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PALO ALTO, USA

eVTOL

18.19 SEPTEMBER 2024 PALO ALTO

THE eVTOL SHOW | USA

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SEPTEMBER 18.19 2024 I
PALO ALTO, USA

CONFERENCE & EXPO | SUMMIT

WELCOME TO THE eVTOL SHOW USA 2024

Participate in this industry-leading event where the eVTOL community, industry leaders, engineers and technologists representing global OEMs and their key suppliers, explore the exciting future for the eVTOL manufacturing industry and discuss the design, materials, innovations and disruptive technologies shaping the future of air mobility

WHAT TO EXPECT

WeAutomotive Group produce some of the world's leading and most revered conferences, summits, and exhibitions covering electric vehicle, battery technology and smart automotive manufacturing. We are thrilled this year to combine our expertise in next-generation electric mobility, to launch what is poised to be the largest global Conference and Exhibition series for eVTOL manufactures and their solution providers

Drawing on our global network, what makes our event format unique is the truly high OEM participation, attracting delegates from all of the majors as well as innovative start-ups from across the world. That same diligence, and commitment to excellence, has been transferred to create a technical forum covering the entire eVTOL product lifecycle

The agenda has been diligently researched and curated in partnership with the eVTOL community and it's tiers to ensure it addresses the most pertinent current challenges and key investment areas. The eVTOL Show USA provides attendees with a high-end event experience, unparalleled technical-conference agenda, and the opportunity to engage with the full lifecycle faculty of decision-makers, all under one roof – in a welcoming, personable environment

Many eVTOL companies have now moved from early stages, concepts, and mock-ups to tangible prototypes and ready to scale manufacturing facilities. Although most are still subscale and pre-certification, many are flying prototypes. The industry has amassed over 6,000 cumulative flight hours of aircraft testing and the race to breaking the market is now on. The locations for production facilities are starting to be announced, and several early vertiports have been built, with vertiport players refining their concepts and laying out operating models

As part of WeAutomotive Group's premier xEV event portfolio, The eVTOL Show is the hub for the eVTOL industry manufacturing leaders, engineers, maintenance heads, CTOs, technologists, and experts alike to collectively address the key challenges and industry innovations surrounding the commercialization of eVTOL platforms, paving the way for the next-generation of air mobility

This conference analyzes the commercial readiness of eVTOL aircraft, the technology challenges, the need for infrastructure, the route to certification, the materials, technology and processes needed to scale up production, as well as cloud infrastructure, supply chain considerations, and battery technology and developments. We hope you can join us!

Join NA's largest gathering of eVTOL designers, engineers and senior executives as we focus on the scale up of eVTOL production **at North America's largest technical conference and exhibition for eVTOL professionals** – where experts will engage during a series of case study presentations, interactive panels, and unparalleled networking opportunities

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Key Topics

- eVTOL Value Chain And Key Use Cases
- How eVTOLs Will Be Handled In The Airspace
- In-Depth Analysis Of Market Trends And Key Developments
- Certification Process And Handling Of Safety Concerns
- Finalizing And Freezing Designs To Build Conforming Prototypes
- Focusing On Building Out Their Production Systems
- Managing Battery Recharging Times
- Minimizing Turnaround Time And Maximizing Number Of Flights Per Aircraft
- Increasing Range And Shorten Turnaround Times
- The Challenge Of Off-The-Shelf EV Batteries
- The Need For A Secure, Robust, And Efficient Cloud Platform
- Creating A New Low Altitude Air Traffic Management System
- Incorporating Multiprotocol Label Switching, A Private Ground-Based Network Data Routing Technique For Faster Connections
- Artificial Intelligence And Machine Learning Applications In The Cloud
- Coordinating With The FAA And EASA To Find A Path To Certification
- Why eVTOL Projects Are Using Performance-Based Requirements In Their Certification Bases
- Overcoming Differences From Available Certification Requirements
- Advanced Modelling And Simulation
- Managing The Complexity Of Loading
- Developing A Battery To Fit The Unique Needs Of An eVTOL
- Overcoming Battery Challenges With Cycle Life, Energy Density, And Feasibility
- Protecting Against Manufacturing Defects At The Cell Level
- Composites To Meet The Strict Structural Requirements And The Desire For Lightweighting
- The Growing Use Of Thermoplastic Resin Systems As Production Volumes Increase
- Increasing Battery Energy Density
- Is Lithium-Silicon Based Chemistry Presently The Best Solution For eVTOL Applications
- The Use Of Silicon-Based Anodes With Silicon Oxide As The Active Material
- Managing Changing Temperature Parameters For Batteries
- Overcoming Lifecycle Challenges
- Simulation For eVTOL Pilot Training Full Motion Flight Simulators
- Mixed-Reality Simulators
- Solid State Batteries
- Sodium-Ion Batteries
- Hydrogen Fuel Cells
- Noise And Vibrations Mitigation
- Overcoming The Near-Term Challenges Of The Use Of Fossil Fuel Certification Approaches
- Approaching New Technology From An Absolute Versus Relative Safety Perspective
- Managing The Extensive Use Of Automation
- Thermal Runaway Risks Inherent With Some Lithium-Based Chemistries
- Handling And Computational Challenges For Battery Data
- Learning From The Experiences In The EV And Grid Storage Space
- How To Comply With RTCA DO-311, SAE AIR6897 And FAA AC 20-184
- Influences From Automotive And Biomimicry In The Cabin Design For eVTOLs
- Utilizing The Automotive Industry's Reductive Design Approach
- Understanding Material Considerations
- Ensuring That The Cross-Sectional Area Is Minimized To Reduce Drag
- Adapting More Of The Practices Of The Automotive Sector To Address Growing Demand
- Combining The Benefits Of Safety And High Standards Of The Aviation Industry
- Adopt The Latest Thinking, Tools, And Processes In Production
- The Challenges Of Setting Up Supply Chains And Production Capabilities
- The Need For More Advanced, Automated, And Digital Manufacturing Processes
- IFR Could Be A Necessity For Even Some Short Flights
- The Market For Building And Running The Ground Infrastructure
- Lack Of Clarity Is Impeding Progress In Finalizing Ground Infrastructure Plans
- Challenges To Rooftop Vertiports
- Overcoming The Not In My Backyard Syndrome
- Can eVTOL Design Achieve The Required Level Of Environmental Sustainability

Trending Topics

- The Future Of eVTOLs - How Will The Market For eVTOLs Evolve In The Next 30 Years?
- The Pathway To Commercialization - The Future Air Mobility Industry Is Making Steady Progress But Must Maintain The Momentum To Gain Scale And Meet Certification Timelines
- Battery Charging - Pushing The Boundaries Of Battery Recharging To Meet The Requirements Of Large Scale Operations
- Certification Transferability, Not Harmonization eVTOL Certification- Where Are They Now And The Challenges That Still Lie Ahead
- Developing An Aerospace Cloud System To Meet Other Emerging Needs Of The eVTOL Industry
- Complexity Of eVTOL Designs Leads To The Requirement For Modelling To Support The Certification Process
- Battery Thermal Management - eVTOL Aircraft Have Unique Battery Challenges That Will Require Developers To Change How They Think About Battery Systems And The Designs Of Electric Vehicles
- Composites Opportunities In eVTOLs - As eVTOL OEMs Seek To Advance Program Certification, Production Scale-Up, And Lightweighting, Composites Will Play A Crucial Role
- Why Lithium-Ion Batteries Will Remain The Cornerstone Technology For The Successful Introduction Of Advanced Air Mobility (AAM).
- Could eVTOL Simulators Be A Bridge To The Future Of Flight Training?
- Next-Generation Battery Technology: The Impact Of New Battery Technology On The Future Development Of eVTOLs Should Not Be Underestimated. Lithium-Ion Batteries Are No Longer The Only Choice
- Noise And Vibration Considerations In eVTOL Aircraft And Methods Of Control For The Comfort Of The Pilot And Passengers On Board
- Harnessing The Recent Achievements On The Certification Process For eVTOL Aircraft To Overcome The Technology Hurdles That Must Be Traversed Before They Can Reach The Finish Line
- Determining Battery State Of Health (SoH) And Cell-Level Degradation Becomes A Considerable Challenge If Data Is Not Properly Curated And (Automatically) Analysed After Every Charge/Discharge Cycle.
- The Growing Influence Of Automotive Design Techniques To Define The Look And Feel Of eVTOL Aircraft Cabins
- Manufacturing: To Move To High-Volume Production, Developers Of eVTOL Aircraft Must Adopt The Disruptive Technologies Being Pursued Across The Manufacturing Sector
- No IFR, No eVTOL Air Taxi Services; Adapting To Operate Safely Under Instrument Flight Rules (IFR) In Adverse Meteorological Conditions
- Infrastructure Barriers To The Elevated Future Of Mobility - Are Cities Ready With The Infrastructure Needed For Urban Air Transportation?
- Meeting The Sustainability Challenge - Has The eVTOL Industry Overpromised On Green

AGENDA 2024

| DAY 1 – TECHNOLOGY

08:00

Registration | Breakfast Reception

08:30

Chairman's Opening Address

08:40

Strategies For Accelerating Commercialization Of The Future Air Mobility Industry

- Learn about the importance of finalizing designs and building conforming prototypes to kickstart testing processes essential for meeting certification timelines
- Understand the necessity for both manufacturers and suppliers to prioritize the development of robust production systems to meet entry-into-service deadlines
- Explore how the industry's evolution may lead to a clearer understanding of successful technologies, designs, and business models, potentially resulting in consolidation and streamlining of talent and ideas
- Discover the critical role of infrastructure projects, including vertiports and facilities supporting innovative propulsion designs like battery-electric charging and hydrogen, in meeting lead time requirements
- Gain insights into how companies with innovative ideas and strong execution capabilities are likely to attract continued funding, driving the industry's growth and development

09:00 Session 1 - Technology

Navigating The Complexities Of eVTOL Technology

- Explore the unique challenge of maintaining consistent aircraft weight throughout flight, prohibiting emergency fuel dumping and necessitating innovative solutions for landing with the same weight as take-off
- Delve into the debate surrounding human pilots versus autonomous systems in eVTOL operations, recognizing the immense challenges and safety concerns associated with fully automated flight in busy urban environments
- Acknowledge that while automation technology is advancing, achieving full autonomy for eVTOLs in densely populated areas may still be decades away, emphasizing the need for continued innovation and development in the field
- Recognize that while eVTOLs hold promise for revolutionizing urban mobility, significant technological hurdles must be overcome before widespread passenger operations become feasible, underscoring the importance of a cautious and methodical approach to implementation
- Understand the technical intricacies surrounding battery operation and lifespan in electric vertical take-off and landing (eVTOL) aircraft, crucial for ensuring safe and sustainable flight operations

09:20

Challenges And Opportunities For Fly-By-Wire Flight Control Systems In eVTOL Aircraft

- Delve into the complexities and prospects of fly-by-wire flight control systems for eVTOL aircraft, exploring both challenges and opportunities
- Explore the distinct challenges eVTOL aircraft pose to fly-by-wire systems, including rapid response times, diverse flight modes, and redundancy requirements
- Discuss strategies for ensuring the safety and reliability of fly-by-wire systems in eVTOLs, including fault-tolerant designs, redundancy protocols, and real-time monitoring
- Explore how advanced fly-by-wire technologies can enhance the performance of eVTOL aircraft, improving stability, manoeuvrability, and energy efficiency
- Address regulatory hurdles and certification requirements associated with implementing fly-by-wire systems in eVTOLs, and discuss potential pathways for overcoming these challenges
- Examine emerging trends and innovations in fly-by-wire technology that have the potential to shape the future of eVTOL flight control systems, paving the way for safer, more efficient urban air mobility

09:40

Strategies For Efficient Landing Control For eVTOL Vehicles

- Explore the potential applications of optimal landing control algorithms for electric vertical take-off and landing (eVTOL) vehicles, including urban air mobility, passenger transportation, package delivery, and aircraft carrier landing missions
- Understand the importance of developing efficient algorithms that can generate accurate optimal landing trajectories for eVTOL vehicles while considering operational constraints and high-fidelity aerodynamic models
- Learn about the formulation of an optimal control problem with fixed time of flight, with the control effort chosen as the performance measure, specifically for quadrotor eVTOL vehicle landing missions
- Discover the main contribution of the work, which involves incorporating aerodynamic models driven by ordinary differential equations (ODEs) into the optimal control problem formulation, enabling higher-fidelity landing solutions crucial for future eVTOL operations
- Gain insights from preliminary simulation results using the DJI Matrice 100 vehicle, showcasing the effectiveness of the proposed approach in two landing cases, highlighting its potential impact on enhancing eVTOL vehicle operations

10:00

Critical Aspects Of Flight Test Instrumentation And Telemetry For eVTOL And Flying Taxis

- Highlight the essential components and integration strategies necessary for successful flight testing
- Understand the importance of configuring flight test instrumentation systems to collect relevant data, including parameters such as airspeed, altitude, and battery performance
- Explore effective management techniques for flight test instrumentation, including data logging, real-time monitoring, and post-flight analysis
- Address the integration challenges associated with combining various telemetry systems, sensors, and onboard instruments to ensure seamless data collection and transmission
- Learn best practices for ensuring the success of flight testing campaigns, including meticulous planning, rigorous testing protocols, and continuous system refinement
- Consider the future developments and advancements in flight test instrumentation and telemetry technology, and their potential impact on the eVTOL industry's growth and evolution

10:20

Morning Networking Break

11:00 Session 2 - Batteries 1

The Crucial Role Of Battery Technology In Powering The Future Of Flight For eVTOLs

- Explore the significance of lithium-ion batteries as the cornerstone technology driving the eVTOL industry forward
- Highlight the high energy density of lithium-ion batteries and its impact on eVTOL flight range and efficiency
- Discuss promising alternatives to lithium-ion batteries, including lithium-sulphur and lithium-air technologies, and their potential to enhance energy density and flight capabilities
- Explore the transformative potential of solid-state batteries in revolutionizing energy storage for eVTOLs, including increased safety, energy density, and cycle life
- Examine the surge in funding and research efforts towards advancing battery technology for eVTOLs, signalling a promising future for sustainable flight

11:20

eVTOLs Are More Than Flying Cars And Battery Analysis Reveals Unique Operating Demands

- Explore how eVTOL batteries differ from electric car batteries and the challenges in meeting the specific power and performance demands of eVTOL flight
- Learn about ORNL's innovative approach to evaluating lithium-ion batteries under extreme power draw conditions and the implications for eVTOL battery development
- Understand the fundamental engineering changes needed to optimize battery systems for eVTOL applications, balancing high power demands with longevity and durability

- Discover the importance of real-time battery performance monitoring during flight stages like climbing, hovering, and descent, and its role in ensuring safe and efficient eVTOL operations
- Gain insights into ORNL's ongoing research on developing new battery chemistries and electrolytes tailored for eVTOL missions, and the potential for advancements in battery technology to revolutionize the future of air mobility

11:40

The Importance Of Thermal Management In eVTOL Aircraft

- Understand why effective thermal management is vital for optimizing the performance of eVTOL aircraft, as it ensures the efficient operation of electronic components within the propulsion system
- Highlight the requirement for both pre-heating and cooling mechanisms because battery systems in eVTOLs require precise temperature control within a narrow operating window for optimal efficiency
- Reveal the risks to motors and inverters in eVTOL powertrains because of the heat generated during operation, which poses risks such as damage to magnets, windings, and degradation of silicon carbide components if not adequately managed
- Explain that because of the importance of mass and propulsion system efficiency in eVTOL design, thermal management systems must be lightweight and compact while effectively dissipating heat from electronic components
- Discuss various cooling approaches – indirect cooling methods, such as cold plate liquid cooling with water, offer superior heat dissipation compared to direct cooling approaches, striking a balance between cooling capacity, and added weight for optimal eVTOL performance

12:20

Fabrication, Testing, And Comparative Analysis Of Lithium Sulphur And Lithium-Ion Electrochemistries

- Addressing fundamental barriers in eVTOL aircraft, focusing on comparing lithium sulphur and lithium-ion electrochemistries to optimize energy and power
- Compare specific energy and power characteristics through identical fabrication processes for lithium sulphur and lithium-ion coin cells
- Analyse the results of discharge cycles, cycle life, and impedance that were measured under conditions unique to eVTOL aircraft, including high C-rates, half cycles, and high transients, revealing key performance differences between the two electrochemistries
- Explain that lithium sulphur exhibits more than twice the specific energy of lithium-ion up to currents of almost C/2, making it a compelling option for eVTOL applications
- Explain that despite its higher specific energy, lithium sulphur faces challenges with impedance, leading to lower cycle life compared to lithium-ion. However, the problem can potentially be mitigated by employing half cycles

12:40

Advancing Electric Aviation With Solid-State Architecture Batteries

- Composite materials are being successfully adopted for certification and Low Initial Rate Production (LRIP) eVTOL aircraft variants today
- As demand for eVTOL grows, vehicle build rates will increase and the challenge of high-rate composite production will become a reality
- Additional in-flight data will provide greater understanding of specific component in-service performance which will validate future eVTOL component requirements
- Today's composite technology selection will be presented and contrasted against future market needs
- Key market challenges will be identified and areas that will benefit from industry collaboration discussed

13:00

Networking Lunch Break

14:00 Session 3 - Materials

Why Thermosets Overcome The Material Selection Dilemma In eVTOL Fabrication

- Explore the multifaceted considerations involved in selecting materials for composite parts, including performance requirements, size, complexity, production volume, and a crucial new factor: ease of certification
- Understand the paramount importance placed by Original Equipment Manufacturers (OEMs) on obtaining rapid certification for eVTOL aircraft, leading to a preference for tried-and-tested materials over innovative options
- Recognize the prevailing trend among eVTOL OEMs, with over 90% opting for thermoset-rich platforms due to their historical prevalence in the aerospace industry and familiarity among regulatory authorities
- Discuss the delicate balance between innovation and regulatory compliance in the eVTOL industry, where the imperative of certification often influences material selection decisions more than technical advancement
- Consider potential shifts in material preferences as the eVTOL sector evolves, with ongoing advancements in composite materials and increased regulatory acceptance of alternative resin types potentially reshaping the landscape of material choices for future eVTOL platforms

14:20

Is A Transition to Thermoplastics The Inevitable Future For eVTOL Composite Structures

- Discuss the inevitable shift toward thermoplastic-intensive structures in the production of eVTOLs as manufacturing volumes increase to several thousand aircraft per year, signalling a departure from traditional thermoset resin systems
- Explore the potential expansion of thermoplastic usage beyond small parts in first-generation eVTOLs, as advancements in production techniques and material properties enable their application in larger structural components
- Highlight the weight-saving benefits of thermoplastics, particularly fibre-reinforced thermoplastics, which offer lighter-weight vehicles and faster production rates due to reduced cycle times compared to traditional materials
- Examine the sustainability advantages of thermoplastics, including their inherent recyclability properties, aligning with the ongoing initiative of the composites industry to improve environmental sustainability
- Showcase the proactive steps taken by key composite materials suppliers, such as Toray, in marketing thermoplastics for eVTOL applications, signalling the industry's readiness to embrace this transition and drive innovation in composite manufacturing for the future of urban air mobility

14:40

Streamlining Production With Collaboration Between OEMs And Material Suppliers

- Highlight the pressing need for higher production rates in the eVTOL industry to meet growing demand and scale operations effectively
- Emphasize the importance of lowering costs in eVTOL manufacturing processes to enhance affordability and accessibility for both manufacturers and consumers
- Discuss the collaborative efforts between OEMs (Original Equipment Manufacturers) and material suppliers to optimize production processes and materials, focusing on design-for-manufacture principles
- Explore the concept of designing simpler parts for fabrication and assembly, enabling more efficient manufacturing workflows, and reducing production complexities
- Illustrate how this collaborative approach fosters innovation in eVTOL manufacturing, driving advancements in both design and production methods to meet the industry's evolving needs and challenges

15:00

Navigating Supply Challenges In The Commercialisation Of The eVTOL Industry

- Highlight the projected growth trajectory of the eVTOL industry and the expected increase in production volumes as demand rises
- Discuss the importance of integrating automation into manufacturing processes to meet growing production demands efficiently, especially as program volumes approach significant milestones
- Address the potential challenges related to the supply of critical materials, particularly carbon fibre, as demand for composite materials increases in the eVTOL industry.
- Emphasize the unique position of the eVTOL sector as a high-growth and high-volume market that relies heavily on composite materials to achieve weight targets and performance goals
- Advocate for collaborative efforts among industry stakeholders to address supply chain challenges and drive innovation in material sourcing and manufacturing processes to ensure sustainable growth in the eVTOL industry

15:20

Afternoon Networking Break

16:00 Session 4 - Batteries 2

Revolutionizing eVTOL Power With The Promise Of Lithium-Sulphur Batteries

- Overcome the limitations of Lithium-Ion batteries that face challenges such as mineral dependency, supply chain constraints, costs, and safety risks
- Discuss whether super materials like 3D Graphene can pave the way for widespread electrification? Instead of incremental improvements to Lithium-Ion chemistry, explore the potential of Lithium-Sulphur battery chemistry
- Understand the advantages of Lithium-Sulphur: Lithium-Sulphur offers high energy density, lightweight properties, and improved safety without the need for nickel, cobalt, manganese, or graphite in the cathode or anode
- Explain the technology behind the accelerated progress that was not expected to advance by the 2030s, Lithium-Sulphur technology is advancing ahead of schedule, thanks to innovations like 3D Graphene, promising a sooner-than-expected transition to this promising battery chemistry

16:20

Rethinking The Traditional Assumptions For Thermal Stability In Battery Design

- Highlight the limitations of relying solely on pack level or system level State of Health (SoH) computations, emphasizing the need for increased thermal stability in battery design
- Explore the nature of lithium-ion batteries and their susceptibility to thermal runaway, underscoring the importance of addressing thermal stability at the cell level
- Discuss the implications of thermal instability at the pack level, including safety concerns and potential performance degradation
- Examine the broader implications of inadequate thermal stability on overall system performance, reliability, and longevity
- Advocate for a holistic approach to battery design that prioritizes enhanced thermal stability at both the cell and system levels to ensure safe and reliable operation in diverse applications

16:40

Conceptual Design Of Solid-State Li-Battery For Urban Air Mobility

- Emphasize the importance of providing safe and efficient electrical energy storage systems for eVTOL aircraft, with a focus on all-solid-state Li batteries due to their non-flammable technology and high theoretical gravimetric energy
- Highlight the use of a pseudo-2-dimensional cell model combined with a microstructure surrogate model approach to gain insights into the impact of cathode microstructure on internal process limitations, enabling a knowledge-driven assessment of the technology's potential
- Discuss the incorporation of the developed model into a global optimization algorithm to predict optimum battery size tailored to the dynamic load demand of eVTOL aircraft, ensuring optimal performance
- Analyse the results that indicate that when carbon black and active materials are premixed, the battery outperforms configurations where solid electrolyte and active materials are premixed, particularly at low carbon black concentrations in the cathode combination
- Suggest that optimizing the composition and distribution of electrode components can enhance power and energy density, thereby extending the mission range of all-solid-state batteries for urban air mobility applications

17:00

Unravelling The Electrochemical Dynamics Of eVTOL Li-Ion Batteries

- Highlight the multifaceted demands that eVTOL aircraft impose on Li-ion batteries (LIBs), including stringent phase-disparate requirements driven by mission constraints and architectural design
- Explain how through a mechanistic modelling framework, the electrochemical implications of eVTOL architecture, mission constraints, and electrode design on LIBs offers insights into the unique challenges faced by these batteries
- Describe how current densities during critical phases such as landing and balked manoeuvres are identified as pivotal triggers for thermal safety concerns, underscoring the importance of understanding phase-specific demands on battery performance
- Reveal the key limitations that stem from the intersection of initial energy consumption and thermal convection during cold starts, exacerbated by altitude variations, to shed light on the complexities of eVTOL battery operation in varying environmental conditions
- Practical insights into the dynamic response of battery thermal management systems in light of mission-specific thermo-electrochemical interactions, providing valuable guidance for optimizing battery performance and safety across a range of eVTOL applications, including passenger mobility, cargo transport, and emergency medical services

17:20

Chair's Closing Remarks

17:30

All Attendee Evening Drink Reception

AGENDA 2024

| DAY 2 – INFRASTRUCTURE AND OPERATIONS

08:00

Registration | Breakfast Reception

08:30

Chairman's Opening Address

08:40 Session 4 - Infrastructure 1

Building The Foundation By Designing Vertiport Facilities For eVTOL Success

- Explore the critical operational requirements for vertiport facilities, including landing area design, approach paths, load bearing capacity, and safety standards for electric propulsion and battery storage
- Understand that vertiport facilities are not one-size-fits-all and may vary in configuration based on expected throughput and the specific characteristics of the eVTOL aircraft they serve
- Learn how the dimensional requirements of vertiport landing areas are influenced by an aircraft's Critical Dimensions (CD) and maximum gross take-off weights, impacting design regulations
- Discover the essential standards for facilities to enable the boarding and discharging of passengers and cargo by VTOL aircraft, even at early stages of development
- Delve into the importance of addressing noise requirements and ensuring safety standards for batteries and other hazardous materials within vertiport facilities to support sustainable AAM operations

09:00

Navigating The Complexities Of Site Selection For Vertiports For eVTOL Operations

- Understand the complexities of finding suitable sites in densely populated urban areas that is difficult due to existing infrastructure and limited open areas
- Discover why navigating complex zoning regulations and obtaining permits can be time-consuming, with potential opposition from local communities
- Learn why finding adequate space with access to utilities is challenging for vertiports because of the requirements for extensive infrastructure, including landing pads, charging stations, and passenger facilities,
- Discuss the noise, environmental impact, and safety that are significant considerations, requiring vertiports to be located away from densely populated areas and obstacles
- Acknowledge that vertiports need to integrate with existing transportation networks and this may involve navigating complex real estate markets, balancing cost considerations with proximity to urban centres

09:20

How Ready Is The Infrastructure To House The Commercialisation Of The eVTOL Industry?

- Recognising that AAM infrastructure encompasses various components such as landing infrastructure, zoning, airspace management, power sources, and digital infrastructure, that are all vital for commercial service initiation
- Reveal that despite imminent vehicle certification, infrastructure development lags OEMs' pace, posing a significant challenge to the industry's growth and success
- Understanding that while initial operations will utilize existing infrastructure like airports and heliports, the future of AAM relies on leveraging unique performance capabilities to land on urban rooftops and other suitable spaces
- Assessing critical factors like permitting, weather considerations, cybersecurity, and multimodal operations and why it plays a pivotal role in shaping AAM infrastructure's readiness and resilience
- Addressing infrastructure gaps requires collaborative efforts among industry stakeholders, policymakers, and urban planners to streamline regulations, investments, and implementation strategies

09:40

United States eVTOL Infrastructure – Navigating The Role Of State And Local Government In Vertiport Development

- Understand the economic benefits and how state and local governments wil play a pivotal role in planning and facilitating the development of vertiport infrastructure to unlock the projected economic advantages of AAM
- Acknowledge the need to allow room for growth and how vertiport siting must account for future demand and expansion, aligning with both government and industry forecasts to accommodate the evolving needs of the AAM market
- Recognise the value of integrating with surface transportation and why vertiports should be strategically linked to surface transportation networks, particularly crucial for efficient cargo operations, enhancing connectivity and accessibility
- Explore zoning and regulatory frameworks to establish zoning protections around vertiports that is vital for airspace management, although localized approaches may create uncertainty for developers. Collaboration with regulators is essential to navigate zoning and regulatory requirements for successful infrastructure development
- Discuss how industry stakeholders must engage with federal, state, and local regulators to address zoning, permitting, and regulatory hurdles, fostering collaboration to secure investments and initiate construction of vertiport facilities

10:00

Building Vertiport Infrastructure For eVTOL Operations From The Ground UP

- Explore the critical role of vertiports in facilitating ground operations for eVTOLs, serving as essential hubs for take-off, landing, and passenger boarding
- Discuss the unique infrastructure requirements of vertiports, including landing pads, charging stations, passenger terminals, and maintenance facilities
- Highlight the importance of location selection and design considerations for vertiports to optimize accessibility, minimize environmental impact, and ensure efficient operations
- Address challenges and opportunities in the construction and integration of vertiport infrastructure within urban environments, including zoning regulations, airspace management, and community engagement
- Showcase innovative design concepts and successful case studies of vertiport projects worldwide, demonstrating best practices and lessons learned for future development initiatives|

10:20

Morning Networking Break

11:00 Session 6 - Operations

Innovative Strategies For Seamless Integration Of eVTOLs In Urban Mobility Networks

- Explore the seamless integration of eVTOLs into urban transportation networks alongside existing modes of mobility
- Highlight the potential benefits of eVTOLs, including reduced congestion, shorter travel times, and enhanced connectivity within cities
- Address key considerations such as infrastructure requirements, airspace management, and regulatory frameworks necessary for successful eVTOL integration
- Emphasize the importance of collaboration among stakeholders, including policymakers, city planners, and technology providers, to ensure effective integration and maximize the societal benefits of eVTOLs
- Showcase case studies and best practices from cities around the world that have successfully integrated eVTOLs into their transportation systems, offering valuable insights for future urban planning initiatives

11:20

Noise And Vibration Considerations In eVTOL Aircraft And Methods Of Control For The Comfort Of The Pilot And Passengers On Board

- The FAA and EASA have formed working groups on Noise Vibration Harshness (NVH) to formulate strict noise regulations and ensure compliance by different eVTOL manufacturers on acceptable community noise levels (exterior noise) and pilot and passenger comfort levels during air travel (interior noise)
- Research facilities under the aegis of the NASA have been assisting FAA in developing eVTOL aircraft concept designs, developing generic codes for predicting the performance and noise signatures of these aircraft, and analysing and characterising the noise generated by these vehicles
- The common sources of noise and vibrations are the engine, transmission, and propulsion system, therefore designing a new system requires careful considerations and mitigation plans to eliminate undesirable noise and vibration, especially for mass produced products
- Typical solutions involve isolating the source of excitation, applying dampeners, and detuning structural resonances, however, these fixes typically require adding more mass and weight to the aircraft or redesigning its structure (trading off the performance)

11:40

Advanced Air Mobility: Opportunities, Challenges, And Research Needs For The State Of California

- Engage the public and community stakeholders on an array of AAM issues
- Conduct scenario planning and support institutional readiness to help prepare local and regional governments for AAM and related aviation innovations that could impact communities
- Understand the equity impacts of vertiport placement and AAM routing on neighbourhoods and vulnerable populations
- Develop vertiport and AAM land use compatibility resources
- Identify energy, take-off/landing, and emergency response infrastructure needed to support AAM
- Understand environmental, social, and behaviour impacts of AAM
- Measure the lifecycle GHG impacts of AAM activities
- Identify the economic opportunities and impacts of AAM

12:20

Paving The Way To Integrate eVTOL Traffic Into Busy Airports

- Gain insight into the collaboration between NASA's Ames Research Centre and Joby Aviation to develop a groundbreaking air traffic simulation aimed at integrating air taxis and eVTOL vehicles into the US's busiest airports
- Explain how representatives from the FAA, air traffic controllers' associations, and stakeholders witnessed the simulation, highlighting the collaborative effort to ensure safe integration of new aircraft into national airspace
- Understand how the simulation, featuring active and retired air traffic controllers, evaluated traffic schedules developed by Joby based on market analysis and anticipated future demand, providing valuable insights into operational feasibility
- Initial analysis suggests scalability of procedures for eVTOL operations in airports nationwide, potentially reducing workload on air traffic controllers and enhancing efficiency
- Findings from the simulation will be shared with the FAA, commercial industry, and airports to inform the development of air traffic control tools and procedures, paving the way for high-tempo integration of eVTOLs into airport operations and advancing NASA's Advanced Air Mobility mission for a sustainable and efficient air transportation system

12:40

Reach For The Skies By Integrating eVTOLs Into Urban And Regional Airspace

- Delve into the complexities of integrating eVTOLs into both urban and regional airspace, addressing challenges and opportunities
- Examine the regulatory landscape and airspace management strategies required to ensure safe and efficient integration of eVTOLs alongside existing air traffic
- Discuss the role of advanced air traffic management systems, including UTM (Unmanned Traffic Management) and U-Space, in coordinating eVTOL operations and minimizing congestion
- Explore infrastructure needs such as vertiports, charging stations, and communication systems to support eVTOL operations within urban and regional environments
- Highlight potential benefits of eVTOL integration, including reduced congestion, improved accessibility, and enhanced transportation options for both urban and rural communities

13:00

Networking Lunch Break

14:00 Session 7- Charging & Ground Operations

Challenges And Solutions In eVTOL Aircraft Charging Infrastructure

- Understand the evolving electrical charging needs of eVTOL aircraft and the complex requirements for electrical infrastructure at vertiports
- Explore how potential flight routes and aircraft parameters influence energy consumption calculations, essential for determining charging demands
- Learn about the agent-based modelling approach used to analyse total vertiport operation, considering flight schedules, passenger demand, and charging infrastructure
- Discover the significance of identifying the necessary number of chargers and charging strategies for potential vertiport sites, including constrained and unconstrained scenarios
- Gain insights into the grid impact analysis, highlighting the need for infrastructure upgrades or energy storage systems to accommodate charging demands without compromising grid reliability or power supply

14:20

Battery Charging – Pushing The Boundaries Of Battery Recharging To Meet The Requirements Of Large Scale Operations

- Battery recharging times are an important metric that is directly connected to the operational success of the eVTOL sector
- Meeting the requirements to effectively operate at scale, battery recharging needs to be as fast as possible, to minimize turnaround time and maximize number of flights per aircraft
- Can cutting edge battery technology increase range and shorten turnaround times—two factors that could go a long way toward helping an unproven industry succeed in a very sceptical market
- Why off-the-shelf EV batteries will not be good enough and why eVTOL manufacturers may have to pay higher prices for certificated, high-performance batteries that will be able to extend aircraft range and reduce turnaround times

14:40

The Advantages And Challenges Of Unleashing Liquid Hydrogen On eVTOL Aviation

- Understand that liquid hydrogen presents significant challenges in infrastructure development due to limited existing transport and storage infrastructure, as well as high costs associated with complex storage systems
- Despite challenges, liquid hydrogen offers performance advantages over battery electric energy, including better range, flight duration, and payload capacity for rotary-wing eVTOL vehicles.
- Learn that liquid hydrogen aircraft boast faster recharge or refuelling cycles compared to battery-powered counterparts, enhancing operational efficiency and turnaround times
- Acknowledge that while batteries offer simplicity, many eVTOL developers are exploring liquid hydrogen for its zero carbon emissions, aligning with global efforts towards sustainable aviation
- Discuss how the pursuit of carbon-free technology has spurred substantial investment from governments and private sectors, driving research and development in liquid hydrogen as a clean energy source for eVTOL aviation

15:00

Unlocking The Potential Of Vertiports With Sustainable Urban Air Mobility

- Understand how urban mobility is undergoing a zero-carbon revolution with the imminent introduction of eVTOLs and vertiports worldwide, presenting a novel and transformative market landscape
- Outlines three main business models pursued by eVTOL operators and underscores the importance of accommodating diverse approaches within vertiport design to facilitate market growth and innovation
- Highlight the factors influencing the selection and development of vertiport locations, including operational and regulatory requirements, are discussed in detail to provide insights for airport operators venturing into urban air mobility
- Introduce the importance of community engagement, which emerges as a critical aspect of vertiport development, emphasizing the need for collaboration with local communities to ensure the effective integration of vertiport networks into urban environments
- Explain how airport operators are positioned to play a pivotal role in fostering the growth of the urban air mobility industry, leveraging vertiports to enhance connectivity, alleviate local congestion, and expand accessibility to new passenger demographics

15:20

Afternoon Networking Break

16:00 Session 8 - Infrastructure 2

Securing The Skies With Effective Cybersecurity Implementation For Electric Aviation Infrastructure

- Assess the cybersecurity landscape, including components, interconnections, and operational data criticality, to identify vulnerabilities and sensitivities
- Review existing cybersecurity best practices and analyze their applicability to electric charging systems in the aviation sector
- Highlight the importance of developing common cybersecurity policies and practices among stakeholders to minimize attack surfaces and enhance response capabilities
- Utilize references and knowledge from ground vehicle development to inform cybersecurity strategies for electric aviation infrastructure
- Advocate for the integration of cybersecurity strategies into the initial stages of design and procurement for electric aviation systems to enhance defensibility and resilience against cyber threats

16:20

Navigating Vertiport Throughput Challenges In Urban Air Mobility

- Understand how vertiports are pivotal in enabling efficient Urban Air Mobility (UAM) by facilitating fast passenger processing
- Introduce hourly passenger throughput per area as a performance metric for vertiport efficiency assessment
- How using VoloCity as a reference vehicle, the study highlights the space requirement per passenger per hour, providing insights into vertiport design
- Present analysis of 13 eVTOL designs reveals that smaller maximum vehicle dimensions correlate with higher passenger throughput capacity, emphasizing design considerations for optimal UAM operations
- Offer valuable insights into vertiport operations and design strategies crucial for maximizing passenger throughput and enhancing the efficiency of Urban Air Mobility systems

16:40

Connecting The Building Blocks To Prepare For AAM Take-Off

- Recognise that transport operators, governments, and regulators face challenges in integrating AAM, requiring proactive collaboration and innovative solutions
- Understand how airports must adapt infrastructure for AAM services, while rail and metro operators can enhance connectivity opportunities
- Discover how governments and regulators play a pivotal role in fostering a safe, environmentally sustainable, and commercially viable AAM environment
- Learn how urban planners aim to maximize social, economic, and environmental benefits by seamlessly integrating AAM into existing transport networks
- Showcase why hospitals and building developers must incorporate AAM infrastructure into future designs to leverage the opportunities presented by AAM services

17:00

The Potential Of Vertiports To Transform Airports And The Need To Rethink Future Strategy

- Understand how vertiports will revolutionize the traditional airport landscape, introducing a new era of integration between these emerging infrastructures and conventional airports
- Recognise that while vertiports will reshape urban transportation, conventional airports, especially hubs, will retain significance. They will continue serving longer distance and trunk routes due to the range, speed, and capacity limitations of AAM vehicles
- Learn how AAM can elevate airports beyond standalone infrastructure to become integral urban intercity hubs. They offer an alternative mode of transportation, alleviating ground transportation congestion and increasing connectivity throughout urban and suburban areas without extensive ground infrastructure costs
- Explore the opportunities to repurpose smaller, underutilised airports to ensure their relevance and sustainability
- Assess how integrating AAM with airports aligns with sustainability goals by increasing capacity and connectivity while minimizing environmental impacts and represents a forward-thinking approach to urban mobility

17:20

Chair's Closing Remarks

17:30

All Attendee Evening Drink Reception

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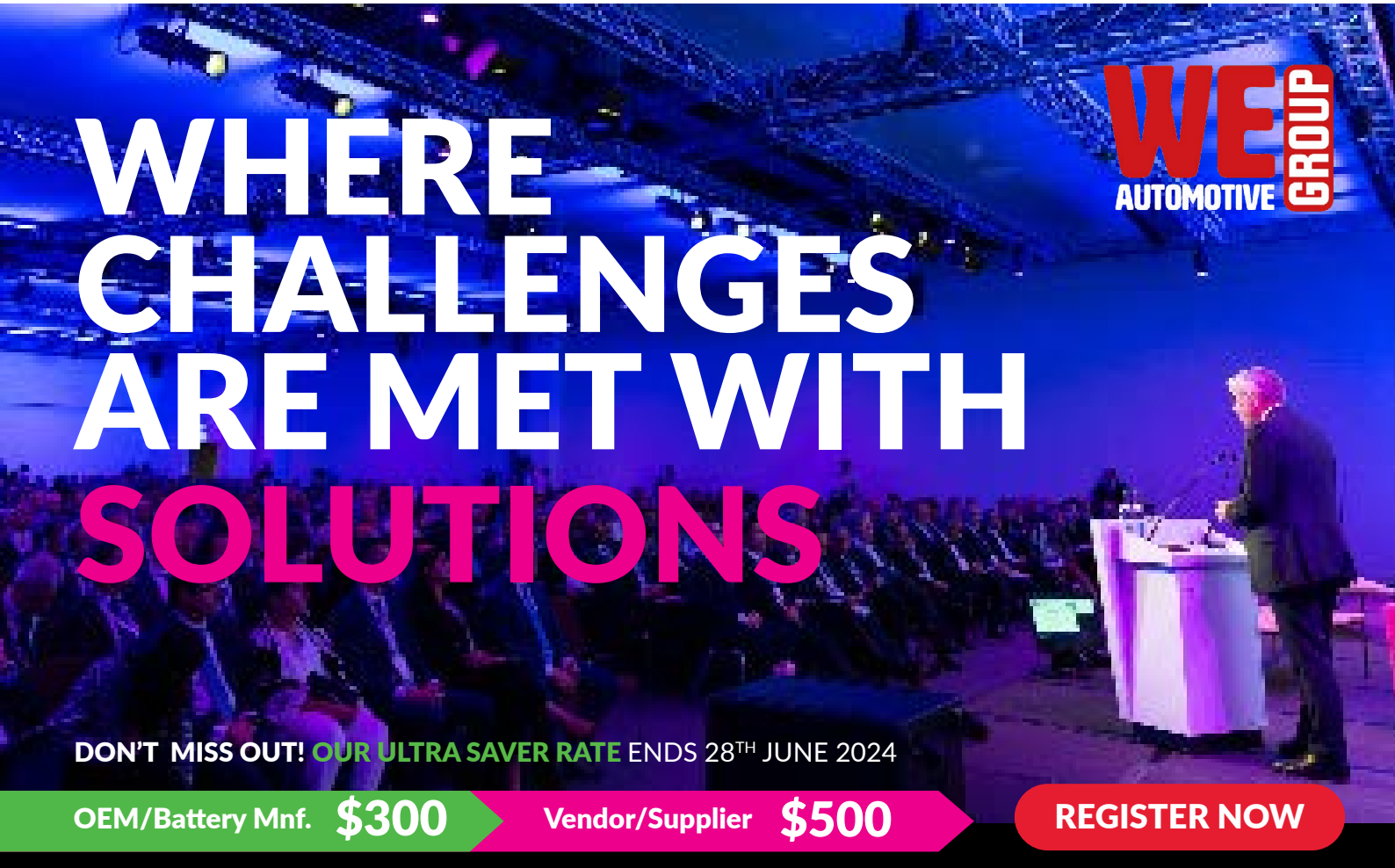

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Exhibitors offering advanced battery systems, including lithium-ion batteries and next-generation energy storage solutions tailored for eVTOL applications; Battery Thermal Management, Battery Management Systems - Battery Technologies

Flight Control And Avionics:
Exhibitors showcasing flight control systems, avionics components, and navigation systems designed specifically for eVTOL operations

Aerodynamics And Airframe Design:
Exhibitors providing aerodynamic design expertise, airframe components, and lightweight materials to optimize eVTOL efficiency and performance

Charging Infrastructure:
Exhibitors specializing in charging infrastructure solutions for eVTOL vehicles, including charging stations, ground power systems, and wireless charging technologies

Propeller And Rotor Systems:
Exhibitors offering advanced propeller and rotor systems, including composite materials, blade design, and noise reduction technologies for eVTOL applications

Electric Powertrain Integration:
Exhibitors showcasing integrated electric powertrain solutions, including motor, controller, gearbox, and thermal management systems for eVTOL aircraft

Safety Systems And Certification:
Exhibitors providing safety systems, redundancy solutions, and certification services to meet the stringent safety standards and regulatory requirements of eVTOL operations

Lightweight Materials And Composites:
Exhibitors offering lightweight materials, composites, and structural solutions to reduce weight and increase energy efficiency in eVTOL aircraft

Simulation and Modeling Software:
Exhibitors providing simulation and modeling software tools for eVTOL design, performance analysis, and optimization of aerodynamics, energy consumption, and flight characteristics

Flight Test And Validation Services:
Exhibitors specializing in flight test services, validation, and certification support for eVTOL aircraft, including aerodynamic testing, structural testing, and performance evaluation

Component And Systems Integration:
Exhibitors offering component and systems integration services, including system architecture design, electronics integration, and testing for eVTOL platforms

Power Distribution Systems:
Exhibitors specializing in power distribution systems, including electrical distribution panels, circuit breakers, and power management solutions for eVTOL aircraft

Pilot Control Systems:
Exhibitors offering pilot control systems, including flight control interfaces, control panels, and human-machine interfaces (HMIs) for eVTOL operations

Avionics:
Exhibitors providing avionics systems and components, such as displays, communication systems, weather radar, and collision avoidance systems for eVTOL aircraft

Flight Management:
Exhibitors showcasing flight management systems (FMS) and software solutions for route planning, navigation, and performance optimization in eVTOL operations

Data Management:
Exhibitors specializing in data management and analytics platforms, including data acquisition, storage, processing, and data-driven insights for eVTOL operations

Instrumentation:
Exhibitors offering instrumentation systems, sensors, and measurement devices for monitoring critical parameters, such as altitude, airspeed, and engine performance in eVTOL aircraft

Navigation Aids:
Exhibitors providing navigation aids and systems, including GPS (Global Positioning System), GNSS (Global Navigation Satellite System), and other positioning technologies for eVTOL operations

Batteries:
Exhibitors specializing in battery technologies for eVTOL applications, including advanced lithium-ion batteries, solid-state batteries, and innovative battery management systems

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Exhibitors offering electrical power systems and components, such as generators, inverters, and power conversion units for eVTOL aircraft

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Our programs are diligently researched and curated in partnership with the eVTOL community, to **ensure they address the most pertinent current challenges and key investment areas.** This level of detail is part of our pioneering approach to content and ensures that we attract the highest level of attendees.

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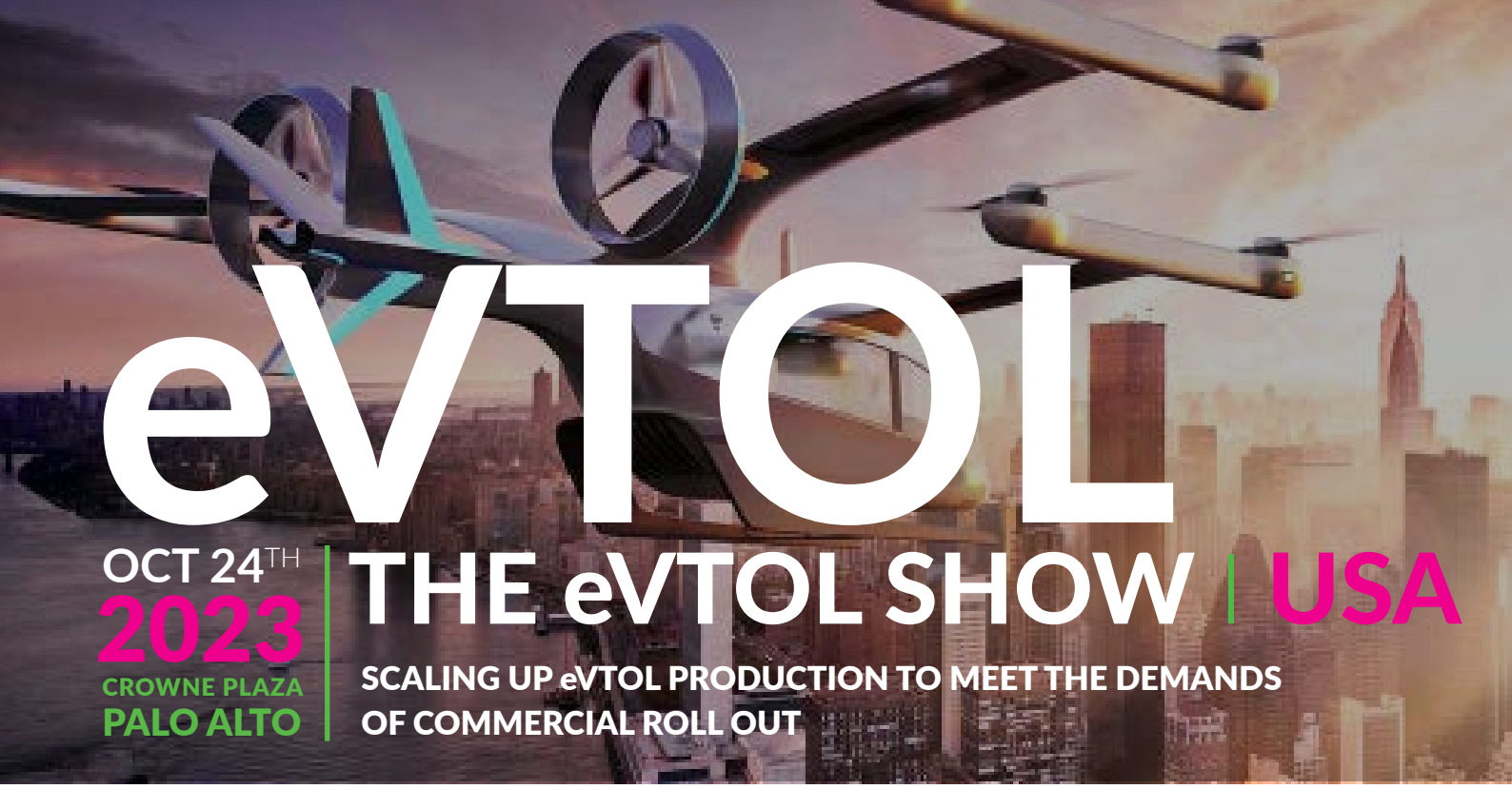

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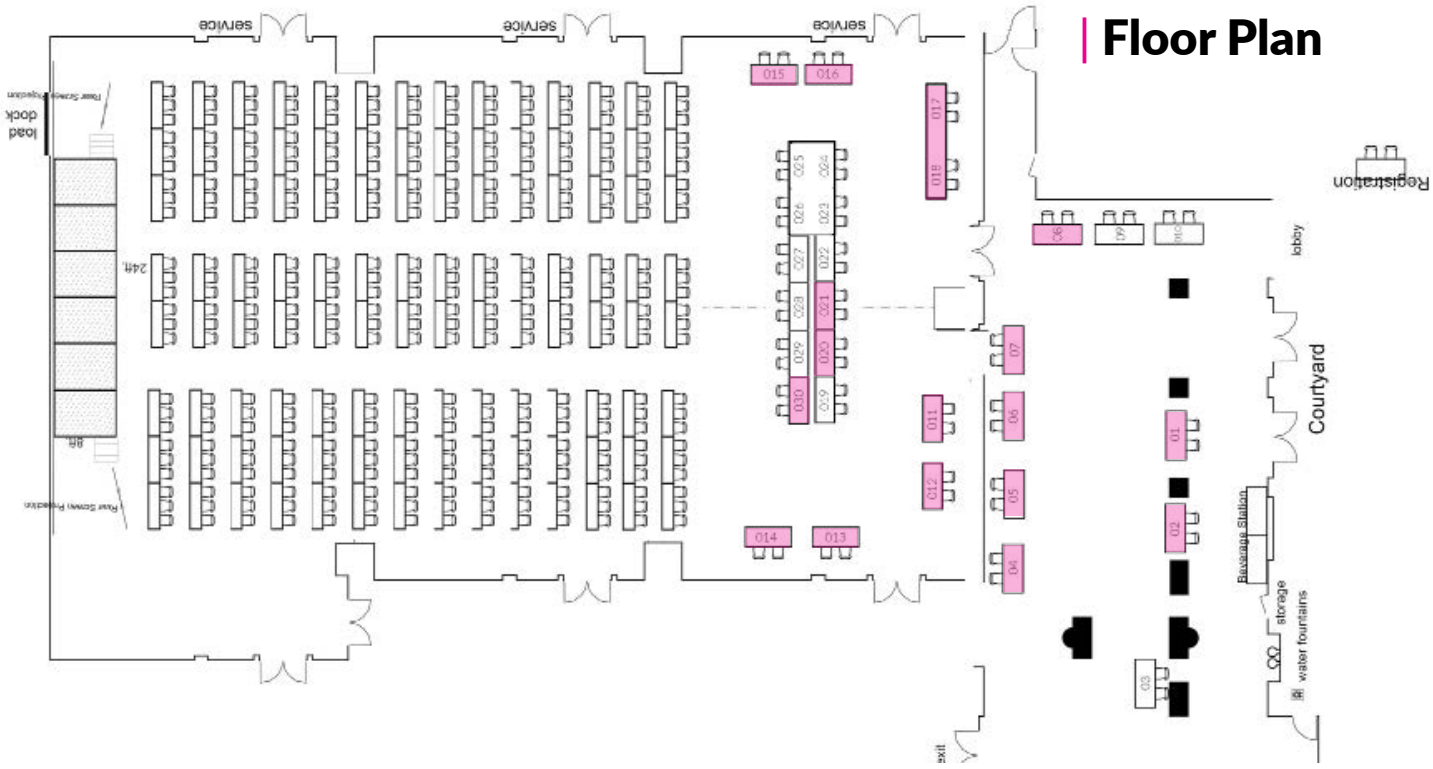

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