jon Huntsman, a missing piece of the advanced composites cluster work was that of capital development. The link between innovation and sustainable job creation is evident in any of the high technology fields and is fueled by a strong capital market.

As outlined in section A1, during the planning phase of this work, the capital market development team will create an implementable plan for developing a capital recruitment and placement strategy. This strategy will address capital needs in early technology development (research and seed funding), early company growth (angel and venture), and company expansion (growth capital, debt, private equity, IPO, and merger/acquisition). The strategy will include recruiting investment funds from strategic corporate investors, federal funding in both main federal programs and their associated SBIR/STTR programs, early investors (seed/angel), venture investors, private equity investors, and debt instruments.

This group will also create an implementable model of technology transfer that will address moving technology from research institutions to corporate entities. This model will focus on multiple paths to innovation creation including: corporate-sponsored research, federally-sponsored research, and multiple corporate entities ranging from early-stage start-up to multinational corporate partners.

Planning Grant Targets:

Implementable Plan for:

- Fund development that strategically incorporates private, strategic, state, and federal funds
- In planning this fund, use Utah’s discovered best practices in fund development
- Employ a technology commercialization strategy aligned with the developed capital strategy and supported by the Advanced Composites Innovation Center

Long-term Goal:

- Sustainable funding model to create an economic engine that moves IP formed by the collaboration of Utah’s advanced composites industry with advanced researchers to developmental companies that create either significant stand-alone companies or strategic growth opportunities via acquisition for Utah’s existing companies.

Today in Utah, several groups have well-tested, effective models of funding early-stage innovation, early-stage companies, and mid-market companies.
Additionally, Utah has implemented a successful strategy to attract outside funds to Utah through the Utah Fund of Funds. Each of these Utah programs originally borrowed extensively from predecessor programs found throughout the United States and then these models were modified to better fit Utah’s environment. Today, Utah’s programs and models are routinely considered best practices. We will leverage these groups to design an implementation-ready plan for the creation of sustainable capital models to support the advanced composites space.

The table below lists the investment initiatives and funds in the State of Utah willing to advise our team on designing an implementation-ready strategy for building an Advanced Composites Capital Market. Additionally, team members on this proposal played key roles in the development and success of more than half of the programs listed below. Similarly, we will use the best practices found in these groups in designing a capital strategy for Utah’s advanced composites market.

<table>
<thead>
<tr>
<th>Fund</th>
<th>Strength</th>
<th>Focus</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Utah TVC Engine Program</td>
<td>Targeted, vetted ideation investing</td>
<td>Initial ideation</td>
<td>$1.2M Annually</td>
</tr>
<tr>
<td>Upstart</td>
<td>Early funding, with strong business leadership</td>
<td>Ideation</td>
<td>$15M Fund I</td>
</tr>
<tr>
<td></td>
<td>Helps early companies with capital and highly experienced management</td>
<td>Pre-management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-revenue</td>
<td></td>
</tr>
<tr>
<td>Kickstart</td>
<td>Capital efficient models</td>
<td>Idea tion</td>
<td>$26M Fund II</td>
</tr>
<tr>
<td></td>
<td>Partnering with area angel groups</td>
<td>Pre-revenue</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community-based Investing</td>
<td>Early revenue</td>
<td></td>
</tr>
<tr>
<td>U of U TVC Fund</td>
<td>Technology commercialization</td>
<td>Ideation</td>
<td>$10M Target</td>
</tr>
<tr>
<td></td>
<td>Partnering with local funds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recruitment of non local funds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pelion Ventures</td>
<td>Venture investing</td>
<td>Early investing</td>
<td>$194M Fund V</td>
</tr>
<tr>
<td></td>
<td>Entrepreneur mentoring</td>
<td>Pre and post revenue</td>
<td></td>
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<tr>
<td></td>
<td>Deal syndication</td>
<td>A/B/C Round investing</td>
<td></td>
</tr>
<tr>
<td>Utah Fund of Funds</td>
<td>Investment in venture funds — Outreach to non-regional capital</td>
<td>Seed, venture and</td>
<td>$300M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>growth capital fund</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>investing</td>
<td></td>
</tr>
<tr>
<td>Sorenson Capital</td>
<td>Private equity investing</td>
<td>Post-revenue</td>
<td>$400M Fund II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Growth capital</td>
<td></td>
</tr>
</tbody>
</table>
A2.1.4.1 Ideation Funding Programs

Investment Process (from the University of Utah Technology and Venture Commercialization)

Over the past six years, the U of U’s TVC has consistently rated as one of the nation’s most prolific commercialization centers and 2012 data show the trend is continuing. The TVC started 18 new companies in 2011, whereas MIT generated the most startups of any institution at 25. The TVC was ranked No. 1 in 2009 and 2010, tied for first in 2008 and was No. 2 in 2006 and 2007. In addition to the number of start-up formations, the U of U also ranked well above average in multiple categories, such as licenses, patents, and disclosures.

The U of U TVC has built a robust commercialization engine that discloses, tracks, funds and assists university technology and companies in their growth, value creation and commercialization. The TVC describes its commercialization process as its “Commercialization Engine” (hereafter “Engine”). The TVC Engine has combined all funding resources and programs into an integrated commercialization funding program focused on early-stage vetting, de-risking and development of ideas and technologies. This Engine is a milestone-driven process that provides faculty inventors with business guidance (a business “Champion”) and incremental funding to move discoveries through stages toward commercialization.

The Engine is a three-stage, flexible framework built to develop and execute a commercialization plan. The initial stage of the Engine is discovery, which is focused on the potential product, market, and customer. The second stage is focused on de-risking, which includes obtaining actionable feedback from the market and developing the critical path forward. The third stage focuses on executing the business case/model, including building a management team, obtaining initial investment, and generating first revenue. In addition to funding, each project ideally will have a business Champion; an experienced entrepreneur/business expert who will have the business and market knowledge to help guide the principal investor (“PI”) through the business issues in commercialization.

The Business and Technology Development Manager (“BTDM”) at the TVC will work with the PI to prepare the funding request, identify the appropriate funding amount, and develop the
presentation for the Engine Committee meeting. Once funded, an engaged business Champion
will begin execution of the milestones laid out in the funding request.

The TVC Engine is one of the reasons the U of U TVC is considered among the best
commercialization offices in the United States; in fact, the TVC manages over 250 technologies
per year through the Engine. The TVC Engine provides every university technology with a
process of discovery and validation, and for technologies with promise, milestone identification,
risk mitigation, resource allocation, and accountability.

Throughout the Engine’s multiple step process, technologies are either removed or propelled
forward; many technologies do not proceed past the initial stage. This Engine is unique to
universities and investment firms, driven by the TVC’s large annual budget and large highly skilled
staff. In comparison, a $25M venture fund will have a team of 2 to 4 individuals and an annual
budget of $625K; the TVC has a 675% larger team and a 1,180% larger budget.

**TVC Fund**

The TVC Fund I, LP (“TVC Fund” or “Fund”) is a seed stage venture capital fund that has a
strategic relationship as a preferred funder to invest alongside the U of U’s TVC. The Fund is
expected to invest, at a minimum, on a 50/50 basis alongside the TVC in all of the TVC
investments. The Fund intends to fully and completely mirror the TVC office investment
decisions. The Fund will participate in the TVC’s milestone investment approach; providing each
investment small amounts of finance and accelerating financing amounts as technologies
progress through successful milestones. The TVC Fund will provide additional capital for the
most promising university technology, allow the TVC to retain larger ownership positions, give
more technologies the opportunity to receive funding, and improve risk exposure through
greater diversification. **TVC Fund**

A.2.1.4.2 **Seed and Angel Investing:**
Early development/pre-revenue/early revenue

**UpStart Ventures:**

Start Ventures (“UpStart”) partners with universities and technology founders through both
capital investment and business foundation expertise. UpStart will identify what it regards as
highly promising portfolio opportunities, team up with founding scientists, and form and initially
manage the majority of the Fund’s portfolio companies, referred to as “business founders”. The
Fund will usually acquire approximately 50% of a portfolio company’s initial founders’ stock at a
very modest cost. Such a large equity stake, though subject to dilution by later rounds of
financing, is expected to leave the Fund with a significant ownership position when its
investments liquidate.

Scientific co-founders are chosen with care not only for the commercial potential of their
science but also for their personal motivation to bring their science to the marketplace
expeditiously. Their ability to focus on the key research for a sustained period of time and to
reliably meet milestones for its development are important considerations. The traits of energy,
ambition, and integrity are just as important for scientific founders as they are for business managers.

UpStart’s startups will exclusively license core technologies from the science co-founder’s universities, with complementary technologies often licensed from other leading institutions. UpStart anticipates that kernels of science will often be supplemented by synergistic contributions from other universities that will enable portfolio companies to achieve first-mover status in their fields. Companies previously started by the General Partner’s Principals have successfully employed this strategy: scientific co-founders of Myriad Genetics, Acacia Biosciences, Q Therapeutics, and Sera Prognostic hailed from Harvard, UC Berkeley, Cornell Medical College, and Brigham Young University, respectively.

Once the portfolio companies are formed with a favorable structure, UpStart will achieve an operational advantage by employing a virtual company approach. Rather than spending substantial sums on staff, space, and equipment for each portfolio company, the Fund will realize considerable savings by maintaining the companies in the university labs of their scientific founders at least through preclinical proof-of-concept studies. Much of the basic research will have incubated for many years in the academic labs, funded by government and foundation grants. The Fund will assist its portfolio companies to take full advantage of available grant funds. UpStart is an attractive model for consideration within the Advanced Composites Innovation Center. In the planning process, we will consider the potential of leveraging Upstart’s legal agreements, term sheets, etc., which have been refined over many years of operation.

**Kickstart Ventures**

Kickstart is a seed fund raised using private and university funds that is sector-agnostic. It is interested in strong technology-backed intellectual property as long as it has a clear, capital-efficient path to market. The Kickstart mission is to kick start companies in the Intermountain West by aligning technology creators, industry, entrepreneurs, and capital sources behind the funding and mentoring seed investments. Kickstart focuses on “sourcing, vetting, syndicating and assisting” seed-stage startups and will invest in companies with $1-5M in pre-money valuation that are looking to raise up to $3M, but have previously raised between $100K to $2M.

**Park City Angel Network (PCAN)**

The PCAN is a group of 70+ accredited investors dedicated to improving the investing experience of both the investor and the entrepreneur. PCAN provides seed- and early-stage capital in the range of $150k to $1.5MM. PCAN focuses on investing in companies with promising opportunities whose quality of ideas matches the region’s quality of life.

PCAN’s members are successful businesspeople, entrepreneurs, executives, professionals, and other business leaders who have built and funded strong companies. PCAN mentors and coaches the entrepreneurs in which they invest, serves on their boards, provides contacts, and assists with team building, strategic planning, and fundraising.
The PCAN has a well-structured sourcing system and vetting system. The structure of PCAN is adopted from angel networks around the country and has been adapted to the Utah region. Several regional funds utilize PCAN diligence. In the planning phase we will explore this low cost model of members sharing in the diligence effort for use in the early capital market supporting the advanced composites cluster.

A2.1.4.3 **Venture Investors**

**Pre-revenue/early revenue/early growth**

**Pelion Venture Partners**

working side by side with some of the most innovative companies in the industry, while achieving industry-leading returns for its limited partners. Pelion's technology and market experience has given the fund the ability to understand complex technologies and recognize the potential of emerging companies and new markets.

Pelion Venture Partners seek great minds, resourceful innovators, and resilient entrepreneurs, to which they add their own expertise, forged from the individual experiences of Pelion executives, managers, technologists, lawyers, and financial experts. This experience is the touchstone of success.

Pelion Venture Partners is well placed in the national venture community and brings syndications with several larger outside venture firms from around the country.

A2.1.4.4 **Private Equity Investors**

**Revenue expansion/M&A support**

**Sorenson Capital**

Sorenson Capital is a private equity firm headquartered in Salt Lake City, Utah. Sorenson provides small to middle-market buyout and growth equity investments, with a particular focus on opportunities in selected states in the Mountain and Western regions of the United States.

Sorenson Capital's specialty is partnering with management teams to invest for the long term in companies that have established strategic positions, strong growth characteristics, attractive margins and healthy industry dynamics.

A2.1.4.5 **State Based Investment Programs:**

**Utah Fund of Funds:** Recruitment of Non Local Venture Funds

Utah Fund of Funds focused on bringing alternative capital to Utah in order to finance and grow Utah-based businesses. In addition to capital, the Utah Fund of Funds (UFOF) program recruited funds to participate in the Utah economic ecosystem. More specifically, one cornerstone of UFOF’s approach was “recruitment” where UFOF took advantage of every interaction and opportunity to “recruit” each fund it met. It would be important to persuade
funds regarding the unique and attractive aspects of the State and the State’s clusters. In UFOF’s experience, many fund managers did not know about Utah’s numerous budding businesses and successes. The second stage of recruitment involves getting the fund manager to spend a few days in Utah, at which time UFOF took responsibility to maximize the productivity of managers’ time by introducing them to relevant businesses, entrepreneurs, and government leaders. The UFOF was able to attract unprecedented fund deal flow for a state-based fund of funds. The UFOF met and “recruited” nearly 500 funds to participate in the UFOF program.

For example, the UFOF visited with 2x Consumer Products Growth Partners in 2008. The UFOF team, led by Jeremy Nielson of the Capital Market Development Team, built a strong relationship with the 2x Consumer team to receive UFOF deal flow. Over the next two years the UFOF team sent 2x Consumer several investment opportunities and invited the firm principals to UFOF events. More than 2 years after starting a relationship with 2x Consumer, the UFOF team introduced Orabrush, a Utah-based company, to the firm. This introduction ultimately resulted in an investment by 2x Consumer. Today Orabrush is an active growing company selling their product in Wal-Mart and other major retailers.

Introductions on Behalf of Entrepreneurs and Companies. Another approach is making introductions on behalf of entrepreneurs and companies. UFOF developed a process to maximize the benefit to the entrepreneur/company. UFOF met with over 300 companies and entrepreneurs and made over 1,500 introductions.

The following are a few examples of the efforts outlined above:

Lingotek: Lingotek is a translation software company based in Provo, Utah. Jeremy Neilson made a number of introductions for Lingotek which resulted in an early stage venture capital investment from Flywheel Ventures. Flywheel is not part of the UFOF portfolio. Subsequent to Flywheel’s investment in Lingotek, Flywheel made another investment in a Utah company called InteliSum. This illustrates the tendency of funds, after having made their first investment in a community, to make a second and third investment. The UFOF Program helps in getting that first investment.

Top Ten Review: Top Ten Review is a product review service similar to Consumer Reports. Mr. Neilson made several introductions for Top Ten Review, including an introduction to Highway 12 Ventures, and worked with Top Ten Review for over 12 months. The company eventually received an investment from Highway 12, a UFOF portfolio fund.

A2.1.4.5 Early Stage Investment Program:

In our proposed planning we will explore an early stage investment program with specific focus on creation of strategy for:

1) Matching federal SBIR/STTR funds with both state funds and private funds.
a. Federal funds can serve as a de-risking and antidilution mechanism for seed and angel funding domains. Unfortunately, many companies create SBIR/STTR submissions with divergent interests to early capital investors. The matching of companies creating SBIR/STTR proposals with funding groups can help align the grant writing efforts of both the market and the funds, thereby assuring the potential to develop a private/public partnership fund for matching SBIR/STTR efforts.

2) Creation of fund development co-implemented with incubator/research center development, where the fund would potentially own the incubator's physical space, allowing the added real estate holdings to decrease risk the incubator and capital fund and improve returns.

3) A derivative of the Utah Fund of Funds focused on the advanced composites market with an additional focus on recruiting strategic corporate investors in addition to pure equity investors.

4) A SBIR/STTR Center within the Advanced Composites Innovation Center(s) (see below for description of the Innovation Center(s)) We will base this strategy on the USTAR SBIR/STTR Assistance Center as vying for SBIR/STTR funds can be an intense, complex process, daunting for boot-strapping young companies as well as the more established technology business.

To address this need, the Utah Science Technology and Research Initiative (USTAR) opened the SBIR-STTR Assistance Center (SSAC) in cooperation with and located at Salt Lake Community College-Miller Campus in Sandy. The SSAC is Utah’s source for information and assistance in preparing and submitting SBIR-STTR applications.

Since the SSAC began in 2008, the center has helped more than 100 Utah businesses and innovators and brought more than $4.7 million to the state in federal grants.

USTAR's SSAC application success rate is 25%, considerably higher than the 17% national average.
A2.3 Economic Ecosystem

While the regional economic ecosystem underlying Utah’s advanced composites industry is very robust, several strategic areas could provide for long-term growth and sustainability. In looking at economic ecosystem development, we focus on creating a tight and effective supply chain in Utah. This requires a focus on supply chain elements and the interactions among the supply chain elements. It does little good to build strong export channels if there are significant breaks in the supply chain that create bottlenecks or even stop flow.

We will develop a strategy to further our infrastructure with a focus on:

1) Building a tight, well-informed economic community centered on advanced composites;

2) Transporting products;

3) Developing an in depth analysis of the supply chain to support the growth and sustainability of the advanced composites industry in Utah and undertaking a strategy of company recruitment to strengthen Utah’s supply chain.

A2.3.1 Building a tight, well-informed advanced composites economic community

In the recent past, Utah has successfully started the Advanced Composites Working Group (ACWG) and has worked closely with the Utah branch of the Society for the Advancement of Material Processing and Engineering (Utah SAMPE) to bring about significant communication among advanced composite companies, educators, and government in the state. This communication enables the community to create strategies that strengthen the ecosystem. Examples include:

1) A collaboration of EDCUtah, GOED, and the ACWG performed an initial supply chain analysis. This analysis found a striking lack of tooling manufacturers supporting the advanced composites industry in Utah, which resulted in specific company recruitment efforts to bring one of the premier tooling companies, Janicki Industries, to Utah.

2) Industry partnering with regional vocational schools to create educational programs to fulfill workforce needs on the shop floor.

3) Development of an international marketing effort resulting in the widening of Utah channels to the international market.

4) An enhanced relationship between the international body of SAMPE with the Utah body of SAMPE (now the largest SAMPE branch).
Community development has hit a few broad strokes over the past few years, but enormous potential remains to strengthen the cluster as international competition intensifies. While the various companies communicate and generally know one another, they do not know one another at the product and services level.

**To remedy this we will create an implementable plan for integrating the entire Utah advanced composites industry membership into the newly developed Utah Manufacturing Capabilities Assessment Network (UMCAN) and its accompanying database.**

A2.3.1.1 **The Utah Manufacturing Capabilities Assessment Network (UMCAN)**

The mission of the UMCAN is to enhance, promote, and increase networking, collaboration, and opportunities for growth among Utah manufacturing companies. By creating a system that makes it easy to find manufacturers by capabilities and products, the network will showcase Utah manufacturing and identify opportunities for manufacturers to grow their businesses.

This will be accomplished through the development of a database of Utah manufacturer and cloud-based software that facilitates searching for manufacturers by various and multiple search criteria. This web application will match qualified Utah manufacturers with companies in need of their services. The software will also identify companies that could qualify for new opportunities through implementing improvements, obtaining certifications, adding equipment, or hiring additional employees.

Large Utah manufacturers have expressed interest and willingness to source more of their contracts locally with the potential benefits of reducing costs, shortening lead times, and increasing quality. Purchasing and supply chain managers from several significant manufacturers have stated there are tens of millions of dollars of contracts currently sourced out of state that could be brought back for local manufacturers. Currently it is difficult and time consuming to find Utah-based manufacturers to meet their needs. Furthermore, many small and mid-sized Utah manufacturers currently have limited networking channels with larger Utah companies. Both sizes of manufacturers need each other's capabilities and processes, yet they are unable to connect to solve supply chain issues dealing with logistics, cost, and quality issues.

**The solution.** UMCAN - The network allows companies of all sizes to market their capabilities, qualifications, labor availability, machinery, and processes. It also gives them a simple tool to discover Utah businesses capable of meeting their manufacturing needs. Companies outside of Utah also will have access to the system to find Utah manufacturers qualified to meet their sourcing needs.
Scope of Work of the UMCAN

During the first phase of development we will be working with Utah manufacturers of all sizes and industries, their customers, and other industry constituents to determine what company-specific information to collect and insert into the database. We also will work with them to define what criteria are needed to identify potential opportunities for Utah manufacturers. We will be conducting in-person interviews of manufacturing sourcing professionals and other key decision makers within Utah companies. We also will administer online surveys and phone call interviews as we validate the functionality of the system with the end users.

Being able to collect and manage the correct manufacturing company data is essential to the project’s success. Performing data analysis, determining key performance metrics, and studying industry trends within the software platform are equally important. These analytical tools will be built into the system to help the Utah Manufacturers Association (UMA), the Manufacturing Extension Partnership (MEP), and in the case of advanced composite, EDCUtah and GOED better understand the current state of manufacturing in Utah. This information will enable the UMA and MEP to amplify the positive effect they currently have on the manufacturing industry. These data and output also can assist state and local economic development agencies identify the areas needed for improvement within the supply chain, thus, assisting EDCUtah and GOED in recruiting companies to Utah that fill the advanced composites supply chain needs.

A2.3.2 Analysis of Utah’s Advanced Composite’s Supply Chain and Corporate Recruiting

As remarkable as Utah’s advanced composite supply chain is, a rudimentary analysis shows that Utah is lacking a significant presence of resin production companies (carbon fiber structures are often called string and glue structures, where the carbon fiber is the ‘string’ and specifically designed chemical resins are the ‘glue’). As one can imagine, the resin and its properties make up a large part of the properties of an advanced composite piece. If a rudimentary analysis is able to discover a significant hole in the supply chain, a more detailed and thorough analysis is required.

During the planning grant, performance team members from EDCUtah and the Utah Manufacturing Association will perform a complete supply chain analysis. Using the needs identified for Utah’s advanced composite cluster we will create a list of first, second, and third tier companies for targeted recruiting.

To support the potential corporate recruiting efforts, EDCUtah will create a site list that addresses both sites that are ready and well situated for composite companies and potential sites that require enhancement. We will supply the list of sites and required enhancements to local economic development offices to enable specific site improvement efforts. Our team will focus on sites in economically distressed areas.
A2.3.3 Transport of resources and products

A robust infrastructure must offer the efficient movement of people and product. The legacy of the 2002 Winter Olympics has provided this robust infrastructure in regards to transporting people along the Wasatch Front, where the majority of the advanced composite industry is located. The highway system connecting the more remote counties like Cache Valley, Summit, and Wasatch are also very robust. This infrastructure also serves for intrastate movement of services and product along the Utah advanced composite supply chain. In regards to making the Utah advanced composites cluster more competitive internationally we will look toward reducing the burden of access to foreign merchandise and markets.

Specifically, we will develop an implementation-ready strategy that uses Salt Lake City’s Foreign Trade Zone (FTZ) to increase Utah’s ability to develop international channels. The strategy will explore multiple usage ideas such as the development of shared warehousing and production facilities within the FTZ.

Foreign-Trade Zones (FTZs) are regulated by the Foreign-Trade Zone Board within the U.S. Department of Commerce. The Secretary of Commerce and the Secretary of the Treasury comprise the Foreign-Trade Zone Board. Additionally, The Commissioner of U.S. Customs and Border Protection plays a key role, providing a position during the Board voting process with respect to customs security, control and resource matters.

The Foreign-Trade Zone Board defines a Foreign-Trade Zone as:

“A designated location in the United States where companies can use special procedures that help encourage U.S. activity and value added in competition with foreign alternatives by allowing delayed or reduced duty payments on foreign merchandise, as well as other savings. A site which has been granted zone status may not be used for zone activity until the site has been separately approved for FTZ activation by local U.S. Customs and Border Protection (CBP) officials, and the zone activity remains under the supervision of CBP. FTZ sites and facilities remain within the jurisdiction of local, state or federal governments or agencies.”

FTZs are generally divided into general-purpose zones and subzones. General-purpose zones are typically public facilities used by multiple firms, and are most commonly ports or industrial parks utilized by small to medium-sized businesses for warehousing, distribution and some processing/assembly. Subzones, on the other hand, are sponsored by general-purpose zones, but typically involve a single firm’s site which is used for more extensive manufacturing/processing or warehousing/distribution that cannot easily be accomplished in a general-purpose zone. There are currently 250 general-purpose zones and over 500 subzones approved in the U.S.

Salt Lake City’s Foreign-Trade Zone #30

The original Utah FTZ #30 operated from 1977 until 1996 in Salt Lake City’s International Center. However, the FTZ was deactivated in 1996 due to an apparent lack of use. Most recently, FTZ #30 was re-designated through Board Order 1606, dated February 13, 2009. In this Board Order, the Foreign-Trade Zone Board approved the reorganization and expansion of FTZ
#30 through a public-private partnership between Salt Lake City Corporation and the Rockefeller Group. Under this agreement, Salt Lake City Corporation is the grantee of the FTZ designation on a 55 acre site owned in Salt Lake City that is owned by the Rockefeller Group. FTZ #30 is located between I-80 and SR 201, just west of Bangerter Highway, at 1105 South 4800 West. FTZ #30 is ideal for companies shipping product east. FTZ #30 is across the street from Union Pacific Railroad’s Salt Lake City Intermodal Hub; the Union Pacific railroad’s first intersection for eastbound freight from the three largest West Coast ports of LA/Long Beach, Seattle/Tacoma, and Oakland.

**Regional Foreign-Trade Zones**

While every state in the inter-mountain west has an FTZ, not all are active zones. FTZ #75 in Arizona appears to have led the region in recent years as the most active FTZ in the inter-mountain west. Here is a brief summary of the most active inter-mountain west zones:

- **FTZ #75** in Phoenix, Arizona received over $1B in merchandise for the 9 firms it serves, which in turn employed over 13,800 individuals as of the end of 2010.

- Nevada was second in activity, as of the end of 2010, with two very active zones. FTZ #89 (near Las Vegas) and FTZ #126 (near Reno) combined to receive $675MM in merchandise for the 76 firms they serve; these companies in turn provided 381 jobs.

- **FTZ #123** in Denver, Colorado was the third most active zone in the region. FTZ #110 served one firm, which received over $498MM in merchandise and employed 230 people as of the end of 2010.

- **FTZ #110** in Albuquerque, New Mexico is the region’s fourth most active FTZ. FTZ #110 served one firm, which received over $167MM in merchandise and employed 325 as of the end of 2010.

Nevada was the only state from the inter-mountain west to crack the top 15 for any FTZ activity (number of firms served in NV’s case). No other FTZs from the inter-mountain west ranked in the top 15 in the nation for either exports, employment, value of merchandise received, or number of firms served by the FTZs in each given state.

**National Trends in Foreign-Trade Zones**

- As of the end of 2010, Texas led the nation in FTZ exports, employment, value of merchandise received in FTZs, and number of firms served by the state’s 33 FTZs. Also as of the end of 2010, general-purpose zones in Texas served 394 firms that in turn employed over 51,000 people. California was also a frequent top-five finisher in the nation, for FTZ

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employment, value of merchandise received, and number of firms served by that state’s 18 FTZs.

- Even land-locked states without major sea ports cracked the top 15 in the nation. State such as Tennessee, Nevada and Kentucky all made the top 15 in the nation for either FTZ exports, employment, value of merchandise received, or number of firms served by FTZs.

- The Foreign-Trade Zone Board reports that plastic and composite material manufacturing is taking place FTZ sub-zones in states that include: California, Florida, Indiana, Kentucky, Michigan, Minnesota, Mississippi, New York, Ohio, Oklahoma, South Carolina, Texas, Washington, West Virginia, and Wisconsin.

**Foreign-Trade Zone for IMCP**

FTZ #30 in Utah will be a valuable asset for the region’s composite industry, allowing existing and future companies in the supply chain to benefit from reduced or deferred duty payments and create an ecosystem conducive to expansion into new global markets.

To further increase the utility of FTZ #30, we will explore during the planning grant the requirements of creating multiple subordinate FTZs to FTZ #30. This strategy would allow a broader regional impact of the FTZ’s attributes. For instance, we will specifically explore the potential of the planned Innovation Center(s) as a subordinated FTZ(s).

### A2.3.4 Bringing Best Practices of Manufacturing to the Entire Advanced Composites Cluster

Early in a company’s life, incorporating efficient manufacturing processes is often overlooked. This is partly due to the expense of learning best practices. The MEP works with small and medium-sized businesses throughout Utah to help keep them on track with the resources and training they need to stay profitable. MEP is funded by a federal, state, local and private sources, and is flexible in what they offer business in order to fully serve their needs.

The MEP uses the 5-P Success Strategy, an architecture, like a rack, that is filled with individual services and resources that the particular business needs in order to not just succeed, but to thrive and grow. After testing and evaluation, a tailored suite of services is created that will help the company overcome its’ weaknesses, and begin to increase it’s profit margins and revenues.

We will work with MEP leadership at Utah Valley University to design and fund programs both for large group presentation and individual company training. We will design this strategy as one of the proposal’s “proof-of-concept” strategies. This term is used on a limited number of the smaller strategies in this proposal that will be designed to explore using early federal funds to provide a proof-of-concept for the strategy. To find sustainability we expect to create negotiated metrics that will show the value add of the proof-of-concept implementation and, in turn, earn sustained support from the industrial partners.
A2.4 **Workforce Development**

Workforce development is a community effort and while innovation is critical, integrating innovation into the existing workforce development community is essential to bringing innovation to practice. As stated by Giloth in the 1990s, “Today’s workforce development implies more than employment training in the narrow sense: It means substantial employer engagement, deep community connections, career advancement, integrative human service supports, contextual and industry-driven education and training, reformed community colleges, and connective tissue of networks.” We will partner closely with the Utah Department of Workforce Services (DWS), and their associated board, the State Workforce Investment Board (SWIB), and Governor’s Office of Economic Development (GOED) and heavily leverage their Utah Cluster Acceleration Partnership in planning our Workforce Development strategies. In fact, part of our planning efforts will focus on bringing the fruits of this partnership closer to industry by moving UCAP findings, information, and other data into a tool offered by the Utah Manufacturers Association (UMA).

We will explore the creation of an implementable strategy to use the UMCAN and Department of Workforce Services (DWS) UCAP databases to inform the industry of graduating students.

**SWIB Capabilities:** The statutory authority and duties of the SWIB are to create employer-driven plans for and to assess the implementation of the federal/state workforce investment system to meet Utah’s workforce needs. This Board is comprised of industry representatives, including members from the advanced composite supply chain, and also executives from both the Utah System of Higher Education and the Utah College of Applied Technology. The SWIB’s members are appointed by the governor and have the following statutory functions:

- Develop and oversee Utah’s state workforce services plan
- Develop a statewide employment statistics system
- Designate one-stop operators (DWS is Utah’s designated one-stop operator)
- Forge industry-led partnerships
- Integrate economic and workforce development
- Assist employers with hiring needs.

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2 Learning from the Field: Economic Growth and Workforce Development in the 1990s, Robert P. Giloth. Economic Development Quarterly *November 2000* vol. 14 no. 4 340-359
DWS Capabilities: DWS also has significant workforce development resources throughout the state. DWS administers 36 one-stop offices, each office with staff members who are specifically assigned to work with employers in their community. These staff members have significant relationships with advanced composites firms in Utah, Salt Lake, Davis, Weber, and Box Elder counties. These same staff members also coordinate educational partnerships with the educational institutions in their respective communities that have advanced composite programs.

Distribution of Training Dollars: The State of Utah has a unique, successful partnership that is an ideal distribution mechanism for training funds awarded. The Utah Cluster Acceleration Partnership (UCAP) is a proven model for collaboration in cluster industries, creating synergies among the Utah System of Higher Education, the Department of Workforce Services, and the Governor’s Office of Economic Development. The UCAP Executive Committee, comprised of the executive for each agency, oversees the funding and operations of the program.

The UCAP program provides funding to educational institutions to develop, implement, or enhance educational programs that are responsive to regional and statewide industry needs. Specifically UCAP was created to address the following four opportunities and concerns:

Goal #1 Increase Economic Cluster Connectivity and Educational Alignment
Goal #2 Respond to Skill Gaps
Goal #3 Enhance the Role of the Regional Institutions in Economic Development
Goal #4 Promote Regional Stewardship.

UCAP has contributed to the resolution of each of the original concerns that led to its creation. Outcomes for the program to date have included 22 new certificates or degrees that are aligned with industry needs.

UCAP awards funding to industry/education collaboration groups to develop strategies that will accelerate the growth of a respective industry in Utah. UCAP also awards grants to fund the strategic action items identified by the industry/education collaboration groups.

The strategies developed by the industry/education collaboration groups typically include new educational programs at trade schools, community colleges, and universities. The UCAP program has been highly successful in leveraging funding to create and enhance new educational programs.

Advanced Composites: UCAP has funded several industry/education collaboration groups that support the advanced composites industry. These groups facilitated the development or enhancement of certificate and degree programs that train and educate the workforce in advanced composites professions. The certificate programs include Certificate Composite Materials Technology; Graduate Certificate in Aerospace Management; Certificate Green Construction; and Certificate Green Enterprise Development. The degree programs related to advanced composites that were developed or enhanced by a UCAP industry/
education collaboration group include an Associates degree in Industrial Technology and a BS in Electronics Engineering.

Enrollment in these newly created programs has been significant. For example, enrollment in the BS in Electronics Engineering program was 123 in 2011 and jumped to 179 in 2012. The green construction programs have seen total enrollment of over 1,500. UCAP has shown unprecedented success in being able to develop, design, implement, and start enrolling students in educational programs that meet industry needs.

Deliverables: UCAP has a demonstrated track record of being able to obligate and expend funds in a timely manner. UCAP also has produced significant outcomes that have helped to support industry in Utah. This program is ready made to efficiently distribute grant money to educational institutions that can develop or enhance programs providing a workforce for the advanced composites industry.

We will develop a plan to increase equipment placement in the universities, applied technology colleges, and community colleges. The plan will focus on aligning the training/educational programs with industry needs. As part of the plan, we will explore items such as accelerated amortization schedules for equipment purchased with a planned donation to Utah’s training community.

The cluster initiative begun in 2005 found success in assisting Salt Lake Community College and Davis, Mountainland, and Ogden-Weber Applied Technology Colleges in creating training programs aligned with the advanced composites cluster. These programs benefited from both expertise and equipment donations from industry partners.

The equipment donations achieve two aims; the training programs receive needed pieces of equipment at no expense and since the equipment comes directly from industry the transfer of equipment from industry to training intrinsically aligns training to industry practice.

To strengthen the alignment with industry and assure training programs have current equipment we will create an implementation-ready plan to accelerate equipment donation to the training programs by creating a state program and potentially moving the program to the federal level where accelerated amortization of equipment is allowed on equipment with a planned donation schedule. This will have a two-fold impact. It will encourage industry to renew equipment at a faster rate and will move more current equipment into the training programs.

Working with our industry partners we will create a comprehensive skill set “needs list” for existing and future advanced composites technician level training programs. Using this needs list we will design an implementation-ready plan to reconcile Utah’s technology training programs in advanced composites to the needs list and create a set of advanced composites educational pathways. We will also include potential expansion of programs based on the needs list to addition training institutions in Utah.
Workforce Education Development, Planning, and Implementation

According to a recent report from the National Association of Manufacturers, 51% of the U.S. manufacturing workforce demand is for skilled production workers and 46% for scientists and engineers, while only 7% is for unskilled production workers. However, a workforce deficit has developed as 47% of U.S. manufacturing workers have not completed education beyond high school.

In response to this deficit, Salt Lake Community College in partnership with regional colleges and universities in the Utah System of Higher Education as well as identified Applied Technology Colleges in the Utah College of Applied Technology, have created a common advanced composites curriculum as a foundation for stackable credentials and educational pathways which allow multiple access points for both traditional and non-traditional students.

As part of Utah’s planning strategy for the next level of advanced composites education and training, SLCC will act as the educational convener to bring together industry, government, and university participants to discuss collaboration opportunities for refining and implementing additional composites technologies (e.g., modeling, design, nano, plastics and manufacturing) and training a skilled workforce to meet both short and long-term needs of Utah’s manufacturing employers. A proposed advanced composites educational pathways model would include related, nationally recognized and portable industry certifications, undergraduate, and graduate education credentialing in related areas as indicated below:

**Figure:** We will work with industry and our educational partners to create educational pathways for training the next generation of advanced composites technologists and engineers

Developing and refining this educational model will allow for continuous addition of industry-driven programming and certification requests.
Creation of a Comprehensive Skill Set “Needs” List For Existing and Future Programming

Salt Lake Community college will act as educational convener to manage a comprehensive needs list for existing as well as future programming associated with advanced composites training and education at applied technology and community college levels: Management of the needs lists will be used to identify needed skill sets for the existing and future workforce and identify “skill gaps” in the following areas:

- Career readiness in the area of advanced composites manufacturing. Proposed use of Work Keys assessment tool as part of Utah’s designation in national “work ready” communities agenda.
- Related and national recognized portable industry certifications which should be included in skill development to fill critical position shortages at technician level positions
- Related engineering and STEM educational pathways necessary to grow and sustain a comprehensive workforce for advanced composites manufacturing

We will explore, as a proof-of-concept, the use of instruments such as a forgivable student loan to encourage the movement of the trained workforce to rural areas.

The more rural counties have a problem in growing manufacturing industries, especially those underpinned by technology such as the advanced composites industry. Efforts to develop a new sector in a rural county suffer from the chicken-and-egg problem. A prerequisite to starting a business in a new location is the presence of an appropriately trained workforce, yet how can rural governments direct specialized training if there are no businesses locating in their area?

Garfield County, by many measures, is the most rural county in the State of Utah, and among the poorest. Garfield’s primary economic sectors are travel/tourism and agriculture. While these sectors are the economic foundation of the region and important elements to Utah’s economy, both sectors generally only create jobs that are low paying and seasonal. The depth of the seasonal employment problem can be seen in the figure below.

Figure:
The unemployment rate in Garfield County, Utah. This graph shows the extreme seasonality of Garfield’s economy. Breaking the chicken-and-egg problem could help to stabilize economies in rural areas like Garfield County.
There is an opportunity before us to crack this particular egg.

During the proposed planning phase we will, in collaboration with Garfield County, explore a proof-of-concept strategy to establish a student loan program for students from Garfield County who study advanced materials at an institution of higher learning within the state. The student loans will be forgiven if those students return to Garfield County and either start a business focused on advanced materials or work for a similar, newly established business for a given time.

Such a program would kickstart a kind of economic development Garfield County has never seen and would further the IMCP’s goal of developing advanced materials businesses within the state. To use the well-worn phrase, such a program would be win-win.
A.2.5 Market Development:

Our market development efforts will involve both domestic and foreign markets and focus on leveraging the Governor’s Office of Economic Development (GOED) Procurement and Technical Assistance Center (PTAC), collaboration with EDCUtah for trade show attendance, and international relationships group.

A.2.5.1 Engaging Utah Procurement Technical Assistance Centers for the Advanced Composites Cluster.

We will create an implementation-ready strategy of using the state of Utah’s Procurement and Technical Assistance Center (PTAC) and USTAR groups to track opportunities and provide a framework for industry teams to see contracting opportunities with the federal government and the large integration companies.

A.2.5.1.2 About PTAC’s

The PTAC’s help small businesses with all phases of Government contracting -federal, state, and local. Counselors provide one-on-one and group instruction that helps clients identify contracting opportunities, which can create growth of market share and revenues for them. The government is an excellent customer because they generally purchase in large quantities, and pay their bills on time.

PTAC is an important part of The Governor’s Office of Economic Development, with eight offices throughout the state focused on:

- BID Match software to find bid opportunities.
- One-on-one counseling
- Workshops and Conferences
- Registration Assistance (DUNS, SAM, BIDSYNC)
- Contracting Partnerships:
  - Prime / Sub
  - Mentor / Protégé
  - Teaming agreements
- 8(a) / Hub Zone Opportunities
- Bid Proposals (response to an RFP)
- Procurement Histories / Pricing Data
- GSA Assistance

The PTAC program’s services have served that state extremely well and offer expertise that small and medium business find hard to replicate. As with most services offered by government agencies, scaling is a serious challenge.
In the planning grant, we will explore strategies involving the industrial partners jointly funding a person within the PTAC program who would be focused on the advanced composites cluster. This strategy would leverage PTAC’s infrastructure. We will explore using early federal funds to provide a proof-of-concept for this strategy. To find sustainability we expect to create negotiated metrics that will show the value add of the proof-of-concept implementation and, in turn, earn sustained support from the industrial partners.

A2.5.1 Helping Companies Leverage Existing Efforts in Market Outreach

We will develop a sustainable plan to offer subsidies to small and medium-sized companies participation in international trade missions and the Utah advanced composites trade booth.

A2.5.1.1 Improving Access to National and International Trade Shows

During the initial cluster work initiated in 2005 with the advanced composites cluster, a partnership initiated by GOED with management by EDCUtah created a program to build shared Utah representation at major national and international shows focused on advanced materials. This program continues to include the State of Utah sponsoring a reception and large booth housing Utah companies at major shows.

During the planning grant we will work to create an implementation-ready strategy to build this program that will include:

- Focused recruitment of more companies to participate in the Utah booth
- Technical program presentations highlighting innovations from Utah’s advanced composites clusters
- Coordinated personnel recruitment at the trade shows to enhance Utah’s workforce

Figure: Utah Trade Show Booth: A collaboration of GOED, EDCUtah and the Advanced Composites Working Group (ACWG) created a Utah booth that brings Utah companies together for tour-de-force showing of Utah’s advanced composites cluster. Companies big and small from Utah participate in this booth in shows from Santa Barbara, CA to Paris, France
A2.5.1.1 Foreign Trade Missions with the Governor of Utah

The State of Utah organizes and leads several trade missions each year to different locations around the world. The State of Utah takes great care to ensure that Trade mission focus heavily on Small and Medium Size Enterprizes (SME's). Generally, SME's need to leverage established networks and relationships more than larger corporations do.

A typical trade mission will begin with a US Embassy in-country briefing. This briefing takes each of the trade mission participants through some of the more rudimentary elements of doing business in-country. Topics would include tax and legal considerations, culture and business expectations, security and personal safety to name a few. Following the briefing we arrange one-on-one meetings with companies who are looking to partner, distribute, and/or purchase products that Utah companies sell. These are arranged in several different ways including; US Commercial Services, Third-party consultants, personal networks, and/or host-country government support. In addition to these activities there are meetings with specific government agencies that control or regulate the industries of the companies participating.

The State of Utah leverages Trade Missions not only to increase exports from Utah, but also to attract Foreign Direct Investment. Trade Missions are a great opportunity to make the business case that Utah is the premier business destination in the United States, as attested to by Forbes Magazine who has ranked Utah the Best Place for Business three years in a row. During a trade mission the State presents all of the characteristics that make Utah a very low-risk investment.

The State of Utah led trade missions to Vietnam, Indonesia, Japan, Korea, Mexico, Chile, and Thailand in 2012 and for 2013 trade missions were taken to or planned for Israel, UK, Philippines, Peru, Brazil and China.

We will develop a sustainable plan, based on a proof-of-concept, measured exploration, to offer private and publicly funded subsidies to small- and medium-sized companies for participation in international trade missions and the Utah advanced composites trade booth.
As with exploitation of the state's PTAC program, to find sustainability we expect to create negotiated metrics that will show the value add of the proof-of-concept implementation and, in turn, earn sustained support from the industrial partners.

The expectation in building proof-of-concept programs, like PTAC, SBIR/STTR, and subsidies for trade show attendance and foreign trade missions is during execution of the designed strategies under federal funding is that not all proof-of-concepts will survive the transition from program-supported to industry-supported. Thus, the weight will be on the managers of these programs to find the true value add with the industrial partners during the proof-of-concept period. The advanced composites cluster is dense enough in Utah that we assume there are enough industrial partners to fund true value-added programs.