UAS and SmallSat Weekly News

Contents

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

14Nov20

LILIUM LANDS TAX CREDITS TO HELP BUILD ORLANDO 'VERTIPORT' November 12, 2020 Jim Moore

Lilium, a German company, forged agreements with the city of Orlando, Florida, and a local property developer to build a hub for the electric vertical takeoff and landing Lilium Jet near Orlando International Airport.

The partnership between Lilium, which hopes to certify its battery-powered Lilium Jet in Europe and the United States by 2025, Tavistock Development Co., and the city of Orlando, Florida, was **announced November 11**, billed to be the first urban and regional air mobility hub in the United States. The "vertiport" stands to be added to the growing mix of amenities in Lake Nona, a 17-acre planned community located just southeast of Orlando International Airport. The infrastructure upgrade remains subject to FAA approval, as does the aircraft Lilium hopes to dispatch to destinations around the city, and beyond.

Renderings of the 56,000-square-foot transportation hub depict what could become a job-creating selling point for a **"community of and for the future."** Orlando Mayor Buddy Dyer enthused about the prospect of high-paying jobs supporting a transportation ecosystem that left at least one other local official unable to resist invoking cartoon icon George Jetson and his fictional flying car. https://www.aopa.org/news-and-media/all-news/2020/november/12/florida-fosters-future-flock-of-flying-cars?utm_source=epilot&utm_medium=email

Scientific Systems Conducts Demonstration Teaming UAV with Search and Rescue Canines November 12, 2020 News

In ground breaking research conducted for the Defense Advanced Research Projects Agency Information Innovation Office, Scientific Systems Company, Inc. has demonstrated a team composed of a fully autonomous unmanned aerial vehicle and a search and rescue canine collaborating without intervention from a human handler to conduct a simulated search and rescue mission.

SSCI's Teammate Aware Autonomy (TAA) system was used with its Collaborative Mission Autonomy and Finding Objects thru Closed Loop Understanding of the Scene software. TAA develops predictive models of non-authoritative teammates – in this case a canine – that

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

respond to limited types of commands, enabling novel teams comprised of both autonomous agents and sentient teammates to work together. The UAV, with a birds-eye view of a landscape and powered by artificial intelligence for locating objects, can guide the sentient canine teammate with an unmatched sense of smell.

During this demonstration, the TAA system was successfully used by the FOCUS UAV to navigate the canine, command it to begin a search and identify the canine's alert behavior, cueing the FOCUS UAV to autonomously investigate the alert location. The canine was equipped with an electronic TAA vest, used to both broadcast audio commands to the canine from the UAV and to provide the UAV with real-time data from the canine. This capability is not meant to replace the human handler. Instead, this technology could, in the future, allow a human handler to control a much larger pack of canines and UAV teams, ensuring improved and more responsive search and rescue results. https://uasweekly.com/2020/11/12/scientific-systems-company-conducts-first-of-its-kind-demonstration-using-uav-teamed-with-search-and-rescue-canines/?utm_source=rss&utm_medium=rss&utm_campaign=scientific-systems-company-conducts-first-of-its-kind-demonstration-using-uav-teamed-with-search-and-rescue-canines&utm_term=2020-11-13

Drone powered by hydrogen flies for more than three hours Josh Spires Nov. 13th 2020

An experimental drone has managed to stay in the air for an impressive 3.5 hours thanks to a hydrogen fuel cell developed by a team at the Delft University of Technology in the Netherlands. The vertical take-off and landing drone uses 12 motors. The project is a collaboration among the team from the Delft University of Technology, the Royal Netherlands Navy and the Netherlands Coastguard.

The drone weighs 29 pounds and has a wingspan of 9.8 feet, with six motors on each side of the fuselage. Up to seven motors can stop working without affecting the drone.

While on the ground, the drone is angled up slightly, which is more efficient for the motors to lift the drone as they work more like a helicopter than a plane. To keep itself in the air, it uses a 300-bar 6.8-liter carbon composite hydrogen cylinder fed by an 800-watt fuel cell that converts it to electricity for the motors. As a result of the reaction, the drone emits oxygen and water, making it great for the environment compared to gas-powered drones.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

You can watch the video of the test flight to learn more about the drone and the team behind it. A very cool watch! https://dronedj.com/2020/11/13/drone-powered-by-hydrogen-flies-for-more-than-three-hours/

Hey chum — new Splashdrone feature for night fishing Scott Simmie Nov. 13th 2020

If you haven't heard of using a drone instead of a fishing rod, Splashdrone would like to have a word with you. Not only can it carry and drop a line, but it can also dispense chum while watching with a camera built for low light. Are you hooked yet?

Splashdrone is the name given to the waterproof drones built by Swellpro. As their website explains, "The Base Platform comes with no cameras. After being equipped with different camera or payload release systems, it can be used for filming, fishing, boating or rescue.

It can also dispense up to one kilogram of stinky, sloppy chum into the water to get things rolling. Of course, that means you'll have to *really* clean the dispenser after landing… but it beats dispensing chum by hand.

And while we can't seem to locate a video of chum stirring up schools of voracious fish, we did manage to find something that is arguably more practical: A release system for Search and Rescue. It can easily pinpoint a swimmer in distress and drop a life preserver. And that's cool. See the film: https://dronedj.com/2020/11/13/waterproof-drone-night-fishing/#more-40977

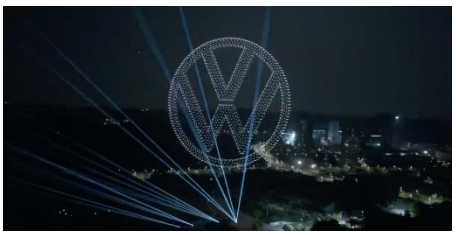
Wild new Volkswagen ID.4 drone show rocks Shenzhen Scott Simmie Nov. 13th 2020

Just yesterday, we brought you the recent record-breaking light show involving 3,051 drones. Today, it's a new show — but it's also impressive.

Today's video features 2,000 drones in perfect sync. Plus, the people who programmed this show knew what they were doing when it comes to the lights. The choreography, if you can call it that, is stellar.

The show was put on to promote Volkswagen. And so, as you might guess, you're going to see some cars. There's one shot where the grill badge literally pops.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net



Clearly, the software and hardware packages are really becoming great. If we had the dough, we'd be in this business in a second. Mind you, charging up 2,000 batteries sounds, well, a little tedious. But we're glad someone was willing to do it! See the show: https://dronedj.com/2020/11/13/wild-new-volkswagen-drone-show-rocks-shenzhen/#more-40964

Medical drones take flight in the Netherlands for the first time Josh Spires Nov. 12th 2020

Over the next few months, medical delivery drones will take flight in the Netherlands between two hospitals to deliver emergency medicines, blood, and other time-sensitive samples. The drones will be flying between the Isala Diaconessenhuis Meppel hospital and the Isala Ziekenhuis hospital. This also marks the first time drones have flown beyond visual line of sight in overpopulated areas.

The drone is that of Dutch manufacturer Avy. It is a vertical take-off and landing drone and is controlled remotely via a pilot. It is fully electric and has been designed to produce as little sound as possible.

The drone can fly at 75 kilometers (~46 miles) per hour and takes 15 to 20 minutes to make its way from one hospital to another. The drones are set to be tested until around mid-2021 and have been granted access to the airspace by the Environment and Transport Inspectorate.

The drones will only be flying during working days and will fly over a 15-kilometer (~9 miles) distance between the hospitals. They will follow a pre-planned path with the airspace around it closed off to any other aircraft. The pre-planned flight ensures the drones don't fly over houses or farms. https://dronedj.com/2020/11/12/medical-drones-take-flight-in-the-netherlands-for-the-first-time/#more-40715

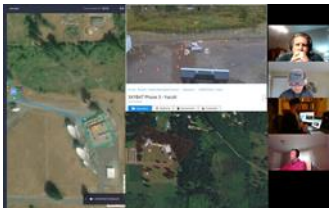
15Nov20

Israeli drone kept tabs on spread of fire in Washington state SHOSHANNA SOLOMON 8 November 2020

A drone developed by Israel's Percepto, a maker of unmanned aerial vehicles, helped telecom conglomerate Verizon inspect critical communications infrastructure that could have been

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

destroyed by fire in the state of Washington, ensuring the potentially life-saving communications capability of rescue workers who could not access the area in person.



The Big Hollow Fire in Washington state burned more than 24,000 acres and resulted in mandatory evacuation orders in September. Concerned that fire, heat, water or smoke damage could potentially interrupt critical rescue and firefighting communications, the company needed to urgently assess the integrity of its equipment and facility.

To access the remote facility with one of its Percepto autonomous drones, Verizon's drone subsidiary, Skyward, attained a special "beyond visual line of sight" waiver from the Federal Aviation Administration – allowing them to operate the Sparrow without an onsite pilot or on-ground visual observer.

The waiver enabled Skyward pilots to fly the drone missions from their homes -– enabling 24/7 operations and no pilot or observer on site. Getting the waiver represented "a regulatory milestone for autonomous drones for emergency response," the statement said.

The flight operations team included an operations manager observing from Alaska, 1,600 miles from site; the director of aviation development centers, 25 miles from the site; a remote pilot 23 miles from the site; and a remote navigator 18 miles from the site, the company said in a statement.

The operators instructed the vehicle where to go and at what altitude to fly, and the drone provided real-time photos and videos that allowed rescue workers to monitor the situation and predict the spread and direction of the fire. https://www.timesofisrael.com/israeli-drone-kept-tabs-on-spread-of-fire-in-washington-state/

Drones Will Patrol Beaches in Australia to Protect Crowds from Sharks – and Coronavirus Harry McNabb November 13, 2020

In addition to monitoring beaches for sharks, drones will be used to monitor social distancing at popular beaches to slow the spread of the coronavirus. This monitoring will be combined with new fines for gatherings over 20 people: each participant in such a gathering could be subject to $1,000 fine. This is an escalation of prior ordnances, where only the organizer was subject to a fine.

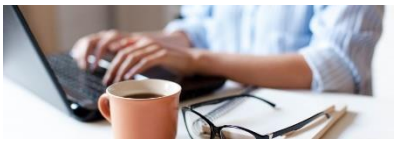
Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

The US and many European countries are experiencing a sharp uptick in Coronavirus cases as the weather is turning colder; Australia is entering the summer season. Despite Australia's low case count, authorities fear that travel restrictions may lead to more beach gatherings and could lead to an outbreak of the virus.

Between normal patrol hours, drones piloted by lifeguards fly 10-15 minute flights at least twice every hour. According to Australian government statistics, 2018/19 drone trials last summer covered approximately 25,000 km and nearly 9,000 flights. The flights identified 350 sharks and led to beach evacuations 48 times. https://dronelife.com/2020/11/13/drones-patrol-beaches-in-australia/

16Nov20

DRONE PILOT GROUND SCHOOL OFFERS A MONTH OF DISCOUNTS ON PART 107 TRAINING November 16, 2020 Sally French The Drone Girl News



Drone Pilot Ground School is the online test prep I used to study for (and pass on my first try!) the Part 107 test. As part of the course, you'll get video lectures, 300 practice questions including actual FAA questions, a 12 page cram sheet, and 1:1 customer support. Perhaps most importantly, you'll have access to the UAV Coach community, which entails an active forum for asking great questions (like, 'how much should I get paid for this piloting gig?' or 'which drone conferences are actually worthwhile to attend?'), plus an informative weekly newsletter that, yes, I read in entirety each week.

Not to mention, if recent, newly-imposed coronavirus-lockdown measures have you stuck back at home again, it's not *all* bad news. After all, studying for your Part 107 test (even if you're a a hobby pilot) is my No. 1 recommended way to spend your time at home during coronavirus.

Use this link and the Drone Pilot Ground School sale price will automatically apply (for purchases made before Nov. 30). http://www.thedronegirl.com/2020/11/16/drone-pilot-ground-school-sale/

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

DJI unveils latest agricultural drone AGRICULTURE HEADLINE NEWS JOE PESKETT NOVEMBER 16, 2020

The drone's modular and portable design makes it accessible and scalable for farmers who are ready to apply digital insights and automated spray technology into their operations. It features autonomous flight planning and terrain-sensing radar, as well as extended flight time, high payload capacity and off-the-grid power options.

It can carry a maximum payload of 20kg, and the layout of the nozzles has been optimized to achieve a 20% improvement on the uniformity of spray droplets and the effective spray width of seven meters.

It folds and unfolds "in seconds", and the spray tank and battery are both swappable, reducing downtime and increasing workflow. https://www.commercialdroneprofessional.com/dji-unveils-latest-agricultural-drone/

Pandemic drones will deliver test kit to your house Rick Karlin Oct. 15, 2020.

CHEEKTOWAGA — Retail giant Walmart has teamed up with an aerial drone company, DroneUp, and Quest Diagnostics to use drones to deliver self-administered COVID-19 tests to people who live in this Buffalo suburb.

The program, first reported in the Buffalo News, is experimental, and limited to single family homes within a mile of a Walmart store. The drones can drop off the swab test kits on someone's driveway or front walk – wherever they request it – and the user then mails in the test after taking it.

"It's a pilot program," said Amy Wiegand, spokeswoman for the Virginia-based DroneUp delivery company that is working with Walmart on the system.

The program started Monday and it's the second of its kind after a similar one began in North Las Vegas, Nevada, in September. https://www.timesunion.com/business/article/Pandemic-drones-will-deliver-test-kit-to-your-15651031.php

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

D-Fend Solutions Significantly Expands Operations in North America November 13, 2020 Counter UAS

D-Fend Solutions – the leader in radio frequency, cyber-based, non-kinetic, non-jamming, counter-drone takeover technology – today announced the expansion of its North American headquarters in McLean, Virginia. This announcement follows D-Fend Solutions' strategic focus on North America, its continued growth in the region during 2020 and the strong adoption of its flagship product, EnforceAir, by North American military and special forces, national and homeland security, law enforcement, airports, border patrol, VIP executive protection and event and stadium organizations.

D-Fend Solutions' tapped Terry DiVittorio as General Manager to lead the North American business. He was formerly a career non-commissioned officer in the U.S. Air Force, the director and portfolio manager of national security accounts for both a large system integrator and top-tier consulting firm and president at a cyber-intelligence technology company. He has brought on ten technical and domain experts for North American operations – including a team in Canada. D-Fend Solutions North America is now fully staffed and equipped to perform business lifecycle services including sales, system demonstrations, service delivery, support and ongoing service and maintenance for clients. https://uasweekly.com/2020/11/13/d-fend-solutions-significantly-expands-operations-in-north-america/?utm_source=rss&utm_medium=rss&utm_campaign=d-fend-solutions-significantly-expands-operations-in-north-america&utm_term=2020-11-16

DARPA Names Participants for UAS Aerial Combat Algorithm Prototyping Effort

Brenda Marie Rivers November 16, 2020 Contract Awards, News

MQ-9 UAV

The Defense Advanced Research Projects Agency has awarded contracts to five research and industry organizations to develop manned and unmanned aerial combat maneuvering concepts as part of the agency's Air Fight Evolution initiative.

DARPA said that Boeing, EpiSci, physicsAI, Heron Systems and Georgia Tech Research Institute will work to create autonomous "aerial dogfighting" algorithms designed for individual- and group-based tactical behaviors under the ACE program's Technical Space 1 category. TA1 covers

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

synthetic intelligence approaches for one-on-one, two-on-one, or two-and-two aerial battles within visual range.

The contractors will conduct modeling and simulation as well as subscale unmanned flights which will culminate in a full-scale consultant plane flight in 2023.
https://blog.executivebiz.com/darpa-names-participants-for-uas-aerial-combat-algorithm-prototyping-effort?utm_campaign=ExecutiveBiz%20Daily%20Headlines%2011.16.2020%20%28UVqPED%29&utm_medium=email&utm_source=ExecutiveBiz%20Daily%20Briefing&_ke=eyJrbF9lbWFpbCI6ICJyb2JlcnQucmVhQGF4Y2VsLnVzIiwgImtsX2NvbXBhbnlfaWQiOiAiVEJLS3hQIn0%3D

Drone delivery service Volansi expands with new Oregon facility Scott Simmie Nov. 16th 2020

Volansi is expanding its capacity for middle-mile drone delivery services with a new facility in Oregon's Bend area. This location, says a news release, "will support the company's expansion as it develops, produces, and tests its next generation of industry-defining delivery aircraft."

Volansi already has ongoing operations in Africa, the Caribbean and the United States. Its business model is to provide delivery service to customers in the mining, oil & gas, medical and defense industries. You can get a sense of what they do in this video – which unfortunately cannot be embedded into this story.

One of Volansi's drones can carry up to 50 pounds of payload

The new facility will aid the company as it expands its drone delivery offerings. But it will also be involved with the manufacture of the company's drones.

Their fleet includes the VOLY C10 and VOLY M20 autonomous drones. The VOLY C10 can carry up to 10 pounds of cargo over 50 miles. The company says its recently announced drone delivery project in North Carolina demonstrates that it's one of the only drone delivery services capable of transporting fragile, temperature-controlled vaccines.
https://dronedj.com/2020/11/16/drone-delivery-volansi-expands-to-oregon/#more-41127

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

17Nov20

The First Commercial Night Drone Delivery Miriam McNabb November 16, 2020

Singapore based F-drones is filling a significant need with drone delivery. Working in the maritime sector, it offers on-demand drone delivery to ships in port. The application offers a benefit in time and cost savings for deliveries which might normally have to be postponed until a larger load can be brought by boat.

Night operation is generally prohibited without special permission around the world. F-drones made the first commercial drone delivery at night 1 November 2020 to Berge Sarstein to send a 3D printed critical part weighing 3 kilograms over 5 kilometers within 7 minutes. The payload was the world's first 3D Printed CE-Certified Lifting Tool from Wartsila, sent in partnership with Wilhelmsen Group," says a press release.

Drone delivery at night is particularly critical for the maritime industry, as ports operate 24 hours. "One of the possibilities that this opens up is the delivery of urgent items at night, such as critical spare parts and medicine," points out the press release. "With its drone solution, the items can be delivered within minutes and can be a safer option compared to taking a boat out and sending items up a pilot ladder/gangway at night!" https://dronelife.com/2020/11/16/the-first-commercial-night-drone-delivery-f-drones-can-now-offer-24-7-maritime-delivery-services/

New Version of B4UFly App Released Today: Localized Advisories, Crowdsourcing Miriam McNabb November 16, 2020

"Coinciding with the FAA's Drone Safety Awareness Week, Kittyhawk is releasing a new update to B4UFLY that adds a new layer of localized advisories with the ability for the largest community of drone pilots and airspace stakeholders to impact safe and compliant drone flights."

It is a free airspace intelligence app, sponsored by the FAA but developed and maintained by drone platform developers Kittyhawk.io. With this new version, Kittyhawk is addressing a major challenge for drone operators: local regulations. "Where to safely fly your drone needs to account for your takeoff, landing, and complete area of operations," says the press release. "Over the last year, one of the biggest areas of feedback we've received has centered around "missing" advisories. Drone pilots are seeking out information — both airspace and

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

local ground rules — to understand where they should operate…. With today's update, Kittyhawk is addressing this in two ways — crowdsourcing advisories from users combined with publishing new authoritative local data." https://dronelife.com/2020/11/16/new-version-of-b4ufly-app-released-today-localized-advisories-crowdsourcing/

Iowa Signs Participating Addendum with DroneUp for Drone Services

amy.wiegand@droneup.com

Virginia Beach, VA (November 17, 2020) -- DroneUp, LLC and the State of Iowa have signed a Participating Addendum for the NASPO ValuePoint contract for Unmanned Aerial Vehicle services available to all state agencies, commissions, political subdivisions, institutions and local public bodies. The award is the first of its kind for the drone industry.

DroneUp was awarded a Services Master Agreement by the Commonwealth of Virginia in August 2019 available for use by all 50 states. The State of Iowa is now able to use the award for the benefit of state departments, institutions, agencies and political subdivisions. For further information: https://www.droneup.com/naspo-valuepoint/ Primary users are expected to be Agriculture & Game Management, Emergency Management, Transportation, Forestry, Mines, Minerals and Energy, Public Universities and Community Colleges.

Tom Walker, DroneUp's CEO, stated, "Iowa allows businesses to thrive through education and innovation. We look forward to supporting hardworking state and local agencies both in Iowa and nationwide." amy.wiegand@droneup.com

Hybrid Fuel-Electric Multirotor Drone Achieves 10-Hour Flight Time 15 Nov 2020

Mike Ball

Quaternium, in conjunction with electronic fuel injection developer Löweheiser, has achieved a flight time of 10 hours 14 minutes with the company's hybrid fuel-electric multirotor HYBRiX drone. According to Quaternium, this flight time represents a new record.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

An experimental version of HYBRiX drone was used for the flight, equipped with a full tank of 16 liters and Löweheiser's fuel injection system optimized for UAVs. The small size of the system allowed it to be integrated onto the drone without sacrificing performance. A team from Löweheiser monitored the engine parameters during the 10-hour mission, providing operators with data that allowed them to optimize the performance of the engine.
https://www.unmannedsystemstechnology.com/2020/11/hybrid-fuel-electric-multirotor-drone-achieves-10-hour-flight-time/?utm_source=UST+eBrief&utm_campaign=113a357d2a-eBrief_2020_17Nov&utm_medium=email&utm_term=0_6fc3c01e8d-113a357d2a-111778317

BVLOS Drone Research Consortium Formed in UK 15 Nov 2020 Mike Ball

Drone management software developer Dronecloud is leading a consortium that is researching innovative Beyond Visual Line of Sight technologies for unmanned aerial vehicles. The consortium, known as Project Rise, is part of the Future Flight Challenge project, funded by UK Research and Innovation. It includes industry specialists Sky-drones, Cranfield University and Skyports.

Project Rise aims to develop systems that will integrate evolving Unmanned Traffic Management technologies with onboard control systems of UAVs. This will form part of a centralized Command and Control solution based on Dronecloud's existing Software as a Service platform. The project integrates disparate systems at scale for safer, more reliable auditable drone flights, even beyond line of sight.

The project will initially develop a proof-of-concept system consisting of an integrated software and hardware hub incorporating UAS hardware, ground control stations, flight commissioning and planning, flight control and telemetry, deconfliction services, supplementary data feeds, airspace authorizations, flight noticeboard, Electronic ID, auditability, flight termination, accident and incident reporting and digital flight logging. It will culminate in field trials of a BVLOS drone delivery operation at the Cranfield University test facility.
https://www.unmannedsystemstechnology.com/2020/11/bvlos-drone-research-consortium-formed-in-uk/?utm_source=UST+eBrief&utm_campaign=113a357d2a-eBrief_2020_17Nov&utm_medium=email&utm_term=0_6fc3c01e8d-113a357d2a-111778317

Architectural Design and Urban Planning Support Autonomous Air and Ground Vehicles November 16, 2020 News

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

JDavis, an architecture and urban planning firm, with offices in Raleigh and Philadelphia, will collaborate with the broad range of members of The Collective to envision how the design of buildings and surrounding areas will support advanced mobility.

"The Collective is gathering all stakeholders around a common vision," said JDavis Partner and Technical Director Matt Ansley. "We are already collaborating with members of The Collective to explore how to incorporate innovative building design and urban planning to support advanced mobility that connects our communities in new ways."

Building and urban planning designs will incorporate take-off and landing spaces to blend with the transfer of people and products using drones and autonomous vehicles and robots on the ground. Emerging services range from medical package and food delivery to transportation, including airport shuttles, air taxi and air ambulances with electronic vertical takeoff and landing drones, autonomous vehicles and robotic transportation systems in smart cities. https://uasweekly.com/2020/11/16/architectural-design-and-urban-planning-evolving-to-support-autonomous-air-and-ground-vehicles/?utm_source=rss&utm_medium=rss&utm_campaign=architectural-design-and-urban-planning-evolving-to-support-autonomous-air-and-ground-vehicles&utm_term=2020-11-17

WISK, NASA PARTNER TO INTEGRATE UAM APPLICATIONS AT NATIONAL LEVEL

AUVSI NEWS NOV 17, 2020

Urban Air Mobility company Wisk is partnering with NASA to focus on the safe integration of autonomous aircraft systems into Urban Air Mobility applications at a national level.

The partnership is part of NASA's Advanced Air Mobility National Campaign strategy to develop key guidance for UAM operations. Initially, the partnership will address National Campaign safety scenarios with a focus on autonomous flight and contingency management, including collision avoidance and flight path management.

Through the partnership, NASA and Wisk plan on executing optimized opportunities to evaluate architectures, perform simulation studies, and develop an overall validation framework that can be leveraged for autonomous flight assessments. This will be done in close cooperation

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

with industry standards organizations, and it might include guidance on airspace structure, flight procedures, minimum performance requirements for participating aircraft, and standards that will influence the evolution of autonomous systems. https://www.auvsi.org/industry-news/wisk-nasa-partner-safely-integrate-autonomous-aircraft-systems-uam-applications

18Nov20

Orbit Fab to launch first fuel tanker in 2021 with Spaceflight Debra Werner November 17, 2020

SAN FRANCISCO – Orbit Fab, a startup preparing to establish fuel depots in space, announced an agreement Nov. 17 with Spaceflight Inc. to send its first microsatellite into orbit in 2021.

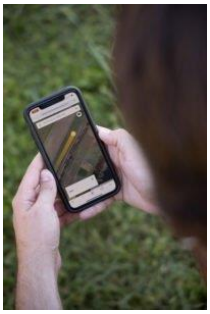
Under the agreement, Orbit Fab's first operational fuel depot, Tanker-001 Tenzing, will launch aboard a SpaceX Falcon 9 as early as June 2021. It will store a green propellant in sun synchronous orbit to refuel other spacecraft, Orbit Fab CEO Daniel Faber told *SpaceNews.*

"We're building the world's first operational satellite fuel depot," Faber said. "This helps us solve the chicken and egg problem. No one is buying fuel in orbit because no one is selling it. We built an egg." Orbit Fab has not yet said what type of propellant it will offer or how much of it will be stored.

"We are putting inventory into orbit as a demonstration and a signal of our commitment to take different fuels to different orbits." https://spacenews.com/orbit-fab-to-launch-with-spaceflight/

UTM Pilot Program Completes Second Phase: Safe and Scalable Drone Operations Miriam McNabb November 17, 2020

"The FAA's Unmanned Aircraft System Traffic Management Pilot Program completed its second phase with the Mid-Atlantic Aviation Partnership at a final demonstration in Virginia this week," says a Wing communication. "The program launched in early 2019 to identify the set of baseline capabilities required to support drone integration and ultimately inform the FAA's Unmanned Aircraft System Traffic Management implementation plan."



The UTM Pilot Program is way to bring the complex layers of a robust framework together, allowing for collaboration between major providers. "Industry partners Wing, AirMap, AiRXOS, and ANRA came to the

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

program with production-ready technology and processes that could demonstrate "Remote Identification (RID) technologies and operations with increasing volumes and densities" to enable a UTM ecosystem in a new, innovative way."

"The program has successfully demonstrated that UTM technology infrastructure has reached a level of maturity that can support the next phase of drone integration; one that will enable BVLOS operations," Matthew Satterly, Policy and Government Relations at Wing, tells DRONELIFE. https://dronelife.com/2020/11/17/utm-pilot-program-completes-second-phase-the-future-of-safe-and-scalable-drone-operations/

THE TOP DRONE MANUFACTURERS OF 2020 November 18, 2020 Sally French The Drone Girl

To probably no one's surprise, the top commercial drone manufacturer of 2020 is DJI, which has a 70-80% market share.

The numbers are based on a report from German analytics firm Drone Industry Insights, which analyzed 430 global companies whose core business is to manufacture drones.

Here are the top three commercial drone manufacturers of 2020:

1. DJI
2. Yuneec
3. Parrot

They all make both consumer-focused drones as well as enterprise-focused drones. And like those three companies, most of the top players focus on building drones in the <$10,000 price range.

As part of their report, DII broke down the manufacturers by either commercial drone manufacturers, or what it calls dual-use drone manufacturers, to account for drone makers designing drones for both commercial *and* governmental use. Here are the top three dual-use drone manufacturers of 2020:

1. AeroVironment
2. Insitu
3. Aeronautics

AeroVironment increased revenues by 17% in fiscal year 2020 from 2019, to $367.3 million. The increase in revenues was primarily due to a $44.7 million increase in product sales and a $8.3

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

million increase in service revenues. Close behind is Insitu, which Boeing acquired in 2008 for an estimated $400 million.

And Israeli-based Aeronautics rounds out No. 3 after defense contractor Rafael Advanced Defense Systems acquired a 50% stake in the company in 2019.
http://www.thedronegirl.com/2020/11/18/top-drone-manufacturers-2020/

Flylogix Meets Methane Emissions Measurement Milestone Press 16 November 2020

Partnering with gas-sensor experts SeekOps and energy majors Total, Chrysaor and BP, Flylogix is developing a measurement technique specifically focused on offshore asset monitoring. Flylogix conducted a first trial during August 2020 and has since flown over 1,500km of BVLOS flights collecting over 170,000 measurements.

Obtaining verifiable, accurate emissions data is crucial for baselining the current situation and demonstrating meaningful emission reduction over the coming years. This is critical as energy producers target demanding greenhouse gas intensity reductions within the next five years and transition towards net zero by 2050.

Unmanned Aerial System-based solutions offer significant advantages in cost, safety, reliability and environmental responsibility over all other alternatives. Further trials will be conducted to collect data from other North Sea offshore assets scheduled for early 2021. https://www.suasnews.com/2020/11/flylogix-meets-methane-emissions-measurement-milestone/?mc_cid=22900bd960&mc_eid=9cec79331a&utm_campaign=Energy%20Drone%20%26%20Robotics%20Coalition%20Content&utm_medium=email&_hsmi=100232266&_hsenc=p2ANqtz-8uksGkfgD9QLAoLSILgbIcp8Gw-JmKNOr99N63W9lNA1Sv6TLn8OkEJ9qE0bcFERCO6B_GWD4RyfW4vVTmuz2peiUk9A&utm_content=100232266&utm_source=hs_email

Hyundai Motor to unveil unmanned cargo aircraft in 2026 Byung-Uk Do Nov 08, 2020

The Korea Economic Daily

The project is part of the automotive group's long-term goal to shift its business portfolio toward urban air mobility, one of its key growth engines. Hyundai will soon send out a request for information to companies interested in partnering with the automaker on the project.

Hyundai's UAS for cargo transport will have wings as it will be designed to carry heavier payloads for commercial use, with vertical take-off and landing capabilities in urban

environments.

Hyundai Motor's urban aircraft concept with vertical take-off and landing capabilities

Hyundai Motor's new Chairman Chung Euisun, who took the group's leadership last month, has emphasized that the automaker will shift its business portfolio breakdown so automobiles account for half of its sales, followed by UAM with 30% and robotics at 20%. Hyundai plans to invest $1.5 billion in UAM over the next five years to cultivate new business opportunities in future mobility.
https://www.kedglobal.com/newsView/ked202011080001?utm_campaign=Energy%20Drone%20%26%20Robotics%20Coalition%20Content&utm_medium=email&_hsmi=100232266&_hsenc=p2ANqtz-8aOdm4qcORCZEFhNEJ0AWn-Dx0Lql6_sEMi4V2RRcsnj24781TOSu_yZOZkigrZ_GslarIpxahQPTnK2LeYiMf1F_41w&utm_content=100232266&utm_source=hs_email

CAL Analytics launches drone safety platform to reduce risk Josh Spires Nov. 18th 2020

The platform results from a collaborative effort between CAL Analytics, ResilienX, TrueWeather Solutions, Kongsberg Geospatial, Kent State University and Ohio State University.

Late last month, CAL Analytics tested its regional detect-and-avoid system for drones flying in unmanned traffic management environments. Today it has announced that this system has gone live to customers.

A great benefit of the service is the lack of onboard systems and sensors needed. This way, all drones will detect and avoid other aircraft in the air without needing to be equipped with additional hardware. The system also integrates with UAS service suppliers to receive real-time data from the drone and send it to the detect-and-avoid system. This allows the system to automatically command the drone where it should go to avoid a collision. CAL Analytics has been working with AiRXOS to help with the development of the automation system.
https://dronedj.com/2020/11/18/cal-analytics-launches-drone-safety-platform-to-reduce-risk/#more-41322

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

19Nov20

FAA, NASA UAS Demonstrations Mark End of UTM Pilot Program Kelsey Reichmann November 18, 2020

The second phase of the Federal Aviation Administration's unmanned aircraft systems traffic management pilot program ended with testing demonstrations in partnership with the National Aeronautics and Space Administration focused on testing remote identification technology and beyond visual line of sigh operations.

The demonstrations used test sites at the Virginia Tech Mid-Atlantic Aviation Partnership and the New York UAS Test Site with each event attracting over 100 participants. The demonstrations collaborated with local public safety agencies to show complex UTM capabilities in BVLOS operations.

The FAA and NASA demonstrated the ability of the FAA to access information from industry with the FAA UTM Flight Information Management System prototype and infrastructure and exchange secure information between the FAA and industry. The demonstrations also used UAS volume reservations and in-flight separation to show how UAS would operate in a high-density environment. "The demonstrations will help move us closer to safe beyond-visual-line-of-sight drone operations," Pamela Whitley, the FAA's acting assistant administrator for NextGen, said in a press statement. https://www.aviationtoday.com/2020/11/18/faa-nasa-uas-demonstrations-mark-end-utm-pilot-program/

US Navy studies resupplying ships and submarines using small UAVs Garrett Reim18 November 2020

Toward that goal, the Naval Air Warfare Center Aircraft Division acquired in October a Blue Water Maritime Logistics UAV prototype made by start-up Skyways to demonstrate long-range ship-to-ship and ship-to-shore cargo transport at NAS Patuxent River in Maryland. The small UAV is to be customized for requirements set by military sealift operations.

Naval cargo transport requires vehicles that can successfully operate through difficult environments that include heavy winds, open water and pitching vessels at sea."

Skyways' UAV has a fixed wing, an internal combustion engine that powers a pusher propeller and four electric rotors for vertical flight.

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

The service says it was selected because it was able to autonomously transport a 20lb payload to a moving ship 21.7nm away without refueling.

The USN plans to make a few modifications to Skyways' UAV. "We're excited to get to work on such innovations as folding wings for better handling and ship storage, a dual propulsion system that runs on both electricity and JP-5, an internal versus external cargo capacity and an automatic dependent surveillance broadcast identification system."

The USN believes using a UAV would be a more efficient vehicle for aerial resupply missions than the Sikorsky MH-60R Seahawk or the forthcoming Bell Boeing CMV-22B Osprey. https://www.flightglobal.com/military-uavs/us-navy-studies-resupplying-ships-and-submarines-using-small-uavs/141199.article

Skyfront Unveils Control Handoff Capability During First Drone Delivery to a Submarine November 19, 2020 News

The hybrid-electric Skyfront Perimeter drone was recently used to perform the first ship-to-submarine delivery via small unmanned aircraft. During the historic flight, the Perimeter took off from a moving surface vessel and delivered supplies to the crew of the ballistic missile submarine.

The flight used Skyfront's command and control handoff capability. During the flight, pilots aboard the surface vessel launched the drone and flew it near the submarine. Once there, pilots aboard the submarine took control of the drone and released the package onto the top of the sub.

The capability is needed for long range missions to maintain line-of-sight control by using multiple distributed pilots to comply with aviation rules and regulations. It also allows pilots to maintain control of the vehicle while flying over rugged terrain where radio links are likely to be compromised by line-of-sight obstructions. https://uasweekly.com/2020/11/19/skyfront-unveils-control-handoff-capability-during-first-drone-delivery-to-a-submarine/?utm_source=rss&utm_medium=rss&utm_campaign=skyfront-unveils-control-handoff-capability-during-first-drone-delivery-to-a-submarine&utm_term=2020-11-19

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

20Nov20

Feds charge Hollywood man after drone collides with LAPD helicopter RICHARD WINTON STAFF WRITER NOV. 19, 2020

The collision damaged the chopper's fuselage and required the LAPD pilot to make an emergency landing following the September encounter. The drone, which authorities say was operated by Andrew Rene Hernandez, then tumbled from the sky and crashed into a vehicle.

Hernandez, 22, was arrested Thursday and charged with unsafe operation of an unmanned aircraft after an investigation by the FBI, the LAPD and the Federal Aviation Administration.

The potentially deadly collision occurred Sept. 18 after Los Angeles police officers responding to a predawn burglary call at a Hollywood pharmacy requested air support. As the LAPD helicopter flew toward to the scene, the pilot spotted a drone and attempted to avoid the unmanned aircraft, according to federal prosecutors. Despite the evasive maneuver, the drone stuck the helicopter, forcing the pilot to make an emergency landing. The drone hit the chopper's nose, antenna and bottom cowlings and could have caused the aircraft to crash, prosecutors with the U.S. attorney's office said.

An examination of the drone's camera and video card identified Hernandez as the operator, prosecutors said. The FBI executed search warrants at his home in late October.During an interview with FBI agents, Hernandez admitted to flying the drone on Sept. 18 after he heard police vehicles and an approaching helicopter shortly after midnight, prosecutors said.

According to the complaint, Hernandez said he flew his drone "to see what was going on." As the drone was ascending, Hernandez saw it "smacked" by the police helicopter, and it fell to the ground at a nearby residence.

Hernandez will appear in federal court Thursday. The misdemeanor offense carries a maximum sentence of one year in federal prison. https://www.latimes.com/california/story/2020-11-19/feds-charge-hollywood-man-after-drone-crashes-into-lapd-helicopter

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

mscasser@umd.edu; ursula.s.powidzki@gmail.com; rkaese@tedco.md; darryl.r.mitchell@nasa.gov; kris.a.romig@nasa.gov; gary.evans@axcel.us; mike.hitch@nasa.gov; denise.a.lawless@nasa.gov; christina.d.moats-xavier@nasa.gov; thomas.e.johnson@nasa.gov; tony@teamalaris.com; daniel.morris@nianet.org; myaz@hampton.gov; stanley@nianet.org; william.edmonson@nianet.org; heather.gramm1@maryland.gov; elizdietzmann@gmail.com; steven.bain@oncourse-llc.com; Marty@General-Ideas.com; james@djmontgomery.com; rkwhite@vbgov.com; mburgess@airsightglobal.com; eleavitt@airsightglobal.com; b.hanrahan@precisionhawk.com; danginobell@outlook.com; Tcheek503@yahoo.com; w.j.fredericks@advancedaircraftcompany.com; jeanhaskell415@gmail.com; jha@eservices.virginia.edu; ayoung5090@aol.com; jcc7s@eservices.virginia.edu; cxcarter@odu.edu; msandy@odu.edu; robert.a.baker.ctr@navy.mil; rick@crtnsolutions.com; eupchurch@sitechma.com; sjohnson@adaptiveaero.com; dubtravis@hotmail.com; p.gelhausen@avidaerospace.com; pcushing@williamsmullen.com; rkorroch@williamsmullen.com; steven.walk@nhgs.tec.va.us; tanner.loper@nhgs.tec.va.us; talberts@odu.edu; rdwyer@hrmffa.org; kenny.elliot@yorkcounty.gov; william.a.wrobel@nasa.gov; harry@virginiauas.com; asubramani@avineon.com; jcampbell@avineon.com; sean@hazonsolutions.com; scott@virginiauas.com; Bob@virginiauas.com; jcronin@odu.edu; peter.bale@srsgrp.com; cquigley@hrmffa.org; chris@hoistcam.com; ed@hazonsolutions.com; msatterlund@mwcllc.com; sadlerc@yorkcounty.gov; ariela@powerofavatar.com; dataariseconsulting@gmail.com; kim.lochrie@vaspace.org; dyoung@genedge.org; david@hazonsolutions.com; ralph@jeremycreekfarm.com; jeff.johnson@vtcrc.com; emcmillion@reinventhr.org; director@doav.virginia.gov; jspore@reinventhr.org; richard.r.antcliff@nasa.gov; paulrobinson@atr-usa.com; vic.z.tumwa@nasa.gov; jacobw@us.ibm.com; dlandman@odu.edu; sherwood@nianet.org; peter.mchugh@nianet.org; cedric.sauvion@act.nato.int; arch@archandassoc.com; jnoel@yorkcounty.gov; cmeredith@nnva.gov; cstuppard27@gmail.com; carl.conti@sisinc.org; Hughesfamily51@charter.net; tom.walker@webteks.com; zak@unrealworx.com; jack@generalaerocompany.com; bruce.holmes@airmarkets.aero; peter.mchugh@nianet.org; mpoplawski@nnva.gov; mark.flynn@doav.virginia.gov; tom.mastaglio@mymic.net; jshaeffe@odu.edu; rclaud@odu.edu; pmengden@swiftengineering.com; astreett@swiftengineering.com; kielyw@msn.com; dcgrulke@cox.net; mboshier@cox.net; jrea23@hotmail.com; mastaglio@hotmail.com; kenaijunkie@hotmail.com; murat@destecs.net; dlandman@odu.edu; robert.stolle@cit.org; jolson@ecpi.edu; wiedmanj@gmail.com; w1wnr@aol.com; alex.synnott@gmail.com; jkirby145@yahoo.com; Daniel@lingoconsulting.com; l.delaporte3@gmail.com; cyook@kslaw.com; allcvi@consolidatedventuresinc.com; jholman@hreda.com; savery@oihr.org; charity.gavaza@poquoson-va.gov; mjkaszub@odu.edu; twc4223@yahoo.com; boshier@verizon.net; dslindleyva@gmail.com; ilind@att.net; aaron@tidewaterglobal.net; jeffdye01@gmail.com; dtackels@dronedeploy.com; cwirt@nnva.gov; abece001@odu.edu; jflyn003@odu.edu; dtb7p@virginia.edu; kenneth.niederberger@gmail.com;

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

Ashley.rowe@yorkcounty.gov; 757byair@gmail.com; juliewheatley@co.accomack.va.us; junnam@asm-usa.com; mohara@ball.com; robert.fleishauer@ssaihq.com; manning@stcnet.com; mkim@genexsystems.com; rwhite@vigyan.com; skyemciver@gmail.com; khoffler@adaptiveaero.com; jerylhill@cox.net; bwachter@bihrle.com; mproffitt@adaptiveaero.com; james.closs@nianet.org; djones@dslcc.edu; director@lakecountyedc.com; Carine.cherrier@act.nato.int; cshelton@startwheel.org; aradovic@dcnteam.com; cgeraghty@pro-enviro.com; jimmy@lyftedmedia.com; bheenan@morphtec.com; ed.albrigo@cit.org; joe.fuller@dartfleet.com; jharenchar@rmg-usa.com; asynnott@telegraphoffice.com; jim@ust-media.com; anthony.vittone@dartfleet.com; jairusmwenzel@gmail.com; mbrenner@spotmybus.com; john.robinson@srsgrp.com; jgill@tcc.edu; arthur@promediavideoservices.com; walt@fcg-co.com; david.throckmorton@nianet.org; photographybydavid.dr@gmail.com; mgboyd99@gmail.com; johndcalder@gmail.com; mpapazis@scott-macon.com; bigbenjmn@gmail.com; bljohnson@virginiamohs.com; amy.wiegand@droneup.com; stevel@co.kinggeorge.state.va.us; dbrillembourg@avidaerospace.com; daniel.g.wolfe@usi-inc.net; blarys@cox.net; kim@wildflowerintl.com; carly@wildflowerintl.com; DMorris@ReinventHR.org; genevieve.ebarle@nianet.org; marco.rubin@cit.org; mytravelexpert@msn.com; jchapman@cwm-law.com; codyreese21@yahoo.com; jcostuli@odu.edu; jselfridge@gmail.com; chris@assayonwheels.com; dbarton@daa.com; pierre@si-forest.com; lynn.mcdaniel@ctr-cit.org; tracy.tynan@cit.org; jerylrhill@gmail.com; chewlett@deloitte.com; aoksoy@odu.edu; terry.holley@maryland.gov; charles@tudorproductions.com; hbrauer@pcfvirginia.org; Frederic.dalorso@act.nato.int; bj.sharon.hall@sbcglobal.net; chris.moad@earlycharm.com; info@droneii.com; EdMullinSr@outlook.com; Brian.spratt@si-forest.com; Mike.griffin@si-forest.com; Lisa.May@murphian.com; mfrigelj@pmasolution.com; amy.wiegand@droneup.com; joe.fuller@dartfleet.com; roger.venezia@maryland.gov; mattisdrone@gmail.com; johnmarkva@mac.com; jhawk009@odu.edu; dmperkins@odu.edu; ngrden@odu.edu; davidplace47@gmail.com; elfisher@nps.edu; ksrawat@ecsu.edu; Thomas.garrett@yahoo.com; marco@expressdroneparts.com; chilson@ou.edu; info@pt2go.com; wasilewj@evms.edu; shaun@caterboom.com; kbarquinero@gmail.com; amy.k.klarup@nasa.gov; Daniel.Berry@act.nato.int; cvidoli@fastmail.fm; evandro@airgility.co; Jeanne.larcombe@gmail.com; s.snedecor@advancedaircraftcompany.com; rbesser@stevens.edu; ac@cordillera-apps.com; cj@cjspadycpa.com; eashby2008@gmail.com; lena.little@nasa.gov; michael.l.french.civ@mail.mil; mrichards@wildflowerintl.com; Amber.Wilson@doav.virginia.gov; Theresa@redorangestudio.com; keagle@odu.edu; ac@cordillera-apps.com; uasci@dcnteam.com; carole.mattessich@nianet.org; dbowles@odu.edu; joshb@uavfactory.com; mcopeland@eagleaviation.tech.com; gp@cordillera-apps.com; roberthrea@gmail.com; miriam@dronelife.com; david@where2wheel.com; chris.bugg@sandler.com; zachary.johns@hush.aero; joe.piazza@teamalaris.com; aj.gallagher@hush.aero; jonathan.kelly@ssaihq.com; steve_fitzsimmons@comcast.net; dougsmith@hreda.com; mail@GlobalStrategySupport.com; larry.lombardi@currituckcountync.gov; dgagne@divcom.com; mickey@cowden.tech; rese.cleaver@droneup.com; Jim@JHWUnmannedSolutions.com; ovadia.salama@gmail.com; csteward1@unl.edu; ajaques@airt.ngo;

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net

byron@airsupply.com; wyatt@airsupply.com; Andrew@airsupply.com; nio@phaseone.com; rbo@phaseone.com; colter.menke@maryland.gov; steve.jarriel@dronevideopartners.com; david@americanaerospace.com; bobaldrich@geturgently.com; chris@geturgently.com; patrice@trisdom.com; missie@vpdrone.com; pramod@airgility.co; Don.Berchoff@trueweathersolutions.com; sales@inertiallabs.com; ccoffey@lrprecisiontooling.com; mwhite@lrprecisiontooling.com; don@zenithaerotech.com; anielsen@odu.edu; JMay@autonomousflight.us; Tim@QuestKnightEnterprises.com

Word: anthony.vittone@droneup.com; stanley@nianet.org

Robert Rea | Axcel Innovation | Charlottesville and Portsmouth, VA
robert.rea@axcel.us | 757-309-5869 | www.axcelinnovation.net