



ICAO

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North American, Central American and Caribbean Office

WORKING PAPER

NACC/DCA/11 — WP/11
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**Eleventh North American, Central American and Caribbean Directors of Civil Aviation Meeting
(NACC/DCA/11)**

Varadero, Cuba, 28-30 June 2023

**Agenda Item 4: NAM/CAR Regional Safety/Air Navigation Implementation
4.2 Air Navigation Implementation Matters**

NACC AIRSPACE OPTIMIZATION CONCEPT

(Presented by the Secretariat)

EXECUTIVE SUMMARY	
The Airspace Optimization Task Force has been active with CANSO and IATA in the optimization of the Regions' airspace. This paper will outline the goals and accomplishments of this effort thus far.	
Action:	Suggested Action is presented in Section 4
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Strategic Objective 1 – Safety• Strategic Objective 2 – Air Navigation Capacity and Efficiency• Strategic Objective 4 – Economic Development of Air Transport• Strategic Objective 5 – Environmental Protection
<i>References:</i>	<ul style="list-style-type: none">• Second Meeting of the Airspace Optimization Task Force (AO/TF/2), Fourth Meeting of the Air Traffic Flow Management Implementation Task Force (ATFM/TF/4) and Sixth Meeting of the CANSO IATA ICAO Free Route Airspace (CIIFRA/6) Team, (AO/TF/2/ATFM/TF/4/CIIFRA/6), 13 to 17 February 2023

1. Introduction

1.1 The Airspace Optimization Team developed through collaboration of CANSO, IATA and ICAO forming a team known as CANSO IATA ICAO Free Route Airspace Team (CIIFRA).

2. Plan

2.1 The CIIFRA Team came up with a two-pronged attack to take immediate advantage of "low hanging fruit" as well as systematic move towards Free Route Airspace.

Airspace Optimization CAR Region

North American, Central American and Caribbean Working Group (NACC/WG)
Air Space Optimization Task Force

Two-Pronged Attack

- End to End route Optimization
- User Preferred Route/Strategic Direct Routing
- Free Route Airspace



2.2 Track 1- Optimization of point-to-point routes via request by airlines then approval process by states. States asked to consider request and if unable to comply to do best they can. New route implemented in phased trials eventually going to 1 year. Once in 1 year trial period, the route will be put forth to be published and become a permanent option. There will be a 20 route limit in trial basis so the publishing of routes is vital in order to keep moving new routes into optimization. Savings are substantial as shown below:



The CANSO-IATA-ICAO Free Route Airspace (CIIFRA) Trial UPRs Benefit Data As of: January 12, 2023

Baseline Flight Plan Route vs Trial UPRs Reported Data Projected to 1-Year Savings	
Savings:	
Flight min	19,535 min
Fuel (lb)	3,806,672 lb
CO2 (kg)	6,273,658 kg
Cost (\$ USD)	\$ 3,260,444

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Track 2- UPR to SDR to FRA.

2.3 A trial **User Preferred Route (UPR)** - is ongoing between Atlanta and Lima. The airline is able to file the route that is most efficient on a daily basis without pre-coordination.

	Baseline vs UPR	
	12 Day	1 Year
Savings	116	3,528
Flight min:	12,479	379,570
Fuel (lb):	17,887	544,057
CO2 (kg):	15,325	466,138
Cost (\$):		

2.4 Strategic Direct Routing (SDR) – SDR allows users to plan a route using any named waypoints within a specified volume of airspace as long as the route complies with parameters set by the State. The parameters may include restrictions such as hours in which SDR rules apply, at or above altitude requirements and maximum distance between waypoints. Users must file flights via authorized (i.e., published) routes to the entry and exit point at the boundaries of the SDR airspace volume; that is, the SDR system only applies inside the defined volume of airspace. SDR is considered to be a transition to the implementation of the Free Route Airspace (FRA) concept.

2.5 Mexico has been testing SDR’s since October 2022. The trial is progressing well, initially started at or above FL290 between 0000L and 0600L for selected airlines. As the trial progressed, additional airlines were added to a current status of 13 airlines and Airlink Ambulance. In May, Mexican airspace was stratified into two volumes, CIIFRA Night Airspace, FL290-400 and CIIFRA 24H airspace at or above FL410 effective 24 hours a day 7 days a week.

2.6 A planned event will take place in Mexico City , Mexico from 25 to 29 September 2023, focusing on training Air Navigation Service Providers (ANSPs) on the process of implementing SDRs in their airspace and Navigation Services in the Mexican Airspace (SENEAM) will assist. Other areas in early stages of SDR implementation are San Juan and Trinidad and Tobago Civil Aviation Authority (TTCAA) in PIARCO.

2.7 1 Year Savings End to End Optimization/UPR and SDR

	All phases included
Savings:	
Flight min	31,448 min=33 round trips KATL-SPJC
Fuel (lb)	4,694,076 lb
CO2 (kg)	8,414,360 kg= 20,774,678 miles driven by average car*
Cost (\$ USD)	\$ 4,950,953

3. Future

3.1 The move to FRA will require an analysis of ANSPs and their ability to support it. The Optimization Team has asked the Air Navigation Services (ANS) Task Forces to begin looking into how to support the ANSPs in this endeavour. Here are some areas that were addressed at the Second Meeting of the Airspace Optimization Task Force (AO/TF/2), Fourth Meeting of the Air Traffic Flow Management Implementation Task Force (ATFM/TF/4) and Sixth Meeting of the CANSO IATA ICAO Free Route Airspace (CIIFRA/6) Team, (AO/TF/2/ATFM/TF/4/CIIFRA/6), held at the IATA Americas Regional Office, Miami, United States, from 13 to 17 February 2023.

3.2 Air Traffic Flow Management (ATFM)

- Availability of ATFM Tactical Resources
- Common ATFM procedures and terminology (Doc 9971)
- Data Sharing amongst all stakeholders (Agreement & Implementation)
 - Letters of Agreement (LoAs)
- Data Driven Approach
 - Set Measurable Targets (Key Performance Indicators (KPIs))
- Real time Airport /Sector Capacity display
- Post event review

3.3 Aeronautical Meteorology (MET)

- Standardized Weather Reports
 - Volcanic Ash
 - Concentration Charts
 - METAR Ash Report Accuracy and Standardization
 - Airport Contingency Procedures i.e., Ash contamination Assessment/Removal
- Weather forecast and updates given from an aviation perspective
- Space Weather
- Special Weather Report Requirements for Temperature (Aeronautical special meteorological report (SPECI))
- Digital Automatic terminal information service (ATIS)
- Turbulence, Icing reports

3.4 Aerodromes and Ground Aids (AGA)

- Analysis/inputs for airport planning and design.
 - Airports master planning Air Traffic Management (ATM) inputs.
 - Airports Coordinate construction/maintenance projects
 - Airport Airside/Landside balance and harmonization
- High speed taxi/exits.
- Utilizing airports for Collaborative Decision Making(CDM) (ATFM-CDM).
- Collaboration Technical/Operational details
 - Lighting and Ground Aids (Approach)
 - Ongoing Obstacle Analysis
 - Pavement Classification Number (PCN) Value

3.5 Communications, Navigation and Surveillance (CNS)

- Synchronize and Harmonize Communication and Surveillance
- Surveillance data sharing/redundancy for surveillance and communications.
- Regional Gap Analysis
- Network communication for Air Traffic Services (ATS)

- Explore alternative technologies i.e., Space-based Very High Frequency (VHF)
- Estimates or CPL information for traffic in FRA
- Capability of ATM systems
- Digital ATIS

3.6 Aeronautical Information Management (AIM)

- Enhancing Aeronautical information regulation and control (AIRAC) publishing cycles
- Make publications digital
 - Publication of Electronic Flight Procedures
 - Cost of AIPs
- Electronic Terrain and Obstacle Data (e-TOD)
- Flight Planning Reject (REJ) (Format)/Flight and flow - information for a collaborative environment (FF-ICE) Update (Air Traffic Services Inter-facility Data Communication Task Force (AIDC-TF))

4. **Suggested Action.**

4.1 The Meeting is invited to consider the accomplishments achieved thus far and continue to support the effort through participation of ANSP Representatives to achieve FRA which is called for in ICAO Aviation System Block Upgrade (ASBU) Free Route Operations (FRO)-B1.