

## BREAKOUT SESSION 10.

### AIR VEHICLE TECHNOLOGY PART 1

**Concern:** Who can we talk to about us developing electric motor, multi propellers and batteries for NASA Maxwell X57 aircraft? And how about lighter than air structures?

**Response:** Maxwell X57 is not a part of SBIR program. There is nothing in the solicitation with regard to such technology but it doesn't mean that NASA is not interested in it.

**Concern:** Is work around structure and solar and battery support built into a wing in the Zona project still available?

**Response:** Phase I and Phase II have already occurred and the model is built. Now we are waiting for the tunnel time to open. Right now the focus is on the airframe.

**Concern:** The is focus on reducing structural mass, and designing materials and structures and even microstructures. I was wondering if mesoscale geometries, thrust materials, geometries were included in that approach.

**Response:** Yes, it seems it does fit the description in the subtopic area. A big part of this area is also software tools, computational tools to help design such structures. Those are seriously lacking and SBC has IP in that regard.

**Concern:** There is an airframe structure that is broken up per style in the discreet units. It would be better served if NASA requested to bring a concept for how you would bring different disciplines together for an integrated design efforts and NASA would support these breakthroughs with some integrating complementary technologies. Also, despite being small we are more advanced than that. Can you jump levels if we can show we have technologies that are more effective and can be almost ready to commercialize?

**Response:** SBIR has done that in certain areas like hybrid electric or turboelectric propulsion where NASA was seeking out concepts like that. NASA tended to look at SBIR community more at the lower TRL level, but rather for seed ideas which can be raised up to TRL chain. It is a function of the small business' size and resources, and developing system level demo takes these resources. Point well taken, it should be looked at more. And regarding the level jumping, these are very short duration level (6 months) so there is not much time for skipping the levels. If it is a unique idea and it is a 6 months' effort, propose it.

**Concern:** Are you looking at sensors in autonomous aviation transformation? If not, what other aspect of autonomy are you looking at here?

**Response:** There are many aspects in autonomy. Within air vehicles is focus vehicle and aspects on autonomy in items to put on an airplane like sensors, processors, software, radar, etc. There are some subtopics in the draft that capture autonomy aspect, like Vehicle Safety and Situational Awareness. There are aspects in autonomy that NASA is interested and the idea is that we want all of them to come together and contribute to the dream of self-driving card and aircrafts.

**Concern:** Integration into National Space System where the end user may be the FAA - NASA has a lot of innovation and research that helps them formulate the policies. What is practical to the relationship of innovators coming to NASA but balancing it with the FAA and their culture and their appetite to change. With autonomous vehicles it requires some change.

**Response:** Air travel is the safest mode of travel due to regulatory bodies such as FAA since they made sure that the public is safe. NASA provides technologies and work closely with FAA and regulatory bodies, we tell them what is coming and help them prepare for it. E.g. We have some standards that the FAA mandates in terms of emissions for NOx. People are concerned about the particles emission that are going into the atmosphere from aviation we have done research and today potentially with new fuels and bio fuels and we have traced the number and type of particles coming from emissions and we shared them with the FAA. We already see change happening, with electric technology taking place, which helps control the system in the aircraft. The FAA is aware of the change coming and NASA is working with them to make them aware of the new upcoming technologies.

**Concern:** With so many projects under your topic area, how do you do resource allocation to ensure best return on investment in terms of technology. How do you know what technology will pay most?

**Response:** We have outcomes that we lay out in the strategic plan and they dictate the roadmaps that have been created. They have been created and evolve based on observation and interactions with industry, academia, etc. Based on that we create outcomes and work towards it.

**Concern:** Regarding hybrid propulsion systems, is NASA biased towards one fuel VS the other (JP8, Diesel, gasoline)? What are the existing provisions in terms of keeping the company proprietary information from getting disseminated outside of NASA?

**Response:** NASA is agnostic to the fuel and the hybrid system. By law, small businesses have more data rights than any other type of entities that work with the federal government. There are specific data rights and IP provisions that have been written for SBIR and STTR awardees and the information is protected.

**Concern:** When reading the solicitation, there may be many interpretations of scope and it can vary widely from one person to another. How to ensure we stay within the scope?

**Response:** This conference is the first step to open discussion with technical experts. Public forums are a good place to engage.

**Concern:** What is the plan to do convergence across the different projects to get the latest and greatest into Maxwell X-57?

**Response:** Maxwell's purpose is to develop / demonstrate technology; coordinated across all mission directorates.