



Optimus – An Air Canada Maintenance Cost Optimization Solution

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IATA MCC - October 5th 2022

AIRBUS A321-200

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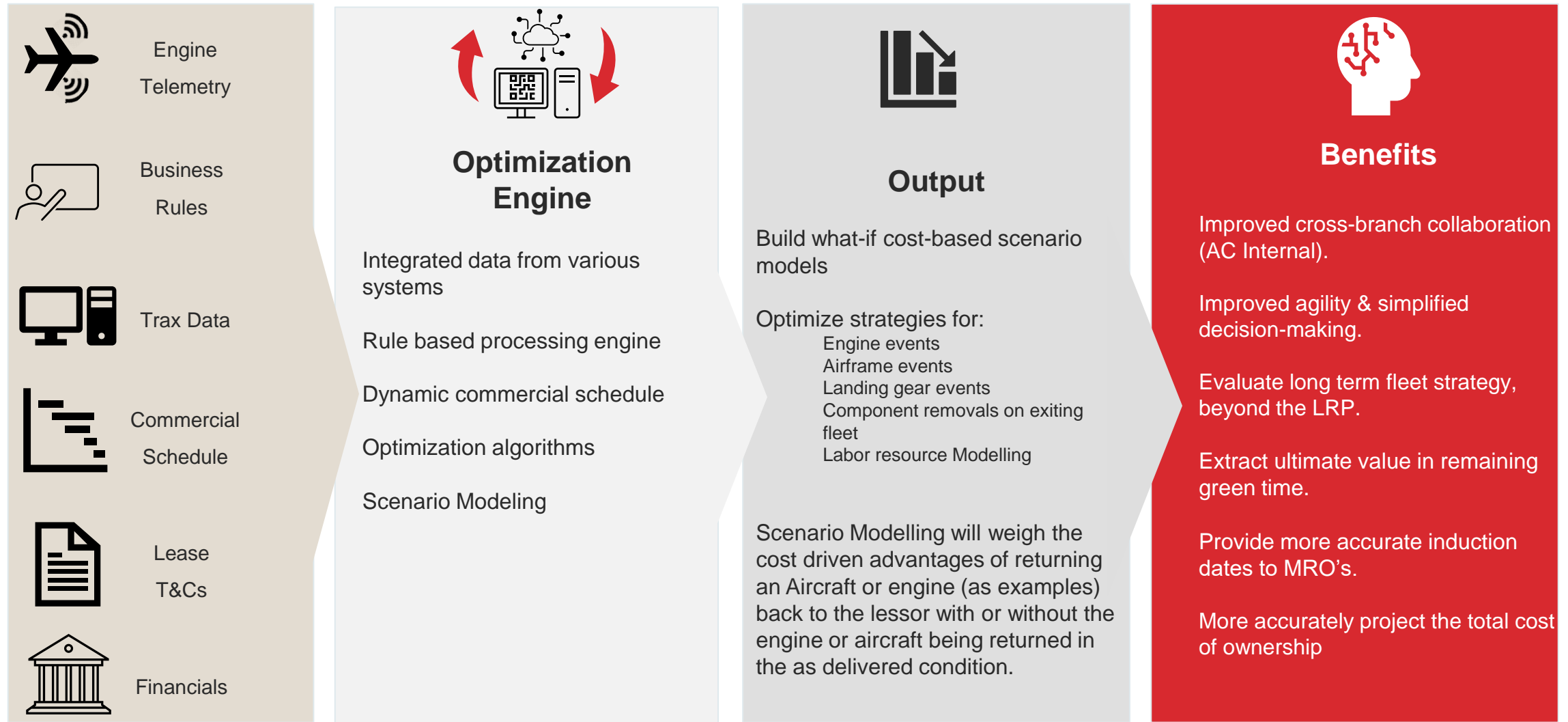


Never waste a good crisis

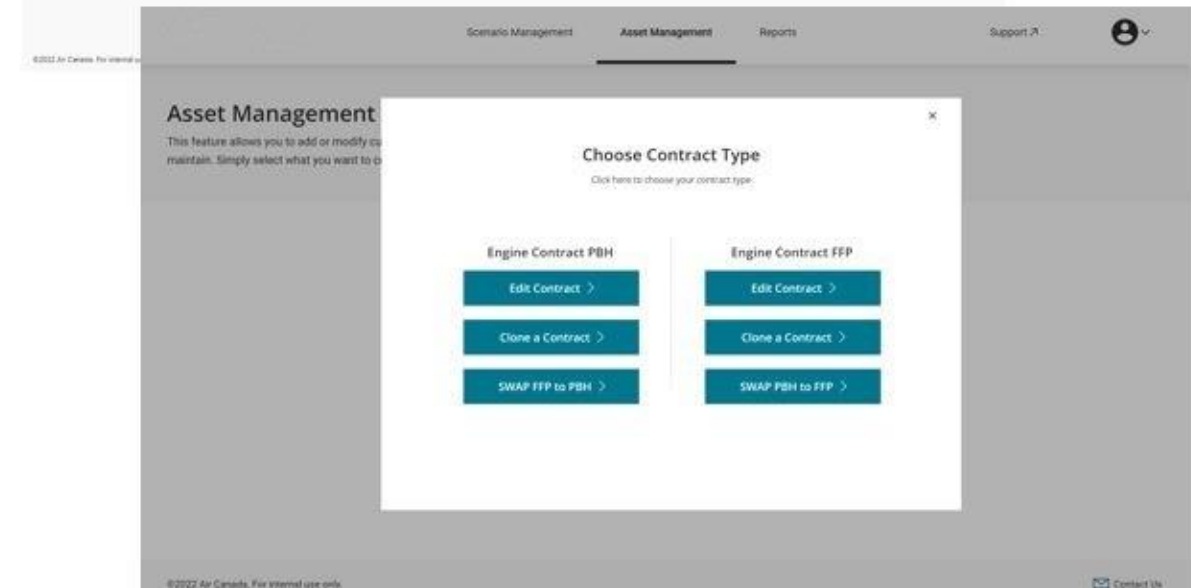
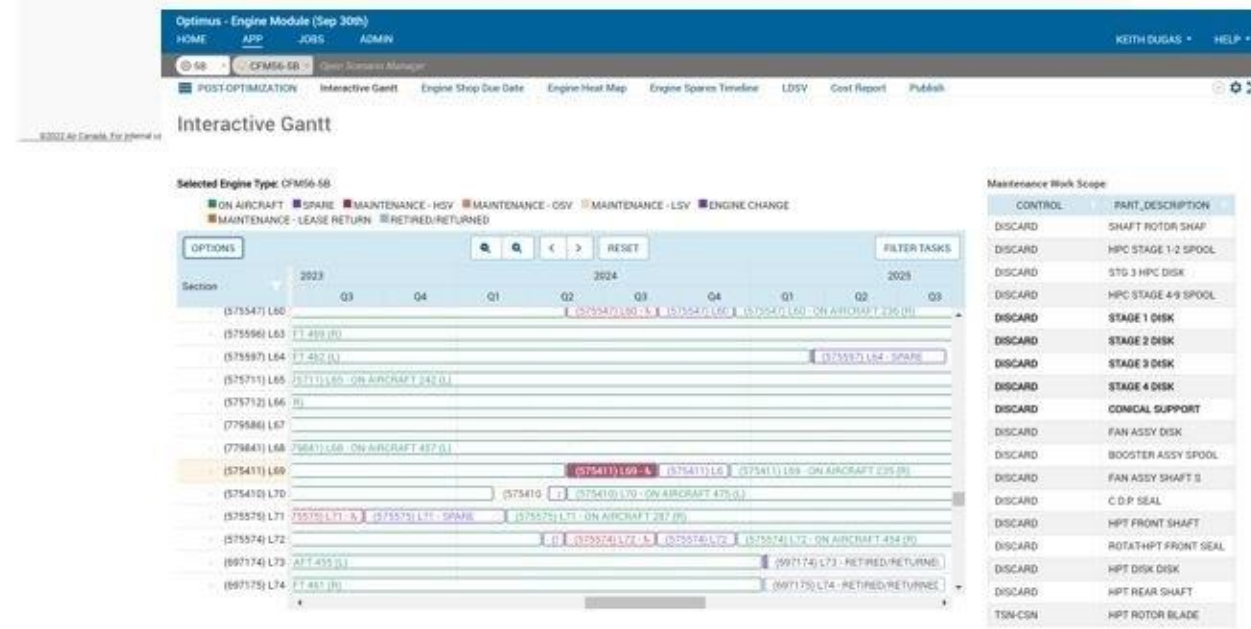
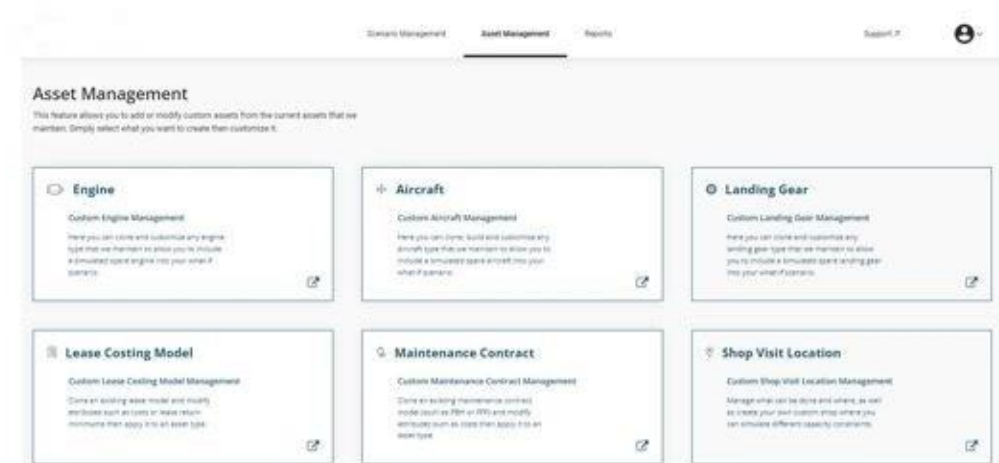
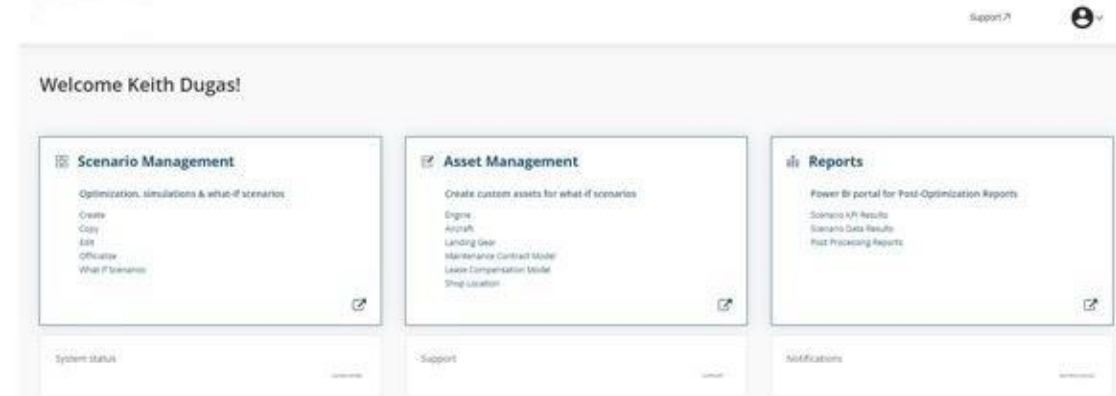
- Winston Churchill's infamous mis-quote



High-level Vision



Technology Stack = FICO Xpress, Plotly, Power BI, Transactional UI

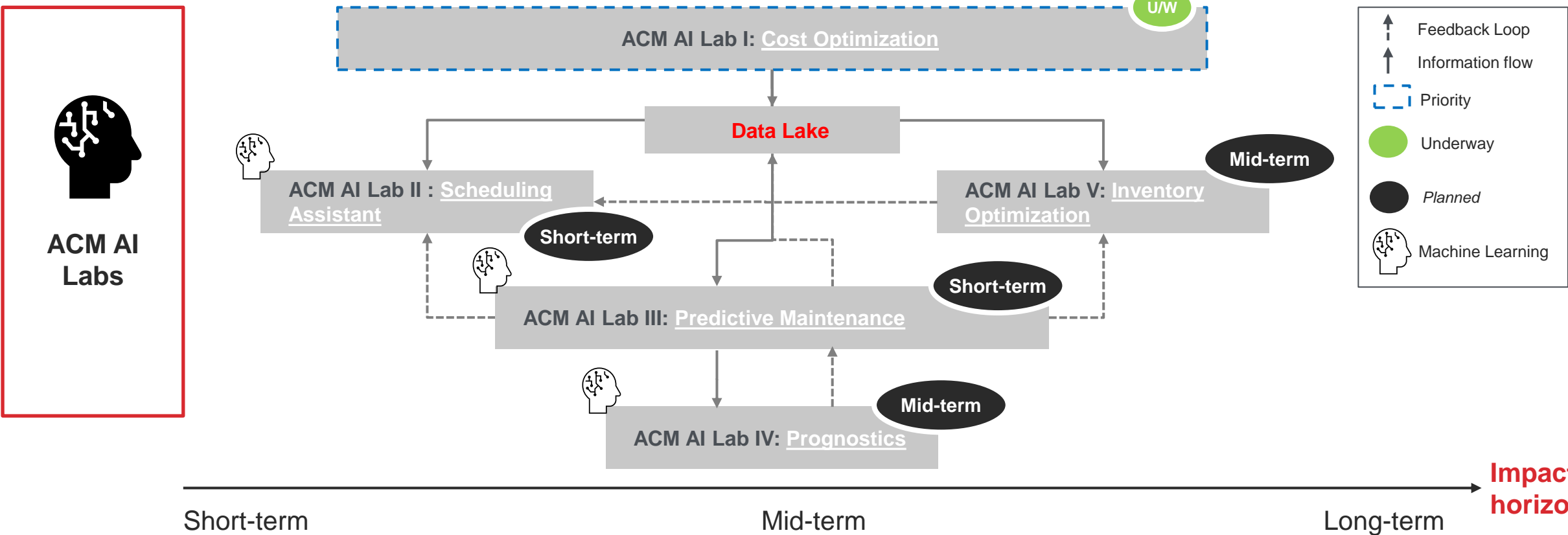


Building a foundation on the Economics of AI as it relates to Maintenance Costs

The Maintenance Cost Optimization models in our **Lab 1** will provide a solid foundation for the other AI labs.

Leading into combinatorial optimization, prediction machines, a prognostics app and augmenting our inventory optimization

Interdependency Map: understanding how different opportunities fit together



Gartner Report – AI Capability (Build vs Buy)

Figure 1. Build Versus Buy: A Use-Case View

Build Versus Buy: A Use-Case View



Source: Gartner
762137_C

Gartner

Quick Answer: How Should I Decide Whether to Build or Buy AI Capabilities?

Published 16 February 2022 · © G00762137 · 3 min read

Current Topic: Executive Leadership, Artificial Intelligence, Artificial Intelligence

Executive leaders must choose whether to build or buy artificial intelligence solutions as part of digital acceleration. Decide quickly whether to build or buy, including outsourced IT development AI solutions, with this sample flowchart.

Quick Answer:

How should I decide whether to build or buy artificial intelligence (AI) capabilities?

- Certify if the use case will make your organization unique and valuable. As its related product or product advances that gives you a defensive advantage within your industry demands you control its intellectual property (IP) to the greatest possible extent.
- Obtain a list of vendors who offer the solution you require based on capabilities required for current and future use cases. Vendor availability risk is a key factor. Choosing to buy from the only vendor who offers the product you need places you at unacceptable risk.
- Document the skill strategy that would allow you to harness the risk between buy and build strategy and opportunities. Without the skills to build, maintain and improve the product, you cannot build it and achieve success. Minimize technical debt where you can.

More Detail

In Figure 1, we sketch the three key decisions you must make – and the order in which we suggest you make them – as you decide whether to build or buy access to the AI-enabled application or feature you need.

Some generalizations may provide further guidance. We recommend that:

Source: Gartner, © 2022 G00762137

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Gartner





Thank you
Merci

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Appendix



Overview



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Overview is produced by:
Air Canada Corporate
Communications

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What's New

Air Canada's Global Network Restart Accelerates

As travel restrictions ease worldwide, people are ready to travel and Air Canada has expanded its international and North American networks. With the most seats and frequencies of any Canadian carrier and a schedule at 90% of its pre-pandemic North American capacity in Summer 2022, Air Canada's leadership and extensive network will stimulate the recovery of the travel and tourism industry.

DOMESTIC NETWORK

Air Canada serves every province and its domestic schedule includes service to 51 Canadian airports. New domestic flights from Montreal to Gander, Vancouver to Halifax, Vancouver to Quebec, Calgary to Quebec, and Calgary to Fort St. John begin summer 2022.

U.S. TRANSBORDER RESTART

Air Canada's proud tradition of being the largest foreign carrier in the U.S. is reflected in its transborder schedule with 94 routes, 46 U.S. airports and up to 438 daily flights between the two countries. New transborder flights from Montreal to Atlanta and Detroit, Toronto to Salt Lake City, and Vancouver to Austin begin in summer 2022.

INTERNATIONAL NETWORK RESTART

Air Canada expands its summer schedule with the recent service resumption announcement of 34 routes to Europe, Asia, Africa and The Middle East. The airline's international network extends to 67 airports from its Toronto, Montreal and Vancouver hubs, as well as from Calgary and Halifax, and 96 total routes.

a glance

Air Canada at

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Class A variable voting
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TRAVEL POLICY FOR BOOKING WITH COMPLETE CONFIDENCE

Air Canada's new refund policy applies to all tickets purchased. The airline offers options including a refund to the original form of payment, an Air Canada travel voucher or the equivalent in Aeroplan points plus an additional 65% bonus if Air Canada has to cancel a flight or change the schedule by more than three hours.

ARE YOU TRAVELLING ABROAD?


Passengers are responsible for making sure they meet all government entry requirements, including all required travel documents, visas, health certificates and comply with all other entry criteria.

Check Air Canada's [Travel Ready Hub](#)  for the most recent government entry requirements. Government requirements may change at short notice.

SCAN YOUR COVID-19 TRAVEL DOCUMENTS

Air Canada's digital solution is available on select routes through its mobile app for customers to securely upload and verify their COVID-19 test results. This feature will help travellers conveniently validate compliance with government health travel requirements prior to arriving at the airport.

New On-board Safety video

[Ode to Canada](#)  is Air Canada's new on-board pre-flight safety video that takes customers on a stunning journey across Canada from coast-to-coast-to-coast to each province and territory through all four seasons while presenting aircraft safety instructions in an compelling way.



In the community

Air Canada has been part of Canadians' lives and given back to communities across Canada for over 80 years. Established as a registered charitable organization in 2012, the Air Canada Foundation's mission is focused on the health and well-being of children and youth in Canada and on helping connect sick children to the medical care they need away from home, granting children's wishes and alleviating child poverty.

The Foundation works towards its mission by:

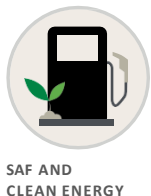
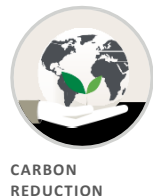
- Offering financial and in-kind support to Canadian registered charities.
- Donating Aeroplan points to 15 paediatric hospitals across Canada, enabling children to access the medical care they need away from home.
- Supporting employees' philanthropy in their local communities by providing airline tickets for charity fundraising.
- Raising funds through its Every Bit Counts program, which encourages customers to donate spare change of any denomination on board flights or through airport collection containers.
- Holding an annual golf tournament to raise funds; its ninth annual golf tournament in 2021 netted over \$765,000 in support of children's organizations.

The Air Canada Foundation also partners with Canadian NGOs in times of disaster, both locally and internationally, and supports major health-related causes.

Donate cash or Aeroplan points today at aircanada.com/foundation 


FLEET AND
OPERATIONS


INNOVATION


SAFE AND
CLEAN ENERGY

CARBON
REDUCTION
AND REMOVALS

Commits to Net Zero Emissions by 2050

Air Canada has committed to a net zero emissions goal from all global operations by 2050, demonstrating its long-term commitment to advancing climate change sustainability throughout its business. To reach this, Air Canada has set absolute midterm GHG net reduction targets by 2030 in its air and ground operations compared to its 2019 baseline.

Aeroplan

Air Canada's Aeroplan is Canada's leading travel loyalty program, chosen by millions of travellers worldwide. Aeroplan helps members travel more and offers the ability to earn or redeem points on all Air Canada flights as well as the world's largest airline partner network, encompassing over 40 airlines serving hundreds of destinations across the globe.

Members earn points with Aeroplan's 150+ financial, retail, and travel partners, including online shopping via the Aeroplan [eStore](#). In addition to flights, members also have access to an extensive range of merchandise, hotel and car rental rewards.

Aeroplan offers members exceptional benefits including obtaining flight rewards more quickly by combining points with Aeroplan Family Sharing, and saving on redemptions with no additional cash surcharges on Air Canada flights. Aeroplan's unique everyday partnerships with Uber Canada, Starbucks®, and LCBO enable members to earn points directly when making a purchase. Plus, Aeroplan Elite™ Status Members and eligible Aeroplan credit cardholders have access to additional benefits, such as preferred pricing on flight rewards, lounge access, and more.

aircanada.com/aeroplan



Air Canada Cargo Business

Air Canada Cargo, the freight division of Air Canada, provides services within Canada and to major cities around the world. In March 2020, it re-engineered its business model from primarily transporting cargo in the belly of passenger aircraft to launching cargo-only flights, including temporarily modifying several widebody aircraft to double cargo capacity. To date, over 14,000 cargo flights have been completed, playing a valuable role in maintaining the global supply chain by providing critical capacity that allows medical supplies, food and consumer goods to reach communities around the world.

In late 2021, the first dedicated Boeing 767-300ER freighter aircraft joined the Air Canada fleet to provide consistent capacity on key air cargo routes such as Toronto to Miami, Quito, Lima, Mexico City and Guadalajara, with more routes being added as additional aircraft enter service.

Air Canada Cargo's robust network connects through its main hubs in Toronto, Montreal and Vancouver.

aircanada.com/cargo





Air Canada CleanCare+

Air Canada is committed to end-to-end health and safety protocols. Using leading biosafety standards and enhanced preventive measures, the airline has refined its processes to keep customers safe throughout the travel experience, **putting safety first, always.**

Check-in

Health screening questions, touch-free check-in processes, and validation of health-related travel documentation pre-travel on select routes, as well as the disinfection of frequently touched areas such as check-in counters and kiosks, are just some of the measures implemented for customer safety.

Boarding

Ongoing cleaning at gate areas, regular health screening questions for all customers, adjusted boarding processes facilitating physical distancing and mandatory face coverings for all employees and customers are steps designed to protect everyone on board.

On board

All high-touch areas are sanitized with a hospital-grade disinfectant before every flight, and each time an aircraft overnights it receives a thorough cleaning. Additional preventive measures like mandatory face coverings, personal care kits and adjusted onboard services are also in place to better protect customers and employees.



Corporate Citizenship



"I feel proud to have supported our country and fellow Canadians during these unprecedented times. Working with the Red Cross gave me a chance to give back in a meaningful way." – Air Canada employee Ameena Youssef on working with the Canadian Red Cross in their fight against COVID-19

With the help of employees like Ameena and others, Air Canada supports communities in need across the country for various causes. This is one example of many other actions and accomplishments outlined in Air Canada's 2020 corporate sustainability report, [Citizens of the World](#).

As a global airline and as citizens of the world, Air Canada aims — in everything it does — to integrate economic, environmental, and social factors organized into three sustainability pillars: Our Business, Our People and Our Planet. (aircanada.com/CSR).



Principal Hubs

Air Canada's three hubs, Toronto (YYZ), the primary global hub, Montreal (YUL), a principal gateway to French and other international markets, and Vancouver (YVR), the airline's premier gateway to the Asia-Pacific, offer Air Canada customers convenient connections under one roof.

Fleet Renewal

Air Canada's fleet modernization program began in 2014 by adding next-generation, fuel efficient aircraft with industry leading customer amenities. The ultra-efficient 787 Dreamliners now comprise nearly 50 per cent of the wide body fleet and deliver an approximate 20 per cent improvement in fuel efficiency over the aircraft they replaced. The Airbus A220-300 (formerly known as the Bombardier C Series) and 737 MAX 8 aircraft feature similar product specs and in-flight entertainment as the 787 Dreamliner. They are also expected to average approximately 20 per cent less fuel consumption per seat and emit 20 per cent less CO₂ and 50 per cent less nitrogen oxides than the aircraft they replace.

Premium Offerings

Air Canada Signature Service is an end-to-end premium service with lie-flat seats, access to airport concierge services at many airports, expedited check-in and security clearance (where available), priority baggage handling and preferential boarding. Customers also enjoy Air Canada Maple Leaf Lounge pre-flight and access to the exclusive Air Canada Signature Suite.

Premium Economy cabin features enhanced comfort and amenities and is offered on all wide-body aircraft: 787 Dreamliners, Boeing 777-300ERs and -200LRs, and Airbus A330-300s.

Preferred Seats are offered in the Economy cabin for those who would like extra space between seats (up to 10 cm more) and convenience to board earlier and exit sooner on arrival.

The **Air Canada Signature Suite** has raised the bar with its five-star dining experience, setting a new standard for premium travel in North America. It is located in Terminal 1 at Toronto Pearson and at Vancouver International Airport for select Signature Service customers travelling to international destinations.

Maple Leaf Lounges are a comfortable way to relax or catch up on work before take-off with services and amenities to make the pre-flight experience more pleasurable and productive. Lounge services also offer several touchless features, including presentation of all reading materials in digital format through PressReader and our *AC @ La Table* menu ordering app that allows customers to order hot snacks directly from their seat by simply scanning a QR code or tapping an NFC chip.

Air Canada Café, at Toronto Pearson offers a wide selection of specialty beverages to grab and go or to be enjoyed with complimentary Wi-Fi in a relaxed, bistro-type setting.

Air Canada Concierge services at 50 airports worldwide are available to Aeroplan Super Elite Members and, on day of travel at the airport, to Signature Service customers. Concierges are an immediate resource in-person at select airports and by phone 24/7 for all travel and airport-related matters, personalized services and priority.





Culinary and Wine Talent

Air Canada's panel of celebrated Canadian culinary and wine talent have designed award-winning food and wine options that guide the airline's caterers.



Chef David Hawksworth
creates signature dishes with Canadian flair that are exclusively featured on Air Canada flights to Europe, Africa, and the Middle East in Signature Class and the Air Canada Signature Suite.



Chef Antonio Park
prepares destination-inspired menu that are presented on select Air Canada flights from Canada to Asia and South America, as well as in Signature Class – North America.



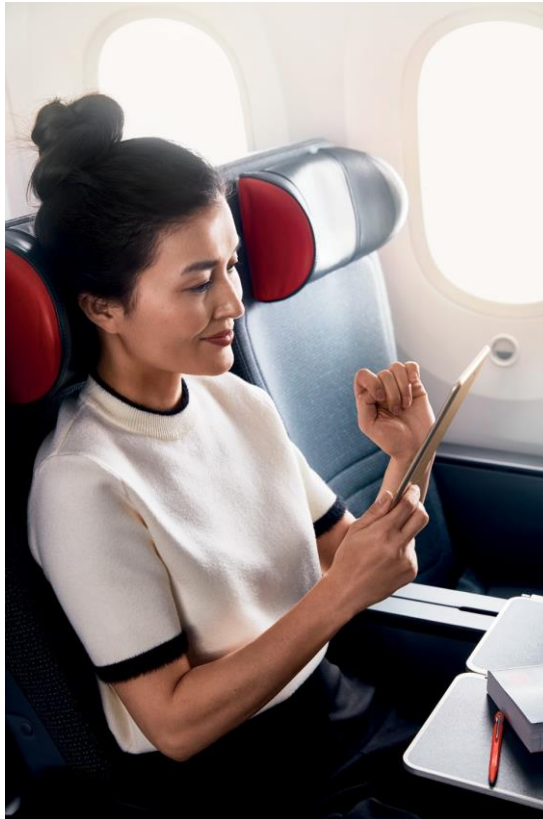
Chef Jérôme Ferrer
designs meals for the airline's Premium Economy and Economy Class customers on all flights departing Canada for Europe and Asia, as well as Australia and South America.



Chef Vikram Vij
creates modern Indian dishes for all cabins of service on Air Canada's Canada-India flights from Toronto and Vancouver.



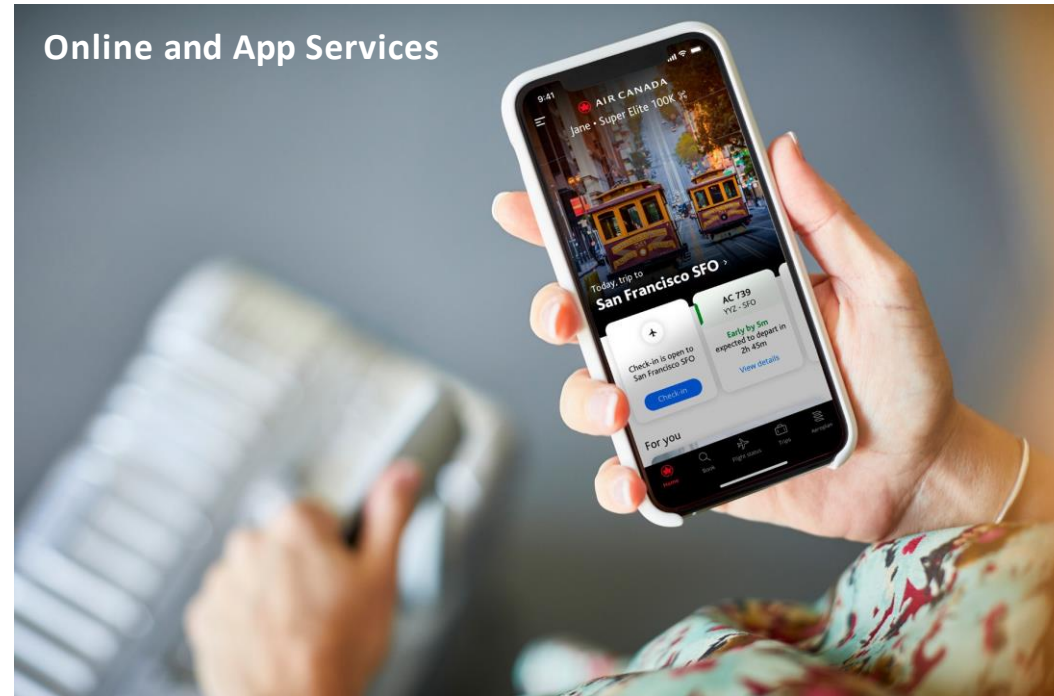
Sommelier Véronique Rivest
is Air Canada's sommelier. Her carefully hand-picked wines pair with food at 30,000 feet.



Wi-Fi

Air Canada offers Wi-Fi access on select North American, Caribbean and international flights. Customers can save by purchasing access before their flight or buy on board. With a Wi-Fi purchase, customers also receive complimentary access to 7,000+ magazines and newspapers through the PressReader app. Find out if Wi-Fi is available on your next flight: (aircanada.com/wifi)

Online and App Services



Book flights, car rentals and hotel stays as well as purchase gift cards, flight passes and more online.

Self-service features are available to modify itineraries and purchase upgrades.

Check-in and verify flight status 24 hours prior to departure and confirm your contact information. Kiosks at most airports provide self-service at airport arrival.

Stay in contact with real-time mobile app updates. You will also be automatically signed up to receive alerts including gate and time information.

Self-manage your itinerary during severe weather and irregular operations with the “Self-Service Rebooking Tool” and follow travel alerts at aircanada.com/operationaloutlook



Air Canada Rouge

Air Canada Rouge service includes complimentary streaming entertainment, a premium cabin, specialized customer service, high-speed satellite Internet on-board its Airbus A319, A320 and A321 fleet. With flights to leisure destinations in the U.S., the Caribbean and within Canada, Air Canada Rouge has served more than 30 million customers since launching on July 1, 2013.

Air Canada Express

Air Canada enhances its North American domestic and transborder network through a capacity purchase agreement with Jazz Aviation LP. This Canadian regional carrier operates flights on behalf of Air Canada under the Air Canada Express brand.



New Rouge Uniforms
(2021-09)




Specialized Services

Family Travel – Customers with young children may take advantage of dedicated check-in counters at major hubs, complimentary on-board travel goodies, fun children’s meal options, and early boarding. Customers can register their children for free online at Air Canada Skyriders to receive additional travel goodies.

aircanada.com/familytraveltips 

Air Canada Vacations is a leading Canadian tour operator, offering all-inclusive packages featuring accommodation, roundtrip airfare on board Air Canada, Air Canada Rouge, and its Star Alliance partners, Aeroplan flight rewards, as well as a wide assortment of cruises, tours and excursions. A repeat recipient of the *Travel Media Agents’* “Choice Award for Favourite Tour Operator,” Air Canada Vacations offers hundreds of destinations in the Caribbean, Mexico, Central and South America, Asia, Europe, and the U.S.


aircanadavacations.com 

Jetz is Air Canada’s premium charter aviation service provider delivering superior Business Class service to satisfy the travel needs of professional sports teams, entertainment groups, and corporate clients.

aircanada.com/jetz 

Awards

- In 2021, Air Canada was recognized for its people, products and services at the **2021 Skytrax World Airline Awards** with honours for: **Best Airline Staff in North America, Best Airline Staff in Canada, Best Business Class Lounge in North America, and Excellence for COVID-19.**
- In 2021, Air Canada received **APEX’s Diamond Status Certification** for the Air Canada CleanCare+ biosafety program for managing COVID-19, the only airline in Canada to attain the highest APEX ranking.
- Air Canada was named the **2018 Eco-Airline of the Year at the Air Transport World (ATW) 44th Annual Airline Industry Achievement Awards** for being the first airline in the world to voluntarily join the World Bank’s IMF Carbon Pricing Leadership Coalition.
- Air Canada is routinely at the top of employer awards, including **Forbes World’s Best Employers, Mediacorp’s Montreal Best Employers and Best Diversity Employers and Achiever’s Most Engaged Workplaces**, among others.

A black and white photograph of a TCA biplane on a grassy field. The plane is white with dark lettering. The wing has 'TCA' written on it, and the fuselage has 'CF-TS'. The tail has 'CF-1'. Two men are standing near the plane, one in a light shirt and dark pants, the other in a long coat and hat. A crowd of people is visible in the foreground, and a sign is on the right. The text 'First flight from Vancouver to Seattle' is overlaid in the top right.

First flight from
Vancouver to Seattle

September 1
1937

First airline to install
alcohol de-icing nozzles



1938

First trans-Atlantic flight,
Montreal to Prestwick



1943

TCA's
3 millionth
passenger

July
1950



Installation
of anti-skid
brakes

1950s



1960s



Introduction of jet aircraft

1963



Computerized reservation system

1965



Covered walkways



First female pilot,
Captain Judy Cameron

1977



2015



1988

Privatization of
Air Canada



First carrier to make its European flights non-smoking

1990s

Debut of
self-service
kiosks



Merger with Canadian Airlines



SARS



Hostile takeover bid



2000s

9-11



A collage celebrating Air Canada's 85th anniversary. The background features various historical and modern Air Canada uniforms and aircraft. In the top left, a woman in a 1940s-style uniform. In the top center, a man in a 1950s-style uniform. In the top right, a woman in a 1960s-style uniform. In the middle left, a man in a 1970s-style uniform. In the middle center, a woman in a 1980s-style uniform. In the middle right, a woman in a 1990s-style uniform. In the bottom left, two women in 1940s-style uniforms. In the bottom center, a woman in a 1950s-style uniform. In the bottom right, a woman in a 1960s-style uniform. The text "Celebrating 85 years" is overlaid in the center. The collage also includes images of Air Canada aircraft, including a DC-8 and a 737, and the Air Canada logo. The text "HSBC" is visible on the tail of the 737.

Celebrating 85 years

