Aviation and Aerospace ACTION PLAN

SOUTH COUNTY ECONOMIC DEVELOPMENT COUNCIL

1111 Bay Blvd., Suite E. Chula Vista, CA 91911
Phone: 619.424.5143 | Fax: 619.424.5738
www.SouthCountyEDC.com

SCEDC
South County Economic Development Council

Background

The South County Economic Development Council (SCEDC), together with our partners, the City of San Diego, San Diego Regional Economic Development Corporation, East County Economic Development Council and San Diego Military Advisory Council, are collaborating on building resiliency into the defense supply chain. The aviation and aerospace industry is a critical component of this. To better understand the current and future needs and opportunities of this industry, SCEDC conducted an aviation and aerospace forum on May 11, 2017. Representatives from the following companies participated on the panel:

Paul Guckian, VP Engineering
Qualcomm Technologies, Inc.

Robert Walker, Senior Director
of Marketing & Proposals
General Atomics Aeronautical Systems

Jim Edwards, Senior VP,
General Counsel & Corporate Secretary
Cubic Corporation

Mike Grondalski, VP of Operations
UTC Aerospace Systems

Darryl Anunciado, Owner & CEO
Action Drone Inc.

Janine Banuelos, HR Manager
Jabil Packing Solutions – San Diego

The purpose of the forum was to obtain an overview of the status of the Aerospace and Aviation industry in the San Diego region and assist with its resiliency as it relates to the ebb and flow of government contracting and the economy. Manufacturers representing the key facets of the aerospace supply chain, including the military, commercial and recreational division were invited to participate in this event. During the discussion, panelists conveyed the current outlook and future of this industry, together with potential limitations on achieving the industry's full potential in the San Diego region. Opportunities and challenges, together with desirable mitigation actions or needs for the future, are identified throughout the report.

" The next industrial revolution is things ***connected*** *to each other. "*

~ Mike Grondalski, UTC Aerospace Systems

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Military History

"The Navy first sailed into San Diego Bay in 1846. Since that time, the infrastructure to support the Navy and Marine Corps in San Diego has grown to include the largest population of U.S. military in the world. Home to numerous major commands, military installations and approximately 135,000 service members, San Diego's vital air and sea training ranges, the existing military infrastructure, its' network of firms with expertise in shipbuilding, unmanned vehicles and equipment, cybersecurity, electronics, wireless communication, computer systems, and energy and environmental sciences make the San Diego region critical to our national security objectives." [1]

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[1] San Diego Military Advisory Council (SDMAC), *Impact Study – Current Study, 2017.* https://www.sdmac.org/MEIS2017/

> *" **San Diego is unique** in its ability to bring both defense technology and a very robust number of academic institutions to the region. "*
>
> *~ Robert Walker, General Atomics Aeronautical Systems*

"Like the military, San Diego's aerospace industry has a long history in San Diego. In the early 1900s, Ryan Airlines built the Spirit of St. Louis and Reuben Fleet brought Consolidated Aircraft Corporation to Lindbergh Field. Since then, San Diego's aerospace industry has been an integral part of the region's – and the world's – innovation and defense economies. Home to some of the world's largest aerospace, aircraft, and research and development companies, San Diego is a North American aerospace hub. San Diego is also part of a much larger aerospace ecosystem that includes robust operations throughout Southern California. Southern California's aerospace industry employs more than 85,000 people, and in 2014, the industry's output totaled $39.9 billion. Tacking on to the Southern California success, Baja California, Mexico is one of the world's leading aerospace manufacturing hubs – home to Honeywell, Cobham and Eaton, to name a few." [2]

[2] San Diego Regional Economic Development Corporation (EDC), *Our Economy – Aerospace,* 2016. http://www.sandiegobusiness.org/our-economy/aerospace

Commercial and Military Aircraft

Unmanned Aerial Vehicles (UAVs)

The application of UAVs to a wide variety of industry sectors has only begun. Panelists agreed that the collection of data via UAVs will increase efficiency and productivity, and has only begun to infiltrate and cross-over into other industries. They provided examples of UAV usage that included checking utility lines, filming property for sale, determining erosion, and coordinate firefighting, just to mention a few. Panelists noted that the use of UAVs will be driven by the need for data. To understand the full potential of data collection via UAVs, data will need to be managed and put into action. Data collection is limitless, and, as a result, there will be a need to minimize the time used to process the data collected. This is further compounded by multiple users with different software platforms. To achieve this, collaboration and partnerships with universities and research institutions will be critical.

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Commercial and Military Aircraft

Local and federal regulations minimize the potential of UAV usage. Specifically, current local and federal regulations are not sufficiently developed to facilitate drone usage in domestic industrial application. Panelists note the FAA needs to quickly address the integration issue through flight management, and suggest that technology can play a significant role in this. On November 8, 2017 the Department of Transportation issued a notice to establish innovation zones for testing complex UAV operations. This may be an opportunity to address cumbersome regulations.

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San Diego is perfect for testing drones, with its mixed climates, terrain, rural, suburban and urban environments. However, drone users are constrained, especially in the urban environment, due to the flight patterns of airplanes flying into Lindbergh Field International Airport. Panelists used other airports as an example of how to integrate a local airport with drone usage. It was suggested that an opportunity to investigate how other urban airports handle the integration of drones be explored for applicability to San Diego. This will allow for additional data to be collected and provide a baseline for safety and regulations as the FAA moves forward using this data.

Action:

- *Discuss testing of drones in proximity to airport with San Diego International Airport*
- *Discuss how the FAA can be engaged to establish clearer and more consistent policy with regard to local and federal drone usage to better support infrastructure and industry application*

Challenges

Regulations

Many current regulations are a business hindrance. Expanding into the international market has been a strategy that has allowed companies to pivot from national to international work and vice versa, as opportunities arise. However, panelists consider the current regulations governing exports as burdensome and restrictive. Addressing restrictive policies on U.S. exports could lead to accelerated growth in defense related industries. This is especially true of exporting technology. Export restrictions versus interoperability between countries could be addressed through revised policies on international sales.

The regulatory environment in the State of California makes it more difficult to conduct business, especially when using new technology. There is a need to help educate local, state and federal political leaders to ensure they are aware of opportunities that exist in this industry and how they are stymied by regulations that act as a deterrent to system and product development in this region. As such, this industry's economic impact is constrained. Burdensome regulations also lead to the high cost of business operations. That, combined with a high tax rate, is what they attribute to some jobs going out of state.

Action:

- *Identify those specific regulations, state and federal, that are in need of revision*
- *Establish a core group to work with local and Federal representatives to propose clear concise changes in the regulations that are unnecessarily restrictive and impede international trade*
- *Secure Federal trade liaison in San Diego that can directly act as Ombudsman for local companies*
- *Support local assistance programs that provide education and mentorship to small companies desiring international exposure and sale of their products*

Challenges

Resilience Strategies

> *" The missed opportunity is if you don't diversify and you don't look ahead and* ***take risks.*** *"*
>
> *~ Paul Guckian, Qualcomm*

The unpredictable cycle of defense spending was cited as a major concern for companies that need to be responsive. Whether it is Department of Defense budgets, issues with government spending or downsizing of the military, the ability to make your company resilient to this ebb and flow of funding is a challenge. To combat this, companies have created innovative cultures that allow them to serve both the military and commercial markets. As a result, they have become global leaders, developing international markets and maintaining a global presence. This allows them to remain agile and devote their resources where there is a need.

Diversity appears to be the key to success for resiliency. Diversification of suppliers is needed to guarantee product delivery, and the need to foster existing vendors by helping them to grow and diversify helps sustain the vendor base. This allows for rapid turnaround of resources and provides additional sources for raw materials. They noted the need for emerging markets to bring additional suppliers which can further enhance the supplier

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network. To ensure suppliers understand the opportunities with the larger defense contractors, there is a need to ensure connectivity and networking between them, as well as create supplier development opportunities. Several of the companies shared their current efforts toward supporting their suppliers, which included individual company assistance, required training, on-site audits and acting as mentors.

Companies also use technology as a resiliency strategy. Companies conveyed the use of sense and avoid technologies that highlight needed actions, prior to moving ahead with development. Others conveyed investment in their employee's education as critical to their resiliency plan and offered additional training as ways to retain their employees.

Action:

- *Improve supplier network and "safety net"*
- *Support local assistance programs that provide education and mentorship to small companies desiring international exposure and sale of products*
- *Create supplier development and mentor opportunities within major industries*

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Workforce

" We have robust intern programs so that people coming out of the universities can ***work with us*** *during the summer. If they find the work challenging and interesting, we can recruit them. "*

~ Jim Edwards, Cubic Corporation

All of the panelists acknowledged a skill gap and cited a need for additional workforce. There is a desire to recruit and train adequate talent, but several factors are impeding their ability to do this at a level consistent with the growth of their industry.

Looking toward the future, the aerospace industry is in need of an increased workforce that is flexible with crossover skills into various types of jobs. Panelists conveyed there are over 200 recent openings for engineering and manufacturing jobs in San Diego, primarily located in defense or defense supplier companies.

There was concern expressed for both a better skilled and educated workforce. Panelists cited weak technical capabilities in the labor market and shared the need for local universities to create a more educated workforce, especially in engineering, data analysis and interpretation.

One of the current labor concerns, is the need for skilled labor. The blue collar workforce, which was described as “artisans”, are aging and exiting the workforce. The new generation of workers do not have the skill set to backfill these positions. Additionally, there was a sentiment expressed that society may have unintentionally made blue collar work appear less attractive. This has led to a decrease in skills training in high schools. To fill this gap, the panelists suggest increasing familiarization of defense industry opportunities with educators. They also suggest tapping into military personnel who were recently discharged, to augment the shortfall. Panelists cited the high cost of housing; cost of living; cost of labor/wages and many human resource regulations as the major difficulties of recruiting out of state employees. Cultivating a workforce that meets the needs of the region’s growing industries, will help address the labor issues.

Workforce

*" What attracts talent is the **interest** of the work and that's what we focus on. "*

~ Paul Guckian, Qualcomm

*" For the **new** generations coming we see a lot of gaps in technical skills. "*

~ Janine Banuelos, Jabil

Action:

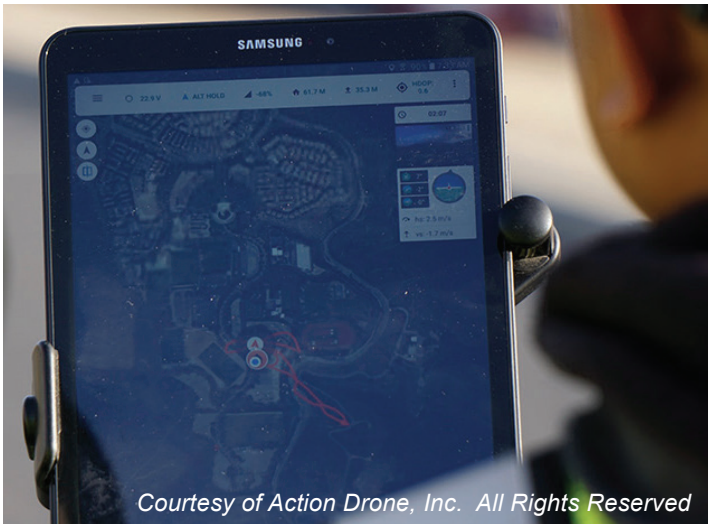
- *Develop a coordinated effort to reach out to high school, college and university students to entice them to enter the STEM fields.*
- *Provide internships to qualified students as an incentive to enter into STEM related fields.*
- *Provide company tours for students and for instructors to emphasize the wide variety of jobs that are available in the aerospace sector.*
- *Strengthen opportunities for retired and discharged military to take advantage of local defense job opportunities*
- *Improve access to and develop specialized training*
- *Establish cross-training opportunities and use existing workforce to train others*
- *Identify specific job requirements and requisite training needs to convey to the education community*
- *Investigate skilled classes returning to schools*
- *Explore the possibility of training collaborations with the requiring companies for difficult and unique training needs*
- *Collaborate with professional organizations to provide a platform to promote and assist with collaboration within the industry*

Workforce

Unmanned Aerial Vehicles (UAV) Training

There is a need to prepare a workforce that uses the latest technology. There is also a need for educators to use that same technology to train the incoming workforce. To address the anticipated increase in the need for UAV pilots, more and expanded training programs must be developed. To accomplish this, panelists suggested the development of curriculum that culminates with the issuance of a UAV pilot certificate and to have classes locally. The UAV pilot certificate should validate that the recipient has the skill set necessary to command a UAV, and the knowledge of the rules and regulations governing UAVs. Furthermore, there will be a need to develop curriculum in the areas of manufacturing and technical services for UAV repair. Once UAV pilots are trained and certified, there will need to be a concerted effort to unite experts in their respective fields with the trained UAV pilots. This will enable experts and pilots to discuss the possibilities for UAV usage in their respective industries.

The primary benefit of using UAVs is the data gathering opportunities. Panelists anticipate an abundance of data being gathered, with an undersupply of trained personnel necessary to interpret it. To ensure we are maximizing the opportunities that UAVs can provide, there is a need for a concerted effort to educate the future workforce in software and data interpretation. The industry currently acknowledges that video gamers have a skill set to become UAV pilots with additional training, however, the interpretation and processing of data will require a different set of skills and training. Additionally, due to the anticipated increase in UAVs, there is a need for flight management personnel and those who can create flight plans using multi-aircraft systems. Bridging the gap between pilots and surveyors, and pilots and data interpreters, is critical to the success of the UAV industry in San Diego.



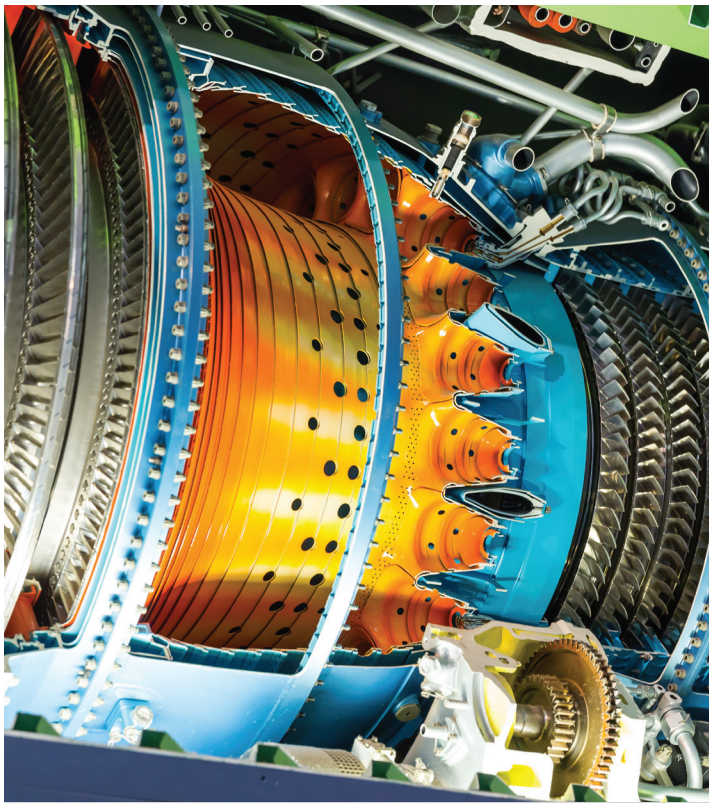
Action:

- *Pursue UAV pilot training certificate programs locally*
- *Determine the existing and anticipated needs for data analyst and flight management personnel*
- *Investigate appropriate technology to manage data analytics*

Workforce

Commercial and Military Training

Both the defense and commercial industry can benefit by using avatars to train crews of commercial airlines and littoral ships. If this method of training were approved, many more flight crews could train in various locations at a substantially reduced cost to the military and airlines. Panelists commented that this could better prepare flight crews, as they would be working with the most recent technology.



Action:

- *Investigate the use of avatars for training*

> *" We work **with the Navy,** using different ways to keep crews current, and even more sophisticated ways of enhanced combat training that is extraordinarily effective. "*
>
> *~ Jim Edwards, Cubic Corporation*

Areas of Innovation and Growth

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" We are currently being bombarded by industries asking us to help develop their ability to use UAVs ***to enhance*** *their capabilities of inspections or other things that are required and hazardous and usually done by humans. "*

~ Darryl Anunciado, Action Drone Inc.

San Diego is uniquely positioned for testing new UAV applications. With its airport located in a metropolitan area, the combination of high rise facilities and the nature of the adjacent airspace, enables unique airspace integration testing capabilities. A prime example of UAV testing in this type of environment, occurs in the State of Florida. Florida allows for a narrowed landing and takeoff strip that offers more opportunities to test UAVs. Panelists suggest that allowing UAV testing in urbanized areas, yields more opportunity for research and development. Additionally, there is a need for large testing areas that allow for UAVs to be tested in natural environments. It was recommended that these areas be large enough to accommodate swarm type testing requirements, as panelists believe that swarm testing abilities will be expanding.

The primary function of UAVs is to gather data. San Diego is home to the San Diego Supercomputer Center (SDSC) which offers high performance computing, grid computing, computational biology, geoinformatics, computational physics, computational chemistry, data management, scientific visualization, and computer networking. Growth opportunities include leveraging the SDSC for data management and interpretation as a critical component of the research and development for this new industry.

Data is collected by sensors, so the manufacturing of sensors offers new opportunities for industrial related jobs. With its location on the international border, San Diego is poised to have the research and development occur within the region, and the manufacturing of sensors occur in northern Baja, Mexico.

" We truly have a ***technology hub*** *here in San Diego that collaborates, innovates and interfaces with a variety of different industries. "*

~ Robert Walker, General Atomics Aeronautical Systems

The represented companies are looking for ways to help develop applications. They cite the need to explore third party applications and expressed that the future is in problem solving products and systems. Panelists cited that research conducted at universities, and government programs such as

those at NASA, are critical to the development of their products. The need for advanced materials development is supported through research by postsecondary educational institutions and research centers. Local university research or collaboration exists in limited manner, but should be encouraged and expanded upon, especially with a focus on the high tech sectors. There is a need for the universities to maintain and invest in their commitment to research and development. Also, there is a need to create more design, research and development support centers throughout the region for product, system and material testing and development. This would allow for a rapid response to customer requests and allow for a "first to market" environment to exist in the San Diego region.

There is an overall consensus that working together would benefit both companies and the region, however, this raised intellectual property and privacy concerns. Panelists noted that the federal government is moving towards open systems architecture and infrastructure requirements. For the region to remain competitive in the areas of design, testing and performance, the sharing and integration of systems is a future model. Panelists thought university access could assist with this effort. Open architecture was cited as one of the immediate tools that could be used for payload adaptability.

Action:

- *Conduct a feasibility study on an R&D/ prototyping center for smart systems that uses shared infrastructure in collaboration with universities, where companies can design, develop and test new systems, materials, and data analytic models*
- *Develop a specialized supplier development program to help integrate regional companies faster and with shared resources*
- *Convene industry representatives to explore systematic change on big issues*

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Aerospace & Aviation Task Force:

Adam Sparks, Mangia Italiano
Becky Cortez, LifeVantage
Bill Tunstall, SCEDC
Dhore Anunciado, Action Drone, Inc.
Eric Washington, Torrey Pines Bank
Flavio Olivieri, CaliBaja
Laura Humphreys, Bayside YMCA
Leonardo Hernandez, HDR Inc.
Nici Boon, NBIC Associates
Patricia Trauth, Rick Engineering
Susan Guerra, Chesnut Properties
Tom Starr, Southwest Airlines
Vanessa Mapula Garcia, SDG&E

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