

FLIGHT OPTIMIZATION:

THE SUSTAINABILITY AND COST REDUCTION BENEFITS OF OPTIMIZING COMMERCIAL FLIGHT PATHS

Today's commercial airlines are working to meet sustainability goals designed to help combat climate change. At the same time, the airlines' need to enhance profit margins creates a set of complex challenges for the aviation industry.

Thankfully, technologies on the market can help with these challenges – including a new generation of flight profile optimization tools that can increase sustainability while also creating cost saving. But before exploring the ways in which flight profile optimization tools impact an airline's carbon footprint and bottom line, we should explore why overcoming these challenges is so imperative for today's commercial airlines as well as the planet.

The Case for Cutting Carbon and Costs

In 2021, the International Air Transport Association (IATA) established a goal for the global air transport industry to be carbon-neutral by 2050. This has made reducing the amount of jet fuel burnt a priority for many airlines looking to reduce their carbon footprints.

By reducing fuel consumption, airlines can also position themselves to support the industry's carbon neutrality goals. And they can benefit in another way – by creating cost savings that can help with profitability, which for some airlines can be razor-thin.

According to IATA, in 2022, approximately 30 percent of a commercial airline's operating expenses were fuel costs. Thus, a commercial airline can potentially improve its bottom line by reducing the amount of fuel that it burns. This is important because the IATA projects that airlines will have a profit margin in the single digits (\$2.20 in profit per passenger) in 2023.

Technologies that can reduce fuel consumption can benefit both the environment and an airline's bottom line, and this is why adopting flight profile optimization tools is an attractive option for airlines across the commercial aviation industry.



Introducing FlightHub[™] Flight Profile Optimization (FPO)

Airlines looking to reduce their fuel consumption can do so almost immediately by simply flying routes that are optimized for fuel efficiency. One of the best ways to identify more efficient routes is with flight profile optimization (FPO) tools.

Flight profile optimization tools are advanced, real-time decision-making tools for flight crews, airline operators, ATM, and dispatchers designed to identify the most efficient flight paths between a departure airport and a destination airport.

These solutions function similarly to the wayfinding applications available for car drivers today – analyzing all available information and then making recommendations to the pilot. While the air traffic managers will ultimately make the final decision on flight path changes, the flight crews will need to review and validate any modifications as well.

But can solutions like flight profile optimization really deliver enough fuel savings to impact both the bottom line and the carbon footprint of a major commercial airline?

FPO by the Numbers

Flight plans can be lengthened significantly by forecasted storms and other severe weather phenomena, which in turn, impacts passenger experience.

Flight crews and dispatchers will often plan and file their projected flight paths well in advance, using weather data available at the filing time. However, the weather is constantly changing and shifting. This is especially true in the summer, when it can result in storms and other severe weather seemingly appearing out of nowhere, only to disappear just as quickly. This means that the flight plans submitted by pilots are often impacted by weather patterns and systems that may no longer exist when the flight

departs.

The Collins Aerospace FPO solution is designed to find the best route – the safest, most fuel-efficient, and potentially most cost-effective way – to deliver passengers from their point of departure to their destination. It does this by taking a number of factors into consideration, including air traffic, real-time weather information, and other data points.

By analyzing real-time, up-to-the-minute weather and flight data, FPO can alert pilots and dispatchers to weather and air traffic changes, making a more direct, more fuel-efficient flight path possible. These improved flight path options are delivered directly to the pilot's electronic flight folder (EFF) and available via their electronic flight bag (EFB) solution in the cockpit.

In this way, pilots can easily be proactively alerted to more fuel-efficient flight paths via the same EFB solution they leverage for all other flight applications and information and immediately make better, more fuel-efficient route decisions-and this increased efficiency can deliver significant results.





FPO Helps Deliver Cost and Sustainability Benefits

Collins Aerospace has witnessed its FPO solution reduce fuel consumption by up to 1,000 lbs. (approximately 150.9 gallons or 454 kg) per aircraft on certain flights of more than 2,100 nautical miles. This reduced fuel consumption would result in 7,000 fewer pounds of CO2 being released into the atmosphere per flight, and a cost savings of approximately \$439 per flight.

While those numbers may appear low, it's important to remember that airlines fly thousands of transcontinental flights per year. The savings can be impressive when extrapolated across an airline's annual flight schedule.

For example, if an airline were to fly 3,600 transcontinental flights per year, they could potentially recognize more than \$1.5 million in total cost savings at year-end by utilizing the Collins Aerospace FPO solution. They could also potentially keep more than 25 million pounds of CO2 from being released into the atmosphere.

But can FPO also deliver fuel savings when flights are traveling shorter distances?

Collins Aerospace has witnessed its FPO solution reduce fuel consumption by up to 498 lbs. (approximately 74.7 gallons) during mid-continental flights ranging from 750 – 1,500 nautical miles. This reduced fuel consumption would result in a \$217 savings per flight.

With many airlines operating more than 36,000 midcontinental flights per year, FPO could potentially deliver a total cost savings of more than \$7.8 million while keeping 125 million pounds of CO2 from entering the atmosphere.

Conclusion

While commercial airlines are benefiting from postpandemic travel demands, profit margins are always top of mind. As airlines look to improve profitability and deliver real value to shareholders, one method is to improve the management of operating expenses.

Collins' FlightHub FPO combined with its FlightHub EFF solutions can enable pilots to make better flight path decisions and help keep airline costs in check by reducing the amount of fuel they burn on every flight. It can also help airlines meet the aggressive carbon emissions goals that have been set for the industry.

With carbon reduction goals looming and airlines making just a few dollars in profit from each passenger, FPO is a solution that can help reduce the amount of CO2 entering the atmosphere and save millions of dollars for airlines by reducing the amount of fuel they burn on each flight.

While reviewing historical flight paths, I saw a map of one flight last summer from Seattle to Washington, D.C. The route from Seattle to D.C. should be a straight line, but this flight was more like a hockey stick because, to avoid a predicted storm, the plane flew to Georgia, and then turned north to travel up the coast to get to Washington, D.C. Not only did this flight path burn more fuel, but it required thousands of extra pounds of fuel to be loaded onto the flight, which then further impacted its fuel efficiency. This is a great example of where FPO could help."

-Jon Merritt, Collins Aerospace

