



DAIR ***TO INNOVATE 2024***

A DAY OF INSPIRATION & COLLABORATION



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Executive Summary

The DAIR To Innovate 2024 Conference and Tech Showcase convened leaders from industry, academia, and various levels of government to explore strategies for advancing the aerospace sector through collaboration, sustainability, and innovation. Organized by Downsview Aerospace Innovation & Research (DAIR), the event served as a platform to address pressing challenges and opportunities shaping the future of aerospace.

Innovation emerged as a key theme, with discussions emphasizing the importance of reducing aviation's environmental impact. Solutions included innovations to address carbon emissions, improve energy efficiency, and accelerate the adoption of sustainable technologies. Success stories, such as projects funded through the DAIR Green Fund, showcased practical applications and pathways to achieving sustainability targets.

Collaboration was another focal point, highlighting models that unite SMEs, academia, and industry giants. The adoption of frameworks like Aéro Montréal's MACH Excellence Framework by DAIR underscored the importance of scalable, proven methods for supporting SME growth and fostering partnerships across regions. Examples from Quebec's Innovation Zones and Ontario's research initiatives demonstrated the potential for nationwide cooperation to drive the sector forward.

Emerging technologies and workforce development were also critical topics. Presentations explored advancements in additive manufacturing, green aviation technologies, and strategies for addressing workforce shortages. Programs promoting experiential learning, mentorship, and diversity were identified as key to preparing the next generation of aerospace professionals.

The event showcased successful projects, such as from the DAIR Green Fund and the DAIR Supplier Development Initiative, as well as pan-Canadian successes such as CRIAQ-led initiatives and collaborative programs that have delivered transformative impacts. These examples demonstrated the value of partnerships in tackling complex challenges.

DAIR To Innovate 2024 concluded with a call to action for stronger collaboration across Canada's aerospace ecosystem. By leveraging proven models and fostering complementary partnerships, attendees were encouraged to work toward a sustainable, resilient, and innovative future for the industry. DAIR reaffirmed its commitment to enabling impactful collaboration in aerospace innovation.

Context

The ***DAIR To Innovate 2024*** event brought together over 280 individuals, key stakeholders from the aerospace industry, academic institutions, government agencies, and small to medium-sized enterprises (SMEs) to address the pressing challenges and emerging opportunities within Canada's aerospace sector.

Hosted by Downsview Aerospace Innovation & Research (DAIR), the event aimed to foster collaboration, showcase innovative technologies, and promote sustainable practices that can propel the industry into the future. Against a backdrop of growing environmental concerns, workforce challenges, and rapid technological advancements, the event provided a platform for thought leaders to exchange ideas, share success stories, and discuss actionable strategies to strengthen the sector.

With a focus on sustainability, workforce development, and cross-sector collaboration, ***DAIR To Innovate 2024*** emphasized the critical role of partnerships in shaping a resilient and competitive aerospace ecosystem for Canada and beyond.



Event Agenda

8:00 AM TO 8:45 AM

Participants Arrival and Registration

8:45 AM TO 9:05 AM

Welcoming Addresses

9:05 AM TO 9:20 AM

Morning Keynote : Sylvain Boisvert

9:20 AM TO 10:20 AM

Panel 1 : Charting a sustainable flight path

10:20 AM TO 10:50 AM

Networking and Official opening of the Tech Showcase

10:50 AM TO 11:00 AM

Speaker : Mike Mueller

11:00 AM TO 11:45 AM

Panel 2 : Decarbonization as a competitive advantage

11:45 AM TO 1:05 PM

Lunch and Tech Showcase

1:05 PM TO 1:15 PM

Afternoon Keynote : Janet Wardle

1:15 PM TO 2:15 PM

Panel 3 : Unlocking new potential

2:15 PM TO 2:25 PM

Speaker : Matthew Aiken

2:25 PM TO 3:00 PM

Networking and Tech Showcase

3:00 PM TO 3:50 PM

Panel 4 : Shaping tomorrow

3:50 PM TO 4:50 PM

Panel 5 : Advancing a collaborative approach

4:50 PM TO 5:00 PM

Closing Comments

5:00 PM TO 6:30 PM

Reception – held within the Tech Showcase area

Tech Showcase

The Tech Showcase is a key feature of *DAIR To Innovate*, highlighting collaboration, innovation and research that defines Ontario and Canada's aerospace industry as leading-edge and full of possibility. Attendees of the conference explored the displays and interactive demonstrations, asked questions and networked.

This year the Tech Showcase featured SMEs, OEMs, and service providers exhibiting their innovative technologies and projects. Exhibitors were busy during networking breaks, lunch, and the evening reception discussing collaborative opportunities to continue the growth of Canada's aerospace industry. Unique to this year's Tech Showcase, was the Bombardier EcoJet FTV displayed in the main hangar of the conference venue, as well as a full Siemens Experience Centre display.



Summary of Discussion Panels and Speakers

4.1 Event Introduction

The *DAIR To Innovate 2024* event opened with a series of insightful introductions by prominent leaders who set the stage for a day dedicated to fostering collaboration and innovation in Canada's aerospace sector. Verlyn Smith, Supplier Development and Continuous Improvement Manager at DAIR, highlighted the importance of supplier engagement in driving industry growth. Craig Stephenson, CEO of Centennial College, welcomed attendees on behalf of the hosting partner and emphasized the vital role of education in building a skilled aerospace workforce.

Keynotes from government representatives underscored the public sector's commitment to the industry. Filomena Tassi, Minister responsible for the Federal Economic Development Agency for Southern Ontario, spoke about federal initiatives supporting aerospace innovation and sustainability, while Vic Fedeli, Ontario's Minister of Economic Development, Job Creation, and Trade, highlighted provincial efforts to boost economic development and technological advancement in aerospace.

Finally, Phil Arthurs, Executive Director of DAIR, and Stephen McCullough, Senior Vice President at Bombardier and Vice Chair at DAIR, reflected on the hub's mission to unite industry, academia, and government in addressing the challenges and opportunities shaping the future of aerospace. Their remarks set a collaborative and forward-thinking tone for the event, emphasizing the importance of partnerships in driving the sector's success.



4.2 Keynote Speaker : Sylvain Boisvert General Manager, Safran Canada

The talk highlighted Canadian aerospace achievements, such as the multiple landing gear programs having development and manufacturing in Toronto, and the sector's robust post-COVID recovery, with record commercial aviation activity, growing business aviation, and increased helicopter operations. Sustainability emerged as a key focus, emphasizing net-zero emissions targets for 2035 and 2050, advancements in sustainable aviation fuel (SAF), and ongoing challenges in scaling SAF production. The importance of addressing global supply chain disruptions was noted, with calls for strengthening Canada's aerospace ecosystem through collaboration and reduced international reliance. Finally, talent development was underscored, emphasizing the role of institutions like Centennial College and the need for investment in workforce training to meet industry demands.



4.3 Panel 1: Charting a Sustainable Flight Path – The State of Aerospace in Ontario and Across Canada

MODERATOR :

Natasha Gagnon,
CEO, *Ontario Aerospace Council (OAC)*

PANELISTS :

Alyson Gasperetti,
Plant Manager, *Fleet Canada Inc.*

Enguerran Michel,
Director Research & Technology, *Bombardier*

Pervez Canteenwalla,
Program Leader, Low Emission Aviation Program, *National Research Council of Canada (NRC)*

John Wyzykowski,
Aviation and Leadership consultant, *Former Lilium/P&WC*

The first panel featured representatives from Fleet Canada, Bombardier, the National Research Council of Canada (NRC), and a former executive at Pratt & Whitney Canada and Lilium, moderated by the Ontario Aerospace Council, addressed key issues in the aerospace industry, including workforce development, sustainability, supply chain resilience, and innovation.

Panelists highlighted the challenges in recruiting and retaining skilled tradespeople and engineers, as retirements outpace replacements. To address this, partnerships with colleges, hands-on training programs, and initiatives like the OAC's 360 virtual aerospace experience were emphasized.

Achieving net-zero emissions by 2050 was a major focus. Efforts discussed included sustainable aviation fuels (SAF), hydrogen, and hybrid-electric propulsion systems. Bombardier stressed the need for rapid innovation and collaboration with academia, industry, and government. John Wyzykowski shared advancements in propulsion technologies, addressing challenges like battery life and SAF scalability.

Disruptions from geopolitical tensions, natural disasters, and supplier bankruptcies were discussed. Strategies like multi-sourcing, AI-driven demand forecasting, and co-development with suppliers were presented as essential to enhancing resilience. Bombardier emphasized the need for scalable SAF production in Ontario to support this effort.

The panel showcased emerging technologies, including autonomous aircraft and hybrid-electric solutions. Horizon Aircraft's in-development and eVTOL, itself a DAIR Green Fund recipient, and pan-Canadian programs like Bombardier's EcoJet highlight Ontario's leadership and potential in advanced air mobility. Knowledge transfer from research to certification processes was identified as a crucial element for maintaining global competitiveness.



4.4 Speaker : Mike Mueller President and CEO, AIAC

Mike Mueller provided an update on the National Aerospace Strategy, sharing key insights from the Aerospace Industries Association of Canada (AIAC). He emphasized the strong growth and promising opportunities within the aerospace sector, which supports around 200,000 well-paying jobs nationwide.

The discussion highlighted the critical role of small businesses in the industry, as well as the significant influence government policies have on their operations. The AIAC has outlined three main priorities for advancing the aerospace sector: implementing a comprehensive National Aerospace Strategy, addressing skills and talent shortages, and embracing disruptive technologies.

To support these goals, AIAC is actively collaborating with colleges and universities, working to inform policy, foster innovation, and introduce fresh ideas into the industry. Through these partnerships, AIAC aims to create a robust and adaptable aerospace ecosystem equipped to meet future demands.

4.5 Panel 2 : Decarbonization as a Competitive Advantage

MODERATOR :

Valerie Myers,

Senior Director, Global Procurement & Supply Chain Management, CAE

PANELISTS :

Gordon Bourque,

Business Development Executive, Akonovia

Larry Fitzgerald,

CEO, RAMPF Composite Solutions

The panel centered on sustainability, with key insights shared by experts from decarbonization, aerospace, and supply chain management. Gordon Bourque from Akonovia introduced his background in consulting, focusing on decarbonization efforts in buildings. Larry Fitzgerald, CEO of RAMPF Composite Solutions, discussed the company's focus on lightweight solutions in aerospace and the challenges of addressing its significant supply chain carbon footprint. Valerie Myers from CAE, with 30 years of experience in supply chain and aerospace, defined sustainability and shared her extensive experience in addressing unsustainable practices in her career. She emphasized both the economic and environmental importance of sustainability, particularly in aerospace.

The discussion delved into sustainability in aerospace and supply chains, with a focus on nearshoring and collaboration to reduce emissions. RAMPF Composite Solutions revealed that 70% of its carbon footprint stemmed from its supply chain, reinforcing the need for a comprehensive decarbonization approach. Participants highlighted the importance of resilience in supply chains in the face of climate challenges, and the potential for innovation in decarbonization efforts.

Nonprofit organizations like DAIR were recognized for their role in supporting SMEs with education, funding, and project execution. Larry shared positive outcomes from DAIR's Supplier Development Initiative, which helped his company address its carbon footprint. The group stressed the importance of collaboration, governance, and values in achieving sustainability goals.

Cost concerns around decarbonization were addressed, framing it as an investment rather than a burden. Practical examples included optimizing heating systems and adopting eco-friendly technologies to balance costs with energy savings. Additionally, sustainability initiatives were seen as a driver for attracting and retaining talent, with projects in hydrogen and electrified aircraft appealing to young professionals.

The conversation concluded with a focus on the urgency of starting the decarbonization journey, with an emphasis on collaboration, innovation, and knowledge sharing to stay competitive and environmentally responsible.



4.6 Keynote Speaker : Janet Wardle COO, MHI Canada Aerospace

The Canadian aerospace industry contributes nearly \$30 billion to GDP and supports over 200,000 manufacturing jobs, leading the country in R&D investment and innovation. However, maintaining this leadership requires vigilance, as global competitors continue to advance. Success depends on a collaborative ecosystem involving OEMs, suppliers, SMEs, government, academia, and industry associations.

Canada's aerospace achievements have deep historical roots, exemplified by the Avro Arrow project—a "Team Canada" initiative that united industry, government, and academia to deliver remarkable results. This legacy serves as a reminder of the sector's potential and a call to leverage collective strengths for future progress. A short video on the Avro Arrow project underscored its lasting impact and inspired continued ambition. The industry's growth will rely on building upon this heritage while fostering collaboration to sustain innovation and competitiveness.



4.7 Special Presentation : Glenn Chapnik Senior Director of Project Engineering, Bombardier

Glenn provided an update on Bombardier's growth, noting an increase in employees from 15,000 to 18,000 and a significant presence across Canada with 1400 suppliers and an economic contribution of \$5.7 billion. In Ontario, Bombardier contributes \$1.1 billion to the GDP and employs 6,000 people. The company recently moved to a new, \$660 million state-of-the-art facility at Pearson Airport, which has reduced greenhouse gas emissions by 65%.

Bombardier is also focused on digital transformation, implementing a new PLM system, Teamcenter, and a revised CAD solution, NX, in 2024 to reduce design time and costs. Additionally, the company is enhancing data management across the product lifecycle.

Efforts in the connected supply chain include using AI to predict component obsolescence and improve quality integration. Bombardier is partnering with Siemens to achieve real-time data accuracy, focusing on digitalization, value chain management, and supplier collaboration.



4.8 Panel 3 : Unlocking new Potential with digital technologies and Product Lifecycle Management (PLM)

MODERATOR :

Steve Cargnello,

Green Fund and R&D Manager, *DAIR*

PANELISTS :

Pascal Bédard,

Senior Specialist and Business Architect, *Bombardier*

George Rendell,

VP, Product Management and Marketing, *Siemens*

Pranav Khanolkar,

PHD Candidate, Ready Lab, *University of Toronto*

The panel discussion focused on the future of Product Lifecycle Management (PLM) digitization, with a strong emphasis on technology adoption and challenges. A key shift in aerospace was highlighted, moving from traditional CAD/CAM PLM systems to a more holistic product lifecycle management approach. Bombardier's Business Architect Pascal Bédard discussed how this broader view integrates engineering and product development, supporting new technologies and innovation.

Siemens' George Rendell spoke about the innovative tools in product development, emphasizing the patents awarded and customer-driven enhancements in NX design. He pointed out the challenges of overcoming workflow inertia and user data complexities during digital transformations and stressed the importance of a pragmatic approach to these changes.

The academic perspective from Pranav of the University of Toronto underscored PLM's importance in engineering education and the need for effective data management in digital transformations. Siemens also discussed its work in supporting industries like aerospace, leading in integrated design and simulation workflows. However, challenges remain, particularly with the sustainability module in NX, which has not yet been fully adopted in aerospace.

Regarding interoperability, Siemens highlighted its efforts to integrate PLM software with various supply chains using open standards like JT, which reduce customer effort. Further discussions centered on the evolution of PLM over the past five years, touching on the impact of machine learning, AI, and immersive engineering.

Siemens Xcelerator program was discussed, featuring innovations in cloud SaaS, digital threads, and AI capabilities. Immersive Engineering and cloud deployment were also identified as tools that improve user experience and product security. AI-enabled tools like the NX AI copilot, aimed at enhancing workflows, were showcased.



4.9 Speaker : Matthew Aiken President and Principal Consultant, Murisphere Solutions

Matthew Aiken delves into the evolving world of platform business models, emphasizing their role in driving innovation by connecting multiple participants within a network. Unlike traditional business models that focus on delivering value to customers and optimizing internal operations, platform models orchestrate resources and facilitate seamless interactions between users, as exemplified by Uber's ability to eliminate friction in hailing a taxi.

Aiken highlights the importance of celebrating innovation and using networks to solve problems collaboratively, and how the newly launched DAIR Innovation Network can help support. He highlighted upcoming plans including design thinking workshops which can provide curated and bespoke solutions for participants, starting with two essential questions: what problem needs solving, and what is the immediate goal?

Closing his talk, Aiken reiterates the significance of innovation, collaboration, and continuous learning. He acknowledges the support of the DAIR team in advancing these efforts and invites further discussions, encouraging participants to contribute to innovative solutions and future projects and be a part of the DAIR Innovation Network.



4.10 Panel 4 : Shaping tomorrow – Cultivating the skills of the next generation aerospace workforce

MODERATOR :

Ashton Jila,

Director Engineering Co-OP, *Toronto Metropolitan University (TMU)*

PANELISTS :

Ron Ganis,

Technical Fellow, *Collins Aerospace*

Tim Repestski,

Program Coordinator, Professor, *Centennial College*

Renu Kumar,

Operations Manager, *Trinity Aerospace*

Patrick Coulter,

Director, Business Development, *FlightSafety International*

The panel discussion on cultivating the next generation workforce in aerospace, moderated by Ashton Jila from TMU, featured insights from industry and academic leaders. Panelists included Ron Ganis from Collins Aerospace, Tim Repetski from Centennial College, Renu Kumar from Trinity Aerospace, and Patrick Coulter from FlightSafety International. They addressed critical challenges and opportunities in preparing future aerospace professionals.

Key skills emphasized included digital literacy, sustainability, cost-effective manufacturing, and technical communication. Emotional intelligence and cultural competencies were highlighted as essential for collaboration within a global industry. Panelists stressed the importance of soft skills, such as confidence and effective communication, supported by partnerships between academia and industry.

Ensuring inclusivity and accessibility in aerospace education was a central theme. Outreach to high school students, storytelling to inspire underrepresented groups, and visible representation in the industry were identified as vital. The panel underscored the importance of creating an inclusive environment where students from all backgrounds can thrive.

Fostering innovation through experiential learning and mentorship emerged as a priority. Patrick Coulter and Ron Gannis emphasized collaboration between academia and industry to provide real-world challenges, while mentors were seen as instrumental in guiding students and creating safe spaces for creativity.

The role of mentorship in professional growth was explored, with panelists advocating for its integration into capstone projects and industry practices. Low time commitments from mentors can significantly impact student's transitions into professional roles.

Lastly, the panel discussed strengthening ties between academia and industry through advisory committees, co-op programs, scholarships, and site visits. These initiatives ensure curricula remain relevant to emerging technologies and industry needs.

The session concluded with a call to action for industry leaders to actively engage with educational institutions, fostering the development of a skilled and diverse aerospace workforce.



4.11 Panel 5 : Advancing collaborative approach to the Canadian aerospace innovation ecosystem

MODERATOR :

François Provencher,
Expert Consultant, *Innovitech*

PANELISTS :

Etienne Leclerc-Jolette,
VP Partnerships, *CRIAQ*

Mélanie Lussier,
President and CEO, *Aéro Montréal*

Michel Dion,
General Manager, *INSAT*

Phil Arthurs,
Executive Director, *DAIR*

Suzanne Kearns,
Founding Director, *WISA*

The discussion brought together leaders from key organizations to explore sustainability and collaboration in aerospace. Michel Dion, CEO of INSAT, highlighted his organization's mission to advance sustainable aviation technologies, while Phil Arthurs of DAIR emphasized the importance of collaboration in driving innovation. François Provencher from Innovitech stressed the need for partnerships within Quebec's aerospace ecosystem, Mélanie Lussier shared Aéro Montréal's efforts to unite industry players in the region, and Etienne Leclerc-Jolette outlined CRIAQ's role in fostering collaboration among industry, academia, and government.

Sustainability was a central theme, with Suzanne Kearns of the Waterloo Institute for Sustainable Aeronautics emphasizing social, environmental, and economic sustainability. Michel Dion warned that aviation's carbon footprint, currently 3% of global emissions, could rise to 24% by 2050 without intervention. Collaboration was highlighted as essential for addressing these challenges, with examples like Quebec's Innovation Zones and Aéro Montréal's innovation centers driving progress in sustainable aviation as well as programs such as INSAT and the DAIR Green Fund.

Specific collaborative projects showcased success. Etienne Leclerc-Jolette shared a CRIAQ initiative involving 12 partners focused on additive manufacturing, valued at \$1 million over two to three years. Michel Dion presented INSAT's focus on SME-driven projects to accelerate sustainable technology commercialization and its organization's pan-Canadian goals, while Phil Arthurs highlighted the DAIR Green Fund's role in Ontario's aerospace ecosystem.

Looking forward, participants stressed leveraging successful models like Aéro Montréal's MACH Excellence Framework for SME development and fostering nationwide collaboration. Mélanie Lussier and Phil Arthurs emphasized scaling such frameworks across regions to support innovation including the use of the MACH Excellence Framework within DAIR's Supplier Development Initiative. Michel Dion from INSAT advocated for cross-regional relationships, ensuring efforts complement rather than duplicate.

The session concluded with a call for more touchpoints to enhance collaboration, supporting the aerospace ecosystem's evolution toward a sustainable and innovative future.



Conclusions

The *DAIR To Innovate 2024* event concluded with a resounding call for action, underscoring the importance of collaboration, innovation, and sustainability in shaping the future of Canada's aerospace sector. Throughout the day, attendees engaged in meaningful discussions, shared success stories, and explored innovative solutions to address the industry's most pressing challenges, from environmental sustainability to workforce development.

Key takeaways included the vital role of partnerships between industry, academia, and government in fostering cutting-edge research and supporting the next generation of aerospace professionals. The event highlighted the need for continued investment in emerging technologies, inclusive workforce strategies, and sustainable practices to ensure the resilience and competitiveness of Canada's aerospace ecosystem.

As the event was closing, DAIR reaffirmed its commitment to serving as a hub for collaboration and innovation, encouraging participants to build on the momentum generated during the event. Attendees were inspired to leverage the insights, connections, and opportunities gained to drive meaningful progress in their organizations and across the industry.

With a focus on action and collaboration, *DAIR to Innovate 2024* left participants with a clear message : by working together, stakeholders can overcome challenges, seize opportunities, and pave the way for a brighter, more sustainable future for aerospace in Canada and beyond.

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Tech Showcase





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